

Definitive Interconnection
System Impact Study for
Generation Interconnection
Requests
(DISIS-2013-001-1)

August 2013

Generator Interconnection

Revision History

Date	Author	Change Description
07/31/2013	SPP	Report Issued (DISIS-2013-001) – Group 6 Interconnection Requests not included in this issue.
08/30/2013	SPP	Group 6 Interconnection Requests results appended and NRIS withdrawals accounted, Report Re-Posted (DISIS-2013-001-1)

Executive Summary

Generation Interconnection customers have requested a Definitive Interconnection System Impact Study (DISIS) under the Generation Interconnection Procedures (GIP) in the Southwest Power Pool Open Access Transmission Tariff (OATT). The Interconnection Customers' requests have been clustered together for the following System Impact Cluster Study window which closed March 31, 2013. The customers will be referred to in this study as the DISIS-2013-001 Interconnection Customers. This System Impact Study analyzes the interconnecting of multiple generation interconnection requests associated with new generation totaling approximately 1,689.5 MW of new generation which would be located within the transmission systems of American Electric Cooperative Corporation (AEPW), Lincoln Electric System (LES), Nebraska Public Power District (NPPD), Oklahoma Gas and Electric (OKGE) Omaha Public Power District (OPPD), Southwestern Public Service (SPS), and Sunflower Electric Power Corporation/Mid-Kansas Electric Power LLC (SUNC)/(MKEC). The various generation interconnection requests have differing proposed in-service dates¹. The generation interconnection requests included in this System Impact Cluster Study are listed in Appendix A by their queue number, amount, requested interconnection service, area, requested interconnection point, proposed interconnection point, and the requested in-service date.

Power flow analysis has indicated that for the power flow cases studied, 1,689.5 MW of nameplate generation may be interconnected with transmission system reinforcements within the SPP transmission system. Dynamic stability and power factor analysis has determined the need for reactive compensation in accordance with FERC Order #661A for wind farm interconnection requests and those requirements are listed for each interconnection request within the contents of this report. Dynamic stability analysis has determined that the transmission system will remain stable with the assigned Network Upgrades and necessary reactive compensation requirements.

In no way does this study guarantee operation for all periods of time. This interconnection study identifies and assigns transmission reinforcements for Energy Resource (ER) interconnection injection constraints (defined as a 20% distribution factor impact) and Network Resource (NR) constraints if requested by the Customer. This interconnection study does not assign transmission reinforcements for all potential transmission constraints. It should be noted that although this study analyzed many of the most probable contingencies, it is not an all-inclusive list and cannot account for every operational situation. Because of this, it is likely that the Customer(s) may be required to reduce their generation output to 0 MW, also known as curtailment, under certain system conditions to allow system operators to maintain the reliability of the transmission network.

¹ The generation interconnection requests in-service dates will need to be deferred based on the required lead time for the Network Upgrades necessary. The Interconnection Customers that proceed to the Facility Study will be provided a new in-service date based on the Facility Study's time for completion of the Network Upgrades necessary.

The total estimated minimum cost for interconnecting the DISIS-2013-001 Interconnection Customers is estimated at \$633,043,530.00. These costs are shown in Appendix E and F. Interconnection Service to DISIS-2013-001 Interconnection Customers is also contingent upon higher queued customers paying for certain required network upgrades. **The in-service date for the DISIS customers will be deferred until the construction of these network upgrades can be completed.**

These costs do not include the Interconnection Customer Interconnection Facilities as defined by the SPP Open Access Transmission Tariff (OATT). This cost does not include additional network constraints in the SPP transmission system identified and shown in Appendix H.

Network constraints listed in Appendix H are in the local area of the new generation when this generation is injected throughout the SPP footprint for Energy Resource Interconnection Service (ERIS) requests. Certain Interconnection Requests were also studied for Network Resource Interconnection Service (NRIS). Those constraints are also listed in Appendix H. Additional network constraints will have to be verified with a Transmission Service Request (TSR) and associated studies. With a defined source and sink in a TSR, this list of Network Constraints will be refined and expanded to account for all Network Upgrade requirements.

The required interconnection costs listed in Appendix E and F do not include all costs associated with the deliverability of the energy to final customers. These costs are determined by separate studies if the Customer submits a Transmission Service Request through SPP's Open Access Same Time Information System (OASIS) as required by Attachment Z1 of the SPP OATT.

Table of Contents

Introduction.....	1
Model Development	2
Identification of Network Constraints.....	6
Determination of Cost Allocated Network Upgrades.....	6
Required Interconnection Facilities	7
Power Flow Analysis	7
Stability Analysis.....	12
Conclusion	17
Appendices	18
A: Generation Interconnection Requests Considered for Impact Study.....	A0
B: Prior Queued Interconnection Requests.....	B0
C: Study Groupings	#0
D: Proposed Point of Interconnection One Line Diagrams	D0
E: Cost Allocation per Interconnection Request (Including Prior Queued Upgrades)	E0
F: Cost Allocation per Proposed Study Network Upgrade	F0
G: Power Flow Analysis (Constraints Used For Mitigation).....	G0
H: Power Flow Analysis (Other Constraints Not Requiring Mitigation)	H0
I: Power Flow Analysis (Constraints from Category C Contingencies)	I0
J: Group 1 Dynamic Stability Analysis Report.....	J0
K: Group 3 Dynamic Stability Analysis Report	K0
L: Group 5 Dynamic Stability Analysis Report	L0
M: Group 6 Dynamic Stability Analysis Report.....	M0
N: Group 8 Dynamic Stability Analysis Report	N0
O: Group 9 Dynamic Stability Analysis Report	O0
P: Group 12 Dynamic Stability Analysis Report.....	P0
Q: Group 14 Dynamic Stability Analysis Report	Q0

Introduction

Pursuant to the Southwest Power Pool (SPP) Open Access Transmission Tariff (OATT), SPP has conducted this Definitive Interconnection System Impact Study (DISIS) for certain generation interconnection requests in the SPP Generation Interconnection Queue. These interconnection requests have been clustered together for the following System Impact Study window which closed March 31, 2013. The customers will be referred to in this study as the DISIS-2013-001 Interconnection Customers. This DISIS analyzes the interconnecting of multiple generation interconnection requests associated with new generation totaling 1,689.5 MW which would be located within the transmission systems of American Electric Cooperative Corporation (AEPW), Lincoln Electric System (LES), Nebraska Public Power District (NPPD), Oklahoma Gas and Electric (OKGE) Omaha Public Power District (OPPD), Southwestern Public Service (SPS), and Sunflower Electric Power Corporation/Mid-Kansas Electric Power LLC (SUNC)/(MKEC). The various generation interconnection requests have differing proposed in-service dates². The generation interconnection requests included in this System Impact Study are listed in Appendix A by their queue number, amount, requested interconnection service, area, requested interconnection point, proposed interconnection point, and the requested in-service date.

The primary objective of this DISIS is to identify the system constraints associated with connecting the generation to the area transmission system. The Impact Study and other subsequent Interconnection Studies are designed to identify required interconnection facilities, Network Upgrades and other Direct Assignment Facilities needed to accept power into the grid at each specific interconnection receipt point.

² The generation interconnection requests in-service dates will need to be deferred based on the required lead time for the Network Upgrades necessary. The Interconnection Customers that proceed to the Facility Study will be provided a new in-service date based on the completion of the Facility Study.

Model Development

Interconnection Requests Included in the Cluster

SPP has included all interconnection requests that submitted a Definitive Interconnection System Impact Study Agreement no later than March 31, 2013 and were subsequently accepted by Southwest Power Pool under the terms of the Generator Interconnection Procedures (GIP). The interconnection requests that are included in this study are listed in Appendix A.

Affected System Interconnection Request

Also included in this Definitive Interconnection System Impact Study are three Affected System Studies. The Affected System Study Requests have been given the designations: ASGI-2013-001 (11.5MW, Point of Interconnection is PanTex South 115kV), ASGI-2013-002 (18.4 MW, Point of Interconnection is Farmers Electric Tucumcari 115kV), and ASGI-2013-003 (18.4 MW, Point of Interconnection is Farmers Electric Clovis 115kV). ASGI-2013-001 is located on a Customer distribution voltage bus served by the Southwestern Public Service Transmission System. ASGI-2013-001 was studied in Group 5 (Amarillo Area), ASGI-2013-002 and ASGI-2013-003 was studied in Group 6 (southern Texas Panhandle).

Previously Queued Interconnection Requests

The previous queued requests included in this study are listed in Appendix B. In addition to the Base Case Upgrades, the previous queued requests and associated upgrades were assumed to be in-service and added to the Base Case models. These projects were dispatched as Energy Resources with equal distribution across the SPP footprint. Prior queued projects that requested Network Resource Interconnection Service (NRIS) were dispatched in an additional analysis into the balancing authority of the interconnecting transmission owner.

Development of Base Cases

Power Flow

The 2012 series Transmission Service Request (TSR) Models 2013 spring, 2014 summer and winter peak, and the 2018 summer and winter peak, and 2023 summer peak scenario 0 cases were used for this study. After the cases were developed, each of the control areas' resources were then re-dispatched to account for the new generation requests using current dispatch orders.

Dynamic Stability

The 2012 series SPP Model Development Working Group (MDWG) Models 2013 winter, 2014 summer, and 2023 summer peak cases were used as starting points for this study.

Base Case Upgrades

The following facilities are part of the SPP Transmission Expansion Plan, the Balanced Portfolio or recently approved Priority Projects. These facilities have an approved Notification to Construct (NTC) or are in construction stages and were assumed to be in-service at the time of dispatch and added to the base case models. The DISIS-2013-001 Interconnection Customers have not been assigned acceleration costs for the below listed projects. The DISIS-2013-001 Interconnection Customers Generation Facilities in service dates may need to be delayed until the completion of

the following upgrades. If for some reason, construction on these projects is discontinued, additional restudies will be needed to determine the interconnection needs of the DISIS Interconnection Customers.

- **Balanced Portfolio Projects³:**
 - Woodward – Border – TUCO 345kV project, scheduled for 5/19/2014 in-service
 - Woodward 345/138kV circuit #2 autotransformer
 - TUCO 345/138kV circuit #2 autotransformer
 - Reactors at Woodward and Border
 - Iatan – Nashua 345kV, scheduled for 6/1/2015 in-service
 - Nashua 345/161kV autotransformer
 - Muskogee – Seminole 345kV, scheduled for 12/31/2013 in-service
- **Priority Projects⁴:**
 - Hitchland – Woodward double circuit 345kV, scheduled for 6/30/2014 in-service
 - Hitchland 345/230kV circuit #2 autotransformer
 - Woodward – Thistle double circuit 345kV, scheduled for 12/31/2014 in-service
 - Spearville – Clark County double circuit 345kV, scheduled for 12/31/2014 in-service
 - Clark County – Thistle double circuit 345kV, scheduled for 12/31/2014 in-service
 - Thistle – Wichita double circuit 345kV, scheduled for 12/31/2014 in-service
 - Thistle 345/138kV autotransformer, scheduled for 12/31/2014 in-service
 - Thistle – Flat Ridge 138kV, scheduled for 12/31/2014 in-service
- Sheldon – SW 7th and Pleasant Hill 115kV circuit #2 rebuild, scheduled for 7/31/2013 in-service⁵
- Hays – South Hays 115kV line rebuild, scheduled for 6/1/2015 in-service⁶
- Arcadia – Redbud 345kV circuit #1 and #2 terminal equipment replacement, scheduled for 11/17/2013 in-service⁷

Contingent Upgrades

The following facilities do not yet have approval. These facilities have been assigned to higher queued interconnection customers. These facilities have been included in the models for the DISIS-2013-001 study and are assumed to be in service. This list may not be all inclusive. The DISIS-2013-001 Interconnection Customers, at this time, do not have responsibility for these facilities but may later be assigned the cost of these facilities if higher queued customers terminate their Generation Interconnection Agreement or withdraw from the interconnection queue. The DISIS-2013-001 Interconnection Customer Generation Facilities in-service dates may need to be delayed until the completion of the following upgrades.

³ Notification to Construct (NTC) issued June 2009

⁴ Notification to Construct (NTC) issued June 2010

⁵ SPP Regional Reliability 2012 ITPNT Project Per SPP-NTC-200171

⁶ SPP Regional Reliability 2013 ITPNT Project Per SPP-NTC-200210

⁷ SPP Regional Reliability 2013 ITPNT Project Per SPP-NTC-200204

- Upgrades assigned to ICS-2008-001 Interconnection Customers
 - Amarillo South – Swisher 230kV replace line traps
 - Finney-Holcomb 345kV circuit #2 build
- Upgrades assigned to DISIS-2009-001 Interconnection Customers:
 - Fort Dodge – North Fort Dodge – Spearville 115kV circuit #2 build
 - Fort Randall – Madison County – Kelly 230kV circuit #1 rerate (320MVA)
 - Spearville 345/115kV autotransformer circuit #1 build
- Upgrades assigned to DISIS-2010-001 Interconnection Customers:
 - Switch 2749 – Wildorado 69kV circuit # 1 rebuild
- Upgrades assigned to DISIS-2010-002 Interconnection Customers:
 - Twin Church – Dixon County 230kV circuit #1 rerate (320MVA)
- Upgrades assigned to DISIS-2011-001 Interconnection Customers:
 - Beaver County – Buckner 345kV circuit #1 build
 - Beaver County 345kV Expansion (Tap & Tie Hitchland – Woodward circuit #2 into Beaver County 345kV)
 - Spearville – Mullergren – Reno double circuit 345kV build
 - Tatonga – Matthewson - Cimarron 345kV circuit #2 build
 - Tatonga terminal equipment upgrade (1792 MVA)
 - Hoskins – Dixon County – Twin Church 230kV circuit #1 conductor clearance increase
 - (NRIS only) Spearville – Mullergren 230kV circuit #1 rebuild
 - (NRIS only) FPL Switch – Woodward - Mooreland 138kV circuit #1 rebuild
 - (NRIS only) Woodward – Woodward EHV 138kV rebuild
 - (NRIS only) Woodward 138/69kV auto replacement
 - (NRIS only) Woodward (OGE) – Woodward (WFEC) 69kV rebuild
- Upgrades assigned to DISIS-2011-002 interconnection Customers:
 - Amoco Wasson – Oxy Tap – Yoakum 230kV circuit #1 replace line traps
 - Harbine – Crete 115kV circuit #1 build
 - Jones – Lubbock South 230kV circuit #2 replace line traps
 - Power System Stabilizers - Install Power System Stabilizers @ Tolk(Units: 1,2) and Jones (Units: 1,2,3,4)
 - Mustang – Yoakum 230kV circuit #1 replace line traps
 - West Brock – SUB 967 – SUB 968 – SUB 969 – SUB 974 69kV circuit #1 replace terminal equipment
 - (NRIS only) Allen – Lubbock South 115kV circuit #1 rebuild
 - (NRIS only) Hydro Carbon Tap - Sub974 69kV circuit #1 rewire CT
 - (NRIS only) Lubbock South 230/115kV Autotransformer build circuit #2
 - (NRIS only) Nebraska City U Syracuse – SUB 970 circuit #1 replace terminal equipment
 - (NRIS only) Benton – Wichita 345kV circuit #1 rerate (1195MVA)
 - (NRIS only) Chisholm – Maize – Evans Energy Center 138kV circuit #1 rebuild
 - (NRIS only) Duncan – Tosco – Comanche Tap 69kV rebuild
 - (NRIS only) Yoakum 230/115kV transformer circuit #1 and #2 replacements
- Upgrades assigned to DISIS-2012-001 interconnection Customers:
 - Holcomb 345/115/13.8kV Transformer circuit #2 build
 - Denver North – Mustang 115kV circuit #1 rebuild
 - Denver South – Mustang 115kV circuit#1 rebuild
- Upgrades assigned to DISIS-2012-002 interconnection Customers:
 - Dixon County – Rasmussen (WAPA) 230kV circuit #1 build
 - Lake Creek – Lone Wolf 69kV circuit #1 reset CT
 - Remington – Fairfax 138kV circuit #1 conductor clearance increase

- TUCO Interchange 345/230/13.2kV Autotransformer circuit #3 build⁸

Potential Upgrades Not in the Base Case

Any potential upgrades that do not have a Notification to Construct (NTC) and not explicitly listed within this report have not been included in the base case. These upgrades include any identified in the SPP Extra-High Voltage (EHV) overlay plan, or any other SPP planning study other than the upgrades listed above in the previous section.

Regional Groupings

The interconnection requests listed in Appendix A were grouped together into twelve active regional groups based on geographical and electrical impacts. These groupings are shown in Appendix C.

To determine interconnection impacts, fifteen different generation dispatch scenarios of the spring base case models were developed to accommodate the regional groupings.

Power Flow

For each group, the various wind generating plants were modeled at 100% nameplate of maximum generation. The other wind generating plants in each area were modeled at 80% nameplate while the wind generating plants in the other areas were modeled at 20% nameplate of maximum generation. These projects were dispatched as Energy Resources with a load factor by area distribution across the SPP footprint. Certain projects that requested Network Resource Interconnection Service were dispatched in an additional analysis into the balancing authority of the interconnecting transmission owner. This method allowed for the identification of network constraints that were common to the regional groupings that could then in turn have the mitigating upgrade cost allocated throughout the entire cluster. Other sensitivity analyses are also performed with all interconnection requests in each group being dispatched at 100% nameplate.

Peaking units were not dispatched in the 2013 spring model. To study peaking units' impacts, the 2014 summer and winter and 2018 summer and winter, and 2023 summer seasonal models were chosen and peaking units were modeled at 100% of the nameplate rating and wind generating facilities were modeled at 10% of the nameplate rating. Each interconnection request was also modeled separately at 100% nameplate for certain analyses.

Dynamic Stability

For each group, all interconnection requests were studied at 100% nameplate output while the other groups were dispatched at 20% output for wind requests and 100% output for thermal requests.

⁸ TUCO Interchange 345/230/13.2kV Autotransformer circuit #3 might require a new substation adjacent or close to the existing TUCO Interchange substation.

Identification of Network Constraints

The initial set of network constraints were found by using PSS®MUST First Contingency Incremental Transfer Capability (FCITC) analysis on the entire cluster grouping dispatched at the various levels mentioned above. These constraints were then screened to determine if any of the generation interconnection requests had at least a 20% Distribution Factor (DF) upon the constraint.

Constraints that measured at least a 20% DF from at least one interconnection request were considered for mitigation. Interconnection Requests that have requested Network Resource Interconnection Service (NRIS) were also studied in the NRIS analysis to determine if any constraint had at least a 3% DF. If so, these constraints were also considered for mitigation.

Determination of Cost Allocated Network Upgrades

Cost Allocated Network Upgrades of wind generation interconnection requests were determined using the 2013 spring model. Cost Allocated Network Upgrades of peaking units was determined using the 2018 summer peak model. A PSS®MUST sensitivity analysis was performed to determine the Distribution Factors (DF), a distribution factor with no contingency that each generation interconnection request had on each new upgrade. The impact each generation interconnection request had on each upgrade project was weighted by the size of each request. Finally the costs due by each request for a particular project were then determined by allocating the portion of each request's impact over the impact of all affecting requests.

For example, assume that there are three Generation Interconnection requests, X, Y, and Z that are responsible for the costs of Upgrade Project '1'. Given that their respective PTDF for the project have been determined, the cost allocation for Generation Interconnection request 'X' for Upgrade Project 1 is found by the following set of steps and formulas:

- Determine an Impact Factor on a given project for all responsible GI requests:

$$\text{Request X Impact Factor on Upgrade Project 1} = \text{PTDF}(X) * \text{MW}(X) = X1$$

$$\text{Request Y Impact Factor on Upgrade Project 1} = \text{PTDF}(Y) * \text{MW}(Y) = Y1$$

$$\text{Request Z Impact Factor on Upgrade Project 1} = \text{PTDF}(Z) * \text{MW}(Z) = Z1$$

- Determine each request's Allocation of Cost for that particular project:

$$\text{Request X's Project 1 Cost Allocation (\$)} = \frac{\text{Network Upgrade Project 1 Cost(\$)} * X1}{X1 + Y1 + Z1}$$

- Repeat previous for each responsible GI request for each Project

The cost allocation of each needed Network Upgrade is determined by the size of each request and its impact on the given project. This allows for the most efficient and reasonable mechanism for sharing the costs of upgrades.

Credits for Amounts Advanced for Network Upgrades

Interconnection Customer shall be entitled to credits in accordance with Attachment Z2 of the SPP Tariff for any Network Upgrades including any tax gross-up or any other tax-related payments associated with the Network Upgrades, and not refunded to the Interconnection Customer.

Required Interconnection Facilities

The requirement to interconnect the 1,689.5 MW of generation into the existing and proposed transmission systems in the affected areas of the SPP transmission footprint consist of the necessary cost allocated shared facilities listed in Appendix F by upgrade. The interconnection requirements for the cluster total an estimated \$633,043,530.00. Interconnection Facilities specific to each generation interconnection request are listed in Appendix E. A preliminary one-line drawing for each generation interconnection request are listed in Appendix D.

A list of constraints that were identified and used for mitigation are listed in Appendix G. Listed within Appendix G are the ERIS constraints with greater than or equal to a 20% DF, as well as, the NRIS constraints that have a DF of 3% or greater. Other Network Constraints which are not requiring mitigation are shown in Appendix H. With a defined source and sink in a TSR, this list of Network Constraints will be refined and expanded to account for all Network Upgrade requirements. Additional constraints identified by NERC category “C” contingencies are listed in Appendix I.

Power Flow Analysis

Power Flow Analysis Methodology

The ACCC function of PSS®E was used to simulate single element and special (i.e., breaker-to-breaker, multi-element, etc) contingencies in portions or all of the modeled control areas of SPP, as well as, other control areas external to SPP and the resulting scenarios analyzed. NERC Category “B” and “C” contingencies were evaluated.

Power Flow Analysis

A power flow analysis was conducted for each Interconnection Customer’s facility using modified versions of the 2013 spring peak, 2014 summer and winter peak, and the 2018 summer and winter peak, 2023 summer peak models. The output of the Interconnection Customer’s facility was offset in each model by a reduction in output of existing online SPP generation. This method allows the request to be studied as an Energy Resource Interconnection Service request (ERIS). Certain

requests that are pursuing Network Resource Interconnection Service (NRIS) had an additional analysis conducted for displacing resources in the interconnecting Transmission Owner’s balancing authority.

This analysis was conducted assuming that previous queued requests in the immediate area of these interconnect requests were in-service. The analysis of each Customer’s project indicates that criteria violations will occur on the AECI, GRDA, LES, MIDW, NPPD, OKGE, OPPD, SUNC/MKEC, and WAPA transmission systems under system intact and contingency conditions in the peak seasons.

Cluster Group 1 (Woodward Area)

In addition to the 5,447.9 MW of previously queued generation in the area, 48.0 MW of new interconnection service was studied. No new ERIS constraints for mitigation were found in this area. Since the posting of the original study, Interconnection Customer GEN-2013-003 has dropped its request for NRIS. As a result, there are no NRIS constraints were found in this area.

Cluster Group 2 (Hitchland Area)

In addition to the 3,180.2 MW of previously queued generation in the area, 0.0 MW of new interconnection service was studied. No new constraints were found in this area.

Cluster Group 3 (Spearville Area)

In addition to the 5,294.0 MW of previously queued generation in the area, 99.0 MW of new interconnection service was studied. No new ERIS constraints for mitigation were found in this area. For Interconnection Custer GEN-2013-010 that requested NRIS, there are constraints on the Knoll – North Hays – Vine Street - Hays - South Hays 115kV circuit #1. The South Hays – Hays 115kV constraint is to be mitigated by an approved ITP Near term project.

Group 3: ERIS Constraints			
MONITORED ELEMENT	RATE B (MVA)	TC%LOADING (% MVA)	CONTINGENCY
Currently, no new ERIS constraints for mitigation were found			

Group 3: NRIS Constraints			
MONITORED ELEMENT	RATE B (MVA)	TC%LOADING (% MVA)	CONTINGENCY
HAYS PLANT - VINE STREET 115KV CKT 1	88	132.9914	KNOLL 230 - POSTROCK6 230.00 230KV CKT 1
HAYS PLANT - SOUTH HAYS 115KV CKT 1	99	138.6822	KNOLL 230 - POSTROCK6 230.00 230KV CKT 1
KNOLL - N HAYS3 115.00 115KV CKT 1	99	106.9207	KNOLL 230 - POSTROCK6 230.00 230KV CKT 1
N HAYS3 115.00 - VINE STREET 115KV CKT 1	99	111.2549	KNOLL 230 - POSTROCK6 230.00 230KV CKT 1

Cluster Group 4/11 (NW Kansas Group)

In addition to the 2,189.3 MW of previously queued generation in the area, 0.0 MW of new interconnection service was studied. No new constraints were found in this area.

Cluster Group 5 (Amarillo Area)

In addition to the 1,332.6 MW of previously queued generation in the area, 11.5 MW of new interconnection service was studied. No new constraints were found in this area.

Cluster Group 6 (South Texas Panhandle/New Mexico)

In addition to the 3,290.8 MW of previously queued generation in the area, 688.2 MW of new interconnection service was studied. ERIS constraints were observed including the Tolk 345/230/13kV transformer, Tolk West – Plant X 230kV circuit #1, Tolk East – Plant X 230kV circuit #1, and Deaf Smith – Plant X 230kV lines. A second 345/230/13kV transformer, addition of a third 230kV circuit between Tolk – Plant X, and terminal equipment upgrades on Deaf Smith and Plant X substations will relieve these constraints. Also, from the stability analysis of Group 6, a need for 345kV reinforcements were identified for the loss of TUCO Interchange – Border 345kV circuit. To mitigate this constraint, a new 345kV Sweetwater Substation must be added which will tap into the TUCO Interchange – Border 345kV line. From the Sweetwater substation, a new 345kV line to Tuco and an additional 345kV line to Gracemont must be added. For interconnection requests with NRIS, a number of additional upgrades were identified in Appendices E and F for mitigation of overloads.

Group 6: ERIS Constraints			
MONITORED ELEMENT	RATE B (MVA)	TC%LOADING (% MVA)	CONTINGENCY
TOLK STATION (ABBXL844501) 345/230/13.2KV TRANSFORMER CKT 1	557	100	EDDY COUNTY INTERCHANGE (ABB AEM30711) 345/230/13.2KV TRANSFORMER CKT 1
PLANT X STATION - TOLK STATION WEST 230KV CKT 1	502	115.0112	PLANT X STATION - TOLK STATION EAST 230KV CKT 2
PLANT X STATION - TOLK STATION EAST 230KV CKT 2	502	113.6744	PLANT X STATION - TOLK STATION WEST 230KV CKT 1
DEAF SMITH COUNTY INTERCHANGE - PLANT X STATION 230KV CKT 1	351	113.6668	PLANT X STATION - POTTER COUNTY INTERCHANGE 230KV CKT 1

Group 6: NRIS Constraints			
MONITORED ELEMENT	RATE B (MVA)	TC%LOADING (% MVA)	CONTINGENCY
CURRY COUNTY INTERCHANGE - DEAF SMITH REC-#20 115KV CKT 1	96	120.577	DEAF SMITH COUNTY INTERCHANGE - PLANT X STATION 230KV CKT 1
EDDY COUNTY INTERCHANGE (WH XHS70551) 230/115/13.2KV TRANSFORMER CKT 1	167	129.2935	EDDY COUNTY INTERCHANGE (UPDATE_LATER) 230/115/13.2KV TRANSFORMER CKT 2
HITCHLAND INTERCHANGE (H TP80148301) 230/115/13.2KV TRANSFORMER CKT 1	250	102.9243	OCHILTREE (H TP80219401) 230/115/13.2KV TRANSFORMER CKT 1
HALE CO INTERCHANGE - TUCO INTERCHANGE 115KV CKT 1	96	107.1589	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1
PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	116.6265	TOLK STATION EAST - TUCO INTERCHANGE 230KV CKT 1
STANTON SUB - TUCO INTERCHANGE 115KV CKT 1	160	101.4927	CARLISLE INTERCHANGE - TUCO INTERCHANGE 230KV CKT 1

Cluster Group 7 (Southwestern Oklahoma)

In addition to the 2,000.8 MW of previously queued generation in the area, 0.0 MW of new interconnection service was studied. No new constraints were found in this area.

Cluster Group 8 (South Central Kansas/North Oklahoma)

In addition to the 2,834.1 MW of previously queued generation in the area, 247.3 MW of new interconnection service was studied. An additional 1,200 MW of existing generation was studied for Interconnection Requests that share a Point of Interconnection (POI) with the studied generation. ERIS constraints were observed including the Vinita Junction 138/69kV transformer and Vinita – Vinita Junction 69kV circuit #1. Replacement of the Vinita Junction transformer to a larger size along with reconductoring the Vinita – Vinita Junction and upgrading associated terminal

equipment will relieve the ERIS overloads. For interconnection requests with NRIS, a number of additional upgrades were identified in Appendices E and F for mitigation of overloads. Constraints on the Redbud-Arcadia 345kV line are mitigated by an ITP Near Term project. Further coordination with AEPW, GRDA, and AECL will occur in the Facility Study. Additionally, Interconnection Customer GEN-2013-012 has dropped its request for NRIS. This change eliminates the need to upgrade the Arcadia – Kamo Memorial 138kV circuit at this time.

Group 8: ERIS Constraints			
MONITORED ELEMENT	RATE B (MVA)	TC%LOADING (% MVA)	CONTINGENCY
VINITA JUNCTION (VINITAJC) 138/69/13.8KV TRANSFORMER CKT 1	62	115.4526	SUB 404 - HOCKERVILLE (HOCK 138) 161/138/12.5KV TRANSFORMER CKT 1
VINITA - VINITA JUNCTION 69KV CKT 1	69	104.0979	SUB 404 - HOCKERVILLE (HOCK 138) 161/138/12.5KV TRANSFORMER CKT 1
ARCADIA - REDBUD 345KV CKT 1	1195	100.5075	ARCADIA - REDBUD 345KV CKT 2
ARCADIA - REDBUD 345KV CKT 2	1195	100.7689	ARCADIA - REDBUD 345KV CKT 1

Group 8: NRIS Constraints			
MONITORED ELEMENT	RATE B (MVA)	TC%LOADING (% MVA)	CONTINGENCY
CATOOSA - TERRA NITROGEN TAP 138KV CKT 1	136	105.5437	NORTHEAST STATION - OWASSO SOUTH 138KV CKT 1
EASTERN STATE HOSPITAL TAP - VINITA NEO TAP 69KV CKT 1'	48	106.368	SUB 404 - HOCKERVILLE (HOCK 138) 161/138/12.5KV TRANSFORMER CKT 1
EXPLORER PIPELINE TAP - J6 69KV CKT 1	48	101.5359	SUB 404 - HOCKERVILLE (HOCK 138) 161/138/12.5KV TRANSFORMER CKT 1
J6 - VINITA NEO TAP 69KV CKT 1	48	103.3134	SUB 404 - HOCKERVILLE (HOCK 138) 161/138/12.5KV TRANSFORMER CKT 1
TERRA NITROGEN TAP - VERDIGRIS 138KV CKT 1	136	116.7092	NORTHEAST STATION - OWASSO SOUTH 138KV CKT 1

Cluster Group 9/10 (Nebraska)

In addition to the 2,013.4 MW of previously queued generation in the area, 465.2 MW of new interconnection service was studied. An additional 211.0 MW of requested generation on the Fort Randall – Columbus 230kV line will cause the need for significant 230/115kV transmission reinforcements in this area. To mitigate the ERIS base case and contingent constraints, a new 230kV transmission line and 345/230kV transformer at a new 345/230kV substation tapping the Hoskins – Shell Creek 345kV circuit #1 is proposed along with a 230/115kV Madison County transformer with a new 115kV transmission line from Madison County to North Petersburg. Additionally, the Sterling – GEN-2013-018 Tap – Hydrocarbon Tap – Sub 970 and Sterling 115/69kV transformer have thermal limit constraints. Mitigation for the constraints would include substation work, a second sterling transformer, and conductor clearance. Also, should higher queued projects withdraw from the Sterling/Hydrocarbon area, a restudy maybe required to determine the need for network upgrades assigned to higher queued requests.

Group 9/10: ERIS Constraints			
MONITORED ELEMENT	RATE B (MVA)	TC%LOADING (% MVA)	CONTINGENCY
FT RANDAL - G12_005T 230.00 230KV CKT 1	320	127.7595	KELLY - MADISONCO 230.00 230KV CKT 1
G12_005T 230.00 - MADISONCO 230.00 230KV CKT 1	320	105.3137	KELLY - MADISONCO 230.00 230KV CKT 1
KELLY - MADISONCO 230.00 230KV CKT 1	320	127.696	FT RANDAL - G12_005T 230.00 230KV CKT 1
G13_018T 69.000 - HYDROCARBON TAP 69KV CKT 1	57	129.1555	SUB 963 - SUB 977 69KV CKT 1
HYDROCARBON TAP - SUB 970 69KV CKT 1	64	115.0103	SUB 963 - SUB 977 69KV CKT 1
STERLING 115/69KV TRANSFORMER CKT 1	56	102.0566	G13_018T 69.000 - HYDROCARBON TAP 69KV CKT 1

MADISONCO 230.00 - S_NORFOLK 230.00 230KV CKT 1	320	105.0224	KELLY - MADISONCO 230.00 230KV CKT 1
S_NORFOLK 345.00 (SNORFOLKT) 345/230/13.8KV TRANSFORMER CKT 1	336	101.6138	KELLY - MADISONCO 230.00 230KV CKT 1

Group 9/10: NRIS Constraints			
MONITORED ELEMENT	RATE B (MVA)	TC%LOADING (% MVA)	CONTINGENCY
Currently, no new NRIS constraints for mitigation were found			

Cluster Group 12 (Northwest Arkansas)

In addition to the 0.0 MW of previously queued generation in the area, 30.0 MW of new interconnection service was studied. An additional 620.0 MW of existing generation was studied for Interconnection Requests that share a Point of Interconnection (POI) with the studied generation. No new constraints were found in this area.

Cluster Group 13 (Northwest Missouri)

In addition to the 285.8 MW of previously queued generation in the area, 0.0 MW of new interconnection service was studied. No new constraints were found in this area.

Cluster Group 14 (South Central Oklahoma)

In addition to the 262.2 MW of previously queued generation in the area, 100.3 MW of new interconnection service was studied. No new constraints were found in this area.

Curtailment and System Reliability

In no way does this study guarantee operation for all periods of time. It should be noted that although this study analyzed many of the most probable contingencies, it is not an all-inclusive list and cannot account for every operational situation. Because of this, it is likely that the Customer(s) may be required to reduce their generation output to 0 MW, also known as curtailment, under certain system conditions to allow system operators to maintain the reliability of the transmission network.

Stability Analysis

A stability analysis was conducted for each Interconnection Customer using modified versions of the 2012 series SPP Model Development Working Group (MDWG) Models 2013 winter, 2014 summer, and 2023 summer peak dynamic cases. The MDWG 2013 winter peak case was modified to model the transmission network as of the end of 2014 and was used as the 2014 winter peak model for this study. The stability analysis was conducted with all upgrades in service that were identified in the power flow analysis. For each group, the interconnection requests were studied at 100% nameplate output while the other groups were dispatched at 20% output for wind requests and 100% output for fossil requests. The output of the Interconnection Customer’s facility was offset in each model by a reduction in output of existing online SPP generation. The following synopsis is included for each group. The entire stability study for each group can be found in the Appendices section.

Cluster Group 1 (Woodward Area)

The Group 1 stability analysis for this study was performed by S&C Electric (S&C). Stability analysis has determined that when all previously assigned and currently assigned network upgrades are placed in service the transmission system will remain stable and low voltage ride through requirements are satisfied for the contingencies studied. There were no wind farm Interconnection Requests located in Group 1.

Cluster Group 2 (Hitchland Area)

There was no stability analysis conducted in the Hitchland area due to no requests in the area.

Cluster Group 3 (Spearville Area)

The Group 3 stability analysis for this study was performed by POWER-tek Global, Inc. (POWER-tek). Stability analysis has determined that with the power factor requirements and all previously assigned and current assigned network upgrades in service, the transmission system will remain stable and all interconnection requests in Group 3 will meet FERC Order #661A low voltage ride through (LVRT) requirements.

With the power factor requirements and all network upgrades in service, all interconnection requests in Group 3 will meet FERC Order #661A low voltage ride through (LVRT) requirements.

Power Factor Requirements:

Request	Size (MW)	Generator Model	Point of Interconnection	Power Factor Requirement at POI*	
				Lagging (supplying)	Leading (absorbing)
GEN-2013-010	99.0	Siemens 3.0MW	GEN-2012-011 Tap 345kV (Tap on Spearville to Post Rock 345kV line)	0.95	0.95

*As reactive power is required for all projects, the final requirement in the GIA will be the pro-forma 95% lagging to 95% leading at the point of interconnection.

Cluster Group 4/11 (Northwest Kansas Area)

There was no stability analysis conducted in the northwest Kansas area due to no requests in the area.

Cluster Group 5 (Amarillo Area)

The Group 5 stability analysis for this study was performed by SPP Staff. Stability analysis has determined that with the power factor requirements and all network upgrades in service, the transmission system will remain stable and all interconnection requests in Group 5 will meet FERC Order #661A low voltage ride through (LVRT) requirements.

Power Factor Requirements:

Request	Size (MW)	Generator Model	Point of Interconnection	Power Factor Requirement at POI*	
				Lagging (supplying)	Leading (absorbing)
ASGI-2013-001	11.5	Siemens 2.3MW VS	PanTex South 115kV	0.95	0.95

*As reactive power is required for all projects, the final requirement in the GIA will be the pro-forma 95% lagging to 95% leading at the point of interconnection.

Cluster Group 6 (South Texas Panhandle/New Mexico)

The Group 6 stability analysis for this study was performed partially by Burns & McDonnell and partially by SPP Staff. The analysis identified stability issues for loss of the Border – TUCO 345kV line. To alleviate this stability issue, the following 345kV reinforcements were identified. A new 345kV Sweetwater Substation must be added which will tap into the TUCO Interchange – Border 345kV line. In addition, a 345kV line from TUCO Interchange to Sweetwater line must be added as well as a new 345kV line from Sweetwater to Gracemont. For the other studied contingencies, stability analysis has determined that with the power factor requirements and all previously assigned and current assigned network upgrades in service, the transmission system will remain stable and all interconnection requests in Group 6 will meet FERC Order #661A low voltage ride through (LVRT) requirements.

Power Factor Requirements:

Request	Size (MW)	Generator Model	Point of Interconnection	Power Factor Requirement at POI*	
				Lagging (supplying)	Leading (absorbing)
GEN-2013-013	248.4	Siemens 2.3MW	Tap Eddy County – Tolk 345kV	0.95	0.95
GEN-2013-016	191 Summer 203 Winter	GENROU	TUCO 345kV	0.95	0.95
GEN-2013-017	199.5	GE 1.7MW	Tap TUCO – O.K.U. 345kV	0.95	0.95
ASGI-2013-002	18.4	Siemens 2.3MW VS	FE-Tucumcari 115kV	0.95	0.95

Request	Size (MW)	Generator Model	Point of Interconnection	Power Factor Requirement at POI*	
				Lagging (supplying)	Leading (absorbing)
ASGI-2013-003	18.4	Siemens 2.3MW VS	FE-Clovis 115kV	0.95	0.95

*As reactive power is required for all projects, the final requirement in the GIA will be the pro-forma 95% lagging to 95% leading at the point of interconnection.

Cluster Group 7 (Southwest Oklahoma Area)

There was no stability analysis conducted in the southwest Oklahoma area due to no requests in the area.

Cluster Group 8 (South Central Kansas/North Oklahoma)

The Group 8 stability analysis for this study was performed by Quanta Technologies Inc. (Quanta). The analysis identified an issue in the Category ‘C’ analysis for prior outage situation for GEN-2013-012 Interconnection Request in the 2013WP and 2014SP models. The mitigation for this prior outage situation is to back down the GEN-2013-012 generation dispatch. The third Arcadia-Redbud 345kV circuit scheduled for 2019 will alleviate this condition. For the other studied contingencies, stability analysis has determined that with the power factor requirements and all previously assigned and current assigned network upgrades in service, the transmission system will remain stable and all interconnection requests in Group 8 will meet FERC Order #661A low voltage ride through (LVRT) requirements.

With the power factor requirements and all network upgrades in service, all interconnection requests in Group 3 will meet FERC Order #661A low voltage ride through (LVRT) requirements.

Power Factor Requirements:

Request	Size (MW)	Generator Model	Point of Interconnection	Power Factor Requirement at POI*	
				Lagging (supplying)	Leading (absorbing)
GEN-2013-009	100.3	GE 1.7MW	Tap on Alluwe Tap to Vinita Junction 138kV line	0.95	0.95

*As reactive power is required for all projects, the final requirement in the GIA will be the pro-forma 95% lagging to 95% leading at the point of interconnection.

Cluster Group 9/10 (Nebraska)

The Group 9/10 stability analysis for this study was performed by Mitsubishi Electric Power Products Inc. (MEPPI). Stability analysis has determined that with the power factor requirements and all previously assigned and current assigned network upgrades in service, the transmission system will remain stable and all interconnection requests in Group 9/10 will meet FERC Order #661A low voltage ride through (LVRT) requirements.

With the power factor requirements and all network upgrades in service, all interconnection requests in Group 9/10 will meet FERC Order #661A low voltage ride through (LVRT) requirements.

Power Factor Requirements:

Request	Size (MW)	Generator Model	Point of Interconnection	Power Factor Requirement at POI*	
				Lagging (supplying)	Leading (absorbing)
GEN-2012-005	81.0	GE 1.62MW (583503)	Tap Fort Randall – Columbus 230kV	0.95	0.95
GEN-2013-002	50.6	Siemens 2.3MW	Tap Sheldon – Folsom 115kV	0.95	0.95
GEN-2013-004	206.5	GE 1.75MW	Tap Fort Randall – Columbus 230kV	0.95	0.95
GEN-2013-005	73.5	GE 1.75MW	Tap Fort Randall – Columbus 230kV	0.95	0.95
GEN-2013-006	50.6	Siemens 2.3MW	Tap Fort Randall – Columbus 230kV	0.95	0.95
GEN-2013-008	74.8	GE 1.7MW	Steele City 115kV	0.95	0.95
GEN-2013-014	25.5	GE 1.7MW	Tap Pauline – Guide Rock 115kV	0.95	0.95
GEN-2013-015	125.8	GE 1.7MW	Tap Pauline – Hildreth 115kV	0.95	0.95
GEN-2013-018	50.2	GE 1.62MW	Tap S974 – Hydrocarbon Tap 69kV	0.95	0.95

*As reactive power is required for all projects, the final requirement in the GIA will be the pro-forma 95% lagging to 95% leading at the point of interconnection.

Cluster Group 12 (Northwest Arkansas Area)

The Group 12 stability analysis for this study was performed by Excel Engineering (Excel). Stability analysis has determined that with the power factor requirements and all previously assigned and current assigned network upgrades in service, the transmission system will remain stable. There were no wind farm requests in Group 12.

Cluster Group 13 (Northwest Missouri Area)

There was no stability analysis conducted in the Northwest Missouri area due to no requests in the area.

Cluster Group 14 (South Central Oklahoma)

The Group 14 stability analysis for this study was performed by Excel Engineering (Excel). Stability analysis has determined that with the power factor requirements and all previously assigned and current assigned network upgrades in service, the transmission system will remain stable and all interconnection requests in Group 14 will meet FERC Order #661A low voltage ride through (LVRT) requirements.

With the power factor requirements and all network upgrades in service, all interconnection requests in Group 14 will meet FERC Order #661A low voltage ride through (LVRT) requirements.

Power Factor Requirements:

Request	Size (MW)	Generator Model	Point of Interconnection	Power Factor Requirement at POI*	
				Lagging (supplying)	Leading (absorbing)
GEN-2013-007	100.0	Vestas 2.0MW V100 VCSS	Tap Prices Fall – Carter 138kV	0.95	0.95

*As reactive power is required for all projects, the final requirement in the GIA will be the pro-forma 95% lagging to 95% leading at the point of interconnection.

Conclusion

The minimum cost of interconnecting 1,689.5 MW of new interconnection requests included in this Definitive Interconnection System Impact Study is estimated at \$633,043,530.00 for the Allocated Network Upgrades and Transmission Owner Interconnection Facilities are listed in Appendix E and F. These costs do not include the cost of upgrades of other transmission facilities listed in Appendix H which are Network Constraints.

These interconnection costs do not include any cost of Network Upgrades determined to be required by short circuit analysis. These studies will be performed if the Interconnection Customer executes the appropriate Interconnection Facilities Study Agreement and provides the required data along with demonstration of Site Control and the appropriate deposit. At the time of the Interconnection Facilities Study, a better determination of the interconnection facilities may be available.

The required interconnection costs listed in Appendices E, and F, and other upgrades associated with Network Constraints do not include all costs associated with the deliverability of the energy to final customers. These costs are determined by separate studies if the Customer submits a Transmission Service Request (TSR) through SPP's Open Access Same Time Information System (OASIS) as required by Attachment Z1 of the SPP Open Access Transmission Tariff (OATT).

Appendices

A: Generation Interconnection Requests Considered for Impact Study

See next page.

A: Generation Interconnection Requests Considered for Impact Study

Request	Amount	Service	Area	Requested Point of Interconnection	Proposed Point of Interconnection	Requested In-Service Date	In Service Date Delayed Until no earlier than*
ASGI-2013-001	11.50	ER	SPS	PanTex South 115kV	PanTex South 115kV		
ASGI-2013-002	18.40	ER	SPS	FE Tucumcari 115kV	FE Tucumcari 115kV		
ASGI-2013-003	18.40	ER	SPS	FE Clovis 115kV	FE Clovis 115kV		
GEN-2012-005	81.00	ER/NR	NPPD	Tap Fort Randall - Columbus (North of Madison Co) 230kV	Tap Fort Randall - Columbus (North of Madison Co) 230kV	6/1/2015	TBD
GEN-2013-002	50.60	ER/NR	LES	Tap Sheldon - Folsom 115kV CKT 1	Tap Sheldon - Folsom 115kV CKT 1	12/31/2013	TBD
GEN-2013-003	48.00	ER/NR	OKGE	Tap Woodwad - Thistle 345kV CKT (GEN-2012-016 Tap)	Tap Woodwad - Thistle 345kV Dbl CKT (GEN-2012-016 Tap)	3/1/2017	12/31/2014
GEN-2013-004	6.00	ER/NR	NPPD	Tap Fort Randall - Columbus (Madison County)	Tap Fort Randall - Columbus (Madison County)	1/1/2014	TBD
GEN-2013-005	73.50	ER/NR	NPPD	Madison County (GEN-2008-086N2 Sub)	Madison County (GEN-2008-086N2 Sub)	12/31/2014	TBD
GEN-2013-006	50.60	ER	NPPD	Tap Fort Randall - Columbus (Madison County)	Tap Fort Randall - Columbus (Madison County)	10/1/2014	TBD
GEN-2013-007	100.30	ER/NR	OKGE	Tap Prices Falls - Carter 138kV	Tap Prices Falls - Carter 138kV	12/31/2014	TBD
GEN-2013-008	1.20	ER	NPPD	Steele City 115kV	Steele City 115kV	12/31/2013	TBD
GEN-2013-009	100.30	ER/NR	AEPW	Tap Northeastern - Vinita 138kV	Tap Alluwe Tap - Vinita Junction 138kV	12/31/2015	TBD
GEN-2013-010	99.00	ER/NR	SUNCMKEC	Tap Spearville - Post Rock 345kV	Tap Spearville - Post Rock 345kV (GEN-2012-011 Tap)	12/31/2015	TBD
GEN-2013-011	30.00	ER	AEPW	Turk 138kV	Turk 138kV		TBD
GEN-2013-012	147.00	ER/NR	OKGE	Redbud 345kV	Redbud 345kV	11/30/2014	TBD
GEN-2013-013	248.40	ER/NR	SPS	Tap Eddy County - Tolk 345kV	Tap Eddy County - Tolk 345kV	12/1/2014	TBD
GEN-2013-014	25.50	ER/NR	NPPD	Tap Guide Rock - Pauline (GEN-2008-123N Tap) 115kV	Tap Guide Rock - Pauline (GEN-2008-123N Tap) 115kV	12/31/2014	TBD
GEN-2013-015	125.80	ER/NR	NPPD	Tap Pauline - Hildreth 115kV	Tap Pauline - Hildreth 115kV	12/31/2015	TBD
GEN-2013-016	203.00	ER	SPS	TUCO 345kV	TUCO 345kV	12/1/2016	TBD
GEN-2013-017	200.00	ER/NR	SPS	Tap TUCO - OKU 345kV	Tap TUCO - OKU 345kV	12/31/2014	TBD
GEN-2013-018	51.00	ER/NR	OPPD	Tap S974 - Hydrocarbon Tap 69kV	Tap S974 - Hydrocarbon Tap 69kV	10/31/2014	TBD
Total: 1,689.50							

*Requests that dependent upon Priority Projects or Balanced Portfolio may be delayed until 12/31/2014. Other requests in-service date to be determined after Facility Study.

B: Prior Queued Interconnection Requests

See next page.

B: Prior Queued Interconnection Requests

Request	Amount	Area	Requested/Proposed Point of Interconnection	Status or In-Service Date
ASGI-2010-006	150.00	AECI	Tap Fairfax (AECI) - Shilder (AEPW) 138kV	AECI queue Affected Study
ASGI-2010-010	42.20	SPS	Lovington 115kV	Lea County Affected Study
ASGI-2010-020	30.00	SPS	Tap LE-Tatum - LE-Crossroads 69kV	Lea County Affected Study
ASGI-2010-021	15.00	SPS	Tap LE-Saunders Tap - LE-Anderson 69kV	Lea County Affected Study
ASGI-2011-001	28.80	SPS	Lovington 115kV	On-Line
ASGI-2011-002	10.00	SPS	Herring 115kV	On-Line
ASGI-2011-003	10.00	SPS	Hendricks 115kV	On-Line
ASGI-2011-004	20.00	SPS	Pleasant Hill 69kV	Under Study (DISIS-2011-002)
ASGI-2012-002	18.15	SPS	FE-Clovis Interchange 115kV	Under Study (DISIS-2012-002)
ASGI-2012-006	22.50	SUNCMKEC	Tap Hugoton - Rolla 69kV	Under Study (DISIS-2012-001)
GEN-2001-014	96.00	WFEC	Ft Supply 138kV	On-Line
GEN-2001-026	74.00	WFEC	Washita 138kV	On-Line
GEN-2001-033	180.00	SPS	San Juan Tap 230kV	On-Line at 120MW
GEN-2001-036	80.00	SPS	Norton 115kV	On-Line
GEN-2001-037	102.00	OKGE	FPL Moreland Tap 138kV	On-Line
GEN-2001-039A	105.00	SUNCMKEC	Tap Greensburg - Ft Dodge (Shooting Star Tap) 115kV	On-Line
GEN-2001-039M	99.00	SUNCMKEC	Central Plains Tap 115kV	On-Line
GEN-2002-004	200.00	WERE	Latham 345kV	On-Line at 150MW
GEN-2002-005	120.00	WFEC	Red Hills Tap 138kV	On-Line
GEN-2002-008	240.00	SPS	Hitchland 345kV	On-Line at 120MW
GEN-2002-009	80.00	SPS	Hansford 115kV	On-Line
GEN-2002-022	240.00	SPS	Bushland 230kV	On-Line
GEN-2002-023N	0.80	NPPD	Harmony 115kV	On-Line
GEN-2002-025A	150.00	SUNCMKEC	Spearville 230kV	On-Line
GEN-2003-004	100.00	WFEC	Washita 138kV	On-Line
GEN-2003-005	100.00	WFEC	Anadarko - Paradise (Blue Canyon) 138kV	On-Line
GEN-2003-006A	200.00	SUNCMKEC	Elm Creek 230kV	On-Line
GEN-2003-019	250.00	MIDW	Smoky Hills Tap 230kV	On-Line
GEN-2003-020	160.00	SPS	Martin 115kV	On-Line
GEN-2003-021N	75.00	NPPD	Ainsworth Wind Tap 115kV	On-Line
GEN-2003-022	120.00	AEPW	Washita 138kV	On-Line
GEN-2004-005N	30.00	NPPD	St Francis 115kV	On Suspension
GEN-2004-014	154.50	SUNCMKEC	Spearville 230kV	On-Line at 100MW
GEN-2004-020	27.00	AEPW	Washita 34.5kV	On-Line
GEN-2004-023	20.60	WFEC	Washita 138kV	On-Line
GEN-2004-023N	75.00	NPPD	Columbus Co 115kV	On-Line
GEN-2005-003	30.60	WFEC	Washita 138kV	On-Line
GEN-2005-008	120.00	OKGE	Woodward 138kV	On-Line
GEN-2005-012	250.00	SUNCMKEC	Spearville 345kV	On-Line at 160MW
GEN-2005-013	201.00	WERE	Tap Latham - Neosho (Caney River) 345kV	On-Line
GEN-2006-002	101.00	AEPW	Sweetwater 230kV	On-Line
GEN-2006-006	205.50	SUNCMKEC	Spearville 345kV	On Schedule for 2015
GEN-2006-010	620.00	AEPW	Turk 138kV	On-Line
GEN-2006-018	170.00	SPS	TUCO Interchange 230kV	On-Line

Request	Amount	Area	Requested/Proposed Point of Interconnection	Status or In-Service Date
GEN-2006-020N	42.00	NPPD	Bloomfield 115kV	On-Line
GEN-2006-020S	18.90	SPS	DWS Frisco 115kV	On-Line
GEN-2006-021	101.00	SUNCMKEC	Flat Ridge Tap 138kV	On-Line
GEN-2006-022	150.00	SUNCMKEC	Ninnescah 115kV	On Schedule for 2014
GEN-2006-024S	19.80	WFEC	Buffalo Bear Tap 69kV	On-Line
GEN-2006-026	604.00	SPS	Hobbs 230kV & Hobbs 115kV	On-Line
GEN-2006-031	75.00	MIDW	Knoll 115kV	On-Line
GEN-2006-035	225.00	AEPW	Sweetwater 230kV	On-Line at 132MW
GEN-2006-037N1	75.00	NPPD	Broken Bow 115kV	On Schedule for 2014
GEN-2006-038N005	80.00	NPPD	Broken Bow 115kV	On-Line
GEN-2006-038N019	80.00	NPPD	Petersburg North 115kV	On-Line
GEN-2006-040	108.00	SUNCMKEC	Mingo 115kV	On Suspension
GEN-2006-043	99.00	AEPW	Sweetwater 230kV	On-Line
GEN-2006-044	370.00	SPS	Hitchland 345kV	On-Line at 80MW
GEN-2006-044N	40.50	OPPD	North Petersburg 115kV	On-Line
GEN-2006-046	131.00	OKGE	Dewey 138kV	On-Line
GEN-2006-047	240.00	SPS	Tap Bushland - Deaf Smith (Buffalo) 230kV	On Suspension
GEN-2007-011	135.00	SUNCMKEC	Syracuse 115kV	On Suspension
GEN-2007-011N08	81.00	NPPD	Bloomfield 115kV	On-Line
GEN-2007-021	201.00	OKGE	Tatonga 345kV	On Schedule for 2014
GEN-2007-025	300.00	WERE	Viola 345kV	On-Line
GEN-2007-032	150.00	WFEC	Tap Clinton Junction - Clinton 138kV	On Schedule for 2013
GEN-2007-038	200.00	SUNCMKEC	Spearville 345kV	On Schedule for 2015
GEN-2007-040	200.00	SUNCMKEC	Buckner 345kV	On-Line at 132MW
GEN-2007-043	200.00	OKGE	Minco 345kV	On-Line
GEN-2007-044	300.00	OKGE	Tatonga 345kV	On Schedule for 2014
GEN-2007-046	199.50	SPS	Hitchland 115kV	On Schedule for 2014
GEN-2007-048	400.00	SPS	Tap Amarillo S - Swisher 230kV	On Schedule for 2014
GEN-2007-050	170.00	OKGE	Woodward EHV 138kV	On-Line at 150MW
GEN-2007-052	150.00	WFEC	Anadarko 138kV	On-Line
GEN-2007-057	34.50	SPS	Moore County East 115kV	Withdrawn
GEN-2007-062	765.00	OKGE	Woodward EHV 345kV	On Schedule for 2014
GEN-2008-003	101.00	OKGE	Woodward EHV 138kV	On-Line
GEN-2008-008	60.00	SPS	Graham 69kV	On Suspension
GEN-2008-009	60.00	SPS	San Juan Tap 230kV	On Schedule for 2014
GEN-2008-013	300.00	OKGE	Tap Wichita - Woodring (Hunter) 345kV	On-Line at 235MW
GEN-2008-017	300.00	SUNCMKEC	Setab 345kV	On Schedule for 2015
GEN-2008-018	405.00	SPS	Finney 345kV	On Schedule for 2014
GEN-2008-019	300.00	OKGE	Tatonga 345kV	On Schedule for 2015
GEN-2008-021	42.00	WERE	Wolf Creek 345kV	On-Line
GEN-2008-022	300.00	SPS	Tap Eddy Co - Tolk (Chaves County) 345kV	On Schedule for 2015
GEN-2008-023	150.00	AEPW	Hobart Junction 138kV	On-Line
GEN-2008-025	101.00	SUNCMKEC	Ruleton 115kV	Withdrawn
GEN-2008-029	250.00	OKGE	Woodward EHV 138kV	On Schedule for 2014
GEN-2008-037	101.00	WFEC	Tap Washita - Blue Canyon Wind 138kV	On-Line
GEN-2008-044	197.80	OKGE	Tatonga 345kV	On-Line
GEN-2008-047	300.00	SPS	Tap Hitchland - Woodward Ckt 1 (Beaver County) 345kV	IA Pending

Request	Amount	Area	Requested/Proposed Point of Interconnection	Status or In-Service Date
GEN-2008-051	322.00	SPS	Potter County 345kV	On-Line at 161MW
GEN-2008-071	76.80	OKGE	Newkirk 138kV	On Suspension
GEN-2008-079	98.90	SUNCMKEC	Tap Cudahy - Ft Dodge 115kV	On-Line
GEN-2008-086N02	200.00	NPPD	Tap Ft Randle - Columbus (Madison County) 230kV	On Schedule for 2014
GEN-2008-088	50.60	SPS	Vega 69kV	On Schedule for 2014
GEN-2008-092	201.00	MIDW	Knoll 230kV	IA Pending
GEN-2008-098	100.80	WERE	Tap Lacygne - Wolf Creek (Anderson County) 345kV	On Schedule for 2015
GEN-2008-1190	60.00	OPPD	S1399 161kV	On-Line
GEN-2008-123N	89.70	NPPD	Tap Guide Rock - Pauline 115kV	On Schedule for 2014
GEN-2008-124	200.00	SUNCMKEC	Spearville 345kV	On Schedule for 2016
GEN-2008-124T	42.00	SPS	TC-Keyes Texas County 69kV	On Schedule for 2014
GEN-2008-129	80.00	MIPU	Pleasant Hill 161kV	On-Line
GEN-2009-008	199.50	MIDW	South Hays 230kV	On Schedule for 2015
GEN-2009-016	100.80	AEPW	Falcon Road 138kV	Withdrawn
GEN-2009-020	48.60	MIDW	Tap Nekoma - Bazine 69kV	On Schedule for 2015
GEN-2009-025	60.00	OKGE	Tap Deer Creek - Sinclair Blackwell 69kV	On-Line
GEN-2009-040	73.80	WERE	Marshall 115kV	On Schedule for 2015
GEN-2009-073T	48.00	SPS	TC-Eva Texas County 69kV	Withdrawn
GEN-2010-001	300.00	SPS	Tap Hitchland - Woodward Ckt 1 (Beaver County) 345kV	On Schedule for 2014 (204 MW) and 2015 (96 MW)
GEN-2010-003	100.80	WERE	Tap Lacygne - Wolf Creek (Anderson County) 345kV	On Schedule for 2015
GEN-2010-005	300.00	WERE	Viola 345kV	On-Line at 114MW
GEN-2010-006	205.00	SPS	Jones 230kV	On-Line
GEN-2010-009	165.60	SUNCMKEC	Buckner 345kV	On-Line
GEN-2010-011	30.00	OKGE	Tatonga 345kV	On Line
GEN-2010-014	358.80	SPS	Hitchland 345kV	On Schedule for 2016
GEN-2010-015	200.10	SUNCMKEC	Spearville 345kV	On Schedule for 2015
GEN-2010-020	20.00	SPS	Roswell 69kV	On Suspension
GEN-2010-036	4.60	WERE	6th Street 115kV	On-Line
GEN-2010-040	300.00	OKGE	Cimarron 345kV	On-Line
GEN-2010-041	10.50	OPPD	S 1399 161kV	IA Pending
GEN-2010-044	99.00	NPPD	Harbine 115kV	IA Pending
GEN-2010-045	197.80	SUNCMKEC	Buckner 345kV	IA Pending
GEN-2010-046	56.00	SPS	TUCO Interchange 230kV	On Schedule for 2016
GEN-2010-048	70.00	MIDW	Tap Beach Station - Redline 115kV	IA Pending
GEN-2010-051	200.00	NPPD	Tap Twin Church - Hoskins 230kV	On Schedule for 2014
GEN-2010-055	4.50	AEPW	Wekiwa 138kV	On-Line
GEN-2010-056	151.20	MIPU	Tap Saint Joseph - Cooper 345kV	On Suspension
GEN-2010-057	201.00	MIDW	Rice County 230kV	On-Line
GEN-2010-058	20.00	SPS	Chaves County 115kV	On Suspension
GEN-2010-061	180.00	MIDW	Tap Post Rock - Spearville (GEN-2011-017T) 345kV	Facility Study
GEN-2011-007	250.00	OKGE	Tap Cimarron - Woodring (Matthewson) 345kV	On Schedule for 2014
GEN-2011-008	600.00	SUNCMKEC	Clark County 345kV	IA Pending
GEN-2011-010	100.80	OKGE	Minco 345kV	On-Line
GEN-2011-011	50.00	KACP	Iatan 345kV	On-Line
GEN-2011-012	104.50	SPS	Tap Moore County - Hitchland 345kV	IA Pending
GEN-2011-014	201.00	SPS	Tap Hitchland - Woodward Ckt 1 (Beaver County) 345kV	IA Pending
GEN-2011-016	200.10	SUNCMKEC	Spearville 345kV	IA Pending

Request	Amount	Area	Requested/Proposed Point of Interconnection	Status or In-Service Date
GEN-2011-017	299.00	SUNCMKEC	Tap Spearville - PostRock (GEN-2011-017T) 345kV	IA Pending
GEN-2011-018	73.60	NPPD	Steele City 115kV	On Schedule for 2013
GEN-2011-019	299.00	OKGE	Woodward 345kV	IA Pending
GEN-2011-020	299.00	OKGE	Woodward 345kV	IA Pending
GEN-2011-021	299.00	SPS	Beaver County 345kV	IA Pending
GEN-2011-022	299.00	SPS	Hitchland 345kV	IA Pending
GEN-2011-023	299.00	SUNCMKEC	Clark County 345kV	IA Pending
GEN-2011-024	299.00	OKGE	Tatonga 345kV	Withdrawn
GEN-2011-025	82.30	SPS	Tap Floyd County - Crosby County 115kV	On Suspension
GEN-2011-027	120.00	NPPD	Hoskins 230kV	IA Pending
GEN-2011-037	7.00	WFEC	Blue Canyon 5 138kV	On-Line
GEN-2011-040	111.00	OKGE	Tap Ratliff - Pooleville 138kV	On Schedule for 2014
GEN-2011-043	150.00	SUNCMKEC	Thistle 345kV	Facility Study
GEN-2011-044	150.00	SUNCMKEC	Thistle 345kV	Facility Study
GEN-2011-045	205.00	SPS	Jones 230kV	On-Line
GEN-2011-046	27.00	SPS	Lopez 115kV	On Schedule for 2013
GEN-2011-048	175.00	SPS	Mustang 230kV	On Schedule for 2014
GEN-2011-049	250.00	OKGE	Border 345kV	IA Pending
GEN-2011-050	109.80	AEPW	Tap Rush Springs - Marlow 138kV	IA Pending
GEN-2011-051	104.40	OKGE	Tap Woodward - Tatonga 345kV	IA Pending
GEN-2011-054	300.00	OKGE	Cimarron 345kV	On Schedule for 2013 (200 MW) and 2014 (99 MW)
GEN-2011-055	52.80	OPPD	South Sterling 69kV	Facility Study
GEN-2011-056	3.60	NPPD	Jeffrey 115kV	On-Line
GEN-2011-056A	3.60	NPPD	John 1 115kV	On-Line
GEN-2011-056B	4.50	NPPD	John 2 115kV	On-Line
GEN-2011-057	150.40	WERE	Creswell 138kV	On Schedule for 2014
GEN-2012-001	61.20	SPS	Tap Grassland - Borden County 230kV	On-Line
GEN-2012-002	101.20	SUNCMKEC	Tap Pile - Scott City 115kV	IA Pending
GEN-2012-004	41.40	OKGE	Tap Ratliff - Pooleville 138kV	On Schedule for 2014
GEN-2012-007	120.00	SUNCMKEC	Rubart 115kV	IA Pending
GEN-2012-008	40.00	SPS	Mustang 115kV & Mustang 230kV	Withdrawn
GEN-2012-009	15.00	SPS	Mustang 230kV	Facility Study
GEN-2012-010	15.00	SPS	Mustang 230kV	Facility Study
GEN-2012-011	200.00	SUNCMKEC	Tap Spearville - Post Rock 345kV (North of GEN-2011-017 Tap)	Facility Study
GEN-2012-016	312.00	OKGE	Tap Woodward - Thistle 345kV Dbl CKT	Facility Study
GEN-2012-017	115.00	NPPD	Cooper 345kV	Withdrawn
GEN-2012-018	200.00	NPPD	Tap Hoskins - Twin Church 230kV (GEN-2010-051T)	Facility Study
GEN-2012-020	477.12	SPS	TUCO 230kV	Facility Study
GEN-2012-021	4.80	LES	Terry Bundy Generating Station 115kV	Facility Study
GEN-2012-023	115.00	WERE	Viola 345kV	Facility Study
GEN-2012-024	180.00	SUNCMKEC	Clark County 345kV	Facility Study
GEN-2012-026	100.00	MIDW	Colby 115kV	Facility Study
GEN-2012-027	136.00	AEPW	Shidler 138kV	Facility Study
GEN-2012-028	74.80	WFEC	Gotebo 69kV	Facility Study
GEN-2012-031	200.10	OKGE	Cimarron 345kV (GEN-2010-040 Sub)	Facility Study
GEN-2012-032	300.00	OKGE	Tap Rose Hill - Sooner 345kV	Facility Study

Request	Amount	Area	Requested/Proposed Point of Interconnection	Status or In-Service Date
GEN-2012-033	98.82	OKGE	Tap and Tie South 4th - Bunch Creek & Enid Tap - Fairmont (GEN-2012-033T) 138kV	Facility Study
GEN-2012-034	7.00	SPS	Mustang 230kV	Facility Study
GEN-2012-035	7.00	SPS	Mustang 230kV	Facility Study
GEN-2012-036	7.00	SPS	Mustang 230kV	Facility Study
GEN-2012-037	203.00	SPS	TUCO 345kV	Facility Study
GEN-2012-040	76.50	WFEC	Newkirk 138kV	Facility Study
GEN-2012-041	121.50	OKGE	Tap Rose Hill - Sooner 345kV	IA Pending
Gray County Wind (Montezuma)	110.00	SUNCMKEC	Gray County Tap 115kV	On-Line
Llano Estacado (White Deer)	80.00	SPS	Llano Wind 115kV	On-Line
NPPD Distributed (Broken Bow)	8.30	NPPD	Broken Bow 115kV	On-Line
NPPD Distributed (Burwell)	3.00	NPPD	Ord 115kV	On-Line
NPPD Distributed (Columbus Hydro)	45.00	NPPD	Columbus 115kV	On-Line
NPPD Distributed (North Platte - Lexington)	54.00	NPPD	Multiple: Jeffrey 115kV, John_1 115kV, John_2 115kV	On-Line
NPPD Distributed (Ord)	10.80	NPPD	Ord 115kV	On-Line
NPPD Distributed (Stuart)	2.10	NPPD	Ainsworth 115kV	On-Line
Redbud	1,200.00	OKGE	Redbud 345kV	On-Line
SPS Distributed (Dumas 19th St)	20.00	SPS	Dumas 19th Street 115kV	On-Line
SPS Distributed (Etter)	20.00	SPS	Etter 115kV	On-Line
SPS Distributed (Hopi)	10.00	SPS	Hopi 115kV	On-Line
SPS Distributed (Jal)	10.00	SPS	S Jal 115kV	On-Line
SPS Distributed (Lea Road)	10.00	SPS	Lea Road 115kV	On-Line
SPS Distributed (Monument)	10.00	SPS	Monument 115kV	On-Line
SPS Distributed (Moore E)	25.00	SPS	Moore East 115kV	On-Line
SPS Distributed (Ocotillo)	10.00	SPS	Ocotillo 115kV	On-Line
SPS Distributed (Sherman)	20.00	SPS	Sherman 115kV	On-Line
SPS Distributed (Spearman)	10.00	SPS	Spearman 69kV	On-Line
SPS Distributed (TC-Texas County)	20.00	SPS	Texas County 115kV	On-Line
Total: 29,951.1				

C: Study Groupings

See next page

C. Study Groups

GROUP 1: WOODWARD AREA			
Request	Capacity	Area	Proposed Point of Interconnection
GEN-2001-014	96.00	WFEC	Ft Supply 138kV
GEN-2001-037	102.00	OKGE	FPL Moreland Tap 138kV
GEN-2005-008	120.00	OKGE	Woodward 138kV
GEN-2006-024S	19.80	WFEC	Buffalo Bear Tap 69kV
GEN-2006-046	131.00	OKGE	Dewey 138kV
GEN-2007-021	201.00	OKGE	Tatonga 345kV
GEN-2007-043	200.00	OKGE	Minco 345kV
GEN-2007-044	300.00	OKGE	Tatonga 345kV
GEN-2007-050	170.00	OKGE	Woodward EHV 138kV
GEN-2007-062	765.00	OKGE	Woodward EHV 345kV
GEN-2008-003	101.00	OKGE	Woodward EHV 138kV
GEN-2008-019	300.00	OKGE	Tatonga 345kV
GEN-2008-029	250.00	OKGE	Woodward EHV 138kV
GEN-2008-044	197.80	OKGE	Tatonga 345kV
GEN-2010-011	30.00	OKGE	Tatonga 345kV
GEN-2010-040	300.00	OKGE	Cimarron 345kV
GEN-2011-007	250.00	OKGE	Tap Cimarron - Woodring (Matthewson) 345kV
GEN-2011-010	100.80	OKGE	Minco 345kV
GEN-2011-019	299.00	OKGE	Woodward 345kV
GEN-2011-020	299.00	OKGE	Woodward 345kV
GEN-2011-024	299.00	OKGE	Tatonga 345kV
GEN-2011-051	104.40	OKGE	Tap Woodward - Tatonga 345kV
GEN-2011-054	300.00	OKGE	Cimarron 345kV
GEN-2012-016	312.00	OKGE	Tap Woodward - Thistle 345kV Dbl CKT
GEN-2012-031	200.10	OKGE	Cimarron 345kV (GEN-2010-040 Sub)
PRIOR QUEUED SUBTOTAL	5,447.90		
GEN-2013-003	48.00	OKGE	Tap Woodwad - Thistle 345kV Dbl CKT (GEN-2012-016 Tap)
CURRENT CLUSTER SUBTOTAL	48.00		
AREA TOTAL	5,495.90		

GROUP 2: HITCHLAND AREA			
Request	Capacity	Area	Proposed Point of Interconnection
ASGI-2011-002	10.00	SPS	Herring 115kV
GEN-2002-008	240.00	SPS	Hitchland 345kV
GEN-2002-009	80.00	SPS	Hansford 115kV
GEN-2003-020	160.00	SPS	Martin 115kV
GEN-2006-020S	18.90	SPS	DWS Frisco 115kV
GEN-2006-044	370.00	SPS	Hitchland 345kV
GEN-2007-046	199.50	SPS	Hitchland 115kV
GEN-2007-057	34.50	SPS	Moore County East 115kV
GEN-2008-047	300.00	SPS	Tap Hitchland - Woodward Ckt 1 (Beaver County) 345kV
GEN-2008-124T	42.00	SPS	TC-Keyes Texas County 69kV
GEN-2009-073T	48.00	SPS	TC-Eva Texas County 69kV
GEN-2010-001	300.00	SPS	Tap Hitchland - Woodward Ckt 1 (Beaver County) 345kV
GEN-2010-014	358.80	SPS	Hitchland 345kV
GEN-2011-012	104.50	SPS	Tap Moore County - Hitchland 345kV
GEN-2011-014	201.00	SPS	Tap Hitchland - Woodward Ckt 1 (Beaver County) 345kV
GEN-2011-021	299.00	SPS	Beaver County 345kV
GEN-2011-022	299.00	SPS	Hitchland 345kV
SPS Distributed (Dumas 19th St)	20.00	SPS	Dumas 19th Street 115kV
SPS Distributed (Etter)	20.00	SPS	Etter 115kV
SPS Distributed (Moore E)	25.00	SPS	Moore East 115kV
SPS Distributed (Sherman)	20.00	SPS	Sherman 115kV
SPS Distributed (Spearman)	10.00	SPS	Spearman 69kV
SPS Distributed (TC-Texas County)	20.00	SPS	Texas County 115kV
PRIOR QUEUED SUBTOTAL	3,180.20		
AREA TOTAL	3,180.20		

GROUP 3: SPEARVILLE AREA			
Request	Capacity	Area	Proposed Point of Interconnection
ASGI-2012-006	22.50	SUNCMKEC	Tap Hugoton - Rolla 69kV
GEN-2001-039A	105.00	SUNCMKEC	Tap Greensburg - Ft Dodge (Shooting Star Tap) 115kV
GEN-2002-025A	150.00	SUNCMKEC	Spearville 230kV
GEN-2004-014	154.50	SUNCMKEC	Spearville 230kV
GEN-2005-012	250.00	SUNCMKEC	Spearville 345kV
GEN-2006-006	205.50	SUNCMKEC	Spearville 345kV
GEN-2006-021	101.00	SUNCMKEC	Flat Ridge Tap 138kV
GEN-2006-022	150.00	SUNCMKEC	Ninnescah 115kV
GEN-2007-038	200.00	SUNCMKEC	Spearville 345kV
GEN-2007-040	200.00	SUNCMKEC	Buckner 345kV
GEN-2008-018	405.00	SPS	Finney 345kV
GEN-2008-079	98.90	SUNCMKEC	Tap Cudahy - Ft Dodge 115kV
GEN-2008-124	200.00	SUNCMKEC	Spearville 345kV
GEN-2010-009	165.60	SUNCMKEC	Buckner 345kV
GEN-2010-015	200.10	SUNCMKEC	Spearville 345kV
GEN-2010-045	197.80	SUNCMKEC	Buckner 345kV
GEN-2010-061	180.00	MIDW	Tap Post Rock - Spearville (GEN-2011-017T) 345kV
GEN-2011-008	600.00	SUNCMKEC	Clark County 345kV
GEN-2011-016	200.10	SUNCMKEC	Spearville 345kV
GEN-2011-017	299.00	SUNCMKEC	Tap Spearville - PostRock (GEN-2011-017T) 345kV
GEN-2011-023	299.00	SUNCMKEC	Clark County 345kV
GEN-2011-043	150.00	SUNCMKEC	Thistle 345kV
GEN-2011-044	150.00	SUNCMKEC	Thistle 345kV
GEN-2012-007	120.00	SUNCMKEC	Rubart 115kV
GEN-2012-011	200.00	SUNCMKEC	Tap Spearville - Post Rock 345kV (North of GEN-2011-017 Tap)
GEN-2012-024	180.00	SUNCMKEC	Clark County 345kV
Gray County Wind (Montezuma)	110.00	SUNCMKEC	Gray County Tap 115kV
PRIOR QUEUED SUBTOTAL	5,294.00		
GEN-2013-010	99.00	SUNCMKEC	Tap Spearville - Post Rock 345kV (GEN-2012-011 Tap)
CURRENT CLUSTER SUBTOTAL	99.00		
AREA TOTAL	5,393.00		

GROUP 4/11: NW KANSAS AREA

Request	Capacity	Area	Proposed Point of Interconnection
GEN-2001-039M	99.00	SUNCMKEC	Central Plains Tap 115kV
GEN-2003-006A	200.00	SUNCMKEC	Elm Creek 230kV
GEN-2003-019	250.00	MIDW	Smoky Hills Tap 230kV
GEN-2006-031	75.00	MIDW	Knoll 115kV
GEN-2006-040	108.00	SUNCMKEC	Mingo 115kV
GEN-2007-011	135.00	SUNCMKEC	Syracuse 115kV
GEN-2008-017	300.00	SUNCMKEC	Setab 345kV
GEN-2008-025	101.00	SUNCMKEC	Ruleton 115kV
GEN-2008-092	201.00	MIDW	Knoll 230kV
GEN-2009-008	199.50	MIDW	South Hays 230kV
GEN-2009-020	48.60	MIDW	Tap Nekoma - Bazine 69kV
GEN-2010-048	70.00	MIDW	Tap Beach Station - Redline 115kV
GEN-2010-057	201.00	MIDW	Rice County 230kV
GEN-2012-002	101.20	SUNCMKEC	Tap Pile - Scott City 115kV
GEN-2012-026	100.00	MIDW	Colby 115kV
PRIOR QUEUED SUBTOTAL	2,189.30		
AREA TOTAL	2,189.30		

GROUP 5: AMARILLO AREA

Request	Capacity	Area	Proposed Point of Interconnection
GEN-2002-022	240.00	SPS	Bushland 230kV
GEN-2006-047	240.00	SPS	Tap Bushland - Deaf Smith (Buffalo) 230kV
GEN-2007-048	400.00	SPS	Tap Amarillo S - Swisher 230kV
GEN-2008-051	322.00	SPS	Potter County 345kV
GEN-2008-088	50.60	SPS	Vega 69kV
Llano Estacado (White Deer)	80.00	SPS	Llano Wind 115kV
PRIOR QUEUED SUBTOTAL	1,332.60		
ASGI-2013-001	11.50	SPS	PanTex South 115kV
CURRENT CLUSTER SUBTOTAL	11.50		
AREA TOTAL	1,344.10		

GROUP 6: S-TX PANHANDLE/NW AREA			
Request	Capacity	Area	Proposed Point of Interconnection
ASGI-2010-010	42.20	SPS	Lovington 115kV
ASGI-2010-020	30.00	SPS	Tap LE-Tatum - LE-Crossroads 69kV
ASGI-2010-021	15.00	SPS	Tap LE-Saunders Tap - LE-Anderson 69kV
ASGI-2011-001	28.80	SPS	Lovington 115kV
ASGI-2011-003	10.00	SPS	Hendricks 115kV
ASGI-2011-004	20.00	SPS	Pleasant Hill 69kV
ASGI-2012-002	18.15	SPS	FE-Clovis Interchange 115kV
GEN-2001-033	180.00	SPS	San Juan Tap 230kV
GEN-2001-036	80.00	SPS	Norton 115kV
GEN-2006-018	170.00	SPS	TUCO Interchange 230kV
GEN-2006-026	604.00	SPS	Hobbs 230kV & Hobbs 115kV
GEN-2008-008	60.00	SPS	Graham 69kV
GEN-2008-009	60.00	SPS	San Juan Tap 230kV
GEN-2008-022	300.00	SPS	Tap Eddy Co - Tolk (Chaves County) 345kV
GEN-2010-006	205.00	SPS	Jones 230kV
GEN-2010-020	20.00	SPS	Roswell 69kV
GEN-2010-046	56.00	SPS	TUCO Interchange 230kV
GEN-2010-058	20.00	SPS	Chaves County 115kV
GEN-2011-025	82.30	SPS	Tap Floyd County - Crosby County 115kV
GEN-2011-045	205.00	SPS	Jones 230kV
GEN-2011-046	27.00	SPS	Lopez 115kV
GEN-2011-048	175.00	SPS	Mustang 230kV
GEN-2012-001	61.20	SPS	Tap Grassland - Borden County 230kV
GEN-2012-008	40.00	SPS	Mustang 115kV & Mustang 230kV
GEN-2012-009	15.00	SPS	Mustang 230kV
GEN-2012-010	15.00	SPS	Mustang 230kV
GEN-2012-020	477.12	SPS	TUCO 230kV
GEN-2012-034	7.00	SPS	Mustang 230kV
GEN-2012-035	7.00	SPS	Mustang 230kV
GEN-2012-036	7.00	SPS	Mustang 230kV
GEN-2012-037	203.00	SPS	TUCO 345kV
SPS Distributed (Hopi)	10.00	SPS	Hopi 115kV
SPS Distributed (Jal)	10.00	SPS	S Jal 115kV
SPS Distributed (Lea Road)	10.00	SPS	Lea Road 115kV
SPS Distributed (Monument)	10.00	SPS	Monument 115kV
SPS Distributed (Ocotillo)	10.00	SPS	Ocotillo 115kV
PRIOR QUEUED SUBTOTAL	3,290.77		
ASGI-2013-002	18.40	SPS	FE Tucumcari 115kV
ASGI-2013-003	18.40	SPS	FE Clovis 115kV
GEN-2013-013	248.40	SPS	Tap Eddy County - Tolk 345kV
GEN-2013-016	203.00	SPS	TUCO 345kV
GEN-2013-017	200.00	SPS	Tap TUCO - OKU 345kV
CURRENT CLUSTER SUBTOTAL	688.20		
AREA TOTAL	3,979.0		

GROUP 7: SW OKLAHOMA AREA			
Request	Capacity	Area	Proposed Point of Interconnection
GEN-2001-026	74.00	WFEC	Washita 138kV
GEN-2002-005	120.00	WFEC	Red Hills Tap 138kV
GEN-2003-004	100.00	WFEC	Washita 138kV
GEN-2003-005	100.00	WFEC	Anadarko - Paradise (Blue Canyon) 138kV
GEN-2003-022	120.00	AEPW	Washita 138kV
GEN-2004-020	27.00	AEPW	Washita 34.5kV
GEN-2004-023	20.60	WFEC	Washita 138kV
GEN-2005-003	30.60	WFEC	Washita 138kV
GEN-2006-002	101.00	AEPW	Sweetwater 230kV
GEN-2006-035	225.00	AEPW	Sweetwater 230kV
GEN-2006-043	99.00	AEPW	Sweetwater 230kV
GEN-2007-032	150.00	WFEC	Tap Clinton Junction - Clinton 138kV
GEN-2007-052	150.00	WFEC	Anadarko 138kV
GEN-2008-023	150.00	AEPW	Hobart Junction 138kV
GEN-2008-037	101.00	WFEC	Tap Washita - Blue Canyon Wind 138kV
GEN-2009-016	100.80	AEPW	Falcon Road 138kV
GEN-2011-037	7.00	WFEC	Blue Canyon 5 138kV
GEN-2011-049	250.00	OKGE	Border 345kV
GEN-2012-028	74.80	WFEC	Gotebo 69kV
PRIOR QUEUED SUBTOTAL	2,000.80		
AREA TOTAL	2,000.80		

GROUP 8: N-OK/S-KS AREA			
Request	Capacity	Area	Proposed Point of Interconnection
ASGI-2010-006	150.00	AECI	Tap Fairfax (AECI) - Shilder (AEPW) 138kV
GEN-2002-004	200.00	WERE	Latham 345kV
GEN-2005-013	201.00	WERE	Tap Latham - Neosho (Caney River) 345kV
GEN-2007-025	300.00	WERE	Viola 345kV
GEN-2008-013	300.00	OKGE	Tap Wichita - Woodring (Hunter) 345kV
GEN-2008-021	42.00	WERE	Wolf Creek 345kV
GEN-2008-071	76.80	OKGE	Newkirk 138kV
GEN-2008-098	100.80	WERE	Tap Lacygne - Wolf Creek (Anderson County) 345kV
GEN-2009-025	60.00	OKGE	Tap Deer Creek - Sinclair Blackwell 69kV
GEN-2010-003	100.80	WERE	Tap Lacygne - Wolf Creek (Anderson County) 345kV
GEN-2010-005	300.00	WERE	Viola 345kV
GEN-2010-055	4.50	AEPW	Wekiwa 138kV
GEN-2011-057	150.40	WERE	Creswell 138kV
GEN-2012-023	115.00	WERE	Viola 345kV
GEN-2012-027	136.00	AEPW	Shidler 138kV
GEN-2012-032	300.00	OKGE	Tap Rose Hill - Sooner 345kV
GEN-2012-033	98.82	OKGE	Tap and Tie South 4th - Bunch Creek & Enid Tap - Fairmont (GEN-2012-033T) 138kV
GEN-2012-040	76.50	WFEC	Newkirk 138kV
GEN-2012-041	121.50	OKGE	Tap Rose Hill - Sooner 345kV
Redbud	1,200.00	OKGE	Redbud 345kV
PRIOR QUEUED SUBTOTAL	4,034.12		
GEN-2013-009	100.30	AEPW	Tap Alluwe Tap - Vinita Junction 138kV
GEN-2013-012	147.00	OKGE	Redbud 345kV
CURRENT CLUSTER SUBTOTAL	247.30		
AREA TOTAL	4,281.4		

GROUP 9/10: NEBRASKA AREA			
Request	Capacity	Area	Proposed Point of Interconnection
GEN-2002-023N	0.80	NPPD	Harmony 115kV
GEN-2003-021N	75.00	NPPD	Ainsworth Wind Tap 115kV
GEN-2004-005N	30.00	NPPD	St Francis 115kV
GEN-2004-023N	75.00	NPPD	Columbus Co 115kV
GEN-2006-020N	42.00	NPPD	Bloomfield 115kV
GEN-2006-037N1	75.00	NPPD	Broken Bow 115kV
GEN-2006-038N005	80.00	NPPD	Broken Bow 115kV
GEN-2006-038N019	80.00	NPPD	Petersburg North 115kV
GEN-2006-044N	40.50	OPPD	North Petersburg 115kV
GEN-2007-011N08	81.00	NPPD	Bloomfield 115kV
GEN-2008-086N02	200.00	NPPD	Tap Ft Randle - Columbus (Madison County) 230kV
GEN-2008-1190	60.00	OPPD	S1399 161kV
GEN-2008-123N	89.70	NPPD	Tap Guide Rock - Pauline 115kV
GEN-2009-040	73.80	WERE	Marshall 115kV
GEN-2010-041	10.50	OPPD	S 1399 161kV
GEN-2010-044	99.00	NPPD	Harbine 115kV
GEN-2010-051	200.00	NPPD	Tap Twin Church - Hoskins 230kV
GEN-2011-018	73.60	NPPD	Steele City 115kV
GEN-2011-027	120.00	NPPD	Hoskins 230kV
GEN-2011-055	52.80	OPPD	South Sterling 69kV
GEN-2011-056	3.60	NPPD	Jeffrey 115kV
GEN-2011-056A	3.60	NPPD	John 1 115kV
GEN-2011-056B	4.50	NPPD	John 2 115kV
GEN-2012-017	115.00	NPPD	Cooper 345kV
GEN-2012-018	200.00	NPPD	Tap Hoskins - Twin Church 230kV (GEN-2010-051T)
GEN-2012-021	4.80	LES	Terry Bundy Generating Station 115kV
NPPD Distributed (Broken Bow)	8.30	NPPD	Broken Bow 115kV
NPPD Distributed (Burwell)	3.00	NPPD	Ord 115kV
NPPD Distributed (Columbus Hydro)	45.00	NPPD	Columbus 115kV
NPPD Distributed (North Platte - Lexington)	54.00	NPPD	Multiple: Jeffrey 115kV, John_1 115kV, John_2 115kV
NPPD Distributed (Ord)	10.80	NPPD	Ord 115kV
NPPD Distributed (Stuart)	2.10	NPPD	Ainsworth 115kV
PRIOR QUEUED SUBTOTAL	2,013.40		
GEN-2012-005	81.00	NPPD	Tap Fort Randall - Columbus (North of Madison Co) 230kV
GEN-2013-002	50.60	LES	Tap Sheldon - Folsom 115kV CKT 1
GEN-2013-004	6.00	NPPD	Tap Fort Randall - Columbus (Madison County)
GEN-2013-005	73.50	NPPD	Madison County (GEN-2008-086N2 Sub)
GEN-2013-006	50.60	NPPD	Tap Fort Randall - Columbus (Madison County)
GEN-2013-008	1.20	NPPD	Steele City 115kV
GEN-2013-014	25.50	NPPD	Tap Guide Rock - Pauline (GEN-2008-123N Tap) 115kV
GEN-2013-015	125.80	NPPD	Tap Pauline - Hildreth 115kV
GEN-2013-018	51.00	OPPD	Tap S974 - Hydrocarbon Tap 69kV
CURRENT CLUSTER SUBTOTAL	465.20		
AREA TOTAL	2,478.6		

GROUP 12: NW AR AREA

Request	Capacity	Area	Proposed Point of Interconnection
GEN-2006-010	620.00	AEPW	Turk 138kV
PRIOR QUEUED SUBTOTAL	620.00		
GEN-2013-011	30.00	AEPW	Turk 138kV
CURRENT CLUSTER SUBTOTAL	30.00		
AREA TOTAL	650.00		

GROUP 13: NW MISSOURI AREA

Request	Capacity	Area	Proposed Point of Interconnection
GEN-2008-129	80.00	MIPU	Pleasant Hill 161kV
GEN-2010-036	4.60	WERE	6th Street 115kV
GEN-2010-056	151.20	MIPU	Tap Saint Joseph - Cooper 345kV
GEN-2011-011	50.00	KACP	Iatan 345kV
PRIOR QUEUED SUBTOTAL	285.80		
AREA TOTAL	285.80		

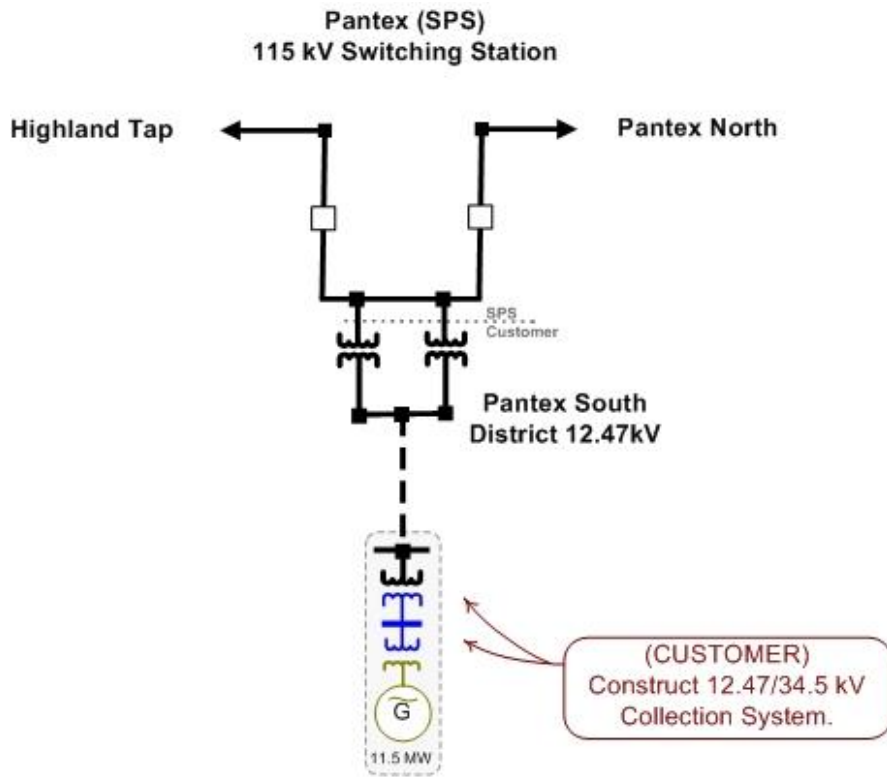
GROUP 14: S OKLAHOMA AREA

Request	Capacity	Area	Proposed Point of Interconnection
GEN-2011-040	111.00	OKGE	Tap Ratliff - Pooleville 138kV
GEN-2011-050	109.80	AEPW	Tap Rush Springs - Marlow 138kV
GEN-2012-004	41.40	OKGE	Tap Ratliff - Pooleville 138kV
PRIOR QUEUED SUBTOTAL	262.20		
GEN-2013-007	100.30	OKGE	Tap Prices Falls - Carter 138kV
CURRENT CLUSTER SUBTOTAL	100.30		
AREA TOTAL	362.50		

CLUSTER TOTAL (CURRENT STUDY)	1,689.5	MW
PQ TOTAL (PRIOR QUEUED)	29,951.1	MW
CLUSTER TOTAL (INCLUDING PRIOR QUEUED)	31,640.6	MW

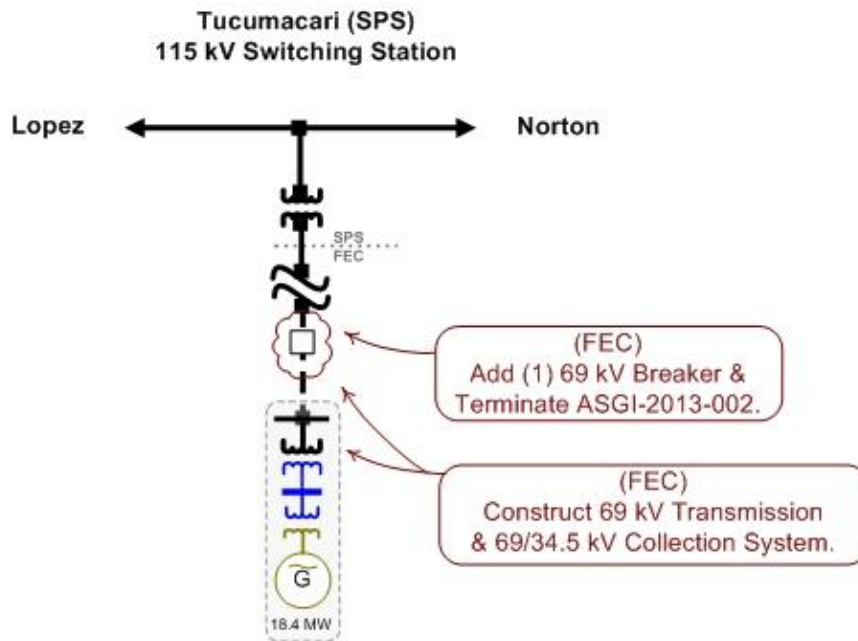
D: Proposed Point of Interconnection One Line Diagrams

ASGI-2013-001



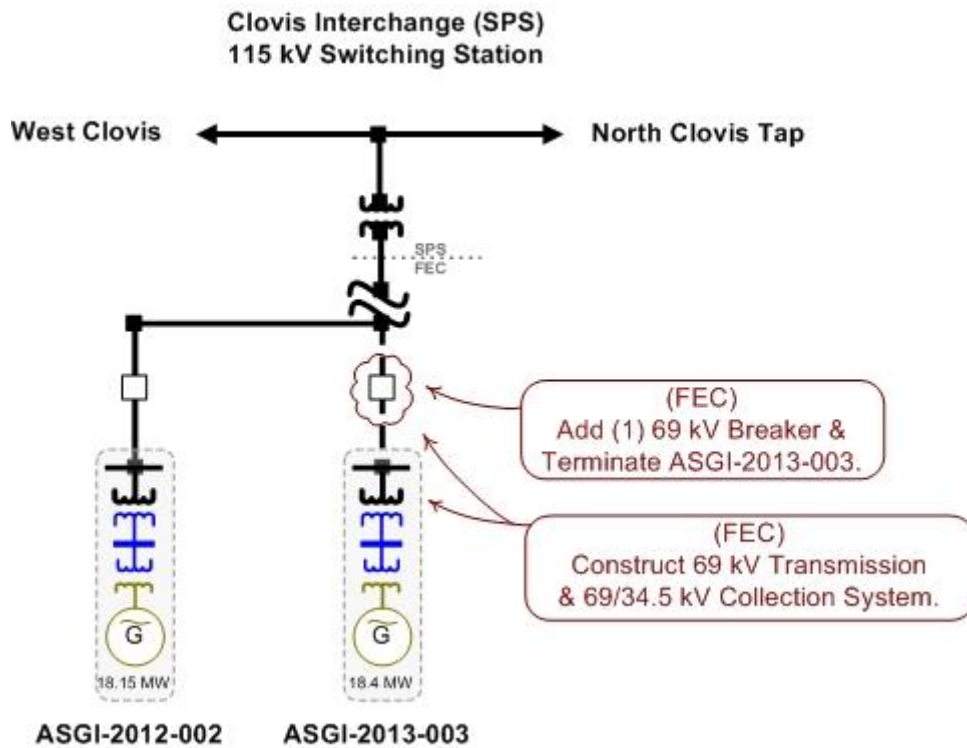
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ASGI-2013-002

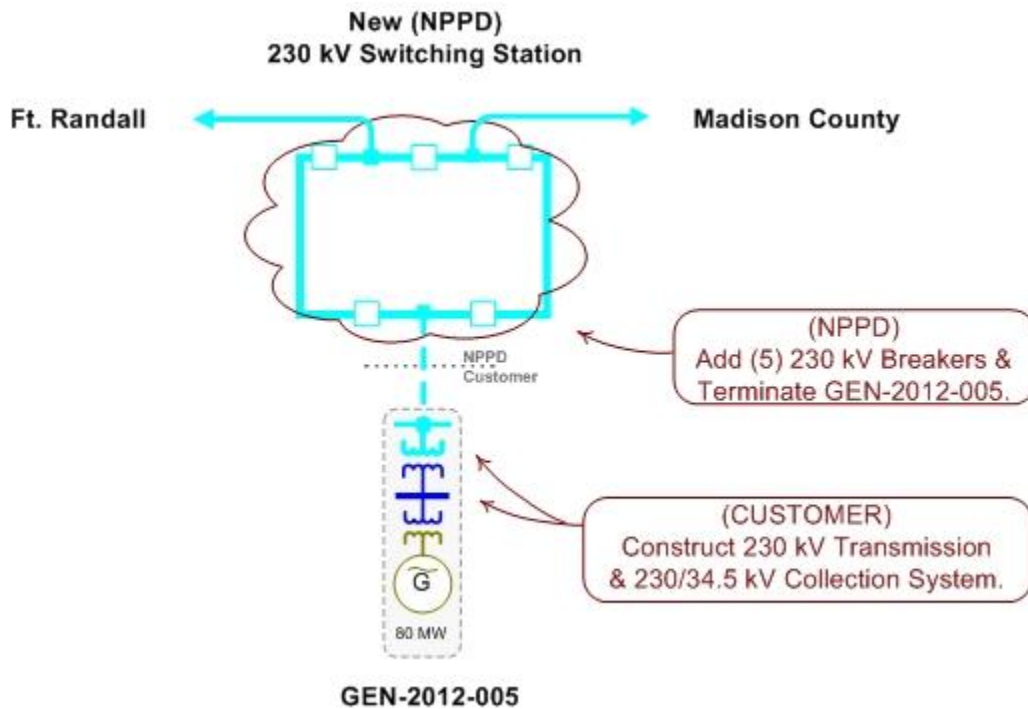


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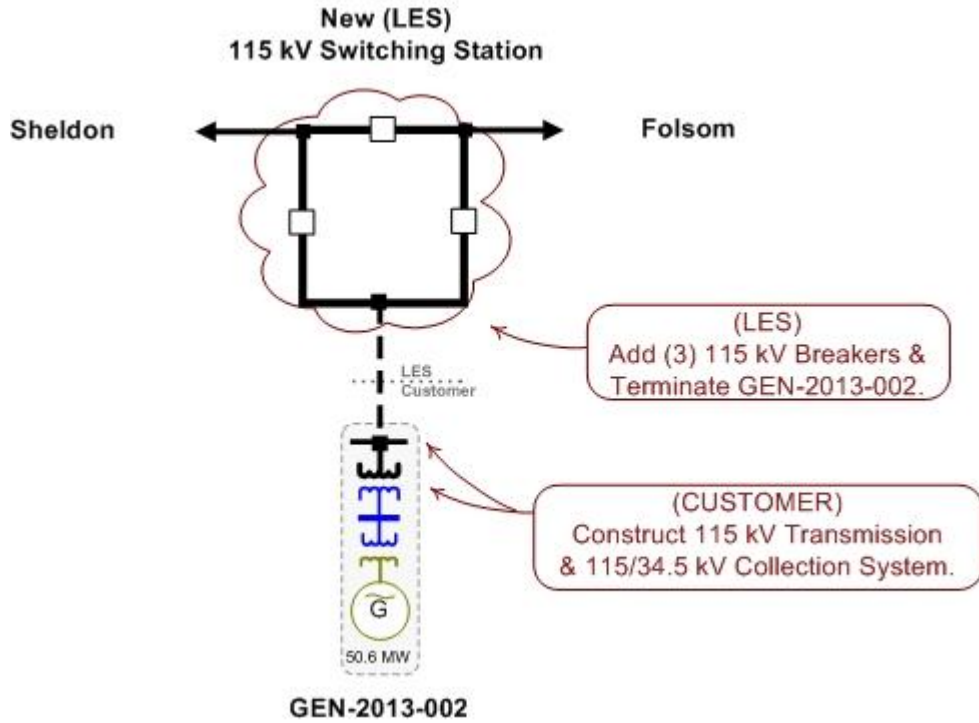
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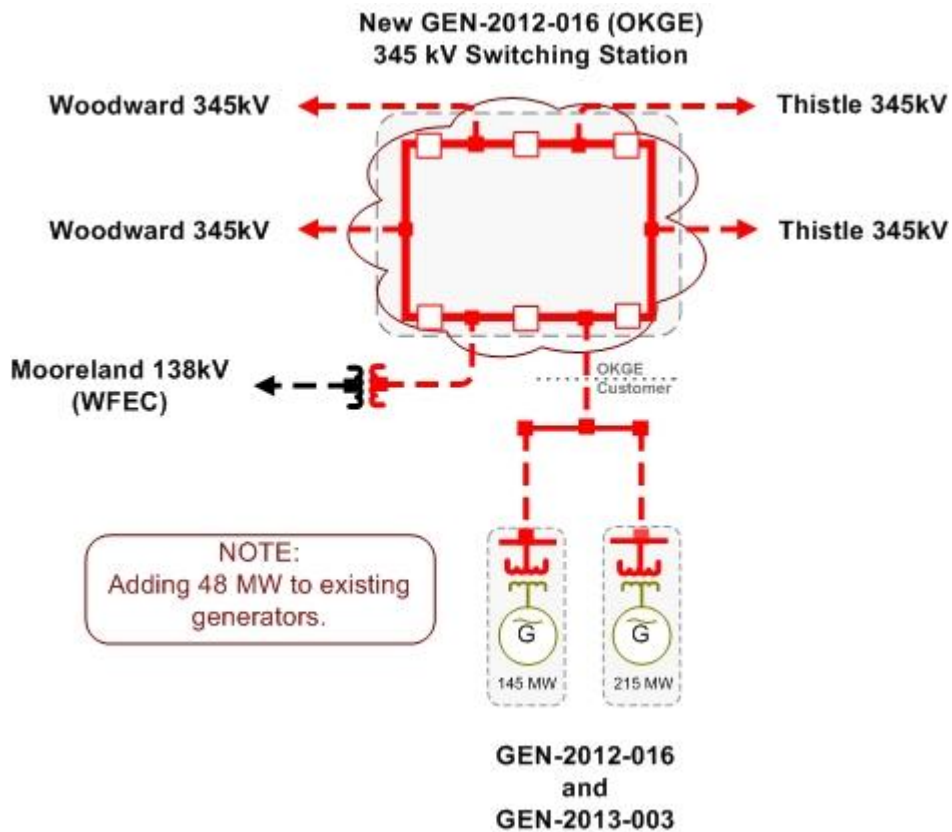
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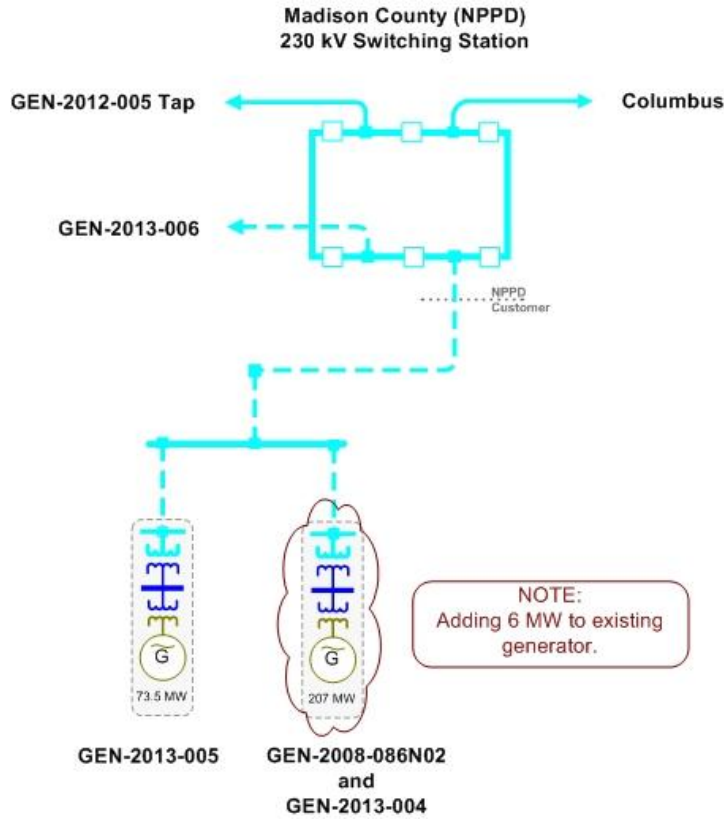
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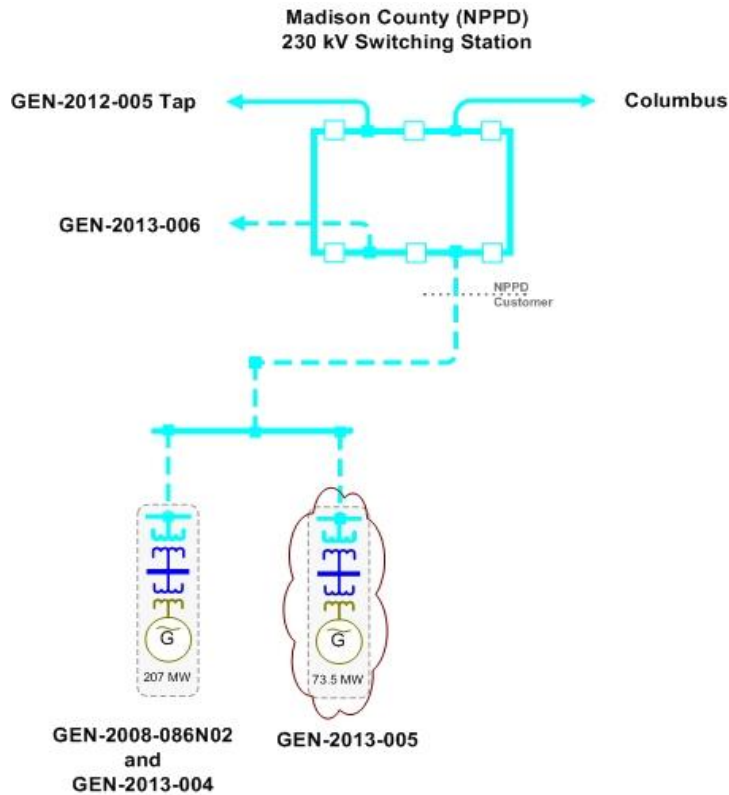
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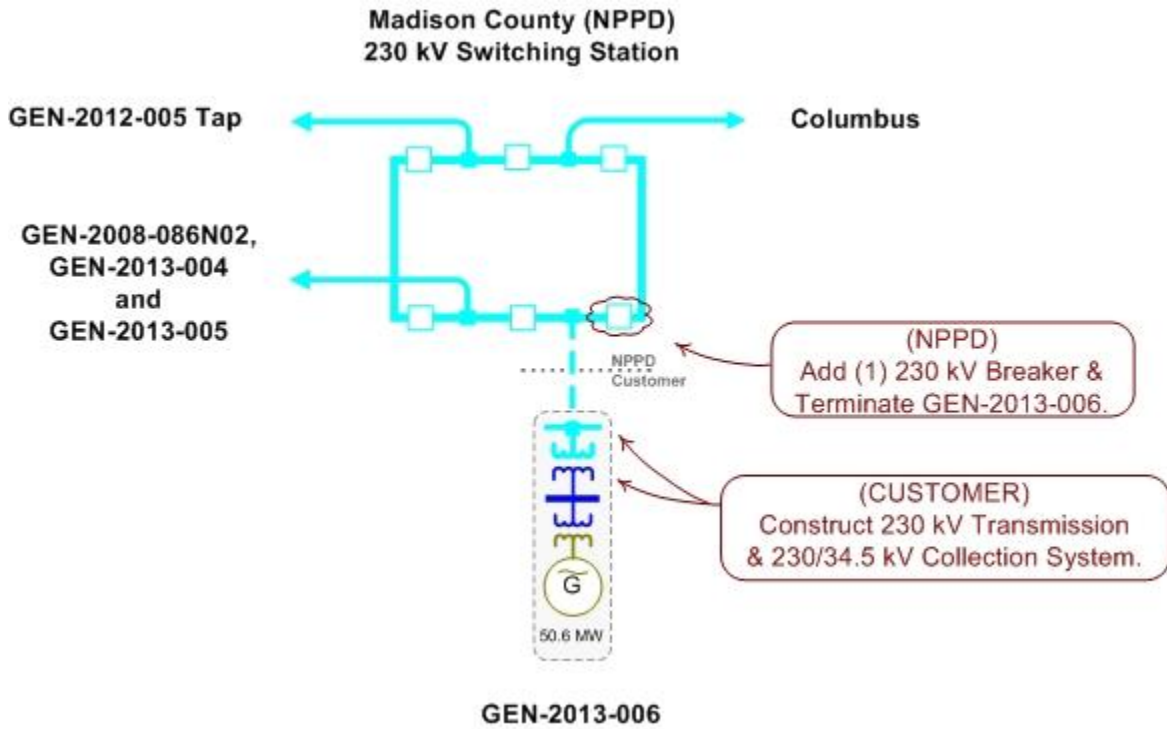
GEN-2013-004



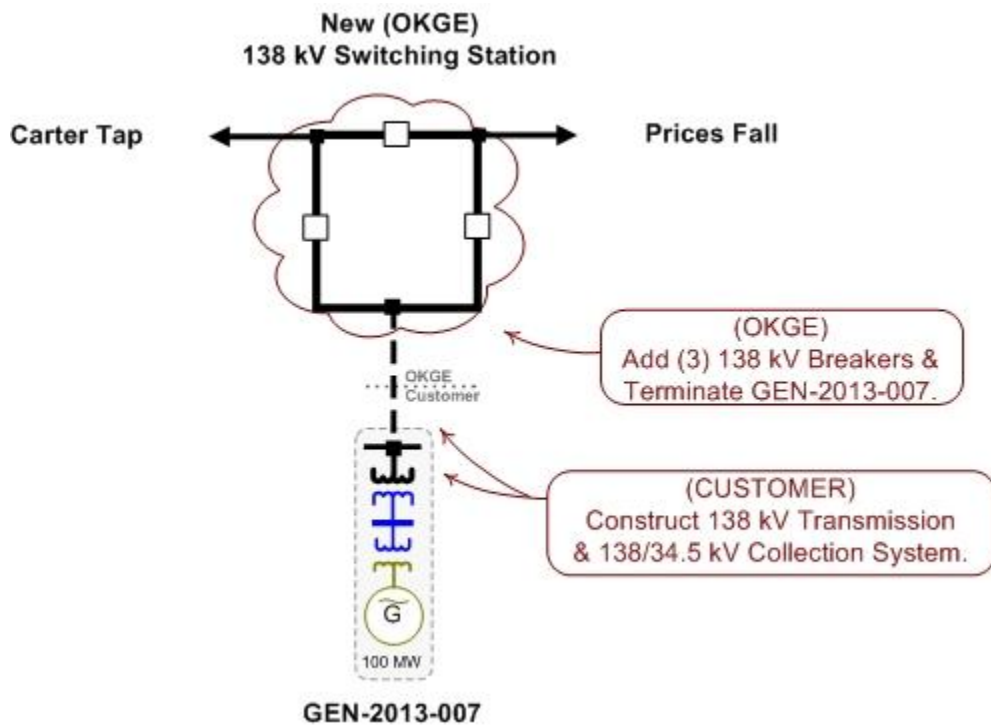
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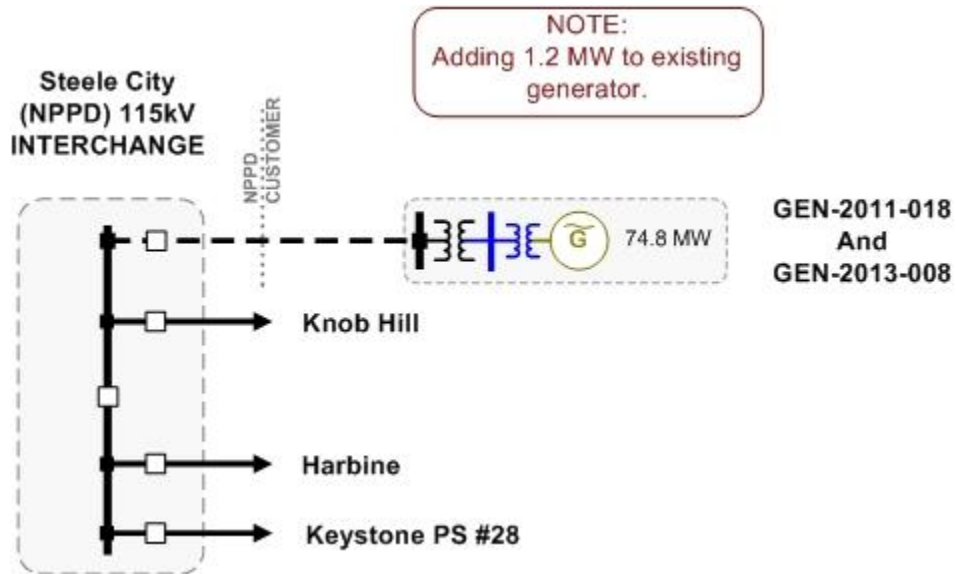
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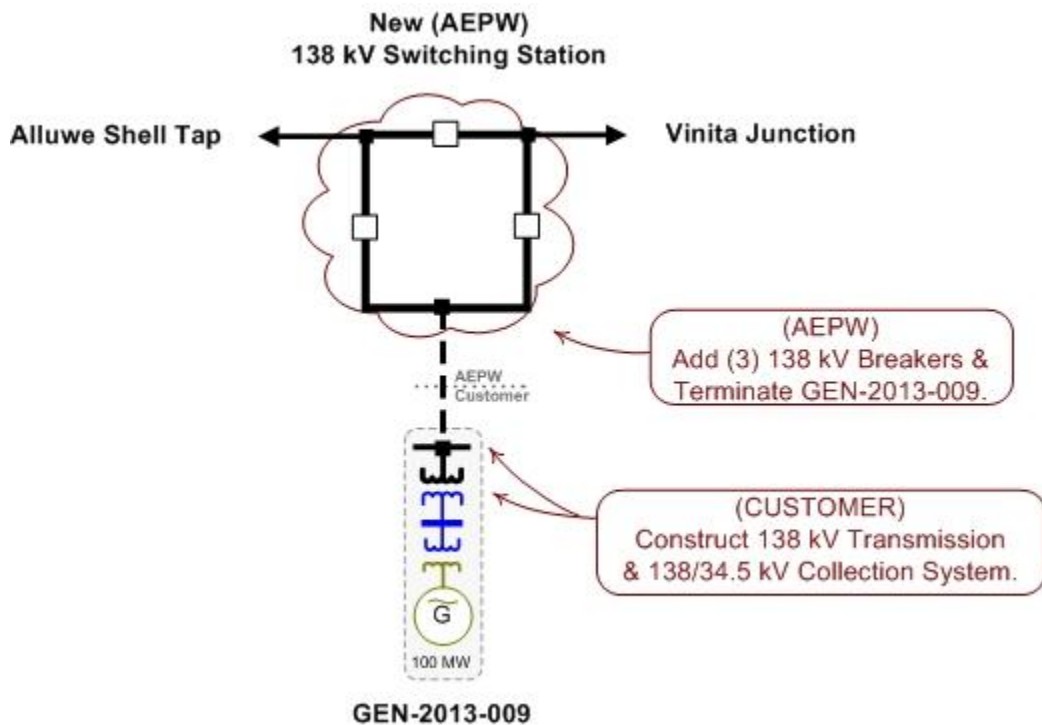
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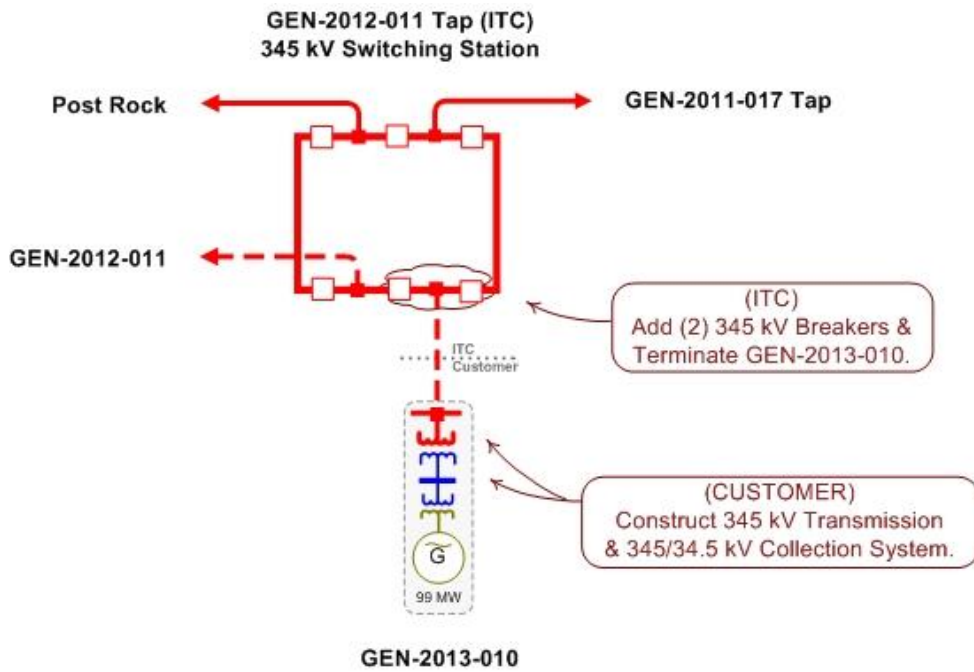
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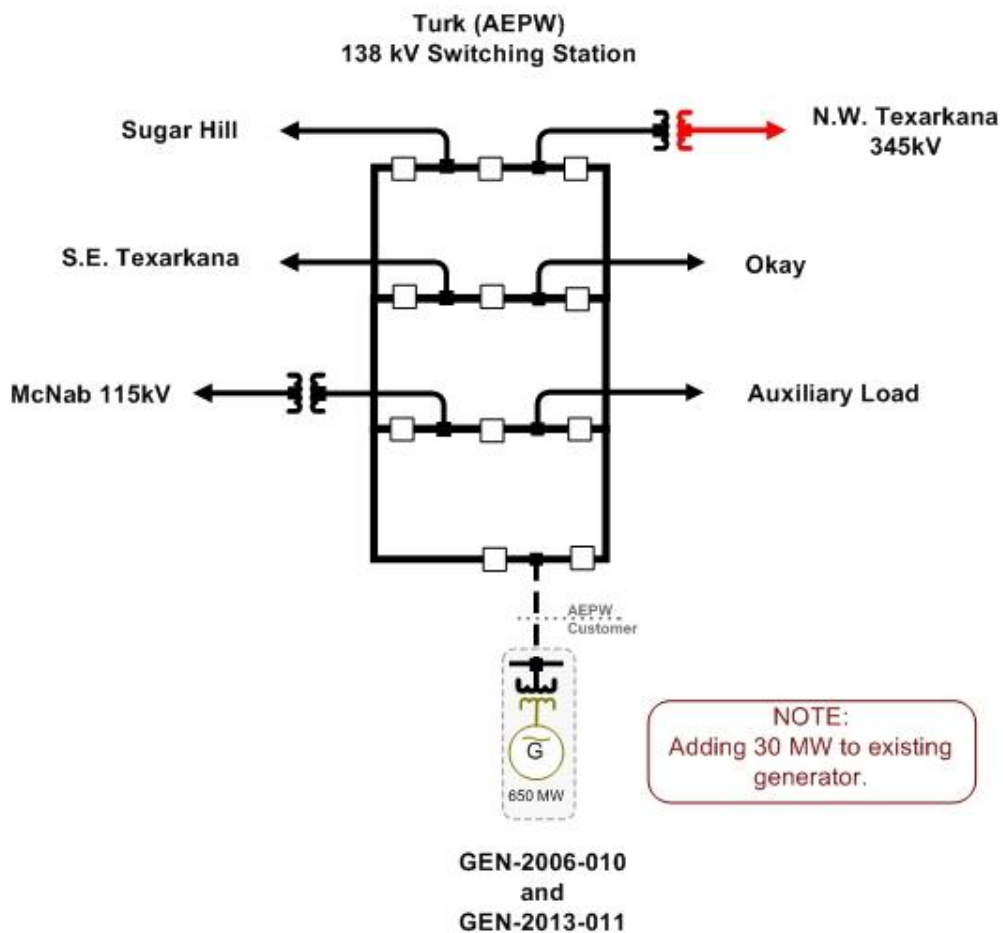
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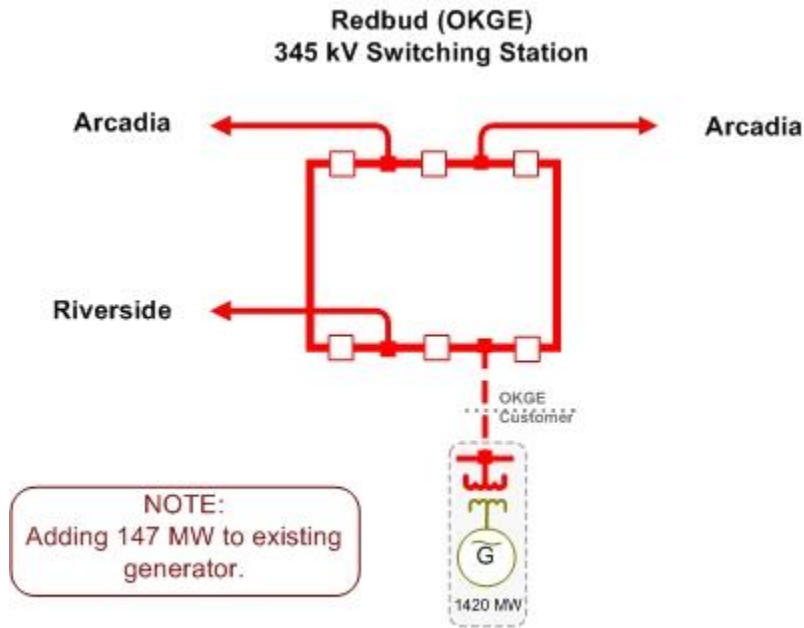
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GEN-2013-011

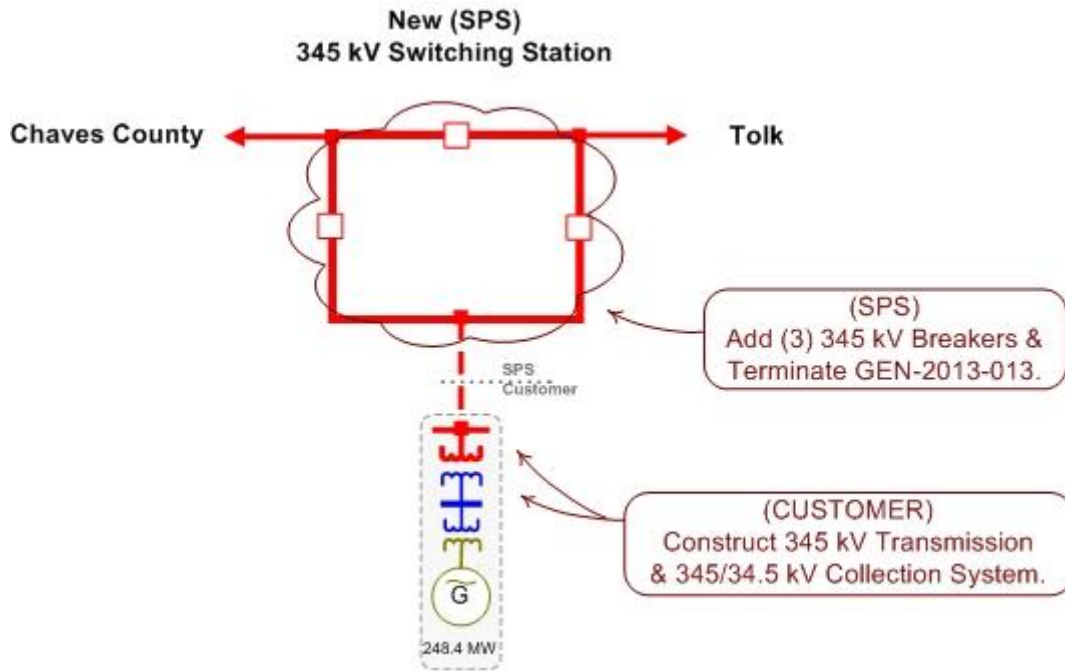


GEN-2013-012



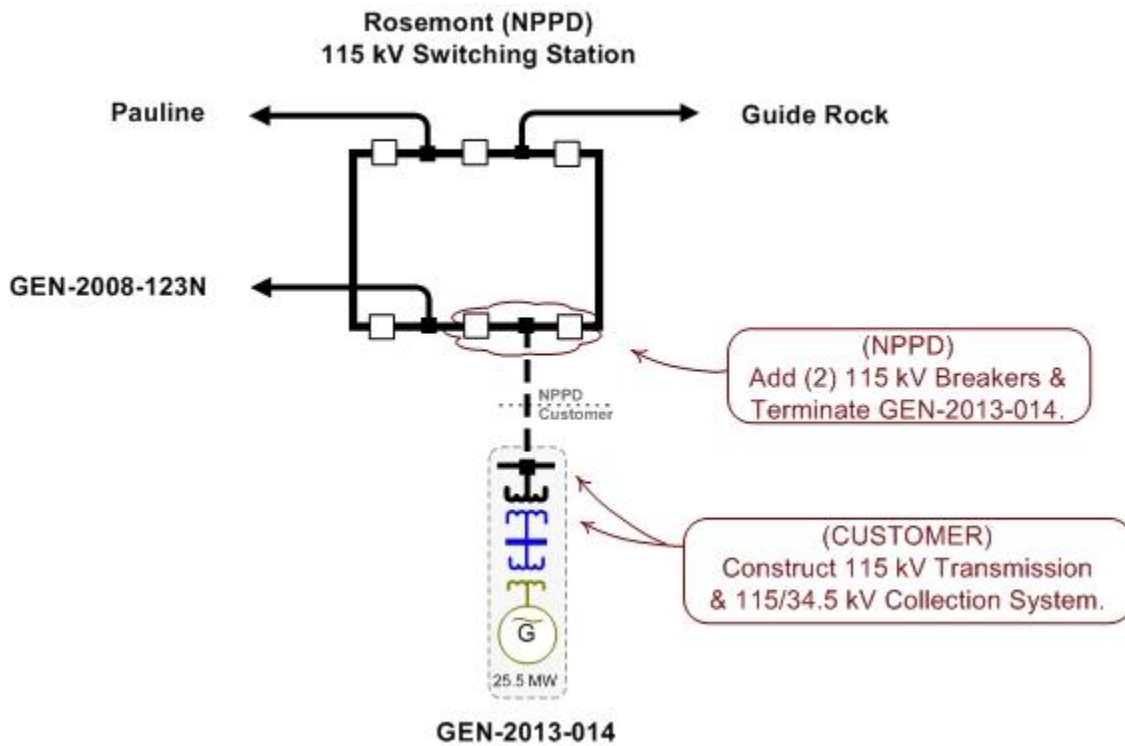
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GEN-2013-013

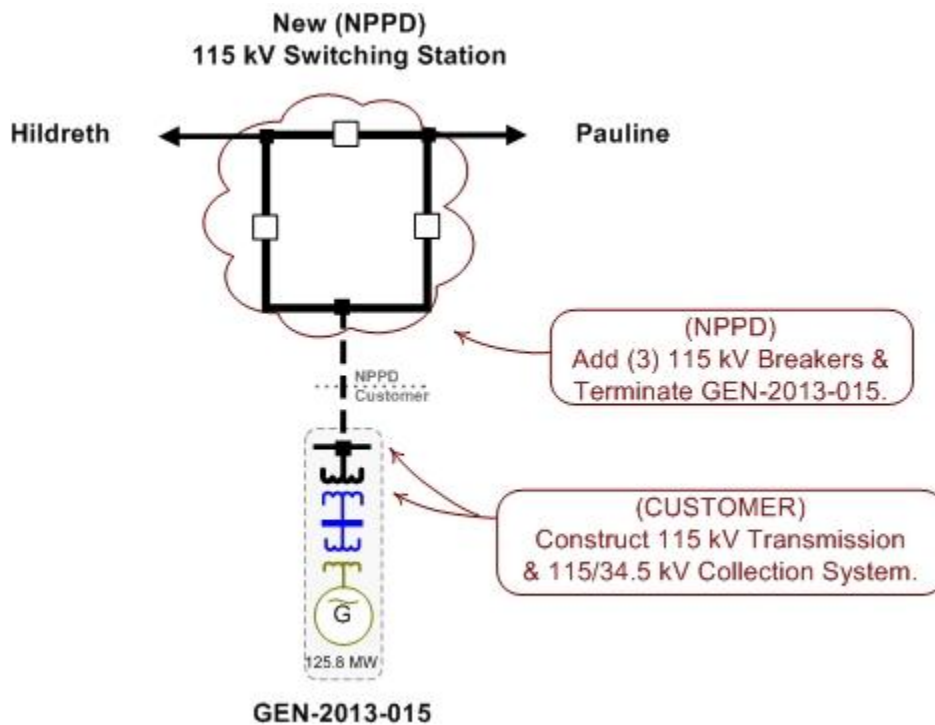


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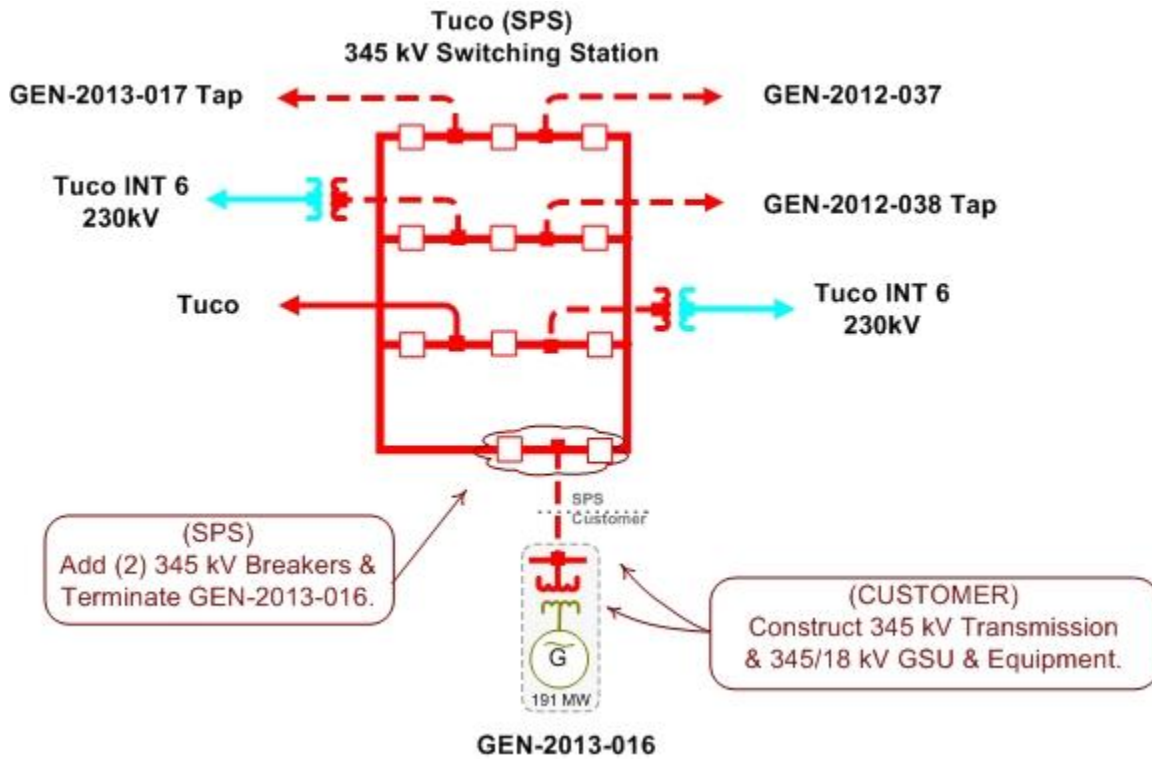
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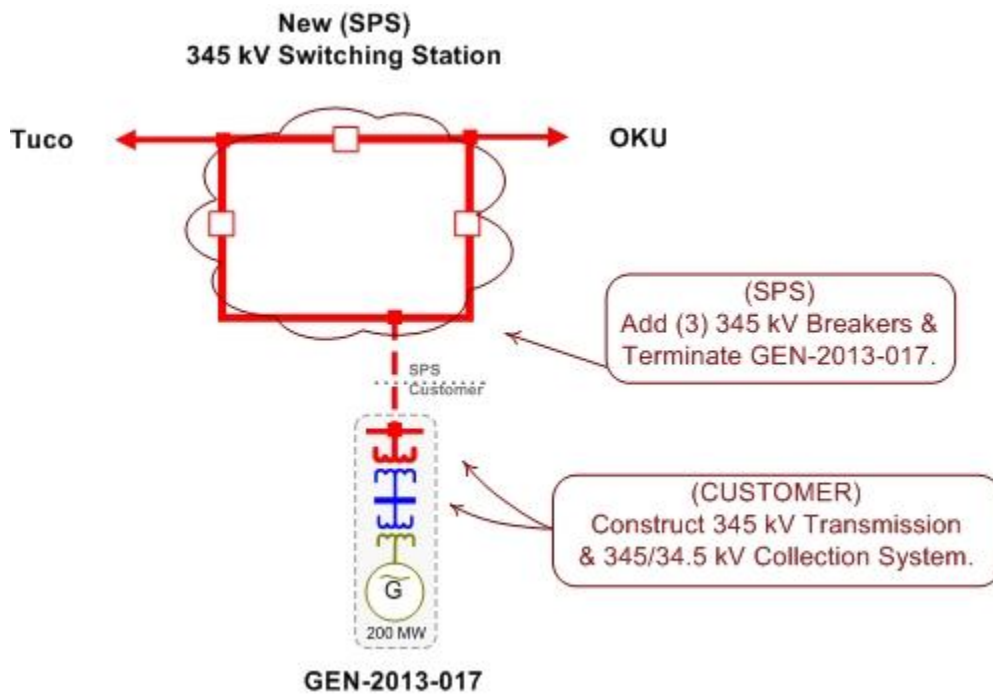
GEN-2013-015



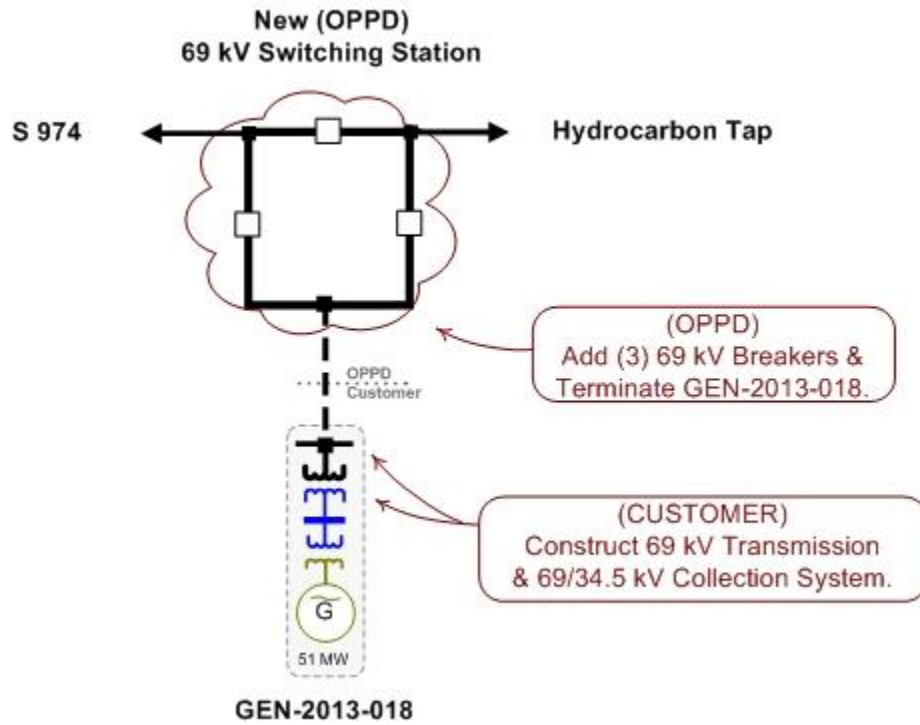
GEN-2013-016



GEN-2013-017



GEN-2013-018



E: Cost Allocation per Interconnection Request (Including Prior Queued Upgrades)

Important Note:

****WITHDRAWAL OF HIGHER QUEUED PROJECTS WILL CAUSE A RESTUDY
AND MAY RESULT IN HIGHER INTERCONNECTION COSTS****

This section shows each Generation Interconnection Request Customer, their current study impacted Network Upgrades, and the previously allocated upgrades upon which they rely to accommodate their interconnection to the transmission system.

The costs associated with the current study Network Upgrades are allocated to the Customers shown in this report.

In addition should a higher queued request, defined as one this study includes as a prior queued request, withdraw, the Network Upgrades assigned to the withdrawn request may be reallocated to the remaining requests that have an impact on the Network Upgrade under a restudy. Also, should a Interconnection Request choose to go into service prior to the operation date of any necessary Network Upgrades, the costs associated with those upgrades may be reallocated to the impacted Interconnection Request. The actual costs allocated to each Generation Interconnection Request Customer will be determined at the time of a restudy.

The required interconnection costs listed do not include all costs associated with the deliverability of the energy to final customers. These costs are determined by separate studies if the Customer submits a Transmission Service Request through SPP's Open Access Same Time Information System (OASIS) as required by Attachment Z1 of the SPP OATT. In addition, costs associated with a short circuit analysis will be allocated should the Interconnection Request Customer choose to execute a Facility Study Agreement.

There may be additional costs allocated to each Customer. See Appendix F for more details.

Appendix E. Cost Allocation Per Request

(Including Previously Allocated Network Upgrades*)

Interconnection Request and Upgrades	Upgrade Type	Allocated Cost	Upgrade Cost
ASGI-2013-001			
ASGI-2013-001 Interconnection Costs See One-Line Diagram.	Current Study	\$0.00	\$0.00
Amarillo - GEN-2007-048 Tap - Swisher 230kV CKT 1 Replace Wave Traps at both terminals: Per GEN-2007-048 Interconnection	Previously Allocated		\$0.00
Beaver County - Buckner 345kV Build approximately 90 miles of 345kV from Beaver County - Gray County @ 3000 amps	Previously Allocated		\$170,209,050.00
Beaver County - Woodward 345kV Dbl CKT Priority Project: Hitchland - Woodward Dbl 345kV CKT (Total Project E&C Cost Shown)	Previously Allocated		\$226,040,727.00
Beaver County 345kV Expansion Beaver County Expansion: Tap & Tie in Hitchland - Woodward 345kV CKT 2	Previously Allocated		\$3,500,000.00
Border - Tuco Interchange 345KV CKT 1 Balanced Portfolio: Tuco - Woodward 345kV CKT 1 (Total Project E&C Cost Shown)	Previously Allocated		\$249,247,072.00
Border - Woodward 345KV CKT 1 Balanced Portfolio: Tuco - Woodward 345kV CKT 1 (Total Project E&C Cost Shown)	Previously Allocated		\$249,247,072.00
Clark - Thistle 345KV Dbl CKT Priority Project: Spearville - Clark - Thistle Dbl 345kV CKT (Total Project E&C Cost Shown.)	Previously Allocated		\$426,504,292.00
Hitchland - Beaver County 345kV Dbl CKT Priority Project: Hitchland - Woodward Dbl 345kV CKT (Total Project E&C Cost Shown)	Previously Allocated		\$226,040,727.00
Hitchland 345/230kV Autotransformer CKT 2 Priority Project: Hitchland 345/230kV Autotransformer CKT 2 (Total Project E&C Cost Shown).	Previously Allocated		\$8,883,760.00
Spearville -Clark 345KV Dbl CKT Priority Project: Spearville - Clark - Thistle Dbl 345kV CKT (Total Project E&C Cost Shown.)	Previously Allocated		\$426,504,292.00
Thistle - Flat Ridge 138kV CKT 1 Priority Project: Thistle - Flat Ridge 138kV CKT 1 (Total Project E&C Cost Shown.)	Previously Allocated		\$5,776,280.00
Thistle - Wichita 345KV Dbl CKT Priority Project: Thistle - Wichita Dbl 345kV CKT (Total Project E&C Cost Shown.)	Previously Allocated		\$426,504,292.00
Thistle 345/138KV Transformer CKT 1 Priority Project: Thistle 345/138KV Transformer CKT 1 (Total Project E&C Cost Shown.)	Previously Allocated		\$6,585,986.00

* Withdrawal of higher queued projects will cause a restudy and may result in higher costs

Interconnection Request and Upgrades	Upgrade Type	Allocated Cost	Upgrade Cost
TUCO 345/230/13.2kV Autotransformer CKT 3 Build TUCO 345/230/13.2kV Autotransformer CKT 3 at new substation adjacent to the TUCO substation	Previously Allocated		\$15,000,000.00
TUCO Interchange 345/230/13.2KV Autotransformer CKT 2 Balanced Portfolio: TUCO 345/230 kV Transformer CKT 2 (Total Project E&C Cost Shown)	Previously Allocated		\$14,900,907.00
Woodward XFMR 345/138/13.8kV CKT 2 Balanced Portfolio: Woodward 345/138kV Transformer CKT 2 & 50 MVAR Reactor (Total Project E&C Cost Shown).	Previously Allocated		\$249,247,072.00
	Current Study Total	\$0.00	

ASGI-2013-002

ASGI-2013-002 Interconnection Costs See One-Line Diagram.	Current Study	\$0.00	\$0.00
Deaf Smith - Plant X 230kV CKT 1 Replace line traps at both ends	Current Study	\$32,052.00	\$1,000,000.00
Elk City - Gracemont 345kV CKT 1 Build approximately 105 miles of 345kV	Current Study	\$4,466,023.58	\$175,061,392.00
Sweetwater - Elk City 345kV CKT 1 Build Sweetwater Substation and approximately 45 miles of 345kV	Current Study	\$1,990,270.99	\$87,489,138.00
Tolk - Plant X 230kV CKT 3 Build a 3rd circuit between Tolk - Plant X 230kV	Current Study	\$932,979.36	\$20,000,000.00
Tolk 345/230/13kV Transformer CKT 2 Build second 345/230/13kV transformer at Tolk	Current Study	\$19,076.08	\$15,000,000.00
TUCO Interchange - Sweetwater 345kV CKT 2 Build approximately 142 miles of 345kV	Current Study	\$2,628,721.90	\$123,000,000.00
Amoco Wasson - Oxy Tap 230kV CKT 1 Replace line traps at both terminals	Previously Allocated		\$200,000.00
Beaver County - Woodward 345kV Dbl CKT Priority Project: Hitchland - Woodward Dbl 345kV CKT (Total Project E&C Cost Shown)	Previously Allocated		\$226,040,727.00
Beaver County 345kV Expansion Beaver County Expansion: Tap & Tie in Hitchland - Woodward 345kV CKT 2	Previously Allocated		\$3,500,000.00
Border - Tuco Interchange 345KV CKT 1 Balanced Portfolio: Tuco - Woodward 345kV CKT 1 (Total Project E&C Cost Shown)	Previously Allocated		\$249,247,072.00
Border - Woodward 345KV CKT 1 Balanced Portfolio: Tuco - Woodward 345kV CKT 1 (Total Project E&C Cost Shown)	Previously Allocated		\$249,247,072.00

* Withdrawal of higher queued projects will cause a restudy and may result in higher costs

Interconnection Request and Upgrades	Upgrade Type	Allocated Cost	Upgrade Cost
Hitchland - Beaver County 345kV Dbl CKT Priority Project: Hitchland - Woodward Dbl 345kV CKT (Total Project E&C Cost Shown)	Previously Allocated		\$226,040,727.00
Hitchland 345/230kV Autotransformer CKT 2 Priority Project: Hitchland 345/230kV Autotransformer CKT 2 (Total Project E&C Cost Shown).	Previously Allocated		\$8,883,760.00
Mustang - Yoakum 230kV CKT 1 Replace line traps at both terminals	Previously Allocated		\$200,000.00
Oxy Tap - Yoakum 230kV CKT 1 Replace line traps at both terminals	Previously Allocated		\$200,000.00
Thistle - Flat Ridge 138kV CKT 1 Priority Project: Thistle - Flat Ridge 138kV CKT 1 (Total Project E&C Cost Shown.)	Previously Allocated		\$5,776,280.00
Thistle - Wichita 345KV Dbl CKT Priority Project: Thistle - Wichita Dbl 345kV CKT (Total Project E&C Cost Shown.)	Previously Allocated		\$426,504,292.00
Thistle 345/138KV Transformer CKT 1 Priority Project: Thistle 345/138kV Transformer CKT 1 (Total Project E&C Cost Shown.)	Previously Allocated		\$6,585,986.00
TUCO 345/230/13.2kV Autotransformer CKT 3 Build TUCO 345/230/13.2kV Autotransformer CKT 3 at new substation adjacent to the TUCO substation	Previously Allocated		\$15,000,000.00
TUCO Interchange 345/230/13.2KV Autotransformer CKT 2 Balanced Portfolio: TUCO 345/230 kV Transformer CKT 2 (Total Project E&C Cost Shown)	Previously Allocated		\$14,900,907.00
Woodward XFMR 345/138/13.8kV CKT 2 Balanced Portfolio: Woodward 345/138kV Transformer CKT 2 & 50 MVAR Reactor (Total Project E&C Cost Shown).	Previously Allocated		\$249,247,072.00
	Current Study Total	\$10,069,123.91	

ASGI-2013-003

ASGI-2013-003 Interconnection Costs See One-Line Diagram.	Current Study	\$0.00	\$0.00
Deaf Smith - Plant X 230kV CKT 1 Replace line traps at both ends	Current Study	\$35,070.30	\$1,000,000.00
Elk City - Gracemont 345kV CKT 1 Build approximately 105 miles of 345kV	Current Study	\$4,480,766.49	\$175,061,392.00
Sweetwater - Elk City 345kV CKT 1 Build Sweetwater Substation and approximately 45 miles of 345kV	Current Study	\$1,996,841.13	\$87,489,138.00
Tolk - Plant X 230kV CKT 3 Build a 3rd circuit between Tolk - Plant X 230kV	Current Study	\$962,803.69	\$20,000,000.00

* Withdrawal of higher queued projects will cause a restudy and may result in higher costs

Interconnection Request and Upgrades	Upgrade Type	Allocated Cost	Upgrade Cost
Tolk 345/230/13kV Transformer CKT 2 Build second 345/230/13kV transformer at Tolk	Current Study	\$22,738.26	\$15,000,000.00
TUCO Interchange - Sweetwater 345kV CKT 2 Build approximately 142 miles of 345kV	Current Study	\$2,641,644.26	\$123,000,000.00
Amoco Wasson - Oxy Tap 230kV CKT 1 Replace line traps at both terminals	Previously Allocated		\$200,000.00
Beaver County - Woodward 345kV Dbl CKT Priority Project: Hitchland - Woodward Dbl 345kV CKT (Total Project E&C Cost Shown)	Previously Allocated		\$226,040,727.00
Beaver County 345kV Expansion Beaver County Expansion: Tap & Tie in Hitchland - Woodward 345kV CKT 2	Previously Allocated		\$3,500,000.00
Border - Tuco Interchange 345KV CKT 1 Balanced Portfolio: Tuco - Woodward 345kV CKT 1 (Total Project E&C Cost Shown)	Previously Allocated		\$249,247,072.00
Border - Woodward 345KV CKT 1 Balanced Portfolio: Tuco - Woodward 345kV CKT 1 (Total Project E&C Cost Shown)	Previously Allocated		\$249,247,072.00
Hitchland - Beaver County 345kV Dbl CKT Priority Project: Hitchland - Woodward Dbl 345kV CKT (Total Project E&C Cost Shown)	Previously Allocated		\$226,040,727.00
Hitchland 345/230kV Autotransformer CKT 2 Priority Project: Hitchland 345/230kV Autotransformer CKT 2 (Total Project E&C Cost Shown).	Previously Allocated		\$8,883,760.00
Mustang - Yoakum 230kV CKT 1 Replace line traps at both terminals	Previously Allocated		\$200,000.00
Oxy Tap - Yoakum 230kV CKT 1 Replace line traps at both terminals	Previously Allocated		\$200,000.00
Thistle - Flat Ridge 138kV CKT 1 Priority Project: Thistle - Flat Ridge 138kV CKT 1 (Total Project E&C Cost Shown.)	Previously Allocated		\$5,776,280.00
Thistle - Wichita 345KV Dbl CKT Priority Project: Thistle - Wichita Dbl 345kV CKT (Total Project E&C Cost Shown.)	Previously Allocated		\$426,504,292.00
Thistle 345/138KV Transformer CKT 1 Priority Project: Thistle 345/138kV Transformer CKT 1 (Total Project E&C Cost Shown.)	Previously Allocated		\$6,585,986.00
TUCO 345/230/13.2kV Autotransformer CKT 3 Build TUCO 345/230/13.2kV Autotransformer CKT 3 at new substation adjacent to the TUCO substation	Previously Allocated		\$15,000,000.00
TUCO Interchange 345/230/13.2KV Autotransformer CKT 2 Balanced Portfolio: TUCO 345/230 kV Transformer CKT 2 (Total Project E&C Cost Shown)	Previously Allocated		\$14,900,907.00

* Withdrawal of higher queued projects will cause a restudy and may result in higher costs

Interconnection Request and Upgrades	Upgrade Type	Allocated Cost	Upgrade Cost
Woodward XFMR 345/138/13.8kV CKT 2 Balanced Portfolio: Woodward 345/138kV Transformer CKT 2 & 50 MVAR Reactor (Total Project E&C Cost Shown).	Previously Allocated		\$249,247,072.00
	Current Study Total	\$10,139,864.13	

GEN-2012-005

GEN-2012-005 Interconnection Costs See One-Line Diagram.	Current Study	\$7,000,000.00	\$7,000,000.00
Madison County - North Petersburg 115kV CKT 1 Build approximately 25 miles of new 115kV circuit from Madison County - North Petersburg	Current Study	\$2,341,951.43	\$18,000,000.00
Madison County - South Norfolk 230kV CKT 1 Build approximately 25 miles of new 230kV circuit from Madison County - South Norfolk	Current Study	\$4,329,586.53	\$25,000,000.00
Madison County 230/115/13.8kV Transformer CKT 1 Build Madison County 230/115/13.8kV Transformer	Current Study	\$903,355.37	\$6,000,000.00
South Norfolk 345/230/13.8kV Transformer CKT 1 Build new 345/230/13.8kV transformer	Current Study	\$1,385,467.69	\$8,000,000.00
South Norfolk 345/230kV Substation Build new 345/230kV substation on Hoskins - Shell Creek 345kV	Current Study	\$2,078,201.53	\$12,000,000.00
Fort Randall - Columbus 230kV CKT 1 Conductor clearance increase	Previously Allocated		\$2,900,000.00
Hoskins - Dixon County - Twin Church 230kV Rerate per NPPD Facility Study	Previously Allocated		\$500,000.00
Twin Church - Dixon County 230kV Increase conductor clearances to accommodate 320MVA facility rating	Previously Allocated		\$100,000.00
	Current Study Total	\$18,038,562.55	

GEN-2013-002

GEN-2013-002 Interconnection Costs See One-Line Diagram.	Current Study	\$3,000,000.00	\$3,000,000.00
Dixon County - Rasmussen 230kV CKT 1 Build approximately 40 miles of new 230kV	Previously Allocated		\$40,000,000.00
GEN-2013-002 TAP - Folsom & Pleasant Hill 115kV CKT 2 Per ITP NT 2011 (Total Project E&C Cost Shown)	Previously allocated		\$6,534,843.00
Sheldon - GEN-2013-002 Tap 115kV CKT 2 Per ITP NT 2011 (Total Project E&C Cost Shown)	Previously allocated		\$6,534,843.00

* Withdrawal of higher queued projects will cause a restudy and may result in higher costs

Interconnection Request and Upgrades	Upgrade Type	Allocated Cost	Upgrade Cost
SUB 967 - SUB 968 69kV CKT 1 Replace terminal equipment	Previously Allocated		\$16,000.00
SUB 968 - SUB 969 69kV CKT 1 Mitigated by replacing terminal equipment at Sub 969	Previously Allocated		\$0.00
Twin Church - Dixon County 230kV Increase conductor clearances to accommodate 320MVA facility rating	Previously Allocated		\$100,000.00
West Brock - SUB967 69kV CKT 1 Mitigated by replacing terminal equipment at Sub 967	Previously Allocated		\$0.00
	Current Study Total	\$3,000,000.00	

GEN-2013-003

Benton - Wichita 345kV CKT 1 NRIS only required upgrade: Replace terminal equipment at Benton and Wichita	Current Study	\$1,183,000.00	\$1,183,000.00
GEN-2013-003 Interconnection Costs See One-Line Diagram.	Current Study	\$0.00	\$0.00
Border - Tuco Interchange 345KV CKT 1 Balanced Portfolio: Tuco - Woodward 345kV CKT 1 (Total Project E&C Cost Shown)	Previously Allocated		\$249,247,072.00
Border - Woodward 345KV CKT 1 Balanced Portfolio: Tuco - Woodward 345kV CKT 1 (Total Project E&C Cost Shown)	Previously Allocated		\$249,247,072.00
Clark - Thistle 345KV Dbl CKT Priority Project: Spearville - Clark - Thistle Dbl 345kV CKT (Total Project E&C Cost Shown.)	Previously Allocated		\$426,504,292.00
Matthewson - Cimarron 345kV CKT 2 Build second 345kV circuit from Matthewson - Cimarron @ 3000 amps	Previously Allocated		\$42,903,753.00
Mullergren - Reno 345kV Dbl CKT Build approximately 92 miles of new Dbl 345kV circuit from Mullergren - Reno @ 3000 amps	Previously Allocated		\$210,887,465.33
Muskogee - Seminole 345KV CKT 1 Balanced Portfolio: Seminole - Muskogee 345 kV CKT 1 (Total Project E&C Cost Shown).	Previously Allocated		\$170,000,000.00
Spearville - Mullergren 345kV Dbl CKT Build approximately 85 miles of new Dbl 345kV circuit from Spearville - Mullergren @ 3000 amps	Previously Allocated		\$196,323,921.67
Spearville -Clark 345KV Dbl CKT Priority Project: Spearville - Clark - Thistle Dbl 345kV CKT (Total Project E&C Cost Shown.)	Previously Allocated		\$426,504,292.00
Tatonga - Matthewson 345kV CKT 2 Build second 345kV circuit from Tatonga - Matthewson @ 3000 amps	Previously Allocated		\$104,260,473.00

* Withdrawal of higher queued projects will cause a restudy and may result in higher costs

Interconnection Request and Upgrades	Upgrade Type	Allocated Cost	Upgrade Cost
Thistle - Flat Ridge 138kV CKT 1 Priority Project: Thistle - Flat Ridge 138kV CKT 1 (Total Project E&C Cost Shown.)	Previously Allocated		\$5,776,280.00
Thistle - Wichita 345kV Dbl CKT Priority Project: Thistle - Wichita Dbl 345kV CKT (Total Project E&C Cost Shown.)	Previously Allocated		\$426,504,292.00
Thistle - Woodward 345kV Dbl CKT Priority Project: Thistle - Woodward Dbl 345kV CKT (Total Project E&C Cost Shown)	Previously Allocated		\$207,782,000.00
Thistle 345/138kV Transformer CKT 1 Priority Project: Thistle 345/138kV Transformer CKT 1 (Total Project E&C Cost Shown.)	Previously Allocated		\$6,585,986.00
TUCO 345/230/13.2kV Autotransformer CKT 3 Build TUCO 345/230/13.2kV Autotransformer CKT 3 at new substation adjacent to the TUCO substation	Previously Allocated		\$15,000,000.00
TUCO Interchange 345/230/13.2kV Autotransformer CKT 2 Balanced Portfolio: TUCO 345/230 kV Transformer CKT 2 (Total Project E&C Cost Shown)	Previously Allocated		\$14,900,907.00
	Current Study Total	\$1,183,000.00	

GEN-2013-004

GEN-2013-004 Interconnection Costs See One-Line Diagram.	Current Study	\$0.00	\$0.00
Madison County - North Petersburg 115kV CKT 1 Build approximately 25 miles of new 115kV circuit from Madison County - North Petersburg	Current Study	\$717,162.53	\$18,000,000.00
Madison County - South Norfolk 230kV CKT 1 Build approximately 25 miles of new 230kV circuit from Madison County - South Norfolk	Current Study	\$946,736.49	\$25,000,000.00
Madison County 230/115/13.8kV Transformer CKT 1 Build Madison County 230/115/13.8kV Transformer	Current Study	\$233,434.10	\$6,000,000.00
South Norfolk 345/230/13.8kV Transformer CKT 1 Build new 345/230/13.8kV transformer	Current Study	\$302,955.68	\$8,000,000.00
South Norfolk 345/230kV Substation Build new 345/230kV substation on Hoskins - Shell Creek 345kV	Current Study	\$454,433.52	\$12,000,000.00
Dixon County - Rasmussen 230kV CKT 1 Build approximately 40 miles of new 230kV	Previously Allocated		\$40,000,000.00
Fort Randall - Columbus 230kV CKT 1 Conductor clearance increase	Previously Allocated		\$2,900,000.00
Hoskins - Dixon County - Twin Church 230kV Rerate per NPPD Facility Study	Previously Allocated		\$500,000.00

* Withdrawal of higher queued projects will cause a restudy and may result in higher costs

Interconnection Request and Upgrades	Upgrade Type	Allocated Cost	Upgrade Cost
Twin Church - Dixon County 230kV Increase conductor clearances to accommodate 320MVA facility rating	Previously Allocated		\$100,000.00
	Current Study Total	\$2,654,722.32	
GEN-2013-005			
GEN-2013-005 Interconnection Costs See One-Line Diagram.	Current Study	\$0.00	\$0.00
Madison County - North Petersburg 115kV CKT 1 Build approximately 25 miles of new 115kV circuit from Madison County - North Petersburg	Current Study	\$8,845,004.54	\$18,000,000.00
Madison County - South Norfolk 230kV CKT 1 Build approximately 25 miles of new 230kV circuit from Madison County - South Norfolk	Current Study	\$11,676,416.77	\$25,000,000.00
Madison County 230/115/13.8kV Transformer CKT 1 Build Madison County 230/115/13.8kV Transformer	Current Study	\$2,879,020.63	\$6,000,000.00
South Norfolk 345/230/13.8kV Transformer CKT 1 Build new 345/230/13.8kV transformer	Current Study	\$3,736,453.37	\$8,000,000.00
South Norfolk 345/230kV Substation Build new 345/230kV substation on Hoskins - Shell Creek 345kV	Current Study	\$5,604,680.05	\$12,000,000.00
Dixon County - Rasmussen 230kV CKT 1 Build approximately 40 miles of new 230kV	Previously Allocated		\$40,000,000.00
Fort Randall - Columbus 230kV CKT 1 Conductor clearance increase	Previously Allocated		\$2,900,000.00
Hoskins - Dixon County - Twin Church 230kV Rerate per NPPD Facility Study	Previously Allocated		\$500,000.00
Twin Church - Dixon County 230kV Increase conductor clearances to accommodate 320MVA facility rating	Previously Allocated		\$100,000.00
	Current Study Total	\$32,741,575.36	

GEN-2013-006

GEN-2013-006 Interconnection Costs See One-Line Diagram.	Current Study	\$3,000,000.00	\$3,000,000.00
Madison County - North Petersburg 115kV CKT 1 Build approximately 25 miles of new 115kV circuit from Madison County - North Petersburg	Current Study	\$6,095,881.50	\$18,000,000.00
Madison County - South Norfolk 230kV CKT 1 Build approximately 25 miles of new 230kV circuit from Madison County - South Norfolk	Current Study	\$8,047,260.21	\$25,000,000.00

* Withdrawal of higher queued projects will cause a restudy and may result in higher costs

Interconnection Request and Upgrades	Upgrade Type	Allocated Cost	Upgrade Cost
Madison County 230/115/13.8kV Transformer CKT 1 Build Madison County 230/115/13.8kV Transformer	Current Study	\$1,984,189.89	\$6,000,000.00
South Norfolk 345/230/13.8kV Transformer CKT 1 Build new 345/230/13.8kV transformer	Current Study	\$2,575,123.27	\$8,000,000.00
South Norfolk 345/230kV Substation Build new 345/230kV substation on Hoskins - Shell Creek 345kV	Current Study	\$3,862,684.90	\$12,000,000.00
Dixon County - Rasmussen 230kV CKT 1 Build approximately 40 miles of new 230kV	Previously Allocated		\$40,000,000.00
Fort Randall - Columbus 230kV CKT 1 Conductor clearance increase	Previously Allocated		\$2,900,000.00
Hoskins - Dixon County - Twin Church 230kV Rerate per NPPD Facility Study	Previously Allocated		\$500,000.00
Twin Church - Dixon County 230kV Increase conductor clearances to accommodate 320MVA facility rating	Previously Allocated		\$100,000.00
	Current Study Total	\$25,565,139.77	

GEN-2013-007

GEN-2013-007 Interconnection Costs See One-Line Diagram.	Current Study	\$3,000,000.00	\$3,000,000.00
	Current Study Total	\$3,000,000.00	

GEN-2013-008

GEN-2013-008 Interconnection Costs See One-Line Diagram.	Current Study	\$0.00	\$0.00
Dixon County - Rasmussen 230kV CKT 1 Build approximately 40 miles of new 230kV	Previously Allocated		\$40,000,000.00
GEN-2013-002 TAP - Folsom & Pleasant Hill 115kV CKT 2 Per ITP NT 2011 (Total Project E&C Cost Shown)	Previously allocated		\$6,534,843.00
Harbine - Crete 115kV CKT 1 Build approximately 35 miles of 115kV from Harbine - Crete	Previously Allocated		\$17,200,000.00
Sheldon - GEN-2013-002 Tap 115kV CKT 2 Per ITP NT 2011 (Total Project E&C Cost Shown)	Previously allocated		\$6,534,843.00
	Current Study Total	\$0.00	

GEN-2013-009

* Withdrawal of higher queued projects will cause a restudy and may result in higher costs

Interconnection Request and Upgrades	Upgrade Type	Allocated Cost	Upgrade Cost
Catoosa - Terra Nitrogen Tap 138kV CKT 1 NRIS only required upgrade: Rebuild approximately 6 miles of 138kV	Current Study	\$6,000,000.00	\$6,000,000.00
GEN-2013-009 Interconnection Costs See One-Line Diagram.	Current Study	\$7,500,000.00	\$7,500,000.00
J6 (AECI) - Explorer Tap 69kV CKT 1 NRIS only required upgrade: Rebuild approximately 5 miles of 69kV	Current Study	\$4,000,000.00	\$4,000,000.00
Terra Nitrogen Tap - Verdigras 138kV CKT 1 NRIS only required upgrade: Rebuild approximately 4 miles of 138kV	Current Study	\$4,000,000.00	\$4,000,000.00
Vinita - Eastern State Hospital Tap 69kV CKT 1 NRIS only required upgrade: Rebuild approximately 2 miles of 69kV	Current Study	\$1,600,000.00	\$1,600,000.00
Vinita - Vinita Junction 69kV CKT 1 Rebuild approximately 3 miles of 69kV	Current Study	\$2,100,000.00	\$2,100,000.00
Vinita Junction 138/69/13.2kV Transformer CKT 1 Replace existing Vinita Junction transformer	Current Study	\$2,000,000.00	\$2,000,000.00
Vinita Neo Tap - J6 (AECI) 69kV CKT 1 NRIS only required upgrade: Rebuild approximately 2 miles of 69kV	Current Study	\$1,600,000.00	\$1,600,000.00
Arcadia - Redbud 345kV Dbl CKT 1 Per 2014 ITP NT: Upgrade terminal equipment for both circuits	Previously Allocated		\$1,010,523.00
	Current Study Total	\$28,800,000.00	

GEN-2013-010

GEN-2013-010 Interconnection Costs See One-Line Diagram.	Current Study	\$3,300,000.00	\$3,300,000.00
Hays Plant - Vine 115kV CKT 1 NRIS only required upgrade: Rebuild approximately 1/4 mile of 115kV	Current Study	\$1,000,000.00	\$1,000,000.00
Knoll - North Hays - Vine Street 115kV CKT 1 NRIS only required upgrade: Rebuild approximately 6 miles of 115kV line	Current Study	\$4,500,000.00	\$4,500,000.00
Beaver County - Buckner 345kV Build approximately 90 miles of 345kV from Beaver County - Gray County @ 3000 amps	Previously Allocated		\$170,209,050.00
Beaver County - Woodward 345kV Dbl CKT Priority Project: Hitchland - Woodward Dbl 345kV CKT (Total Project E&C Cost Shown)	Previously Allocated		\$226,040,727.00
Beaver County 345kV Expansion Beaver County Expansion: Tap & Tie in Hitchland - Woodward 345kV CKT 2	Previously Allocated		\$3,500,000.00

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Interconnection Request and Upgrades	Upgrade Type	Allocated Cost	Upgrade Cost
Border - Tuco Interchange 345KV CKT 1 Balanced Portfolio: Tuco - Woodward 345kV CKT 1 (Total Project E&C Cost Shown)	Previously Allocated		\$249,247,072.00
Border - Woodward 345KV CKT 1 Balanced Portfolio: Tuco - Woodward 345kV CKT 1 (Total Project E&C Cost Shown)	Previously Allocated		\$249,247,072.00
Clark - Thistle 345KV Dbl CKT Priority Project: Spearville - Clark - Thistle Dbl 345kV CKT (Total Project E&C Cost Shown.)	Previously Allocated		\$426,504,292.00
Hitchland 345/230kV Autotransformer CKT 2 Priority Project: Hitchland 345/230kV Autotransformer CKT 2 (Total Project E&C Cost Shown.)	Previously Allocated		\$8,883,760.00
Matthewson - Cimarron 345kV CKT 2 Build second 345kV circuit from Matthewson - Cimarron @ 3000 amps	Previously Allocated		\$42,903,753.00
Mullergren - Reno 345kV Dbl CKT Build approximately 92 miles of new Dbl 345kV circuit from Mullergren - Reno @ 3000 amps	Previously Allocated		\$210,887,465.33
South Hays - Hays Plant 115kV CKT 1 NRIS only required upgrade: Per NTC 200210	Previously Allocated		\$4,734,006.00
Spearville - Mullergren 345kV Dbl CKT Build approximately 85 miles of new Dbl 345kV circuit from Spearville - Mullergren @ 3000 amps	Previously Allocated		\$196,323,921.67
Spearville -Clark 345KV Dbl CKT Priority Project: Spearville - Clark - Thistle Dbl 345kV CKT (Total Project E&C Cost Shown.)	Previously Allocated		\$426,504,292.00
Tatonga - Matthewson 345kV CKT 2 Build second 345kV circuit from Tatonga - Matthewson @ 3000 amps	Previously Allocated		\$104,260,473.00
Thistle - Flat Ridge 138kV CKT 1 Priority Project: Thistle - Flat Ridge 138kV CKT 1 (Total Project E&C Cost Shown.)	Previously Allocated		\$5,776,280.00
Thistle - Wichita 345KV Dbl CKT Priority Project: Thistle - Wichita Dbl 345kV CKT (Total Project E&C Cost Shown.)	Previously Allocated		\$426,504,292.00
Thistle 345/138KV Transformer CKT 1 Priority Project: Thistle 345/138kV Transformer CKT 1 (Total Project E&C Cost Shown.)	Previously Allocated		\$6,585,986.00
	Current Study Total	\$8,800,000.00	

GEN-2013-011

GEN-2013-011 Interconnection Costs See One-Line Diagram.	Current Study	\$0.00	\$0.00
	Current Study Total	\$0.00	

GEN-2013-012

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Interconnection Request and Upgrades	Upgrade Type	Allocated Cost	Upgrade Cost
GEN-2013-012 Interconnection Costs See One-Line Diagram.	Current Study	\$0.00	\$0.00
Arcadia - Redbud 345kV Dbl CKT 1 Per 2014 ITP NT: Upgrade terminal equipment for both circuits	Previously Allocated		\$1,010,523.00
	Current Study Total	\$0.00	
GEN-2013-013			
Deaf Smith - Plant X 230kV CKT 1 Replace line traps at both ends	Current Study	\$786,532.13	\$1,000,000.00
Elk City - Gracemont 345kV CKT 1 Build approximately 105 miles of 345kV	Current Study	\$63,468,995.14	\$175,061,392.00
GEN-2013-013 Interconnection Costs See One-Line Diagram.	Current Study	\$13,000,000.00	\$13,000,000.00
Plant X Station 230/115/13kV Transformer CKT 2 NRIS only required upgrade: Build second 230/115/13kV transformer at Plant X	Current Study	\$8,000,000.00	\$8,000,000.00
Sweetwater - Elk City 345kV CKT 1 Build Sweetwater Substation and approximately 45 miles of 345kV	Current Study	\$28,284,781.21	\$87,489,138.00
Tolk - Plant X 230kV CKT 3 Build a 3rd circuit between Tolk - Plant X 230kV	Current Study	\$15,699,954.06	\$20,000,000.00
Tolk 345/230/13kV Transformer CKT 2 Build second 345/230/13kV transformer at Tolk	Current Study	\$14,764,949.97	\$15,000,000.00
TUCO Interchange - Stanton 115kV CKT 1 NRIS only required upgrade: Rebuild approximately 18 miles of 115kV	Current Study	\$466,745.81	\$10,000,000.00
TUCO Interchange - Sweetwater 345kV CKT 2 Build approximately 142 miles of 345kV	Current Study	\$37,920,130.27	\$123,000,000.00
Amoco Wasson - Oxy Tap 230kV CKT 1 Replace line traps at both terminals	Previously Allocated		\$200,000.00
Beaver County - Woodward 345kV Dbl CKT Priority Project: Hitchland - Woodward Dbl 345kV CKT (Total Project E&C Cost Shown)	Previously Allocated		\$226,040,727.00
Beaver County 345kV Expansion Beaver County Expansion: Tap & Tie in Hitchland - Woodward 345kV CKT 2	Previously Allocated		\$3,500,000.00
Border - Tuco Interchange 345kV CKT 1 Balanced Portfolio: Tuco - Woodward 345kV CKT 1 (Total Project E&C Cost Shown)	Previously Allocated		\$249,247,072.00

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Interconnection Request and Upgrades	Upgrade Type	Allocated Cost	Upgrade Cost
Border - Woodward 345KV CKT 1 Balanced Portfolio: Tuco - Woodward 345kV CKT 1 (Total Project E&C Cost Shown)	Previously Allocated		\$249,247,072.00
Eddy County 230/115/13kV Transformer CKT 1 NRIS only required upgrade: Per 2013 ITP NT SPP-NTC-200214	Previously Allocated		\$4,265,720.00
Eddy County 230/115/13kV Transformer CKT 2 NRIS only required upgrade: Per 2012 ITP NT SPP-NTC-200166	Previously Allocated		\$6,761,086.00
Hitchland - Beaver County 345kV Dbl CKT Priority Project: Hitchland - Woodward Dbl 345kV CKT (Total Project E&C Cost Shown)	Previously Allocated		\$226,040,727.00
Hitchland 345/230kV Autotransformer CKT 2 Priority Project: Hitchland 345/230kV Autotransformer CKT 2 (Total Project E&C Cost Shown).	Previously Allocated		\$8,883,760.00
Mustang - Yoakum 230kV CKT 1 Replace line traps at both terminals	Previously Allocated		\$200,000.00
Oxy Tap - Yoakum 230kV CKT 1 Replace line traps at both terminals	Previously Allocated		\$200,000.00
Thistle - Flat Ridge 138kV CKT 1 Priority Project: Thistle - Flat Ridge 138kV CKT 1 (Total Project E&C Cost Shown.)	Previously Allocated		\$5,776,280.00
Thistle - Wichita 345KV Dbl CKT Priority Project: Thistle - Wichita Dbl 345kV CKT (Total Project E&C Cost Shown.)	Previously Allocated		\$426,504,292.00
Thistle 345/138KV Transformer CKT 1 Priority Project: Thistle 345/138kV Transformer CKT 1 (Total Project E&C Cost Shown.)	Previously Allocated		\$6,585,986.00
TUCO 345/230/13.2kV Autotransformer CKT 3 Build TUCO 345/230/13.2kV Autotransformer CKT 3 at new substation adjacent to the TUCO substation	Previously Allocated		\$15,000,000.00
TUCO Interchange 345/230/13.2KV Autotransformer CKT 2 Balanced Portfolio: TUCO 345/230 kV Transformer CKT 2 (Total Project E&C Cost Shown)	Previously Allocated		\$14,900,907.00
Woodward XFMR 345/138/13.8kV CKT 2 Balanced Portfolio: Woodward 345/138kV Transformer CKT 2 & 50 MVAR Reactor (Total Project E&C Cost Shown).	Previously Allocated		\$249,247,072.00
	Current Study Total	\$182,392,088.59	

GEN-2013-014

GEN-2013-014 Interconnection Costs See One-Line Diagram.	Current Study	\$2,000,000.00	\$2,000,000.00
Harbine - Crete 115kV CKT 1 Build approximately 35 miles of 115kV from Harbine - Crete	Previously Allocated		\$17,200,000.00

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Interconnection Request and Upgrades	Upgrade Type	Allocated Cost	Upgrade Cost
	Current Study Total	\$2,000,000.00	
GEN-2013-015			
GEN-2013-015 Interconnection Costs See One-Line Diagram.	Current Study	\$5,000,000.00	\$5,000,000.00
	Current Study Total	\$5,000,000.00	
GEN-2013-016			
Elk City - Gracemont 345kV CKT 1 Build approximately 105 miles of 345kV	Current Study	\$58,165,162.64	\$175,061,392.00
GEN-2013-016 Interconnection Costs See One-Line Diagram.	Current Study	\$20,000,000.00	\$20,000,000.00
Sweetwater - Elk City 345kV CKT 1 Build Sweetwater Substation and approximately 45 miles of 345kV	Current Study	\$35,394,658.42	\$87,489,138.00
Tolk - Plant X 230kV CKT 3 Build a 3rd circuit between Tolk - Plant X 230kV	Current Study	\$1,407,633.45	\$20,000,000.00
Tolk 345/230/13kV Transformer CKT 2 Build second 345/230/13kV transformer at Tolk	Current Study	\$89,383.09	\$15,000,000.00
TUCO Interchange - Sweetwater 345kV CKT 2 Build approximately 142 miles of 345kV	Current Study	\$46,354,941.65	\$123,000,000.00
Beaver County - Woodward 345kV Dbl CKT Priority Project: Hitchland - Woodward Dbl 345kV CKT (Total Project E&C Cost Shown)	Previously Allocated		\$226,040,727.00
Beaver County 345kV Expansion Beaver County Expansion: Tap & Tie in Hitchland - Woodward 345kV CKT 2	Previously Allocated		\$3,500,000.00
Border - Tuco Interchange 345KV CKT 1 Balanced Portfolio: Tuco - Woodward 345kV CKT 1 (Total Project E&C Cost Shown)	Previously Allocated		\$249,247,072.00
Border - Woodward 345KV CKT 1 Balanced Portfolio: Tuco - Woodward 345kV CKT 1 (Total Project E&C Cost Shown)	Previously Allocated		\$249,247,072.00
Hitchland - Beaver County 345kV Dbl CKT Priority Project: Hitchland - Woodward Dbl 345kV CKT (Total Project E&C Cost Shown)	Previously Allocated		\$226,040,727.00
Thistle - Flat Ridge 138kV CKT 1 Priority Project: Thistle - Flat Ridge 138kV CKT 1 (Total Project E&C Cost Shown.)	Previously Allocated		\$5,776,280.00
Thistle - Wichita 345KV Dbl CKT Priority Project: Thistle - Wichita Dbl 345kV CKT (Total Project E&C Cost Shown.)	Previously Allocated		\$426,504,292.00

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Interconnection Request and Upgrades	Upgrade Type	Allocated Cost	Upgrade Cost
Thistle 345/138KV Transformer CKT 1 Priority Project: Thistle 345/138kV Transformer CKT 1 (Total Project E&C Cost Shown.)	Previously Allocated		\$6,585,986.00
TUCO 345/230/13.2kV Autotransformer CKT 3 Build TUCO 345/230/13.2kV Autotransformer CKT 3 at new substation adjacent to the TUCO substation	Previously Allocated		\$15,000,000.00
TUCO Interchange 345/230/13.2KV Autotransformer CKT 2 Balanced Portfolio: TUCO 345/230 kV Transformer CKT 2 (Total Project E&C Cost Shown)	Previously Allocated		\$14,900,907.00
Woodward XFMR 345/138/13.8kV CKT 2 Balanced Portfolio: Woodward 345/138kV Transformer CKT 2 & 50 MVAR Reactor (Total Project E&C Cost Shown).	Previously Allocated		\$249,247,072.00
	Current Study Total	\$161,411,779.25	

GEN-2013-017

Deaf Smith - Plant X 230kV CKT 1 Replace line traps at both ends	Current Study	\$146,345.56	\$1,000,000.00
Elk City - Gracemont 345kV CKT 1 Build approximately 105 miles of 345kV	Current Study	\$44,480,444.16	\$175,061,392.00
GEN-2013-017 Interconnection Costs See One-Line Diagram.	Current Study	\$13,000,000.00	\$13,000,000.00
Hitchland 230/115/13kV Transformer CKT 2 NRIS only required upgrade: Build second 230/115/13kV transformer at Hitchland	Current Study	\$6,000,000.00	\$6,000,000.00
Sweetwater - Elk City 345kV CKT 1 Build Sweetwater Substation and approximately 45 miles of 345kV	Current Study	\$19,822,586.26	\$87,489,138.00
Tolk - Plant X 230kV CKT 3 Build a 3rd circuit between Tolk - Plant X 230kV	Current Study	\$996,629.44	\$20,000,000.00
Tolk 345/230/13kV Transformer CKT 2 Build second 345/230/13kV transformer at Tolk	Current Study	\$103,852.61	\$15,000,000.00
TUCO Interchange - Stanton 115kV CKT 1 NRIS only required upgrade: Rebuild approximately 18 miles of 115kV	Current Study	\$9,533,254.19	\$10,000,000.00
TUCO Interchange - Sweetwater 345kV CKT 2 Build approximately 142 miles of 345kV	Current Study	\$33,454,561.92	\$123,000,000.00
Amoco Wasson - Oxy Tap 230kV CKT 1 Replace line traps at both terminals	Previously Allocated		\$200,000.00
Border - Tuco Interchange 345KV CKT 1 Balanced Portfolio: Tuco - Woodward 345kV CKT 1 (Total Project E&C Cost Shown)	Previously Allocated		\$249,247,072.00

* Withdrawal of higher queued projects will cause a restudy and may result in higher costs

Interconnection Request and Upgrades	Upgrade Type	Allocated Cost	Upgrade Cost
Border - Woodward 345KV CKT 1 Balanced Portfolio: Tuco - Woodward 345kV CKT 1 (Total Project E&C Cost Shown)	Previously Allocated		\$249,247,072.00
Eddy County 230/115/13kV Transformer CKT 1 NRIS only required upgrade: Per 2013 ITP NT SPP-NTC-200214	Previously Allocated		\$4,265,720.00
Eddy County 230/115/13kV Transformer CKT 2 NRIS only required upgrade: Per 2012 ITP NT SPP-NTC-200166	Previously Allocated		\$6,761,086.00
Hitchland - Beaver County 345kV Dbl CKT Priority Project: Hitchland - Woodward Dbl 345kV CKT (Total Project E&C Cost Shown)	Previously Allocated		\$226,040,727.00
Hitchland 345/230kV Autotransformer CKT 2 Priority Project: Hitchland 345/230kV Autotransformer CKT 2 (Total Project E&C Cost Shown).	Previously Allocated		\$8,883,760.00
Mustang - Yoakum 230kV CKT 1 Replace line traps at both terminals	Previously Allocated		\$200,000.00
Oxy Tap - Yoakum 230kV CKT 1 Replace line traps at both terminals	Previously Allocated		\$200,000.00
Thistle - Flat Ridge 138kV CKT 1 Priority Project: Thistle - Flat Ridge 138kV CKT 1 (Total Project E&C Cost Shown.)	Previously Allocated		\$5,776,280.00
Thistle - Wichita 345KV Dbl CKT Priority Project: Thistle - Wichita Dbl 345kV CKT (Total Project E&C Cost Shown.)	Previously Allocated		\$426,504,292.00
Thistle 345/138KV Transformer CKT 1 Priority Project: Thistle 345/138KV Transformer CKT 1 (Total Project E&C Cost Shown.)	Previously Allocated		\$6,585,986.00
TUCO 345/230/13.2kV Autotransformer CKT 3 Build TUCO 345/230/13.2kV Autotransformer CKT 3 at new substation adjacent to the TUCO substation	Previously Allocated		\$15,000,000.00
TUCO Interchange 345/230/13.2KV Autotransformer CKT 2 Balanced Portfolio: TUCO 345/230 kV Transformer CKT 2 (Total Project E&C Cost Shown)	Previously Allocated		\$14,900,907.00
Woodward XFMR 345/138/13.8kV CKT 2 Balanced Portfolio: Woodward 345/138kV Transformer CKT 2 & 50 MVAR Reactor (Total Project E&C Cost Shown).	Previously Allocated		\$249,247,072.00
	Current Study Total	\$127,537,674.14	

GEN-2013-018

GEN-2013-018 Interconnection Costs See One-Line Diagram.	Current Study	\$5,000,000.00	\$5,000,000.00
GEN-2013-018 Tap - Hydrocarbon Tap 69kV CKT 1 Replace switches at Hydrocarbon Tap	Current Study	\$10,000.00	\$10,000.00

* Withdrawal of higher queued projects will cause a restudy and may result in higher costs

Interconnection Request and Upgrades	Upgrade Type	Allocated Cost	Upgrade Cost
Sterling 115/69kV Transformer CKT 2 Build second 115/69kV Sterling transformer	Current Study	\$4,000,000.00	\$4,000,000.00
Sub 970 - Hydrocarbon Tap - GEN-2013-018 Tap - Sub 974 69kV CKT 1 Conductor Clearance increase to 100°C	Current Study	\$1,700,000.00	\$1,700,000.00
GEN-2013-002 TAP - Folsom & Pleasant Hill 115kV CKT 2 Per ITP NT 2011 (Total Project E&C Cost Shown)	Previously allocated		\$6,534,843.00
Nebraska City U Syracuse - SUB 970 CKT 1 NRIS only required upgrade: Replace Terminal Equipment	Previously Allocated		\$16,000.00
Sheldon - GEN-2013-002 Tap 115kV CKT 2 Per ITP NT 2011 (Total Project E&C Cost Shown)	Previously allocated		\$6,534,843.00
SUB 967 - SUB 968 69kV CKT 1 Replace terminal equipment	Previously Allocated		\$16,000.00
SUB 968 - SUB 969 69kV CKT 1 Mitigated by replacing terminal equipment at Sub 969	Previously Allocated		\$0.00
SUB 969 - SUB 974 69kV CKT 1 Mitigated by replacing terminal equipment at Sub 969	Previously Allocated		\$0.00
Twin Church - Dixon County 230kV Increase conductor clearances to accommodate 320MVA facility rating	Previously Allocated		\$100,000.00
West Brock - SUB967 69kV CKT 1 Mitigated by replacing terminal equipment at Sub 967	Previously Allocated		\$0.00
	Current Study Total	\$10,710,000.00	
TOTAL CURRENT STUDY COSTS:		\$633,043,530.02	

* Withdrawal of higher queued projects will cause a restudy and may result in higher costs

F: Cost Allocation per Proposed Study Network Upgrade

Important Note:

****WITHDRAWAL OF HIGHER QUEUED PROJECTS WILL CAUSE A RESTUDY
AND MAY RESULT IN HIGHER INTERCONNECTION COSTS****

This section shows each Direct Assigned Facility and Network Upgrade and the Generation Interconnection Request Customer(s) which have an impact in this study assuming all higher queued projects remain in the queue and achieve commercial operation.

The required interconnection costs listed do not include all costs associated with the deliverability of the energy to final customers. These costs are determined by separate studies if the Customer submits a Transmission Service Request through SPP's Open Access Same Time Information System (OASIS) as required by Attachment Z1 of the SPP OATT. In addition, costs associated with a short circuit analysis will be allocated should the Interconnection Request Customer choose to execute a Facility Study Agreement.

There may be additional costs allocated to each Customer. See Appendix E for more details.

Appendix F. Cost Allocation by Upgrade

ASGI-2013-001 Interconnection Costs		\$0.00
See One-Line Diagram.		
	ASGI-2013-001	\$0.00
	Total Allocated Costs	\$0.00
ASGI-2013-002 Interconnection Costs		\$0.00
See One-Line Diagram.		
	ASGI-2013-002	\$0.00
	Total Allocated Costs	\$0.00
ASGI-2013-003 Interconnection Costs		\$0.00
See One-Line Diagram.		
	ASGI-2013-003	\$0.00
	Total Allocated Costs	\$0.00
Benton - Wichita 345kV CKT 1		\$1,183,000.00
NRIS only required upgrade: Replace terminal equipment at Benton and Wichita		
	GEN-2013-003	\$1,183,000.00
	Total Allocated Costs	\$1,183,000.00
Catoosa - Terra Nitrogen Tap 138kV CKT 1		\$6,000,000.00
NRIS only required upgrade: Rebuild approximately 6 miles of 138kV		
	GEN-2013-009	\$6,000,000.00
	Total Allocated Costs	\$6,000,000.00
Deaf Smith - Plant X 230kV CKT 1		\$1,000,000.00
Replace line traps at both ends		
	ASGI-2013-002	\$32,052.00
	ASGI-2013-003	\$35,070.30
	GEN-2013-013	\$786,532.13
	GEN-2013-017	\$146,345.56
	Total Allocated Costs	\$1,000,000.00

* Withdrawal of higher queued projects will cause a restudy and may result in higher costs

Elk City - Gracemont 345kV CKT 1**\$175,061,392.00**

Build approximately 105 miles of 345kV

ASGI-2013-002	\$4,466,023.58
ASGI-2013-003	\$4,480,766.49
GEN-2013-013	\$63,468,995.14
GEN-2013-016	\$58,165,162.64
GEN-2013-017	\$44,480,444.16

Total Allocated Costs	\$175,061,392.00
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GEN-2012-005 Interconnection Costs**\$7,000,000.00**

See One-Line Diagram.

GEN-2012-005	\$7,000,000.00
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Total Allocated Costs	\$7,000,000.00
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GEN-2013-002 Interconnection Costs**\$3,000,000.00**

See One-Line Diagram.

GEN-2013-002	\$3,000,000.00
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Total Allocated Costs	\$3,000,000.00
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GEN-2013-003 Interconnection Costs**\$0.00**

See One-Line Diagram.

GEN-2013-003	\$0.00
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Total Allocated Costs	\$0.00
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GEN-2013-004 Interconnection Costs**\$0.00**

See One-Line Diagram.

GEN-2013-004	\$0.00
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Total Allocated Costs	\$0.00
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GEN-2013-005 Interconnection Costs**\$0.00**

See One-Line Diagram.

GEN-2013-005	\$0.00
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Total Allocated Costs	\$0.00
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GEN-2013-006 Interconnection Costs**\$3,000,000.00**

See One-Line Diagram.

GEN-2013-006	\$3,000,000.00
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Total Allocated Costs	\$3,000,000.00
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* Withdrawal of higher queued projects will cause a restudy and may result in higher costs

GEN-2013-007 Interconnection Costs		\$3,000,000.00
See One-Line Diagram.		
	GEN-2013-007	\$3,000,000.00
	Total Allocated Costs	\$3,000,000.00
GEN-2013-008 Interconnection Costs		\$0.00
See One-Line Diagram.		
	GEN-2013-008	\$0.00
	Total Allocated Costs	\$0.00
GEN-2013-009 Interconnection Costs		\$7,500,000.00
See One-Line Diagram.		
	GEN-2013-009	\$7,500,000.00
	Total Allocated Costs	\$7,500,000.00
GEN-2013-010 Interconnection Costs		\$3,300,000.00
See One-Line Diagram.		
	GEN-2013-010	\$3,300,000.00
	Total Allocated Costs	\$3,300,000.00
GEN-2013-011 Interconnection Costs		\$0.00
See One-Line Diagram.		
	GEN-2013-011	\$0.00
	Total Allocated Costs	\$0.00
GEN-2013-012 Interconnection Costs		\$0.00
See One-Line Diagram.		
	GEN-2013-012	\$0.00
	Total Allocated Costs	\$0.00
GEN-2013-013 Interconnection Costs		\$13,000,000.00
See One-Line Diagram.		
	GEN-2013-013	\$13,000,000.00
	Total Allocated Costs	\$13,000,000.00
GEN-2013-014 Interconnection Costs		\$2,000,000.00
See One-Line Diagram.		
	GEN-2013-014	\$2,000,000.00
	Total Allocated Costs	\$2,000,000.00

* Withdrawal of higher queued projects will cause a restudy and may result in higher costs

GEN-2013-015 Interconnection Costs		\$5,000,000.00
See One-Line Diagram.		
	GEN-2013-015	\$5,000,000.00
	Total Allocated Costs	\$5,000,000.00
GEN-2013-016 Interconnection Costs		\$20,000,000.00
See One-Line Diagram.		
	GEN-2013-016	\$20,000,000.00
	Total Allocated Costs	\$20,000,000.00
GEN-2013-017 Interconnection Costs		\$13,000,000.00
See One-Line Diagram.		
	GEN-2013-017	\$13,000,000.00
	Total Allocated Costs	\$13,000,000.00
GEN-2013-018 Interconnection Costs		\$5,000,000.00
See One-Line Diagram.		
	GEN-2013-018	\$5,000,000.00
	Total Allocated Costs	\$5,000,000.00
GEN-2013-018 Tap - Hydrocarbon Tap 69kV CKT 1		\$10,000.00
Replace switches at Hydrocarbon Tap		
	GEN-2013-018	\$10,000.00
	Total Allocated Costs	\$10,000.00
Hays Plant - Vine 115kV CKT 1		\$1,000,000.00
NRIS only required upgrade: Rebuild approximately 1/4 mile of 115kV		
	GEN-2013-010	\$1,000,000.00
	Total Allocated Costs	\$1,000,000.00
Hitchland 230/115/13kV Transformer CKT 2		\$6,000,000.00
NRIS only required upgrade: Build second 230/115/13kV transformer at Hitchland		
	GEN-2013-017	\$6,000,000.00
	Total Allocated Costs	\$6,000,000.00
J6 (AECD) - Explorer Tap 69kV CKT 1		\$4,000,000.00
NRIS only required upgrade: Rebuild approximately 5 miles of 69kV		
	GEN-2013-009	\$4,000,000.00
	Total Allocated Costs	\$4,000,000.00

* Withdrawal of higher queued projects will cause a restudy and may result in higher costs

Madison County - North Petersburg 115kV CKT 1 **\$18,000,000.00**

Build approximately 25 miles of new 115kV circuit from Madison County - North Petersburg

GEN-2012-005	\$2,341,951.43
GEN-2013-004	\$717,162.53
GEN-2013-005	\$8,845,004.54
GEN-2013-006	\$6,095,881.50

Total Allocated Costs **\$18,000,000.00**

Madison County - South Norfolk 230kV CKT 1 **\$25,000,000.00**

Build approximately 25 miles of new 230kV circuit from Madison County - South Norfolk

GEN-2012-005	\$4,329,586.53
GEN-2013-004	\$946,736.49
GEN-2013-005	\$11,676,416.77
GEN-2013-006	\$8,047,260.21

Total Allocated Costs **\$25,000,000.00**

Madison County 230/115/13.8kV Transformer CKT 1 **\$6,000,000.00**

Build Madison County 230/115/13.8kV Transformer

GEN-2012-005	\$903,355.37
GEN-2013-004	\$233,434.10
GEN-2013-005	\$2,879,020.63
GEN-2013-006	\$1,984,189.89

Total Allocated Costs **\$6,000,000.00**

Vinita Neo Tap - J6 (AECI) 69kV CKT 1 **\$1,600,000.00**

NRIS only required upgrade: Rebuild approximately 2 miles of 69kV

GEN-2013-009	\$1,600,000.00
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Total Allocated Costs **\$1,600,000.00**

Knoll - North Hays - Vine Street 115kV CKT 1 **\$4,500,000.00**

NRIS only required upgrade: Rebuild approximately 6 miles of 115kV line

GEN-2013-010	\$4,500,000.00
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Total Allocated Costs **\$4,500,000.00**

Plant X Station 230/115/13kV Transformer CKT 2 **\$8,000,000.00**

NRIS only required upgrade: Build second 230/115/13kV transformer at Plant X

GEN-2013-013	\$8,000,000.00
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Total Allocated Costs **\$8,000,000.00**

* Withdrawal of higher queued projects will cause a restudy and may result in higher costs

South Norfolk 345/230/13.8kV Transformer CKT 1 **\$8,000,000.00**

Build new 345/230/13.8kV transformer

GEN-2012-005	\$1,385,467.69
GEN-2013-004	\$302,955.68
GEN-2013-005	\$3,736,453.37
GEN-2013-006	\$2,575,123.27

Total Allocated Costs **\$8,000,000.00**

South Norfolk 345/230kV Substation **\$12,000,000.00**

Build new 345/230kV substation on Hoskins - Shell Creek 345kV

GEN-2012-005	\$2,078,201.53
GEN-2013-004	\$454,433.52
GEN-2013-005	\$5,604,680.05
GEN-2013-006	\$3,862,684.90

Total Allocated Costs **\$12,000,000.00**

Sterling 115/69kV Transformer CKT 2 **\$4,000,000.00**

Build second 115/69kV Sterling transformer

GEN-2013-018	\$4,000,000.00
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Total Allocated Costs **\$4,000,000.00**

Sub 970 - Hydrocarbon Tap - GEN-2013-018 Tap - Sub 974 69kV CKT 1 **\$1,700,000.00**

Conductor Clearance increase to 100°C

GEN-2013-018	\$1,700,000.00
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Total Allocated Costs **\$1,700,000.00**

Sweetwater - Elk City 345kV CKT 1 **\$87,489,138.00**

Build Sweetwater Substation and approximately 45 miles of 345kV

ASGI-2013-002	\$1,990,270.99
ASGI-2013-003	\$1,996,841.13
GEN-2013-013	\$28,284,781.21
GEN-2013-016	\$35,394,658.42
GEN-2013-017	\$19,822,586.26

Total Allocated Costs **\$87,489,138.00**

Terra Nitrogen Tap - Verdigras 138kV CKT 1 **\$4,000,000.00**

NRIS only required upgrade: Rebuild approximately 4 miles of 138kV

GEN-2013-009	\$4,000,000.00
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Total Allocated Costs **\$4,000,000.00**

* Withdrawal of higher queued projects will cause a restudy and may result in higher costs

Tolk 345/230/13kV Transformer CKT 2**\$15,000,000.00**

Build second 345/230/13kV transformer at Tolk

ASGI-2013-002	\$19,076.08
ASGI-2013-003	\$22,738.26
GEN-2013-013	\$14,764,949.97
GEN-2013-016	\$89,383.09
GEN-2013-017	\$103,852.61

Total Allocated Costs	\$15,000,000.00
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Tolk - Plant X 230kV CKT 3**\$20,000,000.00**

Build a 3rd circuit between Tolk - Plant X 230kV

ASGI-2013-002	\$932,979.36
ASGI-2013-003	\$962,803.69
GEN-2013-013	\$15,699,954.06
GEN-2013-016	\$1,407,633.45
GEN-2013-017	\$996,629.44

Total Allocated Costs	\$20,000,000.00
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TUCO Interchange - Stanton 115kV CKT 1**\$10,000,000.00**

NRIS only required upgrade: Rebuild approximately 18 miles of 115kV

GEN-2013-013	\$466,745.81
GEN-2013-017	\$9,533,254.19

Total Allocated Costs	\$10,000,000.00
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TUCO Interchange - Sweetwater 345kV CKT 2**\$123,000,000.00**

Build approximately 142 miles of 345kV

ASGI-2013-002	\$2,628,721.90
ASGI-2013-003	\$2,641,644.26
GEN-2013-013	\$37,920,130.27
GEN-2013-016	\$46,354,941.65
GEN-2013-017	\$33,454,561.92

Total Allocated Costs	\$123,000,000.00
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Vinita - Eastern State Hospital Tap 69kV CKT 1**\$1,600,000.00**

NRIS only required upgrade: Rebuild approximately 2 miles of 69kV

GEN-2013-009	\$1,600,000.00
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Total Allocated Costs	\$1,600,000.00
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* Withdrawal of higher queued projects will cause a restudy and may result in higher costs

Vinita - Vinita Junction 69kV CKT 1

\$2,100,000.00

Rebuild approximately 3 miles of 69kV

GEN-2013-009

\$2,100,000.00

Total Allocated Costs

\$2,100,000.00

Vinita Junction 138/69/13.2kV Transformer CKT 1

\$2,000,000.00

Replace existing Vinita Junction transformer

GEN-2013-009

\$2,000,000.00

Total Allocated Costs

\$2,000,000.00

* Withdrawal of higher queued projects will cause a restudy and may result in higher costs

G: Power Flow Analysis (Constraints Used For Mitigation)

See next page.

SOLUTION	GROUP	SCENARIO	SEASON	SOURCE	DIRECTION	MONITORED ELEMENT	RATEB		TC%LOADING		CONTINGENCY
							(MVA)	TDF	(% MVA)		
FDNS	06ASGI_13_002		0	13G	ASGI_13_002	TO->FROM	PLANT X STATION - TOLK STATION WEST 230KV CKT 1	502	0.33359	100.3963	PLANT X STATION - TOLK STATION EAST 230KV CKT 2
FDNS	6		0	13G	ASGI_13_002	TO->FROM	PLANT X STATION - TOLK STATION WEST 230KV CKT 1	502	0.33368	100	PLANT X STATION - TOLK STATION EAST 230KV CKT 2
FDNS	06ASGI_13_003		0	13G	ASGI_13_003	TO->FROM	PLANT X STATION - TOLK STATION WEST 230KV CKT 1	502	0.34419	100.6718	PLANT X STATION - TOLK STATION EAST 230KV CKT 2
FDNS	6		0	13G	ASGI_13_003	TO->FROM	PLANT X STATION - TOLK STATION WEST 230KV CKT 1	502	0.34428	100	PLANT X STATION - TOLK STATION EAST 230KV CKT 2
FDNS	09ALLBPSON		0	13G	G12_005	TO->FROM	FT RANDAL - G12_005T 230.00 230KV CKT 1	320	1	127.7744	KELLY - MADISONCO 230.00 230KV CKT 1
FDNS	09G12_005BPSON		0	13G	G12_005	TO->FROM	FT RANDAL - G12_005T 230.00 230KV CKT 1	320	1	127.7595	KELLY - MADISONCO 230.00 230KV CKT 1
FDNS	00G12_005		0	13SP	G12_005	TO->FROM	FT RANDAL - G12_005T 230.00 230KV CKT 1	320	1	127.7044	KELLY - MADISONCO 230.00 230KV CKT 1
FDNS	00G12_005		0	18SP	G12_005	TO->FROM	FT RANDAL - G12_005T 230.00 230KV CKT 1	320	1	127.5891	KELLY - MADISONCO 230.00 230KV CKT 1
FDNS	00G12_005		0	13WP	G12_005	TO->FROM	FT RANDAL - G12_005T 230.00 230KV CKT 1	320	1	127.5269	KELLY - MADISONCO 230.00 230KV CKT 1
FDNS	09G12_005		0	13G	G12_005	TO->FROM	FT RANDAL - G12_005T 230.00 230KV CKT 1	320	1	127.5002	KELLY - MADISONCO 230.00 230KV CKT 1
FDNS	00G12_005		0	23SP	G12_005	TO->FROM	FT RANDAL - G12_005T 230.00 230KV CKT 1	320	1	127.4993	KELLY - MADISONCO 230.00 230KV CKT 1
FDNS	00G12_005		0	18WP	G12_005	TO->FROM	FT RANDAL - G12_005T 230.00 230KV CKT 1	320	1	127.4004	KELLY - MADISONCO 230.00 230KV CKT 1
FDNS	09NR		0	13G	G12_005	TO->FROM	FT RANDAL - G12_005T 230.00 230KV CKT 1	320	1	110.4823	KELLY - MADISONCO 230.00 230KV CKT 1
FDNS	09NRBPSON		0	13G	G12_005	TO->FROM	FT RANDAL - G12_005T 230.00 230KV CKT 1	320	1	110.4823	KELLY - MADISONCO 230.00 230KV CKT 1
FDNS	09BPSON		0	13G	G12_005	TO->FROM	FT RANDAL - G12_005T 230.00 230KV CKT 1	320	1	100.7094	KELLY - MADISONCO 230.00 230KV CKT 1
FDNS	9		0	13G	G12_005	TO->FROM	FT RANDAL - G12_005T 230.00 230KV CKT 1	320	1	100.2819	KELLY - MADISONCO 230.00 230KV CKT 1
FDNS	09ALLBPSON		0	13G	G12_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	1	127.9705	FT RANDAL - G12_005T 230.00 230KV CKT 1
FDNS	09G12_005BPSON		0	13G	G12_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	1	127.696	FT RANDAL - G12_005T 230.00 230KV CKT 1
FDNS	09G12_005		0	13G	G12_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	1	127.1278	FT RANDAL - G12_005T 230.00 230KV CKT 1
FDNS	00G12_005		0	18WP	G12_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	1	126.7439	FT RANDAL - G12_005T 230.00 230KV CKT 1
FDNS	00G12_005		0	13WP	G12_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	1	126.594	FT RANDAL - G12_005T 230.00 230KV CKT 1
FDNS	00G12_005		0	13SP	G12_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	1	126.5664	FT RANDAL - G12_005T 230.00 230KV CKT 1
FDNS	00G12_005		0	18SP	G12_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	1	126.524	FT RANDAL - G12_005T 230.00 230KV CKT 1
FDNS	00G12_005		0	23SP	G12_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	1	126.3747	FT RANDAL - G12_005T 230.00 230KV CKT 1
FDNS	00G12_005		0	13SP	G12_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.31787	123.7214	FT RANDAL - UTICA JCT 230KV CKT 1
FDNS	00G12_005		0	23SP	G12_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.31325	123.3076	FT RANDAL - UTICA JCT 230KV CKT 1
FDNS	00G12_005		0	13SP	G12_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.30846	119.7861	FT RANDAL - SIOUX CITY 230KV CKT 1
FDNS	00G12_005		0	13SP	G12_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.29724	119.7277	FT THOMPSON - GRAND ISLAND 345KV CKT 1
FDNS	00G12_005		0	23SP	G12_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.30332	119.3247	FT RANDAL - SIOUX CITY 230KV CKT 1
FDNS	00G12_005		0	18SP	G12_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.31581	119.0896	FT RANDAL - UTICA JCT 230KV CKT 1
FDNS	00G12_005		0	23SP	G12_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.28508	117.9922	GRAND ISLAND - HOLT.CO3 345.00 345KV CKT 1
FDNS	00G12_005		0	23SP	G12_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.28752	117.5942	FT RANDAL - SPENCER 115KV CKT 1
FDNS	00G12_005		0	23SP	G12_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.29269	117.4419	FT THOMPSON - HOLT.CO3 345.00 345KV CKT 1
FDNS	00G12_005		0	23SP	G12_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.28752	117.3607	ONEILL - SPENCER 115KV CKT 1
FDNS	00G12_005		0	13SP	G12_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.2912	117.2678	FT RANDAL - SPENCER 115KV CKT 1
FDNS	00G12_005		0	13SP	G12_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.2912	117.0512	ONEILL - SPENCER 115KV CKT 1
FDNS	00G12_005		0	23SP	G12_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.27823	116.3527	HOSKINS - RAUN 345KV CKT 1
FDNS	00G12_005		0	23SP	G12_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.28134	116.135	GEN640009 1-COOPER NUCLEAR STATION
FDNS	00G12_005		0	23SP	G12_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.28134	115.9192	GEN532751 1-WOLF CREEK GENERATING STATION UNIT 1
FDNS	00G12_005		0	13SP	G12_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.29553	115.7699	RASMUSN - UTICA JCT 230KV CKT 1
FDNS	00G12_005		0	23SP	G12_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.28134	115.7025	GEN645012 2-NEBRASKA CITY 2
FDNS	00G12_005		0	23SP	G12_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.29041	115.688	RASMUSN - UTICA JCT 230KV CKT 1
FDNS	00G12_005		0	13SP	G12_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.28563	115.6662	GEN640009 1-COOPER NUCLEAR STATION
FDNS	00G12_005		0	13SP	G12_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.28297	115.6068	HOSKINS - RAUN 345KV CKT 1
FDNS	00G12_005		0	23SP	G12_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.28134	115.5844	GEN645011 1-NEBRASKA CITY 1
FDNS	00G12_005		0	13SP	G12_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.28563	115.516	GEN532751 1-WOLF CREEK GENERATING STATION UNIT 1
FDNS	00G12_005		0	13SP	G12_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.28563	115.4857	GEN645012 2-NEBRASKA CITY 2
FDNS	00G12_005		0	13SP	G12_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.28563	115.372	GEN645011 1-NEBRASKA CITY 1
FDNS	00G12_005		0	23SP	G12_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.28134	115.342	GEN542962 2-IATAN UNIT #2
FDNS	00G12_005		0	18SP	G12_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.30617	115.2834	FT RANDAL - SIOUX CITY 230KV CKT 1
FDNS	00G12_005		0	23SP	G12_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.28134	115.0909	GEN640010 1-GERALD GENTLEMAN STATION UNIT 1
FDNS	00G12_005		0	23SP	G12_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.28134	115.0329	GEN640011 2-GERALD GENTLEMAN STATION UNIT 2
FDNS	00G12_005		0	23SP	G12_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.28134	115.0299	GEN542957 1-IATAN UNIT #1
FDNS	00G12_005		0	23SP	G12_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.28134	115.0288	GEN532651 1-JEFFREY ENERGY CENTER UNIT 1
FDNS	00G12_005		0	23SP	G12_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.28134	115.0273	GEN532653 1-JEFFREY ENERGY CENTER UNIT 3
FDNS	00G12_005		0	23SP	G12_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.28134	115.0271	GEN532652 1-JEFFREY ENERGY CENTER UNIT 2
FDNS	00G12_005		0	13SP	G12_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.28563	115.0108	GEN542962 2-IATAN UNIT #2
FDNS	00G12_005		0	23SP	G12_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.28208	114.903	HANLON - STORLA 230KV CKT 1
FDNS	00G12_005		0	23SP	G12_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.28438	114.8518	FT RANDAL - WHITE SWAN 115KV CKT 1
FDNS	00G12_005		0	23SP	G12_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.28134	114.8435	GEN542955 1-LACYGNE UNIT #1
FDNS	00G12_005		0	13SP	G12_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.28638	114.8395	HANLON - STORLA 230KV CKT 1
FDNS	00G12_005		0	23SP	G12_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.28438	114.8308	TYNDALL - WHITE SWAN 115KV CKT 1
FDNS	00G12_005		0	23SP	G12_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.28134	114.7236	GEN640028 1-COLUMCOGENERATION
FDNS	00G12_005		0	13SP	G12_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.28563	114.7038	GEN542957 1-IATAN UNIT #1
FDNS	00G12_005		0	23SP	G12_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.28134	114.69	GEN542956 2-LACYGNE UNIT #2
FDNS	00G12_005		0	13SP	G12_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.28563	114.6882	GEN532651 1-JEFFREY ENERGY CENTER UNIT 1
FDNS	00G12_005		0	13SP	G12_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.28563	114.678	GEN532653 1-JEFFREY ENERGY CENTER UNIT 3
FDNS	00G12_005		0	13SP	G12_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.28563	114.6779	GEN532652 1-JEFFREY ENERGY CENTER UNIT 2
FDNS	00G12_005		0	23SP	G12_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.28282	114.6636	GAVINS POINT - HARTINGTON 115KV CKT 1
FDNS	00G12_005		0	13SP	G12_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.28563	114.6431	GEN640010 1-GERALD GENTLEMAN STATION UNIT 1
FDNS	00G12_005		0	23SP	G12_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.28173	114.6279	KEYSTONE - SIDNEY 345KV CKT 1

SOLUTION	GROUP	SCENARIO	SEASON	SOURCE	DIRECTION	MONITORED ELEMENT	RATEB (MVA)	TDF	TC%LOADING (% MVA)	CONTINGENCY
FDNS	00G12_005		0 23SP	G12_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.27238	114.6264	COLUMEAST - NW68TH & HOLDREGE 345KV CKT 1
FDNS	00G12_005		0 13SP	G12_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.28616	114.6195	KEYSTONE - SIDNEY 345KV CKT 1
FDNS	00G12_005		0 13SP	G12_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.28606	114.6138	FT THOMPSON - LETCHER 230KV CKT 1
FDNS	00G12_005		0 23SP	G12_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.28134	114.5956	GEN641089 2-ENERGY CENTER 2
FDNS	00G12_005		0 23SP	G12_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.28134	114.5864	GEN542951 5-HAWTHORN UNIT #5
FDNS	00G12_005		0 23SP	G12_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.28178	114.5839	FT THOMPSON - LETCHER 230KV CKT 1
FDNS	00G12_005		0 23SP	G12_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.28134	114.5798	GEN645001 1-FORT CALHOUN 1
FDNS	00G12_005		0 13SP	G12_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.28865	114.5576	FT RANDAL - WHITE SWAN 115KV CKT 1
FDNS	00G12_005		0 13SP	G12_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.28865	114.5475	TYNDALL - WHITE SWAN 115KV CKT 1
FDNS	00G12_005		0 13SP	G12_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.28563	114.5394	GEN640011 2-GERALD GENTLEMAN STATION UNIT 2
FDNS	00G12_005		0 13SP	G12_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.2875	114.4937	GAVINS POINT - HARTINGTON 115KV CKT 1
FDNS	00G12_005		0 23SP	G12_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.28506	114.4368	UTICA JCT - VFODNES 230KV CKT 1
FDNS	00G12_005		0 13SP	G12_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.28563	114.4327	GEN640028 1-COLUMCOGENERATION
FDNS	00G12_005		0 23SP	G12_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.28134	114.4231	GEN525562 1-TOLK GEN #2 24 KV
FDNS	00G12_005		0 23SP	G12_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.28062	114.3874	103RD & ROKEBY - SUB 3458 NEB CTY 345KV CKT 1
FDNS	00G12_005		0 13SP	G12_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.28563	114.3834	GEN542955 1-LACYGNE UNIT #1
FDNS	00G12_005		0 13SP	G12_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.28563	114.3724	GEN542956 2-LACYGNE UNIT #2
FDNS	00G12_005		0 13SP	G12_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.28585	114.3562	SPLIT ROCK TAP - WHITE 345KV CKT 1
FDNS	00G12_005		0 23SP	G12_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.28205	114.3423	PAHOJA - SIOUX FALLS 230KV CKT 1
FDNS	00G12_005		0 13SP	G12_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.28563	114.3395	GEN641089 2-ENERGY CENTER 2
FDNS	00G12_005		0 13SP	G12_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.28563	114.2095	GEN542951 5-HAWTHORN UNIT #5
FDNS	00G12_005		0 13SP	G12_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.28614	114.1975	BLOOMFIELD - GAVINS POINT 115KV CKT 1
FDNS	00G12_005		0 13SP	G12_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.28657	114.1932	PAHOJA - SIOUX FALLS 230KV CKT 1
FDNS	00G12_005		0 13SP	G12_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.28614	114.1901	BLOOMFIELD - CREIGHTON 115KV CKT 1
FDNS	00G12_005		0 13SP	G12_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.28896	114.1639	CLEARWATER - ONEILL 115KV CKT 1
FDNS	00G12_005		0 13SP	G12_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.28638	114.1439	HANLON - SIOUX FALLS 230KV CKT 1
FDNS	00G12_005		0 13SP	G12_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.28927	114.1344	UTICA JCT - VFODNES 230KV CKT 1
FDNS	00G12_005		0 13SP	G12_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.28616	114.1094	ARPIN - EAU CLAIRE 345KV CKT 1
FDNS	00G12_005		0 18SP	G12_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.29435	114.089	FT THOMPSON - GRAND ISLAND 345KV CKT 1
FDNS	00G12_005		0 18SP	G12_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.28914	113.873	FT RANDAL - SPENCER 115KV CKT 1
FDNS	00G12_005		0 18SP	G12_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.28914	113.6729	ONEILL - SPENCER 115KV CKT 1
FDNS	00G12_005		0 13WP	G12_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.31707	113.5615	FT RANDAL - UTICA JCT 230KV CKT 1
FDNS	00G12_005		0 23SP	G12_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.28134	113.4003	BASE CASE
FDNS	00G12_005		0 13SP	G12_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.28563	113.0744	BASE CASE
FDNS	00G12_005		0 23SP	G12_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.28134	112.4587	GEN652457 1-GARRISON
FDNS	00G12_005		0 23SP	G12_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.28134	112.4587	GEN652458 2-GARRISON
FDNS	00G12_005		0 23SP	G12_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.28134	112.4587	GEN652459 3-GARRISON
FDNS	00G12_005		0 23SP	G12_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.28072	112.4286	COLUMBUS - SCHUYLER 115KV CKT 1
FDNS	00G12_005		0 18SP	G12_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.28362	112.4171	GEN640009 1-COOPER NUCLEAR STATION
FDNS	00G12_005		0 23SP	G12_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.28277	112.3893	NUNDRWD - WAYSIDE 230KV CKT 1
FDNS	00G12_005		0 18SP	G12_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.28362	112.3308	GEN532751 1-WOLF CREEK GENERATING STATION UNIT 1
FDNS	00G12_005		0 23SP	G12_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.28134	112.2637	GEN652542 1-BIG BEND
FDNS	00G12_005		0 23SP	G12_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.28134	112.2637	GEN652543 3-BIG BEND
FDNS	00G12_005		0 23SP	G12_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.28134	112.2419	GEN652544 5-BIG BEND
FDNS	00G12_005		0 23SP	G12_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.28178	112.2067	ATCHSNT3 345.00 - COOPER 345KV CKT 1
FDNS	00G12_005		0 23SP	G12_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.28126	112.2047	COLUMBUS - GENOA 115KV CKT 1
FDNS	00G12_005		0 23SP	G12_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.28178	112.0943	ATCHSNT3 345.00 - BOONEVILLE 345KV CKT 1
FDNS	00G12_005		0 18SP	G12_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.28077	112.0785	HOSKINS - RAUN 345KV CKT 1
FDNS	00G12_005		0 13SP	G12_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.28665	112.0177	HOSKINS (HOSKINS T2) 345/230/13.8KV TRANSFORMER CKT 1
FDNS	00G12_005		0 13SP	G12_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.28563	111.9981	GEN652460 4-GARRISON
FDNS	00G12_005		0 23SP	G12_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.28239	111.9941	NELIGH.EAST3345.00 (NELIGH.E T1) 345/115/13.8KV TRANSFORMER CKT 1
FDNS	00G12_005		0 18SP	G12_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.28362	111.9861	GEN645012 2-NEBRASKA CITY 2
FDNS	00G12_005		0 13SP	G12_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.28732	111.9633	AINSWORTH - CALAMUS 115KV CKT 1
FDNS	00G12_005		0 13SP	G12_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.28732	111.9446	CALAMUS - THEDFORD 115KV CKT 1
FDNS	00G12_005		0 13SP	G12_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.28502	111.9219	COLUMBUS - SCHUYLER 115KV CKT 1
FDNS	00G12_005		0 13SP	G12_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.28563	111.9159	GEN652457 1-GARRISON
FDNS	00G12_005		0 13SP	G12_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.28563	111.9159	GEN652458 2-GARRISON
FDNS	00G12_005		0 13SP	G12_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.28563	111.9159	GEN652459 3-GARRISON
FDNS	00G12_005		0 18SP	G12_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.28362	111.873	GEN645011 1-NEBRASKA CITY 1
FDNS	00G12_005		0 23SP	G12_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.28247	111.8601	MAXWELL - STAPLETON 115KV CKT 1
FDNS	00G12_005		0 23SP	G12_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.28239	111.841	HOSKINS - NELIGH.EAST3345.00 345KV CKT 1
FDNS	00G12_005		0 13SP	G12_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.28732	111.8237	AINSWORTH - AINSWORTH 115KV CKT 1
FDNS	00G12_005		0 13SP	G12_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.28604	111.8219	ATCHSNT3 345.00 - COOPER 345KV CKT 1
FDNS	00G12_005		0 23SP	G12_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.28235	111.8116	STEGALL - WAYSIDE 230KV CKT 1
FDNS	00G12_005		0 13SP	G12_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.28566	111.7925	LAKEFIELD 3 - RAUN 345KV CKT 1
FDNS	00G12_005		0 13SP	G12_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.28563	111.7863	GEN652542 1-BIG BEND
FDNS	00G12_005		0 13SP	G12_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.28563	111.7863	GEN652543 3-BIG BEND
FDNS	00G12_005		0 13SP	G12_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.28563	111.7849	GEN652544 5-BIG BEND
FDNS	00G12_005		0 13SP	G12_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.28596	111.7826	ALBION - GENOA 115KV CKT 1
FDNS	00G12_005		0 18SP	G12_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.29321	111.7724	RASMUSN - UTICA JCT 230KV CKT 1
FDNS	00G12_005		0 23SP	G12_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.28134	111.7527	GEN652556 2-OAHE

SOLUTION	GROUP	SCENARIO	SEASON	SOURCE	DIRECTION	MONITORED ELEMENT	RATEB		TC%LOADING		CONTINGENCY				
							(MVA)	TDF	(% MVA)						
FDNS	00G12_005		0	23SP	G12_005	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1		320	0.28134	111.7527	GEN652557 4-OAHE
FDNS	00G12_005		0	23SP	G12_005	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1		320	0.28134	111.7527	GEN652558 6-OAHE
FDNS	00G12_005		0	13SP	G12_005	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1		320	0.28732	111.7312	MAXWELL - THEDFORD 115KV CKT 1
FDNS	00G12_005		0	13SP	G12_005	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1		320	0.28604	111.7122	ATCHSNT3 345.00 - BOONEVILLE 345KV CKT 1
FDNS	00G12_005		0	18SP	G12_005	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1		320	0.28362	111.6961	GEN542962 2-IATAN UNIT #2
FDNS	00G12_005		0	23SP	G12_005	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1		320	0.28134	111.6794	GEN652546 1-FT RANDAL
FDNS	00G12_005		0	13SP	G12_005	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1		320	0.28563	111.6308	GEN652559 1-OAHE
FDNS	00G12_005		0	23SP	G12_005	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1		320	0.28134	111.5771	GEN659296 1-SDPRAIRWIND1W0.6900
FDNS	00G12_005		0	18SP	G12_005	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1		320	0.28362	111.5705	GEN640010 1-GERALD GENTLEMAN STATION UNIT 1
FDNS	00G12_005		0	23SP	G12_005	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1		320	0.29758	111.4423	FT RANDAL - LAKE PLATT 230KV CKT 1
FDNS	00G12_005		0	23SP	G12_005	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1		320	0.27907	111.4298	KELLY (KELLY T1) 230/115/13.2KV TRANSFORMER CKT 1
FDNS	00G12_005		0	23SP	G12_005	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1		320	0.27907	111.4282	COLUMBUS - KELLY 115KV CKT 1
FDNS	00G12_005		0	13SP	G12_005	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1		320	0.28696	111.4195	STEGALL - WAYSIDE 230KV CKT 1
FDNS	00G12_005		0	18SP	G12_005	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1		320	0.28362	111.4119	GEN532651 1-JEFFREY ENERGY CENTER UNIT 1
FDNS	00G12_005		0	18SP	G12_005	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1		320	0.28362	111.407	GEN532653 1-JEFFREY ENERGY CENTER UNIT 3
FDNS	00G12_005		0	18SP	G12_005	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1		320	0.28362	111.4069	GEN532652 1-JEFFREY ENERGY CENTER UNIT 2
FDNS	00G12_005		0	18SP	G12_005	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1		320	0.28362	111.406	GEN640011 2-GERALD GENTLEMAN STATION UNIT 2
FDNS	00G12_005		0	23SP	G12_005	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1		320	0.28134	111.406	GEN652547 3-FT RANDAL
FDNS	00G12_005		0	23SP	G12_005	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1		320	0.28134	111.406	GEN652548 5-FT RANDAL
FDNS	00G12_005		0	23SP	G12_005	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1		320	0.28134	111.406	GEN652549 7-FT RANDAL
FDNS	00G12_005		0	18SP	G12_005	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1		320	0.28362	111.3851	GEN542957 1-IATAN UNIT #1
FDNS	09NR		0	13G	G12_005	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1		320	1	111.3521	FT RANDAL - G12_005T 230.00 230KV CKT 1
FDNS	09NRBPSON		0	13G	G12_005	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1		320	1	111.3521	FT RANDAL - G12_005T 230.00 230KV CKT 1
FDNS	00G12_005		0	23SP	G12_005	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1		320	0.28539	111.3194	RAUN - SIOUX CITY 345KV CKT 1
FDNS	00G12_005		0	18SP	G12_005	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1		320	0.28362	111.2265	GEN542955 1-LACYGNE UNIT #1
FDNS	00G12_005		0	13SP	G12_005	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1		320	0.28563	111.2199	GEN652556 2-OAHE
FDNS	00G12_005		0	13SP	G12_005	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1		320	0.28563	111.2199	GEN652557 4-OAHE
FDNS	00G12_005		0	13SP	G12_005	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1		320	0.28563	111.2199	GEN652558 6-OAHE
FDNS	00G12_005		0	13SP	G12_005	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1		320	0.28563	111.169	GEN652546 1-FT RANDAL
FDNS	00G12_005		0	18SP	G12_005	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1		320	0.28657	111.1183	FT RANDAL - WHITE SWAN 115KV CKT 1
FDNS	00G12_005		0	13SP	G12_005	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1		320	0.28596	111.1157	COLUMBUS - GENOA 115KV CKT 1
FDNS	00G12_005		0	23SP	G12_005	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1		320	0.28134	111.1098	GEN659110 1-LELAND OLDS UNIT1
FDNS	00G12_005		0	18SP	G12_005	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1		320	0.28657	111.1	TYNDALL - WHITE SWAN 115KV CKT 1
FDNS	00G12_005		0	13SP	G12_005	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1		320	0.28339	111.0833	KELLY (KELLY T1) 230/115/13.2KV TRANSFORMER CKT 1
FDNS	00G12_005		0	13SP	G12_005	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1		320	0.28339	111.073	COLUMBUS - KELLY 115KV CKT 1
FDNS	00G12_005		0	18SP	G12_005	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1		320	0.28362	111.0657	GEN542956 2-LACYGNE UNIT #2
FDNS	00G12_005		0	23SP	G12_005	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1		320	0.27787	111.0396	COLUMEAST - KELLY 230KV CKT 1
FDNS	00G12_005		0	23SP	G12_005	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1		320	0.27787	111.0369	COLUMEAST (COL.EAST T3) 230/115/13.8KV TRANSFORMER CKT 1
FDNS	00G12_005		0	13SP	G12_005	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1		320	0.28563	111.0302	GEN652547 3-FT RANDAL
FDNS	00G12_005		0	13SP	G12_005	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1		320	0.28563	111.0302	GEN652548 5-FT RANDAL
FDNS	00G12_005		0	13SP	G12_005	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1		320	0.28563	111.0302	GEN652549 7-FT RANDAL
FDNS	00G12_005		0	18SP	G12_005	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1		320	0.28411	111.0226	KEYSTONE - SIDNEY 345KV CKT 1
FDNS	00G12_005		0	23SP	G12_005	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1		320	0.298	111.0142	FT RANDAL - FT THOMPSON 230KV CKT 1
FDNS	00G12_005		0	23SP	G12_005	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1		320	0.28134	111.0121	GEN659285 1-DEERCREEK 1G13.800
FDNS	00G12_005		0	18SP	G12_005	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1		320	0.28442	111.004	HANLON - STORLA 230KV CKT 1
FDNS	00G12_005		0	18SP	G12_005	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1		320	0.28362	110.9555	GEN640028 1-COLUMCOGENERATION
FDNS	00G12_005		0	18SP	G12_005	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1		320	0.28362	110.9458	GEN542951 5-HAWTHORN UNIT #5
FDNS	00G12_005		0	18SP	G12_005	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1		320	0.28362	110.9249	GEN641089 2-ENERGY CENTER 2
FDNS	00G12_005		0	18SP	G12_005	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1		320	0.28541	110.9167	GAVINS POINT - HARTINGTON 115KV CKT 1
FDNS	00G12_005		0	18SP	G12_005	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1		320	0.28411	110.858	FT THOMPSON - LETCHER 230KV CKT 1
FDNS	00G12_005		0	18SP	G12_005	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1		320	0.28362	110.8538	GEN645001 1-FORT CALHOUN 1
FDNS	00G12_005		0	23SP	G12_005	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1		320	0.29758	110.7691	FT THOMPSON - LAKE PLATT 230KV CKT 1
FDNS	00G12_005		0	18SP	G12_005	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1		320	0.28362	110.7583	GEN525562 1-TOLK GEN #2 24 KV
FDNS	00G12_005		0	18SP	G12_005	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1		320	0.28742	110.7388	UTICA JCT - VFODNES 230KV CKT 1
FDNS	00G12_005		0	18SP	G12_005	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1		320	0.28362	110.7055	GEN514806 1-SOONER UNIT 2
FDNS	00G12_005		0	18SP	G12_005	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1		320	0.28362	110.7	GEN514805 1-SOONER UNIT 1
FDNS	00G12_005		0	13SP	G12_005	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1		320	0.28217	110.5838	COLUMEAST (COL.EAST T3) 230/115/13.8KV TRANSFORMER CKT 1
FDNS	00G12_005		0	13SP	G12_005	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1		320	0.28217	110.5799	COLUMEAST - KELLY 230KV CKT 1
FDNS	00G12_005		0	13SP	G12_005	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1		320	0.28563	110.3143	GEN659110 1-LELAND OLDS UNIT1
FDNS	00G12_005		0	13SP	G12_005	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1		320	0.30214	110.1559	FT RANDAL - LAKE PLATT 230KV CKT 1
FDNS	00G12_005		0	13SP	G12_005	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1		320	0.28563	110.0975	GEN659285 1-DEERCREEK 1G13.800
FDNS	00G12_005		0	13SP	G12_005	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1		320	0.29057	109.9097	RAUN - SIOUX CITY 345KV CKT 1
FDNS	00G12_005		0	13SP	G12_005	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1		320	0.30256	109.8013	FT RANDAL - FT THOMPSON 230KV CKT 1
FDNS	00G12_005		0	18SP	G12_005	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1		320	0.28362	109.7453	BASE CASE
FDNS	00G12_005		0	18WP	G12_005	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1		320	0.31534	109.7048	FT RANDAL - UTICA JCT 230KV CKT 1
FDNS	00G12_005		0	13WP	G12_005	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1		320	0.30751	109.6936	FT RANDAL - SIOUX CITY 230KV CKT 1
FDNS	00G12_005		0	13SP	G12_005	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1		320	0.30214	109.481	FT THOMPSON - LAKE PLATT 230KV CKT 1
FDNS	00G12_005		0	13SP	G12_005	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1		320	0.28653	109.2652	HOSKINS - SHELL CREEK 345KV CKT 1
FDNS	00G12_005		0	18SP	G12_005	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1		320	0.28362	108.7498	GEN652460 4-GARRISON
FDNS	00G12_005		0	18SP	G12_005	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1		320	0.28362	108.7069	GEN652457 1-GARRISON
FDNS	00G12_005		0	18SP	G12_005	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1		320	0.28362	108.7069	GEN652458 2-GARRISON

SOLUTION	GROUP	SCENARIO	SEASON	SOURCE	DIRECTION	MONITORED ELEMENT	RATEB		TC%LOADING		CONTINGENCY			
							(MVA)	TDF	(% MVA)					
FDNS	00G12_005		0	18SP	G12_005	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1	320	0.28362	108.7069	GEN652459 3-GARRISON
FDNS	00G12_005		0	18SP	G12_005	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1	320	0.28504	108.7025	STAPLETON - THEDFORD 115KV CKT 1
FDNS	00G12_005		0	18SP	G12_005	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1	320	0.28459	108.6959	HOSKINS (HOSKINS T2) 345/230/13.8KV TRANSFORMER CKT 1
FDNS	00G12_005		0	18SP	G12_005	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1	320	0.28504	108.6718	AINSWORTH - AINSWORTH 115KV CKT 1
FDNS	00G12_005		0	23SP	G12_005	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1	320	0.28134	108.6562	GEN659111 2-LELAND OLDS UNIT2
FDNS	00G12_005		0	18SP	G12_005	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1	320	0.28301	108.5784	COLUMBUS - SCHUYLER 115KV CKT 1
FDNS	00G12_005		0	18SP	G12_005	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1	320	0.28362	108.5157	GEN652542 1-BIG BEND
FDNS	00G12_005		0	18SP	G12_005	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1	320	0.28362	108.5157	GEN652543 3-BIG BEND
FDNS	00G12_005		0	18SP	G12_005	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1	320	0.28362	108.4927	GEN652544 5-BIG BEND
FDNS	09ALLBPSON		0	13G	G12_005	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1	320	0.31775	108.4868	FT RANDAL - UTICA JCT 230KV CKT 1
FDNS	00G12_005		0	18SP	G12_005	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1	320	0.28417	108.471	ATCHSNT3 345.00 - COOPER 345KV CKT 1
FDNS	00G12_005		0	23SP	G12_005	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1	320	0.28221	108.4521	HOSKINS - SHELL CREEK 345KV CKT 1
FDNS	00G12_005		0	18SP	G12_005	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1	320	0.28393	108.4311	ALBION - GENOA 115KV CKT 1
FDNS	00G12_005		0	18SP	G12_005	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1	320	0.28417	108.3569	ATCHSNT3 345.00 - BOONEVILLE 345KV CKT 1
FDNS	09G12_005		0	13G	G12_005	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1	320	0.31775	108.3477	FT RANDAL - UTICA JCT 230KV CKT 1
FDNS	00G12_005		0	18SP	G12_005	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1	320	0.28539	108.3277	NUNDRWD - WAYSIDE 230KV CKT 1
FDNS	00G12_005		0	23SP	G12_005	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1	320	0.28134	108.3266	GEN659103 1-ANTELOPE VALLEY UNIT1
FDNS	00G12_005		0	23SP	G12_005	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1	320	0.28134	108.3266	GEN659107 2-ANTELOPE VALLEY UNIT2
FDNS	00G12_005		0	18SP	G12_005	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1	320	0.29981	108.2845	FT RANDAL - LAKE PLATT 230KV CKT 1
FDNS	00G12_005		0	18SP	G12_005	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1	320	0.28504	107.9749	MAXWELL - STAPLETON 115KV CKT 1
FDNS	00G12_005		0	18SP	G12_005	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1	320	0.28362	107.9741	GEN652546 1-FT RANDAL
FDNS	00G12_005		0	18SP	G12_005	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1	320	0.28362	107.9599	GEN652556 2-OAHE
FDNS	00G12_005		0	18SP	G12_005	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1	320	0.28362	107.9599	GEN652557 4-OAHE
FDNS	00G12_005		0	18SP	G12_005	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1	320	0.28362	107.9599	GEN652558 6-OAHE
FDNS	00G12_005		0	18SP	G12_005	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1	320	0.30023	107.937	FT RANDAL - FT THOMPSON 230KV CKT 1
FDNS	00G12_005		0	23SP	G12_005	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1	320	0.2669	107.8621	SHELL CREEK (SHELLCREEKT1) 345/230/13.8KV TRANSFORMER CKT 1
FDNS	00G12_005		0	23SP	G12_005	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1	320	0.2669	107.8564	KELLY - SHELL CREEK 230KV CKT 1
FDNS	00G12_005		0	18SP	G12_005	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1	320	0.28485	107.8215	STEGALL - WAYSIDE 230KV CKT 1
FDNS	00G12_005		0	18SP	G12_005	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1	320	0.28138	107.741	COLUMBUS - KELLY 115KV CKT 1
FDNS	00G12_005		0	18SP	G12_005	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1	320	0.28138	107.7395	KELLY (KELLY T1) 230/115/13.2KV TRANSFORMER CKT 1
FDNS	00G12_005		0	18SP	G12_005	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1	320	0.28393	107.7071	COLUMBUS - GENOA 115KV CKT 1
FDNS	00G12_005		0	18SP	G12_005	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1	320	0.28362	107.6245	GEN652547 3-FT RANDAL
FDNS	00G12_005		0	18SP	G12_005	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1	320	0.28362	107.6245	GEN652548 5-FT RANDAL
FDNS	00G12_005		0	18SP	G12_005	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1	320	0.28362	107.6245	GEN652549 7-FT RANDAL
FDNS	00G12_005		0	18SP	G12_005	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1	320	0.29981	107.5851	FT THOMPSON - LAKE PLATT 230KV CKT 1
FDNS	09G12_005BPSON		0	13G	G12_005	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1	320	0.31774	107.523	FT RANDAL - UTICA JCT 230KV CKT 1
FDNS	00G12_005		0	13SP	G12_005	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1	320	0.28563	107.4932	GEN659111 2-LELAND OLDS UNIT2
FDNS	00G12_005		0	13SP	G12_005	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1	320	0.27103	107.4858	SHELL CREEK (SHELLCREEKT1) 345/230/13.8KV TRANSFORMER CKT 1
FDNS	00G12_005		0	13SP	G12_005	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1	320	0.27103	107.4742	KELLY - SHELL CREEK 230KV CKT 1
FDNS	00G12_005		0	18SP	G12_005	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1	320	0.28795	107.3083	RAUN - SIOUX CITY 345KV CKT 1
FDNS	00G12_005		0	18SP	G12_005	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1	320	0.28016	107.294	COLUMEAST - KELLY 230KV CKT 1
FDNS	00G12_005		0	18SP	G12_005	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1	320	0.28016	107.2931	COLUMEAST (COL.EAST T3) 230/115/13.8KV TRANSFORMER CKT 1
FDNS	00G12_005		0	18SP	G12_005	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1	320	0.28362	107.2328	GEN659285 1-DEERCREEK 1G13.800
FDNS	00G12_005		0	18SP	G12_005	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1	320	0.28362	107.2322	GEN659110 1-LELAND OLDS UNIT1
FDNS	00G12_005		0	13SP	G12_005	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1	320	0.28563	107.142	GEN659103 1-ANTELOPE VALLEY UNIT1
FDNS	00G12_005		0	13SP	G12_005	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1	320	0.28563	107.142	GEN659107 2-ANTELOPE VALLEY UNIT2
FDNS	00G12_005		0	23SP	G12_005	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1	320	0.28134	106.6462	GEN562402 1-G12_005_3 0.6900
FDNS	00G12_005		0	13WP	G12_005	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1	320	0.29598	106.4497	FT THOMPSON - GRAND ISLAND 345KV CKT 1
FDNS	09ALLBPSON		0	13G	G12_005	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1	320	0.30833	106.277	FT RANDAL - SIOUX CITY 230KV CKT 1
FDNS	00G12_005		0	13SP	G12_005	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1	320	0.28563	106.029	GEN562402 1-G12_005_3 0.6900
FDNS	09G12_005		0	13G	G12_005	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1	320	0.30833	105.8855	FT RANDAL - SIOUX CITY 230KV CKT 1
FDNS	00G12_005		0	18SP	G12_005	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1	320	0.28393	105.8087	HOSKINS - SHELL CREEK 345KV CKT 1
FDNS	00G12_005		0	18WP	G12_005	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1	320	0.30567	105.7974	FT RANDAL - SIOUX CITY 230KV CKT 1
FDNS	00G12_005		0	13WP	G12_005	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1	320	0.28478	105.6207	GEN640009 1-COOPER NUCLEAR STATION
FDNS	00G12_005		0	13WP	G12_005	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1	320	0.2903	105.5817	FT RANDAL - SPENCER 115KV CKT 1
FDNS	00G12_005		0	13WP	G12_005	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1	320	0.27412	105.5324	COLUMWEST - GRAND ISLAND 230KV CKT 1
FDNS	00G12_005		0	13WP	G12_005	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1	320	0.29453	105.5295	RASMUSN - UTICA JCT 230KV CKT 1
FDNS	00G12_005		0	13WP	G12_005	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1	320	0.28478	105.4477	GEN645012 2-NEBRASKA CITY 2
FDNS	00G12_005		0	13WP	G12_005	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1	320	0.2903	105.3099	ONEILL - SPENCER 115KV CKT 1
FDNS	00G12_005		0	13WP	G12_005	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1	320	0.28478	105.1704	GEN532751 1-WOLF CREEK GENERATING STATION UNIT 1
FDNS	09G12_005BPSON		0	13G	G12_005	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1	320	0.30833	105.03	FT RANDAL - SIOUX CITY 230KV CKT 1
FDNS	00G12_005		0	13WP	G12_005	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1	320	0.28554	104.9959	HANLON - STORLA 230KV CKT 1
FDNS	00G12_005		0	13WP	G12_005	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1	320	0.28852	104.6647	UTICA JCT - VFODNES 230KV CKT 1
FDNS	00G12_005		0	13WP	G12_005	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1	320	0.28661	104.6638	GAVINS POINT - HARTINGTON 115KV CKT 1
FDNS	00G12_005		0	13WP	G12_005	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1	320	0.28522	104.6516	FT THOMPSON - LETCHER 230KV CKT 1
FDNS	00G12_005		0	13WP	G12_005	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1	320	0.28478	104.6175	GEN640028 1-COLUMCOGENERATION
FDNS	00G12_005		0	13WP	G12_005	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1	320	0.28529	104.6159	KEYSTONE - SIDNEY 345KV CKT 1
FDNS	00G12_005		0	18SP	G12_005	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1	320	0.28362	104.59	GEN659111 2-LELAND OLDS UNIT2
FDNS	00G12_005		0	13WP	G12_005	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1	320	0.28478	104.5748	GEN645011 1-NEBRASKA CITY 1
FDNS	00G12_005		0	13WP	G12_005	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1	320	0.28478	104.5197	GEN542962 2-IATAN UNIT #2
FDNS	00G12_005		0	13WP	G12_005	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1	320	0.2878	104.4929	FT RANDAL - WHITE SWAN 115KV CKT 1

SOLUTION	GROUP	SCENARIO	SEASON	SOURCE	DIRECTION	MONITORED ELEMENT	RATEB		TC%LOADING		CONTINGENCY			
							(MVA)	TDF	(% MVA)					
FDNS	00G12_005		0	13WP	G12_005	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1	320	0.2878	104.4699	TYNDALL - WHITE SWAN 115KV CKT 1
FDNS	00G12_005		0	13WP	G12_005	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1	320	0.28478	104.4559	GEN532652 1-JEFFREY ENERGY CENTER UNIT 2
FDNS	00G12_005		0	18SP	G12_005	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1	320	0.26887	104.4337	SHELL CREEK (SHELLCREEKT1) 345/230/13.8KV TRANSFORMER CKT 1
FDNS	00G12_005		0	13WP	G12_005	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1	320	0.27557	104.423	COLUMEAST - NW68TH & HOLDREGE 345KV CKT 1
FDNS	00G12_005		0	18SP	G12_005	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1	320	0.26887	104.4215	KELLY - SHELL CREEK 230KV CKT 1
FDNS	00G12_005		0	13WP	G12_005	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1	320	0.28748	104.3962	SIOUX FALLS - SPLIT ROCK 230KV CKT 1
FDNS	00G12_005		0	13WP	G12_005	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1	320	0.28478	104.3605	GEN542957 1-IATAN UNIT #1
FDNS	00G12_005		0	13WP	G12_005	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1	320	0.28478	104.2519	GEN641089 2-ENERGY CENTER 2
FDNS	00G12_005		0	18SP	G12_005	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1	320	0.28362	104.2433	GEN659103 1-ANTELOPE VALLEY UNIT1
FDNS	00G12_005		0	18SP	G12_005	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1	320	0.28362	104.2433	GEN659107 2-ANTELOPE VALLEY UNIT2
FDNS	00G12_005		0	13WP	G12_005	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1	320	0.28554	104.2427	HANLON - SIOUX FALLS 230KV CKT 1
FDNS	00G12_005		0	13WP	G12_005	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1	320	0.28541	104.2315	CARPENTER - HURON 230KV CKT 1
FDNS	00G12_005		0	13WP	G12_005	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1	320	0.28382	104.1967	GRAND ISLAND - SWEETWATER 345KV CKT 1
FDNS	00G12_005		0	13WP	G12_005	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1	320	0.28478	104.1792	GEN640011 2-GERALD GENTLEMAN STATION UNIT 2
FDNS	00G12_005		0	13WP	G12_005	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1	320	0.28478	103.1845	BASE CASE
FDNS	09ALLBPSON		0	13G	G12_005	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1	320	0.29695	103.1363	FT THOMPSON - GRAND ISLAND 345KV CKT 1
FDNS	00G12_005		0	18WP	G12_005	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1	320	0.27281	102.966	COLUMWEST - GRAND ISLAND 230KV CKT 1
FDNS	00G12_005		0	18SP	G12_005	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1	320	0.28362	102.7461	GEN562402 1-G12_005_3_0.6900
FDNS	09G12_005		0	13G	G12_005	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1	320	0.29695	102.689	FT THOMPSON - GRAND ISLAND 345KV CKT 1
FDNS	00G12_005		0	18WP	G12_005	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1	320	0.28311	102.5729	GEN640009 1-COOPER NUCLEAR STATION
FDNS	00G12_005		0	18WP	G12_005	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1	320	0.2886	102.5388	FT RANDAL - SPENCER 115KV CKT 1
FDNS	09ALLBPSON		0	13G	G12_005	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1	320	0.28542	102.409	GEN640009 1-COOPER NUCLEAR STATION
FDNS	00G12_005		0	18WP	G12_005	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1	320	0.2886	102.2649	ONEILL - SPENCER 115KV CKT 1
FDNS	09ALLBPSON		0	13G	G12_005	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1	320	0.28907	102.2194	UTICA JCT - VFODNES 230KV CKT 1
FDNS	00G12_005		0	13WP	G12_005	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1	320	0.28486	102.2062	LAKEFIELD 3 - RAUN 345KV CKT 1
FDNS	00G12_005		0	18WP	G12_005	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1	320	0.28311	102.2004	GEN645012 2-NEBRASKA CITY 2
FDNS	00G12_005		0	13WP	G12_005	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1	320	0.28478	102.1992	GEN652460 4-GARRISON
FDNS	00G12_005		0	13WP	G12_005	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1	320	0.28478	102.1991	GEN652461 5-GARRISON
FDNS	09ALLBPSON		0	13G	G12_005	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1	320	0.28694	102.1777	PETERSBRG.N7115.00 - PETERSBURG 115KV CKT 1
FDNS	09G12_005		0	13G	G12_005	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1	320	0.28543	102.1702	GEN640009 1-COOPER NUCLEAR STATION
FDNS	00G12_005		0	13WP	G12_005	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1	320	0.28478	102.1636	GEN652457 1-GARRISON
FDNS	00G12_005		0	13WP	G12_005	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1	320	0.28478	102.1636	GEN652458 2-GARRISON
FDNS	00G12_005		0	13WP	G12_005	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1	320	0.28478	102.1636	GEN652459 3-GARRISON
FDNS	09ALLBPSON		0	13G	G12_005	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1	320	0.28694	102.1463	ALBION - PETERSBURG 115KV CKT 1
FDNS	00G12_005		0	13WP	G12_005	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1	320	0.28478	102.1117	GEN659296 1-SDPAIRWINDLW0.6900
FDNS	00G12_005		0	18WP	G12_005	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1	320	0.28311	102.11	GEN532751 1-WOLF CREEK GENERATING STATION UNIT 1
FDNS	09ALLBPSON		0	13G	G12_005	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1	320	0.28718	102.0816	G10-51T 230.00 - HOSKINS 230KV CKT 1
FDNS	00G12_005		0	18WP	G12_005	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1	320	0.27403	102.0508	COLUMEAST - NW68TH & HOLDREGE 345KV CKT 1
FDNS	00G12_005		0	13WP	G12_005	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1	320	0.28644	102.0493	MAXWELL - THEDFORD 115KV CKT 1
FDNS	00G12_005		0	13WP	G12_005	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1	320	0.28577	102.0279	HOSKINS (HOSKINS T2) 345/230/13.8KV TRANSFORMER CKT 1
FDNS	09G12_005		0	13G	G12_005	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1	320	0.28908	101.9683	UTICA JCT - VFODNES 230KV CKT 1
FDNS	00G12_005		0	18WP	G12_005	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1	320	0.29268	101.9511	RASMUSN - UTICA JCT 230KV CKT 1
FDNS	00G12_005		0	13WP	G12_005	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1	320	0.28478	101.9162	GEN652542 1-BIG BEND
FDNS	00G12_005		0	13WP	G12_005	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1	320	0.28478	101.9162	GEN652543 3-BIG BEND
FDNS	00G12_005		0	13WP	G12_005	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1	320	0.28478	101.9139	GEN652544 5-BIG BEND
FDNS	00G12_005		0	13WP	G12_005	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1	320	0.2852	101.9116	ATCHSNT3 345.00 - COOPER 345KV CKT 1
FDNS	09ALLBPSON		0	13G	G12_005	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1	320	0.28542	101.858	GEN640028 1-COLUMCOGENERATION
FDNS	09ALLBPSON		0	13G	G12_005	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1	320	0.28802	101.8352	SIOUX FALLS - SPLIT ROCK 230KV CKT 1
FDNS	09ALLBPSON		0	13G	G12_005	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1	320	0.28618	101.8333	HANLON - STORLA 230KV CKT 1
FDNS	09ALLBPSON		0	13G	G12_005	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1	320	0.28542	101.8261	GEN645012 2-NEBRASKA CITY 2
FDNS	09G12_005BPSON		0	13G	G12_005	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1	320	0.29695	101.7964	FT THOMPSON - GRAND ISLAND 345KV CKT 1
FDNS	00G12_005		0	13WP	G12_005	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1	320	0.28418	101.7961	COLUMBUS - SCHUYLER 115KV CKT 1
FDNS	09BPSON		0	13G	G12_005	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1	320	1	101.748	FT RANDAL - G12_005T 230.00 230KV CKT 1
FDNS	9		0	13G	G12_005	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1	320	1	101.7282	FT RANDAL - G12_005T 230.00 230KV CKT 1
FDNS	00G12_005		0	13WP	G12_005	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1	320	0.2852	101.7255	ATCHSNT3 345.00 - BOONEVILLE 345KV CKT 1
FDNS	09ALLBPSON		0	13G	G12_005	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1	320	0.28594	101.6988	KEYSTONE - SIDNEY 345KV CKT 1
FDNS	09ALLBPSON		0	13G	G12_005	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1	320	0.28542	101.694	GEN645011 1-NEBRASKA CITY 1
FDNS	09ALLBPSON		0	13G	G12_005	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1	320	0.2873	101.691	GAVINS POINT - HARTINGTON 115KV CKT 1
FDNS	09ALLBPSON		0	13G	G12_005	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1	320	0.28542	101.6829	GEN532751 1-WOLF CREEK GENERATING STATION UNIT 1
FDNS	00G12_005		0	18WP	G12_005	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1	320	0.2936	101.6756	FT THOMPSON - GRAND ISLAND 345KV CKT 1
FDNS	09G12_005		0	13G	G12_005	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1	320	0.28619	101.6718	HANLON - STORLA 230KV CKT 1
FDNS	09G12_005		0	13G	G12_005	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1	320	0.28694	101.6717	PETERSBRG.N7115.00 - PETERSBURG 115KV CKT 1
FDNS	00G12_005		0	13WP	G12_005	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1	320	0.28478	101.6607	GEN652546 1-FT RANDAL
FDNS	09G12_005		0	13G	G12_005	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1	320	0.28543	101.6591	GEN645012 2-NEBRASKA CITY 2
FDNS	09G12_005		0	13G	G12_005	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1	320	0.28694	101.6397	ALBION - PETERSBURG 115KV CKT 1
FDNS	09ALLBPSON		0	13G	G12_005	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1	320	0.28907	101.6387	SIOUX FALLS - VFODNES 230KV CKT 1
FDNS	00G12_005		0	18WP	G12_005	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1	320	0.28311	101.6307	GEN640028 1-COLUMCOGENERATION
FDNS	00G12_005		0	18WP	G12_005	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1	320	0.28311	101.6228	GEN542962 2-IATAN UNIT #2
FDNS	00G12_005		0	18WP	G12_005	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1	320	0.28391	101.6152	HANLON - STORLA 230KV CKT 1
FDNS	09G12_005		0	13G	G12_005	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1	320	0.28543	101.6047	GEN532751 1-WOLF CREEK GENERATING STATION UNIT 1
FDNS	09G12_005		0	13G	G12_005	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1	320	0.29536	101.592	RASMUSN - UTICA JCT 230KV CKT 1

SOLUTION	GROUP	SCENARIO	SEASON	SOURCE	DIRECTION	MONITORED ELEMENT	RATEB		TC%LOADING		CONTINGENCY
							(MVA)	TDF	(% MVA)		
FDNS	09G12_005		0 13G	G12_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.28802	101.5786	SIoux FALLS - SPLIT ROCK 230KV CKT 1	
FDNS	09G12_005		0 13G	G12_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.28594	101.571	KEYSTONE - SIDNEY 345KV CKT 1	
FDNS	09ALLBPSON		0 13G	G12_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.29535	101.5708	RASMUSN - UTICA JCT 230KV CKT 1	
FDNS	00G12_005		0 13WP	G12_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.28644	101.5665	AINSWORTH - AINSWORTH 115KV CKT 1	
FDNS	00G12_005		0 18WP	G12_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.28311	101.5445	GEN645011 1-NEBRASKA CITY 1	
FDNS	00G12_005		0 13WP	G12_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.28478	101.5438	GEN652556 2-OAHE	
FDNS	00G12_005		0 13WP	G12_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.28478	101.5438	GEN652557 4-OAHE	
FDNS	00G12_005		0 13WP	G12_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.28478	101.5438	GEN652558 6-OAHE	
FDNS	00G12_005		0 18WP	G12_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.28694	101.5281	UTICA JCT - VFODNES 230KV CKT 1	
FDNS	09G12_005		0 13G	G12_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.28543	101.5213	GEN645011 1-NEBRASKA CITY 1	
FDNS	09G12_005		0 13G	G12_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.28718	101.4921	G10-51T 230.00 - HOSKINS 230KV CKT 1	
FDNS	09G12_005		0 13G	G12_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.28543	101.4847	GEN640028 1-COLUMCOGENERATION	
FDNS	00G12_005		0 18WP	G12_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.28489	101.4664	GAVINS POINT - HARTINGTON 115KV CKT 1	
FDNS	00G12_005		0 18WP	G12_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.28311	101.4452	GEN532652 1-JEFFREY ENERGY CENTER UNIT 2	
FDNS	09ALLBPSON		0 13G	G12_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.28586	101.4414	FT THOMPSON - LETCHER 230KV CKT 1	
FDNS	09G12_005		0 13G	G12_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.2873	101.4402	GAVINS POINT - HARTINGTON 115KV CKT 1	
FDNS	00G12_005		0 13WP	G12_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.28253	101.4117	COLUMBUS - KELLY 115KV CKT 1	
FDNS	00G12_005		0 13WP	G12_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.28253	101.4116	KELLY (KELLY T1) 230/115/13.2KV TRANSFORMER CKT 1	
FDNS	09ALLBPSON		0 13G	G12_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.28706	101.4013	RASMUSN - SIOUX CITY 230KV CKT 1	
FDNS	09G12_005		0 13G	G12_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.28908	101.3923	SIoux FALLS - VFODNES 230KV CKT 1	
FDNS	09ALLBPSON		0 13G	G12_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.28576	101.3875	ALBION - GENOA 115KV CKT 1	
FDNS	00G12_005		0 13WP	G12_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.28658	101.3787	NUNDRWD - WAYSIDE 230KV CKT 1	
FDNS	00G12_005		0 13WP	G12_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.28478	101.376	GEN652547 3-FT RANDAL	
FDNS	00G12_005		0 13WP	G12_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.28478	101.376	GEN652548 5-FT RANDAL	
FDNS	00G12_005		0 13WP	G12_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.28478	101.376	GEN652549 7-FT RANDAL	
FDNS	00G12_005		0 18WP	G12_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.2836	101.357	FT THOMPSON - LETCHER 230KV CKT 1	
FDNS	09G12_005BPSON		0 13G	G12_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.28542	101.3531	GEN640009 1-COOPER NUCLEAR STATION	
FDNS	00G12_005		0 18WP	G12_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.28606	101.3377	FT RANDAL - WHITE SWAN 115KV CKT 1	
FDNS	00G12_005		0 18WP	G12_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.28311	101.3271	GEN640010 1-GERALD GENTLEMAN STATION UNIT 1	
FDNS	00G12_005		0 18WP	G12_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.28606	101.3137	TYNDALL - WHITE SWAN 115KV CKT 1	
FDNS	00G12_005		0 18WP	G12_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.28358	101.2972	KEYSTONE - SIDNEY 345KV CKT 1	
FDNS	09G12_005		0 13G	G12_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.28586	101.2877	FT THOMPSON - LETCHER 230KV CKT 1	
FDNS	00G12_005		0 18WP	G12_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.28311	101.2816	GEN640011 2-GERALD GENTLEMAN STATION UNIT 2	
FDNS	00G12_005		0 18WP	G12_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.28311	101.2687	GEN542957 1-IATAN UNIT #1	
FDNS	00G12_005		0 18WP	G12_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.28311	101.1884	GEN641089 2-ENERGY CENTER 2	
FDNS	00G12_005		0 18WP	G12_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.28222	101.1776	GRAND ISLAND - SWEETWATER 345KV CKT 1	
FDNS	00G12_005		0 13WP	G12_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.28606	101.0948	STEGALL - WAYSIDE 230KV CKT 1	
FDNS	00G12_005		0 18WP	G12_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.28585	101.0344	ARMOUR - FT RANDAL 115KV CKT 1	
FDNS	09G12_005BPSON		0 13G	G12_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.28907	100.9939	UTICA JCT - VFODNES 230KV CKT 1	
FDNS	00G12_005		0 13WP	G12_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.30138	100.9524	FT RANDAL - LAKE PLATT 230KV CKT 1	
FDNS	00G12_005		0 13WP	G12_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.2813	100.8743	COLUMEAST (COL.EAST T3) 230/115/13.8KV TRANSFORMER CKT 1	
FDNS	00G12_005		0 13WP	G12_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.2813	100.8725	COLUMEAST - KELLY 230KV CKT 1	
FDNS	09G12_005BPSON		0 13G	G12_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.28542	100.8	NC1_GEN-NEBRASKA CITY 1	
FDNS	09G12_005BPSON		0 13G	G12_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.28542	100.7577	GEN645012 2-NEBRASKA CITY 2	
FDNS	09G12_005BPSON		0 13G	G12_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.28542	100.7395	GEN640028 1-COLUMCOGENERATION	
FDNS	09G12_005BPSON		0 13G	G12_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.28618	100.7241	HANLON - STORLA 230KV CKT 1	
FDNS	09G12_005BPSON		0 13G	G12_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.28694	100.7105	PETERSBRG.N7115.00 - PETERSBURG 115KV CKT 1	
FDNS	09G12_005BPSON		0 13G	G12_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.28694	100.6785	ALBION - PETERSBURG 115KV CKT 1	
FDNS	00G12_005		0 13WP	G12_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.30181	100.6481	FT RANDAL - FT THOMPSON 230KV CKT 1	
FDNS	00G12_005		0 23SP	G12_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.28134	100.6294	GEN560717 1-G13_006_3 0.6900	
FDNS	09G12_005BPSON		0 13G	G12_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.28542	100.6227	GEN532751 1-WOLF CREEK GENERATING STATION UNIT 1	
FDNS	09G12_005BPSON		0 13G	G12_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.28802	100.6172	SIoux FALLS - SPLIT ROCK 230KV CKT 1	
FDNS	09G12_005BPSON		0 13G	G12_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.28542	100.6155	GEN645011 1-NEBRASKA CITY 1	
FDNS	09G12_005BPSON		0 13G	G12_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.28594	100.5852	KEYSTONE - SIDNEY 345KV CKT 1	
FDNS	09G12_005BPSON		0 13G	G12_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.29535	100.5813	RASMUSN - UTICA JCT 230KV CKT 1	
FDNS	09G12_005BPSON		0 13G	G12_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.28717	100.5273	G10-51T 230.00 - HOSKINS 230KV CKT 1	
FDNS	09G12_005BPSON		0 13G	G12_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.2873	100.4871	GAVINS POINT - HARTINGTON 115KV CKT 1	
FDNS	00G12_005		0 13WP	G12_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.28478	100.4831	GEN659110 1-LELAND OLDS UNIT1	
FDNS	09G12_005BPSON		0 13G	G12_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.28907	100.4077	SIoux FALLS - VFODNES 230KV CKT 1	
FDNS	00G12_005		0 13WP	G12_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.30138	100.3992	FT THOMPSON - LAKE PLATT 230KV CKT 1	
FDNS	09G12_005BPSON		0 13G	G12_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.28586	100.3328	FT THOMPSON - LETCHER 230KV CKT 1	
FDNS	09ALLBPSON		0 13G	G12_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.28542	100.3284	BASE CASE	
FDNS	09ALLBPSON		0 13G	G12_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.28542	100.3284	NC1_GEN-NEBRASKA CITY 1	
FDNS	09G12_005		0 13G	G12_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.28543	100.2625	BASE CASE	
FDNS	09G12_005		0 13G	G12_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.28543	100.2625	NC1_GEN-NEBRASKA CITY 1	
FDNS	00G12_005		0 13SP	G12_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.28563	100.0882	GEN560717 1-G13_006_3 0.6900	
FDNS	00G12_005		0 18WP	G12_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.28311	100.074	BASE CASE	
FDNS	00G12_005		2 23SP	G12_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.28134	113.406	MADISONCO 230.00 - S_NORFOLK 230.00 230KV CKT 1	
FDNS	00G12_005		2 23SP	G12_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.28134	113.2267	S_NORFOLK 345.00 (SNORFOLK) 345/230/13.8KV TRANSFORMER CKT 1	
FDNS	00G12_005		2 13SP	G12_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.28563	113.1148	MADISONCO 230.00 - S_NORFOLK 230.00 230KV CKT 1	
FDNS	00G12_005		2 13SP	G12_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.28563	112.7925	S_NORFOLK 345.00 (SNORFOLK) 345/230/13.8KV TRANSFORMER CKT 1	

SOLUTION	GROUP	SCENARIO	SEASON	SOURCE	DIRECTION	MONITORED ELEMENT	RATEB		TC%LOADING		CONTINGENCY
							(MVA)	TDF	(% MVA)		
FDNS	00G12_005		2	18SP	G12_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.28363	109.7494	MADISONCO 230.00 -S_NORFOLK 230.00 230KV CKT 1
FDNS	00G12_005		2	18SP	G12_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.28363	109.4292	S_NORFOLK 345.00 (SNORFOLKT) 345/230/13.8KV TRANSFORMER CKT 1
FDNS	00G12_005		2	13WP	G12_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.28478	103.1808	MADISONCO 230.00 -S_NORFOLK 230.00 230KV CKT 1
FDNS	00G12_005		2	13WP	G12_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.28478	102.8575	S_NORFOLK 345.00 (SNORFOLKT) 345/230/13.8KV TRANSFORMER CKT 1
FDNS	09ALLBPSON		2	13G	G12_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.28543	100.3015	MADISONCO 230.00 -S_NORFOLK 230.00 230KV CKT 1
FDNS	09ALLBPSON		2	13G	G12_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.28543	100.0976	S_NORFOLK 345.00 (SNORFOLKT) 345/230/13.8KV TRANSFORMER CKT 1
FDNS	00G12_005		2	18WP	G12_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.28311	100.075	MADISONCO 230.00 -S_NORFOLK 230.00 230KV CKT 1
FDNS	09G12_005		2	13G	G12_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.28543	100	MADISONCO 230.00 -S_NORFOLK 230.00 230KV CKT 1
FDNS	00G12_005		2	23SP	G12_005	FROM->TO	MADISONCO 230.00 -S_NORFOLK 230.00 230KV CKT 1	320	0.2549	105.0224	KELLY - MADISONCO 230.00 230KV CKT 1
FDNS	00G12_005		2	13SP	G12_005	FROM->TO	MADISONCO 230.00 -S_NORFOLK 230.00 230KV CKT 1	320	0.25828	104.0177	KELLY - MADISONCO 230.00 230KV CKT 1
FDNS	00G12_005		2	18SP	G12_005	FROM->TO	MADISONCO 230.00 -S_NORFOLK 230.00 230KV CKT 1	320	0.25693	100.6537	KELLY - MADISONCO 230.00 230KV CKT 1
FDNS	00G12_005		2	23SP	G12_005	FROM->TO	S_NORFOLK 345.00 (SNORFOLKT) 345/230/13.8KV TRANSFORMER CKT 1	336	0.2549	101.6138	KELLY - MADISONCO 230.00 230KV CKT 1
FDNS	00G12_005		2	13SP	G12_005	FROM->TO	S_NORFOLK 345.00 (SNORFOLKT) 345/230/13.8KV TRANSFORMER CKT 1	336	0.25828	100.4225	KELLY - MADISONCO 230.00 230KV CKT 1
FDNS	09G13_002		0	13G	G13_002	FROM->TO	G13_002T 115.00 -SHELDON 115KV CKT 2	43	1	131.1354	G13_002T 115.00 -SW7TH & PLEASANT HILL 115KV CKT 2
FDNS	09NR		0	13G	G13_002	FROM->TO	G13_002T 115.00 -SHELDON 115KV CKT 2	43	1	130.8817	G13_002T 115.00 -SW7TH & PLEASANT HILL 115KV CKT 2
FDNS	09NRBPSON		0	13G	G13_002	FROM->TO	G13_002T 115.00 -SHELDON 115KV CKT 2	43	1	130.8817	G13_002T 115.00 -SW7TH & PLEASANT HILL 115KV CKT 2
FDNS	09G13_002BPSON		0	13G	G13_002	FROM->TO	G13_002T 115.00 -SHELDON 115KV CKT 2	43	1	118.148	G13_002T 115.00 -SW7TH & PLEASANT HILL 115KV CKT 2
FDNS	9		0	13G	G13_002	FROM->TO	G13_002T 115.00 -SHELDON 115KV CKT 2	43	1	103.9597	G13_002T 115.00 -SW7TH & PLEASANT HILL 115KV CKT 2
FDNS	09G13_002BPSON		0	13G	G13_002	FROM->TO	G13_002T 115.00 -SW7TH & PLEASANT HILL 115KV CKT 2	43	0.2628	370.6694	SHELDON - SW7TH & PLEASANT HILL 115KV CKT 1
FDNS	09ALLBPSON		0	13G	G13_002	FROM->TO	G13_002T 115.00 -SW7TH & PLEASANT HILL 115KV CKT 2	43	0.26294	346.1206	SHELDON - SW7TH & PLEASANT HILL 115KV CKT 1
FDNS	09G13_002BPSON		0	13G	G13_002	FROM->TO	G13_002T 115.00 -SW7TH & PLEASANT HILL 115KV CKT 2	43	0.33162	323.6864	MOORE (MOORE T1) 345/115/13.8KV TRANSFORMER CKT 1
FDNS	09BPSON		0	13G	G13_002	FROM->TO	G13_002T 115.00 -SW7TH & PLEASANT HILL 115KV CKT 2	43	0.26292	323.0332	SHELDON - SW7TH & PLEASANT HILL 115KV CKT 1
FDNS	09ALLBPSON		0	13G	G13_002	FROM->TO	G13_002T 115.00 -SW7TH & PLEASANT HILL 115KV CKT 2	43	0.3318	294.5695	MOORE (MOORE T1) 345/115/13.8KV TRANSFORMER CKT 1
FDNS	09NR		0	13G	G13_002	FROM->TO	G13_002T 115.00 -SW7TH & PLEASANT HILL 115KV CKT 2	43	0.36738	293.6182	SHELDON - SW7TH & PLEASANT HILL 115KV CKT 1
FDNS	09NRBPSON		0	13G	G13_002	FROM->TO	G13_002T 115.00 -SW7TH & PLEASANT HILL 115KV CKT 2	43	0.36738	293.6182	SHELDON - SW7TH & PLEASANT HILL 115KV CKT 1
FDNS	09G13_002BPSON		0	13G	G13_002	FROM->TO	G13_002T 115.00 -SW7TH & PLEASANT HILL 115KV CKT 2	43	0.20357	265.8247	103RD & ROKEBY - WAGENER 345KV CKT 1
FDNS	09BPSON		0	13G	G13_002	FROM->TO	G13_002T 115.00 -SW7TH & PLEASANT HILL 115KV CKT 2	43	0.33178	261.3835	MOORE (MOORE T1) 345/115/13.8KV TRANSFORMER CKT 1
FDNS	09G13_002BPSON		0	13G	G13_002	FROM->TO	G13_002T 115.00 -SW7TH & PLEASANT HILL 115KV CKT 2	43	0.20545	261.0706	MOORE - NW68TH & HOLDREGE 345KV CKT 1
FDNS	09G13_002BPSON		0	13G	G13_002	FROM->TO	G13_002T 115.00 -SW7TH & PLEASANT HILL 115KV CKT 2	43	0.20885	256.2633	103RD & ROKEBY - MOORE 345KV CKT 1
FDNS	09G13_002BPSON		0	13G	G13_002	FROM->TO	G13_002T 115.00 -SW7TH & PLEASANT HILL 115KV CKT 2	43	0.19978	255.7888	WAGENER (T851) 345/115/13.8KV TRANSFORMER CKT 1
FDNS	09G13_002BPSON		0	13G	G13_002	FROM->TO	G13_002T 115.00 -SW7TH & PLEASANT HILL 115KV CKT 2	43	0.20906	254.7928	KNOB HILL - STEELE CITY 115KV CKT 1
FDNS	09G13_002BPSON		0	13G	G13_002	FROM->TO	G13_002T 115.00 -SW7TH & PLEASANT HILL 115KV CKT 2	43	0.20022	254.7772	WAGENER (T852) 345/115/13.8KV TRANSFORMER CKT 2
FDNS	09G13_002BPSON		0	13G	G13_002	FROM->TO	G13_002T 115.00 -SW7TH & PLEASANT HILL 115KV CKT 2	43	0.21008	254.6275	BEATRICE - STEINAUER 115KV CKT 1
FDNS	09G13_002BPSON		0	13G	G13_002	FROM->TO	G13_002T 115.00 -SW7TH & PLEASANT HILL 115KV CKT 2	43	0.21008	254.3766	HUMBOLDT - STEINAUER 115KV CKT 1
FDNS	09G13_002BPSON		0	13G	G13_002	FROM->TO	G13_002T 115.00 -SW7TH & PLEASANT HILL 115KV CKT 2	43	0.20679	253.8813	G13_018T 69.000 -HYDROCARBON TAP 69KV CKT 1
FDNS	09G13_002BPSON		0	13G	G13_002	FROM->TO	G13_002T 115.00 -SW7TH & PLEASANT HILL 115KV CKT 2	43	0.20679	253.8768	HYDROCARBON TAP - SUB 970 69KV CKT 1
FDNS	09G13_002BPSON		0	13G	G13_002	FROM->TO	G13_002T 115.00 -SW7TH & PLEASANT HILL 115KV CKT 2	43	0.20679	252.9312	NEB CITY U SYR SUB - SUB 970 69KV CKT 1
FDNS	09G13_002BPSON		0	13G	G13_002	FROM->TO	G13_002T 115.00 -SW7TH & PLEASANT HILL 115KV CKT 2	43	0.2015	252.5915	84TH & LEIGHTON - WAGENER 115KV CKT 1
FDNS	09G13_002BPSON		0	13G	G13_002	FROM->TO	G13_002T 115.00 -SW7TH & PLEASANT HILL 115KV CKT 2	43	0.20508	252.5379	GEN645001 1-FORT CALHOUN 1
FDNS	09G13_002BPSON		0	13G	G13_002	FROM->TO	G13_002T 115.00 -SW7TH & PLEASANT HILL 115KV CKT 2	43	0.20679	252.4765	NEB CITY U SYR SUB - SUB 971 69KV CKT 1
FDNS	09G13_002BPSON		0	13G	G13_002	FROM->TO	G13_002T 115.00 -SW7TH & PLEASANT HILL 115KV CKT 2	43	0.21008	252.4181	HUMBOLDT (HUMBOLDT T2) 161/115/13.8KV TRANSFORMER CKT 1
FDNS	09G13_002BPSON		0	13G	G13_002	FROM->TO	G13_002T 115.00 -SW7TH & PLEASANT HILL 115KV CKT 2	43	0.20587	252.1468	G08-123N 115.00 -PAULINE 115KV CKT 1
FDNS	09G13_002BPSON		0	13G	G13_002	FROM->TO	G13_002T 115.00 -SW7TH & PLEASANT HILL 115KV CKT 2	43	0.20502	251.7	KELLY - MADISONCO 230.00 230KV CKT 1
FDNS	09G13_002BPSON		0	13G	G13_002	FROM->TO	G13_002T 115.00 -SW7TH & PLEASANT HILL 115KV CKT 2	43	0.20508	250.8522	GEN645012 2-NEBRASKA CITY 2
FDNS	09ALLBPSON		0	13G	G13_002	FROM->TO	G13_002T 115.00 -SW7TH & PLEASANT HILL 115KV CKT 2	43	0.20365	249.3823	103RD & ROKEBY - WAGENER 345KV CKT 1
FDNS	09G13_002BPSON		0	13G	G13_002	FROM->TO	G13_002T 115.00 -SW7TH & PLEASANT HILL 115KV CKT 2	43	0.20508	243.6115	BASE CASE
FDNS	09ALLBPSON		0	13G	G13_002	FROM->TO	G13_002T 115.00 -SW7TH & PLEASANT HILL 115KV CKT 2	43	0.20554	242.5081	MOORE - NW68TH & HOLDREGE 345KV CKT 1
FDNS	09ALLBPSON		0	13G	G13_002	FROM->TO	G13_002T 115.00 -SW7TH & PLEASANT HILL 115KV CKT 2	43	0.20915	240.596	KNOB HILL - STEELE CITY 115KV CKT 1
FDNS	09G13_002		0	13G	G13_002	FROM->TO	G13_002T 115.00 -SW7TH & PLEASANT HILL 115KV CKT 2	43	0.26277	240.4147	SHELDON - SW7TH & PLEASANT HILL 115KV CKT 1
FDNS	09ALLBPSON		0	13G	G13_002	FROM->TO	G13_002T 115.00 -SW7TH & PLEASANT HILL 115KV CKT 2	43	0.19986	240.3499	WAGENER (T851) 345/115/13.8KV TRANSFORMER CKT 1
FDNS	09ALLBPSON		0	13G	G13_002	FROM->TO	G13_002T 115.00 -SW7TH & PLEASANT HILL 115KV CKT 2	43	0.20898	239.7699	103RD & ROKEBY - MOORE 345KV CKT 1
FDNS	09ALLBPSON		0	13G	G13_002	FROM->TO	G13_002T 115.00 -SW7TH & PLEASANT HILL 115KV CKT 2	43	0.20511	239.7124	KELLY - MADISONCO 230.00 230KV CKT 1
FDNS	09ALLBPSON		0	13G	G13_002	FROM->TO	G13_002T 115.00 -SW7TH & PLEASANT HILL 115KV CKT 2	43	0.20596	239.5779	G08-123N 115.00 -PAULINE 115KV CKT 1
FDNS	09ALLBPSON		0	13G	G13_002	FROM->TO	G13_002T 115.00 -SW7TH & PLEASANT HILL 115KV CKT 2	43	0.2003	239.3161	WAGENER (T852) 345/115/13.8KV TRANSFORMER CKT 2
FDNS	09ALLBPSON		0	13G	G13_002	FROM->TO	G13_002T 115.00 -SW7TH & PLEASANT HILL 115KV CKT 2	43	0.21018	239.1308	BEATRICE - STEINAUER 115KV CKT 1
FDNS	09ALLBPSON		0	13G	G13_002	FROM->TO	G13_002T 115.00 -SW7TH & PLEASANT HILL 115KV CKT 2	43	0.20688	239.1213	G13_018T 69.000 -HYDROCARBON TAP 69KV CKT 1
FDNS	09ALLBPSON		0	13G	G13_002	FROM->TO	G13_002T 115.00 -SW7TH & PLEASANT HILL 115KV CKT 2	43	0.20688	239.1148	HYDROCARBON TAP - SUB 970 69KV CKT 1
FDNS	09ALLBPSON		0	13G	G13_002	FROM->TO	G13_002T 115.00 -SW7TH & PLEASANT HILL 115KV CKT 2	43	0.21018	238.5469	HUMBOLDT - STEINAUER 115KV CKT 1
FDNS	09ALLBPSON		0	13G	G13_002	FROM->TO	G13_002T 115.00 -SW7TH & PLEASANT HILL 115KV CKT 2	43	0.20688	238.2697	NEB CITY U SYR SUB - SUB 970 69KV CKT 1
FDNS	09ALLBPSON		0	13G	G13_002	FROM->TO	G13_002T 115.00 -SW7TH & PLEASANT HILL 115KV CKT 2	43	0.20688	237.6113	NEB CITY U SYR SUB - SUB 971 69KV CKT 1
FDNS	09ALLBPSON		0	13G	G13_002	FROM->TO	G13_002T 115.00 -SW7TH & PLEASANT HILL 115KV CKT 2	43	0.20159	237.0714	84TH & LEIGHTON - WAGENER 115KV CKT 1
FDNS	09ALLBPSON		0	13G	G13_002	FROM->TO	G13_002T 115.00 -SW7TH & PLEASANT HILL 115KV CKT 2	43	0.21018	236.8819	HUMBOLDT (HUMBOLDT T2) 161/115/13.8KV TRANSFORMER CKT 1
FDNS	09ALLBPSON		0	13G	G13_002	FROM->TO	G13_002T 115.00 -SW7TH & PLEASANT HILL 115KV CKT 2	43	0.20517	236.4326	GEN645001 1-FORT CALHOUN 1
FDNS	09G13_002BPSON		0	13G	G13_002	FROM->TO	G13_002T 115.00 -SW7TH & PLEASANT HILL 115KV CKT 2	43	0.20728	236.4268	BEATRICE POWER STATION - SHELDON 115KV CKT 1
FDNS	09ALLBPSON		0	13G	G13_002	FROM->TO	G13_002T 115.00 -SW7TH & PLEASANT HILL 115KV CKT 2	43	0.20601	235.5556	MARSHALL3 115.00 -SMITTVILLE N.M. COOP (NEMAHA MARSHALL R.E. 115KV CKT 1 BAILEYVILLE N.M. STATION (NEMAHA MARSHALL R - SMITTVILLE N.M. COOP (NEMAHA
FDNS	09ALLBPSON		0	13G	G13_002	FROM->TO	G13_002T 115.00 -SW7TH & PLEASANT HILL 115KV CKT 2	43	0.20601	235.3778	MARSHALL R.E. 115KV CKT 1
FDNS	09ALLBPSON		0	13G	G13_002	FROM->TO	G13_002T 115.00 -SW7TH & PLEASANT HILL 115KV CKT 2	43	0.20601	235.3033	BAILEYVILLE N.M. STATION (NEMAHA MARSHALL R - SOUTH SENECA 115KV CKT 1
FDNS	9		0	13G	G13_002	FROM->TO	G13_002T 115.00 -SW7TH & PLEASANT HILL 115KV CKT 2	43	0.26289	234.7203	SHELDON - SW7TH & PLEASANT HILL 115KV CKT 1
FDNS	09G										

SOLUTION	GROUP	SCENARIO	SEASON	SOURCE	DIRECTION	MONITORED ELEMENT	RATEB		TC%LOADING		CONTINGENCY	
							(MVA)	TDF	(% MVA)			
FDNS	09G13_002BPSON		0	13G	G13_002	FROM->TO	G13_002T	115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.2031	232.0529	COOPER - SUB 3458 NEB CTY 345KV CKT 1
FDNS	09G13_002BPSON		0	13G	G13_002	FROM->TO	G13_002T	115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.20508	229.6527	GEN560711 1-G10_044_3 0.6900
FDNS	09BPSON		0	13G	G13_002	FROM->TO	G13_002T	115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.20553	228.3077	MOORE - NW68TH & HOLDREGE 345KV CKT 1
FDNS	09ALLBPSON		0	13G	G13_002	FROM->TO	G13_002T	115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.20517	227.9028	BASE CASE
FDNS	09G13_002BPSON		0	13G	G13_002	FROM->TO	G13_002T	115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.20508	226.2672	GEN640019 1-SHELDON STATION UNIT 1
FDNS	09BPSON		0	13G	G13_002	FROM->TO	G13_002T	115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.19985	225.5019	WAGENER (T851) 345/115/13.8KV TRANSFORMER CKT 1
FDNS	09G13_002BPSON		0	13G	G13_002	FROM->TO	G13_002T	115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.20508	225.2044	GEN640022 1-BEATRICE POWER STATION UNIT 1
FDNS	09G13_002BPSON		0	13G	G13_002	FROM->TO	G13_002T	115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.20508	225.2039	GEN640023 2-BEATRICE POWER STATION UNIT 2
FDNS	09BPSON		0	13G	G13_002	FROM->TO	G13_002T	115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.20029	224.3901	WAGENER (T852) 345/115/13.8KV TRANSFORMER CKT 2
FDNS	09NR		0	13G	G13_002	FROM->TO	G13_002T	115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.28023	223.6011	NW68TH & HOLDREGE (T141) 345/115/13.8KV TRANSFORMER CKT 1
FDNS	09NRBPSON		0	13G	G13_002	FROM->TO	G13_002T	115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.28023	223.6011	NW68TH & HOLDREGE (T141) 345/115/13.8KV TRANSFORMER CKT 1
FDNS	09G13_002BPSON		0	13G	G13_002	FROM->TO	G13_002T	115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.20508	222.8972	GEN640024 3-BEATRICE POWER STATION UNIT 3
FDNS	09BPSON		0	13G	G13_002	FROM->TO	G13_002T	115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.20914	222.5181	KNOB HILL - STEELE CITY 115KV CKT 1
FDNS	09BPSON		0	13G	G13_002	FROM->TO	G13_002T	115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.20687	221.9912	G13_018T 69.000 - HYDROCARBON TAP 69KV CKT 1
FDNS	09BPSON		0	13G	G13_002	FROM->TO	G13_002T	115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.20687	221.9867	HYDROCARBON TAP - SUB 970 69KV CKT 1
FDNS	09BPSON		0	13G	G13_002	FROM->TO	G13_002T	115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.20896	221.9739	103RD & ROKEBY - MOORE 345KV CKT 1
FDNS	09BPSON		0	13G	G13_002	FROM->TO	G13_002T	115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.20158	221.9173	84TH & LEIGHTON - WAGENER 115KV CKT 1
FDNS	09BPSON		0	13G	G13_002	FROM->TO	G13_002T	115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.21017	221.8065	BEATRICE - STEINAUER 115KV CKT 1
FDNS	09BPSON		0	13G	G13_002	FROM->TO	G13_002T	115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.21017	221.5559	HUMBOLDT - STEINAUER 115KV CKT 1
FDNS	3		0	13G	G13_002	FROM->TO	G13_002T	115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.26285	221.2259	SHELDON - SW7TH & PLEASANT HILL 115KV CKT 1
FDNS	09BPSON		0	13G	G13_002	FROM->TO	G13_002T	115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.20687	221.0159	NEB CITY U SYR SUB - SUB 970 69KV CKT 1
FDNS	09BPSON		0	13G	G13_002	FROM->TO	G13_002T	115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.20516	220.7343	GEN645001 1-FORT CALHOUN 1
FDNS	09BPSON		0	13G	G13_002	FROM->TO	G13_002T	115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.20594	220.7039	G08-123N 115.00 - PAULINE 115KV CKT 1
FDNS	09ALLBPSON		0	13G	G13_002	FROM->TO	G13_002T	115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.20517	220.6224	GEN560756 1-G13_018_3 0.5750
FDNS	09BPSON		0	13G	G13_002	FROM->TO	G13_002T	115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.20687	220.5622	NEB CITY U SYR SUB - SUB 971 69KV CKT 1
FDNS	09BPSON		0	13G	G13_002	FROM->TO	G13_002T	115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.2051	220.5345	KELLY - MADISONCO 230.00 230KV CKT 1
FDNS	09ALLBPSON		0	13G	G13_002	FROM->TO	G13_002T	115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.20737	220.2773	BEATRICE POWER STATION - SHELDON 115KV CKT 1
FDNS	09G13_002BPSON		0	13G	G13_002	FROM->TO	G13_002T	115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.20508	220.2364	GEN560749 1-G13_002_3 0.6900
FDNS	09BPSON		0	13G	G13_002	FROM->TO	G13_002T	115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.21017	219.9795	HUMBOLDT (HUMBOLDT T2) 161/115/13.8KV TRANSFORMER CKT 1
FDNS	09NR		0	13G	G13_002	FROM->TO	G13_002T	115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.3756	219.1076	MOORE (MOORE T1) 345/115/13.8KV TRANSFORMER CKT 1
FDNS	09NRBPSON		0	13G	G13_002	FROM->TO	G13_002T	115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.3756	219.1076	MOORE (MOORE T1) 345/115/13.8KV TRANSFORMER CKT 1
FDNS	09ALLBPSON		0	13G	G13_002	FROM->TO	G13_002T	115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.20517	216.6179	GEN562029 1-G11_018_3 0.6900
FDNS	09NR		0	13G	G13_002	FROM->TO	G13_002T	115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.27984	216.5539	103RD & ROKEBY - WAGENER 345KV CKT 1
FDNS	09NRBPSON		0	13G	G13_002	FROM->TO	G13_002T	115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.27984	216.5539	103RD & ROKEBY - WAGENER 345KV CKT 1
FDNS	09ALLBPSON		0	13G	G13_002	FROM->TO	G13_002T	115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.20315	216.4957	COOPER - SUB 3458 NEB CTY 345KV CKT 1
FDNS	09BPSON		0	13G	G13_002	FROM->TO	G13_002T	115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.20516	212.1281	BASE CASE
FDNS	09ALLBPSON		0	13G	G13_002	FROM->TO	G13_002T	115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.20517	210.6269	GEN560711 1-G10_044_3 0.6900
FDNS	09NR		0	13G	G13_002	FROM->TO	G13_002T	115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.27928	210.4578	MOORE - NW68TH & HOLDREGE 345KV CKT 1
FDNS	09NRBPSON		0	13G	G13_002	FROM->TO	G13_002T	115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.27928	210.4578	MOORE - NW68TH & HOLDREGE 345KV CKT 1
FDNS	09ALLBPSON		0	13G	G13_002	FROM->TO	G13_002T	115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.20517	209.3218	GEN640022 1-BEATRICE POWER STATION UNIT 1
FDNS	09ALLBPSON		0	13G	G13_002	FROM->TO	G13_002T	115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.20517	209.3214	GEN640023 2-BEATRICE POWER STATION UNIT 2
FDNS	09NR		0	13G	G13_002	FROM->TO	G13_002T	115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.28214	208.309	WAGENER (T851) 345/115/13.8KV TRANSFORMER CKT 1
FDNS	09NRBPSON		0	13G	G13_002	FROM->TO	G13_002T	115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.28214	208.309	WAGENER (T851) 345/115/13.8KV TRANSFORMER CKT 1
FDNS	09NR		0	13G	G13_002	FROM->TO	G13_002T	115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.28135	207.1275	WAGENER (T852) 345/115/13.8KV TRANSFORMER CKT 2
FDNS	09NRBPSON		0	13G	G13_002	FROM->TO	G13_002T	115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.28135	207.1275	WAGENER (T852) 345/115/13.8KV TRANSFORMER CKT 2
FDNS	09ALLBPSON		0	13G	G13_002	FROM->TO	G13_002T	115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.20517	206.9995	GEN640024 3-BEATRICE POWER STATION UNIT 3
FDNS	8		0	13G	G13_002	FROM->TO	G13_002T	115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.26271	206.3613	SHELDON - SW7TH & PLEASANT HILL 115KV CKT 1
FDNS	09NR		0	13G	G13_002	FROM->TO	G13_002T	115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.27987	205.5364	103RD & ROKEBY - MOORE 345KV CKT 1
FDNS	09NRBPSON		0	13G	G13_002	FROM->TO	G13_002T	115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.27987	205.5364	103RD & ROKEBY - MOORE 345KV CKT 1
FDNS	09BPSON		0	13G	G13_002	FROM->TO	G13_002T	115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.20736	204.6262	BEATRICE POWER STATION - SHELDON 115KV CKT 1
FDNS	09NR		0	13G	G13_002	FROM->TO	G13_002T	115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.27398	204.4704	G13_018T 69.000 - HYDROCARBON TAP 69KV CKT 1
FDNS	09NRBPSON		0	13G	G13_002	FROM->TO	G13_002T	115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.27398	204.4704	G13_018T 69.000 - HYDROCARBON TAP 69KV CKT 1
FDNS	09NR		0	13G	G13_002	FROM->TO	G13_002T	115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.27398	204.4658	HYDROCARBON TAP - SUB 970 69KV CKT 1
FDNS	09NRBPSON		0	13G	G13_002	FROM->TO	G13_002T	115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.27398	204.4658	HYDROCARBON TAP - SUB 970 69KV CKT 1
FDNS	09NR		0	13G	G13_002	FROM->TO	G13_002T	115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.27685	204.4554	84TH & LEIGHTON - WAGENER 115KV CKT 1
FDNS	09NRBPSON		0	13G	G13_002	FROM->TO	G13_002T	115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.27685	204.4554	84TH & LEIGHTON - WAGENER 115KV CKT 1
FDNS	14		0	13G	G13_002	FROM->TO	G13_002T	115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.26276	204.3452	SHELDON - SW7TH & PLEASANT HILL 115KV CKT 1
FDNS	09ALLBPSON		0	13G	G13_002	FROM->TO	G13_002T	115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.20517	204.331	GEN560749 1-G13_002_3 0.6900
FDNS	09G13_002BPSON		0	13G	G13_002	FROM->TO	G13_002T	115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.20508	203.9876	GEN640020 2-SHELDON STATION UNIT 2
FDNS	09NR		0	13G	G13_002	FROM->TO	G13_002T	115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.27398	203.6209	NEB CITY U SYR SUB - SUB 970 69KV CKT 1
FDNS	09NRBPSON		0	13G	G13_002	FROM->TO	G13_002T	115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.27398	203.6209	NEB CITY U SYR SUB - SUB 970 69KV CKT 1
FDNS	09NR		0	13G	G13_002	FROM->TO	G13_002T	115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.27259	203.2612	KELLY - MADISONCO 230.00 230KV CKT 1
FDNS	09NRBPSON		0	13G	G13_002	FROM->TO	G13_002T	115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.27259	203.2612	KELLY - MADISONCO 230.00 230KV CKT 1
FDNS	09NR		0	13G	G13_002	FROM->TO	G13_002T	115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.27398	203.1525	NEB CITY U SYR SUB - SUB 971 69KV CKT 1
FDNS	09NRBPSON		0	13G	G13_002	FROM->TO	G13_002T	115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.27398	203.1525	NEB CITY U SYR SUB - SUB 971 69KV CKT 1
FDNS	09BPSON		0	13G	G13_002	FROM->TO	G13_002T	115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.20516	203.1045	GEN562029 1-G11_018_3 0.6900
FDNS	09NR		0	13G	G13_002	FROM->TO	G13_002T	115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.27422	202.8661	KNOB HILL - STEELE CITY 115KV CKT 1
FDNS	09NRBPSON		0	13G	G13_002	FROM->TO	G13_002T					

SOLUTION	GROUP	SCENARIO	SEASON	SOURCE	DIRECTION	MONITORED ELEMENT	RATEB		TC%LOADING		CONTINGENCY		
							(MVA)	TDF	(% MVA)				
FDNS	09NRBPSON		0	13G	G13_002	FROM->TO	G13_002T	115.00	- SW7TH & PLEASANT HILL 115KV CKT 2	43	0.27259	202.76	GEN645001 1-FORT CALHOUN 1
FDNS	09BPSON		0	13G	G13_002	FROM->TO	G13_002T	115.00	- SW7TH & PLEASANT HILL 115KV CKT 2	43	0.20314	202.1837	COOPER - SUB 3458 NEB CTY 345KV CKT 1
FDNS	09BPSON		0	13G	G13_002	FROM->TO	G13_002T	115.00	- SW7TH & PLEASANT HILL 115KV CKT 2	43	0.20516	198.1552	GEN560711 1-G10_044_3 0.6900
FDNS	09NR		0	13G	G13_002	FROM->TO	G13_002T	115.00	- SW7TH & PLEASANT HILL 115KV CKT 2	43	0.27259	193.8599	BASE CASE
FDNS	09NRBPSON		0	13G	G13_002	FROM->TO	G13_002T	115.00	- SW7TH & PLEASANT HILL 115KV CKT 2	43	0.27259	193.8599	BASE CASE
FDNS	09BPSON		0	13G	G13_002	FROM->TO	G13_002T	115.00	- SW7TH & PLEASANT HILL 115KV CKT 2	43	0.20516	193.6881	GEN640022 1-BEATRICE POWER STATION UNIT 1
FDNS	09BPSON		0	13G	G13_002	FROM->TO	G13_002T	115.00	- SW7TH & PLEASANT HILL 115KV CKT 2	43	0.20516	193.6877	GEN640023 2-BEATRICE POWER STATION UNIT 2
FDNS	09BPSON		0	13G	G13_002	FROM->TO	G13_002T	115.00	- SW7TH & PLEASANT HILL 115KV CKT 2	43	0.20516	193.0857	GEN560749 1-G13_002_3 0.6900
FDNS	09ALLBPSON		0	13G	G13_002	FROM->TO	G13_002T	115.00	- SW7TH & PLEASANT HILL 115KV CKT 2	43	0.20517	191.8155	GEN640020 2-SHELDON STATION UNIT 2
FDNS	09BPSON		0	13G	G13_002	FROM->TO	G13_002T	115.00	- SW7TH & PLEASANT HILL 115KV CKT 2	43	0.20516	191.3777	GEN640024 3-BEATRICE POWER STATION UNIT 3
FDNS	09NR		0	13G	G13_002	FROM->TO	G13_002T	115.00	- SW7TH & PLEASANT HILL 115KV CKT 2	43	0.27404	185.7278	BEATRICE - HARBINE 115KV CKT 1
FDNS	09NRBPSON		0	13G	G13_002	FROM->TO	G13_002T	115.00	- SW7TH & PLEASANT HILL 115KV CKT 2	43	0.27404	185.7278	BEATRICE - HARBINE 115KV CKT 1
FDNS	09NR		0	13G	G13_002	FROM->TO	G13_002T	115.00	- SW7TH & PLEASANT HILL 115KV CKT 2	43	0.25826	183.3649	ROKEBY - SW7TH & PLEASANT HILL 115KV CKT 1
FDNS	09NRBPSON		0	13G	G13_002	FROM->TO	G13_002T	115.00	- SW7TH & PLEASANT HILL 115KV CKT 2	43	0.25826	183.3649	ROKEBY - SW7TH & PLEASANT HILL 115KV CKT 1
FDNS	09NR		0	13G	G13_002	FROM->TO	G13_002T	115.00	- SW7TH & PLEASANT HILL 115KV CKT 2	43	0.27325	183.0164	COOPER - SUB 3458 NEB CTY 345KV CKT 1
FDNS	09NRBPSON		0	13G	G13_002	FROM->TO	G13_002T	115.00	- SW7TH & PLEASANT HILL 115KV CKT 2	43	0.27325	183.0164	COOPER - SUB 3458 NEB CTY 345KV CKT 1
FDNS	09G13_002		0	13G	G13_002	FROM->TO	G13_002T	115.00	- SW7TH & PLEASANT HILL 115KV CKT 2	43	0.20355	182.7969	103RD & ROKEBY - WAGENER 345KV CKT 1
FDNS	09NR		0	13G	G13_002	FROM->TO	G13_002T	115.00	- SW7TH & PLEASANT HILL 115KV CKT 2	43	0.27259	182.5356	GEN562029 1-G11_018_3 0.6900
FDNS	09NRBPSON		0	13G	G13_002	FROM->TO	G13_002T	115.00	- SW7TH & PLEASANT HILL 115KV CKT 2	43	0.27259	182.5356	GEN562029 1-G11_018_3 0.6900
FDNS	09BPSON		0	13G	G13_002	FROM->TO	G13_002T	115.00	- SW7TH & PLEASANT HILL 115KV CKT 2	43	0.20516	179.8797	GEN640020 2-SHELDON STATION UNIT 2
FDNS	9		0	13G	G13_002	FROM->TO	G13_002T	115.00	- SW7TH & PLEASANT HILL 115KV CKT 2	43	0.20362	178.365	103RD & ROKEBY - WAGENER 345KV CKT 1
FDNS	09NR		0	13G	G13_002	FROM->TO	G13_002T	115.00	- SW7TH & PLEASANT HILL 115KV CKT 2	43	0.27259	177.5296	GEN640019 1-SHELDON STATION UNIT 1
FDNS	09NRBPSON		0	13G	G13_002	FROM->TO	G13_002T	115.00	- SW7TH & PLEASANT HILL 115KV CKT 2	43	0.27259	177.5296	GEN640019 1-SHELDON STATION UNIT 1
FDNS	09NR		0	13G	G13_002	FROM->TO	G13_002T	115.00	- SW7TH & PLEASANT HILL 115KV CKT 2	43	0.27259	176.3654	GEN560711 1-G10_044_3 0.6900
FDNS	09NRBPSON		0	13G	G13_002	FROM->TO	G13_002T	115.00	- SW7TH & PLEASANT HILL 115KV CKT 2	43	0.27259	176.3654	GEN560711 1-G10_044_3 0.6900
FDNS	09G13_002		0	13G	G13_002	FROM->TO	G13_002T	115.00	- SW7TH & PLEASANT HILL 115KV CKT 2	43	0.20543	175.4102	MOORE - NW68TH & HOLDREGE 345KV CKT 1
FDNS	09G13_002		0	13G	G13_002	FROM->TO	G13_002T	115.00	- SW7TH & PLEASANT HILL 115KV CKT 2	43	0.19976	175.2089	WAGENER (T851) 345/115/13.8KV TRANSFORMER CKT 1
FDNS	09G13_002		0	13G	G13_002	FROM->TO	G13_002T	115.00	- SW7TH & PLEASANT HILL 115KV CKT 2	43	0.2002	173.9318	WAGENER (T852) 345/115/13.8KV TRANSFORMER CKT 2
FDNS	3		0	13G	G13_002	FROM->TO	G13_002T	115.00	- SW7TH & PLEASANT HILL 115KV CKT 2	43	0.20361	172.2059	103RD & ROKEBY - WAGENER 345KV CKT 1
FDNS	3		0	13G	G13_002	FROM->TO	G13_002T	115.00	- SW7TH & PLEASANT HILL 115KV CKT 2	43	0.20549	171.0826	MOORE - NW68TH & HOLDREGE 345KV CKT 1
FDNS	09G13_002		0	13G	G13_002	FROM->TO	G13_002T	115.00	- SW7TH & PLEASANT HILL 115KV CKT 2	43	0.20149	170.9814	84TH & LEIGHTON - WAGENER 115KV CKT 1
FDNS	9		0	13G	G13_002	FROM->TO	G13_002T	115.00	- SW7TH & PLEASANT HILL 115KV CKT 2	43	0.20551	170.9099	MOORE - NW68TH & HOLDREGE 345KV CKT 1
FDNS	9		0	13G	G13_002	FROM->TO	G13_002T	115.00	- SW7TH & PLEASANT HILL 115KV CKT 2	43	0.19983	170.8377	WAGENER (T851) 345/115/13.8KV TRANSFORMER CKT 1
FDNS	09NR		0	13G	G13_002	FROM->TO	G13_002T	115.00	- SW7TH & PLEASANT HILL 115KV CKT 2	43	0.27259	169.868	GEN560749 1-G13_002_3 0.6900
FDNS	09NRBPSON		0	13G	G13_002	FROM->TO	G13_002T	115.00	- SW7TH & PLEASANT HILL 115KV CKT 2	43	0.27259	169.868	GEN560749 1-G13_002_3 0.6900
FDNS	9		0	13G	G13_002	FROM->TO	G13_002T	115.00	- SW7TH & PLEASANT HILL 115KV CKT 2	43	0.20027	169.5521	WAGENER (T852) 345/115/13.8KV TRANSFORMER CKT 2
FDNS	09G13_002		0	13G	G13_002	FROM->TO	G13_002T	115.00	- SW7TH & PLEASANT HILL 115KV CKT 2	43	0.20677	169.0009	G13_018T 69.000 - HYDROCARBON TAP 69KV CKT 1
FDNS	09G13_002		0	13G	G13_002	FROM->TO	G13_002T	115.00	- SW7TH & PLEASANT HILL 115KV CKT 2	43	0.20677	168.9963	HYDROCARBON TAP - SUB 970 69KV CKT 1
FDNS	09G13_002		0	13G	G13_002	FROM->TO	G13_002T	115.00	- SW7TH & PLEASANT HILL 115KV CKT 2	43	0.20507	168.6213	GEN645001 1-FORT CALHOUN 1
FDNS	09G13_002		0	13G	G13_002	FROM->TO	G13_002T	115.00	- SW7TH & PLEASANT HILL 115KV CKT 2	43	0.20501	168.24	KELLY - MADISONCO 230.00 230KV CKT 1
FDNS	09G13_002		0	13G	G13_002	FROM->TO	G13_002T	115.00	- SW7TH & PLEASANT HILL 115KV CKT 2	43	0.20677	168.1243	NEB CITY U SYR SUB - SUB 970 69KV CKT 1
FDNS	09G13_002		0	13G	G13_002	FROM->TO	G13_002T	115.00	- SW7TH & PLEASANT HILL 115KV CKT 2	43	0.20585	167.8946	G08-123N 115.00 - PAULINE 115KV CKT 1
FDNS	09G13_002		0	13G	G13_002	FROM->TO	G13_002T	115.00	- SW7TH & PLEASANT HILL 115KV CKT 2	43	0.20884	167.8545	103RD & ROKEBY - MOORE 345KV CKT 1
FDNS	09G13_002		0	13G	G13_002	FROM->TO	G13_002T	115.00	- SW7TH & PLEASANT HILL 115KV CKT 2	43	0.20677	167.6663	NEB CITY U SYR SUB - SUB 971 69KV CKT 1
FDNS	9		0	13G	G13_002	FROM->TO	G13_002T	115.00	- SW7TH & PLEASANT HILL 115KV CKT 2	43	0.20156	166.5724	84TH & LEIGHTON - WAGENER 115KV CKT 1
FDNS	9		0	13G	G13_002	FROM->TO	G13_002T	115.00	- SW7TH & PLEASANT HILL 115KV CKT 2	43	0.20685	164.3637	G13_018T 69.000 - HYDROCARBON TAP 69KV CKT 1
FDNS	9		0	13G	G13_002	FROM->TO	G13_002T	115.00	- SW7TH & PLEASANT HILL 115KV CKT 2	43	0.20685	164.3589	HYDROCARBON TAP - SUB 970 69KV CKT 1
FDNS	9		0	13G	G13_002	FROM->TO	G13_002T	115.00	- SW7TH & PLEASANT HILL 115KV CKT 2	43	0.20514	163.9777	GEN645001 1-FORT CALHOUN 1
FDNS	9		0	13G	G13_002	FROM->TO	G13_002T	115.00	- SW7TH & PLEASANT HILL 115KV CKT 2	43	0.20508	163.5575	KELLY - MADISONCO 230.00 230KV CKT 1
FDNS	9		0	13G	G13_002	FROM->TO	G13_002T	115.00	- SW7TH & PLEASANT HILL 115KV CKT 2	43	0.20685	163.4615	NEB CITY U SYR SUB - SUB 970 69KV CKT 1
FDNS	9		0	13G	G13_002	FROM->TO	G13_002T	115.00	- SW7TH & PLEASANT HILL 115KV CKT 2	43	0.20895	163.1911	103RD & ROKEBY - MOORE 345KV CKT 1
FDNS	9		0	13G	G13_002	FROM->TO	G13_002T	115.00	- SW7TH & PLEASANT HILL 115KV CKT 2	43	0.20593	163.144	G08-123N 115.00 - PAULINE 115KV CKT 1
FDNS	9		0	13G	G13_002	FROM->TO	G13_002T	115.00	- SW7TH & PLEASANT HILL 115KV CKT 2	43	0.20685	163.007	NEB CITY U SYR SUB - SUB 971 69KV CKT 1
FDNS	8		0	13G	G13_002	FROM->TO	G13_002T	115.00	- SW7TH & PLEASANT HILL 115KV CKT 2	43	0.20352	160.848	103RD & ROKEBY - WAGENER 345KV CKT 1
FDNS	3		0	13G	G13_002	FROM->TO	G13_002T	115.00	- SW7TH & PLEASANT HILL 115KV CKT 2	43	0.19981	160.3801	WAGENER (T851) 345/115/13.8KV TRANSFORMER CKT 1
FDNS	09G13_002		0	13G	G13_002	FROM->TO	G13_002T	115.00	- SW7TH & PLEASANT HILL 115KV CKT 2	43	0.20507	159.9088	BASE CASE
FDNS	14		0	13G	G13_002	FROM->TO	G13_002T	115.00	- SW7TH & PLEASANT HILL 115KV CKT 2	43	0.20354	159.3124	103RD & ROKEBY - WAGENER 345KV CKT 1
FDNS	3		0	13G	G13_002	FROM->TO	G13_002T	115.00	- SW7TH & PLEASANT HILL 115KV CKT 2	43	0.20025	158.9759	WAGENER (T852) 345/115/13.8KV TRANSFORMER CKT 2
FDNS	3		0	13G	G13_002	FROM->TO	G13_002T	115.00	- SW7TH & PLEASANT HILL 115KV CKT 2	43	0.20888	158.5291	103RD & ROKEBY - MOORE 345KV CKT 1
FDNS	09NR		0	13G	G13_002	FROM->TO	G13_002T	115.00	- SW7TH & PLEASANT HILL 115KV CKT 2	43	0.23242	157.4631	20TH & PIONEERS - SW7TH & PLEASANT HILL 115KV CKT 1
FDNS	09NRBPSON		0	13G	G13_002	FROM->TO	G13_002T	115.00	- SW7TH & PLEASANT HILL 115KV CKT 2	43	0.23242	157.4631	20TH & PIONEERS - SW7TH & PLEASANT HILL 115KV CKT 1
FDNS	8		0	13G	G13_002	FROM->TO	G13_002T	115.00	- SW7TH & PLEASANT HILL 115KV CKT 2	43	0.2054	157.1128	MOORE - NW68TH & HOLDREGE 345KV CKT 1
FDNS	3		0	13G	G13_002	FROM->TO	G13_002T	115.00	- SW7TH & PLEASANT HILL 115KV CKT 2	43	0.20153	155.7637	84TH & LEIGHTON - WAGENER 115KV CKT 1
FDNS	9		0	13G	G13_002	FROM->TO	G13_002T	115.00	- SW7TH & PLEASANT HILL 115KV CKT 2	43	0.20514	155.3322	BASE CASE
FDNS	14		0	13G	G13_002	FROM->TO	G13_002T	115.00	- SW7TH & PLEASANT HILL 115KV CKT 2	43	0.20543	155.2959	MOORE - NW68TH & HOLDREGE 345KV CKT 1
FDNS	09NR		0	13G	G13_002	FROM->TO	G13_002T	115.00	- SW7TH & PLEASANT HILL 115KV CKT 2	43	0.27259	153.9391	GEN640020 2-SHELDON STATION UNIT 2
FDNS	09NRBPSON		0	13G	G13_002	FROM->TO	G13_002T	115.00	- SW7TH & PLEASANT HILL 115KV CKT 2	43	0.27259	153.9391	GEN640020 2-SHELDON STATION UNIT 2
FDNS	09G13_002		0	13G	G13_002	FROM->TO	G13_002T	115.00	- SW7TH & PLEASANT HILL 115KV CKT 2	43	0.3316	152.6066	MOORE (MOORE T1) 345/115/13.8KV TRANSFORMER CKT 1
FDNS	09G13_002		0	13G	G13_002	FROM->TO	G13_002T	115.00	- SW7TH & PLEASANT HILL 115KV CKT 2	43	0.20756	152.5975	BEATRICE - HARBINE 115KV CKT 1
FDNS	3		0	13G	G13_002	FROM->TO	G13_002T	115.00	- SW7TH & PLEASANT HILL 115KV CKT 2	43	0.20511	152.1892	GEN645001 1-FORT CALHOUN 1
FDNS	3		0	13G	G13_002	FROM->TO	G13_002T	115.00	- SW7TH & PLEASANT HILL 115KV CKT 2	43	0.21014	151.7948	FIRTH - SHELDON 115KV CKT 1

SOLUTION	GROUP	SCENARIO	SEASON	SOURCE	DIRECTION	MONITORED ELEMENT	RATEB		TC%LOADING		CONTINGENCY	
							(MVA)	TDF	(% MVA)			
FDNS	8		0	13G	G13_002	FROM->TO	G13_002T	115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.19972	151.3841	WAGENER (T851) 345/115/13.8KV TRANSFORMER CKT 1
FDNS	09G13_002		0	13G	G13_002	FROM->TO	G13_002T	115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.20507	150.7228	GEN562029 1-G11_018_3 0.6900
FDNS	09G13_002		0	13G	G13_002	FROM->TO	G13_002T	115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.20307	150.6633	COOPER - SUB 3458 NEB CTY 345KV CKT 1
FDNS	14		0	13G	G13_002	FROM->TO	G13_002T	115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.19975	150.1983	WAGENER (T851) 345/115/13.8KV TRANSFORMER CKT 1
FDNS	8		0	13G	G13_002	FROM->TO	G13_002T	115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.20016	149.9215	WAGENER (T852) 345/115/13.8KV TRANSFORMER CKT 2
FDNS	14		0	13G	G13_002	FROM->TO	G13_002T	115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.20019	148.7301	WAGENER (T852) 345/115/13.8KV TRANSFORMER CKT 2
FDNS	9		0	13G	G13_002	FROM->TO	G13_002T	115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.20764	148.0065	BEATRICE - HARBINE 115KV CKT 1
FDNS	8		0	13G	G13_002	FROM->TO	G13_002T	115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.20145	146.5583	84TH & LEIGHTON - WAGENER 115KV CKT 1
FDNS	9		0	13G	G13_002	FROM->TO	G13_002T	115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.20514	146.1905	GEN562029 1-G11_018_3 0.6900
FDNS	9		0	13G	G13_002	FROM->TO	G13_002T	115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.20312	146.1202	COOPER - SUB 3458 NEB CTY 345KV CKT 1
FDNS	09G13_002		0	13G	G13_002	FROM->TO	G13_002T	115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.20507	145.5884	GEN560711 1-G10_044_3 0.6900
FDNS	14		0	13G	G13_002	FROM->TO	G13_002T	115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.20148	145.3648	84TH & LEIGHTON - WAGENER 115KV CKT 1
FDNS	9		0	13G	G13_002	FROM->TO	G13_002T	115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.33176	143.9592	MOORE (MOORE T1) 345/115/13.8KV TRANSFORMER CKT 1
FDNS	3		0	13G	G13_002	FROM->TO	G13_002T	115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.20511	143.5717	BASE CASE
FDNS	8		0	13G	G13_002	FROM->TO	G13_002T	115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.20503	142.6506	GEN645001 1-FORT CALHOUN 1
FDNS	14		0	13G	G13_002	FROM->TO	G13_002T	115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.20506	141.8702	GEN645001 1-FORT CALHOUN 1
FDNS	9		0	13G	G13_002	FROM->TO	G13_002T	115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.20514	141.0792	GEN560711 1-G10_044_3 0.6900
FDNS	8		0	13G	G13_002	FROM->TO	G13_002T	115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.21006	140.6204	FIRTH - SHELDON 115KV CKT 1
FDNS	14		0	13G	G13_002	FROM->TO	G13_002T	115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.20506	139.9563	GEN645012 2-NEBRASKA CITY 2
FDNS	14		0	13G	G13_002	FROM->TO	G13_002T	115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.21008	139.5459	FIRTH - SHELDON 115KV CKT 1
FDNS	9		0	13G	G13_002	FROM->TO	G13_002T	115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.20514	135.9302	GEN560749 1-G13_002_3 0.6900
FDNS	09G13_002		0	13G	G13_002	FROM->TO	G13_002T	115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.20507	135.7764	GEN560749 1-G13_002_3 0.6900
FDNS	8		0	13G	G13_002	FROM->TO	G13_002T	115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.20503	133.9199	BASE CASE
FDNS	14		0	13G	G13_002	FROM->TO	G13_002T	115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.20506	132.6273	BASE CASE
FDNS	09G13_002		0	13G	G13_002	FROM->TO	G13_002T	115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	1	132.5016	G13_002T 115.00 - SHELDON 115KV CKT 2
FDNS	09NR		0	13G	G13_002	FROM->TO	G13_002T	115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	1	131.631	G13_002T 115.00 - SHELDON 115KV CKT 2
FDNS	09NRBPSON		0	13G	G13_002	FROM->TO	G13_002T	115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	1	131.631	G13_002T 115.00 - SHELDON 115KV CKT 2
FDNS	09G13_002		0	13G	G13_002	FROM->TO	G13_002T	115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.20507	129.0211	GEN640020 2-SHELDON STATION UNIT 2
FDNS	3		0	13G	G13_002	FROM->TO	G13_002T	115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.20511	128.1979	GEN640019 1-SHELDON STATION UNIT 1
FDNS	9		0	13G	G13_002	FROM->TO	G13_002T	115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.20514	124.2271	GEN640020 2-SHELDON STATION UNIT 2
FDNS	09G13_002BPSON		0	13G	G13_002	FROM->TO	G13_002T	115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	1	117.8627	G13_002T 115.00 - SHELDON 115KV CKT 2
FDNS	09ALLBPSON		0	13G	G13_002	FROM->TO	G13_002T	115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	1	117.7603	G13_002T 115.00 - SHELDON 115KV CKT 2
FDNS	3		0	13G	G13_002	FROM->TO	G13_002T	115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.20511	117.6797	GEN640020 2-SHELDON STATION UNIT 2
FDNS	8		0	13G	G13_002	FROM->TO	G13_002T	115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.20503	117.3888	GEN640019 1-SHELDON STATION UNIT 1
FDNS	14		0	13G	G13_002	FROM->TO	G13_002T	115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.20506	115.2085	GEN640019 1-SHELDON STATION UNIT 1
FDNS	8		0	13G	G13_002	FROM->TO	G13_002T	115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.20503	110.9367	GEN640020 2-SHELDON STATION UNIT 2
FDNS	14		0	13G	G13_002	FROM->TO	G13_002T	115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.20506	108.3077	GEN640020 2-SHELDON STATION UNIT 2
FDNS	9		0	13G	G13_002	FROM->TO	G13_002T	115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	1	105.7647	G13_002T 115.00 - SHELDON 115KV CKT 2
FDNS	6		2	13G	G13_002	FROM->TO	G13_002T	115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.26276	203.6561	SHELDON - SW7TH & PLEASANT HILL 115KV CKT 1
FDNS	6		2	13G	G13_002	FROM->TO	G13_002T	115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.20355	159.698	103RD & ROKEBY - WAGENER 345KV CKT 1
FDNS	6		2	13G	G13_002	FROM->TO	G13_002T	115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.20543	156.7654	MOORE - NW68TH & HOLDREGE 345KV CKT 1
FDNS	6		2	13G	G13_002	FROM->TO	G13_002T	115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.2002	148.3434	WAGENER (T852) 345/115/13.8KV TRANSFORMER CKT 2
FDNS	6		2	13G	G13_002	FROM->TO	G13_002T	115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.20148	144.9512	84TH & LEIGHTON - WAGENER 115KV CKT 1
FDNS	6		2	13G	G13_002	FROM->TO	G13_002T	115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.20506	141.5115	GEN645001 1-FORT CALHOUN 1
FDNS	6		2	13G	G13_002	FROM->TO	G13_002T	115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.20883	139.7881	103RD & ROKEBY - MOORE 345KV CKT 1
FDNS	6		2	13G	G13_002	FROM->TO	G13_002T	115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.20506	139.685	GEN645012 2-NEBRASKA CITY 2
FDNS	6		2	13G	G13_002	FROM->TO	G13_002T	115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.21009	139.2068	FIRTH - SHELDON 115KV CKT 1
FDNS	6		2	13G	G13_002	FROM->TO	G13_002T	115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.20506	132.1799	BASE CASE
FDNS	6		2	13G	G13_002	FROM->TO	G13_002T	115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.20506	115.4253	GEN640019 1-SHELDON STATION UNIT 1
FDNS	6		2	13G	G13_002	FROM->TO	G13_002T	115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.20506	111.4131	GEN640020 2-SHELDON STATION UNIT 2
FDNS	6		3	13G	G13_002	FROM->TO	G13_002T	115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.26276	203.6718	SHELDON - SW7TH & PLEASANT HILL 115KV CKT 1
FDNS	6		3	13G	G13_002	FROM->TO	G13_002T	115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.20355	159.7068	103RD & ROKEBY - WAGENER 345KV CKT 1
FDNS	6		3	13G	G13_002	FROM->TO	G13_002T	115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.20543	156.7718	MOORE - NW68TH & HOLDREGE 345KV CKT 1
FDNS	6		3	13G	G13_002	FROM->TO	G13_002T	115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.2002	148.4926	WAGENER (T852) 345/115/13.8KV TRANSFORMER CKT 2
FDNS	6		3	13G	G13_002	FROM->TO	G13_002T	115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.20148	144.8486	84TH & LEIGHTON - WAGENER 115KV CKT 1
FDNS	6		3	13G	G13_002	FROM->TO	G13_002T	115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.20506	141.5204	GEN645001 1-FORT CALHOUN 1
FDNS	6		3	13G	G13_002	FROM->TO	G13_002T	115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.20883	139.8012	103RD & ROKEBY - MOORE 345KV CKT 1
FDNS	6		3	13G	G13_002	FROM->TO	G13_002T	115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.20506	139.6938	GEN645012 2-NEBRASKA CITY 2
FDNS	6		3	13G	G13_002	FROM->TO	G13_002T	115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.21009	139.1087	FIRTH - SHELDON 115KV CKT 1
FDNS	6		3	13G	G13_002	FROM->TO	G13_002T	115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.20506	132.1895	BASE CASE
FDNS	6		3	13G	G13_002	FROM->TO	G13_002T	115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.20506	115.4341	GEN640019 1-SHELDON STATION UNIT 1
FDNS	6		3	13G	G13_002	FROM->TO	G13_002T	115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.20506	111.422	GEN640020 2-SHELDON STATION UNIT 2
FDNS	6		4	13G	G13_002	FROM->TO	G13_002T	115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.26276	203.6679	SHELDON - SW7TH & PLEASANT HILL 115KV CKT 1
FDNS	6		4	13G	G13_002	FROM->TO	G13_002T	115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.20355	159.705	103RD & ROKEBY - WAGENER 345KV CKT 1
FDNS	6		4	13G	G13_002	FROM->TO	G13_002T	115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.20543	156.7723	MOORE - NW68TH & HOLDREGE 345KV CKT 1
FDNS	6		4	13G	G13_002	FROM->TO	G13_002T	115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.2002	148.3549	WAGENER (T852) 345/115/13.8KV TRANSFORMER CKT 2
FDNS	6		4	13G	G13_002	FROM->TO	G13_002T	115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.20148	144.9628	84TH & LEIGHTON - WAGENER 115KV CKT 1
FDNS	6		4	13G	G13_002	FROM->TO	G13_002T	115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.20506	141.5234	GEN645001 1-FORT CALHOUN 1
FDNS	6		4	13G	G13_002	FROM->TO	G13_002T	115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.20883	139.7987	103RD & ROKEBY - MOORE 345KV CKT 1
FDNS	6		4	13G	G13_002	FROM->TO	G13_002T	115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43			

SOLUTION	GROUP	SCENARIO	SEASON	SOURCE	DIRECTION	MONITORED ELEMENT	RATEB		TC%LOADING		CONTINGENCY
							(MVA)	TDF	(% MVA)		
FDNS	6		4	13G	G13_002	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.20506	132.1918	BASE CASE
FDNS	6		4	13G	G13_002	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.20506	115.4372	GEN640019 1-SHELDON STATION UNIT 1
FDNS	6		4	13G	G13_002	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.20506	111.4181	GEN640020 2-SHELDON STATION UNIT 2
FDNS	09ALLBPSON		0	13G	G13_004	TO->FROM	FT RANDAL - G12_005T 230.00 230KV CKT 1	320	1	127.7744	KELLY - MADISONCO 230.00 230KV CKT 1
FDNS	09G13_004BPSON		0	13G	G13_004	TO->FROM	FT RANDAL - G12_005T 230.00 230KV CKT 1	320	1	127.7595	KELLY - MADISONCO 230.00 230KV CKT 1
FDNS	00G13_004		0	13SP	G13_004	TO->FROM	FT RANDAL - G12_005T 230.00 230KV CKT 1	320	1	127.7044	KELLY - MADISONCO 230.00 230KV CKT 1
FDNS	00G13_004		0	18SP	G13_004	TO->FROM	FT RANDAL - G12_005T 230.00 230KV CKT 1	320	1	127.5891	KELLY - MADISONCO 230.00 230KV CKT 1
FDNS	00G13_004		0	13WP	G13_004	TO->FROM	FT RANDAL - G12_005T 230.00 230KV CKT 1	320	1	127.5269	KELLY - MADISONCO 230.00 230KV CKT 1
FDNS	00G13_004		0	23SP	G13_004	TO->FROM	FT RANDAL - G12_005T 230.00 230KV CKT 1	320	1	127.4993	KELLY - MADISONCO 230.00 230KV CKT 1
FDNS	00G13_004		0	18WP	G13_004	TO->FROM	FT RANDAL - G12_005T 230.00 230KV CKT 1	320	1	127.4004	KELLY - MADISONCO 230.00 230KV CKT 1
FDNS	09G13_004		0	13G	G13_004	TO->FROM	FT RANDAL - G12_005T 230.00 230KV CKT 1	320	1	122.1794	KELLY - MADISONCO 230.00 230KV CKT 1
FDNS	09NR		0	13G	G13_004	TO->FROM	FT RANDAL - G12_005T 230.00 230KV CKT 1	320	1	110.4823	KELLY - MADISONCO 230.00 230KV CKT 1
FDNS	09NRBPSON		0	13G	G13_004	TO->FROM	FT RANDAL - G12_005T 230.00 230KV CKT 1	320	1	110.4823	KELLY - MADISONCO 230.00 230KV CKT 1
FDNS	09BPSON		0	13G	G13_004	TO->FROM	FT RANDAL - G12_005T 230.00 230KV CKT 1	320	1	100.7094	KELLY - MADISONCO 230.00 230KV CKT 1
FDNS	9		0	13G	G13_004	TO->FROM	FT RANDAL - G12_005T 230.00 230KV CKT 1	320	1	100.2819	KELLY - MADISONCO 230.00 230KV CKT 1
FDNS	09ALLBPSON		0	13G	G13_004	TO->FROM	G12_005T 230.00 - MADISONCO 230.00 230KV CKT 1	320	1	105.3265	KELLY - MADISONCO 230.00 230KV CKT 1
FDNS	09G13_004BPSON		0	13G	G13_004	TO->FROM	G12_005T 230.00 - MADISONCO 230.00 230KV CKT 1	320	1	105.3137	KELLY - MADISONCO 230.00 230KV CKT 1
FDNS	00G13_004		0	13SP	G13_004	TO->FROM	G12_005T 230.00 - MADISONCO 230.00 230KV CKT 1	320	1	105.1503	KELLY - MADISONCO 230.00 230KV CKT 1
FDNS	00G13_004		0	18SP	G13_004	TO->FROM	G12_005T 230.00 - MADISONCO 230.00 230KV CKT 1	320	1	105.04	KELLY - MADISONCO 230.00 230KV CKT 1
FDNS	00G13_004		0	13WP	G13_004	TO->FROM	G12_005T 230.00 - MADISONCO 230.00 230KV CKT 1	320	1	104.983	KELLY - MADISONCO 230.00 230KV CKT 1
FDNS	00G13_004		0	23SP	G13_004	TO->FROM	G12_005T 230.00 - MADISONCO 230.00 230KV CKT 1	320	1	104.9582	KELLY - MADISONCO 230.00 230KV CKT 1
FDNS	00G13_004		0	18WP	G13_004	TO->FROM	G12_005T 230.00 - MADISONCO 230.00 230KV CKT 1	320	1	104.8681	KELLY - MADISONCO 230.00 230KV CKT 1
FDNS	09G13_004		0	13G	G13_004	TO->FROM	G12_005T 230.00 - MADISONCO 230.00 230KV CKT 1	320	1	104.7438	KELLY - MADISONCO 230.00 230KV CKT 1
FDNS	09ALLBPSON		0	13G	G13_004	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	1	127.9705	FT RANDAL - G12_005T 230.00 230KV CKT 1
FDNS	09G13_004BPSON		0	13G	G13_004	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	1	127.696	FT RANDAL - G12_005T 230.00 230KV CKT 1
FDNS	00G13_004		0	18WP	G13_004	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	1	126.7439	FT RANDAL - G12_005T 230.00 230KV CKT 1
FDNS	00G13_004		0	13WP	G13_004	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	1	126.594	FT RANDAL - G12_005T 230.00 230KV CKT 1
FDNS	00G13_004		0	13SP	G13_004	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	1	126.5664	FT RANDAL - G12_005T 230.00 230KV CKT 1
FDNS	00G13_004		0	18SP	G13_004	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	1	126.524	FT RANDAL - G12_005T 230.00 230KV CKT 1
FDNS	00G13_004		0	23SP	G13_004	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	1	126.3746	FT RANDAL - G12_005T 230.00 230KV CKT 1
FDNS	00G13_004		0	13SP	G13_004	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.78442	123.7215	FT RANDAL - UTICA JCT 230KV CKT 1
FDNS	00G13_004		0	23SP	G13_004	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.7824	123.3076	FT RANDAL - UTICA JCT 230KV CKT 1
FDNS	09G13_004		0	13G	G13_004	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	1	122.036	FT RANDAL - G12_005T 230.00 230KV CKT 1
FDNS	00G13_004		0	13SP	G13_004	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.78197	119.7861	FT RANDAL - SIOUX CITY 230KV CKT 1
FDNS	00G13_004		0	13SP	G13_004	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77727	119.7278	FT THOMPSON - GRAND ISLAND 345KV CKT 1
FDNS	00G13_004		0	23SP	G13_004	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77976	119.3247	FT RANDAL - SIOUX CITY 230KV CKT 1
FDNS	00G13_004		0	18SP	G13_004	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.78354	119.0896	FT RANDAL - UTICA JCT 230KV CKT 1
FDNS	00G13_004		0	23SP	G13_004	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77243	117.9922	GRAND ISLAND - HOLT.CO3 345.00 345KV CKT 1
FDNS	00G13_004		0	23SP	G13_004	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77396	117.5942	FT RANDAL - SPENCER 115KV CKT 1
FDNS	00G13_004		0	23SP	G13_004	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77562	117.442	FT THOMPSON - HOLT.CO3 345.00 345KV CKT 1
FDNS	00G13_004		0	23SP	G13_004	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77396	117.3607	ONEILL - SPENCER 115KV CKT 1
FDNS	00G13_004		0	13SP	G13_004	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77599	117.2678	FT RANDAL - SPENCER 115KV CKT 1
FDNS	00G13_004		0	13SP	G13_004	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77599	117.0512	ONEILL - SPENCER 115KV CKT 1
FDNS	00G13_004		0	23SP	G13_004	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.76504	116.3527	HOSKINS - RAUN 345KV CKT 1
FDNS	00G13_004		0	23SP	G13_004	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77289	116.135	GEN640009 1-COOPER NUCLEAR STATION
FDNS	00G13_004		0	23SP	G13_004	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77289	115.9192	GEN532751 1-WOLF CREEK GENERATING STATION UNIT 1
FDNS	00G13_004		0	13SP	G13_004	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77741	115.7699	RASMUSN - UTICA JCT 230KV CKT 1
FDNS	00G13_004		0	23SP	G13_004	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77289	115.7025	GEN645012 2-NEBRASKA CITY 2
FDNS	00G13_004		0	23SP	G13_004	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77519	115.688	RASMUSN - UTICA JCT 230KV CKT 1
FDNS	00G13_004		0	13SP	G13_004	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77492	115.6662	GEN640009 1-COOPER NUCLEAR STATION
FDNS	00G13_004		0	13SP	G13_004	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.76664	115.6068	HOSKINS - RAUN 345KV CKT 1
FDNS	00G13_004		0	23SP	G13_004	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77289	115.5844	GEN645011 1-NEBRASKA CITY 1
FDNS	00G13_004		0	13SP	G13_004	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77492	115.516	GEN532751 1-WOLF CREEK GENERATING STATION UNIT 1
FDNS	00G13_004		0	13SP	G13_004	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77492	115.4857	GEN645012 2-NEBRASKA CITY 2
FDNS	00G13_004		0	13SP	G13_004	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77492	115.372	GEN645011 1-NEBRASKA CITY 1
FDNS	00G13_004		0	23SP	G13_004	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77289	115.342	GEN542962 2-IATAN UNIT #2
FDNS	00G13_004		0	18SP	G13_004	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.78096	115.2834	FT RANDAL - SIOUX CITY 230KV CKT 1
FDNS	00G13_004		0	23SP	G13_004	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77289	115.0909	GEN640010 1-GERALD GENTLEMAN STATION UNIT 1
FDNS	00G13_004		0	23SP	G13_004	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77289	115.0329	GEN640011 2-GERALD GENTLEMAN STATION UNIT 2
FDNS	00G13_004		0	23SP	G13_004	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77289	115.0299	GEN542957 1-IATAN UNIT #1
FDNS	00G13_004		0	23SP	G13_004	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77289	115.0288	GEN532651 1-JEFFREY ENERGY CENTER UNIT 1
FDNS	00G13_004		0	23SP	G13_004	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77289	115.0273	GEN532653 1-JEFFREY ENERGY CENTER UNIT 3
FDNS	00G13_004		0	23SP	G13_004	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77289	115.0271	GEN532652 1-JEFFREY ENERGY CENTER UNIT 2
FDNS	00G13_004		0	13SP	G13_004	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77492	115.0108	GEN542962 2-IATAN UNIT #2
FDNS	00G13_004		0	23SP	G13_004	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77311	114.903	HANLON - STORLA 230KV CKT 1
FDNS	00G13_004		0	23SP	G13_004	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77361	114.8518	FT RANDAL - WHITE SWAN 115KV CKT 1
FDNS	00G13_004		0	23SP	G13_004	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77289	114.8435	GEN542955 1-LACYGNE UNIT #1
FDNS	00G13_004		0	13SP	G13_004	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77512	114.8395	HANLON - STORLA 230KV CKT 1
FDNS	00G13_004		0	23SP	G13_004	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77361	114.8308	TYNDALL - WHITE SWAN 115KV CKT 1
FDNS	00G13_004		0	23SP	G13_004	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77289	114.7236	GEN640028 1-COLUMCOGENERATION
FDNS	00G13_004		0	13SP	G13_004	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77492	114.7038	GEN542957 1-IATAN UNIT #1

SOLUTION	GROUP	SCENARIO	SEASON	SOURCE	DIRECTION	MONITORED ELEMENT	RATEB (MVA)	TDF	TC%LOADING (% MVA)	CONTINGENCY
FDNS	00G13_004		0 23SP	G13_004	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77289	114.69	GEN542956 2-LACYGNE UNIT #2
FDNS	00G13_004		0 13SP	G13_004	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77492	114.6882	GEN532651 1-JEFFREY ENERGY CENTER UNIT 1
FDNS	00G13_004		0 13SP	G13_004	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77492	114.678	GEN532653 1-JEFFREY ENERGY CENTER UNIT 3
FDNS	00G13_004		0 13SP	G13_004	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77492	114.6779	GEN532652 1-JEFFREY ENERGY CENTER UNIT 2
FDNS	00G13_004		0 23SP	G13_004	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77298	114.6636	GAVINS POINT - HARTINGTON 115KV CKT 1
FDNS	00G13_004		0 13SP	G13_004	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77492	114.6431	GEN640010 1-GERALD GENTLEMAN STATION UNIT 1
FDNS	00G13_004		0 23SP	G13_004	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77305	114.6279	KEYSTONE - SIDNEY 345KV CKT 1
FDNS	00G13_004		0 23SP	G13_004	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.75787	114.6264	COLUMEAST - NW68TH & HOLDREGE 345KV CKT 1
FDNS	00G13_004		0 13SP	G13_004	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77516	114.6195	KEYSTONE - SIDNEY 345KV CKT 1
FDNS	00G13_004		0 13SP	G13_004	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77502	114.6138	FT THOMPSON - LETCHER 230KV CKT 1
FDNS	00G13_004		0 23SP	G13_004	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77289	114.5956	GEN641089 2-ENERGY CENTER 2
FDNS	00G13_004		0 23SP	G13_004	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77289	114.5864	GEN542951 5-HAWTHORN UNIT #5
FDNS	00G13_004		0 23SP	G13_004	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77302	114.584	FT THOMPSON - LETCHER 230KV CKT 1
FDNS	00G13_004		0 23SP	G13_004	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77289	114.5798	GEN645001 1-FORT CALHOUN 1
FDNS	00G13_004		0 13SP	G13_004	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77564	114.5576	FT RANDAL - WHITE SWAN 115KV CKT 1
FDNS	00G13_004		0 13SP	G13_004	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77564	114.5475	TYNDALL - WHITE SWAN 115KV CKT 1
FDNS	00G13_004		0 13SP	G13_004	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77492	114.5394	GEN640011 2-GERALD GENTLEMAN STATION UNIT 2
FDNS	00G13_004		0 13SP	G13_004	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77506	114.4937	GAVINS POINT - HARTINGTON 115KV CKT 1
FDNS	00G13_004		0 23SP	G13_004	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77447	114.4368	UTICA JCT - VFODNES 230KV CKT 1
FDNS	00G13_004		0 13SP	G13_004	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77492	114.4327	GEN640028 1-COLUMCOGENERATION
FDNS	00G13_004		0 23SP	G13_004	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77289	114.4231	GEN525562 1-TOLK GEN #2 24 KV
FDNS	00G13_004		0 23SP	G13_004	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77184	114.3874	103RD & ROKEBY - SUB 3458 NEB CTY 345KV CKT 1
FDNS	00G13_004		0 13SP	G13_004	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77492	114.3834	GEN542955 1-LACYGNE UNIT #1
FDNS	00G13_004		0 13SP	G13_004	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77492	114.3724	GEN542956 2-LACYGNE UNIT #2
FDNS	00G13_004		0 13SP	G13_004	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77485	114.3562	SPLIT ROCK TAP - WHITE 345KV CKT 1
FDNS	00G13_004		0 23SP	G13_004	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.773	114.3423	PAHOJA - SIOUX FALLS 230KV CKT 1
FDNS	00G13_004		0 13SP	G13_004	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77492	114.3395	GEN641089 2-ENERGY CENTER 2
FDNS	00G13_004		0 13SP	G13_004	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77492	114.2095	GEN542951 5-HAWTHORN UNIT #5
FDNS	00G13_004		0 13SP	G13_004	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77476	114.1975	BLOOMFIELD - GAVINS POINT 115KV CKT 1
FDNS	00G13_004		0 13SP	G13_004	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.7751	114.1932	PAHOJA - SIOUX FALLS 230KV CKT 1
FDNS	00G13_004		0 13SP	G13_004	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77476	114.1901	BLOOMFIELD - CREIGHTON 115KV CKT 1
FDNS	00G13_004		0 13SP	G13_004	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77492	114.1639	CLEARWATER - ONEILL 115KV CKT 1
FDNS	00G13_004		0 13SP	G13_004	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77512	114.1439	HANLON - SIOUX FALLS 230KV CKT 1
FDNS	00G13_004		0 13SP	G13_004	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77643	114.1344	UTICA JCT - VFODNES 230KV CKT 1
FDNS	00G13_004		0 13SP	G13_004	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77535	114.1094	ARPIN - EAU CLAIRE 345KV CKT 1
FDNS	00G13_004		0 18SP	G13_004	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77592	114.089	FT THOMPSON - GRAND ISLAND 345KV CKT 1
FDNS	00G13_004		0 18SP	G13_004	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77499	113.873	FT RANDAL - SPENCER 115KV CKT 1
FDNS	00G13_004		0 18SP	G13_004	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77499	113.6729	ONEILL - SPENCER 115KV CKT 1
FDNS	00G13_004		0 13WP	G13_004	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.7839	113.5615	FT RANDAL - UTICA JCT 230KV CKT 1
FDNS	00G13_004		0 23SP	G13_004	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77289	113.4003	BASE CASE
FDNS	00G13_004		0 13SP	G13_004	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77492	113.0744	BASE CASE
FDNS	00G13_004		0 23SP	G13_004	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77289	112.4587	GEN652457 1-GARRISON
FDNS	00G13_004		0 23SP	G13_004	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77289	112.4587	GEN652458 2-GARRISON
FDNS	00G13_004		0 23SP	G13_004	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77289	112.4587	GEN652459 3-GARRISON
FDNS	00G13_004		0 23SP	G13_004	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77111	112.4286	COLUMBUS - SCHUYLER 115KV CKT 1
FDNS	00G13_004		0 18SP	G13_004	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77395	112.4171	GEN640009 1-COOPER NUCLEAR STATION
FDNS	00G13_004		0 23SP	G13_004	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77346	112.3893	NUNDRWD - WAYSIDE 230KV CKT 1
FDNS	00G13_004		0 18SP	G13_004	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77395	112.3308	GEN532751 1-WOLF CREEK GENERATING STATION UNIT 1
FDNS	00G13_004		0 23SP	G13_004	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77289	112.2637	GEN652542 1-BIG BEND
FDNS	00G13_004		0 23SP	G13_004	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77289	112.2637	GEN652543 3-BIG BEND
FDNS	00G13_004		0 23SP	G13_004	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77289	112.2419	GEN652544 5-BIG BEND
FDNS	00G13_004		0 23SP	G13_004	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77309	112.2067	ATCHSNT3 345.00 - COOPER 345KV CKT 1
FDNS	00G13_004		0 23SP	G13_004	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77175	112.2047	COLUMBUS - GENOA 115KV CKT 1
FDNS	00G13_004		0 23SP	G13_004	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77309	112.0943	ATCHSNT3 345.00 - BOONEVILLE 345KV CKT 1
FDNS	00G13_004		0 18SP	G13_004	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.76553	112.0785	HOSKINS - RAUN 345KV CKT 1
FDNS	00G13_004		0 13SP	G13_004	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77416	112.0177	HOSKINS (HOSKINS T2) 345/230/13.8KV TRANSFORMER CKT 1
FDNS	00G13_004		0 13SP	G13_004	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77492	111.9981	GEN652460 4-GARRISON
FDNS	00G13_004		0 23SP	G13_004	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.773	111.9941	NELIGH.EAST3345.00 (NELIGH.E T1) 345/115/13.8KV TRANSFORMER CKT 1
FDNS	00G13_004		0 18SP	G13_004	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77395	111.9861	GEN645012 2-NEBRASKA CITY 2
FDNS	00G13_004		0 13SP	G13_004	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.7757	111.9633	AINSWORTH - CALAMUS 115KV CKT 1
FDNS	00G13_004		0 13SP	G13_004	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.7757	111.9446	CALAMUS - THEDFORD 115KV CKT 1
FDNS	00G13_004		0 13SP	G13_004	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77318	111.9219	COLUMBUS - SCHUYLER 115KV CKT 1
FDNS	00G13_004		0 13SP	G13_004	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77492	111.9159	GEN652457 1-GARRISON
FDNS	00G13_004		0 13SP	G13_004	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77492	111.9159	GEN652458 2-GARRISON
FDNS	00G13_004		0 13SP	G13_004	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77492	111.9159	GEN652459 3-GARRISON
FDNS	00G13_004		0 18SP	G13_004	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77395	111.873	GEN645011 1-NEBRASKA CITY 1
FDNS	00G13_004		0 23SP	G13_004	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.7734	111.8601	MAXWELL - STAPLETON 115KV CKT 1
FDNS	00G13_004		0 23SP	G13_004	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.773	111.841	HOSKINS - NELIGH.EAST3345.00 345KV CKT 1
FDNS	00G13_004		0 13SP	G13_004	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.7757	111.8237	AINSWORTH - AINSWORTH 115KV CKT 1
FDNS	00G13_004		0 13SP	G13_004	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77513	111.8219	ATCHSNT3 345.00 - COOPER 345KV CKT 1
FDNS	00G13_004		0 23SP	G13_004	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77329	111.8116	STEGALL - WAYSIDE 230KV CKT 1

SOLUTION	GROUP	SCENARIO	SEASON	SOURCE	DIRECTION	MONITORED ELEMENT	RATEB (MVA)	TDF	TC%LOADING (% MVA)	CONTINGENCY
FDNS	00G13_004		0	13SP	G13_004	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77432	111.7925	LAKEFIELD 3 - RAUN 345KV CKT 1
FDNS	00G13_004		0	13SP	G13_004	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77492	111.7863	GEN652542 1-BIG BEND
FDNS	00G13_004		0	13SP	G13_004	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77492	111.7863	GEN652543 3-BIG BEND
FDNS	00G13_004		0	13SP	G13_004	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77492	111.7849	GEN652544 5-BIG BEND
FDNS	00G13_004		0	13SP	G13_004	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77337	111.7826	ALBION - GENOA 115KV CKT 1
FDNS	00G13_004		0	18SP	G13_004	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77636	111.7724	RASMUSN - UTICA JCT 230KV CKT 1
FDNS	00G13_004		0	23SP	G13_004	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77289	111.7527	GEN652556 2-OAHE
FDNS	00G13_004		0	23SP	G13_004	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77289	111.7527	GEN652557 4-OAHE
FDNS	00G13_004		0	23SP	G13_004	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77289	111.7527	GEN652558 6-OAHE
FDNS	00G13_004		0	13SP	G13_004	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.7757	111.7312	MAXWELL - THEDFORD 115KV CKT 1
FDNS	00G13_004		0	13SP	G13_004	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77513	111.7122	ATCHSNT3 345.00 - BOONEVILLE 345KV CKT 1
FDNS	00G13_004		0	18SP	G13_004	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77395	111.6961	GEN542962 2-IATAN UNIT #2
FDNS	00G13_004		0	23SP	G13_004	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77289	111.6794	GEN652546 1-FT RANDAL
FDNS	00G13_004		0	13SP	G13_004	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77492	111.6308	GEN652559 1-OAHE
FDNS	00G13_004		0	23SP	G13_004	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77289	111.5771	GEN659296 1-SDPRAIRWIND1W0.6900
FDNS	00G13_004		0	18SP	G13_004	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77395	111.5705	GEN640010 1-GERALD GENTLEMAN STATION UNIT 1
FDNS	00G13_004		0	23SP	G13_004	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77859	111.4423	FT RANDAL - LAKE PLATT 230KV CKT 1
FDNS	00G13_004		0	23SP	G13_004	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.76647	111.4298	KELLY (KELLY T1) 230/115/13.2KV TRANSFORMER CKT 1
FDNS	00G13_004		0	23SP	G13_004	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.76647	111.4282	COLUMBUS - KELLY 115KV CKT 1
FDNS	00G13_004		0	13SP	G13_004	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77552	111.4195	STEGALL - WAYSIDE 230KV CKT 1
FDNS	00G13_004		0	18SP	G13_004	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77395	111.4119	GEN532651 1-JEFFREY ENERGY CENTER UNIT 1
FDNS	00G13_004		0	18SP	G13_004	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77395	111.407	GEN532653 1-JEFFREY ENERGY CENTER UNIT 3
FDNS	00G13_004		0	18SP	G13_004	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77395	111.4069	GEN532652 1-JEFFREY ENERGY CENTER UNIT 2
FDNS	00G13_004		0	18SP	G13_004	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77395	111.406	GEN640011 2-GERALD GENTLEMAN STATION UNIT 2
FDNS	00G13_004		0	23SP	G13_004	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77289	111.406	GEN652547 3-FT RANDAL
FDNS	00G13_004		0	23SP	G13_004	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77289	111.406	GEN652548 5-FT RANDAL
FDNS	00G13_004		0	23SP	G13_004	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77289	111.406	GEN652549 7-FT RANDAL
FDNS	00G13_004		0	18SP	G13_004	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77395	111.3851	GEN542957 1-IATAN UNIT #1
FDNS	09NR		0	13G	G13_004	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	1	111.3521	FT RANDAL - G12_005T 230.00 230KV CKT 1
FDNS	09NRBPSON		0	13G	G13_004	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	1	111.3521	FT RANDAL - G12_005T 230.00 230KV CKT 1
FDNS	00G13_004		0	23SP	G13_004	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77386	111.3195	RAUN - SIOUX CITY 345KV CKT 1
FDNS	00G13_004		0	18SP	G13_004	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77395	111.2265	GEN542955 1-LACYGNE UNIT #1
FDNS	00G13_004		0	13SP	G13_004	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77492	111.2199	GEN652556 2-OAHE
FDNS	00G13_004		0	13SP	G13_004	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77492	111.2199	GEN652557 4-OAHE
FDNS	00G13_004		0	13SP	G13_004	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77492	111.2199	GEN652558 6-OAHE
FDNS	00G13_004		0	13SP	G13_004	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77492	111.1689	GEN652546 1-FT RANDAL
FDNS	00G13_004		0	18SP	G13_004	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77466	111.1183	FT RANDAL - WHITE SWAN 115KV CKT 1
FDNS	00G13_004		0	13SP	G13_004	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77337	111.1157	COLUMBUS - GENOA 115KV CKT 1
FDNS	00G13_004		0	23SP	G13_004	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77289	111.1098	GEN659110 1-LELAND OLDS UNIT1
FDNS	00G13_004		0	18SP	G13_004	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77466	111.1	TYNDALL - WHITE SWAN 115KV CKT 1
FDNS	00G13_004		0	13SP	G13_004	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.76841	111.0833	KELLY (KELLY T1) 230/115/13.2KV TRANSFORMER CKT 1
FDNS	00G13_004		0	13SP	G13_004	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.76841	111.073	COLUMBUS - KELLY 115KV CKT 1
FDNS	00G13_004		0	18SP	G13_004	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77395	111.0657	GEN542956 2-LACYGNE UNIT #2
FDNS	00G13_004		0	23SP	G13_004	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.76339	111.0396	COLUMEAST - KELLY 230KV CKT 1
FDNS	00G13_004		0	23SP	G13_004	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.76339	111.0369	COLUMEAST (COL.EAST T3) 230/115/13.8KV TRANSFORMER CKT 1
FDNS	00G13_004		0	13SP	G13_004	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77492	111.0302	GEN652547 3-FT RANDAL
FDNS	00G13_004		0	13SP	G13_004	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77492	111.0302	GEN652548 5-FT RANDAL
FDNS	00G13_004		0	13SP	G13_004	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77492	111.0302	GEN652549 7-FT RANDAL
FDNS	00G13_004		0	18SP	G13_004	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77417	111.0226	KEYSTONE - SIDNEY 345KV CKT 1
FDNS	00G13_004		0	23SP	G13_004	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77873	111.0142	FT RANDAL - FT THOMPSON 230KV CKT 1
FDNS	00G13_004		0	23SP	G13_004	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77289	111.0121	GEN659285 1-DEERCREEK 1G13.800
FDNS	00G13_004		0	18SP	G13_004	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77419	111.004	HANLON - STORLA 230KV CKT 1
FDNS	00G13_004		0	18SP	G13_004	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77395	110.9555	GEN640028 1-COLUMCOGENERATION
FDNS	00G13_004		0	18SP	G13_004	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77395	110.9458	GEN542951 5-HAWTHORN UNIT #5
FDNS	00G13_004		0	18SP	G13_004	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77395	110.9249	GEN641089 2-ENERGY CENTER 2
FDNS	00G13_004		0	18SP	G13_004	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77407	110.9167	GAVINS POINT - HARTINGTON 115KV CKT 1
FDNS	00G13_004		0	18SP	G13_004	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77409	110.858	FT THOMPSON - LETCHER 230KV CKT 1
FDNS	00G13_004		0	18SP	G13_004	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77395	110.8538	GEN645001 1-FORT CALHOUN 1
FDNS	00G13_004		0	23SP	G13_004	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77859	110.7691	FT THOMPSON - LAKE PLATT 230KV CKT 1
FDNS	00G13_004		0	18SP	G13_004	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77395	110.7583	GEN525562 1-TOLK GEN #2 24 KV
FDNS	00G13_004		0	18SP	G13_004	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77555	110.7388	UTICA JCT - VFODNES 230KV CKT 1
FDNS	00G13_004		0	18SP	G13_004	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77395	110.7055	GEN514806 1-SOONER UNIT 2
FDNS	00G13_004		0	18SP	G13_004	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77395	110.7	GEN514805 1-SOONER UNIT 1
FDNS	00G13_004		0	13SP	G13_004	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.76539	110.5838	COLUMEAST (COL.EAST T3) 230/115/13.8KV TRANSFORMER CKT 1
FDNS	00G13_004		0	13SP	G13_004	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.76539	110.5799	COLUMEAST - KELLY 230KV CKT 1
FDNS	09G13_004		0	13G	G13_004	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.78423	110.5747	FT RANDAL - UTICA JCT 230KV CKT 1
FDNS	00G13_004		0	13SP	G13_004	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77492	110.3143	GEN659110 1-LELAND OLDS UNIT1
FDNS	00G13_004		0	13SP	G13_004	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.78069	110.1559	FT RANDAL - LAKE PLATT 230KV CKT 1
FDNS	00G13_004		0	13SP	G13_004	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77492	110.0975	GEN659285 1-DEERCREEK 1G13.800
FDNS	00G13_004		0	13SP	G13_004	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.7761	109.9097	RAUN - SIOUX CITY 345KV CKT 1
FDNS	00G13_004		0	13SP	G13_004	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.78084	109.8014	FT RANDAL - FT THOMPSON 230KV CKT 1

SOLUTION	GROUP	SCENARIO	SEASON	SOURCE	DIRECTION	MONITORED ELEMENT	RATEB		TC%LOADING		CONTINGENCY				
							(MVA)	TDF	(% MVA)						
FDNS	00G13_004		0	18SP	G13_004	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1		320	0.77395	109.7453	BASE CASE
FDNS	00G13_004		0	18WP	G13_004	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1		320	0.78314	109.7048	FT RANDAL - UTICA JCT 230KV CKT 1
FDNS	00G13_004		0	13WP	G13_004	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1		320	0.78136	109.6936	FT RANDAL - SIOUX CITY 230KV CKT 1
FDNS	00G13_004		0	13SP	G13_004	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1		320	0.78069	109.481	FT THOMPSON - LAKE PLATT 230KV CKT 1
FDNS	00G13_004		0	13SP	G13_004	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1		320	0.75638	109.2652	HOSKINS - SHELL CREEK 345KV CKT 1
FDNS	00G13_004		0	18SP	G13_004	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1		320	0.77395	108.7498	GEN652460 4-GARRISON
FDNS	00G13_004		0	18SP	G13_004	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1		320	0.77395	108.7069	GEN652457 1-GARRISON
FDNS	00G13_004		0	18SP	G13_004	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1		320	0.77395	108.7069	GEN652458 2-GARRISON
FDNS	00G13_004		0	18SP	G13_004	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1		320	0.77395	108.7069	GEN652459 3-GARRISON
FDNS	00G13_004		0	18SP	G13_004	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1		320	0.77459	108.7025	STAPLETON - THEDFORD 115KV CKT 1
FDNS	00G13_004		0	18SP	G13_004	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1		320	0.77318	108.6959	HOSKINS (HOSKINS T2) 345/230/13.8KV TRANSFORMER CKT 1
FDNS	00G13_004		0	18SP	G13_004	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1		320	0.77459	108.6718	AINSWORTH - AINSWORTH 115KV CKT 1
FDNS	00G13_004		0	23SP	G13_004	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1		320	0.77289	108.6562	GEN659111 2-LELAND OLDS UNIT2
FDNS	09G13_004		0	13G	G13_004	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1		320	0.78177	108.6367	FT RANDAL - SIOUX CITY 230KV CKT 1
FDNS	00G13_004		0	18SP	G13_004	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1		320	0.77219	108.5784	COLUMBUS - SCHUYLER 115KV CKT 1
FDNS	00G13_004		0	18SP	G13_004	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1		320	0.77395	108.5157	GEN652542 1-BIG BEND
FDNS	00G13_004		0	18SP	G13_004	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1		320	0.77395	108.5157	GEN652543 3-BIG BEND
FDNS	00G13_004		0	18SP	G13_004	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1		320	0.77395	108.4927	GEN652544 5-BIG BEND
FDNS	09ALLBPSON		0	13G	G13_004	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1		320	0.78422	108.4868	FT RANDAL - UTICA JCT 230KV CKT 1
FDNS	00G13_004		0	18SP	G13_004	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1		320	0.77425	108.471	ATCHSNT3 345.00 - COOPER 345KV CKT 1
FDNS	00G13_004		0	23SP	G13_004	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1		320	0.75385	108.4521	HOSKINS - SHELL CREEK 345KV CKT 1
FDNS	00G13_004		0	18SP	G13_004	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1		320	0.77242	108.4311	ALBION - GENOA 115KV CKT 1
FDNS	00G13_004		0	18SP	G13_004	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1		320	0.77425	108.3569	ATCHSNT3 345.00 - BOONEVILLE 345KV CKT 1
FDNS	00G13_004		0	18SP	G13_004	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1		320	0.77472	108.3277	NUNDRWD - WAYSIDE 230KV CKT 1
FDNS	00G13_004		0	23SP	G13_004	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1		320	0.77289	108.3266	GEN659103 1-ANTELOPE VALLEY UNIT1
FDNS	00G13_004		0	23SP	G13_004	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1		320	0.77289	108.3266	GEN659107 2-ANTELOPE VALLEY UNIT2
FDNS	00G13_004		0	18SP	G13_004	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1		320	0.77957	108.2845	FT RANDAL - LAKE PLATT 230KV CKT 1
FDNS	00G13_004		0	18SP	G13_004	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1		320	0.77459	107.9749	MAXWELL - STAPLETON 115KV CKT 1
FDNS	00G13_004		0	18SP	G13_004	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1		320	0.77395	107.9741	GEN652546 1-FT RANDAL
FDNS	00G13_004		0	18SP	G13_004	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1		320	0.77395	107.9599	GEN652556 2-OAHE
FDNS	00G13_004		0	18SP	G13_004	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1		320	0.77395	107.9599	GEN652557 4-OAHE
FDNS	00G13_004		0	18SP	G13_004	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1		320	0.77395	107.9599	GEN652558 6-OAHE
FDNS	00G13_004		0	18SP	G13_004	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1		320	0.77971	107.937	FT RANDAL - FT THOMPSON 230KV CKT 1
FDNS	00G13_004		0	23SP	G13_004	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1		320	0.72865	107.8621	SHELL CREEK (SHELLCREEKT1) 345/230/13.8KV TRANSFORMER CKT 1
FDNS	00G13_004		0	23SP	G13_004	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1		320	0.72865	107.8564	KELLY - SHELL CREEK 230KV CKT 1
FDNS	00G13_004		0	18SP	G13_004	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1		320	0.77449	107.8215	STEGALL - WAYSIDE 230KV CKT 1
FDNS	00G13_004		0	18SP	G13_004	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1		320	0.76743	107.741	COLUMBUS - KELLY 115KV CKT 1
FDNS	00G13_004		0	18SP	G13_004	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1		320	0.76743	107.7395	KELLY (KELLY T1) 230/115/13.2KV TRANSFORMER CKT 1
FDNS	00G13_004		0	18SP	G13_004	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1		320	0.77242	107.7071	COLUMBUS - GENOA 115KV CKT 1
FDNS	00G13_004		0	18SP	G13_004	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1		320	0.77395	107.6245	GEN652547 3-FT RANDAL
FDNS	00G13_004		0	18SP	G13_004	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1		320	0.77395	107.6245	GEN652548 5-FT RANDAL
FDNS	00G13_004		0	18SP	G13_004	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1		320	0.77395	107.6245	GEN652549 7-FT RANDAL
FDNS	00G13_004		0	18SP	G13_004	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1		320	0.77957	107.5851	FT THOMPSON - LAKE PLATT 230KV CKT 1
FDNS	09G13_004BPSON		0	13G	G13_004	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1		320	0.78422	107.523	FT RANDAL - UTICA JCT 230KV CKT 1
FDNS	00G13_004		0	13SP	G13_004	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1		320	0.77492	107.4932	GEN659111 2-LELAND OLDS UNIT2
FDNS	00G13_004		0	13SP	G13_004	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1		320	0.7313	107.4858	SHELL CREEK (SHELLCREEKT1) 345/230/13.8KV TRANSFORMER CKT 1
FDNS	00G13_004		0	13SP	G13_004	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1		320	0.7313	107.4742	KELLY - SHELL CREEK 230KV CKT 1
FDNS	00G13_004		0	18SP	G13_004	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1		320	0.77497	107.3083	RAUN - SIOUX CITY 345KV CKT 1
FDNS	00G13_004		0	18SP	G13_004	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1		320	0.76439	107.294	COLUMEAST - KELLY 230KV CKT 1
FDNS	00G13_004		0	18SP	G13_004	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1		320	0.76439	107.2931	COLUMEAST (COL.EAST T3) 230/115/13.8KV TRANSFORMER CKT 1
FDNS	00G13_004		0	18SP	G13_004	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1		320	0.77395	107.2328	GEN659285 1-DEERCREEK 1G13.800
FDNS	00G13_004		0	18SP	G13_004	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1		320	0.77395	107.2322	GEN659110 1-LELAND OLDS UNIT1
FDNS	00G13_004		0	13SP	G13_004	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1		320	0.77492	107.142	GEN659103 1-ANTELOPE VALLEY UNIT1
FDNS	00G13_004		0	13SP	G13_004	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1		320	0.77492	107.142	GEN659107 2-ANTELOPE VALLEY UNIT2
FDNS	00G13_004		0	23SP	G13_004	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1		320	0.77289	106.6462	GEN562402 1-G12_005_3 0.6900
FDNS	00G13_004		0	13WP	G13_004	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1		320	0.77648	106.4497	FT THOMPSON - GRAND ISLAND 345KV CKT 1
FDNS	09ALLBPSON		0	13G	G13_004	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1		320	0.78177	106.277	FT RANDAL - SIOUX CITY 230KV CKT 1
FDNS	00G13_004		0	13SP	G13_004	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1		320	0.77492	106.029	GEN562402 1-G12_005_3 0.6900
FDNS	00G13_004		0	18SP	G13_004	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1		320	0.7552	105.8087	HOSKINS - SHELL CREEK 345KV CKT 1
FDNS	00G13_004		0	18WP	G13_004	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1		320	0.78054	105.7974	FT RANDAL - SIOUX CITY 230KV CKT 1
FDNS	00G13_004		0	13WP	G13_004	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1		320	0.77436	105.6207	GEN640009 1-COOPER NUCLEAR STATION
FDNS	00G13_004		0	13WP	G13_004	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1		320	0.7754	105.5817	FT RANDAL - SPENCER 115KV CKT 1
FDNS	00G13_004		0	13WP	G13_004	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1		320	0.75018	105.5324	COLUMWEST - GRAND ISLAND 230KV CKT 1
FDNS	00G13_004		0	13WP	G13_004	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1		320	0.77678	105.5295	RASMUSN - UTICA JCT 230KV CKT 1
FDNS	00G13_004		0	13WP	G13_004	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1		320	0.77436	105.4477	GEN645012 2-NEBRASKA CITY 2
FDNS	00G13_004		0	13WP	G13_004	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1		320	0.7754	105.3099	ONEILL - SPENCER 115KV CKT 1
FDNS	00G13_004		0	13WP	G13_004	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1		320	0.77436	105.1704	GEN532751 1-WOLF CREEK GENERATING STATION UNIT 1
FDNS	09G13_004BPSON		0	13G	G13_004	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1		320	0.78176	105.03	FT RANDAL - SIOUX CITY 230KV CKT 1
FDNS	00G13_004		0	13WP	G13_004	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1		320	0.77457	104.9959	HANLON - STORLA 230KV CKT 1
FDNS	00G13_004		0	13WP	G13_004	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1		320	0.77592	104.6647	UTICA JCT - VFODNES 230KV CKT 1
FDNS	00G13_004		0	13WP	G13_004	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1		320	0.77448	104.6638	GAVINS POINT - HARTINGTON 115KV CKT 1

SOLUTION	GROUP	SCENARIO	SEASON	SOURCE	DIRECTION	MONITORED ELEMENT	RATEB		TC%LOADING		CONTINGENCY
							(MVA)	TDF	(% MVA)		
FDNS	00G13_004		0 13WP	G13_004	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77447	104.6516	FT THOMPSON - LETCHER 230KV CKT 1	
FDNS	09G13_004		0 13G	G13_004	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77689	104.629	FT THOMPSON - GRAND ISLAND 345KV CKT 1	
FDNS	00G13_004		0 13WP	G13_004	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77436	104.6175	GEN640028 1-COLUMCOGENERATION	
FDNS	00G13_004		0 13WP	G13_004	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77459	104.6159	KEYSTONE - SIDNEY 345KV CKT 1	
FDNS	00G13_004		0 18SP	G13_004	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77395	104.59	GEN659111 2-LELAND OLDS UNIT2	
FDNS	00G13_004		0 13WP	G13_004	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77436	104.5748	GEN645011 1-NEBRASKA CITY 1	
FDNS	09G13_004		0 13G	G13_004	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77466	104.5381	GEN640009 1-COOPER NUCLEAR STATION	
FDNS	00G13_004		0 13WP	G13_004	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77436	104.5197	GEN542962 2-IATAN UNIT #2	
FDNS	00G13_004		0 13WP	G13_004	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77508	104.4929	FT RANDAL - WHITE SWAN 115KV CKT 1	
FDNS	00G13_004		0 13WP	G13_004	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77508	104.4699	TYNDALL - WHITE SWAN 115KV CKT 1	
FDNS	09G13_004		0 13G	G13_004	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77618	104.4686	UTICA JCT - VFODNES 230KV CKT 1	
FDNS	00G13_004		0 13WP	G13_004	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77436	104.4559	GEN532652 1-JEFFREY ENERGY CENTER UNIT 2	
FDNS	00G13_004		0 18SP	G13_004	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.73008	104.4337	SHELL CREEK (SHELLCREEKT1) 345/230/13.8KV TRANSFORMER CKT 1	
FDNS	00G13_004		0 13WP	G13_004	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.75906	104.423	COLUMEAST - NW68TH & HOLDREGE 345KV CKT 1	
FDNS	00G13_004		0 18SP	G13_004	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.73008	104.4215	KELLY - SHELL CREEK 230KV CKT 1	
FDNS	00G13_004		0 13WP	G13_004	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77558	104.3962	SIOUX FALLS - SPLIT ROCK 230KV CKT 1	
FDNS	09G13_004		0 13G	G13_004	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77481	104.3848	GAVINS POINT - HARTINGTON 115KV CKT 1	
FDNS	00G13_004		0 13WP	G13_004	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77436	104.3605	GEN542957 1-IATAN UNIT #1	
FDNS	09G13_004		0 13G	G13_004	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77718	104.346	RASMUSN - UTICA JCT 230KV CKT 1	
FDNS	00G13_004		0 13WP	G13_004	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77436	104.2519	GEN641089 2-ENERGY CENTER 2	
FDNS	00G13_004		0 18SP	G13_004	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77395	104.2433	GEN659103 1-ANTELOPE VALLEY UNIT1	
FDNS	00G13_004		0 18SP	G13_004	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77395	104.2433	GEN659107 2-ANTELOPE VALLEY UNIT2	
FDNS	00G13_004		0 13WP	G13_004	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77457	104.2427	HANLON - SIOUX FALLS 230KV CKT 1	
FDNS	00G13_004		0 13WP	G13_004	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77464	104.2315	CARPENTER - HURON 230KV CKT 1	
FDNS	00G13_004		0 13WP	G13_004	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77321	104.1967	GRAND ISLAND - SWEETWATER 345KV CKT 1	
FDNS	00G13_004		0 13WP	G13_004	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77436	104.1792	GEN640011 2-GERALD GENTLEMAN STATION UNIT 2	
FDNS	09G13_004		0 13G	G13_004	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77425	104.163	PETERSBRG.N7115.00 - PETERSBURG 115KV CKT 1	
FDNS	09G13_004		0 13G	G13_004	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77425	104.1311	ALBION - PETERSBURG 115KV CKT 1	
FDNS	09G13_004		0 13G	G13_004	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77582	104.1252	SIOUX FALLS - SPLIT ROCK 230KV CKT 1	
FDNS	09G13_004		0 13G	G13_004	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77466	104.0172	GEN645012 2-NEBRASKA CITY 2	
FDNS	09G13_004		0 13G	G13_004	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77466	103.9975	GEN532751 1-WOLF CREEK GENERATING STATION UNIT 1	
FDNS	09G13_004		0 13G	G13_004	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77618	103.8935	SIOUX FALLS - VFODNES 230KV CKT 1	
FDNS	09G13_004		0 13G	G13_004	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77466	103.8746	GEN645011 1-NEBRASKA CITY 1	
FDNS	09G13_004		0 13G	G13_004	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77266	103.8669	G10-51T 230.00 - HOSKINS 230KV CKT 1	
FDNS	09G13_004		0 13G	G13_004	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77488	103.8353	HANLON - STORLA 230KV CKT 1	
FDNS	09G13_004		0 13G	G13_004	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77466	103.7787	GEN640028 1-COLUMCOGENERATION	
FDNS	09G13_004		0 13G	G13_004	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.7749	103.7132	KEYSTONE - SIDNEY 345KV CKT 1	
FDNS	09G13_004		0 13G	G13_004	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77481	103.53	BELDEN - HARTINGTON 115KV CKT 1	
FDNS	09G13_004		0 13G	G13_004	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77466	103.4874	GEN542962 2-IATAN UNIT #2	
FDNS	09G13_004		0 13G	G13_004	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77554	103.4847	RASMUSN - SIOUX CITY 230KV CKT 1	
FDNS	09G13_004		0 13G	G13_004	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77478	103.4741	FT THOMPSON - LETCHER 230KV CKT 1	
FDNS	09ALLBPSON		0 13G	G13_004	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	1	103.3944	G12_005T 230.00 - MADISONCO 230.00 230KV CKT 1	
FDNS	09G13_004BPSON		0 13G	G13_004	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	1	103.208	G12_005T 230.00 - MADISONCO 230.00 230KV CKT 1	
FDNS	00G13_004		0 13WP	G13_004	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77436	103.1845	BASE CASE	
FDNS	09ALLBPSON		0 13G	G13_004	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77688	103.1363	FT THOMPSON - GRAND ISLAND 345KV CKT 1	
FDNS	00G13_004		0 18WP	G13_004	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.74965	102.966	COLUMWEST - GRAND ISLAND 230KV CKT 1	
FDNS	00G13_004		0 18SP	G13_004	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77395	102.7461	GEN562402 1-G12_005_3 0.6900	
FDNS	00G13_004		0 18WP	G13_004	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	1	102.6187	G12_005T 230.00 - MADISONCO 230.00 230KV CKT 1	
FDNS	00G13_004		0 18WP	G13_004	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77351	102.5729	GEN640009 1-COOPER NUCLEAR STATION	
FDNS	00G13_004		0 18WP	G13_004	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77453	102.5388	FT RANDAL - SPENCER 115KV CKT 1	
FDNS	09G13_004		0 13G	G13_004	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77466	102.5322	BASE CASE	
FDNS	09G13_004		0 13G	G13_004	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77466	102.5322	NC1_GEN-NEBRASKA CITY 1	
FDNS	09ALLBPSON		0 13G	G13_004	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77466	102.409	GEN640009 1-COOPER NUCLEAR STATION	
FDNS	00G13_004		0 13WP	G13_004	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	1	102.3264	G12_005T 230.00 - MADISONCO 230.00 230KV CKT 1	
FDNS	00G13_004		0 13SP	G13_004	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	1	102.2808	G12_005T 230.00 - MADISONCO 230.00 230KV CKT 1	
FDNS	00G13_004		0 18WP	G13_004	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77453	102.2649	ONEILL - SPENCER 115KV CKT 1	
FDNS	00G13_004		0 18SP	G13_004	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	1	102.2215	G12_005T 230.00 - MADISONCO 230.00 230KV CKT 1	
FDNS	09ALLBPSON		0 13G	G13_004	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77618	102.2194	UTICA JCT - VFODNES 230KV CKT 1	
FDNS	00G13_004		0 13WP	G13_004	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77376	102.2062	LAKEFIELD 3 - RAUN 345KV CKT 1	
FDNS	00G13_004		0 18WP	G13_004	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77351	102.2004	GEN645012 2-NEBRASKA CITY 2	
FDNS	00G13_004		0 13WP	G13_004	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77436	102.1992	GEN652460 4-GARRISON	
FDNS	00G13_004		0 13WP	G13_004	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77436	102.1991	GEN652461 5-GARRISON	
FDNS	09ALLBPSON		0 13G	G13_004	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77425	102.1777	PETERSBRG.N7115.00 - PETERSBURG 115KV CKT 1	
FDNS	00G13_004		0 13WP	G13_004	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77436	102.1636	GEN652457 1-GARRISON	
FDNS	00G13_004		0 13WP	G13_004	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77436	102.1636	GEN652458 2-GARRISON	
FDNS	00G13_004		0 13WP	G13_004	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77436	102.1636	GEN652459 3-GARRISON	
FDNS	09ALLBPSON		0 13G	G13_004	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77425	102.1463	ALBION - PETERSBURG 115KV CKT 1	
FDNS	00G13_004		0 13WP	G13_004	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77436	102.1117	GEN659296 1-SDPRAIRIWN1W0.6900	
FDNS	00G13_004		0 18WP	G13_004	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77351	102.11	GEN532751 1-WOLF CREEK GENERATING STATION UNIT 1	
FDNS	09ALLBPSON		0 13G	G13_004	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77265	102.0816	G10-51T 230.00 - HOSKINS 230KV CKT 1	
FDNS	00G13_004		0 18WP	G13_004	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.75817	102.0508	COLUMEAST - NW68TH & HOLDREGE 345KV CKT 1	

SOLUTION	GROUP	SCENARIO	SEASON	SOURCE	DIRECTION	MONITORED ELEMENT	RATEB (MVA)	TDF	TC%LOADING (% MVA)	CONTINGENCY
FDNS	00G13_004		0 13WP	G13_004	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77512	102.0493	MAXWELL - THEDFORD 115KV CKT 1
FDNS	00G13_004		0 23SP	G13_004	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	1	102.0489	G12_005T 230.00 - MADISONCO 230.00 230KV CKT 1
FDNS	00G13_004		0 13WP	G13_004	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77358	102.0279	HOSKINS (HOSKINS T2) 345/230/13.8KV TRANSFORMER CKT 1
FDNS	00G13_004		0 18WP	G13_004	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77592	101.9511	RASMUSN - UTICA JCT 230KV CKT 1
FDNS	00G13_004		0 13WP	G13_004	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77436	101.9162	GEN652542 1-BIG BEND
FDNS	00G13_004		0 13WP	G13_004	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77436	101.9162	GEN652543 3-BIG BEND
FDNS	00G13_004		0 13WP	G13_004	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77436	101.9139	GEN652544 5-BIG BEND
FDNS	00G13_004		0 13WP	G13_004	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77457	101.9116	ATCHSNT3 345.00 - COOPER 345KV CKT 1
FDNS	09ALLBPSON		0 13G	G13_004	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77466	101.858	GEN640028 1-COLUMCOGENERATION
FDNS	09ALLBPSON		0 13G	G13_004	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77582	101.8352	SIoux FALLS - SPLIT ROCK 230KV CKT 1
FDNS	09ALLBPSON		0 13G	G13_004	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77487	101.8333	HANLON - STORLA 230KV CKT 1
FDNS	09ALLBPSON		0 13G	G13_004	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77466	101.8261	GEN645012 2-NEBRASKA CITY 2
FDNS	09G13_004BPSON		0 13G	G13_004	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77688	101.7964	FT THOMPSON - GRAND ISLAND 345KV CKT 1
FDNS	00G13_004		0 13WP	G13_004	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77263	101.7961	COLUMBUS - SCHUYLER 115KV CKT 1
FDNS	09BPSON		0 13G	G13_004	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	1	101.748	FT RANDAL - G12_005T 230.00 230KV CKT 1
FDNS	9		0 13G	G13_004	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	1	101.7282	FT RANDAL - G12_005T 230.00 230KV CKT 1
FDNS	00G13_004		0 13WP	G13_004	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77457	101.7255	ATCHSNT3 345.00 - BOONEVILLE 345KV CKT 1
FDNS	09ALLBPSON		0 13G	G13_004	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77489	101.6988	KEYSTONE - SIDNEY 345KV CKT 1
FDNS	09ALLBPSON		0 13G	G13_004	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77466	101.694	GEN645011 1-NEBRASKA CITY 1
FDNS	09ALLBPSON		0 13G	G13_004	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77481	101.691	GAVINS POINT - HARTINGTON 115KV CKT 1
FDNS	09ALLBPSON		0 13G	G13_004	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77466	101.6829	GEN532751 1-WOLF CREEK GENERATING STATION UNIT 1
FDNS	00G13_004		0 18WP	G13_004	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77531	101.6756	FT THOMPSON - GRAND ISLAND 345KV CKT 1
FDNS	00G13_004		0 13WP	G13_004	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77436	101.6607	GEN652546 1-FT RANDAL
FDNS	09ALLBPSON		0 13G	G13_004	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77618	101.6387	SIoux FALLS - VFODNES 230KV CKT 1
FDNS	00G13_004		0 18WP	G13_004	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77351	101.6307	GEN640028 1-COLUMCOGENERATION
FDNS	00G13_004		0 18WP	G13_004	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77351	101.6228	GEN542962 2-IATAN UNIT #2
FDNS	00G13_004		0 18WP	G13_004	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77376	101.6152	HANLON - STORLA 230KV CKT 1
FDNS	09G13_004		0 13G	G13_004	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77444	101.5788	FALLOW 3 345.00 - GRIMES 345KV CKT 1
FDNS	09ALLBPSON		0 13G	G13_004	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77718	101.5708	RASMUSN - UTICA JCT 230KV CKT 1
FDNS	00G13_004		0 13WP	G13_004	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77512	101.5665	AINSWORTH - AINSWORTH 115KV CKT 1
FDNS	00G13_004		0 18WP	G13_004	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77351	101.5445	GEN645011 1-NEBRASKA CITY 1
FDNS	00G13_004		0 13WP	G13_004	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77436	101.5438	GEN652556 2-OAHE
FDNS	00G13_004		0 13WP	G13_004	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77436	101.5438	GEN652557 4-OAHE
FDNS	00G13_004		0 13WP	G13_004	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77436	101.5438	GEN652558 6-OAHE
FDNS	00G13_004		0 18WP	G13_004	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77513	101.5281	UTICA JCT - VFODNES 230KV CKT 1
FDNS	09G13_004		0 13G	G13_004	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77293	101.4911	COLUMBUS - SCHUYLER 115KV CKT 1
FDNS	09G13_004		0 13G	G13_004	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77466	101.4746	GEN659296 1-SDPRAIRWIND1W0.6900
FDNS	00G13_004		0 18WP	G13_004	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77363	101.4664	GAVINS POINT - HARTINGTON 115KV CKT 1
FDNS	09G13_004		0 13G	G13_004	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77487	101.4621	ATCHSNT3 345.00 - COOPER 345KV CKT 1
FDNS	00G13_004		0 18WP	G13_004	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77351	101.4452	GEN532652 1-JEFFREY ENERGY CENTER UNIT 2
FDNS	09ALLBPSON		0 13G	G13_004	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77478	101.4414	FT THOMPSON - LETCHER 230KV CKT 1
FDNS	00G13_004		0 13WP	G13_004	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.76784	101.4117	COLUMBUS - KELLY 115KV CKT 1
FDNS	00G13_004		0 13WP	G13_004	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.76784	101.4116	KELLY (KELLY T1) 230/115/13.2KV TRANSFORMER CKT 1
FDNS	09ALLBPSON		0 13G	G13_004	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77554	101.4013	RASMUSN - SIoux CITY 230KV CKT 1
FDNS	09G13_004		0 13G	G13_004	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77466	101.3998	GEN652457 1-GARRISON
FDNS	09G13_004		0 13G	G13_004	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77466	101.3998	GEN652458 2-GARRISON
FDNS	09G13_004		0 13G	G13_004	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77466	101.3998	GEN652459 3-GARRISON
FDNS	09ALLBPSON		0 13G	G13_004	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77312	101.3875	ALBION - GENOA 115KV CKT 1
FDNS	00G13_004		0 13WP	G13_004	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77515	101.3787	NUNDRWD - WAYSIDE 230KV CKT 1
FDNS	00G13_004		0 13WP	G13_004	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77436	101.376	GEN652547 3-FT RANDAL
FDNS	00G13_004		0 13WP	G13_004	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77436	101.376	GEN652548 5-FT RANDAL
FDNS	00G13_004		0 13WP	G13_004	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77436	101.376	GEN652549 7-FT RANDAL
FDNS	09G13_004		0 13G	G13_004	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77421	101.3694	G10-51T 230.00 - RASMUSN 230KV CKT 1
FDNS	00G13_004		0 18WP	G13_004	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77366	101.357	FT THOMPSON - LETCHER 230KV CKT 1
FDNS	09G13_004BPSON		0 13G	G13_004	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77466	101.3531	GEN640009 1-COOPER NUCLEAR STATION
FDNS	00G13_004		0 18WP	G13_004	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77423	101.3377	FT RANDAL - WHITE SWAN 115KV CKT 1
FDNS	00G13_004		0 18WP	G13_004	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77351	101.3271	GEN640010 1-GERALD GENTLEMAN STATION UNIT 1
FDNS	09G13_004		0 13G	G13_004	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77466	101.3259	GEN652543 3-BIG BEND
FDNS	09G13_004		0 13G	G13_004	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77466	101.3223	GEN652542 1-BIG BEND
FDNS	09G13_004		0 13G	G13_004	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77466	101.3211	GEN652544 5-BIG BEND
FDNS	00G13_004		0 18WP	G13_004	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77423	101.3137	TYNDALL - WHITE SWAN 115KV CKT 1
FDNS	00G13_004		0 18WP	G13_004	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77372	101.2972	KEYSTONE - SIDNEY 345KV CKT 1
FDNS	00G13_004		0 18WP	G13_004	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77351	101.2816	GEN640011 2-GERALD GENTLEMAN STATION UNIT 2
FDNS	09G13_004		0 13G	G13_004	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77487	101.2741	ATCHSNT3 345.00 - BOONEVILLE 345KV CKT 1
FDNS	00G13_004		0 18WP	G13_004	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77351	101.2687	GEN542957 1-IATAN UNIT #1
FDNS	09G13_004		0 13G	G13_004	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77466	101.2395	GEN652559 1-OAHE
FDNS	09G13_004		0 13G	G13_004	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.7663	101.2335	HOSKINS - RAUN 345KV CKT 1
FDNS	00G13_004		0 18WP	G13_004	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77351	101.1884	GEN641089 2-ENERGY CENTER 2
FDNS	00G13_004		0 18WP	G13_004	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77244	101.1776	GRAND ISLAND - SWEETWATER 345KV CKT 1
FDNS	09G13_004		0 13G	G13_004	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77466	101.1374	GEN659110 1-LELAND OLDS UNIT1
FDNS	00G13_004		0 13WP	G13_004	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77492	101.0948	STEGALL - WAYSIDE 230KV CKT 1

SOLUTION	GROUP	SCENARIO	SEASON	SOURCE	DIRECTION	MONITORED ELEMENT	RATEB		TC%LOADING		CONTINGENCY
							(MVA)	TDF	(% MVA)		
FDNS	09G13_004		0 13G	G13_004	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.76816	101.0493	COLUMBUS - KELLY 115KV CKT 1	
FDNS	09G13_004		0 13G	G13_004	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.76816	101.0413	KELLY (KELLY T1) 230/115/13.2KV TRANSFORMER CKT 1	
FDNS	00G13_004		0 18WP	G13_004	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77453	101.0344	ARMOUR - FT RANDAL 115KV CKT 1	
FDNS	09G13_004BPSON		0 13G	G13_004	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77618	100.9939	UTICA JCT - VFODNES 230KV CKT 1	
FDNS	09G13_004		0 13G	G13_004	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77404	100.9935	LAKEFIELD 3 - RAUN 345KV CKT 1	
FDNS	00G13_004		0 13WP	G13_004	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.78017	100.9524	FT RANDAL - LAKE PLATT 230KV CKT 1	
FDNS	00G13_004		0 13WP	G13_004	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.7648	100.8743	COLUMEAST (COL.EAST T3) 230/115/13.8KV TRANSFORMER CKT 1	
FDNS	00G13_004		0 13WP	G13_004	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.7648	100.8725	COLUMEAST - KELLY 230KV CKT 1	
FDNS	09G13_004		0 13G	G13_004	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77466	100.8328	GEN652556 2-OAHE	
FDNS	09G13_004BPSON		0 13G	G13_004	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77466	100.8	NC1_GEN-NEBRASKA CITY 1	
FDNS	09G13_004BPSON		0 13G	G13_004	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77466	100.7577	GEN645012 2-NEBRASKA CITY 2	
FDNS	09G13_004BPSON		0 13G	G13_004	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77466	100.7395	GEN640028 1-COLUMCOGENERATION	
FDNS	09G13_004BPSON		0 13G	G13_004	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77487	100.7241	HANLON - STORLA 230KV CKT 1	
FDNS	09G13_004		0 13G	G13_004	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77541	100.7236	AINSWORTH - AINSWORTH 115KV CKT 1	
FDNS	09G13_004		0 13G	G13_004	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77466	100.7191	GEN652546 1-FT RANDAL	
FDNS	09G13_004BPSON		0 13G	G13_004	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77425	100.7105	PETERSBRG.N7115.00 - PETERSBURG 115KV CKT 1	
FDNS	09G13_004BPSON		0 13G	G13_004	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77425	100.6785	ALBION - PETERSBURG 115KV CKT 1	
FDNS	09G13_004		0 13G	G13_004	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77522	100.6777	STEGALL - WAYSIDE 230KV CKT 1	
FDNS	09G13_004		0 13G	G13_004	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77545	100.6764	NUNDRWD - WAYSIDE 230KV CKT 1	
FDNS	00G13_004		0 13WP	G13_004	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.78032	100.6481	FT RANDAL - FT THOMPSON 230KV CKT 1	
FDNS	00G13_004		0 23SP	G13_004	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77289	100.6294	GEN560717 1-G13_006_3 0.6900	
FDNS	09G13_004BPSON		0 13G	G13_004	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77466	100.6227	GEN532751 1-WOLF CREEK GENERATING STATION UNIT 1	
FDNS	09G13_004BPSON		0 13G	G13_004	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77582	100.6172	SIOUX FALLS - SPLIT ROCK 230KV CKT 1	
FDNS	09G13_004BPSON		0 13G	G13_004	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77466	100.6155	GEN645011 1-NEBRASKA CITY 1	
FDNS	09G13_004BPSON		0 13G	G13_004	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77489	100.5852	KEYSTONE - SIDNEY 345KV CKT 1	
FDNS	09G13_004BPSON		0 13G	G13_004	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77717	100.5813	RASMUSN - UTICA JCT 230KV CKT 1	
FDNS	09G13_004BPSON		0 13G	G13_004	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77265	100.5273	G10-51T 230.00 - HOSKINS 230KV CKT 1	
FDNS	09G13_004BPSON		0 13G	G13_004	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.7748	100.4871	GAVINS POINT - HARTINGTON 115KV CKT 1	
FDNS	00G13_004		0 13WP	G13_004	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77436	100.4831	GEN659110 1-LELAND OLDS UNIT1	
FDNS	09G13_004		0 13G	G13_004	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.76512	100.4595	COLUMEAST (COL.EAST T3) 230/115/13.8KV TRANSFORMER CKT 1	
FDNS	09G13_004		0 13G	G13_004	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.76512	100.4475	COLUMEAST - KELLY 230KV CKT 1	
FDNS	09G13_004		0 13G	G13_004	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77501	100.4091	GAVINS POINT - YANKON JCT 115KV CKT 1	
FDNS	09G13_004BPSON		0 13G	G13_004	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77618	100.4077	SIOUX FALLS - VFODNES 230KV CKT 1	
FDNS	09G13_004		0 13G	G13_004	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77466	100.4056	GEN652547 3-FT RANDAL	
FDNS	09G13_004		0 13G	G13_004	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77466	100.4056	GEN652548 5-FT RANDAL	
FDNS	09G13_004		0 13G	G13_004	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77466	100.4056	GEN652549 7-FT RANDAL	
FDNS	00G13_004		0 13WP	G13_004	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.78017	100.3992	FT THOMPSON - LAKE PLATT 230KV CKT 1	
FDNS	09G13_004BPSON		0 13G	G13_004	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77477	100.3328	FT THOMPSON - LETCHER 230KV CKT 1	
FDNS	09ALLBPSON		0 13G	G13_004	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77466	100.3284	BASE CASE	
FDNS	09ALLBPSON		0 13G	G13_004	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77466	100.3284	NC1_GEN-NEBRASKA CITY 1	
FDNS	00G13_004		0 13SP	G13_004	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77492	100.0882	GEN560717 1-G13_006_3 0.6900	
FDNS	00G13_004		0 18WP	G13_004	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77351	100.074	BASE CASE	
FDNS	09G13_004		0 13G	G13_004	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77585	100.0707	RAUN - SIOUX CITY 345KV CKT 1	
FDNS	00G13_004		2 23SP	G13_004	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.7729	113.406	MADISONCO 230.00 - S_NORFOLK 230.00 230KV CKT 1	
FDNS	00G13_004		2 23SP	G13_004	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.7729	113.2267	S_NORFOLK 345.00 (SNORFOLKT) 345/230/13.8KV TRANSFORMER CKT 1	
FDNS	00G13_004		2 13SP	G13_004	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77493	113.1148	MADISONCO 230.00 - S_NORFOLK 230.00 230KV CKT 1	
FDNS	00G13_004		2 13SP	G13_004	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77493	112.7925	S_NORFOLK 345.00 (SNORFOLKT) 345/230/13.8KV TRANSFORMER CKT 1	
FDNS	00G13_004		2 18SP	G13_004	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77396	109.7494	MADISONCO 230.00 - S_NORFOLK 230.00 230KV CKT 1	
FDNS	00G13_004		2 18SP	G13_004	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77396	109.4292	S_NORFOLK 345.00 (SNORFOLKT) 345/230/13.8KV TRANSFORMER CKT 1	
FDNS	00G13_004		2 13WP	G13_004	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77436	103.1808	MADISONCO 230.00 - S_NORFOLK 230.00 230KV CKT 1	
FDNS	00G13_004		2 13WP	G13_004	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77436	102.8575	S_NORFOLK 345.00 (SNORFOLKT) 345/230/13.8KV TRANSFORMER CKT 1	
FDNS	09ALLBPSON		2 13G	G13_004	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77467	100.3015	MADISONCO 230.00 - S_NORFOLK 230.00 230KV CKT 1	
FDNS	09ALLBPSON		2 13G	G13_004	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77467	100.0976	S_NORFOLK 345.00 (SNORFOLKT) 345/230/13.8KV TRANSFORMER CKT 1	
FDNS	00G13_004		2 18WP	G13_004	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77352	100.075	MADISONCO 230.00 - S_NORFOLK 230.00 230KV CKT 1	
FDNS	09G13_004		2 13G	G13_004	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77468	100	MADISONCO 230.00 - S_NORFOLK 230.00 230KV CKT 1	
FDNS	00G13_004		2 23SP	G13_004	FROM->TO	MADISONCO 230.00 - S_NORFOLK 230.00 230KV CKT 1	320	0.71646	105.0224	KELLY - MADISONCO 230.00 230KV CKT 1	
FDNS	00G13_004		2 13SP	G13_004	FROM->TO	MADISONCO 230.00 - S_NORFOLK 230.00 230KV CKT 1	320	0.71595	104.0177	KELLY - MADISONCO 230.00 230KV CKT 1	
FDNS	00G13_004		2 18SP	G13_004	FROM->TO	MADISONCO 230.00 - S_NORFOLK 230.00 230KV CKT 1	320	0.71537	100.6537	KELLY - MADISONCO 230.00 230KV CKT 1	
FDNS	00G13_004		2 23SP	G13_004	FROM->TO	S_NORFOLK 345.00 (SNORFOLKT) 345/230/13.8KV TRANSFORMER CKT 1	336	0.71646	101.6138	KELLY - MADISONCO 230.00 230KV CKT 1	
FDNS	00G13_004		2 13SP	G13_004	FROM->TO	S_NORFOLK 345.00 (SNORFOLKT) 345/230/13.8KV TRANSFORMER CKT 1	336	0.71595	100.4225	KELLY - MADISONCO 230.00 230KV CKT 1	
FDNS	09ALLBPSON		0 13G	G13_005	TO->FROM	FT RANDAL - G12_005T 230.00 230KV CKT 1	320	1	127.7744	KELLY - MADISONCO 230.00 230KV CKT 1	
FDNS	09G13_005BPSON		0 13G	G13_005	TO->FROM	FT RANDAL - G12_005T 230.00 230KV CKT 1	320	1	127.7595	KELLY - MADISONCO 230.00 230KV CKT 1	
FDNS	00G13_005		0 13SP	G13_005	TO->FROM	FT RANDAL - G12_005T 230.00 230KV CKT 1	320	1	127.7044	KELLY - MADISONCO 230.00 230KV CKT 1	
FDNS	00G13_005		0 18SP	G13_005	TO->FROM	FT RANDAL - G12_005T 230.00 230KV CKT 1	320	1	127.5891	KELLY - MADISONCO 230.00 230KV CKT 1	
FDNS	00G13_005		0 13WP	G13_005	TO->FROM	FT RANDAL - G12_005T 230.00 230KV CKT 1	320	1	127.5269	KELLY - MADISONCO 230.00 230KV CKT 1	
FDNS	00G13_005		0 23SP	G13_005	TO->FROM	FT RANDAL - G12_005T 230.00 230KV CKT 1	320	1	127.4993	KELLY - MADISONCO 230.00 230KV CKT 1	
FDNS	00G13_005		0 18WP	G13_005	TO->FROM	FT RANDAL - G12_005T 230.00 230KV CKT 1	320	1	127.4004	KELLY - MADISONCO 230.00 230KV CKT 1	
FDNS	09G13_005		0 13G	G13_005	TO->FROM	FT RANDAL - G12_005T 230.00 230KV CKT 1	320	1	122.1794	KELLY - MADISONCO 230.00 230KV CKT 1	
FDNS	09NR		0 13G	G13_005	TO->FROM	FT RANDAL - G12_005T 230.00 230KV CKT 1	320	1	110.4823	KELLY - MADISONCO 230.00 230KV CKT 1	
FDNS	09NRBPSON		0 13G	G13_005	TO->FROM	FT RANDAL - G12_005T 230.00 230KV CKT 1	320	1	110.4823	KELLY - MADISONCO 230.00 230KV CKT 1	
FDNS	09BPSON		0 13G	G13_005	TO->FROM	FT RANDAL - G12_005T 230.00 230KV CKT 1	320	1	100.7094	KELLY - MADISONCO 230.00 230KV CKT 1	

SOLUTION	GROUP	SCENARIO	SEASON	SOURCE	DIRECTION	MONITORED ELEMENT	RATEB (MVA)	TDF	TC%LOADING (% MVA)	CONTINGENCY	
FDNS	9		0	13G	G13_005	TO->FROM	FT RANDAL - G12_005T 230.00 230KV CKT 1	320	1	100.2819	KELLY - MADISONCO 230.00 230KV CKT 1
FDNS	09ALLBPSON		0	13G	G13_005	TO->FROM	G12_005T 230.00 - MADISONCO 230.00 230KV CKT 1	320	1	105.3265	KELLY - MADISONCO 230.00 230KV CKT 1
FDNS	09G13_005BPSON		0	13G	G13_005	TO->FROM	G12_005T 230.00 - MADISONCO 230.00 230KV CKT 1	320	1	105.3137	KELLY - MADISONCO 230.00 230KV CKT 1
FDNS	00G13_005		0	13SP	G13_005	TO->FROM	G12_005T 230.00 - MADISONCO 230.00 230KV CKT 1	320	1	105.1503	KELLY - MADISONCO 230.00 230KV CKT 1
FDNS	00G13_005		0	18SP	G13_005	TO->FROM	G12_005T 230.00 - MADISONCO 230.00 230KV CKT 1	320	1	105.04	KELLY - MADISONCO 230.00 230KV CKT 1
FDNS	00G13_005		0	13WP	G13_005	TO->FROM	G12_005T 230.00 - MADISONCO 230.00 230KV CKT 1	320	1	104.983	KELLY - MADISONCO 230.00 230KV CKT 1
FDNS	00G13_005		0	23SP	G13_005	TO->FROM	G12_005T 230.00 - MADISONCO 230.00 230KV CKT 1	320	1	104.9582	KELLY - MADISONCO 230.00 230KV CKT 1
FDNS	00G13_005		0	18WP	G13_005	TO->FROM	G12_005T 230.00 - MADISONCO 230.00 230KV CKT 1	320	1	104.8681	KELLY - MADISONCO 230.00 230KV CKT 1
FDNS	09G13_005		0	13G	G13_005	TO->FROM	G12_005T 230.00 - MADISONCO 230.00 230KV CKT 1	320	1	104.7438	KELLY - MADISONCO 230.00 230KV CKT 1
FDNS	09ALLBPSON		0	13G	G13_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	1	127.9705	FT RANDAL - G12_005T 230.00 230KV CKT 1
FDNS	09G13_005BPSON		0	13G	G13_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	1	127.696	FT RANDAL - G12_005T 230.00 230KV CKT 1
FDNS	00G13_005		0	18WP	G13_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	1	126.7439	FT RANDAL - G12_005T 230.00 230KV CKT 1
FDNS	00G13_005		0	13WP	G13_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	1	126.594	FT RANDAL - G12_005T 230.00 230KV CKT 1
FDNS	00G13_005		0	13SP	G13_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	1	126.5664	FT RANDAL - G12_005T 230.00 230KV CKT 1
FDNS	00G13_005		0	18SP	G13_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	1	126.524	FT RANDAL - G12_005T 230.00 230KV CKT 1
FDNS	00G13_005		0	23SP	G13_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	1	126.3746	FT RANDAL - G12_005T 230.00 230KV CKT 1
FDNS	00G13_005		0	13SP	G13_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.78442	123.7215	FT RANDAL - UTICA JCT 230KV CKT 1
FDNS	00G13_005		0	23SP	G13_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.7824	123.3076	FT RANDAL - UTICA JCT 230KV CKT 1
FDNS	09G13_005		0	13G	G13_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	1	122.036	FT RANDAL - G12_005T 230.00 230KV CKT 1
FDNS	00G13_005		0	13SP	G13_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.78197	119.7861	FT RANDAL - SIOUX CITY 230KV CKT 1
FDNS	00G13_005		0	13SP	G13_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77727	119.7278	FT THOMPSON - GRAND ISLAND 345KV CKT 1
FDNS	00G13_005		0	23SP	G13_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77976	119.3247	FT RANDAL - SIOUX CITY 230KV CKT 1
FDNS	00G13_005		0	18SP	G13_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.78354	119.0896	FT RANDAL - UTICA JCT 230KV CKT 1
FDNS	00G13_005		0	23SP	G13_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77243	117.9922	GRAND ISLAND - HOLT.CO3 345.00 345KV CKT 1
FDNS	00G13_005		0	23SP	G13_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77396	117.5942	FT RANDAL - SPENCER 115KV CKT 1
FDNS	00G13_005		0	23SP	G13_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77562	117.442	FT THOMPSON - HOLT.CO3 345.00 345KV CKT 1
FDNS	00G13_005		0	23SP	G13_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77396	117.3607	ONEILL - SPENCER 115KV CKT 1
FDNS	00G13_005		0	13SP	G13_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77599	117.2678	FT RANDAL - SPENCER 115KV CKT 1
FDNS	00G13_005		0	13SP	G13_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77599	117.0512	ONEILL - SPENCER 115KV CKT 1
FDNS	00G13_005		0	23SP	G13_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.76504	116.3527	HOSKINS - RAUN 345KV CKT 1
FDNS	00G13_005		0	23SP	G13_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77289	116.135	GEN640009 1-COOPER NUCLEAR STATION
FDNS	00G13_005		0	23SP	G13_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77289	115.9192	GEN532751 1-WOLF CREEK GENERATING STATION UNIT 1
FDNS	00G13_005		0	13SP	G13_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77741	115.7699	RASMUSN - UTICA JCT 230KV CKT 1
FDNS	00G13_005		0	23SP	G13_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77289	115.7025	GEN645012 2-NEBRASKA CITY 2
FDNS	00G13_005		0	23SP	G13_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77519	115.688	RASMUSN - UTICA JCT 230KV CKT 1
FDNS	00G13_005		0	13SP	G13_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77492	115.6662	GEN640009 1-COOPER NUCLEAR STATION
FDNS	00G13_005		0	13SP	G13_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.76664	115.6068	HOSKINS - RAUN 345KV CKT 1
FDNS	00G13_005		0	23SP	G13_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77289	115.5844	GEN645011 1-NEBRASKA CITY 1
FDNS	00G13_005		0	13SP	G13_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77492	115.516	GEN532751 1-WOLF CREEK GENERATING STATION UNIT 1
FDNS	00G13_005		0	13SP	G13_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77492	115.4857	GEN645012 2-NEBRASKA CITY 2
FDNS	00G13_005		0	13SP	G13_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77492	115.372	GEN645011 1-NEBRASKA CITY 1
FDNS	00G13_005		0	23SP	G13_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77289	115.342	GEN542962 2-IATAN UNIT #2
FDNS	00G13_005		0	18SP	G13_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.78096	115.2834	FT RANDAL - SIOUX CITY 230KV CKT 1
FDNS	00G13_005		0	23SP	G13_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77289	115.0909	GEN640010 1-GERALD GENTLEMAN STATION UNIT 1
FDNS	00G13_005		0	23SP	G13_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77289	115.0329	GEN640011 2-GERALD GENTLEMAN STATION UNIT 2
FDNS	00G13_005		0	23SP	G13_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77289	115.0299	GEN542957 1-IATAN UNIT #1
FDNS	00G13_005		0	23SP	G13_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77289	115.0288	GEN532651 1-JEFFREY ENERGY CENTER UNIT 1
FDNS	00G13_005		0	23SP	G13_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77289	115.0273	GEN532653 1-JEFFREY ENERGY CENTER UNIT 3
FDNS	00G13_005		0	23SP	G13_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77289	115.0271	GEN532652 1-JEFFREY ENERGY CENTER UNIT 2
FDNS	00G13_005		0	13SP	G13_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77492	115.0108	GEN542962 2-IATAN UNIT #2
FDNS	00G13_005		0	23SP	G13_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77311	114.903	HANLON - STORLA 230KV CKT 1
FDNS	00G13_005		0	23SP	G13_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77361	114.8518	FT RANDAL - WHITE SWAN 115KV CKT 1
FDNS	00G13_005		0	23SP	G13_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77289	114.8435	GEN542955 1-LACYGNE UNIT #1
FDNS	00G13_005		0	13SP	G13_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77512	114.8395	HANLON - STORLA 230KV CKT 1
FDNS	00G13_005		0	23SP	G13_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77361	114.8308	TYNDALL - WHITE SWAN 115KV CKT 1
FDNS	00G13_005		0	23SP	G13_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77289	114.7236	GEN640028 1-COLUMCOGENERATION
FDNS	00G13_005		0	13SP	G13_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77492	114.7038	GEN542957 1-IATAN UNIT #1
FDNS	00G13_005		0	23SP	G13_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77289	114.69	GEN542956 2-LACYGNE UNIT #2
FDNS	00G13_005		0	13SP	G13_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77492	114.6882	GEN532651 1-JEFFREY ENERGY CENTER UNIT 1
FDNS	00G13_005		0	13SP	G13_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77492	114.678	GEN532653 1-JEFFREY ENERGY CENTER UNIT 3
FDNS	00G13_005		0	13SP	G13_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77492	114.6779	GEN532652 1-JEFFREY ENERGY CENTER UNIT 2
FDNS	00G13_005		0	23SP	G13_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77298	114.6636	GAVINS POINT - HARTINGTON 115KV CKT 1
FDNS	00G13_005		0	13SP	G13_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77492	114.6431	GEN640010 1-GERALD GENTLEMAN STATION UNIT 1
FDNS	00G13_005		0	23SP	G13_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77305	114.6279	KEYSTONE - SIDNEY 345KV CKT 1
FDNS	00G13_005		0	23SP	G13_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.75787	114.6264	COLUMEAST - NW68TH & HOLDREGE 345KV CKT 1
FDNS	00G13_005		0	13SP	G13_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77516	114.6195	KEYSTONE - SIDNEY 345KV CKT 1
FDNS	00G13_005		0	13SP	G13_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77502	114.6138	FT THOMPSON - LETCHER 230KV CKT 1
FDNS	00G13_005		0	23SP	G13_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77289	114.5956	GEN641089 2-ENERGY CENTER 2
FDNS	00G13_005		0	23SP	G13_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77289	114.5864	GEN542951 5-HAWTHORN UNIT #5
FDNS	00G13_005		0	23SP	G13_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77302	114.584	FT THOMPSON - LETCHER 230KV CKT 1
FDNS	00G13_005		0	23SP	G13_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77289	114.5798	GEN645001 1-FORT CALHOUN 1

SOLUTION	GROUP	SCENARIO	SEASON	SOURCE	DIRECTION	MONITORED ELEMENT	RATEB		TC%LOADING		CONTINGENCY				
							(MVA)	TDF	(% MVA)						
FDNS	00G13_005		0	13SP	G13_005	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1		320	0.77564	114.5576	FT RANDAL - WHITE SWAN 115KV CKT 1
FDNS	00G13_005		0	13SP	G13_005	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1		320	0.77564	114.5475	TYNDALL - WHITE SWAN 115KV CKT 1
FDNS	00G13_005		0	13SP	G13_005	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1		320	0.77492	114.5394	GEN640011 2-GERALD GENTLEMAN STATION UNIT 2
FDNS	00G13_005		0	13SP	G13_005	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1		320	0.77506	114.4937	GAVINS POINT - HARTINGTON 115KV CKT 1
FDNS	00G13_005		0	23SP	G13_005	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1		320	0.77447	114.4368	UTICA JCT - VFODNES 230KV CKT 1
FDNS	00G13_005		0	13SP	G13_005	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1		320	0.77492	114.4327	GEN640028 1-COLUMCOGENERATION
FDNS	00G13_005		0	23SP	G13_005	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1		320	0.77289	114.4231	GEN525562 1-TOLK GEN #2 24 KV
FDNS	00G13_005		0	23SP	G13_005	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1		320	0.77184	114.3874	103RD & ROKEBY - SUB 3458 NEB CTY 345KV CKT 1
FDNS	00G13_005		0	13SP	G13_005	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1		320	0.77492	114.3834	GEN542955 1-LACYGNE UNIT #1
FDNS	00G13_005		0	13SP	G13_005	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1		320	0.77492	114.3724	GEN542956 2-LACYGNE UNIT #2
FDNS	00G13_005		0	13SP	G13_005	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1		320	0.77485	114.3562	SPLIT ROCK TAP - WHITE 345KV CKT 1
FDNS	00G13_005		0	23SP	G13_005	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1		320	0.773	114.3423	PAHOJA - SIOUX FALLS 230KV CKT 1
FDNS	00G13_005		0	13SP	G13_005	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1		320	0.77492	114.3395	GEN641089 2-ENERGY CENTER 2
FDNS	00G13_005		0	13SP	G13_005	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1		320	0.77492	114.2095	GEN542951 5-HAWTHORN UNIT #5
FDNS	00G13_005		0	13SP	G13_005	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1		320	0.77476	114.1975	BLOOMFIELD - GAVINS POINT 115KV CKT 1
FDNS	00G13_005		0	13SP	G13_005	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1		320	0.7751	114.1932	PAHOJA - SIOUX FALLS 230KV CKT 1
FDNS	00G13_005		0	13SP	G13_005	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1		320	0.77476	114.1901	BLOOMFIELD - CREIGHTON 115KV CKT 1
FDNS	00G13_005		0	13SP	G13_005	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1		320	0.77492	114.1639	CLEARWATER - ONEILL 115KV CKT 1
FDNS	00G13_005		0	13SP	G13_005	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1		320	0.77512	114.1439	HANLON - SIOUX FALLS 230KV CKT 1
FDNS	00G13_005		0	13SP	G13_005	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1		320	0.77643	114.1344	UTICA JCT - VFODNES 230KV CKT 1
FDNS	00G13_005		0	13SP	G13_005	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1		320	0.77535	114.1094	ARPIN - EAU CLAIRE 345KV CKT 1
FDNS	00G13_005		0	18SP	G13_005	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1		320	0.77592	114.089	FT THOMPSON - GRAND ISLAND 345KV CKT 1
FDNS	00G13_005		0	18SP	G13_005	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1		320	0.77499	113.873	FT RANDAL - SPENCER 115KV CKT 1
FDNS	00G13_005		0	18SP	G13_005	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1		320	0.77499	113.6729	ONEILL - SPENCER 115KV CKT 1
FDNS	00G13_005		0	13WP	G13_005	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1		320	0.7839	113.5615	FT RANDAL - UTICA JCT 230KV CKT 1
FDNS	00G13_005		0	23SP	G13_005	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1		320	0.77289	113.4003	BASE CASE
FDNS	00G13_005		0	13SP	G13_005	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1		320	0.77492	113.0744	BASE CASE
FDNS	00G13_005		0	23SP	G13_005	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1		320	0.77289	112.4587	GEN652457 1-GARRISON
FDNS	00G13_005		0	23SP	G13_005	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1		320	0.77289	112.4587	GEN652458 2-GARRISON
FDNS	00G13_005		0	23SP	G13_005	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1		320	0.77289	112.4587	GEN652459 3-GARRISON
FDNS	00G13_005		0	23SP	G13_005	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1		320	0.77111	112.4286	COLUMBUS - SCHUYLER 115KV CKT 1
FDNS	00G13_005		0	18SP	G13_005	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1		320	0.77395	112.4171	GEN640009 1-COOPER NUCLEAR STATION
FDNS	00G13_005		0	23SP	G13_005	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1		320	0.77346	112.3893	NUNDRWD - WAYSIDE 230KV CKT 1
FDNS	00G13_005		0	18SP	G13_005	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1		320	0.77395	112.3308	GEN532751 1-WOLF CREEK GENERATING STATION UNIT 1
FDNS	00G13_005		0	23SP	G13_005	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1		320	0.77289	112.2637	GEN652542 1-BIG BEND
FDNS	00G13_005		0	23SP	G13_005	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1		320	0.77289	112.2637	GEN652543 3-BIG BEND
FDNS	00G13_005		0	23SP	G13_005	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1		320	0.77289	112.2419	GEN652544 5-BIG BEND
FDNS	00G13_005		0	23SP	G13_005	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1		320	0.77309	112.2067	ATCHSNT3 345.00 - COOPER 345KV CKT 1
FDNS	00G13_005		0	23SP	G13_005	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1		320	0.77175	112.2047	COLUMBUS - GENOA 115KV CKT 1
FDNS	00G13_005		0	23SP	G13_005	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1		320	0.77309	112.0943	ATCHSNT3 345.00 - BOONEVILLE 345KV CKT 1
FDNS	00G13_005		0	18SP	G13_005	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1		320	0.76553	112.0785	HOSKINS - RAUN 345KV CKT 1
FDNS	00G13_005		0	13SP	G13_005	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1		320	0.77416	112.0177	HOSKINS (HOSKINS T2) 345/230/13.8KV TRANSFORMER CKT 1
FDNS	00G13_005		0	13SP	G13_005	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1		320	0.77492	111.9981	GEN652460 4-GARRISON
FDNS	00G13_005		0	23SP	G13_005	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1		320	0.773	111.9941	NELIGH.EAST3345.00 (NELIGH.E T1) 345/115/13.8KV TRANSFORMER CKT 1
FDNS	00G13_005		0	18SP	G13_005	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1		320	0.77395	111.9861	GEN645012 2-NEBRASKA CITY 2
FDNS	00G13_005		0	13SP	G13_005	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1		320	0.7757	111.9633	AINSWORTH - CALAMUS 115KV CKT 1
FDNS	00G13_005		0	13SP	G13_005	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1		320	0.7757	111.9446	CALAMUS - THEDFORD 115KV CKT 1
FDNS	00G13_005		0	13SP	G13_005	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1		320	0.77318	111.9219	COLUMBUS - SCHUYLER 115KV CKT 1
FDNS	00G13_005		0	13SP	G13_005	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1		320	0.77492	111.9159	GEN652457 1-GARRISON
FDNS	00G13_005		0	13SP	G13_005	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1		320	0.77492	111.9159	GEN652458 2-GARRISON
FDNS	00G13_005		0	13SP	G13_005	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1		320	0.77492	111.9159	GEN652459 3-GARRISON
FDNS	00G13_005		0	18SP	G13_005	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1		320	0.77395	111.873	GEN645011 1-NEBRASKA CITY 1
FDNS	00G13_005		0	23SP	G13_005	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1		320	0.7734	111.8601	MAXWELL - STAPLETON 115KV CKT 1
FDNS	00G13_005		0	23SP	G13_005	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1		320	0.773	111.841	HOSKINS - NELIGH.EAST3345.00 345KV CKT 1
FDNS	00G13_005		0	13SP	G13_005	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1		320	0.7757	111.8237	AINSWORTH - AINSWORTH 115KV CKT 1
FDNS	00G13_005		0	13SP	G13_005	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1		320	0.77513	111.8219	ATCHSNT3 345.00 - COOPER 345KV CKT 1
FDNS	00G13_005		0	23SP	G13_005	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1		320	0.77329	111.8116	STEGALL - WAYSIDE 230KV CKT 1
FDNS	00G13_005		0	13SP	G13_005	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1		320	0.77432	111.7925	LAKEFIELD 3 - RAUN 345KV CKT 1
FDNS	00G13_005		0	13SP	G13_005	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1		320	0.77492	111.7863	GEN652542 1-BIG BEND
FDNS	00G13_005		0	13SP	G13_005	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1		320	0.77492	111.7863	GEN652543 3-BIG BEND
FDNS	00G13_005		0	13SP	G13_005	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1		320	0.77492	111.7849	GEN652544 5-BIG BEND
FDNS	00G13_005		0	13SP	G13_005	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1		320	0.77337	111.7826	ALBION - GENOA 115KV CKT 1
FDNS	00G13_005		0	18SP	G13_005	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1		320	0.77636	111.7724	RASMUSN - UTICA JCT 230KV CKT 1
FDNS	00G13_005		0	23SP	G13_005	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1		320	0.77289	111.7527	GEN652556 2-OAHE
FDNS	00G13_005		0	23SP	G13_005	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1		320	0.77289	111.7527	GEN652557 4-OAHE
FDNS	00G13_005		0	23SP	G13_005	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1		320	0.77289	111.7527	GEN652558 6-OAHE
FDNS	00G13_005		0	13SP	G13_005	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1		320	0.7757	111.7312	MAXWELL - THEDFORD 115KV CKT 1
FDNS	00G13_005		0	13SP	G13_005	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1		320	0.77513	111.7122	ATCHSNT3 345.00 - BOONEVILLE 345KV CKT 1
FDNS	00G13_005		0	18SP	G13_005	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1		320	0.77395	111.6961	GEN542962 2-IATAN UNIT #2
FDNS	00G13_005		0	23SP	G13_005	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1		320	0.77289	111.6794	GEN652546 1-FT RANDAL
FDNS	00G13_005		0	13SP	G13_005	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1		320	0.77492	111.6308	GEN652559 1-OAHE

SOLUTION	GROUP	SCENARIO	SEASON	SOURCE	DIRECTION	MONITORED ELEMENT	RATEB (MVA)	TDF	TC%LOADING (% MVA)	CONTINGENCY
FDNS	00G13_005		0	23SP	G13_005	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77289	111.5771	GEN659296 1-SDPRAIRWIND1W0.6900
FDNS	00G13_005		0	18SP	G13_005	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77395	111.5705	GEN640010 1-GERALD GENTLEMAN STATION UNIT 1
FDNS	00G13_005		0	23SP	G13_005	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77859	111.4423	FT RANDAL - LAKE PLATT 230KV CKT 1
FDNS	00G13_005		0	23SP	G13_005	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.76647	111.4298	KELLY (KELLY T1) 230/115/13.2KV TRANSFORMER CKT 1
FDNS	00G13_005		0	23SP	G13_005	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.76647	111.4282	COLUMBUS - KELLY 115KV CKT 1
FDNS	00G13_005		0	13SP	G13_005	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77552	111.4195	STEGALL - WAYSIDE 230KV CKT 1
FDNS	00G13_005		0	18SP	G13_005	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77395	111.4119	GEN532651 1-JEFFREY ENERGY CENTER UNIT 1
FDNS	00G13_005		0	18SP	G13_005	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77395	111.407	GEN532653 1-JEFFREY ENERGY CENTER UNIT 3
FDNS	00G13_005		0	18SP	G13_005	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77395	111.4069	GEN532652 1-JEFFREY ENERGY CENTER UNIT 2
FDNS	00G13_005		0	18SP	G13_005	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77395	111.406	GEN640011 2-GERALD GENTLEMAN STATION UNIT 2
FDNS	00G13_005		0	23SP	G13_005	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77289	111.406	GEN652547 3-FT RANDAL
FDNS	00G13_005		0	23SP	G13_005	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77289	111.406	GEN652548 5-FT RANDAL
FDNS	00G13_005		0	23SP	G13_005	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77289	111.406	GEN652549 7-FT RANDAL
FDNS	00G13_005		0	18SP	G13_005	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77395	111.3851	GEN542957 1-IATAN UNIT #1
FDNS	09NR		0	13G	G13_005	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	1	111.3521	FT RANDAL - G12_005T 230.00 230KV CKT 1
FDNS	09NRBPSON		0	13G	G13_005	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	1	111.3521	FT RANDAL - G12_005T 230.00 230KV CKT 1
FDNS	00G13_005		0	23SP	G13_005	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77386	111.3195	RAUN - SIOUX CITY 345KV CKT 1
FDNS	00G13_005		0	18SP	G13_005	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77395	111.2265	GEN542955 1-LACYGNE UNIT #1
FDNS	00G13_005		0	13SP	G13_005	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77492	111.2199	GEN652556 2-OAHE
FDNS	00G13_005		0	13SP	G13_005	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77492	111.2199	GEN652557 4-OAHE
FDNS	00G13_005		0	13SP	G13_005	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77492	111.2199	GEN652558 6-OAHE
FDNS	00G13_005		0	13SP	G13_005	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77492	111.1689	GEN652546 1-FT RANDAL
FDNS	00G13_005		0	18SP	G13_005	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77466	111.1183	FT RANDAL - WHITE SWAN 115KV CKT 1
FDNS	00G13_005		0	13SP	G13_005	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77337	111.1157	COLUMBUS - GENOA 115KV CKT 1
FDNS	00G13_005		0	23SP	G13_005	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77289	111.1098	GEN659110 1-LELAND OLDS UNIT1
FDNS	00G13_005		0	18SP	G13_005	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77466	111.1	TYNDALL - WHITE SWAN 115KV CKT 1
FDNS	00G13_005		0	13SP	G13_005	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.76841	111.0833	KELLY (KELLY T1) 230/115/13.2KV TRANSFORMER CKT 1
FDNS	00G13_005		0	13SP	G13_005	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.76841	111.073	COLUMBUS - KELLY 115KV CKT 1
FDNS	00G13_005		0	18SP	G13_005	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77395	111.0657	GEN542956 2-LACYGNE UNIT #2
FDNS	00G13_005		0	23SP	G13_005	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.76339	111.0396	COLUMEAST - KELLY 230KV CKT 1
FDNS	00G13_005		0	23SP	G13_005	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.76339	111.0369	COLUMEAST (COL.EAST T3) 230/115/13.8KV TRANSFORMER CKT 1
FDNS	00G13_005		0	13SP	G13_005	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77492	111.0302	GEN652547 3-FT RANDAL
FDNS	00G13_005		0	13SP	G13_005	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77492	111.0302	GEN652548 5-FT RANDAL
FDNS	00G13_005		0	13SP	G13_005	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77492	111.0302	GEN652549 7-FT RANDAL
FDNS	00G13_005		0	18SP	G13_005	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77417	111.0226	KEYSTONE - SIDNEY 345KV CKT 1
FDNS	00G13_005		0	23SP	G13_005	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77873	111.0142	FT RANDAL - FT THOMPSON 230KV CKT 1
FDNS	00G13_005		0	23SP	G13_005	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77289	111.0121	GEN659285 1-DEERCREEK 1G13.800
FDNS	00G13_005		0	18SP	G13_005	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77419	111.004	HANLON - STORLA 230KV CKT 1
FDNS	00G13_005		0	18SP	G13_005	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77395	110.9555	GEN640028 1-COLUMCOGENERATION
FDNS	00G13_005		0	18SP	G13_005	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77395	110.9458	GEN542951 5-HAWTHORN UNIT #5
FDNS	00G13_005		0	18SP	G13_005	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77395	110.9249	GEN641089 2-ENERGY CENTER 2
FDNS	00G13_005		0	18SP	G13_005	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77407	110.9167	GAVINS POINT - HARTINGTON 115KV CKT 1
FDNS	00G13_005		0	18SP	G13_005	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77409	110.858	FT THOMPSON - LETCHER 230KV CKT 1
FDNS	00G13_005		0	18SP	G13_005	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77395	110.8538	GEN645001 1-FORT CALHOUN 1
FDNS	00G13_005		0	23SP	G13_005	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77859	110.7691	FT THOMPSON - LAKE PLATT 230KV CKT 1
FDNS	00G13_005		0	18SP	G13_005	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77395	110.7583	GEN525562 1-TOLK GEN #2 24 KV
FDNS	00G13_005		0	18SP	G13_005	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77555	110.7388	UTICA JCT - VFODNES 230KV CKT 1
FDNS	00G13_005		0	18SP	G13_005	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77395	110.7055	GEN514806 1-SOONER UNIT 2
FDNS	00G13_005		0	18SP	G13_005	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77395	110.7	GEN514805 1-SOONER UNIT 1
FDNS	00G13_005		0	13SP	G13_005	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.76539	110.5838	COLUMEAST (COL.EAST T3) 230/115/13.8KV TRANSFORMER CKT 1
FDNS	00G13_005		0	13SP	G13_005	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.76539	110.5799	COLUMEAST - KELLY 230KV CKT 1
FDNS	09G13_005		0	13G	G13_005	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.78423	110.5747	FT RANDAL - UTICA JCT 230KV CKT 1
FDNS	00G13_005		0	13SP	G13_005	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77492	110.3143	GEN659110 1-LELAND OLDS UNIT1
FDNS	00G13_005		0	13SP	G13_005	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.78069	110.1559	FT RANDAL - LAKE PLATT 230KV CKT 1
FDNS	00G13_005		0	13SP	G13_005	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77492	110.0975	GEN659285 1-DEERCREEK 1G13.800
FDNS	00G13_005		0	13SP	G13_005	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.7761	109.9097	RAUN - SIOUX CITY 345KV CKT 1
FDNS	00G13_005		0	13SP	G13_005	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.78084	109.8014	FT RANDAL - FT THOMPSON 230KV CKT 1
FDNS	00G13_005		0	18SP	G13_005	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77395	109.7453	BASE CASE
FDNS	00G13_005		0	18WP	G13_005	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.78314	109.7048	FT RANDAL - UTICA JCT 230KV CKT 1
FDNS	00G13_005		0	13WP	G13_005	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.78136	109.6936	FT RANDAL - SIOUX CITY 230KV CKT 1
FDNS	00G13_005		0	13SP	G13_005	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.78069	109.481	FT THOMPSON - LAKE PLATT 230KV CKT 1
FDNS	00G13_005		0	13SP	G13_005	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.75638	109.2652	HOSKINS - SHELL CREEK 345KV CKT 1
FDNS	00G13_005		0	18SP	G13_005	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77395	108.7498	GEN652460 4-GARRISON
FDNS	00G13_005		0	18SP	G13_005	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77395	108.7069	GEN652457 1-GARRISON
FDNS	00G13_005		0	18SP	G13_005	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77395	108.7069	GEN652458 2-GARRISON
FDNS	00G13_005		0	18SP	G13_005	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77395	108.7069	GEN652459 3-GARRISON
FDNS	00G13_005		0	18SP	G13_005	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77459	108.7025	STAPLETON - THEDFORD 115KV CKT 1
FDNS	00G13_005		0	18SP	G13_005	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77318	108.6959	HOSKINS (HOSKINS T2) 345/230/13.8KV TRANSFORMER CKT 1
FDNS	00G13_005		0	18SP	G13_005	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77459	108.6718	AINSWORTH - AINSWORTH 115KV CKT 1
FDNS	00G13_005		0	23SP	G13_005	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77289	108.6562	GEN659111 2-LELAND OLDS UNIT2
FDNS	09G13_005		0	13G	G13_005	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.78177	108.6367	FT RANDAL - SIOUX CITY 230KV CKT 1

SOLUTION	GROUP	SCENARIO	SEASON	SOURCE	DIRECTION	MONITORED ELEMENT	RATEB (MVA)	TDF	TC%LOADING (% MVA)	CONTINGENCY
FDNS	00G13_005		0 18SP	G13_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77219	108.5784	COLUMBUS - SCHUYLER 115KV CKT 1
FDNS	00G13_005		0 18SP	G13_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77395	108.5157	GEN652542 1-BIG BEND
FDNS	00G13_005		0 18SP	G13_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77395	108.5157	GEN652543 3-BIG BEND
FDNS	00G13_005		0 18SP	G13_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77395	108.4927	GEN652544 5-BIG BEND
FDNS	09ALLBPSON		0 13G	G13_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.78422	108.4868	FT RANDAL - UTICA JCT 230KV CKT 1
FDNS	00G13_005		0 18SP	G13_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77425	108.471	ATCHSNT3 345.00 - COOPER 345KV CKT 1
FDNS	00G13_005		0 23SP	G13_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.75385	108.4521	HOSKINS - SHELL CREEK 345KV CKT 1
FDNS	00G13_005		0 18SP	G13_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77242	108.4311	ALBION - GENOA 115KV CKT 1
FDNS	00G13_005		0 18SP	G13_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77425	108.3569	ATCHSNT3 345.00 - BOONEVILLE 345KV CKT 1
FDNS	00G13_005		0 18SP	G13_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77472	108.3277	NUNDRWD - WAYSIDE 230KV CKT 1
FDNS	00G13_005		0 23SP	G13_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77289	108.3266	GEN659103 1-ANTELOPE VALLEY UNIT1
FDNS	00G13_005		0 23SP	G13_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77289	108.3266	GEN659107 2-ANTELOPE VALLEY UNIT2
FDNS	00G13_005		0 18SP	G13_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77957	108.2845	FT RANDAL - LAKE PLATT 230KV CKT 1
FDNS	00G13_005		0 18SP	G13_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77459	107.9749	MAXWELL - STAPLETON 115KV CKT 1
FDNS	00G13_005		0 18SP	G13_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77395	107.9741	GEN652546 1-FT RANDAL
FDNS	00G13_005		0 18SP	G13_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77395	107.9599	GEN652556 2-OAHE
FDNS	00G13_005		0 18SP	G13_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77395	107.9599	GEN652557 4-OAHE
FDNS	00G13_005		0 18SP	G13_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77395	107.9599	GEN652558 6-OAHE
FDNS	00G13_005		0 18SP	G13_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77971	107.937	FT RANDAL - FT THOMPSON 230KV CKT 1
FDNS	00G13_005		0 23SP	G13_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.72865	107.8621	SHELL CREEK (SHELLCREEKT1) 345/230/13.8KV TRANSFORMER CKT 1
FDNS	00G13_005		0 23SP	G13_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.72865	107.8564	KELLY - SHELL CREEK 230KV CKT 1
FDNS	00G13_005		0 18SP	G13_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77449	107.8215	STEGALL - WAYSIDE 230KV CKT 1
FDNS	00G13_005		0 18SP	G13_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.76743	107.741	COLUMBUS - KELLY 115KV CKT 1
FDNS	00G13_005		0 18SP	G13_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.76743	107.7395	KELLY (KELLY T1) 230/115/13.2KV TRANSFORMER CKT 1
FDNS	00G13_005		0 18SP	G13_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77242	107.7071	COLUMBUS - GENOA 115KV CKT 1
FDNS	00G13_005		0 18SP	G13_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77395	107.6245	GEN652547 3-FT RANDAL
FDNS	00G13_005		0 18SP	G13_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77395	107.6245	GEN652548 5-FT RANDAL
FDNS	00G13_005		0 18SP	G13_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77395	107.6245	GEN652549 7-FT RANDAL
FDNS	00G13_005		0 18SP	G13_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77957	107.5851	FT THOMPSON - LAKE PLATT 230KV CKT 1
FDNS	09G13_005BPSON		0 13G	G13_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.78422	107.5231	FT RANDAL - UTICA JCT 230KV CKT 1
FDNS	00G13_005		0 13SP	G13_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77492	107.4932	GEN659111 2-LELAND OLDS UNIT2
FDNS	00G13_005		0 13SP	G13_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.7313	107.4858	SHELL CREEK (SHELLCREEKT1) 345/230/13.8KV TRANSFORMER CKT 1
FDNS	00G13_005		0 13SP	G13_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.7313	107.4742	KELLY - SHELL CREEK 230KV CKT 1
FDNS	00G13_005		0 18SP	G13_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77497	107.3083	RAUN - SIOUX CITY 345KV CKT 1
FDNS	00G13_005		0 18SP	G13_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.76439	107.294	COLUMEAST - KELLY 230KV CKT 1
FDNS	00G13_005		0 18SP	G13_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.76439	107.2931	COLUMEAST (COL EAST T3) 230/115/13.8KV TRANSFORMER CKT 1
FDNS	00G13_005		0 18SP	G13_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77395	107.2328	GEN659285 1-DEERCREEK 1G13.800
FDNS	00G13_005		0 18SP	G13_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77395	107.2322	GEN659110 1-LELAND OLDS UNIT1
FDNS	00G13_005		0 13SP	G13_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77492	107.142	GEN659103 1-ANTELOPE VALLEY UNIT1
FDNS	00G13_005		0 13SP	G13_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77492	107.142	GEN659107 2-ANTELOPE VALLEY UNIT2
FDNS	00G13_005		0 23SP	G13_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77289	106.6462	GEN562402 1-G12_005_3 0.6900
FDNS	00G13_005		0 13WP	G13_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77648	106.4497	FT THOMPSON - GRAND ISLAND 345KV CKT 1
FDNS	09ALLBPSON		0 13G	G13_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.78177	106.277	FT RANDAL - SIOUX CITY 230KV CKT 1
FDNS	00G13_005		0 13SP	G13_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77492	106.029	GEN562402 1-G12_005_3 0.6900
FDNS	00G13_005		0 18SP	G13_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.7552	105.8087	HOSKINS - SHELL CREEK 345KV CKT 1
FDNS	00G13_005		0 18WP	G13_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.78054	105.7974	FT RANDAL - SIOUX CITY 230KV CKT 1
FDNS	00G13_005		0 13WP	G13_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77436	105.6207	GEN640009 1-COOPER NUCLEAR STATION
FDNS	00G13_005		0 13WP	G13_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.7754	105.5817	FT RANDAL - SPENCER 115KV CKT 1
FDNS	00G13_005		0 13WP	G13_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.75018	105.5324	COLUMWEST - GRAND ISLAND 230KV CKT 1
FDNS	00G13_005		0 13WP	G13_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77678	105.5295	RASMUSN - UTICA JCT 230KV CKT 1
FDNS	00G13_005		0 13WP	G13_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77436	105.4477	GEN645012 2-NEBRASKA CITY 2
FDNS	00G13_005		0 13WP	G13_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.7754	105.3099	ONEILL - SPENCER 115KV CKT 1
FDNS	00G13_005		0 13WP	G13_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77436	105.1704	GEN532751 1-WOLF CREEK GENERATING STATION UNIT 1
FDNS	09G13_005BPSON		0 13G	G13_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.78176	105.031	FT RANDAL - SIOUX CITY 230KV CKT 1
FDNS	00G13_005		0 13WP	G13_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77457	104.9959	HANLON - STORLA 230KV CKT 1
FDNS	00G13_005		0 13WP	G13_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77592	104.6647	UTICA JCT - VFDNES 230KV CKT 1
FDNS	00G13_005		0 13WP	G13_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77448	104.6638	GAVINS POINT - HARTINGTON 115KV CKT 1
FDNS	00G13_005		0 13WP	G13_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77447	104.6516	FT THOMPSON - LETCHER 230KV CKT 1
FDNS	09G13_005		0 13G	G13_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77689	104.629	FT THOMPSON - GRAND ISLAND 345KV CKT 1
FDNS	00G13_005		0 13WP	G13_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77436	104.6175	GEN640028 1-COLUMCOGENERATION
FDNS	00G13_005		0 13WP	G13_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77459	104.6159	KEYSTONE - SIDNEY 345KV CKT 1
FDNS	00G13_005		0 18SP	G13_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77395	104.59	GEN659111 2-LELAND OLDS UNIT2
FDNS	00G13_005		0 13WP	G13_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77436	104.5748	GEN645011 1-NEBRASKA CITY 1
FDNS	09G13_005		0 13G	G13_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77466	104.5381	GEN640009 1-COOPER NUCLEAR STATION
FDNS	00G13_005		0 13WP	G13_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77436	104.5197	GEN542962 2-IATAN UNIT #2
FDNS	00G13_005		0 13WP	G13_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77508	104.4929	FT RANDAL - WHITE SWAN 115KV CKT 1
FDNS	00G13_005		0 13WP	G13_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77508	104.4699	TYNDALL - WHITE SWAN 115KV CKT 1
FDNS	09G13_005		0 13G	G13_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77618	104.4686	UTICA JCT - VFDNES 230KV CKT 1
FDNS	00G13_005		0 13WP	G13_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77436	104.4559	GEN532652 1-JEFFREY ENERGY CENTER UNIT 2
FDNS	00G13_005		0 18SP	G13_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.73008	104.4337	SHELL CREEK (SHELLCREEKT1) 345/230/13.8KV TRANSFORMER CKT 1
FDNS	00G13_005		0 13WP	G13_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.75906	104.423	COLUMEAST - NW68TH & HOLDRERE 345KV CKT 1

SOLUTION	GROUP	SCENARIO	SEASON	SOURCE	DIRECTION	MONITORED ELEMENT	RATEB		TC%LOADING		CONTINGENCY
							(MVA)	TDF	(% MVA)		
FDNS	00G13_005		0 18SP	G13_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.73008	104.4215	KELLY - SHELL CREEK 230KV CKT 1	
FDNS	00G13_005		0 13WP	G13_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77558	104.3962	SIOUX FALLS - SPLIT ROCK 230KV CKT 1	
FDNS	09G13_005		0 13G	G13_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77481	104.3848	GAVINS POINT - HARTINGTON 115KV CKT 1	
FDNS	00G13_005		0 13WP	G13_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77436	104.3605	GEN542957 1-IATAN UNIT #1	
FDNS	09G13_005		0 13G	G13_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77718	104.346	RASMUSN - UTICA JCT 230KV CKT 1	
FDNS	00G13_005		0 13WP	G13_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77436	104.2519	GEN641089 2-ENERGY CENTER 2	
FDNS	00G13_005		0 18SP	G13_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77395	104.2433	GEN659103 1-ANTELOPE VALLEY UNIT1	
FDNS	00G13_005		0 18SP	G13_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77395	104.2433	GEN659107 2-ANTELOPE VALLEY UNIT2	
FDNS	00G13_005		0 13WP	G13_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77457	104.2427	HANLON - SIOUX FALLS 230KV CKT 1	
FDNS	00G13_005		0 13WP	G13_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77464	104.2315	CARPENTER - HURON 230KV CKT 1	
FDNS	00G13_005		0 13WP	G13_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77321	104.1967	GRAND ISLAND - SWEETWATER 345KV CKT 1	
FDNS	00G13_005		0 13WP	G13_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77436	104.1792	GEN640011 2-GERALD GENTLEMAN STATION UNIT 2	
FDNS	09G13_005		0 13G	G13_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77425	104.163	PETERSBRG.N7115.00 - PETERSBURG 115KV CKT 1	
FDNS	09G13_005		0 13G	G13_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77425	104.1311	ALBION - PETERSBURG 115KV CKT 1	
FDNS	09G13_005		0 13G	G13_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77582	104.1252	SIOUX FALLS - SPLIT ROCK 230KV CKT 1	
FDNS	09G13_005		0 13G	G13_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77466	104.0172	GEN645012 2-NEBRASKA CITY 2	
FDNS	09G13_005		0 13G	G13_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77466	103.9975	GEN532751 1-WOLF CREEK GENERATING STATION UNIT 1	
FDNS	09G13_005		0 13G	G13_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77618	103.8935	SIOUX FALLS - VFDONNS 230KV CKT 1	
FDNS	09G13_005		0 13G	G13_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77466	103.8746	GEN645011 1-NEBRASKA CITY 1	
FDNS	09G13_005		0 13G	G13_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77266	103.8669	G10-51T 230.00 - HOSKINS 230KV CKT 1	
FDNS	09G13_005		0 13G	G13_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77488	103.8353	HANLON - STORLA 230KV CKT 1	
FDNS	09G13_005		0 13G	G13_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77466	103.7787	GEN640028 1-COLUMCOGENERATION	
FDNS	09G13_005		0 13G	G13_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.7749	103.7132	KEYSTONE - SIDNEY 345KV CKT 1	
FDNS	09G13_005		0 13G	G13_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77481	103.53	BELDEN - HARTINGTON 115KV CKT 1	
FDNS	09G13_005		0 13G	G13_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77466	103.4874	GEN542962 2-IATAN UNIT #2	
FDNS	09G13_005		0 13G	G13_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77554	103.4847	RASMUSN - SIOUX CITY 230KV CKT 1	
FDNS	09G13_005		0 13G	G13_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77478	103.4741	FT THOMPSON - LETCHER 230KV CKT 1	
FDNS	09ALLBPSON		0 13G	G13_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	1	103.3944	G12_005T 230.00 - MADISONCO 230.00 230KV CKT 1	
FDNS	09G13_005BPSON		0 13G	G13_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	1	103.208	G12_005T 230.00 - MADISONCO 230.00 230KV CKT 1	
FDNS	00G13_005		0 13WP	G13_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77436	103.1845	BASE CASE	
FDNS	09ALLBPSON		0 13G	G13_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77688	103.1363	FT THOMPSON - GRAND ISLAND 345KV CKT 1	
FDNS	00G13_005		0 18WP	G13_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.74965	102.966	COLUMWEST - GRAND ISLAND 230KV CKT 1	
FDNS	00G13_005		0 18SP	G13_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77395	102.7461	GEN562402 1-G12_005_3 0.6900	
FDNS	00G13_005		0 18WP	G13_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	1	102.6187	G12_005T 230.00 - MADISONCO 230.00 230KV CKT 1	
FDNS	00G13_005		0 18WP	G13_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77351	102.5729	GEN640009 1-COOPER NUCLEAR STATION	
FDNS	00G13_005		0 18WP	G13_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77453	102.5388	FT RANDAL - SPENCER 115KV CKT 1	
FDNS	09G13_005		0 13G	G13_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77466	102.5322	BASE CASE	
FDNS	09G13_005		0 13G	G13_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77466	102.5322	NC1_GEN-NEBRASKA CITY 1	
FDNS	09ALLBPSON		0 13G	G13_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77466	102.409	GEN640009 1-COOPER NUCLEAR STATION	
FDNS	00G13_005		0 13WP	G13_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	1	102.3264	G12_005T 230.00 - MADISONCO 230.00 230KV CKT 1	
FDNS	00G13_005		0 13SP	G13_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	1	102.2808	G12_005T 230.00 - MADISONCO 230.00 230KV CKT 1	
FDNS	00G13_005		0 18WP	G13_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77453	102.2649	ONEILL - SPENCER 115KV CKT 1	
FDNS	00G13_005		0 18SP	G13_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	1	102.2215	G12_005T 230.00 - MADISONCO 230.00 230KV CKT 1	
FDNS	09ALLBPSON		0 13G	G13_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77618	102.2194	UTICA JCT - VFDONNS 230KV CKT 1	
FDNS	00G13_005		0 13WP	G13_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77376	102.2062	LAKEFIELD 3 - RAUN 345KV CKT 1	
FDNS	00G13_005		0 18WP	G13_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77351	102.2004	GEN645012 2-NEBRASKA CITY 2	
FDNS	00G13_005		0 13WP	G13_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77436	102.1992	GEN652460 4-GARRISON	
FDNS	00G13_005		0 13WP	G13_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77436	102.1991	GEN652461 5-GARRISON	
FDNS	09ALLBPSON		0 13G	G13_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77425	102.1777	PETERSBRG.N7115.00 - PETERSBURG 115KV CKT 1	
FDNS	00G13_005		0 13WP	G13_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77436	102.1636	GEN652457 1-GARRISON	
FDNS	00G13_005		0 13WP	G13_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77436	102.1636	GEN652458 2-GARRISON	
FDNS	00G13_005		0 13WP	G13_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77436	102.1636	GEN652459 3-GARRISON	
FDNS	09ALLBPSON		0 13G	G13_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77425	102.1463	ALBION - PETERSBURG 115KV CKT 1	
FDNS	00G13_005		0 13WP	G13_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77436	102.1117	GEN659296 1-SDPRAIRWIND1W0.6900	
FDNS	00G13_005		0 18WP	G13_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77351	102.111	GEN532751 1-WOLF CREEK GENERATING STATION UNIT 1	
FDNS	09ALLBPSON		0 13G	G13_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77265	102.0816	G10-51T 230.00 - HOSKINS 230KV CKT 1	
FDNS	00G13_005		0 18WP	G13_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.75817	102.0508	COLUMEAST - NW68TH & HOLDREGE 345KV CKT 1	
FDNS	00G13_005		0 13WP	G13_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77512	102.0493	MAXWELL - THEDFORD 115KV CKT 1	
FDNS	00G13_005		0 23SP	G13_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	1	102.0489	G12_005T 230.00 - MADISONCO 230.00 230KV CKT 1	
FDNS	00G13_005		0 13WP	G13_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77358	102.0279	HOSKINS (HOSKINS T2) 345/230/13.8KV TRANSFORMER CKT 1	
FDNS	00G13_005		0 18WP	G13_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77592	101.9511	RASMUSN - UTICA JCT 230KV CKT 1	
FDNS	00G13_005		0 13WP	G13_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77436	101.9162	GEN652542 1-BIG BEND	
FDNS	00G13_005		0 13WP	G13_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77436	101.9162	GEN652543 3-BIG BEND	
FDNS	00G13_005		0 13WP	G13_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77436	101.9139	GEN652544 5-BIG BEND	
FDNS	00G13_005		0 13WP	G13_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77457	101.9116	ATCHSNT3 345.00 - COOPER 345KV CKT 1	
FDNS	09ALLBPSON		0 13G	G13_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77466	101.858	GEN640028 1-COLUMCOGENERATION	
FDNS	09ALLBPSON		0 13G	G13_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77582	101.8352	SIOUX FALLS - SPLIT ROCK 230KV CKT 1	
FDNS	09ALLBPSON		0 13G	G13_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77487	101.8333	HANLON - STORLA 230KV CKT 1	
FDNS	09ALLBPSON		0 13G	G13_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77466	101.8261	GEN645012 2-NEBRASKA CITY 2	
FDNS	09G13_005BPSON		0 13G	G13_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77688	101.7964	FT THOMPSON - GRAND ISLAND 345KV CKT 1	
FDNS	00G13_005		0 13WP	G13_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77263	101.7961	COLUMBUS - SCHUYLER 115KV CKT 1	

SOLUTION	GROUP	SCENARIO	SEASON	SOURCE	DIRECTION	MONITORED ELEMENT	RATEB (MVA)	TDF	TC%LOADING (% MVA)	CONTINGENCY
FDNS	09BPSO		0 13G	G13_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	1	101.748	FT RANDAL - G12_005T 230.00 230KV CKT 1
FDNS	9		0 13G	G13_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	1	101.7282	FT RANDAL - G12_005T 230.00 230KV CKT 1
FDNS	00G13_005		0 13WP	G13_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77457	101.7255	ATCHSNT3 345.00 - BOONEVILLE 345KV CKT 1
FDNS	09ALLBPSO		0 13G	G13_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77489	101.6988	KEYSTONE - SIDNEY 345KV CKT 1
FDNS	09ALLBPSO		0 13G	G13_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77466	101.694	GEN645011 1-NEBRASKA CITY 1
FDNS	09ALLBPSO		0 13G	G13_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77481	101.691	GAVINS POINT - HARTINGTON 115KV CKT 1
FDNS	09ALLBPSO		0 13G	G13_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77466	101.6829	GEN532751 1-WOLF CREEK GENERATING STATION UNIT 1
FDNS	00G13_005		0 18WP	G13_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77531	101.6756	FT THOMPSON - GRAND ISLAND 345KV CKT 1
FDNS	00G13_005		0 13WP	G13_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77436	101.6607	GEN652546 1-FT RANDAL
FDNS	09ALLBPSO		0 13G	G13_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77618	101.6387	SIoux FALLS - VFODNES 230KV CKT 1
FDNS	00G13_005		0 18WP	G13_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77351	101.6307	GEN640028 1-COLUMCOGENERATION
FDNS	00G13_005		0 18WP	G13_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77351	101.6228	GEN542962 2-IATAN UNIT #2
FDNS	00G13_005		0 18WP	G13_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77376	101.6152	HANLON - STORLA 230KV CKT 1
FDNS	09G13_005		0 13G	G13_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77444	101.5788	FALLOW 3 345.00 - GRIMES 345KV CKT 1
FDNS	09ALLBPSO		0 13G	G13_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77718	101.5708	RASMUSN - UTICA JCT 230KV CKT 1
FDNS	00G13_005		0 13WP	G13_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77512	101.5665	AINSWORTH - AINSWORTH 115KV CKT 1
FDNS	00G13_005		0 18WP	G13_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77351	101.5445	GEN645011 1-NEBRASKA CITY 1
FDNS	00G13_005		0 13WP	G13_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77436	101.5438	GEN652556 2-OAHE
FDNS	00G13_005		0 13WP	G13_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77436	101.5438	GEN652557 4-OAHE
FDNS	00G13_005		0 13WP	G13_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77436	101.5438	GEN652558 6-OAHE
FDNS	00G13_005		0 18WP	G13_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77513	101.5281	UTICA JCT - VFODNES 230KV CKT 1
FDNS	09G13_005		0 13G	G13_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77293	101.4911	COLUMBUS - SCHUYLER 115KV CKT 1
FDNS	09G13_005		0 13G	G13_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77466	101.4746	GEN659296 1-SDPRAIRWIND1W0.6900
FDNS	00G13_005		0 18WP	G13_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77363	101.4664	GAVINS POINT - HARTINGTON 115KV CKT 1
FDNS	09G13_005		0 13G	G13_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77487	101.4621	ATCHSNT3 345.00 - COOPER 345KV CKT 1
FDNS	00G13_005		0 18WP	G13_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77351	101.4452	GEN532652 1-JEFFREY ENERGY CENTER UNIT 2
FDNS	09ALLBPSO		0 13G	G13_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77478	101.4414	FT THOMPSON - LETCHER 230KV CKT 1
FDNS	00G13_005		0 13WP	G13_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.76784	101.4117	COLUMBUS - KELLY 115KV CKT 1
FDNS	00G13_005		0 13WP	G13_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.76784	101.4116	KELLY (KELLY T1) 230/115/13.2KV TRANSFORMER CKT 1
FDNS	09ALLBPSO		0 13G	G13_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77554	101.4013	RASMUSN - SIOUX CITY 230KV CKT 1
FDNS	09G13_005		0 13G	G13_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77466	101.3998	GEN652457 1-GARRISON
FDNS	09G13_005		0 13G	G13_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77466	101.3998	GEN652458 2-GARRISON
FDNS	09G13_005		0 13G	G13_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77466	101.3998	GEN652459 3-GARRISON
FDNS	09ALLBPSO		0 13G	G13_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77312	101.3875	ALBION - GENOA 115KV CKT 1
FDNS	00G13_005		0 13WP	G13_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77515	101.3787	NUNDRWD - WAYSIDE 230KV CKT 1
FDNS	00G13_005		0 13WP	G13_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77436	101.376	GEN652547 3-FT RANDAL
FDNS	00G13_005		0 13WP	G13_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77436	101.376	GEN652548 5-FT RANDAL
FDNS	00G13_005		0 13WP	G13_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77436	101.376	GEN652549 7-FT RANDAL
FDNS	09G13_005		0 13G	G13_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77421	101.3694	G10-51T 230.00 - RASMUSN 230KV CKT 1
FDNS	00G13_005		0 18WP	G13_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77366	101.357	FT THOMPSON - LETCHER 230KV CKT 1
FDNS	09G13_005BPSO		0 13G	G13_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77466	101.3551	GEN640009 1-COOPER NUCLEAR STATION
FDNS	00G13_005		0 18WP	G13_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77423	101.3377	FT RANDAL - WHITE SWAN 115KV CKT 1
FDNS	00G13_005		0 18WP	G13_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77351	101.3271	GEN640010 1-GERALD GENTLEMAN STATION UNIT 1
FDNS	09G13_005		0 13G	G13_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77466	101.3259	GEN652543 3-BIG BEND
FDNS	09G13_005		0 13G	G13_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77466	101.3223	GEN652542 1-BIG BEND
FDNS	09G13_005		0 13G	G13_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77466	101.3211	GEN652544 5-BIG BEND
FDNS	00G13_005		0 18WP	G13_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77423	101.3137	TYNDALL - WHITE SWAN 115KV CKT 1
FDNS	00G13_005		0 18WP	G13_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77372	101.2972	KEYSTONE - SIDNEY 345KV CKT 1
FDNS	00G13_005		0 18WP	G13_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77351	101.2816	GEN640011 2-GERALD GENTLEMAN STATION UNIT 2
FDNS	09G13_005		0 13G	G13_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77487	101.2741	ATCHSNT3 345.00 - BOONEVILLE 345KV CKT 1
FDNS	00G13_005		0 18WP	G13_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77351	101.2687	GEN542957 1-IATAN UNIT #1
FDNS	09G13_005		0 13G	G13_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77466	101.2395	GEN652559 1-OAHE
FDNS	09G13_005		0 13G	G13_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.7663	101.2335	HOSKINS - RAUN 345KV CKT 1
FDNS	00G13_005		0 18WP	G13_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77351	101.1884	GEN641089 2-ENERGY CENTER 2
FDNS	00G13_005		0 18WP	G13_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77244	101.1776	GRAND ISLAND - SWEETWATER 345KV CKT 1
FDNS	09G13_005		0 13G	G13_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77466	101.1374	GEN659110 1-LELAND OLDS UNIT1
FDNS	00G13_005		0 13WP	G13_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77492	101.0948	STEGALL - WAYSIDE 230KV CKT 1
FDNS	09G13_005		0 13G	G13_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.76816	101.0493	COLUMBUS - KELLY 115KV CKT 1
FDNS	09G13_005		0 13G	G13_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.76816	101.0413	KELLY (KELLY T1) 230/115/13.2KV TRANSFORMER CKT 1
FDNS	00G13_005		0 18WP	G13_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77453	101.0344	ARMOUR - FT RANDAL 115KV CKT 1
FDNS	09G13_005BPSO		0 13G	G13_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77618	100.9943	UTICA JCT - VFODNES 230KV CKT 1
FDNS	09G13_005		0 13G	G13_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77404	100.9935	LAKEFIELD 3 - RAUN 345KV CKT 1
FDNS	00G13_005		0 13WP	G13_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.78017	100.9524	FT RANDAL - LAKE PLATT 230KV CKT 1
FDNS	00G13_005		0 13WP	G13_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.7648	100.8743	COLUMEAST (COL.EAST T3) 230/115/13.8KV TRANSFORMER CKT 1
FDNS	00G13_005		0 13WP	G13_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.7648	100.8725	COLUMEAST - KELLY 230KV CKT 1
FDNS	09G13_005		0 13G	G13_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77466	100.8328	GEN652556 2-OAHE
FDNS	09G13_005BPSO		0 13G	G13_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77466	100.8	NC1_GEN-NEBRASKA CITY 1
FDNS	09G13_005BPSO		0 13G	G13_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77466	100.7598	GEN645012 2-NEBRASKA CITY 2
FDNS	09G13_005BPSO		0 13G	G13_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77466	100.7417	GEN640028 1-COLUMCOGENERATION
FDNS	09G13_005BPSO		0 13G	G13_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77487	100.7242	HANLON - STORLA 230KV CKT 1
FDNS	09G13_005		0 13G	G13_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77541	100.7236	AINSWORTH - AINSWORTH 115KV CKT 1

SOLUTION	GROUP	SCENARIO	SEASON	SOURCE	DIRECTION	MONITORED ELEMENT	RATEB (MVA)	TDF	TC%LOADING (% MVA)	CONTINGENCY
FDNS	09G13_005		0	13G	G13_005	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77466	100.7191	GEN652546 1-FT RANDAL
FDNS	09G13_005BPSON		0	13G	G13_005	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77425	100.7109	PETERSBRG.N7115.00 - PETERSBURG 115KV CKT 1
FDNS	09G13_005BPSON		0	13G	G13_005	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77425	100.6788	ALBION - PETERSBURG 115KV CKT 1
FDNS	09G13_005		0	13G	G13_005	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77522	100.6777	STEGALL - WAYSIDE 230KV CKT 1
FDNS	09G13_005		0	13G	G13_005	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77545	100.6764	NUNDRWD - WAYSIDE 230KV CKT 1
FDNS	00G13_005		0	13WP	G13_005	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.78032	100.6481	FT RANDAL - FT THOMPSON 230KV CKT 1
FDNS	00G13_005		0	23SP	G13_005	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77289	100.6294	GEN560717 1-G13_006_3 0.6900
FDNS	09G13_005BPSON		0	13G	G13_005	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77466	100.6246	GEN532751 1-WOLF CREEK GENERATING STATION UNIT 1
FDNS	09G13_005BPSON		0	13G	G13_005	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77466	100.6175	GEN645011 1-NEBRASKA CITY 1
FDNS	09G13_005BPSON		0	13G	G13_005	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77582	100.6165	SIoux FALLS - SPLIT ROCK 230KV CKT 1
FDNS	09G13_005BPSON		0	13G	G13_005	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77489	100.5852	KEYSTONE - SIDNEY 345KV CKT 1
FDNS	09G13_005BPSON		0	13G	G13_005	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77717	100.5837	RASMUSN - UTICA JCT 230KV CKT 1
FDNS	09G13_005BPSON		0	13G	G13_005	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77265	100.5277	G10-51T 230.00 - HOSKINS 230KV CKT 1
FDNS	09G13_005BPSON		0	13G	G13_005	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.7748	100.4872	GAVINS POINT - HARTINGTON 115KV CKT 1
FDNS	00G13_005		0	13WP	G13_005	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77436	100.4831	GEN659110 1-LELAND OLDS UNIT1
FDNS	09G13_005		0	13G	G13_005	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.76512	100.4595	COLUMEAST (COL.EAST T3) 230/115/13.8KV TRANSFORMER CKT 1
FDNS	09G13_005		0	13G	G13_005	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.76512	100.4475	COLUMEAST - KELLY 230KV CKT 1
FDNS	09G13_005		0	13G	G13_005	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77501	100.4091	GAVINS POINT - YANKON JCT 115KV CKT 1
FDNS	09G13_005BPSON		0	13G	G13_005	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77618	100.4081	SIoux FALLS - VFODNES 230KV CKT 1
FDNS	09G13_005		0	13G	G13_005	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77466	100.4056	GEN652547 3-FT RANDAL
FDNS	09G13_005		0	13G	G13_005	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77466	100.4056	GEN652548 5-FT RANDAL
FDNS	09G13_005		0	13G	G13_005	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77466	100.4056	GEN652549 7-FT RANDAL
FDNS	00G13_005		0	13WP	G13_005	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.78017	100.3992	FT THOMPSON - LAKE PLATT 230KV CKT 1
FDNS	09G13_005BPSON		0	13G	G13_005	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77477	100.3328	FT THOMPSON - LETCHER 230KV CKT 1
FDNS	09ALLBPSON		0	13G	G13_005	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77466	100.3284	BASE CASE
FDNS	09ALLBPSON		0	13G	G13_005	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77466	100.3284	NC1_GEN-NEBRASKA CITY 1
FDNS	00G13_005		0	13SP	G13_005	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77492	100.0882	GEN560717 1-G13_006_3 0.6900
FDNS	00G13_005		0	18WP	G13_005	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77351	100.074	BASE CASE
FDNS	09G13_005		0	13G	G13_005	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77585	100.0707	RAUN - SIOUX CITY 345KV CKT 1
FDNS	00G13_005		2	23SP	G13_005	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.7729	113.406	MADISONCO 230.00 - S_NORFOLK 230.00 230KV CKT 1
FDNS	00G13_005		2	23SP	G13_005	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.7729	113.2267	S_NORFOLK 345.00 (SNORFOLK) 345/230/13.8KV TRANSFORMER CKT 1
FDNS	00G13_005		2	13SP	G13_005	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77493	113.1148	MADISONCO 230.00 - S_NORFOLK 230.00 230KV CKT 1
FDNS	00G13_005		2	13SP	G13_005	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77493	112.7925	S_NORFOLK 345.00 (SNORFOLK) 345/230/13.8KV TRANSFORMER CKT 1
FDNS	00G13_005		2	18SP	G13_005	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77396	109.7494	MADISONCO 230.00 - S_NORFOLK 230.00 230KV CKT 1
FDNS	00G13_005		2	18SP	G13_005	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77396	109.4292	S_NORFOLK 345.00 (SNORFOLK) 345/230/13.8KV TRANSFORMER CKT 1
FDNS	00G13_005		2	13WP	G13_005	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77436	103.1808	MADISONCO 230.00 - S_NORFOLK 230.00 230KV CKT 1
FDNS	00G13_005		2	13WP	G13_005	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77436	102.8575	S_NORFOLK 345.00 (SNORFOLK) 345/230/13.8KV TRANSFORMER CKT 1
FDNS	09ALLBPSON		2	13G	G13_005	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77467	100.3015	MADISONCO 230.00 - S_NORFOLK 230.00 230KV CKT 1
FDNS	09ALLBPSON		2	13G	G13_005	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77467	100.0976	S_NORFOLK 345.00 (SNORFOLK) 345/230/13.8KV TRANSFORMER CKT 1
FDNS	00G13_005		2	18WP	G13_005	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77352	100.075	MADISONCO 230.00 - S_NORFOLK 230.00 230KV CKT 1
FDNS	09G13_005		2	13G	G13_005	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77468	100	MADISONCO 230.00 - S_NORFOLK 230.00 230KV CKT 1
FDNS	00G13_005		2	23SP	G13_005	FROM->TO MADISONCO 230.00 - S_NORFOLK 230.00 230KV CKT 1	320	0.71646	105.0224	KELLY - MADISONCO 230.00 230KV CKT 1
FDNS	00G13_005		2	13SP	G13_005	FROM->TO MADISONCO 230.00 - S_NORFOLK 230.00 230KV CKT 1	320	0.71595	104.0177	KELLY - MADISONCO 230.00 230KV CKT 1
FDNS	00G13_005		2	18SP	G13_005	FROM->TO MADISONCO 230.00 - S_NORFOLK 230.00 230KV CKT 1	320	0.71537	100.6537	KELLY - MADISONCO 230.00 230KV CKT 1
FDNS	00G13_005		2	23SP	G13_005	FROM->TO S_NORFOLK 345.00 (SNORFOLK) 345/230/13.8KV TRANSFORMER CKT 1	336	0.71646	101.6138	KELLY - MADISONCO 230.00 230KV CKT 1
FDNS	00G13_005		2	13SP	G13_005	FROM->TO S_NORFOLK 345.00 (SNORFOLK) 345/230/13.8KV TRANSFORMER CKT 1	336	0.71595	100.4225	KELLY - MADISONCO 230.00 230KV CKT 1
FDNS	09ALLBPSON		0	13G	G13_006	TO->FROM FT RANDAL - G12_005T 230.00 230KV CKT 1	320	1	127.7744	KELLY - MADISONCO 230.00 230KV CKT 1
FDNS	09G13_006BPSON		0	13G	G13_006	TO->FROM FT RANDAL - G12_005T 230.00 230KV CKT 1	320	1	127.7595	KELLY - MADISONCO 230.00 230KV CKT 1
FDNS	00G13_006		0	13SP	G13_006	TO->FROM FT RANDAL - G12_005T 230.00 230KV CKT 1	320	1	127.7044	KELLY - MADISONCO 230.00 230KV CKT 1
FDNS	00G13_006		0	18SP	G13_006	TO->FROM FT RANDAL - G12_005T 230.00 230KV CKT 1	320	1	127.5891	KELLY - MADISONCO 230.00 230KV CKT 1
FDNS	00G13_006		0	13WP	G13_006	TO->FROM FT RANDAL - G12_005T 230.00 230KV CKT 1	320	1	127.5269	KELLY - MADISONCO 230.00 230KV CKT 1
FDNS	00G13_006		0	23SP	G13_006	TO->FROM FT RANDAL - G12_005T 230.00 230KV CKT 1	320	1	127.4993	KELLY - MADISONCO 230.00 230KV CKT 1
FDNS	00G13_006		0	18WP	G13_006	TO->FROM FT RANDAL - G12_005T 230.00 230KV CKT 1	320	1	127.4004	KELLY - MADISONCO 230.00 230KV CKT 1
FDNS	09G13_006		0	13G	G13_006	TO->FROM FT RANDAL - G12_005T 230.00 230KV CKT 1	320	1	122.1794	KELLY - MADISONCO 230.00 230KV CKT 1
FDNS	09BPSON		0	13G	G13_006	TO->FROM FT RANDAL - G12_005T 230.00 230KV CKT 1	320	1	100.7094	KELLY - MADISONCO 230.00 230KV CKT 1
FDNS	9		0	13G	G13_006	TO->FROM FT RANDAL - G12_005T 230.00 230KV CKT 1	320	1	100.2819	KELLY - MADISONCO 230.00 230KV CKT 1
FDNS	09ALLBPSON		0	13G	G13_006	TO->FROM G12_005T 230.00 - MADISONCO 230.00 230KV CKT 1	320	1	105.3265	KELLY - MADISONCO 230.00 230KV CKT 1
FDNS	09G13_006BPSON		0	13G	G13_006	TO->FROM G12_005T 230.00 - MADISONCO 230.00 230KV CKT 1	320	1	105.3137	KELLY - MADISONCO 230.00 230KV CKT 1
FDNS	00G13_006		0	13SP	G13_006	TO->FROM G12_005T 230.00 - MADISONCO 230.00 230KV CKT 1	320	1	105.1503	KELLY - MADISONCO 230.00 230KV CKT 1
FDNS	00G13_006		0	18SP	G13_006	TO->FROM G12_005T 230.00 - MADISONCO 230.00 230KV CKT 1	320	1	105.04	KELLY - MADISONCO 230.00 230KV CKT 1
FDNS	00G13_006		0	13WP	G13_006	TO->FROM G12_005T 230.00 - MADISONCO 230.00 230KV CKT 1	320	1	104.983	KELLY - MADISONCO 230.00 230KV CKT 1
FDNS	00G13_006		0	23SP	G13_006	TO->FROM G12_005T 230.00 - MADISONCO 230.00 230KV CKT 1	320	1	104.9582	KELLY - MADISONCO 230.00 230KV CKT 1
FDNS	00G13_006		0	18WP	G13_006	TO->FROM G12_005T 230.00 - MADISONCO 230.00 230KV CKT 1	320	1	104.8681	KELLY - MADISONCO 230.00 230KV CKT 1
FDNS	09G13_006		0	13G	G13_006	TO->FROM G12_005T 230.00 - MADISONCO 230.00 230KV CKT 1	320	1	104.7438	KELLY - MADISONCO 230.00 230KV CKT 1
FDNS	09ALLBPSON		0	13G	G13_006	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	1	127.9705	FT RANDAL - G12_005T 230.00 230KV CKT 1
FDNS	09G13_006BPSON		0	13G	G13_006	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	1	127.696	FT RANDAL - G12_005T 230.00 230KV CKT 1
FDNS	00G13_006		0	18WP	G13_006	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	1	126.7439	FT RANDAL - G12_005T 230.00 230KV CKT 1
FDNS	00G13_006		0	13WP	G13_006	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	1	126.594	FT RANDAL - G12_005T 230.00 230KV CKT 1
FDNS	00G13_006		0	13SP	G13_006	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	1	126.5664	FT RANDAL - G12_005T 230.00 230KV CKT 1
FDNS	00G13_006		0	18SP	G13_006	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	1	126.524	FT RANDAL - G12_005T 230.00 230KV CKT 1
FDNS	00G13_006		0	23SP	G13_006	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	1	126.3746	FT RANDAL - G12_005T 230.00 230KV CKT 1

SOLUTION	GROUP	SCENARIO	SEASON	SOURCE	DIRECTION	MONITORED ELEMENT	RATEB		TC%LOADING		CONTINGENCY			
							(MVA)	TDF	(% MVA)					
FDNS	00G13_006		0	13SP	G13_006	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1	320	0.78442	123.7215	FT RANDAL - UTICA JCT 230KV CKT 1
FDNS	00G13_006		0	23SP	G13_006	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1	320	0.7824	123.3076	FT RANDAL - UTICA JCT 230KV CKT 1
FDNS	09G13_006		0	13G	G13_006	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1	320	1	122.036	FT RANDAL - G12_005T 230.00 230KV CKT 1
FDNS	00G13_006		0	13SP	G13_006	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1	320	0.78197	119.7861	FT RANDAL - SIOUX CITY 230KV CKT 1
FDNS	00G13_006		0	13SP	G13_006	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1	320	0.77727	119.7278	FT THOMPSON - GRAND ISLAND 345KV CKT 1
FDNS	00G13_006		0	23SP	G13_006	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1	320	0.77976	119.3247	FT RANDAL - SIOUX CITY 230KV CKT 1
FDNS	00G13_006		0	18SP	G13_006	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1	320	0.78354	119.0896	FT RANDAL - UTICA JCT 230KV CKT 1
FDNS	00G13_006		0	23SP	G13_006	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1	320	0.77243	117.9922	GRAND ISLAND - HOLT.CO3 345.00 345KV CKT 1
FDNS	00G13_006		0	23SP	G13_006	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1	320	0.77396	117.5942	FT RANDAL - SPENCER 115KV CKT 1
FDNS	00G13_006		0	23SP	G13_006	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1	320	0.77562	117.442	FT THOMPSON - HOLT.CO3 345.00 345KV CKT 1
FDNS	00G13_006		0	23SP	G13_006	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1	320	0.77396	117.3607	ONEILL - SPENCER 115KV CKT 1
FDNS	00G13_006		0	13SP	G13_006	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1	320	0.77599	117.2678	FT RANDAL - SPENCER 115KV CKT 1
FDNS	00G13_006		0	13SP	G13_006	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1	320	0.77599	117.0512	ONEILL - SPENCER 115KV CKT 1
FDNS	00G13_006		0	23SP	G13_006	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1	320	0.76504	116.3527	HOSKINS - RAUN 345KV CKT 1
FDNS	00G13_006		0	23SP	G13_006	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1	320	0.77289	116.135	GEN640009 1-COOPER NUCLEAR STATION
FDNS	00G13_006		0	23SP	G13_006	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1	320	0.77289	115.9192	GEN532751 1-WOLF CREEK GENERATING STATION UNIT 1
FDNS	00G13_006		0	13SP	G13_006	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1	320	0.77741	115.7699	RASMUSN - UTICA JCT 230KV CKT 1
FDNS	00G13_006		0	23SP	G13_006	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1	320	0.77289	115.7025	GEN645012 2-NEBRASKA CITY 2
FDNS	00G13_006		0	23SP	G13_006	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1	320	0.77519	115.688	RASMUSN - UTICA JCT 230KV CKT 1
FDNS	00G13_006		0	13SP	G13_006	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1	320	0.77492	115.6662	GEN640009 1-COOPER NUCLEAR STATION
FDNS	00G13_006		0	13SP	G13_006	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1	320	0.76664	115.6068	HOSKINS - RAUN 345KV CKT 1
FDNS	00G13_006		0	23SP	G13_006	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1	320	0.77289	115.5844	GEN645011 1-NEBRASKA CITY 1
FDNS	00G13_006		0	13SP	G13_006	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1	320	0.77492	115.516	GEN532751 1-WOLF CREEK GENERATING STATION UNIT 1
FDNS	00G13_006		0	13SP	G13_006	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1	320	0.77492	115.4857	GEN645012 2-NEBRASKA CITY 2
FDNS	00G13_006		0	13SP	G13_006	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1	320	0.77492	115.372	GEN645011 1-NEBRASKA CITY 1
FDNS	00G13_006		0	23SP	G13_006	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1	320	0.77289	115.342	GEN542962 2-IATAN UNIT #2
FDNS	00G13_006		0	18SP	G13_006	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1	320	0.78096	115.2834	FT RANDAL - SIOUX CITY 230KV CKT 1
FDNS	00G13_006		0	23SP	G13_006	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1	320	0.77289	115.0909	GEN640010 1-GERALD GENTLEMAN STATION UNIT 1
FDNS	00G13_006		0	23SP	G13_006	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1	320	0.77289	115.0329	GEN640011 2-GERALD GENTLEMAN STATION UNIT 2
FDNS	00G13_006		0	23SP	G13_006	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1	320	0.77289	115.0299	GEN542957 1-IATAN UNIT #1
FDNS	00G13_006		0	23SP	G13_006	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1	320	0.77289	115.0288	GEN532651 1-JEFFREY ENERGY CENTER UNIT 1
FDNS	00G13_006		0	23SP	G13_006	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1	320	0.77289	115.0273	GEN532653 1-JEFFREY ENERGY CENTER UNIT 3
FDNS	00G13_006		0	23SP	G13_006	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1	320	0.77289	115.0271	GEN532652 1-JEFFREY ENERGY CENTER UNIT 2
FDNS	00G13_006		0	13SP	G13_006	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1	320	0.77492	115.0108	GEN542962 2-IATAN UNIT #2
FDNS	00G13_006		0	23SP	G13_006	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1	320	0.77311	114.903	HANLON - STORLA 230KV CKT 1
FDNS	00G13_006		0	23SP	G13_006	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1	320	0.77361	114.8518	FT RANDAL - WHITE SWAN 115KV CKT 1
FDNS	00G13_006		0	23SP	G13_006	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1	320	0.77289	114.8435	GEN542955 1-LACYGNE UNIT #1
FDNS	00G13_006		0	13SP	G13_006	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1	320	0.77512	114.8395	HANLON - STORLA 230KV CKT 1
FDNS	00G13_006		0	23SP	G13_006	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1	320	0.77361	114.8308	TYNDALL - WHITE SWAN 115KV CKT 1
FDNS	00G13_006		0	23SP	G13_006	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1	320	0.77289	114.7236	GEN640028 1-COLUMCOGENERATION
FDNS	00G13_006		0	13SP	G13_006	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1	320	0.77492	114.7038	GEN542957 1-IATAN UNIT #1
FDNS	00G13_006		0	23SP	G13_006	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1	320	0.77289	114.69	GEN542956 2-LACYGNE UNIT #2
FDNS	00G13_006		0	13SP	G13_006	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1	320	0.77492	114.6882	GEN532651 1-JEFFREY ENERGY CENTER UNIT 1
FDNS	00G13_006		0	13SP	G13_006	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1	320	0.77492	114.678	GEN532653 1-JEFFREY ENERGY CENTER UNIT 3
FDNS	00G13_006		0	13SP	G13_006	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1	320	0.77492	114.6779	GEN532652 1-JEFFREY ENERGY CENTER UNIT 2
FDNS	00G13_006		0	23SP	G13_006	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1	320	0.77298	114.6636	GAVINS POINT - HARTINGTON 115KV CKT 1
FDNS	00G13_006		0	13SP	G13_006	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1	320	0.77492	114.6431	GEN640010 1-GERALD GENTLEMAN STATION UNIT 1
FDNS	00G13_006		0	23SP	G13_006	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1	320	0.77305	114.6279	KEYSTONE - SIDNEY 345KV CKT 1
FDNS	00G13_006		0	23SP	G13_006	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1	320	0.75787	114.6264	COLUMEAST - NW68TH & HOLDREGE 345KV CKT 1
FDNS	00G13_006		0	13SP	G13_006	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1	320	0.77516	114.6195	KEYSTONE - SIDNEY 345KV CKT 1
FDNS	00G13_006		0	13SP	G13_006	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1	320	0.77502	114.6138	FT THOMPSON - LETCHER 230KV CKT 1
FDNS	00G13_006		0	23SP	G13_006	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1	320	0.77289	114.5956	GEN641089 2-ENERGY CENTER 2
FDNS	00G13_006		0	23SP	G13_006	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1	320	0.77289	114.5864	GEN542951 5-HAWTHORN UNIT #5
FDNS	00G13_006		0	23SP	G13_006	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1	320	0.77302	114.584	FT THOMPSON - LETCHER 230KV CKT 1
FDNS	00G13_006		0	23SP	G13_006	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1	320	0.77289	114.5798	GEN645001 1-FORT CALHOUN 1
FDNS	00G13_006		0	13SP	G13_006	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1	320	0.77564	114.5576	FT RANDAL - WHITE SWAN 115KV CKT 1
FDNS	00G13_006		0	13SP	G13_006	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1	320	0.77564	114.5475	TYNDALL - WHITE SWAN 115KV CKT 1
FDNS	00G13_006		0	13SP	G13_006	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1	320	0.77492	114.5394	GEN640011 2-GERALD GENTLEMAN STATION UNIT 2
FDNS	00G13_006		0	13SP	G13_006	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1	320	0.77506	114.4937	GAVINS POINT - HARTINGTON 115KV CKT 1
FDNS	00G13_006		0	23SP	G13_006	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1	320	0.77447	114.4368	UTICA JCT - VFODNES 230KV CKT 1
FDNS	00G13_006		0	13SP	G13_006	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1	320	0.77492	114.4327	GEN640028 1-COLUMCOGENERATION
FDNS	00G13_006		0	23SP	G13_006	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1	320	0.77289	114.4231	GEN525562 1-TOLK GEN #2 24 KV
FDNS	00G13_006		0	23SP	G13_006	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1	320	0.77184	114.3874	103RD & ROKEBY - SUB 3458 NEB CTY 345KV CKT 1
FDNS	00G13_006		0	13SP	G13_006	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1	320	0.77492	114.3834	GEN542955 1-LACYGNE UNIT #1
FDNS	00G13_006		0	13SP	G13_006	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1	320	0.77492	114.3724	GEN542956 2-LACYGNE UNIT #2
FDNS	00G13_006		0	13SP	G13_006	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1	320	0.77485	114.3562	SPLIT ROCK TAP - WHITE 345KV CKT 1
FDNS	00G13_006		0	23SP	G13_006	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1	320	0.773	114.3423	PAHOJA - SIOUX FALLS 230KV CKT 1
FDNS	00G13_006		0	13SP	G13_006	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1	320	0.77492	114.3395	GEN641089 2-ENERGY CENTER 2
FDNS	00G13_006		0	13SP	G13_006	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1	320	0.77492	114.2095	GEN542951 5-HAWTHORN UNIT #5
FDNS	00G13_006		0	13SP	G13_006	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1	320	0.77476	114.1975	BLOOMFIELD - GAVINS POINT 115KV CKT 1
FDNS	00G13_006		0	13SP	G13_006	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1	320	0.7751	114.1932	PAHOJA - SIOUX FALLS 230KV CKT 1

SOLUTION	GROUP	SCENARIO	SEASON	SOURCE	DIRECTION	MONITORED ELEMENT	RATEB (MVA)	TDF	TC%LOADING (% MVA)	CONTINGENCY
FDNS	00G13_006		0	13SP	G13_006	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77476	114.1901	BLOOMFIELD - CREIGHTON 115KV CKT 1
FDNS	00G13_006		0	13SP	G13_006	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77492	114.1639	CLEARWATER - ONEILL 115KV CKT 1
FDNS	00G13_006		0	13SP	G13_006	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77512	114.1439	HANLON - SIOUX FALLS 230KV CKT 1
FDNS	00G13_006		0	13SP	G13_006	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77643	114.1344	UTICA JCT - VFODNES 230KV CKT 1
FDNS	00G13_006		0	13SP	G13_006	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77535	114.1094	ARPIN - EAU CLAIRE 345KV CKT 1
FDNS	00G13_006		0	18SP	G13_006	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77592	114.089	FT THOMPSON - GRAND ISLAND 345KV CKT 1
FDNS	00G13_006		0	18SP	G13_006	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77499	113.873	FT RANDAL - SPENCER 115KV CKT 1
FDNS	00G13_006		0	18SP	G13_006	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77499	113.6729	ONEILL - SPENCER 115KV CKT 1
FDNS	00G13_006		0	13WP	G13_006	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.7839	113.5615	FT RANDAL - UTICA JCT 230KV CKT 1
FDNS	00G13_006		0	23SP	G13_006	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77289	113.4003	BASE CASE
FDNS	00G13_006		0	13SP	G13_006	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77492	113.0744	BASE CASE
FDNS	00G13_006		0	23SP	G13_006	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77289	112.4587	GEN652457 1-GARRISON
FDNS	00G13_006		0	23SP	G13_006	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77289	112.4587	GEN652458 2-GARRISON
FDNS	00G13_006		0	23SP	G13_006	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77289	112.4587	GEN652459 3-GARRISON
FDNS	00G13_006		0	23SP	G13_006	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77111	112.4286	COLUMBUS - SCHUYLER 115KV CKT 1
FDNS	00G13_006		0	18SP	G13_006	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77395	112.4171	GEN640009 1-COOPER NUCLEAR STATION
FDNS	00G13_006		0	23SP	G13_006	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77346	112.3893	NUNDRWD - WAYSIDE 230KV CKT 1
FDNS	00G13_006		0	18SP	G13_006	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77395	112.3308	GEN532751 1-WOLF CREEK GENERATING STATION UNIT 1
FDNS	00G13_006		0	23SP	G13_006	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77289	112.2637	GEN652542 1-BIG BEND
FDNS	00G13_006		0	23SP	G13_006	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77289	112.2637	GEN652543 3-BIG BEND
FDNS	00G13_006		0	23SP	G13_006	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77289	112.2419	GEN652544 5-BIG BEND
FDNS	00G13_006		0	23SP	G13_006	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77309	112.2067	ATCHSNT3 345.00 - COOPER 345KV CKT 1
FDNS	00G13_006		0	23SP	G13_006	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77175	112.2047	COLUMBUS - GENOA 115KV CKT 1
FDNS	00G13_006		0	23SP	G13_006	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77309	112.0943	ATCHSNT3 345.00 - BOONEVILLE 345KV CKT 1
FDNS	00G13_006		0	18SP	G13_006	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.76553	112.0785	HOSKINS - RAUN 345KV CKT 1
FDNS	00G13_006		0	13SP	G13_006	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77416	112.0177	HOSKINS (HOSKINS T2) 345/230/13.8KV TRANSFORMER CKT 1
FDNS	00G13_006		0	13SP	G13_006	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77492	111.9981	GEN652460 4-GARRISON
FDNS	00G13_006		0	23SP	G13_006	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.773	111.9941	NELIGH.EAST3345.00 (NELIGH.E T1) 345/115/13.8KV TRANSFORMER CKT 1
FDNS	00G13_006		0	18SP	G13_006	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77395	111.9861	GEN645012 2-NEBRASKA CITY 2
FDNS	00G13_006		0	13SP	G13_006	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.7757	111.9633	AINSWORTH - CALAMUS 115KV CKT 1
FDNS	00G13_006		0	13SP	G13_006	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.7757	111.9446	CALAMUS - THEDFORD 115KV CKT 1
FDNS	00G13_006		0	13SP	G13_006	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77318	111.9219	COLUMBUS - SCHUYLER 115KV CKT 1
FDNS	00G13_006		0	13SP	G13_006	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77492	111.9159	GEN652457 1-GARRISON
FDNS	00G13_006		0	13SP	G13_006	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77492	111.9159	GEN652458 2-GARRISON
FDNS	00G13_006		0	13SP	G13_006	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77492	111.9159	GEN652459 3-GARRISON
FDNS	00G13_006		0	18SP	G13_006	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77395	111.873	GEN645011 1-NEBRASKA CITY 1
FDNS	00G13_006		0	23SP	G13_006	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.7734	111.8601	MAXWELL - STAPLETON 115KV CKT 1
FDNS	00G13_006		0	23SP	G13_006	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.773	111.841	HOSKINS - NELIGH.EAST3345.00 345KV CKT 1
FDNS	00G13_006		0	13SP	G13_006	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.7757	111.8237	AINSWORTH - AINSWORTH 115KV CKT 1
FDNS	00G13_006		0	13SP	G13_006	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77513	111.8219	ATCHSNT3 345.00 - COOPER 345KV CKT 1
FDNS	00G13_006		0	23SP	G13_006	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77329	111.8116	STEGALL - WAYSIDE 230KV CKT 1
FDNS	00G13_006		0	13SP	G13_006	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77432	111.7925	LAKEFIELD 3 - RAUN 345KV CKT 1
FDNS	00G13_006		0	13SP	G13_006	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77492	111.7863	GEN652542 1-BIG BEND
FDNS	00G13_006		0	13SP	G13_006	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77492	111.7863	GEN652543 3-BIG BEND
FDNS	00G13_006		0	13SP	G13_006	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77492	111.7849	GEN652544 5-BIG BEND
FDNS	00G13_006		0	13SP	G13_006	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77337	111.7826	ALBION - GENOA 115KV CKT 1
FDNS	00G13_006		0	18SP	G13_006	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77636	111.7724	RASMUSN - UTICA JCT 230KV CKT 1
FDNS	00G13_006		0	23SP	G13_006	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77289	111.7527	GEN652556 2-OAHE
FDNS	00G13_006		0	23SP	G13_006	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77289	111.7527	GEN652557 4-OAHE
FDNS	00G13_006		0	23SP	G13_006	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77289	111.7527	GEN652558 6-OAHE
FDNS	00G13_006		0	13SP	G13_006	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.7757	111.7312	MAXWELL - THEDFORD 115KV CKT 1
FDNS	00G13_006		0	13SP	G13_006	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77513	111.7122	ATCHSNT3 345.00 - BOONEVILLE 345KV CKT 1
FDNS	00G13_006		0	18SP	G13_006	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77395	111.6961	GEN542962 2-IATAN UNIT #2
FDNS	00G13_006		0	23SP	G13_006	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77289	111.6794	GEN652546 1-FT RANDAL
FDNS	00G13_006		0	13SP	G13_006	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77492	111.6308	GEN652559 1-OAHE
FDNS	00G13_006		0	23SP	G13_006	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77289	111.5771	GEN659296 1-SDPRAIRWIND1W0.6900
FDNS	00G13_006		0	18SP	G13_006	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77395	111.5705	GEN640010 1-GERALD GENTLEMAN STATION UNIT 1
FDNS	00G13_006		0	23SP	G13_006	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77859	111.4423	FT RANDAL - LAKE PLATT 230KV CKT 1
FDNS	00G13_006		0	23SP	G13_006	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.76647	111.4298	KELLY (KELLY T1) 230/115/13.2KV TRANSFORMER CKT 1
FDNS	00G13_006		0	23SP	G13_006	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.76647	111.4282	COLUMBUS - KELLY 115KV CKT 1
FDNS	00G13_006		0	13SP	G13_006	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77552	111.4195	STEGALL - WAYSIDE 230KV CKT 1
FDNS	00G13_006		0	18SP	G13_006	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77395	111.4119	GEN532651 1-JEFFREY ENERGY CENTER UNIT 1
FDNS	00G13_006		0	18SP	G13_006	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77395	111.407	GEN532653 1-JEFFREY ENERGY CENTER UNIT 3
FDNS	00G13_006		0	18SP	G13_006	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77395	111.4069	GEN532652 1-JEFFREY ENERGY CENTER UNIT 2
FDNS	00G13_006		0	18SP	G13_006	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77395	111.406	GEN640011 2-GERALD GENTLEMAN STATION UNIT 2
FDNS	00G13_006		0	23SP	G13_006	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77289	111.406	GEN652547 3-FT RANDAL
FDNS	00G13_006		0	23SP	G13_006	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77289	111.406	GEN652548 5-FT RANDAL
FDNS	00G13_006		0	23SP	G13_006	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77289	111.406	GEN652549 7-FT RANDAL
FDNS	00G13_006		0	18SP	G13_006	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77395	111.3851	GEN542957 1-IATAN UNIT #1
FDNS	00G13_006		0	23SP	G13_006	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77386	111.3195	RAUN - SIOUX CITY 345KV CKT 1
FDNS	00G13_006		0	18SP	G13_006	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77395	111.2265	GEN542955 1-LACYGNE UNIT #1

SOLUTION	GROUP	SCENARIO	SEASON	SOURCE	DIRECTION	MONITORED ELEMENT	RATEB (MVA)	TDF	TC%LOADING (% MVA)	CONTINGENCY
FDNS	00G13_006		0	13SP	G13_006	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77492	111.2199	GEN652556 2-OAHE
FDNS	00G13_006		0	13SP	G13_006	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77492	111.2199	GEN652557 4-OAHE
FDNS	00G13_006		0	13SP	G13_006	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77492	111.2199	GEN652558 6-OAHE
FDNS	00G13_006		0	13SP	G13_006	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77492	111.1689	GEN652546 1-FT RANDAL
FDNS	00G13_006		0	18SP	G13_006	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77466	111.1183	FT RANDAL - WHITE SWAN 115KV CKT 1
FDNS	00G13_006		0	13SP	G13_006	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77337	111.1157	COLUMBUS - GENOA 115KV CKT 1
FDNS	00G13_006		0	23SP	G13_006	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77289	111.1098	GEN659110 1-LELAND OLDS UNIT1
FDNS	00G13_006		0	18SP	G13_006	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77466	111.1	TYNDALL - WHITE SWAN 115KV CKT 1
FDNS	00G13_006		0	13SP	G13_006	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.76841	111.0833	KELLY (KELLY T1) 230/115/13.2KV TRANSFORMER CKT 1
FDNS	00G13_006		0	13SP	G13_006	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.76841	111.073	COLUMBUS - KELLY 115KV CKT 1
FDNS	00G13_006		0	18SP	G13_006	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77395	111.0657	GEN542956 2-LACYGNE UNIT #2
FDNS	00G13_006		0	23SP	G13_006	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.76339	111.0396	COLUMEAST - KELLY 230KV CKT 1
FDNS	00G13_006		0	23SP	G13_006	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.76339	111.0369	COLUMEAST (COL.EAST T3) 230/115/13.8KV TRANSFORMER CKT 1
FDNS	00G13_006		0	13SP	G13_006	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77492	111.0302	GEN652547 3-FT RANDAL
FDNS	00G13_006		0	13SP	G13_006	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77492	111.0302	GEN652548 5-FT RANDAL
FDNS	00G13_006		0	13SP	G13_006	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77492	111.0302	GEN652549 7-FT RANDAL
FDNS	00G13_006		0	18SP	G13_006	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77417	111.0226	KEYSTONE - SIDNEY 345KV CKT 1
FDNS	00G13_006		0	23SP	G13_006	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77873	111.0142	FT RANDAL - FT THOMPSON 230KV CKT 1
FDNS	00G13_006		0	23SP	G13_006	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77289	111.0121	GEN659285 1-DEERCREEK 1G13.800
FDNS	00G13_006		0	18SP	G13_006	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77419	111.004	HANLON - STORLA 230KV CKT 1
FDNS	00G13_006		0	18SP	G13_006	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77395	110.9555	GEN640028 1-COLUMCOGENERATION
FDNS	00G13_006		0	18SP	G13_006	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77395	110.9458	GEN542951 5-HAWTHORN UNIT #5
FDNS	00G13_006		0	18SP	G13_006	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77395	110.9249	GEN641089 2-ENERGY CENTER 2
FDNS	00G13_006		0	18SP	G13_006	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77407	110.9167	GAVINS POINT - HARTINGTON 115KV CKT 1
FDNS	00G13_006		0	18SP	G13_006	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77409	110.858	FT THOMPSON - LETCHER 230KV CKT 1
FDNS	00G13_006		0	18SP	G13_006	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77395	110.8538	GEN645001 1-FORT CALHOUN 1
FDNS	00G13_006		0	23SP	G13_006	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77859	110.7691	FT THOMPSON - LAKE PLATT 230KV CKT 1
FDNS	00G13_006		0	18SP	G13_006	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77395	110.7583	GEN525562 1-TOLK GEN #2 24 KV
FDNS	00G13_006		0	18SP	G13_006	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77555	110.7388	UTICA JCT - VFODNES 230KV CKT 1
FDNS	00G13_006		0	18SP	G13_006	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77395	110.7055	GEN514806 1-SOONER UNIT 2
FDNS	00G13_006		0	18SP	G13_006	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77395	110.7	GEN514805 1-SOONER UNIT 1
FDNS	00G13_006		0	13SP	G13_006	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.76539	110.5838	COLUMEAST (COL.EAST T3) 230/115/13.8KV TRANSFORMER CKT 1
FDNS	00G13_006		0	13SP	G13_006	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.76539	110.5799	COLUMEAST - KELLY 230KV CKT 1
FDNS	09G13_006		0	13G	G13_006	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.78423	110.5747	FT RANDAL - UTICA JCT 230KV CKT 1
FDNS	00G13_006		0	13SP	G13_006	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77492	110.3143	GEN659110 1-LELAND OLDS UNIT1
FDNS	00G13_006		0	13SP	G13_006	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.78069	110.1559	FT RANDAL - LAKE PLATT 230KV CKT 1
FDNS	00G13_006		0	13SP	G13_006	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77492	110.0975	GEN659285 1-DEERCREEK 1G13.800
FDNS	00G13_006		0	13SP	G13_006	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.7761	109.9097	RAUN - SIOUX CITY 345KV CKT 1
FDNS	00G13_006		0	13SP	G13_006	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.78084	109.8014	FT RANDAL - FT THOMPSON 230KV CKT 1
FDNS	00G13_006		0	18SP	G13_006	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77395	109.7453	BASE CASE
FDNS	00G13_006		0	18WP	G13_006	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.78314	109.7048	FT RANDAL - UTICA JCT 230KV CKT 1
FDNS	00G13_006		0	13WP	G13_006	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.78136	109.6936	FT RANDAL - SIOUX CITY 230KV CKT 1
FDNS	00G13_006		0	13SP	G13_006	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.78069	109.481	FT THOMPSON - LAKE PLATT 230KV CKT 1
FDNS	00G13_006		0	13SP	G13_006	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.75638	109.2652	HOSKINS - SHELL CREEK 345KV CKT 1
FDNS	00G13_006		0	18SP	G13_006	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77395	108.7498	GEN652460 4-GARRISON
FDNS	00G13_006		0	18SP	G13_006	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77395	108.7069	GEN652457 1-GARRISON
FDNS	00G13_006		0	18SP	G13_006	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77395	108.7069	GEN652458 2-GARRISON
FDNS	00G13_006		0	18SP	G13_006	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77395	108.7069	GEN652459 3-GARRISON
FDNS	00G13_006		0	18SP	G13_006	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77459	108.7025	STAPLETON - THEDFORD 115KV CKT 1
FDNS	00G13_006		0	18SP	G13_006	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77318	108.6959	HOSKINS (HOSKINS T2) 345/230/13.8KV TRANSFORMER CKT 1
FDNS	00G13_006		0	18SP	G13_006	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77459	108.6718	AINSWORTH - AINSWORTH 115KV CKT 1
FDNS	00G13_006		0	23SP	G13_006	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77289	108.6562	GEN659111 2-LELAND OLDS UNIT2
FDNS	09G13_006		0	13G	G13_006	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.78177	108.6367	FT RANDAL - SIOUX CITY 230KV CKT 1
FDNS	00G13_006		0	18SP	G13_006	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77219	108.5784	COLUMBUS - SCHUYLER 115KV CKT 1
FDNS	00G13_006		0	18SP	G13_006	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77395	108.5157	GEN652542 1-BIG BEND
FDNS	00G13_006		0	18SP	G13_006	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77395	108.5157	GEN652543 3-BIG BEND
FDNS	00G13_006		0	18SP	G13_006	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77395	108.4927	GEN652544 5-BIG BEND
FDNS	09ALLBPSO		0	13G	G13_006	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.78422	108.4868	FT RANDAL - UTICA JCT 230KV CKT 1
FDNS	00G13_006		0	18SP	G13_006	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77425	108.471	ATCHSNT3 345.00 - COOPER 345KV CKT 1
FDNS	00G13_006		0	23SP	G13_006	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.75385	108.4521	HOSKINS - SHELL CREEK 345KV CKT 1
FDNS	00G13_006		0	18SP	G13_006	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77242	108.4311	ALBION - GENOA 115KV CKT 1
FDNS	00G13_006		0	18SP	G13_006	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77425	108.3569	ATCHSNT3 345.00 - BOONEVILLE 345KV CKT 1
FDNS	00G13_006		0	18SP	G13_006	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77472	108.3277	NUNDRWD - WAYSIDE 230KV CKT 1
FDNS	00G13_006		0	23SP	G13_006	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77289	108.3266	GEN659103 1-ANTELOPE VALLEY UNIT1
FDNS	00G13_006		0	23SP	G13_006	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77289	108.3266	GEN659107 2-ANTELOPE VALLEY UNIT2
FDNS	00G13_006		0	18SP	G13_006	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77957	108.2845	FT RANDAL - LAKE PLATT 230KV CKT 1
FDNS	00G13_006		0	18SP	G13_006	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77459	107.9749	MAXWELL - STAPLETON 115KV CKT 1
FDNS	00G13_006		0	18SP	G13_006	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77395	107.9741	GEN652546 1-FT RANDAL
FDNS	00G13_006		0	18SP	G13_006	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77395	107.9599	GEN652556 2-OAHE
FDNS	00G13_006		0	18SP	G13_006	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77395	107.9599	GEN652557 4-OAHE
FDNS	00G13_006		0	18SP	G13_006	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77395	107.9599	GEN652558 6-OAHE

SOLUTION	GROUP	SCENARIO	SEASON	SOURCE	DIRECTION	MONITORED ELEMENT	RATEB		TC%LOADING		CONTINGENCY
							(MVA)	TDF	(% MVA)		
FDNS	00G13_006		0	18SP	G13_006	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77971	107.937	FT RANDAL - FT THOMPSON 230KV CKT 1	
FDNS	00G13_006		0	23SP	G13_006	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.72865	107.8621	SHELL CREEK (SHELLCREEKT1) 345/230/13.8KV TRANSFORMER CKT 1	
FDNS	00G13_006		0	23SP	G13_006	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.72865	107.8564	KELLY - SHELL CREEK 230KV CKT 1	
FDNS	00G13_006		0	18SP	G13_006	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77449	107.8215	STEGALL - WAYSIDE 230KV CKT 1	
FDNS	00G13_006		0	18SP	G13_006	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.76743	107.741	COLUMBUS - KELLY 115KV CKT 1	
FDNS	00G13_006		0	18SP	G13_006	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.76743	107.7395	KELLY (KELLY T1) 230/115/13.2KV TRANSFORMER CKT 1	
FDNS	00G13_006		0	18SP	G13_006	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77242	107.7071	COLUMBUS - GENOA 115KV CKT 1	
FDNS	00G13_006		0	18SP	G13_006	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77395	107.6245	GEN652547 3-FT RANDAL	
FDNS	00G13_006		0	18SP	G13_006	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77395	107.6245	GEN652548 5-FT RANDAL	
FDNS	00G13_006		0	18SP	G13_006	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77395	107.6245	GEN652549 7-FT RANDAL	
FDNS	00G13_006		0	18SP	G13_006	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77957	107.5851	FT THOMPSON - LAKE PLATT 230KV CKT 1	
FDNS	09G13_006BPSON		0	13G	G13_006	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.78422	107.523	FT RANDAL - UTICA JCT 230KV CKT 1	
FDNS	00G13_006		0	13SP	G13_006	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77492	107.4932	GEN659111 2-LELAND OLDS UNIT2	
FDNS	00G13_006		0	13SP	G13_006	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.7313	107.4858	SHELL CREEK (SHELLCREEKT1) 345/230/13.8KV TRANSFORMER CKT 1	
FDNS	00G13_006		0	13SP	G13_006	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.7313	107.4742	KELLY - SHELL CREEK 230KV CKT 1	
FDNS	00G13_006		0	18SP	G13_006	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77497	107.3083	RAUN - SIOUX CITY 345KV CKT 1	
FDNS	00G13_006		0	18SP	G13_006	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.76439	107.294	COLUMEAST - KELLY 230KV CKT 1	
FDNS	00G13_006		0	18SP	G13_006	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.76439	107.2931	COLUMEAST (COL.EAST T3) 230/115/13.8KV TRANSFORMER CKT 1	
FDNS	00G13_006		0	18SP	G13_006	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77395	107.2328	GEN659285 1-DEERCREEK 1613.800	
FDNS	00G13_006		0	18SP	G13_006	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77395	107.2322	GEN659110 1-LELAND OLDS UNIT1	
FDNS	00G13_006		0	13SP	G13_006	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77492	107.142	GEN659103 1-ANTELOPE VALLEY UNIT1	
FDNS	00G13_006		0	13SP	G13_006	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77492	107.142	GEN659107 2-ANTELOPE VALLEY UNIT2	
FDNS	00G13_006		0	23SP	G13_006	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77289	106.6462	GEN562402 1-G12_005_3 0.6900	
FDNS	00G13_006		0	13WP	G13_006	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77648	106.4497	FT THOMPSON - GRAND ISLAND 345KV CKT 1	
FDNS	09ALLBPSON		0	13G	G13_006	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.78177	106.277	FT RANDAL - SIOUX CITY 230KV CKT 1	
FDNS	00G13_006		0	13SP	G13_006	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77492	106.029	GEN562402 1-G12_005_3 0.6900	
FDNS	00G13_006		0	18SP	G13_006	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.7552	105.8087	HOSKINS - SHELL CREEK 345KV CKT 1	
FDNS	00G13_006		0	18WP	G13_006	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.78054	105.7974	FT RANDAL - SIOUX CITY 230KV CKT 1	
FDNS	00G13_006		0	13WP	G13_006	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77436	105.6207	GEN640009 1-COOPER NUCLEAR STATION	
FDNS	00G13_006		0	13WP	G13_006	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.7754	105.5817	FT RANDAL - SPENCER 115KV CKT 1	
FDNS	00G13_006		0	13WP	G13_006	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.75018	105.5324	COLUMWEST - GRAND ISLAND 230KV CKT 1	
FDNS	00G13_006		0	13WP	G13_006	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77678	105.5295	RASMUSN - UTICA JCT 230KV CKT 1	
FDNS	00G13_006		0	13WP	G13_006	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77436	105.4477	GEN645012 2-NEBRASKA CITY 2	
FDNS	00G13_006		0	13WP	G13_006	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.7754	105.3099	ONEILL - SPENCER 115KV CKT 1	
FDNS	00G13_006		0	13WP	G13_006	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77436	105.1704	GEN532751 1-WOLF CREEK GENERATING STATION UNIT 1	
FDNS	09G13_006BPSON		0	13G	G13_006	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.78176	105.03	FT RANDAL - SIOUX CITY 230KV CKT 1	
FDNS	00G13_006		0	13WP	G13_006	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77457	104.9959	HANLON - STORLA 230KV CKT 1	
FDNS	00G13_006		0	13WP	G13_006	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77592	104.6647	UTICA JCT - VFODNES 230KV CKT 1	
FDNS	00G13_006		0	13WP	G13_006	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77448	104.6638	GAVINS POINT - HARTINGTON 115KV CKT 1	
FDNS	00G13_006		0	13WP	G13_006	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77447	104.6516	FT THOMPSON - LETCHER 230KV CKT 1	
FDNS	09G13_006		0	13G	G13_006	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77689	104.629	FT THOMPSON - GRAND ISLAND 345KV CKT 1	
FDNS	00G13_006		0	13WP	G13_006	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77436	104.6175	GEN640028 1-COLUMCOGENERATION	
FDNS	00G13_006		0	13WP	G13_006	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77459	104.6159	KEYSTONE - SIDNEY 345KV CKT 1	
FDNS	00G13_006		0	18SP	G13_006	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77395	104.59	GEN659111 2-LELAND OLDS UNIT2	
FDNS	00G13_006		0	13WP	G13_006	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77436	104.5748	GEN645011 1-NEBRASKA CITY 1	
FDNS	09G13_006		0	13G	G13_006	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77466	104.5381	GEN640009 1-COOPER NUCLEAR STATION	
FDNS	00G13_006		0	13WP	G13_006	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77436	104.5197	GEN542962 2-IATAN UNIT #2	
FDNS	00G13_006		0	13WP	G13_006	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77508	104.4929	FT RANDAL - WHITE SWAN 115KV CKT 1	
FDNS	00G13_006		0	13WP	G13_006	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77508	104.4699	TYNDALL - WHITE SWAN 115KV CKT 1	
FDNS	09G13_006		0	13G	G13_006	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77618	104.4686	UTICA JCT - VFODNES 230KV CKT 1	
FDNS	00G13_006		0	13WP	G13_006	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77436	104.4559	GEN532652 1-JEFFREY ENERGY CENTER UNIT 2	
FDNS	00G13_006		0	18SP	G13_006	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.73008	104.4337	SHELL CREEK (SHELLCREEKT1) 345/230/13.8KV TRANSFORMER CKT 1	
FDNS	00G13_006		0	13WP	G13_006	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.75906	104.423	COLUMEAST - NW68TH & HOLDREGE 345KV CKT 1	
FDNS	00G13_006		0	18SP	G13_006	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.73008	104.4215	KELLY - SHELL CREEK 230KV CKT 1	
FDNS	00G13_006		0	13WP	G13_006	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77558	104.3962	SIOUX FALLS - SPLIT ROCK 230KV CKT 1	
FDNS	09G13_006		0	13G	G13_006	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77481	104.3848	GAVINS POINT - HARTINGTON 115KV CKT 1	
FDNS	00G13_006		0	13WP	G13_006	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77436	104.3605	GEN542957 1-IATAN UNIT #1	
FDNS	09G13_006		0	13G	G13_006	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77718	104.346	RASMUSN - UTICA JCT 230KV CKT 1	
FDNS	00G13_006		0	13WP	G13_006	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77436	104.2519	GEN641089 2-ENERGY CENTER 2	
FDNS	00G13_006		0	18SP	G13_006	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77395	104.2433	GEN659103 1-ANTELOPE VALLEY UNIT1	
FDNS	00G13_006		0	18SP	G13_006	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77395	104.2433	GEN659107 2-ANTELOPE VALLEY UNIT2	
FDNS	00G13_006		0	13WP	G13_006	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77457	104.2427	HANLON - SIOUX FALLS 230KV CKT 1	
FDNS	00G13_006		0	13WP	G13_006	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77464	104.2315	CARPENTER - HURON 230KV CKT 1	
FDNS	00G13_006		0	13WP	G13_006	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77321	104.1967	GRAND ISLAND - SWEETWATER 345KV CKT 1	
FDNS	00G13_006		0	13WP	G13_006	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77436	104.1792	GEN640011 2-GERALD GENTLEMAN STATION UNIT 2	
FDNS	09G13_006		0	13G	G13_006	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77425	104.163	PETERSBRG.N7115.00 - PETERSBURG 115KV CKT 1	
FDNS	09G13_006		0	13G	G13_006	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77425	104.1311	ALBION - PETERSBURG 115KV CKT 1	
FDNS	09G13_006		0	13G	G13_006	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77582	104.1252	SIOUX FALLS - SPLIT ROCK 230KV CKT 1	
FDNS	09G13_006		0	13G	G13_006	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77466	104.0172	GEN645012 2-NEBRASKA CITY 2	
FDNS	09G13_006		0	13G	G13_006	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77466	103.9975	GEN532751 1-WOLF CREEK GENERATING STATION UNIT 1	
FDNS	09G13_006		0	13G	G13_006	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77618	103.8935	SIOUX FALLS - VFODNES 230KV CKT 1	

SOLUTION	GROUP	SCENARIO	SEASON	SOURCE	DIRECTION	MONITORED ELEMENT	RATEB		TC%LOADING		CONTINGENCY			
							(MVA)	TDF	(% MVA)					
FDNS	09G13_006		0	13G	G13_006	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1	320	0.77466	103.8746	GEN645011 1-NEBRASKA CITY 1
FDNS	09G13_006		0	13G	G13_006	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1	320	0.77266	103.8669	G10-51T 230.00 - HOSKINS 230KV CKT 1
FDNS	09G13_006		0	13G	G13_006	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1	320	0.77488	103.8353	HANLON - STORLA 230KV CKT 1
FDNS	09G13_006		0	13G	G13_006	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1	320	0.77466	103.7787	GEN640028 1-COLUMCOGENERATION
FDNS	09G13_006		0	13G	G13_006	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1	320	0.7749	103.7132	KEYSTONE - SIDNEY 345KV CKT 1
FDNS	09G13_006		0	13G	G13_006	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1	320	0.77481	103.53	BELDEN - HARTINGTON 115KV CKT 1
FDNS	09G13_006		0	13G	G13_006	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1	320	0.77466	103.4874	GEN542962 2-IATAN UNIT #2
FDNS	09G13_006		0	13G	G13_006	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1	320	0.77554	103.4847	RASMUSN - SIOUX CITY 230KV CKT 1
FDNS	09G13_006		0	13G	G13_006	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1	320	0.77478	103.4741	FT THOMPSON - LETCHER 230KV CKT 1
FDNS	09ALLBPSON		0	13G	G13_006	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1	320	1	103.3944	G12_005T 230.00 - MADISONCO 230.00 230KV CKT 1
FDNS	09G13_006BPSON		0	13G	G13_006	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1	320	1	103.208	G12_005T 230.00 - MADISONCO 230.00 230KV CKT 1
FDNS	00G13_006		0	13WP	G13_006	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1	320	0.77436	103.1845	BASE CASE
FDNS	09ALLBPSON		0	13G	G13_006	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1	320	0.77688	103.1363	FT THOMPSON - GRAND ISLAND 345KV CKT 1
FDNS	00G13_006		0	18WP	G13_006	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1	320	0.74965	102.966	COLUMWEST - GRAND ISLAND 230KV CKT 1
FDNS	00G13_006		0	18SP	G13_006	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1	320	0.77395	102.7461	GEN562402 1-G12_005_3 0.6900
FDNS	00G13_006		0	18WP	G13_006	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1	320	1	102.6187	G12_005T 230.00 - MADISONCO 230.00 230KV CKT 1
FDNS	00G13_006		0	18WP	G13_006	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1	320	0.77351	102.5729	GEN640009 1-COOPER NUCLEAR STATION
FDNS	00G13_006		0	18WP	G13_006	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1	320	0.77453	102.5388	FT RANDAL - SPENCER 115KV CKT 1
FDNS	09G13_006		0	13G	G13_006	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1	320	0.77466	102.5322	BASE CASE
FDNS	09G13_006		0	13G	G13_006	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1	320	0.77466	102.5322	NC1_GEN-NEBRASKA CITY 1
FDNS	09ALLBPSON		0	13G	G13_006	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1	320	0.77466	102.409	GEN640009 1-COOPER NUCLEAR STATION
FDNS	00G13_006		0	13WP	G13_006	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1	320	1	102.3264	G12_005T 230.00 - MADISONCO 230.00 230KV CKT 1
FDNS	00G13_006		0	13SP	G13_006	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1	320	1	102.2808	G12_005T 230.00 - MADISONCO 230.00 230KV CKT 1
FDNS	00G13_006		0	18WP	G13_006	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1	320	0.77453	102.2649	ONEILL - SPENCER 115KV CKT 1
FDNS	00G13_006		0	18SP	G13_006	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1	320	1	102.2215	G12_005T 230.00 - MADISONCO 230.00 230KV CKT 1
FDNS	09ALLBPSON		0	13G	G13_006	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1	320	0.77618	102.2194	UTICA JCT - VFODNES 230KV CKT 1
FDNS	00G13_006		0	13WP	G13_006	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1	320	0.77376	102.2062	LAKEFIELD 3 - RAUN 345KV CKT 1
FDNS	00G13_006		0	18WP	G13_006	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1	320	0.77351	102.2004	GEN645012 2-NEBRASKA CITY 2
FDNS	00G13_006		0	13WP	G13_006	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1	320	0.77436	102.1992	GEN652460 4-GARRISON
FDNS	00G13_006		0	13WP	G13_006	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1	320	0.77436	102.1991	GEN652461 5-GARRISON
FDNS	09ALLBPSON		0	13G	G13_006	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1	320	0.77425	102.1777	PETERSBRG.N7115.00 - PETERSBURG 115KV CKT 1
FDNS	00G13_006		0	13WP	G13_006	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1	320	0.77436	102.1636	GEN652457 1-GARRISON
FDNS	00G13_006		0	13WP	G13_006	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1	320	0.77436	102.1636	GEN652458 2-GARRISON
FDNS	00G13_006		0	13WP	G13_006	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1	320	0.77436	102.1636	GEN652459 3-GARRISON
FDNS	09ALLBPSON		0	13G	G13_006	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1	320	0.77425	102.1463	ALBION - PETERSBURG 115KV CKT 1
FDNS	00G13_006		0	13WP	G13_006	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1	320	0.77436	102.1117	GEN659296 1-SDPRAIRWIND1W0.6900
FDNS	00G13_006		0	18WP	G13_006	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1	320	0.77351	102.11	GEN532751 1-WOLF CREEK GENERATING STATION UNIT 1
FDNS	09ALLBPSON		0	13G	G13_006	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1	320	0.77265	102.0816	G10-51T 230.00 - HOSKINS 230KV CKT 1
FDNS	00G13_006		0	18WP	G13_006	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1	320	0.75817	102.0508	COLUMEAST - NW68TH & HOLDREGE 345KV CKT 1
FDNS	00G13_006		0	13WP	G13_006	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1	320	0.77512	102.0493	MAXWELL - THEDFORD 115KV CKT 1
FDNS	00G13_006		0	23SP	G13_006	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1	320	1	102.0489	G12_005T 230.00 - MADISONCO 230.00 230KV CKT 1
FDNS	00G13_006		0	13WP	G13_006	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1	320	0.77358	102.0279	HOSKINS (HOSKINS T2) 345/230/13.8KV TRANSFORMER CKT 1
FDNS	00G13_006		0	18WP	G13_006	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1	320	0.77592	101.9511	RASMUSN - UTICA JCT 230KV CKT 1
FDNS	00G13_006		0	13WP	G13_006	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1	320	0.77436	101.9162	GEN652542 1-BIG BEND
FDNS	00G13_006		0	13WP	G13_006	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1	320	0.77436	101.9162	GEN652543 3-BIG BEND
FDNS	00G13_006		0	13WP	G13_006	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1	320	0.77436	101.9139	GEN652544 5-BIG BEND
FDNS	00G13_006		0	13WP	G13_006	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1	320	0.77457	101.9116	ATCHSNT3 345.00 - COOPER 345KV CKT 1
FDNS	09ALLBPSON		0	13G	G13_006	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1	320	0.77466	101.858	GEN640028 1-COLUMCOGENERATION
FDNS	09ALLBPSON		0	13G	G13_006	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1	320	0.77582	101.8352	SIOUX FALLS - SPLIT ROCK 230KV CKT 1
FDNS	09ALLBPSON		0	13G	G13_006	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1	320	0.77487	101.8333	HANLON - STORLA 230KV CKT 1
FDNS	09ALLBPSON		0	13G	G13_006	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1	320	0.77466	101.8261	GEN645012 2-NEBRASKA CITY 2
FDNS	09G13_006BPSON		0	13G	G13_006	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1	320	0.77688	101.7964	FT THOMPSON - GRAND ISLAND 345KV CKT 1
FDNS	00G13_006		0	13WP	G13_006	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1	320	0.77263	101.7961	COLUMBUS - SCHUYLER 115KV CKT 1
FDNS	09BPSON		0	13G	G13_006	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1	320	1	101.748	FT RANDAL - G12_005T 230.00 230KV CKT 1
FDNS	9		0	13G	G13_006	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1	320	1	101.7282	FT RANDAL - G12_005T 230.00 230KV CKT 1
FDNS	00G13_006		0	13WP	G13_006	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1	320	0.77457	101.7255	ATCHSNT3 345.00 - BOONEVILLE 345KV CKT 1
FDNS	09ALLBPSON		0	13G	G13_006	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1	320	0.77489	101.6988	KEYSTONE - SIDNEY 345KV CKT 1
FDNS	09ALLBPSON		0	13G	G13_006	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1	320	0.77466	101.694	GEN645011 1-NEBRASKA CITY 1
FDNS	09ALLBPSON		0	13G	G13_006	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1	320	0.77481	101.691	GAVINS POINT - HARTINGTON 115KV CKT 1
FDNS	09ALLBPSON		0	13G	G13_006	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1	320	0.77466	101.6829	GEN532751 1-WOLF CREEK GENERATING STATION UNIT 1
FDNS	00G13_006		0	18WP	G13_006	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1	320	0.77531	101.6756	FT THOMPSON - GRAND ISLAND 345KV CKT 1
FDNS	00G13_006		0	13WP	G13_006	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1	320	0.77436	101.6607	GEN652546 1-FT RANDAL
FDNS	09ALLBPSON		0	13G	G13_006	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1	320	0.77618	101.6387	SIOUX FALLS - VFODNES 230KV CKT 1
FDNS	00G13_006		0	18WP	G13_006	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1	320	0.77351	101.6307	GEN640028 1-COLUMCOGENERATION
FDNS	00G13_006		0	18WP	G13_006	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1	320	0.77351	101.6228	GEN542962 2-IATAN UNIT #2
FDNS	00G13_006		0	18WP	G13_006	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1	320	0.77376	101.6152	HANLON - STORLA 230KV CKT 1
FDNS	09G13_006		0	13G	G13_006	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1	320	0.77444	101.5788	FALLOW 3 345.00 - GRIMES 345KV CKT 1
FDNS	09ALLBPSON		0	13G	G13_006	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1	320	0.77718	101.5708	RASMUSN - UTICA JCT 230KV CKT 1
FDNS	00G13_006		0	13WP	G13_006	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1	320	0.77512	101.5665	AINSWORTH - AINSWORTH 115KV CKT 1
FDNS	00G13_006		0	18WP	G13_006	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1	320	0.77351	101.5445	GEN645011 1-NEBRASKA CITY 1
FDNS	00G13_006		0	13WP	G13_006	TO->FROM	KELLY - MADISONCO	230.00	230KV	CKT 1	320	0.77436	101.5438	GEN652556 2-OAHE

SOLUTION	GROUP	SCENARIO	SEASON	SOURCE	DIRECTION	MONITORED ELEMENT	RATEB (MVA)	TDF	TC%LOADING (% MVA)	CONTINGENCY
FDNS	00G13_006		0 13WP	G13_006	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77436	101.5438	GEN652557 4-OAHE
FDNS	00G13_006		0 13WP	G13_006	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77436	101.5438	GEN652558 6-OAHE
FDNS	00G13_006		0 18WP	G13_006	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77513	101.5281	UTICA JCT - VFODNES 230KV CKT 1
FDNS	09G13_006		0 13G	G13_006	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77293	101.4911	COLUMBUS - SCHUYLER 115KV CKT 1
FDNS	09G13_006		0 13G	G13_006	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77466	101.4746	GEN659296 1-SDPRAIRWIND1W0.6900
FDNS	00G13_006		0 18WP	G13_006	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77363	101.4664	GAVINS POINT - HARTINGTON 115KV CKT 1
FDNS	09G13_006		0 13G	G13_006	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77487	101.4621	ATCHSNT3 345.00 - COOPER 345KV CKT 1
FDNS	00G13_006		0 18WP	G13_006	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77351	101.4452	GEN532652 1-JEFFREY ENERGY CENTER UNIT 2
FDNS	09ALLBPSON		0 13G	G13_006	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77478	101.4414	FT THOMPSON - LETCHER 230KV CKT 1
FDNS	00G13_006		0 13WP	G13_006	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.76784	101.4117	COLUMBUS - KELLY 115KV CKT 1
FDNS	00G13_006		0 13WP	G13_006	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.76784	101.4116	KELLY (KELLY T1) 230/115/13.2KV TRANSFORMER CKT 1
FDNS	09ALLBPSON		0 13G	G13_006	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77554	101.4013	RASMUSN - SIOUX CITY 230KV CKT 1
FDNS	09G13_006		0 13G	G13_006	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77466	101.3998	GEN652457 1-GARRISON
FDNS	09G13_006		0 13G	G13_006	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77466	101.3998	GEN652458 2-GARRISON
FDNS	09G13_006		0 13G	G13_006	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77466	101.3998	GEN652459 3-GARRISON
FDNS	09ALLBPSON		0 13G	G13_006	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77312	101.3875	ALBION - GENOA 115KV CKT 1
FDNS	00G13_006		0 13WP	G13_006	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77515	101.3787	NUNDRWD - WAYSIDE 230KV CKT 1
FDNS	00G13_006		0 13WP	G13_006	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77436	101.376	GEN652547 3-FT RANDAL
FDNS	00G13_006		0 13WP	G13_006	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77436	101.376	GEN652548 5-FT RANDAL
FDNS	00G13_006		0 13WP	G13_006	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77436	101.376	GEN652549 7-FT RANDAL
FDNS	09G13_006		0 13G	G13_006	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77421	101.3694	G10-51T 230.00 - RASMUSN 230KV CKT 1
FDNS	00G13_006		0 18WP	G13_006	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77366	101.357	FT THOMPSON - LETCHER 230KV CKT 1
FDNS	09G13_006BPSON		0 13G	G13_006	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77466	101.3531	GEN640009 1-COOPER NUCLEAR STATION
FDNS	00G13_006		0 18WP	G13_006	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77423	101.3377	FT RANDAL - WHITE SWAN 115KV CKT 1
FDNS	00G13_006		0 18WP	G13_006	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77351	101.3271	GEN640010 1-GERALD GENTLEMAN STATION UNIT 1
FDNS	09G13_006		0 13G	G13_006	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77466	101.3259	GEN652543 3-BIG BEND
FDNS	09G13_006		0 13G	G13_006	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77466	101.3223	GEN652542 1-BIG BEND
FDNS	09G13_006		0 13G	G13_006	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77466	101.3211	GEN652544 5-BIG BEND
FDNS	00G13_006		0 18WP	G13_006	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77423	101.3137	TYNDALL - WHITE SWAN 115KV CKT 1
FDNS	00G13_006		0 18WP	G13_006	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77372	101.2972	KEYSTONE - SIDNEY 345KV CKT 1
FDNS	00G13_006		0 18WP	G13_006	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77351	101.2816	GEN640011 2-GERALD GENTLEMAN STATION UNIT 2
FDNS	09G13_006		0 13G	G13_006	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77487	101.2741	ATCHSNT3 345.00 - BOONEVILLE 345KV CKT 1
FDNS	00G13_006		0 18WP	G13_006	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77351	101.2687	GEN542957 1-IATAN UNIT #1
FDNS	09G13_006		0 13G	G13_006	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77466	101.2395	GEN652559 1-OAHE
FDNS	09G13_006		0 13G	G13_006	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.7663	101.2335	HOSKINS - RAUN 345KV CKT 1
FDNS	00G13_006		0 18WP	G13_006	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77351	101.1884	GEN641089 2-ENERGY CENTER 2
FDNS	00G13_006		0 18WP	G13_006	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77244	101.1776	GRAND ISLAND - SWEETWATER 345KV CKT 1
FDNS	09G13_006		0 13G	G13_006	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77466	101.1374	GEN659110 1-LELAND OLDS UNIT1
FDNS	00G13_006		0 13WP	G13_006	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77492	101.0948	STEGALL - WAYSIDE 230KV CKT 1
FDNS	09G13_006		0 13G	G13_006	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.76816	101.0493	COLUMBUS - KELLY 115KV CKT 1
FDNS	09G13_006		0 13G	G13_006	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.76816	101.0413	KELLY (KELLY T1) 230/115/13.2KV TRANSFORMER CKT 1
FDNS	00G13_006		0 18WP	G13_006	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77453	101.0344	ARMOUR - FT RANDAL 115KV CKT 1
FDNS	09G13_006BPSON		0 13G	G13_006	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77618	100.9939	UTICA JCT - VFODNES 230KV CKT 1
FDNS	09G13_006		0 13G	G13_006	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77404	100.9935	LAKEFIELD 3 - RAUN 345KV CKT 1
FDNS	00G13_006		0 13WP	G13_006	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.78017	100.9524	FT RANDAL - LAKE PLATT 230KV CKT 1
FDNS	00G13_006		0 13WP	G13_006	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.7648	100.8743	COLUMEAST (COL.EAST T3) 230/115/13.8KV TRANSFORMER CKT 1
FDNS	00G13_006		0 13WP	G13_006	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.7648	100.8725	COLUMEAST - KELLY 230KV CKT 1
FDNS	09G13_006		0 13G	G13_006	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77466	100.8328	GEN652556 2-OAHE
FDNS	09G13_006BPSON		0 13G	G13_006	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77466	100.8	NC1_GEN-NEBRASKA CITY 1
FDNS	09G13_006BPSON		0 13G	G13_006	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77466	100.7577	GEN645012 2-NEBRASKA CITY 2
FDNS	09G13_006BPSON		0 13G	G13_006	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77466	100.7395	GEN640028 1-COLUMCOGENERATION
FDNS	09G13_006BPSON		0 13G	G13_006	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77487	100.7241	HANLON - STORLA 230KV CKT 1
FDNS	09G13_006		0 13G	G13_006	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77541	100.7236	AINSWORTH - AINSWORTH 115KV CKT 1
FDNS	09G13_006		0 13G	G13_006	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77466	100.7191	GEN652546 1-FT RANDAL
FDNS	09G13_006BPSON		0 13G	G13_006	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77425	100.7105	PETERSBRG.N7115.00 - PETERSBURG 115KV CKT 1
FDNS	09G13_006BPSON		0 13G	G13_006	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77425	100.6785	ALBION - PETERSBURG 115KV CKT 1
FDNS	09G13_006		0 13G	G13_006	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77522	100.6777	STEGALL - WAYSIDE 230KV CKT 1
FDNS	09G13_006		0 13G	G13_006	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77545	100.6764	NUNDRWD - WAYSIDE 230KV CKT 1
FDNS	00G13_006		0 13WP	G13_006	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.78032	100.6481	FT RANDAL - FT THOMPSON 230KV CKT 1
FDNS	00G13_006		0 23SP	G13_006	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77289	100.6294	GEN560717 1-G13_006_3 0.6900
FDNS	09G13_006BPSON		0 13G	G13_006	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77466	100.6227	GEN532751 1-WOLF CREEK GENERATING STATION UNIT 1
FDNS	09G13_006BPSON		0 13G	G13_006	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77582	100.6172	SIOUX FALLS - SPLIT ROCK 230KV CKT 1
FDNS	09G13_006BPSON		0 13G	G13_006	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77466	100.6155	GEN645011 1-NEBRASKA CITY 1
FDNS	09G13_006BPSON		0 13G	G13_006	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77489	100.5852	KEYSTONE - SIDNEY 345KV CKT 1
FDNS	09G13_006BPSON		0 13G	G13_006	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77717	100.5813	RASMUSN - UTICA JCT 230KV CKT 1
FDNS	09G13_006BPSON		0 13G	G13_006	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77265	100.5273	G10-51T 230.00 - HOSKINS 230KV CKT 1
FDNS	09G13_006BPSON		0 13G	G13_006	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.7748	100.4871	GAVINS POINT - HARTINGTON 115KV CKT 1
FDNS	00G13_006		0 13WP	G13_006	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77436	100.4831	GEN659110 1-LELAND OLDS UNIT1
FDNS	09G13_006		0 13G	G13_006	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.76512	100.4595	COLUMEAST (COL.EAST T3) 230/115/13.8KV TRANSFORMER CKT 1
FDNS	09G13_006		0 13G	G13_006	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.76512	100.4475	COLUMEAST - KELLY 230KV CKT 1
FDNS	09G13_006		0 13G	G13_006	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77501	100.4091	GAVINS POINT - YANKON JCT 115KV CKT 1

SOLUTION	GROUP	SCENARIO	SEASON	SOURCE	DIRECTION	MONITORED ELEMENT	RATEB		TC%LOADING		CONTINGENCY
							(MVA)	TDF	(% MVA)		
FDNS	09G13_006BPSON		0 13G	G13_006	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77618	100.4077		SIoux FALLS - VFODNES 230KV CKT 1
FDNS	09G13_006		0 13G	G13_006	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77466	100.4056		GEN652547 3-FT RANDAL
FDNS	09G13_006		0 13G	G13_006	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77466	100.4056		GEN652548 5-FT RANDAL
FDNS	09G13_006		0 13G	G13_006	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77466	100.4056		GEN652549 7-FT RANDAL
FDNS	00G13_006		0 13WP	G13_006	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.78017	100.3992		FT THOMPSON - LAKE PLATT 230KV CKT 1
FDNS	09G13_006BPSON		0 13G	G13_006	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77477	100.3328		FT THOMPSON - LETCHER 230KV CKT 1
FDNS	09ALLBPSON		0 13G	G13_006	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77466	100.3284		BASE CASE
FDNS	09ALLBPSON		0 13G	G13_006	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77466	100.3284		NC1_GEN-NEBRASKA CITY 1
FDNS	00G13_006		0 13SP	G13_006	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77492	100.0882		GEN560717 1-G13_006_3 0.6900
FDNS	00G13_006		0 18WP	G13_006	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77351	100.074		BASE CASE
FDNS	09G13_006		0 13G	G13_006	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77585	100.0707		RAUN - SIOUX CITY 345KV CKT 1
FDNS	00G13_006		2 23SP	G13_006	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.7729	113.406		MADISONCO 230.00 - S_NORFOLK 230.00 230KV CKT 1
FDNS	00G13_006		2 23SP	G13_006	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.7729	113.2267		S_NORFOLK 345.00 (SNORFOLKT) 345/230/13.8KV TRANSFORMER CKT 1
FDNS	00G13_006		2 13SP	G13_006	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77493	113.1148		MADISONCO 230.00 - S_NORFOLK 230.00 230KV CKT 1
FDNS	00G13_006		2 13SP	G13_006	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77493	112.7925		S_NORFOLK 345.00 (SNORFOLKT) 345/230/13.8KV TRANSFORMER CKT 1
FDNS	00G13_006		2 18SP	G13_006	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77396	109.7494		MADISONCO 230.00 - S_NORFOLK 230.00 230KV CKT 1
FDNS	00G13_006		2 18SP	G13_006	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77396	109.4292		S_NORFOLK 345.00 (SNORFOLKT) 345/230/13.8KV TRANSFORMER CKT 1
FDNS	00G13_006		2 13WP	G13_006	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77436	103.1808		MADISONCO 230.00 - S_NORFOLK 230.00 230KV CKT 1
FDNS	00G13_006		2 13WP	G13_006	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77436	102.8575		S_NORFOLK 345.00 (SNORFOLKT) 345/230/13.8KV TRANSFORMER CKT 1
FDNS	09ALLBPSON		2 13G	G13_006	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77467	100.3015		MADISONCO 230.00 - S_NORFOLK 230.00 230KV CKT 1
FDNS	09ALLBPSON		2 13G	G13_006	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77467	100.0976		S_NORFOLK 345.00 (SNORFOLKT) 345/230/13.8KV TRANSFORMER CKT 1
FDNS	00G13_006		2 18WP	G13_006	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77352	100.075		MADISONCO 230.00 - S_NORFOLK 230.00 230KV CKT 1
FDNS	09G13_006		2 13G	G13_006	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77468	100		MADISONCO 230.00 - S_NORFOLK 230.00 230KV CKT 1
FDNS	00G13_006		2 23SP	G13_006	FROM->TO	MADISONCO 230.00 - S_NORFOLK 230.00 230KV CKT 1	320	0.71646	105.0224		KELLY - MADISONCO 230.00 230KV CKT 1
FDNS	00G13_006		2 13SP	G13_006	FROM->TO	MADISONCO 230.00 - S_NORFOLK 230.00 230KV CKT 1	320	0.71595	104.0177		KELLY - MADISONCO 230.00 230KV CKT 1
FDNS	00G13_006		2 18SP	G13_006	FROM->TO	MADISONCO 230.00 - S_NORFOLK 230.00 230KV CKT 1	320	0.71537	100.6537		KELLY - MADISONCO 230.00 230KV CKT 1
FDNS	00G13_006		2 23SP	G13_006	FROM->TO	S_NORFOLK 345.00 (SNORFOLKT) 345/230/13.8KV TRANSFORMER CKT 1	336	0.71646	101.6138		KELLY - MADISONCO 230.00 230KV CKT 1
FDNS	00G13_006		2 13SP	G13_006	FROM->TO	S_NORFOLK 345.00 (SNORFOLKT) 345/230/13.8KV TRANSFORMER CKT 1	336	0.71595	100.4225		KELLY - MADISONCO 230.00 230KV CKT 1
FDNS	0		0 13WP	G13_009	TO->FROM	ARCADIA - REDBUD 345KV CKT 1	1195	0.05421	100.5075		ARCADIA - REDBUD 345KV CKT 2
FDNS	00NR		0 13SP	G13_009	TO->FROM	CATOOSA - TERRA NITROGEN TAP 138KV CKT 1	136	0.06895	103.9431		NORTHEAST STATION - OWASSO SOUTH 138KV CKT 1
FDNS	00NR		0 13SP	G13_009	TO->FROM	TERRA NITROGEN TAP - VERDIGRIS 138KV CKT 1	136	0.06895	115.1096		NORTHEAST STATION - OWASSO SOUTH 138KV CKT 1
FDNS	00NR		0 13SP	G13_009	TO->FROM	TERRA NITROGEN TAP - VERDIGRIS 138KV CKT 1	136	0.06895	109.8602		OWASSO SOUTH - PORT OF CATOOSA TAP 138KV CKT 1
FDNS	00NR		0 13SP	G13_009	TO->FROM	TERRA NITROGEN TAP - VERDIGRIS 138KV CKT 1	136	0.0632	107.2714		40OLOGAH 138.00 - NORTHEAST STATION 138KV CKT 1
FDNS	00NR		0 13SP	G13_009	TO->FROM	TERRA NITROGEN TAP - VERDIGRIS 138KV CKT 1	136	0.0632	106.5741		40OLOGAH 138.00 - CLAREMORE 138KV CKT 1
FDNS	00NR		0 13SP	G13_009	TO->FROM	TERRA NITROGEN TAP - VERDIGRIS 138KV CKT 1	136	0.0632	106.574		CLAREMORE (CLAUTOA) 161/138/13.8KV TRANSFORMER CKT 1
FDNS	00NR		0 13SP	G13_009	TO->FROM	TERRA NITROGEN TAP - VERDIGRIS 138KV CKT 1	136	0.06895	104.6712		CATOOSA - PORT OF CATOOSA TAP 138KV CKT 1
FDNS	00NR		0 13SP	G13_009	TO->FROM	TERRA NITROGEN TAP - VERDIGRIS 138KV CKT 1	136	0.14284	101.9962		G13_009T 138.00 - VINITA JUNCTION 138KV CKT 1
FDNS	00NR		0 13SP	G13_009	TO->FROM	TERRA NITROGEN TAP - VERDIGRIS 138KV CKT 1	136	0.06555	100.6597		NORTHEAST STATION - OWASSO 109TH STREET 138KV CKT 1
FDNS	00NR		0 13SP	G13_009	TO->FROM	VINITA - VINITA JUNCTION 69KV CKT 1	69	0.31586	118.0764		SUB 404 - HOCKERVILLE - VINITA JUNCTION 138KV CKT 1
FDNS	00NR		0 13SP	G13_009	TO->FROM	VINITA - VINITA JUNCTION 69KV CKT 1	69	0.31586	118.0582		SUB 404 - HOCKERVILLE (HOCK 138) 161/138/12.5KV TRANSFORMER CKT 1
FDNS	00NR		0 18SP	G13_009	TO->FROM	VINITA - VINITA JUNCTION 69KV CKT 1	69	0.31715	115.6507		SUB 404 - HOCKERVILLE - VINITA JUNCTION 138KV CKT 1
FDNS	00NR		0 18SP	G13_009	TO->FROM	VINITA - VINITA JUNCTION 69KV CKT 1	69	0.31715	115.6372		SUB 404 - HOCKERVILLE (HOCK 138) 161/138/12.5KV TRANSFORMER CKT 1
FDNS	00NR		0 23SP	G13_009	TO->FROM	VINITA - VINITA JUNCTION 69KV CKT 1	69	0.31752	111.973		SUB 404 - HOCKERVILLE - VINITA JUNCTION 138KV CKT 1
FDNS	00NR		0 23SP	G13_009	TO->FROM	VINITA - VINITA JUNCTION 69KV CKT 1	69	0.31752	111.9625		SUB 404 - HOCKERVILLE (HOCK 138) 161/138/12.5KV TRANSFORMER CKT 1
FDNS	00NR		0 13SP	G13_009	TO->FROM	VINITA - VINITA JUNCTION 69KV CKT 1	69	0.19417	108.1852		BASE CASE
FDNS	00NR		0 18SP	G13_009	TO->FROM	VINITA - VINITA JUNCTION 69KV CKT 1	69	0.195	106.1701		BASE CASE
FDNS	00NR		0 23SP	G13_009	TO->FROM	VINITA - VINITA JUNCTION 69KV CKT 1	69	0.19512	104.6311		BASE CASE
FDNS	00G13_009		0 13SP	G13_009	TO->FROM	VINITA - VINITA JUNCTION 69KV CKT 1	69	0.25935	104.0979		SUB 404 - HOCKERVILLE - VINITA JUNCTION 138KV CKT 1
FDNS	00G13_009		0 13SP	G13_009	TO->FROM	VINITA - VINITA JUNCTION 69KV CKT 1	69	0.25935	104.0736		SUB 404 - HOCKERVILLE (HOCK 138) 161/138/12.5KV TRANSFORMER CKT 1
FDNS	00NR		0 13SP	G13_009	FROM->TO	VINITA JUNCTION (VINITAJC) 138/69/13.8KV TRANSFORMER CKT 1	62	0.31586	131.3275		SUB 404 - HOCKERVILLE (HOCK 138) 161/138/12.5KV TRANSFORMER CKT 1
FDNS	00NR		0 13SP	G13_009	FROM->TO	VINITA JUNCTION (VINITAJC) 138/69/13.8KV TRANSFORMER CKT 1	62	0.31586	131.3233		SUB 404 - HOCKERVILLE - VINITA JUNCTION 138KV CKT 1
FDNS	00NR		0 13SP	G13_009	FROM->TO	VINITA JUNCTION (VINITAJC) 138/69/13.8KV TRANSFORMER CKT 1	62	0.31586	130.6192		SUB 404 - HOCKERVILLE - VINITA JUNCTION 138KV CKT 1
FDNS	00NR		0 13SP	G13_009	FROM->TO	VINITA JUNCTION (VINITAJC) 138/69/13.8KV TRANSFORMER CKT 1	62	0.31586	130.6156		SUB 404 - HOCKERVILLE (HOCK 138) 161/138/12.5KV TRANSFORMER CKT 1
FDNS	00NR		0 18SP	G13_009	FROM->TO	VINITA JUNCTION (VINITAJC) 138/69/13.8KV TRANSFORMER CKT 1	62	0.31715	128.636		SUB 404 - HOCKERVILLE (HOCK 138) 161/138/12.5KV TRANSFORMER CKT 1
FDNS	00NR		0 18SP	G13_009	FROM->TO	VINITA JUNCTION (VINITAJC) 138/69/13.8KV TRANSFORMER CKT 1	62	0.31715	128.6301		SUB 404 - HOCKERVILLE - VINITA JUNCTION 138KV CKT 1
FDNS	00NR		0 18SP	G13_009	FROM->TO	VINITA JUNCTION (VINITAJC) 138/69/13.8KV TRANSFORMER CKT 1	62	0.31715	127.9085		SUB 404 - HOCKERVILLE - VINITA JUNCTION 138KV CKT 1
FDNS	00NR		0 18SP	G13_009	FROM->TO	VINITA JUNCTION (VINITAJC) 138/69/13.8KV TRANSFORMER CKT 1	62	0.31715	127.9064		SUB 404 - HOCKERVILLE (HOCK 138) 161/138/12.5KV TRANSFORMER CKT 1
FDNS	00NR		0 23SP	G13_009	FROM->TO	VINITA JUNCTION (VINITAJC) 138/69/13.8KV TRANSFORMER CKT 1	62	0.31752	124.5505		SUB 404 - HOCKERVILLE (HOCK 138) 161/138/12.5KV TRANSFORMER CKT 1
FDNS	00NR		0 23SP	G13_009	FROM->TO	VINITA JUNCTION (VINITAJC) 138/69/13.8KV TRANSFORMER CKT 1	62	0.31752	124.5416		SUB 404 - HOCKERVILLE - VINITA JUNCTION 138KV CKT 1
FDNS	00NR		0 23SP	G13_009	FROM->TO	VINITA JUNCTION (VINITAJC) 138/69/13.8KV TRANSFORMER CKT 1	62	0.31752	123.8323		SUB 404 - HOCKERVILLE (HOCK 138) 161/138/12.5KV TRANSFORMER CKT 1
FDNS	00NR		0 23SP	G13_009	FROM->TO	VINITA JUNCTION (VINITAJC) 138/69/13.8KV TRANSFORMER CKT 1	62	0.31752	123.831		SUB 404 - HOCKERVILLE - VINITA JUNCTION 138KV CKT 1
FDNS	00G13_009		0 13SP	G13_009	FROM->TO	VINITA JUNCTION (VINITAJC) 138/69/13.8KV TRANSFORMER CKT 1	62	0.25935	115.4526		SUB 404 - HOCKERVILLE (HOCK 138) 161/138/12.5KV TRANSFORMER CKT 1
FDNS	00G13_009		0 13SP	G13_009	FROM->TO	VINITA JUNCTION (VINITAJC) 138/69/13.8KV TRANSFORMER CKT 1	62	0.25935	115.3039		SUB 404 - HOCKERVILLE - VINITA JUNCTION 138KV CKT 1
FDNS	00G13_009		0 13SP	G13_009	FROM->TO	VINITA JUNCTION (VINITAJC) 138/69/13.8KV TRANSFORMER CKT 1	62	0.25935	115.1369		SUB 404 - HOCKERVILLE (HOCK 138) 161/138/12.5KV TRANSFORMER CKT 1
FDNS	00G13_009		0 13SP	G13_009	FROM->TO	VINITA JUNCTION (VINITAJC) 138/69/13.8KV TRANSFORMER CKT 1	62	0.25935	115.0551		SUB 404 - HOCKERVILLE - VINITA JUNCTION 138KV CKT 1
FDNS	00G13_009		0 18WP	G13_009	FROM->TO	VINITA JUNCTION (VINITAJC) 138/69/13.8KV TRANSFORMER CKT 1	62	0.25926	110.4724		SUB 404 - HOCKERVILLE (HOCK 138) 161/138/12.5KV TRANSFORMER CKT 1
FDNS	00G13_009		0 18WP	G13_009	FROM->TO	VINITA JUNCTION (VINITAJC) 138/69/13.8KV TRANSFORMER CKT 1	62	0.25926	110.4195		SUB 404 - HOCKERVILLE - VINITA JUNCTION 138KV CKT 1
FDNS	00G13_009		0 18WP	G13_009	FROM->TO	VINITA JUNCTION (VINITAJC) 138/69/13.8KV TRANSFORMER CKT 1	62	0.25926	110.1513		SUB 404 - HOCKERVILLE (HOCK 138) 161/138/12.5KV TRANSFORMER CKT 1
FDNS	00G13_009		0 18WP	G13_009	FROM->TO	VINITA JUNCTION (VINITAJC) 138/69/13.8KV TRANSFORMER CKT 1	62	0.25926	110.0333		SUB 404 - HOCKERVILLE - VINITA JUNCTION 138KV CKT 1
FDNS	00G13_009		0 18SP	G13_009	FROM->TO	VINITA JUNCTION (VINITAJC) 138/69/13.8KV TRANSFORMER CKT 1	62	0.25945	109.8859		SUB 404 - HOCKERVILLE (HOCK 138) 161/138/12.5KV TRANSFORMER CKT 1
FDNS	00G13_009		0 18SP	G13_009	FROM->TO	VINITA JUNCTION (VINITAJC) 138/69/13.8KV TRANSFORMER CKT 1	62	0.25945	109.7356		SUB 404 - HOCKERVILLE - VINITA JUNCTION 138KV CKT 1

SOLUTION	GROUP	SCENARIO	SEASON	SOURCE	DIRECTION	MONITORED ELEMENT	RATEB		TC%LOADING		CONTINGENCY
							(MVA)	TDF	(% MVA)		
FDNS	00G13_009		0	18SP	G13_009	FROM->TO	VINITA JUNCTION (VINITAJC) 138/69/13.8KV TRANSFORMER CKT 1	62	0.25945	109.4909	SUB 404 - HOCKERVILLE (HOCK 138) 161/138/12.5KV TRANSFORMER CKT 1
FDNS	00G13_009		0	18SP	G13_009	FROM->TO	VINITA JUNCTION (VINITAJC) 138/69/13.8KV TRANSFORMER CKT 1	62	0.25945	109.4056	SUB 404 - HOCKERVILLE - VINITA JUNCTION 138KV CKT 1
FDNS	00G13_009		0	23SP	G13_009	FROM->TO	VINITA JUNCTION (VINITAJC) 138/69/13.8KV TRANSFORMER CKT 1	62	0.25954	105.0606	SUB 404 - HOCKERVILLE (HOCK 138) 161/138/12.5KV TRANSFORMER CKT 1
FDNS	00G13_009		0	23SP	G13_009	FROM->TO	VINITA JUNCTION (VINITAJC) 138/69/13.8KV TRANSFORMER CKT 1	62	0.25954	104.9315	SUB 404 - HOCKERVILLE - VINITA JUNCTION 138KV CKT 1
FDNS	00G13_009		0	23SP	G13_009	FROM->TO	VINITA JUNCTION (VINITAJC) 138/69/13.8KV TRANSFORMER CKT 1	62	0.25954	104.6945	SUB 404 - HOCKERVILLE (HOCK 138) 161/138/12.5KV TRANSFORMER CKT 1
FDNS	00G13_009		0	23SP	G13_009	FROM->TO	VINITA JUNCTION (VINITAJC) 138/69/13.8KV TRANSFORMER CKT 1	62	0.25954	104.6271	SUB 404 - HOCKERVILLE - VINITA JUNCTION 138KV CKT 1
FDNS	08NR		0	13G	G13_009	FROM->TO	VINITA JUNCTION (VINITAJC) 138/69/13.8KV TRANSFORMER CKT 1	62	0.31859	104.2845	SUB 404 - HOCKERVILLE (HOCK 138) 161/138/12.5KV TRANSFORMER CKT 1
FDNS	08G13_009		0	13G	G13_009	FROM->TO	VINITA JUNCTION (VINITAJC) 138/69/13.8KV TRANSFORMER CKT 1	62	0.25954	103.7073	SUB 404 - HOCKERVILLE - VINITA JUNCTION 138KV CKT 1
FDNS	08G13_009		0	13G	G13_009	FROM->TO	VINITA JUNCTION (VINITAJC) 138/69/13.8KV TRANSFORMER CKT 1	62	0.25954	103.7051	SUB 404 - HOCKERVILLE (HOCK 138) 161/138/12.5KV TRANSFORMER CKT 1
FDNS	08NR		0	13G	G13_009	FROM->TO	VINITA JUNCTION (VINITAJC) 138/69/13.8KV TRANSFORMER CKT 1	62	0.31859	103.6883	SUB 404 - HOCKERVILLE (HOCK 138) 161/138/12.5KV TRANSFORMER CKT 1
FDNS	08G13_009		0	13G	G13_009	FROM->TO	VINITA JUNCTION (VINITAJC) 138/69/13.8KV TRANSFORMER CKT 1	62	0.25954	103.1016	SUB 404 - HOCKERVILLE (HOCK 138) 161/138/12.5KV TRANSFORMER CKT 1
FDNS	08G13_009		0	13G	G13_009	FROM->TO	VINITA JUNCTION (VINITAJC) 138/69/13.8KV TRANSFORMER CKT 1	62	0.25954	103.0965	SUB 404 - HOCKERVILLE - VINITA JUNCTION 138KV CKT 1
FDNS	00NR		0	13SP	G13_009	FROM->TO	VINITA JUNCTION (VINITAJC) 138/69/13.8KV TRANSFORMER CKT 1	62	0.19417	100.3894	BASE CASE
FDNS	00NR		0	18WP	G13_009	FROM->TO	VINITA JUNCTION (VINITAJC) 138/69/13.8KV TRANSFORMER CKT 1	62	0.321	100.3669	SUB 404 - HOCKERVILLE - VINITA JUNCTION 138KV CKT 1
FDNS	00NR		0	18WP	G13_009	FROM->TO	VINITA JUNCTION (VINITAJC) 138/69/13.8KV TRANSFORMER CKT 1	62	0.321	100.357	SUB 404 - HOCKERVILLE (HOCK 138) 161/138/12.5KV TRANSFORMER CKT 1
FDNS	00NR		0	18WP	G13_009	FROM->TO	VINITA JUNCTION (VINITAJC) 138/69/13.8KV TRANSFORMER CKT 1	62	0.321	100.1672	SUB 404 - HOCKERVILLE - VINITA JUNCTION 138KV CKT 1
FDNS	00NR		0	18WP	G13_009	FROM->TO	VINITA JUNCTION (VINITAJC) 138/69/13.8KV TRANSFORMER CKT 1	62	0.321	100.1636	SUB 404 - HOCKERVILLE (HOCK 138) 161/138/12.5KV TRANSFORMER CKT 1
FDNS	00NR		2	13SP	G13_009	TO->FROM	CATOOSA - TERRA NITROGEN TAP 138KV CKT 1	136	0.09126	105.5437	NORTHEAST STATION - OWASSO SOUTH 138KV CKT 1
FDNS	00NR		2	13SP	G13_009	TO->FROM	TERRA NITROGEN TAP - VERDIGRIS 138KV CKT 1	136	0.09126	100.3139	OWASSO SOUTH - PORT OF CATOOSA TAP 138KV CKT 1
FDNS	00NR		2	13SP	G13_009	TO->FROM	TERRA NITROGEN TAP - VERDIGRIS 138KV CKT 1	136	0.09126	116.7092	NORTHEAST STATION - OWASSO SOUTH 138KV CKT 1
FDNS	00NR		2	13SP	G13_009	TO->FROM	TERRA NITROGEN TAP - VERDIGRIS 138KV CKT 1	136	0.09126	111.4569	OWASSO SOUTH - PORT OF CATOOSA TAP 138KV CKT 1
FDNS	00NR		2	13SP	G13_009	TO->FROM	TERRA NITROGEN TAP - VERDIGRIS 138KV CKT 1	136	0.10784	107.106	CLAREMORE (CLRAU04) 161/138/13.8KV TRANSFORMER CKT 1
FDNS	00NR		2	13SP	G13_009	TO->FROM	TERRA NITROGEN TAP - VERDIGRIS 138KV CKT 1	136	0.09126	106.269	CATOOSA - PORT OF CATOOSA TAP 138KV CKT 1
FDNS	00NR		2	13SP	G13_009	TO->FROM	TERRA NITROGEN TAP - VERDIGRIS 138KV CKT 1	136	0.04684	104.7295	40OLOGAH 138.00 - NORTHEAST STATION 138KV CKT 1
FDNS	00NR		2	13SP	G13_009	TO->FROM	TERRA NITROGEN TAP - VERDIGRIS 138KV CKT 1	136	0.04684	104.1552	40OLOGAH 138.00 - CLAREMORE 138KV CKT 1
FDNS	00NR		2	13SP	G13_009	TO->FROM	TERRA NITROGEN TAP - VERDIGRIS 138KV CKT 1	136	0.08675	102.1516	NORTHEAST STATION - OWASSO 109TH STREET 138KV CKT 1
FDNS	00NR		2	13SP	G13_009	FROM->TO	VINITA JUNCTION (VINITAJC) 138/69/13.8KV TRANSFORMER CKT 1	62	0.15956	110.4458	SUB 404 - HOCKERVILLE (HOCK 138) 161/138/12.5KV TRANSFORMER CKT 1
FDNS	00NR		2	13SP	G13_009	FROM->TO	VINITA JUNCTION (VINITAJC) 138/69/13.8KV TRANSFORMER CKT 1	62	0.15956	110.2788	SUB 404 - HOCKERVILLE - VINITA JUNCTION 138KV CKT 1
FDNS	00NR		2	13SP	G13_009	FROM->TO	VINITA JUNCTION (VINITAJC) 138/69/13.8KV TRANSFORMER CKT 1	62	0.15956	109.9872	SUB 404 - HOCKERVILLE (HOCK 138) 161/138/12.5KV TRANSFORMER CKT 1
FDNS	00NR		2	13SP	G13_009	FROM->TO	VINITA JUNCTION (VINITAJC) 138/69/13.8KV TRANSFORMER CKT 1	62	0.15956	109.8837	SUB 404 - HOCKERVILLE - VINITA JUNCTION 138KV CKT 1
FDNS	00NR		2	18SP	G13_009	FROM->TO	VINITA JUNCTION (VINITAJC) 138/69/13.8KV TRANSFORMER CKT 1	62	0.16073	107.9353	SUB 404 - HOCKERVILLE (HOCK 138) 161/138/12.5KV TRANSFORMER CKT 1
FDNS	00NR		2	18SP	G13_009	FROM->TO	VINITA JUNCTION (VINITAJC) 138/69/13.8KV TRANSFORMER CKT 1	62	0.16073	107.7756	SUB 404 - HOCKERVILLE - VINITA JUNCTION 138KV CKT 1
FDNS	00NR		2	18SP	G13_009	FROM->TO	VINITA JUNCTION (VINITAJC) 138/69/13.8KV TRANSFORMER CKT 1	62	0.16073	107.4485	SUB 404 - HOCKERVILLE (HOCK 138) 161/138/12.5KV TRANSFORMER CKT 1
FDNS	00NR		2	18SP	G13_009	FROM->TO	VINITA JUNCTION (VINITAJC) 138/69/13.8KV TRANSFORMER CKT 1	62	0.16073	107.352	SUB 404 - HOCKERVILLE - VINITA JUNCTION 138KV CKT 1
FDNS	00NR		2	23SP	G13_009	FROM->TO	VINITA JUNCTION (VINITAJC) 138/69/13.8KV TRANSFORMER CKT 1	62	0.16111	103.372	SUB 404 - HOCKERVILLE (HOCK 138) 161/138/12.5KV TRANSFORMER CKT 1
FDNS	00NR		2	23SP	G13_009	FROM->TO	VINITA JUNCTION (VINITAJC) 138/69/13.8KV TRANSFORMER CKT 1	62	0.16111	103.2226	SUB 404 - HOCKERVILLE - VINITA JUNCTION 138KV CKT 1
FDNS	00NR		2	23SP	G13_009	FROM->TO	VINITA JUNCTION (VINITAJC) 138/69/13.8KV TRANSFORMER CKT 1	62	0.16111	102.8756	SUB 404 - HOCKERVILLE (HOCK 138) 161/138/12.5KV TRANSFORMER CKT 1
FDNS	00NR		2	23SP	G13_009	FROM->TO	VINITA JUNCTION (VINITAJC) 138/69/13.8KV TRANSFORMER CKT 1	62	0.16111	102.7869	SUB 404 - HOCKERVILLE - VINITA JUNCTION 138KV CKT 1
FDNS	00NR		3	18SP	G13_009	FROM->TO	EASTERN STATE HOSPITAL TAP - VINITA NEO TAP 69KV CKT 1	48	0.1834	102.5028	SUB 404 - HOCKERVILLE (HOCK 138) 161/138/12.5KV TRANSFORMER CKT 1
FDNS	00NR		3	18SP	G13_009	FROM->TO	EASTERN STATE HOSPITAL TAP - VINITA NEO TAP 69KV CKT 1	48	0.1834	102.4707	SUB 404 - HOCKERVILLE - VINITA JUNCTION 138KV CKT 1
FDNS	00NR		3	13SP	G13_009	FROM->TO	EASTERN STATE HOSPITAL TAP - VINITA NEO TAP 69KV CKT 1	48	0.1826	102.3691	SUB 404 - HOCKERVILLE (HOCK 138) 161/138/12.5KV TRANSFORMER CKT 1
FDNS	00NR		3	13SP	G13_009	FROM->TO	EASTERN STATE HOSPITAL TAP - VINITA NEO TAP 69KV CKT 1	48	0.1826	102.3457	SUB 404 - HOCKERVILLE - VINITA JUNCTION 138KV CKT 1
FDNS	00NR		4	18SP	G13_009	FROM->TO	EASTERN STATE HOSPITAL TAP - VINITA NEO TAP 69KV CKT 1	48	0.1834	106.368	SUB 404 - HOCKERVILLE (HOCK 138) 161/138/12.5KV TRANSFORMER CKT 1
FDNS	00NR		4	18SP	G13_009	FROM->TO	EASTERN STATE HOSPITAL TAP - VINITA NEO TAP 69KV CKT 1	48	0.1834	106.3359	SUB 404 - HOCKERVILLE - VINITA JUNCTION 138KV CKT 1
FDNS	00NR		4	13SP	G13_009	FROM->TO	EASTERN STATE HOSPITAL TAP - VINITA NEO TAP 69KV CKT 1	48	0.1826	106.3179	SUB 404 - HOCKERVILLE (HOCK 138) 161/138/12.5KV TRANSFORMER CKT 1
FDNS	00NR		4	13SP	G13_009	FROM->TO	EASTERN STATE HOSPITAL TAP - VINITA NEO TAP 69KV CKT 1	48	0.1826	106.2939	SUB 404 - HOCKERVILLE - VINITA JUNCTION 138KV CKT 1
FDNS	00NR		4	13SP	G13_009	TO->FROM	EXPLORER PIPELINE TAP - J6 69KV CKT 1	48	0.1826	101.5359	SUB 404 - HOCKERVILLE (HOCK 138) 161/138/12.5KV TRANSFORMER CKT 1
FDNS	00NR		4	13SP	G13_009	TO->FROM	EXPLORER PIPELINE TAP - J6 69KV CKT 1	48	0.1826	101.5124	SUB 404 - HOCKERVILLE - VINITA JUNCTION 138KV CKT 1
FDNS	00NR		4	18SP	G13_009	TO->FROM	EXPLORER PIPELINE TAP - J6 69KV CKT 1	48	0.1834	101.0203	SUB 404 - HOCKERVILLE (HOCK 138) 161/138/12.5KV TRANSFORMER CKT 1
FDNS	00NR		4	18SP	G13_009	TO->FROM	EXPLORER PIPELINE TAP - J6 69KV CKT 1	48	0.1834	100.9892	SUB 404 - HOCKERVILLE - VINITA JUNCTION 138KV CKT 1
FDNS	00NR		4	13SP	G13_009	TO->FROM	J6 - VINITA NEO TAP 69KV CKT 1	48	0.1826	103.3134	SUB 404 - HOCKERVILLE (HOCK 138) 161/138/12.5KV TRANSFORMER CKT 1
FDNS	00NR		4	13SP	G13_009	TO->FROM	J6 - VINITA NEO TAP 69KV CKT 1	48	0.1826	103.2905	SUB 404 - HOCKERVILLE - VINITA JUNCTION 138KV CKT 1
FDNS	00NR		4	18SP	G13_009	TO->FROM	J6 - VINITA NEO TAP 69KV CKT 1	48	0.1834	102.8805	SUB 404 - HOCKERVILLE (HOCK 138) 161/138/12.5KV TRANSFORMER CKT 1
FDNS	00NR		4	18SP	G13_009	TO->FROM	J6 - VINITA NEO TAP 69KV CKT 1	48	0.1834	102.8488	SUB 404 - HOCKERVILLE - VINITA JUNCTION 138KV CKT 1
FDNS	03NR		0	13G	G13_010	TO->FROM	HAYS PLANT - SOUTH HAYS 115KV CKT 1	99	0.04487	138.6822	KNOLL 230 - POSTROCK6 230.00 230KV CKT 1
FDNS	03NR		0	13G	G13_010	FROM->TO	HAYS PLANT - VINE STREET 115KV CKT 1	88	0.04487	132.9914	KNOLL 230 - POSTROCK6 230.00 230KV CKT 1
FDNS	03NR		0	13G	G13_010	TO->FROM	KNOLL - N HAYS3 115.00 115KV CKT 1	99	0.04487	106.9207	KNOLL 230 - POSTROCK6 230.00 230KV CKT 1
FDNS	03NR		0	13G	G13_010	TO->FROM	N HAYS3 115.00 - VINE STREET 115KV CKT 1	99	0.04487	111.2549	KNOLL 230 - POSTROCK6 230.00 230KV CKT 1
FDNS	03NR		0	13G	G13_010	TO->FROM	N HAYS3 115.00 - VINE STREET 115KV CKT 1	99	0.04487	111.2549	KNOLL 230 - POSTROCK6 230.00 230KV CKT 1
FDNS	0		0	13WP	G13_012	TO->FROM	ARCADIA - REDBUD 345KV CKT 1	1195	0.78478	100.5075	ARCADIA - REDBUD 345KV CKT 2
FDNS	0		0	13WP	G13_012	TO->FROM	ARCADIA - REDBUD 345KV CKT 2	1195	0.78685	100.7689	ARCADIA - REDBUD 345KV CKT 1
FDNS	0		0	13SP	G13_012	TO->FROM	ARCADIA - REDBUD 345KV CKT 2	1195	0.78905	100.123	ARCADIA - REDBUD 345KV CKT 1
FDNS	06NR		0	13G	G13_013	FROM->TO	CURRY COUNTY INTERCHANGE - DEAF SMITH REC-#20 115KV CKT 1	96	0.03179	120.577	DEAF SMITH COUNTY INTERCHANGE - PLANT X STATION 230KV CKT 1
FDNS	06NR		0	13G	G13_013	TO->FROM	DAWN SUB - Panda Energy Substation Hereford 115KV CKT 1	96	0.04289	102.7719	BUFFALO 230.00 - BUSHLAND INTERCHANGE 230KV CKT 1
FDNS	06NR		0	13G	G13_013	FROM->TO	DEAF SMITH COUNTY INTERCHANGE - Panda Energy Substation Hereford 115KV CKT 1	96	0.04289	107.4376	BUFFALO 230.00 - BUSHLAND INTERCHANGE 230KV CKT 1
FDNS	06NR		0	13G	G13_013	TO->FROM	DEAF SMITH COUNTY INTERCHANGE - PLANT X STATION 230KV CKT 1	351	0.08266	102.6321	G13_017T 345.00 - OKLAUNION 345KV CKT 1
FDNS	06NR		0	13G	G13_013	TO->FROM	DEAF SMITH COUNTY INTERCHANGE - PLANT X STATION 230KV CKT 1	351	0.10814	101.1273	PLANT X STATION - POTTER COUNTY INTERCHANGE 230KV CKT 1
FDNS	06NR		0	13G	G13_013	TO->FROM	DEAF SMITH COUNTY INTERCHANGE - PLANT X STATION 230KV CKT 1	351	0.08305	100.5116	BORDER 7345.00 - WOODWARD DISTRICT EHV 345KV CKT 1
FDNS	06NR		0	13G	G13_013	FROM->TO	DEAF SMITH REC-#20 - DEAF SMITH REC-#24 115KV CKT 1	99	0.03179	108.3235	DEAF SMITH COUNTY INTERCHANGE - PLANT X STATION 230KV CKT 1

SOLUTION	GROUP	SCENARIO	SEASON	SOURCE	DIRECTION	MONITORED ELEMENT	RATEB (MVA)	TDF	TC%LOADING (% MVA)	CONTINGENCY
FDNS	00NR		0 23SP	G13_017	FROM->TO	HITCHLAND INTERCHANGE (H TP80148301) 230/115/13.2KV TRANSFORMER CKT 1	250	0.04081	102.9243	OCHILTREE (H TP80219401) 230/115/13.2KV TRANSFORMER CKT 1
FDNS	00NR		0 23SP	G13_017	FROM->TO	HITCHLAND INTERCHANGE (H TP80148301) 230/115/13.2KV TRANSFORMER CKT 1	250	0.04081	102.9243	HITCHLAND INTERCHANGE - OCHILTREE 230KV CKT 1
FDNS	00NR		0 23SP	G13_017	TO->FROM	STANTON SUB - TUCO INTERCHANGE 115KV CKT 1	160	0.04683	101.4927	CARLISLE INTERCHANGE - TUCO INTERCHANGE 230KV CKT 1
FDNS	00NR		0 23SP	G13_017	FROM->TO	TUCO INTERCHANGE (GE M102345) 230/115/13.2KV TRANSFORMER CKT 1	252	0.09836	104.2328	TUCO INTERCHANGE (ENRCO 136401) 230/115/13.2KV TRANSFORMER CKT 2
FDNS	00NR		0 23SP	G13_017	FROM->TO	TUCO INTERCHANGE (GE M102345) 230/115/13.2KV TRANSFORMER CKT 1	252	0.09836	100.6776	TUCO INTERCHANGE (ENRCO 136401) 230/115/13.2KV TRANSFORMER CKT 2
FDNS	00NR		2 13SP	G13_017	TO->FROM	HALE CO INTERCHANGE - TUCO INTERCHANGE 115KV CKT 1	96	0.03615	107.1589	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1
FDNS	00NR		2 23SP	G13_017	FROM->TO	HITCHLAND INTERCHANGE (H TP80148301) 230/115/13.2KV TRANSFORMER CKT 1	250	0.04188	102.9996	HITCHLAND INTERCHANGE - OCHILTREE 230KV CKT 1
FDNS	00NR		2 23SP	G13_017	FROM->TO	HITCHLAND INTERCHANGE (H TP80148301) 230/115/13.2KV TRANSFORMER CKT 1	250	0.04188	102.6895	OCHILTREE (H TP80219401) 230/115/13.2KV TRANSFORMER CKT 1
FDNS	00NR		2 23SP	G13_017	TO->FROM	STANTON SUB - TUCO INTERCHANGE 115KV CKT 1	160	0.04649	100.1227	CARLISLE INTERCHANGE - TUCO INTERCHANGE 230KV CKT 1
FDNS	00NR		3 13SP	G13_017	TO->FROM	HALE CO INTERCHANGE - TUCO INTERCHANGE 115KV CKT 1	96	0.03615	107.0665	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1
FDNS	00NR		3 23SP	G13_017	FROM->TO	HITCHLAND INTERCHANGE (H TP80148301) 230/115/13.2KV TRANSFORMER CKT 1	250	0.04194	102.9246	HITCHLAND INTERCHANGE - OCHILTREE 230KV CKT 1
FDNS	00NR		3 23SP	G13_017	FROM->TO	HITCHLAND INTERCHANGE (H TP80148301) 230/115/13.2KV TRANSFORMER CKT 1	250	0.04194	102.6114	OCHILTREE (H TP80219401) 230/115/13.2KV TRANSFORMER CKT 1
FDNS	00NR		3 23SP	G13_017	TO->FROM	STANTON SUB - TUCO INTERCHANGE 115KV CKT 1	160	0.04645	100.1352	CARLISLE INTERCHANGE - TUCO INTERCHANGE 230KV CKT 1
FDNS	00NR		4 13SP	G13_017	TO->FROM	HALE CO INTERCHANGE - TUCO INTERCHANGE 115KV CKT 1	96	0.03617	107.0367	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1
FDNS	00NR		4 23SP	G13_017	FROM->TO	HITCHLAND INTERCHANGE (H TP80148301) 230/115/13.2KV TRANSFORMER CKT 1	250	0.04195	102.9215	HITCHLAND INTERCHANGE - OCHILTREE 230KV CKT 1
FDNS	00NR		4 23SP	G13_017	FROM->TO	HITCHLAND INTERCHANGE (H TP80148301) 230/115/13.2KV TRANSFORMER CKT 1	250	0.04195	102.6085	OCHILTREE (H TP80219401) 230/115/13.2KV TRANSFORMER CKT 1
FDNS	00NR		4 23SP	G13_017	TO->FROM	STANTON SUB - TUCO INTERCHANGE 115KV CKT 1	160	0.04634	100.2018	CARLISLE INTERCHANGE - TUCO INTERCHANGE 230KV CKT 1
FDNS	00NR		5 23SP	G13_017	FROM->TO	HITCHLAND INTERCHANGE (H TP80148301) 230/115/13.2KV TRANSFORMER CKT 1	250	0.04194	102.923	HITCHLAND INTERCHANGE - OCHILTREE 230KV CKT 1
FDNS	00NR		5 23SP	G13_017	FROM->TO	HITCHLAND INTERCHANGE (H TP80148301) 230/115/13.2KV TRANSFORMER CKT 1	250	0.04194	102.6111	OCHILTREE (H TP80219401) 230/115/13.2KV TRANSFORMER CKT 1
FDNS	00NR		5 23SP	G13_017	TO->FROM	STANTON SUB - TUCO INTERCHANGE 115KV CKT 1	160	0.04627	100.6042	CARLISLE INTERCHANGE - TUCO INTERCHANGE 230KV CKT 1
FDNS	00G13_018		0 23SP	G13_018	FROM->TO	G13_018T 69.000 - HYDROCARBON TAP 69KV CKT 1	57	0.28757	129.1555	SUB 963 - SUB 977 69KV CKT 1
FDNS	00G13_018		0 23SP	G13_018	FROM->TO	G13_018T 69.000 - HYDROCARBON TAP 69KV CKT 1	57	0.28757	128.0227	NEB CITY U SUB 903 - SUB 977 69KV CKT 1
FDNS	00G13_018		0 18SP	G13_018	FROM->TO	G13_018T 69.000 - HYDROCARBON TAP 69KV CKT 1	57	0.28743	124.0097	SUB 963 - SUB 977 69KV CKT 1
FDNS	00G13_018		0 18SP	G13_018	FROM->TO	G13_018T 69.000 - HYDROCARBON TAP 69KV CKT 1	57	0.28743	122.8968	NEB CITY U SUB 903 - SUB 977 69KV CKT 1
FDNS	00G13_018		0 23SP	G13_018	FROM->TO	G13_018T 69.000 - HYDROCARBON TAP 69KV CKT 1	57	0.30754	120.0608	SUB 963 - WEST BROCK 69KV CKT 1
FDNS	00G13_018		0 23SP	G13_018	FROM->TO	G13_018T 69.000 - HYDROCARBON TAP 69KV CKT 1	57	0.38846	119.5354	SUB 968 - SUB 969 69KV CKT 1
FDNS	00G13_018		0 13SP	G13_018	FROM->TO	G13_018T 69.000 - HYDROCARBON TAP 69KV CKT 1	57	0.28743	119.199	SUB 963 - SUB 977 69KV CKT 1
FDNS	00G13_018		0 23SP	G13_018	FROM->TO	G13_018T 69.000 - HYDROCARBON TAP 69KV CKT 1	57	0.38839	118.9186	SUB 967 - SUB 968 69KV CKT 1
FDNS	00G13_018		0 18WP	G13_018	FROM->TO	G13_018T 69.000 - HYDROCARBON TAP 69KV CKT 1	57	0.2874	118.8313	SUB 963 - SUB 977 69KV CKT 1
FDNS	00G13_018		0 13SP	G13_018	FROM->TO	G13_018T 69.000 - HYDROCARBON TAP 69KV CKT 1	57	0.28743	117.8528	NEB CITY U SUB 903 - SUB 977 69KV CKT 1
FDNS	00G13_018		0 18WP	G13_018	FROM->TO	G13_018T 69.000 - HYDROCARBON TAP 69KV CKT 1	57	0.2874	117.664	NEB CITY U SUB 903 - SUB 977 69KV CKT 1
FDNS	00G13_018		0 23SP	G13_018	FROM->TO	G13_018T 69.000 - HYDROCARBON TAP 69KV CKT 1	57	0.55464	117.4773	FIRTH - STERLING 115KV CKT 1
FDNS	00G13_018		0 23SP	G13_018	FROM->TO	G13_018T 69.000 - HYDROCARBON TAP 69KV CKT 1	57	0.55464	117.4758	STERLING 115/69KV TRANSFORMER CKT 1
FDNS	09G13_018BPSON		0 13G	G13_018	FROM->TO	G13_018T 69.000 - HYDROCARBON TAP 69KV CKT 1	57	0.38923	116.8858	SUB 967 - SUB 968 69KV CKT 1
FDNS	00G13_018		0 23SP	G13_018	FROM->TO	G13_018T 69.000 - HYDROCARBON TAP 69KV CKT 1	57	0.38839	116.6096	SUB 967 - WEST BROCK 69KV CKT 1
FDNS	00G13_018		0 18SP	G13_018	FROM->TO	G13_018T 69.000 - HYDROCARBON TAP 69KV CKT 1	57	0.38841	116.1895	SUB 968 - SUB 969 69KV CKT 1
FDNS	09G13_018BPSON		0 13G	G13_018	FROM->TO	G13_018T 69.000 - HYDROCARBON TAP 69KV CKT 1	57	0.38936	115.9739	SUB 968 - SUB 969 69KV CKT 1
FDNS	09ALLBPSON		0 13G	G13_018	FROM->TO	G13_018T 69.000 - HYDROCARBON TAP 69KV CKT 1	57	0.38938	115.92	SUB 968 - SUB 969 69KV CKT 1
FDNS	00G13_018		0 18SP	G13_018	FROM->TO	G13_018T 69.000 - HYDROCARBON TAP 69KV CKT 1	57	0.38834	115.705	SUB 967 - SUB 968 69KV CKT 1
FDNS	09G13_018BPSON		0 13G	G13_018	FROM->TO	G13_018T 69.000 - HYDROCARBON TAP 69KV CKT 1	57	0.38923	115.4614	SUB 967 - WEST BROCK 69KV CKT 1
FDNS	00G13_018		0 18SP	G13_018	FROM->TO	G13_018T 69.000 - HYDROCARBON TAP 69KV CKT 1	57	0.55456	115.2772	FIRTH - STERLING 115KV CKT 1
FDNS	00G13_018		0 18SP	G13_018	FROM->TO	G13_018T 69.000 - HYDROCARBON TAP 69KV CKT 1	57	0.55456	115.2745	STERLING 115/69KV TRANSFORMER CKT 1
FDNS	00G13_018		0 18SP	G13_018	FROM->TO	G13_018T 69.000 - HYDROCARBON TAP 69KV CKT 1	57	0.30746	115.2235	SUB 963 - WEST BROCK 69KV CKT 1
FDNS	00G13_018		0 13SP	G13_018	FROM->TO	G13_018T 69.000 - HYDROCARBON TAP 69KV CKT 1	57	0.38881	114.5071	SUB 968 - SUB 969 69KV CKT 1
FDNS	00G13_018		0 13SP	G13_018	FROM->TO	G13_018T 69.000 - HYDROCARBON TAP 69KV CKT 1	57	0.38873	114.1598	SUB 967 - SUB 968 69KV CKT 1
FDNS	00G13_018		0 13WP	G13_018	FROM->TO	G13_018T 69.000 - HYDROCARBON TAP 69KV CKT 1	57	0.28732	114.0428	SUB 963 - SUB 977 69KV CKT 1
FDNS	00G13_018		0 23SP	G13_018	FROM->TO	G13_018T 69.000 - HYDROCARBON TAP 69KV CKT 1	57	0.29577	113.8568	SUB 904 - SUB 906 SOUTH 69KV CKT 1
FDNS	00G13_018		0 23SP	G13_018	FROM->TO	G13_018T 69.000 - HYDROCARBON TAP 69KV CKT 1	57	0.30345	113.8108	SUB 1214 - SUB 914 69KV CKT 1
FDNS	00G13_018		0 18WP	G13_018	FROM->TO	G13_018T 69.000 - HYDROCARBON TAP 69KV CKT 1	57	0.38825	113.5264	SUB 967 - SUB 968 69KV CKT 1
FDNS	00G13_018		0 18SP	G13_018	FROM->TO	G13_018T 69.000 - HYDROCARBON TAP 69KV CKT 1	57	0.38834	113.4434	SUB 967 - WEST BROCK 69KV CKT 1
FDNS	00G13_018		0 18WP	G13_018	FROM->TO	G13_018T 69.000 - HYDROCARBON TAP 69KV CKT 1	57	0.38835	112.9184	SUB 968 - SUB 969 69KV CKT 1
FDNS	00G13_018		0 13WP	G13_018	FROM->TO	G13_018T 69.000 - HYDROCARBON TAP 69KV CKT 1	57	0.28732	112.8083	NEB CITY U SUB 903 - SUB 977 69KV CKT 1
FDNS	09ALLBPSON		0 13G	G13_018	FROM->TO	G13_018T 69.000 - HYDROCARBON TAP 69KV CKT 1	57	0.38938	112.6035	SUB 967 - SUB 968 69KV CKT 1
FDNS	00G13_018		0 18WP	G13_018	FROM->TO	G13_018T 69.000 - HYDROCARBON TAP 69KV CKT 1	57	0.55457	112.5478	FIRTH - STERLING 115KV CKT 1
FDNS	00G13_018		0 18WP	G13_018	FROM->TO	G13_018T 69.000 - HYDROCARBON TAP 69KV CKT 1	57	0.55457	112.5474	STERLING 115/69KV TRANSFORMER CKT 1
FDNS	00G13_018		0 13SP	G13_018	FROM->TO	G13_018T 69.000 - HYDROCARBON TAP 69KV CKT 1	57	0.55439	112.4914	FIRTH - STERLING 115KV CKT 1
FDNS	00G13_018		0 13SP	G13_018	FROM->TO	G13_018T 69.000 - HYDROCARBON TAP 69KV CKT 1	57	0.55439	112.4881	STERLING 115/69KV TRANSFORMER CKT 1
FDNS	00G13_018		0 13WP	G13_018	FROM->TO	G13_018T 69.000 - HYDROCARBON TAP 69KV CKT 1	57	0.38859	111.9106	SUB 967 - SUB 968 69KV CKT 1
FDNS	00G13_018		0 13SP	G13_018	FROM->TO	G13_018T 69.000 - HYDROCARBON TAP 69KV CKT 1	57	0.38873	111.8692	SUB 967 - WEST BROCK 69KV CKT 1
FDNS	00G13_018		0 13SP	G13_018	FROM->TO	G13_018T 69.000 - HYDROCARBON TAP 69KV CKT 1	57	0.30759	111.5751	SUB 963 - WEST BROCK 69KV CKT 1
FDNS	00G13_018		0 23SP	G13_018	FROM->TO	G13_018T 69.000 - HYDROCARBON TAP 69KV CKT 1	57	0.30849	111.4931	SUB 1214 (S1214 T1) 161/69/13.8KV TRANSFORMER CKT 1

SOLUTION	GROUP	SCENARIO	SEASON	SOURCE	DIRECTION	MONITORED ELEMENT	RATEB		TC%LOADING		CONTINGENCY
							(MVA)	TDF	(% MVA)		
FDNS	00G13_018		0 23SP	G13_018	FROM->TO	G13_018T 69.000 - HYDROCARBON TAP 69KV CKT 1	57	0.28746	111.4283	NEB CITY U SUB 903 - SUB 962 69KV CKT 1	
FDNS	00G13_018		0 13WP	G13_018	FROM->TO	G13_018T 69.000 - HYDROCARBON TAP 69KV CKT 1	57	0.3887	111.3489	SUB 968 - SUB 969 69KV CKT 1	
FDNS	00G13_018		0 18WP	G13_018	FROM->TO	G13_018T 69.000 - HYDROCARBON TAP 69KV CKT 1	57	0.30739	111.1831	SUB 963 - WEST BROCK 69KV CKT 1	
FDNS	09ALLBPSON		0 13G	G13_018	FROM->TO	G13_018T 69.000 - HYDROCARBON TAP 69KV CKT 1	57	0.38938	111.1493	SUB 967 - WEST BROCK 69KV CKT 1	
FDNS	00G13_018		0 18WP	G13_018	FROM->TO	G13_018T 69.000 - HYDROCARBON TAP 69KV CKT 1	57	0.38825	110.6854	SUB 967 - WEST BROCK 69KV CKT 1	
FDNS	00G13_018		0 23SP	G13_018	FROM->TO	G13_018T 69.000 - HYDROCARBON TAP 69KV CKT 1	57	0.29577	110.402	SUB 904 - SUB 985 69KV CKT 1	
FDNS	00G13_018		0 13WP	G13_018	FROM->TO	G13_018T 69.000 - HYDROCARBON TAP 69KV CKT 1	57	0.55436	110.262	FIRTH - STERLING 115KV CKT 1	
FDNS	00G13_018		0 13WP	G13_018	FROM->TO	G13_018T 69.000 - HYDROCARBON TAP 69KV CKT 1	57	0.55436	110.1335	STERLING 115/69KV TRANSFORMER CKT 1	
FDNS	00G13_018		0 23SP	G13_018	FROM->TO	G13_018T 69.000 - HYDROCARBON TAP 69KV CKT 1	57	0.29469	109.7344	PLATTESMOUTH - SUB 985 69KV CKT 1	
FDNS	00G13_018		0 13WP	G13_018	FROM->TO	G13_018T 69.000 - HYDROCARBON TAP 69KV CKT 1	57	0.38859	109.1392	SUB 967 - WEST BROCK 69KV CKT 1	
FDNS	09G13_018		0 13G	G13_018	FROM->TO	G13_018T 69.000 - HYDROCARBON TAP 69KV CKT 1	57	0.38923	108.8976	SUB 967 - SUB 968 69KV CKT 1	
FDNS	00G13_018		0 23SP	G13_018	FROM->TO	G13_018T 69.000 - HYDROCARBON TAP 69KV CKT 1	57	0.31041	108.8488	SUB 1206 (S1206 T1) 161/69/13.8KV TRANSFORMER CKT 1	
FDNS	00G13_018		0 18SP	G13_018	FROM->TO	G13_018T 69.000 - HYDROCARBON TAP 69KV CKT 1	57	0.29571	108.8484	SUB 904 - SUB 906 SOUTH 69KV CKT 1	
FDNS	00G13_018		0 18SP	G13_018	FROM->TO	G13_018T 69.000 - HYDROCARBON TAP 69KV CKT 1	57	0.30338	108.5334	SUB 1214 - SUB 914 69KV CKT 1	
FDNS	09G13_018		0 13G	G13_018	FROM->TO	G13_018T 69.000 - HYDROCARBON TAP 69KV CKT 1	57	0.38936	107.7651	SUB 968 - SUB 969 69KV CKT 1	
FDNS	00G13_018		0 13WP	G13_018	FROM->TO	G13_018T 69.000 - HYDROCARBON TAP 69KV CKT 1	57	0.30748	107.5093	SUB 963 - WEST BROCK 69KV CKT 1	
FDNS	00G13_018		0 18SP	G13_018	FROM->TO	G13_018T 69.000 - HYDROCARBON TAP 69KV CKT 1	57	0.30841	107.5049	SUB 1214 (S1214 T1) 161/69/13.8KV TRANSFORMER CKT 1	
FDNS	09G13_018		0 13G	G13_018	FROM->TO	G13_018T 69.000 - HYDROCARBON TAP 69KV CKT 1	57	0.38923	107.4731	SUB 967 - WEST BROCK 69KV CKT 1	
FDNS	00G13_018		0 18SP	G13_018	FROM->TO	G13_018T 69.000 - HYDROCARBON TAP 69KV CKT 1	57	0.28734	106.2178	NEB CITY U SUB 903 - SUB 962 69KV CKT 1	
FDNS	00G13_018		0 18SP	G13_018	FROM->TO	G13_018T 69.000 - HYDROCARBON TAP 69KV CKT 1	57	0.29571	105.8772	SUB 904 - SUB 985 69KV CKT 1	
FDNS	09G13_018BPSON		0 13G	G13_018	FROM->TO	G13_018T 69.000 - HYDROCARBON TAP 69KV CKT 1	57	0.28768	105.6114	SUB 963 - SUB 977 69KV CKT 1	
FDNS	00G13_018		0 13SP	G13_018	FROM->TO	G13_018T 69.000 - HYDROCARBON TAP 69KV CKT 1	57	0.29589	105.1583	SUB 904 - SUB 906 SOUTH 69KV CKT 1	
FDNS	09G13_018BPSON		0 13G	G13_018	FROM->TO	G13_018T 69.000 - HYDROCARBON TAP 69KV CKT 1	57	0.28768	105.004	NEB CITY U SUB 903 - SUB 977 69KV CKT 1	
FDNS	09G13_018BPSON		0 13G	G13_018	FROM->TO	G13_018T 69.000 - HYDROCARBON TAP 69KV CKT 1	57	0.55431	104.9464	FIRTH - STERLING 115KV CKT 1	
FDNS	09G13_018BPSON		0 13G	G13_018	FROM->TO	G13_018T 69.000 - HYDROCARBON TAP 69KV CKT 1	57	0.55431	104.8373	STERLING 115/69KV TRANSFORMER CKT 1	
FDNS	00G13_018		0 13SP	G13_018	FROM->TO	G13_018T 69.000 - HYDROCARBON TAP 69KV CKT 1	57	0.30352	104.7506	SUB 1214 - SUB 914 69KV CKT 1	
FDNS	09G13_018		0 13G	G13_018	FROM->TO	G13_018T 69.000 - HYDROCARBON TAP 69KV CKT 1	57	0.55431	104.6217	STERLING 115/69KV TRANSFORMER CKT 1	
FDNS	09G13_018		0 13G	G13_018	FROM->TO	G13_018T 69.000 - HYDROCARBON TAP 69KV CKT 1	57	0.55431	104.599	FIRTH - STERLING 115KV CKT 1	
FDNS	00G13_018		0 13SP	G13_018	FROM->TO	G13_018T 69.000 - HYDROCARBON TAP 69KV CKT 1	57	0.30856	103.5885	SUB 1214 (S1214 T1) 161/69/13.8KV TRANSFORMER CKT 1	
FDNS	09ALLBPSON		0 13G	G13_018	FROM->TO	G13_018T 69.000 - HYDROCARBON TAP 69KV CKT 1	57	0.28774	103.5121	SUB 963 - SUB 977 69KV CKT 1	
FDNS	00G13_018		0 18WP	G13_018	FROM->TO	G13_018T 69.000 - HYDROCARBON TAP 69KV CKT 1	57	0.29566	103.4187	SUB 904 - SUB 906 SOUTH 69KV CKT 1	
FDNS	00G13_018		0 18WP	G13_018	FROM->TO	G13_018T 69.000 - HYDROCARBON TAP 69KV CKT 1	57	0.30837	103.3012	SUB 1214 (S1214 T1) 161/69/13.8KV TRANSFORMER CKT 1	
FDNS	00G13_018		0 23SP	G13_018	FROM->TO	G13_018T 69.000 - HYDROCARBON TAP 69KV CKT 1	57	0.3117	103.1708	BASE CASE	
FDNS	09ALLBPSON		0 13G	G13_018	FROM->TO	G13_018T 69.000 - HYDROCARBON TAP 69KV CKT 1	57	0.28774	102.8967	NEB CITY U SUB 903 - SUB 977 69KV CKT 1	
FDNS	00G13_018		0 18WP	G13_018	FROM->TO	G13_018T 69.000 - HYDROCARBON TAP 69KV CKT 1	57	0.28735	102.6932	NEB CITY U SUB 903 - SUB 962 69KV CKT 1	
FDNS	00G13_018		0 18WP	G13_018	FROM->TO	G13_018T 69.000 - HYDROCARBON TAP 69KV CKT 1	57	0.30333	102.4838	SUB 1214 - SUB 914 69KV CKT 1	
FDNS	09G13_018BPSON		0 13G	G13_018	FROM->TO	G13_018T 69.000 - HYDROCARBON TAP 69KV CKT 1	57	0.30787	101.9534	SUB 963 - WEST BROCK 69KV CKT 1	
FDNS	09ALLBPSON		0 13G	G13_018	FROM->TO	G13_018T 69.000 - HYDROCARBON TAP 69KV CKT 1	57	0.55441	101.6909	FIRTH - STERLING 115KV CKT 1	
FDNS	09ALLBPSON		0 13G	G13_018	FROM->TO	G13_018T 69.000 - HYDROCARBON TAP 69KV CKT 1	57	0.55441	101.6663	STERLING 115/69KV TRANSFORMER CKT 1	
FDNS	09ALLBPSON		0 13G	G13_018	FROM->TO	G13_018T 69.000 - HYDROCARBON TAP 69KV CKT 1	57	0.30794	100	SUB 963 - WEST BROCK 69KV CKT 1	
FDNS	00G13_018		0 23SP	G13_018	FROM->TO	HYDROCARBON TAP - SUB 970 69KV CKT 1	64	0.28757	115.0103	SUB 963 - SUB 977 69KV CKT 1	
FDNS	00G13_018		0 23SP	G13_018	FROM->TO	HYDROCARBON TAP - SUB 970 69KV CKT 1	64	0.28757	114.0008	NEB CITY U SUB 903 - SUB 977 69KV CKT 1	
FDNS	00G13_018		0 18SP	G13_018	FROM->TO	HYDROCARBON TAP - SUB 970 69KV CKT 1	64	0.28743	110.4033	SUB 963 - SUB 977 69KV CKT 1	
FDNS	00G13_018		0 18SP	G13_018	FROM->TO	HYDROCARBON TAP - SUB 970 69KV CKT 1	64	0.28743	109.4115	NEB CITY U SUB 903 - SUB 977 69KV CKT 1	
FDNS	00G13_018		0 23SP	G13_018	FROM->TO	HYDROCARBON TAP - SUB 970 69KV CKT 1	64	0.30754	106.9025	SUB 963 - WEST BROCK 69KV CKT 1	
FDNS	00G13_018		0 23SP	G13_018	FROM->TO	HYDROCARBON TAP - SUB 970 69KV CKT 1	64	0.38846	106.3925	SUB 968 - SUB 969 69KV CKT 1	
FDNS	00G13_018		0 13SP	G13_018	FROM->TO	HYDROCARBON TAP - SUB 970 69KV CKT 1	64	0.28743	106.1163	SUB 963 - SUB 977 69KV CKT 1	
FDNS	00G13_018		0 23SP	G13_018	FROM->TO	HYDROCARBON TAP - SUB 970 69KV CKT 1	64	0.38839	105.8434	SUB 967 - SUB 968 69KV CKT 1	
FDNS	00G13_018		0 18WP	G13_018	FROM->TO	HYDROCARBON TAP - SUB 970 69KV CKT 1	64	0.2874	105.6968	SUB 963 - SUB 977 69KV CKT 1	
FDNS	00G13_018		0 13SP	G13_018	FROM->TO	HYDROCARBON TAP - SUB 970 69KV CKT 1	64	0.28743	104.9388	NEB CITY U SUB 903 - SUB 977 69KV CKT 1	
FDNS	00G13_018		0 18WP	G13_018	FROM->TO	HYDROCARBON TAP - SUB 970 69KV CKT 1	64	0.2874	104.6575	NEB CITY U SUB 903 - SUB 977 69KV CKT 1	
FDNS	00G13_018		0 23SP	G13_018	FROM->TO	HYDROCARBON TAP - SUB 970 69KV CKT 1	64	0.55464	104.5966	FIRTH - STERLING 115KV CKT 1	
FDNS	00G13_018		0 23SP	G13_018	FROM->TO	HYDROCARBON TAP - SUB 970 69KV CKT 1	64	0.55464	104.5947	STERLING 115/69KV TRANSFORMER CKT 1	
FDNS	09G13_018BPSON		0 13G	G13_018	FROM->TO	HYDROCARBON TAP - SUB 970 69KV CKT 1	64	0.38923	104.0576	SUB 967 - SUB 968 69KV CKT 1	
FDNS	00G13_018		0 23SP	G13_018	FROM->TO	HYDROCARBON TAP - SUB 970 69KV CKT 1	64	0.38839	103.8194	SUB 967 - WEST BROCK 69KV CKT 1	
FDNS	00G13_018		0 18SP	G13_018	FROM->TO	HYDROCARBON TAP - SUB 970 69KV CKT 1	64	0.38841	103.446	SUB 968 - SUB 969 69KV CKT 1	
FDNS	09G13_018BPSON		0 13G	G13_018	FROM->TO	HYDROCARBON TAP - SUB 970 69KV CKT 1	64	0.38936	103.2459	SUB 968 - SUB 969 69KV CKT 1	
FDNS	09ALLBPSON		0 13G	G13_018	FROM->TO	HYDROCARBON TAP - SUB 970 69KV CKT 1	64	0.38938	103.1985	SUB 968 - SUB 969 69KV CKT 1	
FDNS	00G13_018		0 18SP	G13_018	FROM->TO	HYDROCARBON TAP - SUB 970 69KV CKT 1	64	0.38834	103.0145	SUB 967 - SUB 968 69KV CKT 1	
FDNS	09G13_018BPSON		0 13G	G13_018	FROM->TO	HYDROCARBON TAP - SUB 970 69KV CKT 1	64	0.38923	102.7893	SUB 967 - WEST BROCK 69KV CKT 1	
FDNS	00G13_018		0 18SP	G13_018	FROM->TO	HYDROCARBON TAP - SUB 970 69KV CKT 1	64	0.55456	102.637	FIRTH - STERLING 115KV CKT 1	
FDNS	00G13_018		0 18SP	G13_018	FROM->TO	HYDROCARBON TAP - SUB 970 69KV CKT 1	64	0.55456	102.6336	STERLING 115/69KV TRANSFORMER CKT 1	
FDNS	00G13_018		0 18SP	G13_018	FROM->TO	HYDROCARBON TAP - SUB 970 69KV CKT 1	64	0.30746	102.5905	SUB 963 - WEST BROCK 69KV CKT 1	
FDNS	00G13_018		0 13SP	G13_018	FROM->TO	HYDROCARBON TAP - SUB 970 69KV CKT 1	64	0.38881	101.9465	SUB 968 - SUB 969 69KV CKT 1	
FDNS	00G13_018		0 13SP	G13_018	FROM->TO	HYDROCARBON TAP - SUB 970 69KV CKT 1	64	0.38873	101.6368	SUB 967 - SUB 968 69KV CKT 1	
FDNS	00G13_018		0 13WP	G13_018	FROM->TO	HYDROCARBON TAP - SUB 970 69KV CKT 1	64	0.28732	101.4442	SUB 963 - SUB 977 69KV CKT 1	
FDNS	00G13_018		0 23SP	G13_018	FROM->TO	HYDROCARBON TAP - SUB 970 69KV CKT 1	64	0.29577	101.3861	SUB 904 - SUB 906 SOUTH 69KV CKT 1	
FDNS	00G13_018		0 23SP	G13_018	FROM->TO	HYDROCARBON TAP - SUB 970 69KV CKT 1	64	0.30345	101.3166	SUB 1214 - SUB 914 69KV CKT 1	
FDNS	00G13_018		0 18WP	G13_018	FROM->TO	HYDROCARBON TAP - SUB 970 69KV CKT 1	64	0.38825	101.0025	SUB 967 - SUB 968 69KV CKT 1	
FDNS	00G13_018		0 18SP	G13_018	FROM->TO	HYDROCARBON TAP - SUB 970 69KV CKT 1	64	0.38834	100.9711	SUB 967 - WEST BROCK 69KV CKT 1	
FDNS	00G13_018		0 18WP	G13_018	FROM->TO	HYDROCARBON TAP - SUB 970 69KV CKT 1	64	0.38835	100.4605	SUB 968 - SUB 969 69KV CKT 1	

SOLUTION	GROUP	SCENARIO	SEASON	SOURCE	DIRECTION	MONITORED ELEMENT	RATEB (MVA)	TDF	TC%LOADING (% MVA)	CONTINGENCY	
FDNS	00G13_018		0	13WP	G13_018	FROM->TO	HYDROCARBON TAP - SUB 970 69KV CKT 1	64	0.28732	100.3468	NEB CITY U SUB 903 - SUB 977 69KV CKT 1
FDNS	09ALLBPSON		0	13G	G13_018	FROM->TO	HYDROCARBON TAP - SUB 970 69KV CKT 1	64	0.38938	100.245	SUB 967 - SUB 968 69KV CKT 1
FDNS	00G13_018		0	13SP	G13_018	FROM->TO	HYDROCARBON TAP - SUB 970 69KV CKT 1	64	0.55439	100.151	FIRTH - STERLING 115KV CKT 1
FDNS	00G13_018		0	13SP	G13_018	FROM->TO	HYDROCARBON TAP - SUB 970 69KV CKT 1	64	0.55439	100.1494	STERLING 115/69KV TRANSFORMER CKT 1
FDNS	00G13_018		0	18WP	G13_018	FROM->TO	HYDROCARBON TAP - SUB 970 69KV CKT 1	64	0.55457	100.1398	FIRTH - STERLING 115KV CKT 1
FDNS	00G13_018		0	18WP	G13_018	FROM->TO	HYDROCARBON TAP - SUB 970 69KV CKT 1	64	0.55457	100.1392	STERLING 115/69KV TRANSFORMER CKT 1
FDNS	00G13_018		0	23SP	G13_018	TO->FROM	NEB CITY U SYR SUB - SUB 970 69KV CKT 1	47	0.28757	139.7789	SUB 963 - SUB 977 69KV CKT 1
FDNS	00G13_018		0	23SP	G13_018	TO->FROM	NEB CITY U SYR SUB - SUB 970 69KV CKT 1	47	0.28757	138.432	NEB CITY U SUB 903 - SUB 977 69KV CKT 1
FDNS	00G13_018		0	18SP	G13_018	TO->FROM	NEB CITY U SYR SUB - SUB 970 69KV CKT 1	47	0.28743	135.0367	SUB 963 - SUB 977 69KV CKT 1
FDNS	00G13_018		0	18SP	G13_018	TO->FROM	NEB CITY U SYR SUB - SUB 970 69KV CKT 1	47	0.28743	133.7109	NEB CITY U SUB 903 - SUB 977 69KV CKT 1
FDNS	09G13_018BPSON		0	13G	G13_018	TO->FROM	NEB CITY U SYR SUB - SUB 970 69KV CKT 1	47	0.38923	133.5691	SUB 967 - SUB 968 69KV CKT 1
FDNS	09G13_018BPSON		0	13G	G13_018	TO->FROM	NEB CITY U SYR SUB - SUB 970 69KV CKT 1	47	0.38936	132.4619	SUB 968 - SUB 969 69KV CKT 1
FDNS	09ALLBPSON		0	13G	G13_018	TO->FROM	NEB CITY U SYR SUB - SUB 970 69KV CKT 1	47	0.38938	132.3842	SUB 968 - SUB 969 69KV CKT 1
FDNS	09G13_018BPSON		0	13G	G13_018	TO->FROM	NEB CITY U SYR SUB - SUB 970 69KV CKT 1	47	0.38923	131.8455	SUB 967 - WEST BROCK 69KV CKT 1
FDNS	00G13_018		0	18WP	G13_018	TO->FROM	NEB CITY U SYR SUB - SUB 970 69KV CKT 1	47	0.2874	130.6991	SUB 963 - SUB 977 69KV CKT 1
FDNS	00G13_018		0	13SP	G13_018	TO->FROM	NEB CITY U SYR SUB - SUB 970 69KV CKT 1	47	0.28743	130.5773	SUB 963 - SUB 977 69KV CKT 1
FDNS	00G13_018		0	18WP	G13_018	TO->FROM	NEB CITY U SYR SUB - SUB 970 69KV CKT 1	47	0.2874	129.3095	NEB CITY U SUB 903 - SUB 977 69KV CKT 1
FDNS	00G13_018		0	13SP	G13_018	TO->FROM	NEB CITY U SYR SUB - SUB 970 69KV CKT 1	47	0.28743	129.0416	NEB CITY U SUB 903 - SUB 977 69KV CKT 1
FDNS	00G13_018		0	23SP	G13_018	TO->FROM	NEB CITY U SYR SUB - SUB 970 69KV CKT 1	47	0.30754	129.0392	SUB 963 - WEST BROCK 69KV CKT 1
FDNS	00G13_018		0	23SP	G13_018	TO->FROM	NEB CITY U SYR SUB - SUB 970 69KV CKT 1	47	0.38846	128.5735	SUB 968 - SUB 969 69KV CKT 1
FDNS	09ALLBPSON		0	13G	G13_018	TO->FROM	NEB CITY U SYR SUB - SUB 970 69KV CKT 1	47	0.38938	128.377	SUB 967 - SUB 968 69KV CKT 1
FDNS	00G13_018		0	23SP	G13_018	TO->FROM	NEB CITY U SYR SUB - SUB 970 69KV CKT 1	47	0.38839	127.8315	SUB 967 - SUB 968 69KV CKT 1
FDNS	09ALLBPSON		0	13G	G13_018	TO->FROM	NEB CITY U SYR SUB - SUB 970 69KV CKT 1	47	0.38938	126.6169	SUB 967 - WEST BROCK 69KV CKT 1
FDNS	00G13_018		0	13WP	G13_018	TO->FROM	NEB CITY U SYR SUB - SUB 970 69KV CKT 1	47	0.28732	126.401	SUB 963 - SUB 977 69KV CKT 1
FDNS	00G13_018		0	18SP	G13_018	TO->FROM	NEB CITY U SYR SUB - SUB 970 69KV CKT 1	47	0.38841	126.1261	SUB 968 - SUB 969 69KV CKT 1
FDNS	00G13_018		0	23SP	G13_018	TO->FROM	NEB CITY U SYR SUB - SUB 970 69KV CKT 1	47	0.55464	126.0398	FIRTH - STERLING 115KV CKT 1
FDNS	00G13_018		0	23SP	G13_018	TO->FROM	NEB CITY U SYR SUB - SUB 970 69KV CKT 1	47	0.55464	126.0373	STERLING 115/69KV TRANSFORMER CKT 1
FDNS	00G13_018		0	18SP	G13_018	TO->FROM	NEB CITY U SYR SUB - SUB 970 69KV CKT 1	47	0.38834	125.5445	SUB 967 - SUB 968 69KV CKT 1
FDNS	00G13_018		0	13SP	G13_018	TO->FROM	NEB CITY U SYR SUB - SUB 970 69KV CKT 1	47	0.38881	125.4129	SUB 968 - SUB 969 69KV CKT 1
FDNS	00G13_018		0	23SP	G13_018	TO->FROM	NEB CITY U SYR SUB - SUB 970 69KV CKT 1	47	0.38839	125.1378	SUB 967 - WEST BROCK 69KV CKT 1
FDNS	00G13_018		0	13SP	G13_018	TO->FROM	NEB CITY U SYR SUB - SUB 970 69KV CKT 1	47	0.38873	124.9979	SUB 967 - SUB 968 69KV CKT 1
FDNS	00G13_018		0	13WP	G13_018	TO->FROM	NEB CITY U SYR SUB - SUB 970 69KV CKT 1	47	0.28732	124.9209	NEB CITY U SUB 903 - SUB 977 69KV CKT 1
FDNS	00G13_018		0	18SP	G13_018	TO->FROM	NEB CITY U SYR SUB - SUB 970 69KV CKT 1	47	0.55456	124.9072	FIRTH - STERLING 115KV CKT 1
FDNS	00G13_018		0	18SP	G13_018	TO->FROM	NEB CITY U SYR SUB - SUB 970 69KV CKT 1	47	0.55456	124.9028	STERLING 115/69KV TRANSFORMER CKT 1
FDNS	00G13_018		0	18WP	G13_018	TO->FROM	NEB CITY U SYR SUB - SUB 970 69KV CKT 1	47	0.38825	124.7622	SUB 967 - SUB 968 69KV CKT 1
FDNS	00G13_018		0	18SP	G13_018	TO->FROM	NEB CITY U SYR SUB - SUB 970 69KV CKT 1	47	0.30746	124.6961	SUB 963 - WEST BROCK 69KV CKT 1
FDNS	00G13_018		0	13WP	G13_018	TO->FROM	NEB CITY U SYR SUB - SUB 970 69KV CKT 1	47	0.38859	124.1336	SUB 967 - SUB 968 69KV CKT 1
FDNS	00G13_018		0	18WP	G13_018	TO->FROM	NEB CITY U SYR SUB - SUB 970 69KV CKT 1	47	0.38835	124.0177	SUB 968 - SUB 969 69KV CKT 1
FDNS	09G13_018		0	13G	G13_018	TO->FROM	NEB CITY U SYR SUB - SUB 970 69KV CKT 1	47	0.38923	123.9026	SUB 967 - SUB 968 69KV CKT 1
FDNS	00G13_018		0	18WP	G13_018	TO->FROM	NEB CITY U SYR SUB - SUB 970 69KV CKT 1	47	0.55457	123.5145	FIRTH - STERLING 115KV CKT 1
FDNS	00G13_018		0	18WP	G13_018	TO->FROM	NEB CITY U SYR SUB - SUB 970 69KV CKT 1	47	0.55457	123.5137	STERLING 115/69KV TRANSFORMER CKT 1
FDNS	00G13_018		0	13WP	G13_018	TO->FROM	NEB CITY U SYR SUB - SUB 970 69KV CKT 1	47	0.3887	123.4462	SUB 968 - SUB 969 69KV CKT 1
FDNS	00G13_018		0	13SP	G13_018	TO->FROM	NEB CITY U SYR SUB - SUB 970 69KV CKT 1	47	0.55439	122.8844	FIRTH - STERLING 115KV CKT 1
FDNS	00G13_018		0	13SP	G13_018	TO->FROM	NEB CITY U SYR SUB - SUB 970 69KV CKT 1	47	0.55439	122.8836	STERLING 115/69KV TRANSFORMER CKT 1
FDNS	00G13_018		0	18SP	G13_018	TO->FROM	NEB CITY U SYR SUB - SUB 970 69KV CKT 1	47	0.38834	122.7091	SUB 967 - WEST BROCK 69KV CKT 1
FDNS	09G13_018		0	13G	G13_018	TO->FROM	NEB CITY U SYR SUB - SUB 970 69KV CKT 1	47	0.38936	122.4422	SUB 968 - SUB 969 69KV CKT 1
FDNS	00G13_018		0	13SP	G13_018	TO->FROM	NEB CITY U SYR SUB - SUB 970 69KV CKT 1	47	0.38873	122.2241	SUB 967 - WEST BROCK 69KV CKT 1
FDNS	09G13_018		0	13G	G13_018	TO->FROM	NEB CITY U SYR SUB - SUB 970 69KV CKT 1	47	0.38923	122.1782	SUB 967 - WEST BROCK 69KV CKT 1
FDNS	00G13_018		0	13WP	G13_018	TO->FROM	NEB CITY U SYR SUB - SUB 970 69KV CKT 1	47	0.55436	122.1646	FIRTH - STERLING 115KV CKT 1
FDNS	00G13_018		0	13WP	G13_018	TO->FROM	NEB CITY U SYR SUB - SUB 970 69KV CKT 1	47	0.55436	122.0533	STERLING 115/69KV TRANSFORMER CKT 1
FDNS	00G13_018		0	18WP	G13_018	TO->FROM	NEB CITY U SYR SUB - SUB 970 69KV CKT 1	47	0.30739	121.6529	SUB 963 - WEST BROCK 69KV CKT 1
FDNS	00G13_018		0	13SP	G13_018	TO->FROM	NEB CITY U SYR SUB - SUB 970 69KV CKT 1	47	0.30759	121.6121	SUB 963 - WEST BROCK 69KV CKT 1
FDNS	00G13_018		0	23SP	G13_018	TO->FROM	NEB CITY U SYR SUB - SUB 970 69KV CKT 1	47	0.29577	121.3379	SUB 904 - SUB 906 SOUTH 69KV CKT 1
FDNS	00G13_018		0	18WP	G13_018	TO->FROM	NEB CITY U SYR SUB - SUB 970 69KV CKT 1	47	0.38825	121.3211	SUB 967 - WEST BROCK 69KV CKT 1
FDNS	00G13_018		0	23SP	G13_018	TO->FROM	NEB CITY U SYR SUB - SUB 970 69KV CKT 1	47	0.30345	121.3015	SUB 1214 - SUB 914 69KV CKT 1
FDNS	00G13_018		0	13WP	G13_018	TO->FROM	NEB CITY U SYR SUB - SUB 970 69KV CKT 1	47	0.38859	120.8714	SUB 967 - WEST BROCK 69KV CKT 1
FDNS	09G13_018BPSON		0	13G	G13_018	TO->FROM	NEB CITY U SYR SUB - SUB 970 69KV CKT 1	47	0.28768	119.6956	SUB 963 - SUB 977 69KV CKT 1
FDNS	09G13_018BPSON		0	13G	G13_018	TO->FROM	NEB CITY U SYR SUB - SUB 970 69KV CKT 1	47	0.55431	119.0696	FIRTH - STERLING 115KV CKT 1
FDNS	09G13_018BPSON		0	13G	G13_018	TO->FROM	NEB CITY U SYR SUB - SUB 970 69KV CKT 1	47	0.28768	118.9669	NEB CITY U SUB 903 - SUB 977 69KV CKT 1
FDNS	09G13_018BPSON		0	13G	G13_018	TO->FROM	NEB CITY U SYR SUB - SUB 970 69KV CKT 1	47	0.55431	118.9438	STERLING 115/69KV TRANSFORMER CKT 1
FDNS	00G13_018		0	23SP	G13_018	TO->FROM	NEB CITY U SYR SUB - SUB 970 69KV CKT 1	47	0.28746	118.802	NEB CITY U SUB 903 - SUB 962 69KV CKT 1
FDNS	09G13_018		0	13G	G13_018	TO->FROM	NEB CITY U SYR SUB - SUB 970 69KV CKT 1	47	0.55431	118.6889	STERLING 115/69KV TRANSFORMER CKT 1
FDNS	09G13_018		0	13G	G13_018	TO->FROM	NEB CITY U SYR SUB - SUB 970 69KV CKT 1	47	0.55431	118.6823	FIRTH - STERLING 115KV CKT 1
FDNS	00G13_018		0	23SP	G13_018	TO->FROM	NEB CITY U SYR SUB - SUB 970 69KV CKT 1	47	0.30849	118.6747	SUB 1214 (S1214 T1) 161/69/13.8KV TRANSFORMER CKT 1
FDNS	00G13_018		0	13WP	G13_018	TO->FROM	NEB CITY U SYR SUB - SUB 970 69KV CKT 1	47	0.30748	118.6619	SUB 963 - WEST BROCK 69KV CKT 1
FDNS	00G13_018		0	23SP	G13_018	TO->FROM	NEB CITY U SYR SUB - SUB 970 69KV CKT 1	47	0.29577	117.2312	SUB 904 - SUB 985 69KV CKT 1
FDNS	09ALLBPSON		0	13G	G13_018	TO->FROM	NEB CITY U SYR SUB - SUB 970 69KV CKT 1	47	0.28774	117.0411	SUB 963 - SUB 977 69KV CKT 1
FDNS	00G13_018		0	18SP	G13_018	TO->FROM	NEB CITY U SYR SUB - SUB 970 69KV CKT 1	47	0.29571	116.8438	SUB 904 - SUB 906 SOUTH 69KV CKT 1
FDNS	00G13_018		0	18SP	G13_018	TO->FROM	NEB CITY U SYR SUB - SUB 970 69KV CKT 1	47	0.30338	116.5358	SUB 1214 - SUB 914 69KV CKT 1
FDNS	09ALLBPSON		0	13G	G13_018	TO->FROM	NEB CITY U SYR SUB - SUB 970 69KV CKT 1	47	0.28774	116.318	NEB CITY U SUB 903 - SUB 977 69KV CKT 1
FDNS	09G13_018BPSON		0	13G	G13_018	TO->FROM	NEB CITY U SYR SUB - SUB 970 69KV CKT 1	47	0.30787	115.3824	SUB 963 - WEST BROCK 69KV CKT 1

SOLUTION	GROUP	SCENARIO	SEASON	SOURCE	DIRECTION	MONITORED ELEMENT	RATEB		TC%LOADING		CONTINGENCY
							(MVA)	TDF	(% MVA)		
FDNS	00G13_018		0	18SP	G13_018	TO->FROM	NEB CITY U SYR SUB - SUB 970 69KV CKT 1	47	0.30841	115.3524	SUB 1214 (S1214 T1) 161/69/13.8KV TRANSFORMER CKT 1
FDNS	09ALLBPSON		0	13G	G13_018	TO->FROM	NEB CITY U SYR SUB - SUB 970 69KV CKT 1	47	0.55441	115.1425	FIRTH - STERLING 115KV CKT 1
FDNS	09ALLBPSON		0	13G	G13_018	TO->FROM	NEB CITY U SYR SUB - SUB 970 69KV CKT 1	47	0.55441	115.1211	STERLING 115/69KV TRANSFORMER CKT 1
FDNS	00G13_018		0	18SP	G13_018	TO->FROM	NEB CITY U SYR SUB - SUB 970 69KV CKT 1	47	0.28734	113.9842	NEB CITY U SUB 903 - SUB 962 69KV CKT 1
FDNS	00G13_018		0	13SP	G13_018	TO->FROM	NEB CITY U SYR SUB - SUB 970 69KV CKT 1	47	0.29589	113.6439	SUB 904 - SUB 906 SOUTH 69KV CKT 1
FDNS	00G13_018		0	13SP	G13_018	TO->FROM	NEB CITY U SYR SUB - SUB 970 69KV CKT 1	47	0.30352	113.2097	SUB 1214 - SUB 914 69KV CKT 1
FDNS	09ALLBPSON		0	13G	G13_018	TO->FROM	NEB CITY U SYR SUB - SUB 970 69KV CKT 1	47	0.30794	113.0079	SUB 963 - WEST BROCK 69KV CKT 1
FDNS	09BPSON		0	13G	G13_018	TO->FROM	NEB CITY U SYR SUB - SUB 970 69KV CKT 1	47	0.38938	112.794	SUB 968 - SUB 969 69KV CKT 1
FDNS	09G13_018		0	13G	G13_018	TO->FROM	NEB CITY U SYR SUB - SUB 970 69KV CKT 1	47	0.28767	112.7061	SUB 963 - SUB 977 69KV CKT 1
FDNS	00G13_018		0	18WP	G13_018	TO->FROM	NEB CITY U SYR SUB - SUB 970 69KV CKT 1	47	0.29566	112.1404	SUB 904 - SUB 906 SOUTH 69KV CKT 1
FDNS	09G13_018BPSON		0	13G	G13_018	TO->FROM	NEB CITY U SYR SUB - SUB 970 69KV CKT 1	47	0.32049	112.1186	MOORE (MOORE T1) 345/115/13.8KV TRANSFORMER CKT 1
FDNS	00G13_018		0	18WP	G13_018	TO->FROM	NEB CITY U SYR SUB - SUB 970 69KV CKT 1	47	0.30837	112.0825	SUB 1214 (S1214 T1) 161/69/13.8KV TRANSFORMER CKT 1
FDNS	09G13_018		0	13G	G13_018	TO->FROM	NEB CITY U SYR SUB - SUB 970 69KV CKT 1	47	0.28767	112.0148	NEB CITY U SUB 903 - SUB 977 69KV CKT 1
FDNS	00G13_018		0	13SP	G13_018	TO->FROM	NEB CITY U SYR SUB - SUB 970 69KV CKT 1	47	0.30856	111.9438	SUB 1214 (S1214 T1) 161/69/13.8KV TRANSFORMER CKT 1
FDNS	00G13_018		0	18WP	G13_018	TO->FROM	NEB CITY U SYR SUB - SUB 970 69KV CKT 1	47	0.28735	111.5169	NEB CITY U SUB 903 - SUB 962 69KV CKT 1
FDNS	00G13_018		0	18WP	G13_018	TO->FROM	NEB CITY U SYR SUB - SUB 970 69KV CKT 1	47	0.30333	111.089	SUB 1214 - SUB 914 69KV CKT 1
FDNS	00G13_018		0	13WP	G13_018	TO->FROM	NEB CITY U SYR SUB - SUB 970 69KV CKT 1	47	0.30846	109.2239	SUB 1214 (S1214 T1) 161/69/13.8KV TRANSFORMER CKT 1
FDNS	09BPSON		0	13G	G13_018	TO->FROM	NEB CITY U SYR SUB - SUB 970 69KV CKT 1	47	0.38938	109.0966	SUB 967 - SUB 968 69KV CKT 1
FDNS	00G13_018		0	13WP	G13_018	TO->FROM	NEB CITY U SYR SUB - SUB 970 69KV CKT 1	47	0.2958	109.0608	SUB 904 - SUB 906 SOUTH 69KV CKT 1
FDNS	09ALLBPSON		0	13G	G13_018	TO->FROM	NEB CITY U SYR SUB - SUB 970 69KV CKT 1	47	0.32056	108.9912	MOORE (MOORE T1) 345/115/13.8KV TRANSFORMER CKT 1
FDNS	00G13_018		0	23SP	G13_018	TO->FROM	NEB CITY U SYR SUB - SUB 970 69KV CKT 1	47	0.3117	108.8334	BASE CASE
FDNS	09G13_018		0	13G	G13_018	TO->FROM	NEB CITY U SYR SUB - SUB 970 69KV CKT 1	47	0.30787	108.3801	SUB 963 - WEST BROCK 69KV CKT 1
FDNS	09BPSON		0	13G	G13_018	TO->FROM	NEB CITY U SYR SUB - SUB 970 69KV CKT 1	47	0.38938	107.3681	SUB 967 - WEST BROCK 69KV CKT 1
FDNS	09G13_018		0	13G	G13_018	TO->FROM	NEB CITY U SYR SUB - SUB 970 69KV CKT 1	47	0.55431	106.107	FIRTH - SHELDON 115KV CKT 1
FDNS	00G13_018		0	18SP	G13_018	TO->FROM	NEB CITY U SYR SUB - SUB 970 69KV CKT 1	47	0.31163	105.7494	BASE CASE
FDNS	09BPSON		0	13G	G13_018	TO->FROM	NEB CITY U SYR SUB - SUB 970 69KV CKT 1	47	0.28774	105.6842	SUB 963 - SUB 977 69KV CKT 1
FDNS	09BPSON		0	13G	G13_018	TO->FROM	NEB CITY U SYR SUB - SUB 970 69KV CKT 1	47	0.28774	104.9529	NEB CITY U SUB 903 - SUB 977 69KV CKT 1
FDNS	09G13_018BPSON		0	13G	G13_018	TO->FROM	NEB CITY U SYR SUB - SUB 970 69KV CKT 1	47	0.31208	104.0755	BASE CASE
FDNS	9		0	13G	G13_018	TO->FROM	NEB CITY U SYR SUB - SUB 970 69KV CKT 1	47	0.38938	103.5335	SUB 968 - SUB 969 69KV CKT 1
FDNS	00G13_018		0	13SP	G13_018	TO->FROM	NEB CITY U SYR SUB - SUB 970 69KV CKT 1	47	0.31177	103.5089	BASE CASE
FDNS	00G13_018		0	18WP	G13_018	TO->FROM	NEB CITY U SYR SUB - SUB 970 69KV CKT 1	47	0.31159	103.4565	BASE CASE
FDNS	09ALLBPSON		0	13G	G13_018	TO->FROM	NEB CITY U SYR SUB - SUB 970 69KV CKT 1	47	0.31215	101.9047	BASE CASE
FDNS	00G13_018		0	13WP	G13_018	TO->FROM	NEB CITY U SYR SUB - SUB 970 69KV CKT 1	47	0.31168	101.5685	BASE CASE
FDNS	00G13_018		0	23SP	G13_018	TO->FROM	NEB CITY U SYR SUB - SUB 970 69KV CKT 1	47	0.29469	101.4492	NEHAWKA - SUB 961 69KV CKT 1
FDNS	00G13_018		0	23SP	G13_018	TO->FROM	NEB CITY U SYR SUB - SUB 970 69KV CKT 1	47	0.29469	100.594	NEHAWKA - SUB 962 69KV CKT 1
FDNS	09BPSON		0	13G	G13_018	TO->FROM	NEB CITY U SYR SUB - SUB 970 69KV CKT 1	47	0.30794	100.2498	SUB 963 - WEST BROCK 69KV CKT 1
FDNS	00G13_018		0	18SP	G13_018	FROM->TO	STERLING 115/69KV TRANSFORMER CKT 1	56	0.6783	112.1463	G13_018T 69.000 - HYDROCARBON TAP 69KV CKT 1
FDNS	00G13_018		0	18SP	G13_018	FROM->TO	STERLING 115/69KV TRANSFORMER CKT 1	56	0.6783	112.1139	HYDROCARBON TAP - SUB 970 69KV CKT 1
FDNS	00G13_018		0	23SP	G13_018	FROM->TO	STERLING 115/69KV TRANSFORMER CKT 1	56	0.67835	111.8924	G13_018T 69.000 - HYDROCARBON TAP 69KV CKT 1
FDNS	00G13_018		0	23SP	G13_018	FROM->TO	STERLING 115/69KV TRANSFORMER CKT 1	56	0.67835	111.86	HYDROCARBON TAP - SUB 970 69KV CKT 1
FDNS	00G13_018		0	13SP	G13_018	FROM->TO	STERLING 115/69KV TRANSFORMER CKT 1	56	0.67766	109.1661	G13_018T 69.000 - HYDROCARBON TAP 69KV CKT 1
FDNS	00G13_018		0	13SP	G13_018	FROM->TO	STERLING 115/69KV TRANSFORMER CKT 1	56	0.67766	109.1339	HYDROCARBON TAP - SUB 970 69KV CKT 1
FDNS	00G13_018		0	18WP	G13_018	FROM->TO	STERLING 115/69KV TRANSFORMER CKT 1	56	0.67837	108.1287	G13_018T 69.000 - HYDROCARBON TAP 69KV CKT 1
FDNS	00G13_018		0	18WP	G13_018	FROM->TO	STERLING 115/69KV TRANSFORMER CKT 1	56	0.67837	108.0798	HYDROCARBON TAP - SUB 970 69KV CKT 1
FDNS	00G13_018		0	13WP	G13_018	FROM->TO	STERLING 115/69KV TRANSFORMER CKT 1	56	0.67772	105.9471	G13_018T 69.000 - HYDROCARBON TAP 69KV CKT 1
FDNS	00G13_018		0	13WP	G13_018	FROM->TO	STERLING 115/69KV TRANSFORMER CKT 1	56	0.67772	105.8971	HYDROCARBON TAP - SUB 970 69KV CKT 1
FDNS	00G13_018		0	18SP	G13_018	FROM->TO	STERLING 115/69KV TRANSFORMER CKT 1	56	0.6783	105.1269	NEB CITY U SYR SUB - SUB 970 69KV CKT 1
FDNS	00G13_018		0	23SP	G13_018	FROM->TO	STERLING 115/69KV TRANSFORMER CKT 1	56	0.67835	104.2694	NEB CITY U SYR SUB - SUB 970 69KV CKT 1
FDNS	00G13_018		0	13SP	G13_018	FROM->TO	STERLING 115/69KV TRANSFORMER CKT 1	56	0.67766	102.6832	NEB CITY U SYR SUB - SUB 970 69KV CKT 1
FDNS	09G13_018		0	13G	G13_018	FROM->TO	STERLING 115/69KV TRANSFORMER CKT 1	56	0.67698	102.0566	G13_018T 69.000 - HYDROCARBON TAP 69KV CKT 1
FDNS	09G13_018		0	13G	G13_018	FROM->TO	STERLING 115/69KV TRANSFORMER CKT 1	56	0.67698	102.0255	HYDROCARBON TAP - SUB 970 69KV CKT 1
FDNS	00G13_018		0	18WP	G13_018	FROM->TO	STERLING 115/69KV TRANSFORMER CKT 1	56	0.67837	101.7204	NEB CITY U SYR SUB - SUB 970 69KV CKT 1
FDNS	00G13_018		0	18SP	G13_018	FROM->TO	STERLING 115/69KV TRANSFORMER CKT 1	56	0.6783	101.1407	NEB CITY U SYR SUB - SUB 971 69KV CKT 1
FDNS	00G13_018		0	23SP	G13_018	FROM->TO	STERLING 115/69KV TRANSFORMER CKT 1	56	0.67835	100.1845	NEB CITY U SYR SUB - SUB 971 69KV CKT 1
FDNS	00G13_018		0	13WP	G13_018	FROM->TO	STERLING 115/69KV TRANSFORMER CKT 1	56	0.67772	100.1693	NEB CITY U SYR SUB - SUB 970 69KV CKT 1

H: Power Flow Analysis (Other Constraints Not Requiring Mitigation)

See next page.

SOLUTION	GROUP	SCENARIO	SEASON	SOURCE	DIRECTION	MONITORED ELEMENT	RATEB (MVA)	TDF	TC%LOADING (% MVA)	CONTINGENCY
FDNS	05ALL		0 13G	ASGI_13_001	FROM->TO	ELK CITY 230KV (ELKCTY-6) 230/138/13.8KV TRANSFORMER CKT 1	287	0.14345	100.231	DBL-HTCH-BVR
FDNS	05ALL		0 13G	ASGI_13_001	FROM->TO	ELK CITY 230KV (ELKCTY-6) 230/138/13.8KV TRANSFORMER CKT 1	287	0.12355	102.7587	LAWTON EASTSIDE - OKLAUNION 345KV CKT 1
FDNS	05ALL		0 13G	ASGI_13_001	FROM->TO	ELK CITY 230KV (ELKCTY-6) 230/138/13.8KV TRANSFORMER CKT 1	287	0.12355	101.8377	LAWTON EASTSIDE - OKLAUNION 345KV CKT 1
FDNS	05ALL		0 13G	ASGI_13_001	FROM->TO	BUFFALO 230.00 - DEAF SMITH COUNTY INTERCHANGE 230KV CKT 1	350.6	0.05682	100.9774	BUSHLAND INTERCHANGE - POTTER COUNTY INTERCHANGE 230KV CKT 1
FDNS	03ALL		0 13G	ASGI_13_001	FROM->TO	WICHITA (WICHT12X) 345/138/13.8KV TRANSFORMER CKT 1	440	0.03031	107.3382	BENTON - WICHITA 345KV CKT 1
FDNS	03ALL		0 13G	ASGI_13_001	FROM->TO	WICHITA (WICHT12X) 345/138/13.8KV TRANSFORMER CKT 1	440	0.03031	107.3148	BENTON - WICHITA 345KV CKT 1
FDNS	03ALL		0 13G	ASGI_13_001	TO->FROM	BENTON - WICHITA 345KV CKT 1	932	0.10092	113.2277	DBL-TGA-MATT
FDNS	03ALL		0 13G	ASGI_13_001	TO->FROM	BENTON - WICHITA 345KV CKT 1	932	0.10092	107.2142	G11_051T 345.00 - TATONGA7 345.00 345KV CKT 1
FDNS	03ALL		0 13G	ASGI_13_001	TO->FROM	BENTON - WICHITA 345KV CKT 1	932	0.10092	106.7982	G11_051T 345.00 - WOODWARD DISTRICT EHV 345KV CKT 1
FDNS	03ALL		0 13G	ASGI_13_001	TO->FROM	BENTON - WICHITA 345KV CKT 1	932	0.08045	101.9926	MAIZE - MAIZEW 4 138.00 138KV CKT 1
FDNS	03ALL		0 13G	ASGI_13_001	TO->FROM	BENTON - WICHITA 345KV CKT 1	932	0.08045	101.9901	EVANS ENERGY CENTER NORTH - MAIZEW 4 138.00 138KV CKT 1
FDNS	03ALL		0 13G	ASGI_13_001	TO->FROM	BENTON - WICHITA 345KV CKT 1	932	0.08045	101.9873	SPP-WERE-91
FDNS	03ALL		0 13G	ASGI_13_001	TO->FROM	BENTON - WICHITA 345KV CKT 1	932	0.08045	101.4901	MAIZE - MAIZEE 4 138.00 138KV CKT 1
FDNS	03ALL		0 13G	ASGI_13_001	TO->FROM	BENTON - WICHITA 345KV CKT 1	932	0.08045	101.4845	CHISHOLM - MAIZEE 4 138.00 138KV CKT 1
FDNS	03ALL		0 13G	ASGI_13_001	TO->FROM	BENTON - WICHITA 345KV CKT 1	932	0.08045	101.4834	SPP-WERE-90
FDNS	03ALL		0 13G	ASGI_13_001	TO->FROM	BENTON - WICHITA 345KV CKT 1	932	0.07949	100.5024	WRTOD400
FDNS	03ALL		0 13G	ASGI_13_001	TO->FROM	BENTON - WICHITA 345KV CKT 1	932	0.07934	100	HOYT - JEFFREY ENERGY CENTER 345KV CKT 1
FDNS	03ALL		0 13G	ASGI_13_001	TO->FROM	BENTON - WICHITA 345KV CKT 1	932	0.07902	107.4489	HUNTERS7 345.00 - WOODRING 345KV CKT 1
FDNS	03ALL		0 13G	ASGI_13_001	TO->FROM	BENTON - WICHITA 345KV CKT 1	932	0.07902	105.1622	HUNTERS7 345.00 - VIOLA 7 345.00 345KV CKT 1
FDNS	3		0 13G	ASGI_13_001	TO->FROM	BENTON - WICHITA 345KV CKT 1	932	0.07795	102.1055	GENS32751 1-WOLF CREEK GENERATING STATION UNIT 1
FDNS	03ALL		0 13G	ASGI_13_001	TO->FROM	BENTON - WICHITA 345KV CKT 1	932	0.07698	118.7235	GENS32751 1-WOLF CREEK GENERATING STATION UNIT 1
FDNS	5		0 13G	ASGI_13_001	TO->FROM	FPL SWITCH - WOODWARD 138KV CKT 1	153	0.04545	125.4191	DBL-WWRD-G12
FDNS	05ASGI_13_001		0 13G	ASGI_13_001	TO->FROM	FPL SWITCH - WOODWARD 138KV CKT 1	153	0.04545	125.4942	DBL-WWRD-G12
FDNS	05ALL		0 13G	ASGI_13_001	TO->FROM	FPL SWITCH - WOODWARD 138KV CKT 1	153	0.04519	135.5632	DBL-WWRD-G12
FDNS	6		2 13G	ASGI_13_001	TO->FROM	FPL SWITCH - WOODWARD 138KV CKT 1	153	0.04004	123.226	DBL-WWRD-G12
FDNS	06ALL		2 13G	ASGI_13_001	TO->FROM	FPL SWITCH - WOODWARD 138KV CKT 1	153	0.03964	137.5001	DBL-WWRD-G12
FDNS	6		3 13G	ASGI_13_001	TO->FROM	FPL SWITCH - WOODWARD 138KV CKT 1	153	0.04004	123.2184	DBL-WWRD-G12
FDNS	06ALL		3 13G	ASGI_13_001	TO->FROM	FPL SWITCH - WOODWARD 138KV CKT 1	153	0.03965	137.4852	DBL-WWRD-G12
FDNS	6		4 13G	ASGI_13_001	TO->FROM	FPL SWITCH - WOODWARD 138KV CKT 1	153	0.04004	123.214	DBL-WWRD-G12
FDNS	06ALL		4 13G	ASGI_13_001	TO->FROM	FPL SWITCH - WOODWARD 138KV CKT 1	153	0.03965	137.4858	DBL-WWRD-G12
FDNS	06ALL		0 13G	ASGI_13_002	FROM->TO	DEAF SMITH REC-#20 - DEAF SMITH REC-#24 115KV CKT 1	99	0.19427	111.862	DEAF SMITH COUNTY INTERCHANGE - PLANT X STATION 230KV CKT 1
FDNS	06ALL		0 13G	ASGI_13_002	FROM->TO	DEAF SMITH REC-#24 - PARMER COUNTY SUB 115KV CKT 1	99	0.19427	105.6146	DEAF SMITH COUNTY INTERCHANGE - PLANT X STATION 230KV CKT 1
FDNS	06ALL		0 13G	ASGI_13_002	FROM->TO	CURRY COUNTY INTERCHANGE - DEAF SMITH REC-#20 115KV CKT 1	96	0.19427	124.2496	DEAF SMITH COUNTY INTERCHANGE - PLANT X STATION 230KV CKT 1
FDNS	06ALL		0 13G	ASGI_13_002	FROM->TO	DEAF SMITH COUNTY INTERCHANGE - Panda Energy Substation Hereford 115KV CKT 1	96	0.10861	108.4723	BUFFALO 230.00 - BUSHLAND INTERCHANGE 230KV CKT 1
FDNS	06ASGI_13_002		0 13G	ASGI_13_002	FROM->TO	ELK CITY 230KV (ELKCTY-6) 230/138/13.8KV TRANSFORMER CKT 1	287	0.09552	100.1996	LAWTON EASTSIDE - OKLAUNION 345KV CKT 1
FDNS	06ALL		0 13G	ASGI_13_002	FROM->TO	ELK CITY 230KV (ELKCTY-6) 230/138/13.8KV TRANSFORMER CKT 1	287	0.09469	107.024	SPP-AEPW-32
FDNS	06ALL		0 13G	ASGI_13_002	FROM->TO	ELK CITY 230KV (ELKCTY-6) 230/138/13.8KV TRANSFORMER CKT 1	287	0.09469	105.9984	G13_017T 345.00 - OKLAUNION 345KV CKT 1
FDNS	06ALL		0 13G	ASGI_13_002	FROM->TO	ELK CITY 230KV (ELKCTY-6) 230/138/13.8KV TRANSFORMER CKT 1	287	0.09469	105.4993	SPP-AEPW-32
FDNS	06ALL		0 13G	ASGI_13_002	FROM->TO	ELK CITY 230KV (ELKCTY-6) 230/138/13.8KV TRANSFORMER CKT 1	287	0.09469	104.5697	G13_017T 345.00 - OKLAUNION 345KV CKT 1
FDNS	06ALL		0 13G	ASGI_13_002	FROM->TO	ELK CITY 230KV (ELKCTY-6) 230/138/13.8KV TRANSFORMER CKT 1	287	0.09088	102.2973	DBL-HTCH-BVR
FDNS	06ALL		0 13G	ASGI_13_002	FROM->TO	ELK CITY 230KV (ELKCTY-6) 230/138/13.8KV TRANSFORMER CKT 1	287	0.09088	101.3981	DBL-HTCH-BVR
FDNS	6		0 13G	ASGI_13_002	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.08586	103.6354	TOLK STATION EAST - TUCO INTERCHANGE 230KV CKT 1
FDNS	6		0 13G	ASGI_13_002	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.08586	103.6066	TOLK STATION EAST - TUCO INTERCHANGE 230KV CKT 1
FDNS	06ASGI_13_002		0 13G	ASGI_13_002	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.08584	103.949	TOLK STATION EAST - TUCO INTERCHANGE 230KV CKT 1
FDNS	06ASGI_13_002		0 13G	ASGI_13_002	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.08584	103.9309	TOLK STATION EAST - TUCO INTERCHANGE 230KV CKT 1
FDNS	06ALL		0 13G	ASGI_13_002	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.08514	116.8478	TOLK STATION EAST - TUCO INTERCHANGE 230KV CKT 1
FDNS	06ALL		0 13G	ASGI_13_002	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.08514	116.1042	TOLK STATION EAST - TUCO INTERCHANGE 230KV CKT 1
FDNS	06ALL		0 13G	ASGI_13_002	FROM->TO	WOLFFORTH INTERCHANGE - YUMA INTERCHANGE 115KV CKT 1	154	0.07667	101.7305	TOLK STATION EAST - TUCO INTERCHANGE 230KV CKT 1
FDNS	6		0 13G	ASGI_13_002	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.07123	102.9913	DEAF SMITH COUNTY INTERCHANGE - PLANT X STATION 230KV CKT 1
FDNS	6		0 13G	ASGI_13_002	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.07123	102.9464	DEAF SMITH COUNTY INTERCHANGE - PLANT X STATION 230KV CKT 1
FDNS	06ASGI_13_002		0 13G	ASGI_13_002	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.07121	103.2112	DEAF SMITH COUNTY INTERCHANGE - PLANT X STATION 230KV CKT 1
FDNS	06ASGI_13_002		0 13G	ASGI_13_002	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.07121	103.1662	DEAF SMITH COUNTY INTERCHANGE - PLANT X STATION 230KV CKT 1
FDNS	06ALL		0 13G	ASGI_13_002	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.07053	118.1282	DEAF SMITH COUNTY INTERCHANGE - PLANT X STATION 230KV CKT 1
FDNS	06ALL		0 13G	ASGI_13_002	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.07053	118.0809	DEAF SMITH COUNTY INTERCHANGE - PLANT X STATION 230KV CKT 1
FDNS	06ALL		0 13G	ASGI_13_002	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.07014	105.919	PLANT X STATION - POTTER COUNTY INTERCHANGE 230KV CKT 1
FDNS	06ALL		0 13G	ASGI_13_002	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.07014	105.8747	PLANT X STATION - POTTER COUNTY INTERCHANGE 230KV CKT 1
FDNS	6		0 13G	ASGI_13_002	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.06582	106.7494	LAMB COUNTY INTERCHANGE - TOLK STATION WEST 230KV CKT 1
FDNS	6		0 13G	ASGI_13_002	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.06582	106.7353	LAMB COUNTY INTERCHANGE (WH ALM20172) 230/115/13.2KV TRANSFORMER CKT 1
FDNS	6		0 13G	ASGI_13_002	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.06582	106.7353	SPP-SWPS-K37
FDNS	6		0 13G	ASGI_13_002	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.06582	106.7021	LAMB COUNTY INTERCHANGE - TOLK STATION WEST 230KV CKT 1
FDNS	6		0 13G	ASGI_13_002	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.06582	106.688	LAMB COUNTY INTERCHANGE (WH ALM20172) 230/115/13.2KV TRANSFORMER CKT 1
FDNS	6		0 13G	ASGI_13_002	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.06582	106.688	SPP-SWPS-K37
FDNS	06ASGI_13_002		0 13G	ASGI_13_002	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.06581	106.9634	LAMB COUNTY INTERCHANGE - TOLK STATION WEST 230KV CKT 1
FDNS	06ASGI_13_002		0 13G	ASGI_13_002	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.06581	106.9493	LAMB COUNTY INTERCHANGE (WH ALM20172) 230/115/13.2KV TRANSFORMER CKT 1
FDNS	06ASGI_13_002		0 13G	ASGI_13_002	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.06581	106.9493	SPP-SWPS-K37
FDNS	06ASGI_13_002		0 13G	ASGI_13_002	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.06581	106.9161	LAMB COUNTY INTERCHANGE - TOLK STATION WEST 230KV CKT 1
FDNS	06ASGI_13_002		0 13G	ASGI_13_002	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.06581	106.902	LAMB COUNTY INTERCHANGE (WH ALM20172) 230/115/13.2KV TRANSFORMER CKT 1
FDNS	06ASGI_13_002		0 13G	ASGI_13_002	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.06581	106.902	SPP-SWPS-K37
FDNS	06ALL		0 13G	ASGI_13_002	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.06526	116.4386	LAMB COUNTY INTERCHANGE - TOLK STATION WEST 230KV CKT 1
FDNS	06ALL		0 13G	ASGI_13_002	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.06526	116.4236	LAMB COUNTY INTERCHANGE (WH ALM20172) 230/115/13.2KV TRANSFORMER CKT 1
FDNS	06ALL		0 13G	ASGI_13_002	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.06526	116.4236	SPP-SWPS-K37
FDNS	06ALL		0 13G	ASGI_13_002	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.06526	116.3339	LAMB COUNTY INTERCHANGE - TOLK STATION WEST 230KV CKT 1
FDNS	06ALL		0 13G	ASGI_13_002	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.06526	116.3193	LAMB COUNTY INTERCHANGE (WH ALM20172) 230/115/13.2KV TRANSFORMER CKT 1
FDNS	06ALL		0 13G	ASGI_13_002	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.06526	116.3193	SPP-SWPS-K37
FDNS	06ALL		0 13G	ASGI_13_002	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.0619	102.0296	LAMB COUNTY INTERCHANGE - PLANT X STATION 115KV CKT 1
FDNS	06ALL		0 13G	ASGI_13_002	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.0619	101.9812	LAMB COUNTY INTERCHANGE - PLANT X STATION 115KV CKT 1
FDNS	06ALL		0 13G	ASGI_13_002	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.05992	100.6658	PLANT X STATION - SUNDOWN INTERCHANGE 230KV CKT 1
FDNS	06ALL		0 13G	ASGI_13_002	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.05992	100.6214	PLANT X STATION - SUNDOWN INTERCHANGE 230KV CKT 1

SOLUTION	GROUP	SCENARIO	SEASON	SOURCE	DIRECTION	MONITORED ELEMENT	RATEB (MVA)	TDF	TC%LOADING (% MVA)	CONTINGENCY
FDNS	06ALL		0 13G	ASGI_13_002	TO->FROM	PLANT X STATION - TOLK STATION WEST 230KV CKT 1	502	0.33109	127.9008	PLANT X STATION - TOLK STATION EAST 230KV CKT 2
FDNS	06ALL		0 13G	ASGI_13_002	TO->FROM	PLANT X STATION - TOLK STATION WEST 230KV CKT 2	502	0.32626	126.7856	PLANT X STATION - TOLK STATION WEST 230KV CKT 1
FDNS	06ALL		0 13G	ASGI_13_002	TO->FROM	CARGILL SUB - PARMER COUNTY SUB 115KV CKT 1	96	0.19427	101.0831	DEAF SMITH COUNTY INTERCHANGE - PLANT X STATION 230KV CKT 1
FDNS	06ALL		0 13G	ASGI_13_002	TO->FROM	DEAF SMITH COUNTY INTERCHANGE - PLANT X STATION 230KV CKT 1	351	0.14497	101.5196	PLANT X STATION - POTTER COUNTY INTERCHANGE 230KV CKT 1
FDNS	06ALL		0 13G	ASGI_13_002	TO->FROM	DEAF SMITH COUNTY INTERCHANGE - PLANT X STATION 230KV CKT 1	351	0.11837	103.3563	G13_017T 345.00 - OKLAUNION 345KV CKT 1
FDNS	06ALL		0 13G	ASGI_13_002	TO->FROM	DEAF SMITH COUNTY INTERCHANGE - PLANT X STATION 230KV CKT 1	351	0.11837	102.5937	SPP-AEPW-32
FDNS	06ALL		0 13G	ASGI_13_002	TO->FROM	DEAF SMITH COUNTY INTERCHANGE - PLANT X STATION 230KV CKT 1	351	0.11526	101.1754	BORDER 7345.00 - WOODWARD DISTRICT EHV 345KV CKT 1
FDNS	06ALL		0 13G	ASGI_13_002	TO->FROM	DAWN SUB - Panda Energy Substation Hereford 115KV CKT 1	96	0.10861	103.8101	BUFFALO 230.00 - BUSHLAND INTERCHANGE 230KV CKT 1
FDNS	06ALL		0 13G	ASGI_13_002	TO->FROM	CANYON WEST SUB - DAWN SUB 115KV CKT 1	96	0.10861	100.6987	BUFFALO 230.00 - BUSHLAND INTERCHANGE 230KV CKT 1
FDNS	6		0 13G	ASGI_13_002	TO->FROM	FPL SWITCH - WOODWARD 138KV CKT 1	153	0.04961	139.1328	DBL-WWRD-G12
FDNS	06ASGI_13_002		0 13G	ASGI_13_002	TO->FROM	FPL SWITCH - WOODWARD 138KV CKT 1	153	0.0496	139.5713	DBL-WWRD-G12
FDNS	06ALL		0 13G	ASGI_13_002	TO->FROM	FPL SWITCH - WOODWARD 138KV CKT 1	153	0.04913	156.6884	DBL-WWRD-G12
FDNS	6		0 13G	ASGI_13_002	TO->FROM	FPL SWITCH - WOODWARD 138KV CKT 1	153	0.0332	108.8453	G12-016 TAP 345.00 - WOODWARD DISTRICT EHV 345KV CKT 1
FDNS	06ASGI_13_002		0 13G	ASGI_13_002	TO->FROM	FPL SWITCH - WOODWARD 138KV CKT 1	153	0.03319	109.1198	G12-016 TAP 345.00 - WOODWARD DISTRICT EHV 345KV CKT 1
FDNS	06ALL		0 13G	ASGI_13_002	TO->FROM	FPL SWITCH - WOODWARD 138KV CKT 1	153	0.0329	120.1814	G12-016 TAP 345.00 - WOODWARD DISTRICT EHV 345KV CKT 1
FDNS	06ALL		2 13G	ASGI_13_002	FROM->TO	DEAF SMITH REC-#20 - DEAF SMITH REC-#24 115KV CKT 1	99	0.19119	101.1271	DEAF SMITH COUNTY INTERCHANGE - PLANT X STATION 230KV CKT 1
FDNS	06ALL		2 13G	ASGI_13_002	FROM->TO	CURRY COUNTY INTERCHANGE - DEAF SMITH REC-#20 115KV CKT 1	96	0.19119	113.0161	DEAF SMITH COUNTY INTERCHANGE - PLANT X STATION 230KV CKT 1
FDNS	06ALL		2 13G	ASGI_13_002	FROM->TO	WOLFFORTH INTERCHANGE - YUMA INTERCHANGE 115KV CKT 1	154	0.10383	102.0657	LUBBOCK SOUTH INTERCHANGE - WOLFFORTH INTERCHANGE 230KV CKT 1
FDNS	00ASGI_13_002		2 18WPP	ASGI_13_002	FROM->TO	ELK CITY 230KV (ELCTY-6) 230/138/13.8KV TRANSFORMER CKT 1	287	0.10242	100.2792	ELKCITY7 345.00 - GRACEMONT 345KV CKT 1
FDNS	00ASGI_13_002		2 18WPP	ASGI_13_002	FROM->TO	ELK CITY 230KV (ELCTY-6) 230/138/13.8KV TRANSFORMER CKT 1	287	0.10242	100	ELKCITY7 345.00 - GRACEMONT 345KV CKT 1
FDNS	6		2 13G	ASGI_13_002	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.08806	105.0547	TOLK STATION EAST - TUCO INTERCHANGE 230KV CKT 1
FDNS	6		2 13G	ASGI_13_002	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.08806	105.0094	TOLK STATION EAST - TUCO INTERCHANGE 230KV CKT 1
FDNS	06ASGI_13_002		2 13G	ASGI_13_002	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.08804	105.373	TOLK STATION EAST - TUCO INTERCHANGE 230KV CKT 1
FDNS	06ASGI_13_002		2 13G	ASGI_13_002	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.08804	105.3276	TOLK STATION EAST - TUCO INTERCHANGE 230KV CKT 1
FDNS	06ALL		2 13G	ASGI_13_002	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.08738	118.213	TOLK STATION EAST - TUCO INTERCHANGE 230KV CKT 1
FDNS	06ALL		2 13G	ASGI_13_002	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.08738	117.6187	TOLK STATION EAST - TUCO INTERCHANGE 230KV CKT 1
FDNS	0		2 13SP	ASGI_13_002	FROM->TO	WOLFFORTH INTERCHANGE - YUMA INTERCHANGE 115KV CKT 1	154	0.08379	102.1137	TOLK STATION EAST - TUCO INTERCHANGE 230KV CKT 1
FDNS	00ASGI_13_002		2 13SP	ASGI_13_002	FROM->TO	WOLFFORTH INTERCHANGE - YUMA INTERCHANGE 115KV CKT 1	154	0.08378	103.3172	TOLK STATION EAST - TUCO INTERCHANGE 230KV CKT 1
FDNS	06ALL		2 13G	ASGI_13_002	FROM->TO	WOLFFORTH INTERCHANGE - YUMA INTERCHANGE 115KV CKT 1	154	0.08028	107.0641	TOLK STATION EAST - TUCO INTERCHANGE 230KV CKT 1
FDNS	6		2 13G	ASGI_13_002	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.06993	100.9008	DEAF SMITH COUNTY INTERCHANGE - PLANT X STATION 230KV CKT 1
FDNS	6		2 13G	ASGI_13_002	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.06993	100.8563	DEAF SMITH COUNTY INTERCHANGE - PLANT X STATION 230KV CKT 1
FDNS	06ASGI_13_002		2 13G	ASGI_13_002	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.06992	101.1036	DEAF SMITH COUNTY INTERCHANGE - PLANT X STATION 230KV CKT 1
FDNS	06ASGI_13_002		2 13G	ASGI_13_002	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.06992	101.0591	DEAF SMITH COUNTY INTERCHANGE - PLANT X STATION 230KV CKT 1
FDNS	06ALL		2 13G	ASGI_13_002	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.06959	103.3998	PLANT X STATION - POTTER COUNTY INTERCHANGE 230KV CKT 1
FDNS	06ALL		2 13G	ASGI_13_002	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.06959	103.3548	PLANT X STATION - POTTER COUNTY INTERCHANGE 230KV CKT 1
FDNS	06ALL		2 13G	ASGI_13_002	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.06993	114.56	DEAF SMITH COUNTY INTERCHANGE - PLANT X STATION 230KV CKT 1
FDNS	06ALL		2 13G	ASGI_13_002	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.0693	114.5132	DEAF SMITH COUNTY INTERCHANGE - PLANT X STATION 230KV CKT 1
FDNS	6		2 13G	ASGI_13_002	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.06673	106.8895	LAMB COUNTY INTERCHANGE - TOLK STATION WEST 230KV CKT 1
FDNS	6		2 13G	ASGI_13_002	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.06673	106.8734	SPP-SWPS-K37
FDNS	6		2 13G	ASGI_13_002	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.06673	106.8733	LAMB COUNTY INTERCHANGE (WH ALM20172) 230/115/13.2KV TRANSFORMER CKT 1
FDNS	6		2 13G	ASGI_13_002	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.06673	106.8421	LAMB COUNTY INTERCHANGE - TOLK STATION WEST 230KV CKT 1
FDNS	6		2 13G	ASGI_13_002	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.06673	106.826	LAMB COUNTY INTERCHANGE (WH ALM20172) 230/115/13.2KV TRANSFORMER CKT 1
FDNS	6		2 13G	ASGI_13_002	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.06673	106.826	SPP-SWPS-K37
FDNS	06ASGI_13_002		2 13G	ASGI_13_002	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.06672	107.0969	LAMB COUNTY INTERCHANGE - TOLK STATION WEST 230KV CKT 1
FDNS	06ASGI_13_002		2 13G	ASGI_13_002	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.06672	107.0843	LAMB COUNTY INTERCHANGE (WH ALM20172) 230/115/13.2KV TRANSFORMER CKT 1
FDNS	06ASGI_13_002		2 13G	ASGI_13_002	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.06672	107.0843	SPP-SWPS-K37
FDNS	06ASGI_13_002		2 13G	ASGI_13_002	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.06672	107.0511	LAMB COUNTY INTERCHANGE - TOLK STATION WEST 230KV CKT 1
FDNS	06ASGI_13_002		2 13G	ASGI_13_002	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.06672	107.0384	LAMB COUNTY INTERCHANGE (WH ALM20172) 230/115/13.2KV TRANSFORMER CKT 1
FDNS	06ASGI_13_002		2 13G	ASGI_13_002	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.06672	107.0384	SPP-SWPS-K37
FDNS	06ALL		2 13G	ASGI_13_002	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.06621	116.1793	LAMB COUNTY INTERCHANGE - TOLK STATION WEST 230KV CKT 1
FDNS	06ALL		2 13G	ASGI_13_002	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.06621	116.1661	LAMB COUNTY INTERCHANGE (WH ALM20172) 230/115/13.2KV TRANSFORMER CKT 1
FDNS	06ALL		2 13G	ASGI_13_002	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.06621	116.1661	SPP-SWPS-K37
FDNS	06ALL		2 13G	ASGI_13_002	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.06621	116.1297	LAMB COUNTY INTERCHANGE - TOLK STATION WEST 230KV CKT 1
FDNS	06ALL		2 13G	ASGI_13_002	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.06621	116.1165	LAMB COUNTY INTERCHANGE (WH ALM20172) 230/115/13.2KV TRANSFORMER CKT 1
FDNS	06ALL		2 13G	ASGI_13_002	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.06621	116.1165	SPP-SWPS-K37
FDNS	06ALL		2 13G	ASGI_13_002	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.06228	101.0981	LAMB COUNTY INTERCHANGE - PLANT X STATION 115KV CKT 1
FDNS	06ALL		2 13G	ASGI_13_002	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.06228	101.0503	LAMB COUNTY INTERCHANGE - PLANT X STATION 115KV CKT 1
FDNS	06ALL		2 13G	ASGI_13_002	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.06136	101.2624	PLANT X STATION - SUNDOWN INTERCHANGE 230KV CKT 1
FDNS	06ALL		2 13G	ASGI_13_002	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.06136	101.2179	PLANT X STATION - SUNDOWN INTERCHANGE 230KV CKT 1
FDNS	0		2 13SP	ASGI_13_002	FROM->TO	WOLFFORTH INTERCHANGE - YUMA INTERCHANGE 115KV CKT 1	154	0.05196	104.3908	LUBBOCK SOUTH INTERCHANGE (ABB LLM60043) 230/115/13.2KV TRANSFORMER CKT 1
FDNS	00ASGI_13_002		2 13SP	ASGI_13_002	FROM->TO	WOLFFORTH INTERCHANGE - YUMA INTERCHANGE 115KV CKT 1	154	0.05196	105.1289	LUBBOCK SOUTH INTERCHANGE (ABB LLM60043) 230/115/13.2KV TRANSFORMER CKT 1
FDNS	0		2 13SP	ASGI_13_002	FROM->TO	WOLFFORTH INTERCHANGE - YUMA INTERCHANGE 115KV CKT 1	154	0.05053	110.7067	BASE CASE
FDNS	00ASGI_13_002		2 13SP	ASGI_13_002	FROM->TO	WOLFFORTH INTERCHANGE - YUMA INTERCHANGE 115KV CKT 1	154	0.05052	111.6308	BASE CASE
FDNS	0		2 13SP	ASGI_13_002	FROM->TO	WOLFFORTH INTERCHANGE - YUMA INTERCHANGE 115KV CKT 1	154	0.05043	115.3705	ALLEN SUB - LUBBOCK SOUTH INTERCHANGE 115KV CKT 1
FDNS	0		2 13SP	ASGI_13_002	FROM->TO	WOLFFORTH INTERCHANGE - YUMA INTERCHANGE 115KV CKT 1	154	0.05043	100.3774	ALLEN SUB - SOUTH PLAINS REC-QUAKER 115KV CKT 1
FDNS	00ASGI_13_002		2 13SP	ASGI_13_002	FROM->TO	WOLFFORTH INTERCHANGE - YUMA INTERCHANGE 115KV CKT 1	154	0.05042	116.0998	ALLEN SUB - LUBBOCK SOUTH INTERCHANGE 115KV CKT 1
FDNS	00ASGI_13_002		2 13SP	ASGI_13_002	FROM->TO	WOLFFORTH INTERCHANGE - YUMA INTERCHANGE 115KV CKT 1	154	0.05042	101.0991	ALLEN SUB - SOUTH PLAINS REC-QUAKER 115KV CKT 1
FDNS	0		2 13SP	ASGI_13_002	FROM->TO	WOLFFORTH INTERCHANGE - YUMA INTERCHANGE 115KV CKT 1	154	0.0396	119.6145	CARLISLE INTERCHANGE - TUCO INTERCHANGE 230KV CKT 1
FDNS	00ASGI_13_002		2 13SP	ASGI_13_002	FROM->TO	WOLFFORTH INTERCHANGE - YUMA INTERCHANGE 115KV CKT 1	154	0.03959	120.134	CARLISLE INTERCHANGE - TUCO INTERCHANGE 230KV CKT 1
FDNS	00ASGI_13_002		2 23SP	ASGI_13_002	FROM->TO	WOLFFORTH INTERCHANGE - YUMA INTERCHANGE 115KV CKT 1	154	0.032	100	CARLISLE INTERCHANGE - TUCO INTERCHANGE 230KV CKT 1
FDNS	00ASGI_13_002		2 18SP	ASGI_13_002	FROM->TO	WOLFFORTH INTERCHANGE - YUMA INTERCHANGE 115KV CKT 1	154	0.03142	105.8918	CARLISLE INTERCHANGE - TUCO INTERCHANGE 230KV CKT 1
FDNS	0		2 18SP	ASGI_13_002	FROM->TO	WOLFFORTH INTERCHANGE - YUMA INTERCHANGE 115KV CKT 1	154	0.03141	105.4768	CARLISLE INTERCHANGE - TUCO INTERCHANGE 230KV CKT 1
FDNS	06ALL		2 13G	ASGI_13_002	TO->FROM	PLANT X STATION - TOLK STATION WEST 230KV CKT 1	502	0.31966	118.9947	PLANT X STATION - TOLK STATION EAST 230KV CKT 2
FDNS	06ALL		2 13G	ASGI_13_002	TO->FROM	PLANT X STATION - TOLK STATION EAST 230KV CKT 2	502	0.3148	117.731	PLANT X STATION - TOLK STATION WEST 230KV CKT 1
FDNS	6		2 13G	ASGI_13_002	TO->FROM	FPL SWITCH - WOODWARD 138KV CKT 1	153	0.04308	123.226	DBL-WWRD-G12
FDNS	06ASGI_13_002		2 13G	ASGI_13_002	TO->FROM	FPL SWITCH - WOODWARD 138KV CKT 1	153	0.04307	123.6024	DBL-WWRD-G12
FDNS	06ALL		2 13G	ASGI_13_002	TO->FROM	FPL SWITCH - WOODWARD 138KV CKT 1	153	0.04268	137.5001	DBL-WWRD-G12
FDNS	06ALL		3 13G	ASGI_13_002	FROM->TO	CURRY COUNTY INTERCHANGE - DEAF SMITH REC-#20 115KV CKT 1	96	0.19031	111.5039	DEAF SMITH COUNTY INTERCHANGE - PLANT X STATION 230KV CKT 1

SOLUTION	GROUP	SCENARIO	SEASON	SOURCE	DIRECTION	MONITORED ELEMENT	RATEB (MVA)	TDF	TC%LOADING (% MVA)	CONTINGENCY	
FDNS	06ASGI_13_003		0	13G	ASGI_13_003	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.06828	107.0359	LAMB COUNTY INTERCHANGE - TOLK STATION WEST 230KV CKT 1
FDNS	06ASGI_13_003		0	13G	ASGI_13_003	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.06828	107.0218	LAMB COUNTY INTERCHANGE (WH ALM20172) 230/115/13.2KV TRANSFORMER CKT 1
FDNS	06ASGI_13_003		0	13G	ASGI_13_003	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.06828	107.0218	SPP-SWPS-K37
FDNS	06ALL		0	13G	ASGI_13_003	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.06774	116.4386	LAMB COUNTY INTERCHANGE - TOLK STATION WEST 230KV CKT 1
FDNS	06ALL		0	13G	ASGI_13_003	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.06774	116.4236	LAMB COUNTY INTERCHANGE (WH ALM20172) 230/115/13.2KV TRANSFORMER CKT 1
FDNS	06ALL		0	13G	ASGI_13_003	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.06774	116.4236	SPP-SWPS-K37
FDNS	06ALL		0	13G	ASGI_13_003	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.06774	116.3339	LAMB COUNTY INTERCHANGE - TOLK STATION WEST 230KV CKT 1
FDNS	06ALL		0	13G	ASGI_13_003	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.06774	116.3193	LAMB COUNTY INTERCHANGE (WH ALM20172) 230/115/13.2KV TRANSFORMER CKT 1
FDNS	06ALL		0	13G	ASGI_13_003	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.06774	116.3193	SPP-SWPS-K37
FDNS	06ALL		0	13G	ASGI_13_003	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.06469	102.0296	LAMB COUNTY INTERCHANGE - PLANT X STATION 115KV CKT 1
FDNS	06ALL		0	13G	ASGI_13_003	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.06469	101.9812	LAMB COUNTY INTERCHANGE - PLANT X STATION 115KV CKT 1
FDNS	06ALL		0	13G	ASGI_13_003	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.06199	100.6658	PLANT X STATION - SUNDOWN INTERCHANGE 230KV CKT 1
FDNS	06ALL		0	13G	ASGI_13_003	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.06199	100.6214	PLANT X STATION - SUNDOWN INTERCHANGE 230KV CKT 1
FDNS	06ALL		0	13G	ASGI_13_003	TO->FROM	PLANT X STATION - TOLK STATION WEST 230KV CKT 1	502	0.34169	127.9008	PLANT X STATION - TOLK STATION EAST 230KV CKT 2
FDNS	06ALL		0	13G	ASGI_13_003	TO->FROM	PLANT X STATION - TOLK STATION EAST 230KV CKT 2	502	0.33678	126.7856	PLANT X STATION - TOLK STATION WEST 230KV CKT 1
FDNS	06ALL		0	13G	ASGI_13_003	TO->FROM	CARGILL SUB - PARMER COUNTY SUB 115KV CKT 1	96	0.17846	101.0831	DEAF SMITH COUNTY INTERCHANGE - PLANT X STATION 230KV CKT 1
FDNS	06ALL		0	13G	ASGI_13_003	TO->FROM	DEAF SMITH COUNTY INTERCHANGE - PLANT X STATION 230KV CKT 1	351	0.15386	101.5196	PLANT X STATION - POTTER COUNTY INTERCHANGE 230KV CKT 1
FDNS	06ALL		0	13G	ASGI_13_003	TO->FROM	DEAF SMITH COUNTY INTERCHANGE - PLANT X STATION 230KV CKT 1	351	0.12666	103.3563	G13_017T 345.00 - OKLAUNION 345KV CKT 1
FDNS	06ALL		0	13G	ASGI_13_003	TO->FROM	DEAF SMITH COUNTY INTERCHANGE - PLANT X STATION 230KV CKT 1	351	0.12666	102.5937	SPP-AEPW-32
FDNS	06ALL		0	13G	ASGI_13_003	TO->FROM	DEAF SMITH COUNTY INTERCHANGE - PLANT X STATION 230KV CKT 1	351	0.12357	101.1754	BORDER 7345.00 - WOODWARD DISTRICT EHV 345KV CKT 1
FDNS	06ALL		0	13G	ASGI_13_003	TO->FROM	DAWN SUB - Panda Energy Substation Hereford 115KV CKT 1	96	0.10562	103.8101	BUFFALO 230.00 - BUSHLAND INTERCHANGE 230KV CKT 1
FDNS	06ALL		0	13G	ASGI_13_003	TO->FROM	CANYON WEST SUB - DAWN SUB 115KV CKT 1	96	0.10562	100.6987	BUFFALO 230.00 - BUSHLAND INTERCHANGE 230KV CKT 1
FDNS	6		0	13G	ASGI_13_003	TO->FROM	FPL SWITCH - WOODWARD 138KV CKT 1	153	0.04964	139.1328	DBL-WWRD-G12
FDNS	06ASGI_13_003		0	13G	ASGI_13_003	TO->FROM	FPL SWITCH - WOODWARD 138KV CKT 1	153	0.04962	139.6965	DBL-WWRD-G12
FDNS	06ALL		0	13G	ASGI_13_003	TO->FROM	FPL SWITCH - WOODWARD 138KV CKT 1	153	0.04916	156.6884	DBL-WWRD-G12
FDNS	6		0	13G	ASGI_13_003	TO->FROM	FPL SWITCH - WOODWARD 138KV CKT 1	153	0.03322	108.8453	G12-016 TAP 345.00 - WOODWARD DISTRICT EHV 345KV CKT 1
FDNS	06ASGI_13_003		0	13G	ASGI_13_003	TO->FROM	FPL SWITCH - WOODWARD 138KV CKT 1	153	0.03321	109.2009	G12-016 TAP 345.00 - WOODWARD DISTRICT EHV 345KV CKT 1
FDNS	06ALL		0	13G	ASGI_13_003	TO->FROM	FPL SWITCH - WOODWARD 138KV CKT 1	153	0.03292	120.1814	G12-016 TAP 345.00 - WOODWARD DISTRICT EHV 345KV CKT 1
FDNS	06ALL		2	13G	ASGI_13_003	FROM->TO	DEAF SMITH REC-#20 - DEAF SMITH REC-#24 115KV CKT 1	99	0.17534	101.1271	DEAF SMITH COUNTY INTERCHANGE - PLANT X STATION 230KV CKT 1
FDNS	06ALL		2	13G	ASGI_13_003	FROM->TO	CURRY COUNTY INTERCHANGE - DEAF SMITH REC-#20 115KV CKT 1	96	0.17534	113.0161	DEAF SMITH COUNTY INTERCHANGE - PLANT X STATION 230KV CKT 1
FDNS	06ALL		2	13G	ASGI_13_003	FROM->TO	WOLFFORTH INTERCHANGE - YUMA INTERCHANGE 115KV CKT 1	154	0.10502	102.0657	LUBBOCK SOUTH INTERCHANGE - WOLFFORTH INTERCHANGE 230KV CKT 1
FDNS	00ASGI_13_003		2	18WP	ASGI_13_003	FROM->TO	ELK CITY 230KV (ELKCTY-6) 230/138/13.8KV TRANSFORMER CKT 1	287	0.10242	100.9314	ELKCITY7 345.00 - GRACEMONT 345KV CKT 1
FDNS	00ASGI_13_003		2	18WP	ASGI_13_003	FROM->TO	ELK CITY 230KV (ELKCTY-6) 230/138/13.8KV TRANSFORMER CKT 1	287	0.10242	100.6756	ELKCITY7 345.00 - GRACEMONT 345KV CKT 1
FDNS	6		2	13G	ASGI_13_003	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.09005	105.0547	TOLK STATION EAST - TUCO INTERCHANGE 230KV CKT 1
FDNS	6		2	13G	ASGI_13_003	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.09005	105.0094	TOLK STATION EAST - TUCO INTERCHANGE 230KV CKT 1
FDNS	06ASGI_13_003		2	13G	ASGI_13_003	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.09048	105.5325	TOLK STATION EAST - TUCO INTERCHANGE 230KV CKT 1
FDNS	06ASGI_13_003		2	13G	ASGI_13_003	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.09048	105.4869	TOLK STATION EAST - TUCO INTERCHANGE 230KV CKT 1
FDNS	06ALL		2	13G	ASGI_13_003	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.08982	118.213	TOLK STATION EAST - TUCO INTERCHANGE 230KV CKT 1
FDNS	06ALL		2	13G	ASGI_13_003	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.08982	117.6187	TOLK STATION EAST - TUCO INTERCHANGE 230KV CKT 1
FDNS	0		2	13SP	ASGI_13_003	FROM->TO	WOLFFORTH INTERCHANGE - YUMA INTERCHANGE 115KV CKT 1	154	0.08469	102.1137	TOLK STATION EAST - TUCO INTERCHANGE 230KV CKT 1
FDNS	00ASGI_13_003		2	13SP	ASGI_13_003	FROM->TO	WOLFFORTH INTERCHANGE - YUMA INTERCHANGE 115KV CKT 1	154	0.08467	104.4742	TOLK STATION EAST - TUCO INTERCHANGE 230KV CKT 1
FDNS	06ALL		2	13G	ASGI_13_003	FROM->TO	WOLFFORTH INTERCHANGE - YUMA INTERCHANGE 115KV CKT 1	154	0.08118	107.0641	TOLK STATION EAST - TUCO INTERCHANGE 230KV CKT 1
FDNS	6		2	13G	ASGI_13_003	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.0738	100.9008	DEAF SMITH COUNTY INTERCHANGE - PLANT X STATION 230KV CKT 1
FDNS	6		2	13G	ASGI_13_003	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.0738	100.8563	DEAF SMITH COUNTY INTERCHANGE - PLANT X STATION 230KV CKT 1
FDNS	06ASGI_13_003		2	13G	ASGI_13_003	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.07378	101.2427	DEAF SMITH COUNTY INTERCHANGE - PLANT X STATION 230KV CKT 1
FDNS	06ASGI_13_003		2	13G	ASGI_13_003	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.07378	101.1981	DEAF SMITH COUNTY INTERCHANGE - PLANT X STATION 230KV CKT 1
FDNS	06ALL		2	13G	ASGI_13_003	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.07317	114.56	DEAF SMITH COUNTY INTERCHANGE - PLANT X STATION 230KV CKT 1
FDNS	06ALL		2	13G	ASGI_13_003	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.07317	114.5132	DEAF SMITH COUNTY INTERCHANGE - PLANT X STATION 230KV CKT 1
FDNS	06ALL		2	13G	ASGI_13_003	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.07199	103.3998	PLANT X STATION - POTTER COUNTY INTERCHANGE 230KV CKT 1
FDNS	06ALL		2	13G	ASGI_13_003	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.07199	103.3548	PLANT X STATION - POTTER COUNTY INTERCHANGE 230KV CKT 1
FDNS	6		2	13G	ASGI_13_003	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.06921	106.8895	LAMB COUNTY INTERCHANGE - TOLK STATION WEST 230KV CKT 1
FDNS	6		2	13G	ASGI_13_003	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.06921	106.8734	SPP-SWPS-K37
FDNS	6		2	13G	ASGI_13_003	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.06921	106.8733	LAMB COUNTY INTERCHANGE (WH ALM20172) 230/115/13.2KV TRANSFORMER CKT 1
FDNS	6		2	13G	ASGI_13_003	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.06921	106.8421	LAMB COUNTY INTERCHANGE - TOLK STATION WEST 230KV CKT 1
FDNS	6		2	13G	ASGI_13_003	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.06921	106.826	LAMB COUNTY INTERCHANGE (WH ALM20172) 230/115/13.2KV TRANSFORMER CKT 1
FDNS	6		2	13G	ASGI_13_003	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.06921	106.826	SPP-SWPS-K37
FDNS	06ASGI_13_003		2	13G	ASGI_13_003	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.06919	107.2157	LAMB COUNTY INTERCHANGE - TOLK STATION WEST 230KV CKT 1
FDNS	06ASGI_13_003		2	13G	ASGI_13_003	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.06919	107.2018	LAMB COUNTY INTERCHANGE (WH ALM20172) 230/115/13.2KV TRANSFORMER CKT 1
FDNS	06ASGI_13_003		2	13G	ASGI_13_003	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.06919	107.2018	SPP-SWPS-K37
FDNS	06ASGI_13_003		2	13G	ASGI_13_003	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.06919	107.1681	LAMB COUNTY INTERCHANGE - TOLK STATION WEST 230KV CKT 1
FDNS	06ASGI_13_003		2	13G	ASGI_13_003	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.06919	107.1542	SPP-SWPS-K37
FDNS	06ASGI_13_003		2	13G	ASGI_13_003	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.06919	107.1541	LAMB COUNTY INTERCHANGE (WH ALM20172) 230/115/13.2KV TRANSFORMER CKT 1
FDNS	06ALL		2	13G	ASGI_13_003	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.06869	116.1793	LAMB COUNTY INTERCHANGE - TOLK STATION WEST 230KV CKT 1
FDNS	06ALL		2	13G	ASGI_13_003	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.06869	116.1661	LAMB COUNTY INTERCHANGE (WH ALM20172) 230/115/13.2KV TRANSFORMER CKT 1
FDNS	06ALL		2	13G	ASGI_13_003	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.06869	116.1661	SPP-SWPS-K37
FDNS	06ALL		2	13G	ASGI_13_003	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.06869	116.1297	LAMB COUNTY INTERCHANGE - TOLK STATION WEST 230KV CKT 1
FDNS	06ALL		2	13G	ASGI_13_003	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.06869	116.1165	LAMB COUNTY INTERCHANGE (WH ALM20172) 230/115/13.2KV TRANSFORMER CKT 1
FDNS	06ALL		2	13G	ASGI_13_003	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.06869	116.1165	SPP-SWPS-K37
FDNS	06ALL		2	13G	ASGI_13_003	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.06507	101.0981	LAMB COUNTY INTERCHANGE - PLANT X STATION 115KV CKT 1
FDNS	06ALL		2	13G	ASGI_13_003	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.06507	101.0503	LAMB COUNTY INTERCHANGE - PLANT X STATION 115KV CKT 1
FDNS	06ALL		2	13G	ASGI_13_003	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.06344	101.2624	PLANT X STATION - SUNDOWN INTERCHANGE 230KV CKT 1
FDNS	06ALL		2	13G	ASGI_13_003	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.06344	101.2179	PLANT X STATION - SUNDOWN INTERCHANGE 230KV CKT 1
FDNS	0		2	13SP	ASGI_13_003	FROM->TO	WOLFFORTH INTERCHANGE - YUMA INTERCHANGE 115KV CKT 1	154	0.05262	104.3908	LUBBOCK SOUTH INTERCHANGE (ABB LLM60043) 230/115/13.2KV TRANSFORMER CKT 1
FDNS	00ASGI_13_003		2	13SP	ASGI_13_003	FROM->TO	WOLFFORTH INTERCHANGE - YUMA INTERCHANGE 115KV CKT 1	154	0.0526	105.8458	LUBBOCK SOUTH INTERCHANGE (ABB LLM60043) 230/115/13.2KV TRANSFORMER CKT 1
FDNS	0		2	13SP	ASGI_13_003	FROM->TO	WOLFFORTH INTERCHANGE - YUMA INTERCHANGE 115KV CKT 1	154	0.05116	110.7067	BASE CASE
FDNS	00ASGI_13_003		2	13SP	ASGI_13_003	FROM->TO	WOLFFORTH INTERCHANGE - YUMA INTERCHANGE 115KV CKT 1	154	0.05115	112.5238	BASE CASE
FDNS	0		2	13SP	ASGI_13_003	FROM->TO	WOLFFORTH INTERCHANGE - YUMA INTERCHANGE 115KV CKT 1	154	0.05105	115.3705	ALLEN SUB - LUBBOCK SOUTH INTERCHANGE 115KV CKT 1
FDNS	0		2	13SP	ASGI_13_003	FROM->TO	WOLFFORTH INTERCHANGE - YUMA INTERCHANGE 115KV CKT 1	154	0.05105		

SOLUTION	GROUP	SCENARIO	SEASON	SOURCE	DIRECTION	MONITORED ELEMENT	RATEB (MVA)	TDF	TC%LOADING (% MVA)	CONTINGENCY	
FDNS	6		4	13G	ASGI_13_003	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.09477	107.6042	TOLK STATION EAST - TUCO INTERCHANGE 230KV CKT 1
FDNS	06ASGI_13_003		4	13G	ASGI_13_003	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.09474	108.1529	TOLK STATION EAST - TUCO INTERCHANGE 230KV CKT 1
FDNS	06ASGI_13_003		4	13G	ASGI_13_003	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.09474	108.1069	TOLK STATION EAST - TUCO INTERCHANGE 230KV CKT 1
FDNS	06ALL		4	13G	ASGI_13_003	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.09406	121.0584	TOLK STATION EAST - TUCO INTERCHANGE 230KV CKT 1
FDNS	06ALL		4	13G	ASGI_13_003	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.09406	120.8634	TOLK STATION EAST - TUCO INTERCHANGE 230KV CKT 1
FDNS	0		4	13SP	ASGI_13_003	FROM->TO	WOLFFORTH INTERCHANGE - YUMA INTERCHANGE 115KV CKT 1	154	0.08374	101.8477	TOLK STATION EAST - TUCO INTERCHANGE 230KV CKT 1
FDNS	00ASGI_13_003		4	13SP	ASGI_13_003	FROM->TO	WOLFFORTH INTERCHANGE - YUMA INTERCHANGE 115KV CKT 1	154	0.08371	103.9525	TOLK STATION EAST - TUCO INTERCHANGE 230KV CKT 1
FDNS	06ALL		4	13G	ASGI_13_003	FROM->TO	WOLFFORTH INTERCHANGE - YUMA INTERCHANGE 115KV CKT 1	154	0.08026	105.4754	TOLK STATION EAST - TUCO INTERCHANGE 230KV CKT 1
FDNS	6		4	13G	ASGI_13_003	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.07762	103.1737	DEAF SMITH COUNTY INTERCHANGE - PLANT X STATION 230KV CKT 1
FDNS	6		4	13G	ASGI_13_003	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.07762	103.1287	DEAF SMITH COUNTY INTERCHANGE - PLANT X STATION 230KV CKT 1
FDNS	06ASGI_13_003		4	13G	ASGI_13_003	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.0776	103.5257	DEAF SMITH COUNTY INTERCHANGE - PLANT X STATION 230KV CKT 1
FDNS	06ASGI_13_003		4	13G	ASGI_13_003	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.0776	103.4806	DEAF SMITH COUNTY INTERCHANGE - PLANT X STATION 230KV CKT 1
FDNS	06ALL		4	13G	ASGI_13_003	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.07697	117.4169	DEAF SMITH COUNTY INTERCHANGE - PLANT X STATION 230KV CKT 1
FDNS	06ALL		4	13G	ASGI_13_003	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.07697	117.3695	DEAF SMITH COUNTY INTERCHANGE - PLANT X STATION 230KV CKT 1
FDNS	06ALL		4	13G	ASGI_13_003	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.0754	106.1675	PLANT X STATION - POTTER COUNTY INTERCHANGE 230KV CKT 1
FDNS	06ALL		4	13G	ASGI_13_003	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.0754	106.1219	PLANT X STATION - POTTER COUNTY INTERCHANGE 230KV CKT 1
FDNS	6		4	13G	ASGI_13_003	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.07165	108.6101	LAMB COUNTY INTERCHANGE - TOLK STATION WEST 230KV CKT 1
FDNS	6		4	13G	ASGI_13_003	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.07165	108.5964	LAMB COUNTY INTERCHANGE (WH ALM20172) 230/115/13.2KV TRANSFORMER CKT 1
FDNS	6		4	13G	ASGI_13_003	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.07165	108.5964	SPP-SWPS-K37
FDNS	6		4	13G	ASGI_13_003	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.07165	108.5627	LAMB COUNTY INTERCHANGE - TOLK STATION WEST 230KV CKT 1
FDNS	6		4	13G	ASGI_13_003	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.07165	108.549	LAMB COUNTY INTERCHANGE (WH ALM20172) 230/115/13.2KV TRANSFORMER CKT 1
FDNS	6		4	13G	ASGI_13_003	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.07165	108.549	SPP-SWPS-K37
FDNS	06ASGI_13_003		4	13G	ASGI_13_003	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.07162	108.9264	LAMB COUNTY INTERCHANGE - TOLK STATION WEST 230KV CKT 1
FDNS	06ASGI_13_003		4	13G	ASGI_13_003	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.07162	108.9127	LAMB COUNTY INTERCHANGE (WH ALM20172) 230/115/13.2KV TRANSFORMER CKT 1
FDNS	06ASGI_13_003		4	13G	ASGI_13_003	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.07162	108.9127	SPP-SWPS-K37
FDNS	06ASGI_13_003		4	13G	ASGI_13_003	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.07162	108.8791	LAMB COUNTY INTERCHANGE - TOLK STATION WEST 230KV CKT 1
FDNS	06ASGI_13_003		4	13G	ASGI_13_003	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.07162	108.8655	SPP-SWPS-K37
FDNS	06ASGI_13_003		4	13G	ASGI_13_003	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.07162	108.8654	LAMB COUNTY INTERCHANGE (WH ALM20172) 230/115/13.2KV TRANSFORMER CKT 1
FDNS	06ALL		4	13G	ASGI_13_003	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.07111	118.2951	LAMB COUNTY INTERCHANGE - TOLK STATION WEST 230KV CKT 1
FDNS	06ALL		4	13G	ASGI_13_003	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.07111	118.2819	LAMB COUNTY INTERCHANGE (WH ALM20172) 230/115/13.2KV TRANSFORMER CKT 1
FDNS	06ALL		4	13G	ASGI_13_003	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.07111	118.2819	SPP-SWPS-K37
FDNS	06ALL		4	13G	ASGI_13_003	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.07111	118.2457	LAMB COUNTY INTERCHANGE - TOLK STATION WEST 230KV CKT 1
FDNS	06ALL		4	13G	ASGI_13_003	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.07111	118.2326	LAMB COUNTY INTERCHANGE (WH ALM20172) 230/115/13.2KV TRANSFORMER CKT 1
FDNS	06ALL		4	13G	ASGI_13_003	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.07111	118.2325	SPP-SWPS-K37
FDNS	06ALL		4	13G	ASGI_13_003	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.06894	100.888	SUNDOWN INTERCHANGE - WOLFFORTH INTERCHANGE 230KV CKT 1
FDNS	06ALL		4	13G	ASGI_13_003	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.06894	100.8435	SUNDOWN INTERCHANGE - WOLFFORTH INTERCHANGE 230KV CKT 1
FDNS	06ALL		4	13G	ASGI_13_003	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.06711	104.1303	PLANT X STATION - SUNDOWN INTERCHANGE 230KV CKT 1
FDNS	06ALL		4	13G	ASGI_13_003	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.06711	104.0851	PLANT X STATION - SUNDOWN INTERCHANGE 230KV CKT 1
FDNS	06ALL		4	13G	ASGI_13_003	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.06702	102.6196	LAMB COUNTY INTERCHANGE - PLANT X STATION 115KV CKT 1
FDNS	06ALL		4	13G	ASGI_13_003	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.06702	102.5751	LAMB COUNTY INTERCHANGE - PLANT X STATION 115KV CKT 1
FDNS	0		4	13SP	ASGI_13_003	FROM->TO	WOLFFORTH INTERCHANGE - YUMA INTERCHANGE 115KV CKT 1	154	0.05247	104.4087	LUBBOCK SOUTH INTERCHANGE (ABB LLM60043) 230/115/13.2KV TRANSFORMER CKT 1
FDNS	00ASGI_13_003		4	13SP	ASGI_13_003	FROM->TO	WOLFFORTH INTERCHANGE - YUMA INTERCHANGE 115KV CKT 1	154	0.05245	105.8578	LUBBOCK SOUTH INTERCHANGE (ABB LLM60043) 230/115/13.2KV TRANSFORMER CKT 1
FDNS	0		4	13SP	ASGI_13_003	FROM->TO	WOLFFORTH INTERCHANGE - YUMA INTERCHANGE 115KV CKT 1	154	0.05101	110.7478	BASE CASE
FDNS	00ASGI_13_003		4	13SP	ASGI_13_003	FROM->TO	WOLFFORTH INTERCHANGE - YUMA INTERCHANGE 115KV CKT 1	154	0.05099	112.5639	BASE CASE
FDNS	0		4	13SP	ASGI_13_003	FROM->TO	WOLFFORTH INTERCHANGE - YUMA INTERCHANGE 115KV CKT 1	154	0.05093	115.4072	ALLEN SUB - LUBBOCK SOUTH INTERCHANGE 115KV CKT 1
FDNS	0		4	13SP	ASGI_13_003	FROM->TO	WOLFFORTH INTERCHANGE - YUMA INTERCHANGE 115KV CKT 1	154	0.05093	100.4194	ALLEN SUB - SOUTH PLAINS REC-QUAKER 115KV CKT 1
FDNS	00ASGI_13_003		4	13SP	ASGI_13_003	FROM->TO	WOLFFORTH INTERCHANGE - YUMA INTERCHANGE 115KV CKT 1	154	0.05092	116.528	ALLEN SUB - LUBBOCK SOUTH INTERCHANGE 115KV CKT 1
FDNS	00ASGI_13_003		4	13SP	ASGI_13_003	FROM->TO	WOLFFORTH INTERCHANGE - YUMA INTERCHANGE 115KV CKT 1	154	0.05092	101.8048	ALLEN SUB - SOUTH PLAINS REC-QUAKER 115KV CKT 1
FDNS	0		4	13SP	ASGI_13_003	FROM->TO	WOLFFORTH INTERCHANGE - YUMA INTERCHANGE 115KV CKT 1	154	0.03994	119.6107	CARLISLE INTERCHANGE - TUCO INTERCHANGE 230KV CKT 1
FDNS	00ASGI_13_003		4	13SP	ASGI_13_003	FROM->TO	WOLFFORTH INTERCHANGE - YUMA INTERCHANGE 115KV CKT 1	154	0.03993	120.5985	CARLISLE INTERCHANGE - TUCO INTERCHANGE 230KV CKT 1
FDNS	00ASGI_13_003		4	23SP	ASGI_13_003	FROM->TO	WOLFFORTH INTERCHANGE - YUMA INTERCHANGE 115KV CKT 1	154	0.0319	100.4857	CARLISLE INTERCHANGE - TUCO INTERCHANGE 230KV CKT 1
FDNS	0		4	18SP	ASGI_13_003	FROM->TO	WOLFFORTH INTERCHANGE - YUMA INTERCHANGE 115KV CKT 1	154	0.03133	105.4104	CARLISLE INTERCHANGE - TUCO INTERCHANGE 230KV CKT 1
FDNS	00ASGI_13_003		4	18SP	ASGI_13_003	FROM->TO	WOLFFORTH INTERCHANGE - YUMA INTERCHANGE 115KV CKT 1	154	0.03133	106.2095	CARLISLE INTERCHANGE - TUCO INTERCHANGE 230KV CKT 1
FDNS	6		4	13G	ASGI_13_003	TO->FROM	FPL SWITCH - WOODWARD 138KV CKT 1	153	0.04309	123.214	DBL-WWRD-G12
FDNS	06ASGI_13_003		4	13G	ASGI_13_003	TO->FROM	FPL SWITCH - WOODWARD 138KV CKT 1	153	0.04307	123.7038	DBL-WWRD-G12
FDNS	06ALL		4	13G	ASGI_13_003	TO->FROM	FPL SWITCH - WOODWARD 138KV CKT 1	153	0.04269	137.4858	DBL-WWRD-G12
FNLS-Blown up	03ALL		0	13G	G12_005		Non-converged Contingency	0	0.05359	-	DBL-THIS-CLR
FNLS-Blown up	00NR		0	18WP	G12_005		Non-converged Contingency	0	0.03748	-	ALTW-B111-SW
FNLS-Blown up	00NR		0	18WP	G12_005		Non-converged Contingency	0	0.03748	-	IWA001WAPAB2
FNLS-Blown up	00G12_005		2	18WP	G12_005		Non-converged Contingency	0	0.0469	-	ATC_B2_W-8_G
FDNS	00G12_005		0	18SP	G12_005	FROM->TO	FT RANDAL - SPENCER 115KV CKT 1	124	0.03923	100.1099	BASE CASE
FDNS	09ALL		0	13G	G12_005	TO->FROM	FT RANDAL - G12_005T 230.00 230KV CKT 1	320	1	127.5175	KELLY - MADISONCO 230.00 230KV CKT 1
FDNS	09ALL		0	13G	G12_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	1	127.4997	FT RANDAL - G12_005T 230.00 230KV CKT 1
FDNS	09ALLBPSON		0	13G	G12_005	TO->FROM	FT RANDAL - G12_005T 230.00 230KV CKT 1	320	1	127.7744	KELLY - MADISONCO 230.00 230KV CKT 1
FDNS	09ALLBPSON		0	13G	G12_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	1	127.9705	FT RANDAL - G12_005T 230.00 230KV CKT 1
FDNS	00G12_005		0	13SP	G12_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.3189	123.7147	DAK02WAPAB2
FDNS	09ALL		0	13G	G12_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.31879	109.0804	DAK02WAPAB2
FDNS	09ALLBPSON		0	13G	G12_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.31878	108.5239	DAK02WAPAB2
FDNS	09G12_005		0	13G	G12_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.31878	108.3403	DAK02WAPAB2
FDNS	09G12_005BPSON		0	13G	G12_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.31878	107.5358	DAK02WAPAB2
FDNS	00G12_005		0	13WP	G12_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.31806	113.6169	DAK02WAPAB2
FDNS	09ALL		0	13G	G12_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.31775	109.062	FT RANDAL - UTICA JCT 230KV CKT 1
FDNS	09ALLBPSON		0	13G	G12_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.31775	108.4868	FT RANDAL - UTICA JCT 230KV CKT 1
FDNS	00G12_005		0	18SP	G12_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.31676	119.0206	DAK02WAPAB2
FDNS	00G12_005		0	18WP	G12_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.31629	109.6617	DAK02WAPAB2
FDNS	00G12_005		0	23SP	G12_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.31397	123.3254	DAK02WAPAB2
FDNS	09ALL		0	13G	G12_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.30834	106.871	FT RANDAL - SIOUX CITY 230KV CKT 1
FDNS	09ALLBPSON		0	13G	G12_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.30833	106.277	FT RANDAL - SIOUX CITY 230KV CKT 1

SOLUTION	GROUP	SCENARIO	SEASON	SOURCE	DIRECTION	MONITORED ELEMENT	RATEB (MVA)	TDF	TC%LOADING (% MVA)	CONTINGENCY
FDNS	09ALL		0 13G	G12_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.30191	100.1172	FT THOMPSON - LAKE PLATT 230KV CKT 1
FDNS	09ALL		0 13G	G12_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.29696	103.8189	FT THOMPSON - GRAND ISLAND 345KV CKT 1
FDNS	09ALLBPSON		0 13G	G12_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.29695	103.1363	FT THOMPSON - GRAND ISLAND 345KV CKT 1
FDNS	09ALL		0 13G	G12_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.29536	102.3173	RASMUSN - UTICA JCT 230KV CKT 1
FDNS	09ALLBPSON		0 13G	G12_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.29535	101.5708	RASMUSN - UTICA JCT 230KV CKT 1
FDNS	00G12_005		0 13SP	G12_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.2912	117.3088	LN-WAPA6
FDNS	00G12_005		0 13SP	G12_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.2912	117.3088	NEB001NPPB2
FDNS	00G12_005		0 13WP	G12_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.2903	105.6297	LN-WAPA6
FDNS	00G12_005		0 13WP	G12_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.2903	105.6297	NEB001NPPB2
FDNS	00G12_005		0 18SP	G12_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.28914	113.9238	LN-WAPA6
FDNS	00G12_005		0 18SP	G12_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.28914	113.9238	NEB001NPPB2
FDNS	09ALL		0 13G	G12_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.28908	102.9161	UTICA JCT - VFODNES 230KV CKT 1
FDNS	09ALL		0 13G	G12_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.28908	102.3421	SIoux FALLS - VFODNES 230KV CKT 1
FDNS	09ALLBPSON		0 13G	G12_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.28907	102.2194	UTICA JCT - VFODNES 230KV CKT 1
FDNS	09ALLBPSON		0 13G	G12_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.28907	101.6387	SIoux FALLS - VFODNES 230KV CKT 1
FDNS	09ALL		0 13G	G12_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.28898	100.1016	GAVINS POINT - YANKON JCT 115KV CKT 1
FDNS	00G12_005		0 13SP	G12_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.28896	114.1861	LN-1164
FDNS	00G12_005		0 18WP	G12_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.2886	102.5847	LN-WAPA6
FDNS	00G12_005		0 18WP	G12_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.2886	102.5847	NEB001NPPB2
FDNS	09ALL		0 13G	G12_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.28802	102.5356	SIoux FALLS - SPLIT ROCK 230KV CKT 1
FDNS	09ALLBPSON		0 13G	G12_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.28802	101.8352	SIoux FALLS - SPLIT ROCK 230KV CKT 1
FDNS	00G12_005		0 23SP	G12_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.28752	117.6272	LN-WAPA6
FDNS	00G12_005		0 23SP	G12_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.28752	117.6272	NEB001NPPB2
FDNS	00G12_005		0 13SP	G12_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.2875	114.6192	NEB02WAPAB2
FDNS	00G12_005		0 13SP	G12_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.28732	111.9651	LN-1090
FDNS	09ALL		0 13G	G12_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.28731	102.563	NEB02WAPAB2
FDNS	09ALL		0 13G	G12_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.28731	102.3873	GAVINS POINT - HARTINGTON 115KV CKT 1
FDNS	09ALLBPSON		0 13G	G12_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.2873	101.8374	NEB02WAPAB2
FDNS	09ALLBPSON		0 13G	G12_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.2873	101.691	GAVINS POINT - HARTINGTON 115KV CKT 1
FDNS	09G12_005		0 13G	G12_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.2873	101.6525	NEB02WAPAB2
FDNS	09G12_005BPSON		0 13G	G12_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.2873	100.6411	NEB02WAPAB2
FDNS	09ALL		0 13G	G12_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.28718	102.8142	G10-51T 230.00 - HOSKINS 230KV CKT 1
FDNS	09ALLBPSON		0 13G	G12_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.28718	102.0816	G10-51T 230.00 - HOSKINS 230KV CKT 1
FDNS	09ALL		0 13G	G12_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.28707	102.0969	RASMUSN - SIOUX CITY 230KV CKT 1
FDNS	09ALLBPSON		0 13G	G12_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.28706	101.4013	RASMUSN - SIOUX CITY 230KV CKT 1
FDNS	09ALL		0 13G	G12_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.28695	102.8744	PETERSBRG.N715.00 - PETERSBURG 115KV CKT 1
FDNS	09ALL		0 13G	G12_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.28695	102.8432	ALBION - PETERSBURG 115KV CKT 1
FDNS	09ALLBPSON		0 13G	G12_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.28694	102.1777	PETERSBRG.N715.00 - PETERSBURG 115KV CKT 1
FDNS	09ALLBPSON		0 13G	G12_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.28694	102.1463	ALBION - PETERSBURG 115KV CKT 1
FDNS	00G12_005		0 13WP	G12_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.28661	104.8101	NEB02WAPAB2
FDNS	00G12_005		0 13SP	G12_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.28654	114.4944	DAK01WAPAB2
FDNS	09ALL		0 13G	G12_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.28635	102.2522	DAK01WAPAB2
FDNS	09ALLBPSON		0 13G	G12_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.28634	101.5781	DAK01WAPAB2
FDNS	09G12_005		0 13G	G12_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.28634	101.4081	DAK01WAPAB2
FDNS	09G12_005BPSON		0 13G	G12_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.28634	100.4679	DAK01WAPAB2
FDNS	00G12_005		0 13SP	G12_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.2863	114.088	ROCH OPG
FDNS	00G12_005		0 13SP	G12_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.28629	114.6348	ATC_B2_8E2
FDNS	09ALL		0 13G	G12_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.28619	102.5142	HANLON - STORLA 230KV CKT 1
FDNS	09ALLBPSON		0 13G	G12_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.28618	101.8333	HANLON - STORLA 230KV CKT 1
FDNS	09ALL		0 13G	G12_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.28609	102.2544	ATC_B2_8E2
FDNS	09ALLBPSON		0 13G	G12_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.28609	101.6027	ATC_B2_8E2
FDNS	09G12_005		0 13G	G12_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.28609	101.4376	ATC_B2_8E2
FDNS	09G12_005BPSON		0 13G	G12_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.28608	100.4569	ATC_B2_8E2
FDNS	09ALL		0 13G	G12_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.28595	102.4051	KEYSTONE - SIDNEY 345KV CKT 1
FDNS	09ALLBPSON		0 13G	G12_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.28594	101.6988	KEYSTONE - SIDNEY 345KV CKT 1
FDNS	09ALL		0 13G	G12_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.28587	102.1205	FT THOMPSON - LETCHER 230KV CKT 1
FDNS	09ALLBPSON		0 13G	G12_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.28586	101.4414	FT THOMPSON - LETCHER 230KV CKT 1
FDNS	09ALL		0 13G	G12_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.28584	100	ATCHSNT3 345.00 - COOPER 345KV CKT 1
FDNS	09ALL		0 13G	G12_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.28577	102.148	ALBION - GENOA 115KV CKT 1
FDNS	09ALLBPSON		0 13G	G12_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.28576	101.3875	ALBION - GENOA 115KV CKT 1
FDNS	00G12_005		0 13WP	G12_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.28569	104.5845	DAK01WAPAB2
FDNS	00G12_005		0 13WP	G12_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.28552	104.6915	ATC_B2_8E2
FDNS	09ALL		0 13G	G12_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.28543	103.0239	GEN640009 1-COOPER NUCLEAR STATION
FDNS	09ALL		0 13G	G12_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.28543	102.4965	GEN645012 2-NEBRASKA CITY 2
FDNS	09ALL		0 13G	G12_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.28543	102.3943	GEN640028 1-COLUMBOGENERATION
FDNS	09ALL		0 13G	G12_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.28543	102.3833	GEN532751 1-WOLF CREEK GENERATING STATION UNIT 1
FDNS	09ALL		0 13G	G12_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.28543	102.3677	GEN645011 1-NEBRASKA CITY 1
FDNS	09ALL		0 13G	G12_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.28543	101.0723	BASE CASE
FDNS	09ALL		0 13G	G12_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.28543	101.0723	NC1_GEN-NEBRASKA CITY 1
FDNS	09ALL		0 13G	G12_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.28543	100	GEN640418 1-ELKHORN RIDGE WIND
FDNS	09ALL		0 13G	G12_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.28543	99.9	GEN652457 1-GARRISON
FDNS	09ALL		0 13G	G12_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.28543	99.9	GEN652458 2-GARRISON
FDNS	09ALL		0 13G	G12_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.28543	99.9	GEN652459 3-GARRISON
FDNS	09ALL		0 13G	G12_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.28543	99.9	GEN659296 1-SDPRAIRWIND1W0.6900
FDNS	09ALLBPSON		0 13G	G12_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.28542	102.409	GEN640009 1-COOPER NUCLEAR STATION
FDNS	09ALLBPSON		0 13G	G12_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.28542	101.858	GEN640028 1-COLUMBOGENERATION
FDNS	09ALLBPSON		0 13G	G12_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.28542	101.8261	GEN645012 2-NEBRASKA CITY 2
FDNS	09ALLBPSON		0 13G	G12_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.28542	101.694	GEN645011 1-NEBRASKA CITY 1

SOLUTION	GROUP	SCENARIO	SEASON	SOURCE	DIRECTION	MONITORED ELEMENT	RATEB (MVA)	TDF	TC%LOADING (% MVA)	CONTINGENCY
FDNS	09ALLBPSON		0 13G	G12_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.28542	101.6829	GEN532751 1-WOLF CREEK GENERATING STATION UNIT 1
FDNS	09ALLBPSON		0 13G	G12_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.28542	100.3284	BASE CASE
FDNS	09ALLBPSON		0 13G	G12_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.28542	100.3284	NC1_GEN-NEBRASKA CITY 1
FDNS	00G12_005		0 18SP	G12_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.28541	111.134	NEB02WAPAB2
FDNS	09ALL		0 13G	G12_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.28531	100.0894	FALLOW 3 345.00 - GRIMES 345KV CKT 1
FDNS	00G12_005		0 18WP	G12_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.28489	101.6127	NEB02WAPAB2
FDNS	09ALL		0 13G	G12_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.28483	100	COLUMBUS - SCHUYLER 115KV CKT 1
FDNS	00G12_005		0 18SP	G12_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.28456	110.7026	DAK01WAPAB2
FDNS	00G12_005		0 18SP	G12_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.28416	110.8613	ATC_B2_8E2_G
FDNS	00G12_005		0 18SP	G12_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.28414	110.8076	ATC_B2_8E2
FDNS	00G12_005		0 18WP	G12_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.28405	101.2725	DAK01WAPAB2
FDNS	00G12_005		0 18WP	G12_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.2835	101.0668	ATC_B2_8E2_G
FDNS	00G12_005		0 18WP	G12_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.2835	101.0526	ATC_B2_8E2
FDNS	00G12_005		0 13SP	G12_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.28341	114.3184	TRF-HOSKINS
FDNS	00G12_005		0 13SP	G12_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.28339	111.0833	TRF-KELLY
FDNS	00G12_005		0 23SP	G12_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.28282	114.8749	NEB02WAPAB2
FDNS	00G12_005		0 13WP	G12_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.28253	101.4116	TRF-KELLY
FDNS	00G12_005		0 23SP	G12_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.28222	114.5286	DAK01WAPAB2
FDNS	00G12_005		0 18SP	G12_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.28138	107.7391	TRF-KELLY
FDNS	00G12_005		0 18SP	G12_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.28118	110.8047	TRF-HOSKINS
FDNS	00G12_005		0 23SP	G12_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.27907	111.4295	TRF-KELLY
FDNS	00G12_005		0 23SP	G12_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.27832	115.6405	TRF-HOSKINS
FDNS	09ALL		0 13G	G12_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.27617	100.5991	COLUMEAST - NW68TH & HOLDREGE 345KV CKT 1
FDNS	03ALL		0 13G	G12_005	TO->FROM	BENTON - WICHITA 345KV CKT 1	932	0.03642	107.4489	HUNTERS7 345.00 - WOODRING 345KV CKT 1
FDNS	03ALL		0 13G	G12_005	TO->FROM	BENTON - WICHITA 345KV CKT 1	932	0.03642	105.1622	HUNTERS7 345.00 - VIOLA 7 345.00 345KV CKT 1
FDNS	09ALL		2 13G	G12_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.28544	101.1146	MADISONCO 230.00 - S_NORFOLK 230.00 230KV CKT 1
FDNS	09ALL		2 13G	G12_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.28544	100.9114	S_NORFOLK 345.00 (SNORFOLKT) 345/230/13.8KV TRANSFORMER CKT 1
FDNS	09ALLBPSON		2 13G	G12_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.28543	100.3015	MADISONCO 230.00 - S_NORFOLK 230.00 230KV CKT 1
FDNS	09ALLBPSON		2 13G	G12_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.28543	100.0976	S_NORFOLK 345.00 (SNORFOLKT) 345/230/13.8KV TRANSFORMER CKT 1
FNSL-Blown up	03ALL		0 13G	G13_002		Non-converged Contingency	0	0.05518	-	DBL-THIS-CLR
FDNS	09ALL		0 13G	G13_002	FROM->TO	G13_002T 115.00 - SHELDON 115KV CKT 2	43	1	132.014	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2
FDNS	09ALL		0 13G	G13_002	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	1	128.3706	G13_002T 115.00 - SHELDON 115KV CKT 2
FDNS	09ALLBPSON		0 13G	G13_002	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	1	117.7603	G13_002T 115.00 - SHELDON 115KV CKT 2
FDNS	09ALLBPSON		0 13G	G13_002	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.3318	294.5695	MOORE (MOORE T1) 345/115/13.8KV TRANSFORMER CKT 1
FDNS	03ALL		0 13G	G13_002	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.33169	112.6777	MOORE (MOORE T1) 345/115/13.8KV TRANSFORMER CKT 1
FDNS	09NR		0 13G	G13_002	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.27398	204.4708	ENRONTAP
FDNS	09NRBPSON		0 13G	G13_002	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.27398	204.4708	ENRONTAP
FDNS	09NR		0 13G	G13_002	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.27259	186.7068	LN-WAPA2
FDNS	09NR		0 13G	G13_002	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.27259	186.3617	LN-1094
FDNS	09NR		0 13G	G13_002	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.27259	186.0055	LN-WAPA4
FDNS	09NR		0 13G	G13_002	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.27259	183.4562	LN-MALONEY
FDNS	09NR		0 13G	G13_002	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.27259	182.6896	NEB02WAPAB2
FDNS	09NRBPSON		0 13G	G13_002	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.27259	186.7068	LN-WAPA2
FDNS	09NRBPSON		0 13G	G13_002	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.27259	186.3617	LN-1094
FDNS	09NRBPSON		0 13G	G13_002	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.27259	186.0055	LN-WAPA4
FDNS	09NRBPSON		0 13G	G13_002	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.27259	183.4562	LN-MALONEY
FDNS	09NRBPSON		0 13G	G13_002	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.27259	182.6896	NEB02WAPAB2
FDNS	09ALLBPSON		0 13G	G13_002	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.26294	346.1206	SHELDON - SW7TH & PLEASANT HILL 115KV CKT 1
FDNS	09ALL		0 13G	G13_002	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.26291	258.2818	SHELDON - SW7TH & PLEASANT HILL 115KV CKT 1
FDNS	03ALL		0 13G	G13_002	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.26285	237.9318	SHELDON - SW7TH & PLEASANT HILL 115KV CKT 1
FDNS	14ALL		0 13G	G13_002	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.26277	207.3528	SHELDON - SW7TH & PLEASANT HILL 115KV CKT 1
FDNS	08ALL		0 13G	G13_002	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.26273	209.6905	SHELDON - SW7TH & PLEASANT HILL 115KV CKT 1
FDNS	03ALL		0 13G	G13_002	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.21089	147.1502	LN-FRIEND
FDNS	03ALL		0 13G	G13_002	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.21089	147.0266	FRIEND - GENEVA 115KV CKT 1
FDNS	09ALLBPSON		0 13G	G13_002	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.21018	239.1308	BEATRICE - STEINAUER 115KV CKT 1
FDNS	09ALLBPSON		0 13G	G13_002	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.21018	238.5469	HUMBOLDT - STEINAUER 115KV CKT 1
FDNS	09ALLBPSON		0 13G	G13_002	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.21018	238.4994	LN-1176
FDNS	09ALLBPSON		0 13G	G13_002	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.21018	236.8819	HUMBOLDT (HUMBOLDT T2) 161/115/13.8KV TRANSFORMER CKT 1
FDNS	09BPSON		0 13G	G13_002	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.21017	221.3036	LN-1176
FDNS	03ALL		0 13G	G13_002	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.21014	163.3076	FIRTH - SHELDON 115KV CKT 1
FDNS	14ALL		0 13G	G13_002	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.21009	141.3957	FIRTH - SHELDON 115KV CKT 1
FDNS	09G13_002BPSON		0 13G	G13_002	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.21008	254.0086	LN-1176
FDNS	08ALL		0 13G	G13_002	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.21007	142.8597	FIRTH - SHELDON 115KV CKT 1
FDNS	09ALLBPSON		0 13G	G13_002	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.20915	240.596	KNOB HILL - STEELE CITY 115KV CKT 1
FDNS	09ALL		0 13G	G13_002	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.20913	179.7569	KNOB HILL - STEELE CITY 115KV CKT 1
FDNS	09ALLBPSON		0 13G	G13_002	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.20898	239.7699	103RD & ROKEBY - MOORE 345KV CKT 1
FDNS	09ALL		0 13G	G13_002	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.20896	181.5014	103RD & ROKEBY - MOORE 345KV CKT 1
FDNS	03ALL		0 13G	G13_002	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.20887	173.3787	103RD & ROKEBY - MOORE 345KV CKT 1
FDNS	08ALL		0 13G	G13_002	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.20881	143.6215	103RD & ROKEBY - MOORE 345KV CKT 1
FDNS	09ALL		0 13G	G13_002	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.20765	162.7338	BEATRICE - HARBINE 115KV CKT 1
FDNS	09ALLBPSON		0 13G	G13_002	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.20737	220.2773	BEATRICE POWER STATION - SHELDON 115KV CKT 1
FDNS	09ALLBPSON		0 13G	G13_002	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.20688	239.1213	G13_018T 69.000 - HYDROCARBON TAP 69KV CKT 1
FDNS	09ALLBPSON		0 13G	G13_002	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.20688	239.1209	ENRONTAP
FDNS	09ALLBPSON		0 13G	G13_002	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.20688	239.1148	HYDROCARBON TAP - SUB 970 69KV CKT 1
FDNS	09ALLBPSON		0 13G	G13_002	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.20688	238.2697	NEB CITY U SYR SUB - SUB 970 69KV CKT 1
FDNS	09ALLBPSON		0 13G	G13_002	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.20688	237.6113	NEB CITY U SYR SUB - SUB 971 69KV CKT 1
FDNS	09ALL		0 13G	G13_002	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.20687	182.1494	ENRONTAP
FDNS	09ALL		0 13G	G13_002	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.20687	182.1489	G13_018T 6

SOLUTION	GROUP	SCENARIO	SEASON	SOURCE	DIRECTION	MONITORED ELEMENT	RATEB		TC%LOADING		CONTINGENCY
							(MVA)	TDF	(% MVA)		
FDNS	09ALL		0 13G	G13_002	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2		43	0.20687	182.1441	HYDROCARBON TAP - SUB 970 69KV CKT 1
FDNS	09ALL		0 13G	G13_002	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2		43	0.20687	181.2945	NEB CITY U SYR SUB - SUB 970 69KV CKT 1
FDNS	09ALL		0 13G	G13_002	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2		43	0.20687	180.8261	NEB CITY U SYR SUB - SUB 971 69KV CKT 1
FDNS	09BPSON		0 13G	G13_002	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2		43	0.20687	221.9915	ENRONTAP
FDNS	9		0 13G	G13_002	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2		43	0.20685	164.3642	ENRONTAP
FDNS	09G13_002BPSON		0 13G	G13_002	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2		43	0.20679	253.8817	ENRONTAP
FDNS	09G13_002		0 13G	G13_002	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2		43	0.20677	169.0013	ENRONTAP
FDNS	09ALLBPSON		0 13G	G13_002	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2		43	0.20601	235.5512	SPP-WERE-49B
FDNS	09ALLBPSON		0 13G	G13_002	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2		43	0.20601	235.509	MARSHALL3 115.00 - SMITTYVILLE N.M. COOP (NEMAHA MARSHALL R.E. 115KV CKT 1
FDNS	09ALLBPSON		0 13G	G13_002	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2		43	0.20601	235.3778	BAILEYVILLE N.M. STATION (NEMAHA MARSHALL R - SMITTYVILLE N.M. COOP (NEMAHA MARSHALL R.E. 115KV CKT 1
FDNS	09ALLBPSON		0 13G	G13_002	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2		43	0.20601	235.3033	BAILEYVILLE N.M. STATION (NEMAHA MARSHALL R - SOUTH SENECA 115KV CKT 1
FDNS	09ALLBPSON		0 13G	G13_002	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2		43	0.20596	239.5779	G08-123N 115.00 - PAULINE 115KV CKT 1
FDNS	09ALL		0 13G	G13_002	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2		43	0.20594	182.9788	G08-123N 115.00 - PAULINE 115KV CKT 1
FDNS	09ALLBPSON		0 13G	G13_002	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2		43	0.20554	242.5081	MOORE - NW68TH & HOLDREGE 345KV CKT 1
FDNS	09ALL		0 13G	G13_002	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2		43	0.20552	185.6642	MOORE - NW68TH & HOLDREGE 345KV CKT 1
FDNS	03ALL		0 13G	G13_002	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2		43	0.20549	184.1877	MOORE - NW68TH & HOLDREGE 345KV CKT 1
FDNS	14ALL		0 13G	G13_002	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2		43	0.20543	158.3154	MOORE - NW68TH & HOLDREGE 345KV CKT 1
FDNS	08ALL		0 13G	G13_002	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2		43	0.20541	160.6688	MOORE - NW68TH & HOLDREGE 345KV CKT 1
FDNS	09ALLBPSON		0 13G	G13_002	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2		43	0.20517	236.4326	GEN645001 1-FORT CALHOUN 1
FDNS	09ALLBPSON		0 13G	G13_002	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2		43	0.20517	227.9028	BASE CASE
FDNS	09ALLBPSON		0 13G	G13_002	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2		43	0.20517	220.6224	GEN560756 1-G13_018_3 0.5750
FDNS	09ALLBPSON		0 13G	G13_002	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2		43	0.20517	220.4277	LN-WAPA2
FDNS	09ALLBPSON		0 13G	G13_002	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2		43	0.20517	219.9022	LN-1094
FDNS	09ALLBPSON		0 13G	G13_002	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2		43	0.20517	219.5301	LN-WAPA4
FDNS	09ALLBPSON		0 13G	G13_002	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2		43	0.20517	216.9703	LN-MALONEY
FDNS	09ALLBPSON		0 13G	G13_002	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2		43	0.20517	216.6179	GEN562029 1-G11_018_3 0.6900
FDNS	09ALLBPSON		0 13G	G13_002	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2		43	0.20517	216.5905	NEB02WAPAB2
FDNS	09ALLBPSON		0 13G	G13_002	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2		43	0.20517	210.6269	GEN560711 1-G10_044_3 0.6900
FDNS	09ALLBPSON		0 13G	G13_002	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2		43	0.20517	209.3218	GEN640022 1-BEATRICE POWER STATION UNIT 1
FDNS	09ALLBPSON		0 13G	G13_002	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2		43	0.20517	209.3214	GEN640023 2-BEATRICE POWER STATION UNIT 2
FDNS	09ALLBPSON		0 13G	G13_002	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2		43	0.20517	206.9995	GEN640024 3-BEATRICE POWER STATION UNIT 3
FDNS	09ALLBPSON		0 13G	G13_002	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2		43	0.20517	204.331	GEN560749 1-G13_002_3 0.6900
FDNS	09ALLBPSON		0 13G	G13_002	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2		43	0.20517	191.8155	GEN640020 2-SHELDON STATION UNIT 2
FDNS	09BPSON		0 13G	G13_002	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2		43	0.20516	204.691	LN-WAPA2
FDNS	09BPSON		0 13G	G13_002	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2		43	0.20516	204.3375	LN-1094
FDNS	09BPSON		0 13G	G13_002	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2		43	0.20516	203.8636	LN-WAPA4
FDNS	09BPSON		0 13G	G13_002	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2		43	0.20516	201.3003	LN-MALONEY
FDNS	09ALL		0 13G	G13_002	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2		43	0.20515	180.1153	GEN645001 1-FORT CALHOUN 1
FDNS	09ALL		0 13G	G13_002	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2		43	0.20515	171.5652	BASE CASE
FDNS	09ALL		0 13G	G13_002	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2		43	0.20515	164.2405	GEN560756 1-G13_018_3 0.5750
FDNS	09ALL		0 13G	G13_002	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2		43	0.20515	164.0118	LN-WAPA2
FDNS	09ALL		0 13G	G13_002	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2		43	0.20515	163.8091	LN-1094
FDNS	09ALL		0 13G	G13_002	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2		43	0.20515	163.16	LN-WAPA4
FDNS	09ALL		0 13G	G13_002	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2		43	0.20515	160.6067	LN-MALONEY
FDNS	09ALL		0 13G	G13_002	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2		43	0.20515	160.0672	GEN562029 1-G11_018_3 0.6900
FDNS	09ALL		0 13G	G13_002	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2		43	0.20515	160.0519	NEB02WAPAB2
FDNS	09ALL		0 13G	G13_002	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2		43	0.20515	153.7606	GEN560711 1-G10_044_3 0.6900
FDNS	09ALL		0 13G	G13_002	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2		43	0.20515	146.9539	GEN560749 1-G13_002_3 0.6900
FDNS	09ALL		0 13G	G13_002	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2		43	0.20515	136.9382	GEN640020 2-SHELDON STATION UNIT 2
FDNS	09BPSON		0 13G	G13_002	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2		43	0.20515	200.8202	NEB02WAPAB2
FDNS	9		0 13G	G13_002	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2		43	0.20514	148.4728	LN-STOCKVILL
FDNS	9		0 13G	G13_002	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2		43	0.20514	147.7665	LN-WAPA2
FDNS	9		0 13G	G13_002	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2		43	0.20514	147.4362	LN-1094
FDNS	9		0 13G	G13_002	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2		43	0.20514	146.9595	LN-WAPA4
FDNS	9		0 13G	G13_002	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2		43	0.20514	144.4199	LN-MALONEY
FDNS	9		0 13G	G13_002	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2		43	0.20514	143.8886	NEB02WAPAB2
FDNS	03ALL		0 13G	G13_002	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2		43	0.20514	162.129	DBL-TGA-MATT
FDNS	03ALL		0 13G	G13_002	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2		43	0.20512	167.2303	DBL-SPRVL-MU
FDNS	03ALL		0 13G	G13_002	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2		43	0.20512	167.0267	DBL-MUL-RENO
FDNS	03ALL		0 13G	G13_002	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2		43	0.20512	162.6887	GEN645001 1-FORT CALHOUN 1
FDNS	03ALL		0 13G	G13_002	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2		43	0.20512	162.0548	DBL-BVR-WWRD
FDNS	03ALL		0 13G	G13_002	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2		43	0.20512	154.4343	BASE CASE
FDNS	03ALL		0 13G	G13_002	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2		43	0.20512	146.411	LN-WAPA4
FDNS	03ALL		0 13G	G13_002	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2		43	0.20512	144.1138	LN-MALONEY
FDNS	03ALL		0 13G	G13_002	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2		43	0.20512	139.176	GEN640019 1-SHELDON STATION UNIT 1
FDNS	03ALL		0 13G	G13_002	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2		43	0.20512	123.514	GEN640020 2-SHELDON STATION UNIT 2
FDNS	3		0 13G	G13_002	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2		43	0.20511	136.3533	LN-1094
FDNS	3		0 13G	G13_002	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2		43	0.20511	136.3103	LN-WAPA2
FDNS	3		0 13G	G13_002	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2		43	0.20511	135.691	LN-WAPA4
FDNS	3		0 13G	G13_002	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2		43	0.20511	133.0495	LN-MALONEY
FDNS	3		0 13G	G13_002	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2		43	0.20511	132.0543	NEB02WAPAB2
FDNS	03ALL		0 13G	G13_002	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2		43	0.20511	164.3742	DBL-WICH-THI
FDNS	03ALL		0 13G	G13_002	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2		43	0.20511	147.1631	LN-WAPA2
FDNS	03ALL		0 13G	G13_002	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2		43	0.20511	147.0607	LN-1094
FDNS	03ALL		0 13G	G13_002	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2		43	0.20511	142.7372	NEB02WAPAB2
FDNS	09ALLBPSON		0 13G	G13_002	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2		43	0.20511	239.7124	KELLY - MADISONCO 230.00 230KV CKT 1
FDNS	03ALL		0 13G	G13_002	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2		43	0.2051	162.3419	STEGALL - WAYSIDE 230KV CKT 1

SOLUTION	GROUP	SCENARIO	SEASON	SOURCE	DIRECTION	MONITORED ELEMENT	RATEB (MVA)	TDF	TC%LOADING (% MVA)	CONTINGENCY
FDNS	09ALL		0 13G	G13_002	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.20509	183.4902	KELLY - MADISONCO 230.00 230KV CKT 1
FDNS	09G13_002BPSON		0 13G	G13_002	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.20508	236.2419	LN-WAPA2
FDNS	09G13_002BPSON		0 13G	G13_002	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.20508	235.8299	LN-1094
FDNS	09G13_002BPSON		0 13G	G13_002	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.20508	235.4037	LN-WAPA4
FDNS	09G13_002BPSON		0 13G	G13_002	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.20508	232.8469	LN-MALONEY
FDNS	09G13_002BPSON		0 13G	G13_002	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.20508	232.1886	NEB02WAPAB2
FDNS	09G13_002		0 13G	G13_002	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.20507	151.4274	LN-WAPA4
FDNS	09G13_002		0 13G	G13_002	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.20507	149.2263	LN-MALONEY
FDNS	14		0 13G	G13_002	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.20506	125.2977	LN-WAPA2
FDNS	14		0 13G	G13_002	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.20506	124.5091	LN-WAPA4
FDNS	14		0 13G	G13_002	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.20506	121.9839	LN-MALONEY
FDNS	09G13_002		0 13G	G13_002	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.20506	152.9661	LN-STOCKVILL
FDNS	09G13_002		0 13G	G13_002	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.20506	152.3227	LN-WAPA2
FDNS	09G13_002		0 13G	G13_002	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.20506	152.191	LN-1094
FDNS	09G13_002		0 13G	G13_002	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.20506	148.4385	NEB02WAPAB2
FDNS	14ALL		0 13G	G13_002	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.20506	143.691	GEN645001 1-FORT CALHOUN 1
FDNS	14ALL		0 13G	G13_002	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.20506	141.787	GEN645012 2-NEBRASKA CITY 2
FDNS	14ALL		0 13G	G13_002	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.20506	134.452	BASE CASE
FDNS	14ALL		0 13G	G13_002	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.20506	127.2829	LN-WAPA2
FDNS	14ALL		0 13G	G13_002	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.20506	126.9266	LN-1094
FDNS	14ALL		0 13G	G13_002	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.20506	126.4923	LN-WAPA4
FDNS	14ALL		0 13G	G13_002	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.20506	123.9658	LN-MALONEY
FDNS	14ALL		0 13G	G13_002	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.20506	123.0399	NEB02WAPAB2
FDNS	14ALL		0 13G	G13_002	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.20506	117.1245	GEN640019 1-SHELDON STATION UNIT 1
FDNS	14ALL		0 13G	G13_002	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.20506	109.8235	GEN640020 2-SHELDON STATION UNIT 2
FDNS	14		0 13G	G13_002	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.20505	124.9549	LN-1094
FDNS	14		0 13G	G13_002	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.20505	121.2326	NEB02WAPAB2
FDNS	08ALL		0 13G	G13_002	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.20504	125.463	LN-MALONEY
FDNS	8		0 13G	G13_002	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.20503	126.6007	LN-WAPA2
FDNS	8		0 13G	G13_002	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.20503	126.2683	LN-1094
FDNS	8		0 13G	G13_002	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.20503	125.8119	LN-WAPA4
FDNS	8		0 13G	G13_002	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.20503	123.2797	LN-MALONEY
FDNS	08ALL		0 13G	G13_002	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.20503	144.8741	GEN645001 1-FORT CALHOUN 1
FDNS	08ALL		0 13G	G13_002	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.20503	136.0912	BASE CASE
FDNS	08ALL		0 13G	G13_002	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.20503	128.7952	LN-WAPA2
FDNS	08ALL		0 13G	G13_002	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.20503	128.4475	LN-1094
FDNS	08ALL		0 13G	G13_002	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.20503	127.9979	LN-WAPA4
FDNS	08ALL		0 13G	G13_002	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.20503	124.5462	NEB02WAPAB2
FDNS	08ALL		0 13G	G13_002	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.20503	120.1357	GEN640019 1-SHELDON STATION UNIT 1
FDNS	08ALL		0 13G	G13_002	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.20503	113.1338	GEN640020 2-SHELDON STATION UNIT 2
FDNS	8		0 13G	G13_002	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.20502	122.5195	NEB02WAPAB2
FDNS	03ALL		0 13G	G13_002	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.20493	161.6752	HOYT - STRANGER CREEK 345KV CKT 1
FDNS	03ALL		0 13G	G13_002	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.20425	161.4662	TAMORA - YORK 115KV CKT 1
FDNS	09ALLBPSON		0 13G	G13_002	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.20365	249.3823	103RD & ROKEBY - WAGENER 345KV CKT 1
FDNS	09ALL		0 13G	G13_002	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.20364	193.4729	103RD & ROKEBY - WAGENER 345KV CKT 1
FDNS	03ALL		0 13G	G13_002	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.20362	184.1057	103RD & ROKEBY - WAGENER 345KV CKT 1
FDNS	14ALL		0 13G	G13_002	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.20355	161.7172	103RD & ROKEBY - WAGENER 345KV CKT 1
FDNS	08ALL		0 13G	G13_002	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.20353	163.6216	103RD & ROKEBY - WAGENER 345KV CKT 1
FDNS	09ALLBPSON		0 13G	G13_002	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.20315	216.4957	COOPER - SUB 3458 NEB CTY 345KV CKT 1
FDNS	09ALL		0 13G	G13_002	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.20313	161.092	COOPER - SUB 3458 NEB CTY 345KV CKT 1
FDNS	09ALLBPSON		0 13G	G13_002	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.20159	237.0714	84TH & LEIGHTON - WAGENER 115KV CKT 1
FDNS	09ALL		0 13G	G13_002	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.20157	182.1048	84TH & LEIGHTON - WAGENER 115KV CKT 1
FDNS	03ALL		0 13G	G13_002	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.20154	166.3277	84TH & LEIGHTON - WAGENER 115KV CKT 1
FDNS	14ALL		0 13G	G13_002	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.20148	147.1466	84TH & LEIGHTON - WAGENER 115KV CKT 1
FDNS	08ALL		0 13G	G13_002	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.20146	148.7677	84TH & LEIGHTON - WAGENER 115KV CKT 1
FDNS	09ALLBPSON		0 13G	G13_002	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.2003	239.3161	WAGENER (T852) 345/115/13.8KV TRANSFORMER CKT 2
FDNS	09ALL		0 13G	G13_002	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.20028	184.8724	WAGENER (T852) 345/115/13.8KV TRANSFORMER CKT 2
FDNS	03ALL		0 13G	G13_002	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.20025	169.4529	WAGENER (T852) 345/115/13.8KV TRANSFORMER CKT 2
FDNS	14ALL		0 13G	G13_002	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.2002	150.5248	WAGENER (T852) 345/115/13.8KV TRANSFORMER CKT 2
FDNS	08ALL		0 13G	G13_002	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.20017	152.142	WAGENER (T852) 345/115/13.8KV TRANSFORMER CKT 2
FDNS	09ALLBPSON		0 13G	G13_002	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.19986	240.3499	WAGENER (T851) 345/115/13.8KV TRANSFORMER CKT 1
FDNS	09ALL		0 13G	G13_002	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.19984	186.0786	WAGENER (T851) 345/115/13.8KV TRANSFORMER CKT 1
FDNS	03ALL		0 13G	G13_002	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.19981	170.8215	WAGENER (T851) 345/115/13.8KV TRANSFORMER CKT 1
FDNS	14ALL		0 13G	G13_002	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.19976	151.9943	WAGENER (T851) 345/115/13.8KV TRANSFORMER CKT 1
FDNS	08ALL		0 13G	G13_002	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.19973	153.6041	WAGENER (T851) 345/115/13.8KV TRANSFORMER CKT 1
FDNS	09ALLBPSON		0 13G	G13_002	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.19361	254.5339	NW68TH & HOLDREGE (T141) 345/115/13.8KV TRANSFORMER CKT 1
FDNS	09ALL		0 13G	G13_002	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.1936	202.6756	NW68TH & HOLDREGE (T141) 345/115/13.8KV TRANSFORMER CKT 1
FDNS	09BPSON		0 13G	G13_002	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.1936	239.9993	NW68TH & HOLDREGE (T141) 345/115/13.8KV TRANSFORMER CKT 1
FDNS	9		0 13G	G13_002	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.19358	187.837	NW68TH & HOLDREGE (T141) 345/115/13.8KV TRANSFORMER CKT 1
FDNS	3		0 13G	G13_002	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.19356	177.844	NW68TH & HOLDREGE (T141) 345/115/13.8KV TRANSFORMER CKT 1
FDNS	03ALL		0 13G	G13_002	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.19356	188.0386	NW68TH & HOLDREGE (T141) 345/115/13.8KV TRANSFORMER CKT 1
FDNS	09G13_002BPSON		0 13G	G13_002	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.19353	269.0065	NW68TH & HOLDREGE (T141) 345/115/13.8KV TRANSFORMER CKT 1
FDNS	09G13_002		0 13G	G13_002	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.19352	192.0415	NW68TH & HOLDREGE (T141) 345/115/13.8KV TRANSFORMER CKT 1
FDNS	14		0 13G	G13_002	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.19351	167.0667	NW68TH & HOLDREGE (T141) 345/115/13.8KV TRANSFORMER CKT 1
FDNS	14ALL		0 13G	G13_002	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.19351	168.9382	NW68TH & HOLDREGE (T141) 345/115/13.8KV TRANSFORMER CKT 1
FDNS	08ALL		0 13G	G13_002	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.19349	170.536	NW68TH & HOLDREGE (T141) 345/115/13.8KV TRANSFORMER CKT 1
FDNS	8		0 13G	G13_002	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.19348	168.3876	NW68TH & HOLDREGE (T141) 345/115/13.8KV TRANSFORMER CKT 1
FDNS	09ALLBPSON		0 13G	G13_002	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.19246	214.4687	ROKEBY - SW7TH & PLEASANT HILL 115KV CKT 1

SOLUTION	GROUP	SCENARIO	SEASON	SOURCE	DIRECTION	MONITORED ELEMENT	RATEB		TC%LOADING		CONTINGENCY
							(MVA)	TDF	(% MVA)		
FDNS	09BPSON		0 13G	G13_002	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2		43	0.19245	199.7952	ROKEBY - SW7TH & PLEASANT HILL 115KV CKT 1
FDNS	09ALL		0 13G	G13_002	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2		43	0.19244	163.0475	ROKEBY - SW7TH & PLEASANT HILL 115KV CKT 1
FDNS	9		0 13G	G13_002	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2		43	0.19243	147.9661	ROKEBY - SW7TH & PLEASANT HILL 115KV CKT 1
FDNS	03ALL		0 13G	G13_002	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2		43	0.19241	147.0891	ROKEBY - SW7TH & PLEASANT HILL 115KV CKT 1
FDNS	09G13_002BPSON		0 13G	G13_002	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2		43	0.19238	228.7155	ROKEBY - SW7TH & PLEASANT HILL 115KV CKT 1
FDNS	09G13_002		0 13G	G13_002	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2		43	0.19236	152.2499	ROKEBY - SW7TH & PLEASANT HILL 115KV CKT 1
FDNS	09ALLBPSON		0 13G	G13_002	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2		43	0.1813	185.4449	20TH & PIONEERS - SW7TH & PLEASANT HILL 115KV CKT 1
FDNS	09BPSON		0 13G	G13_002	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2		43	0.18129	172.217	20TH & PIONEERS - SW7TH & PLEASANT HILL 115KV CKT 1
FDNS	09ALL		0 13G	G13_002	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2		43	0.18128	138.003	20TH & PIONEERS - SW7TH & PLEASANT HILL 115KV CKT 1
FDNS	9		0 13G	G13_002	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2		43	0.18127	124.294	20TH & PIONEERS - SW7TH & PLEASANT HILL 115KV CKT 1
FDNS	03ALL		0 13G	G13_002	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2		43	0.18125	123.0495	20TH & PIONEERS - SW7TH & PLEASANT HILL 115KV CKT 1
FDNS	09G13_002BPSON		0 13G	G13_002	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2		43	0.18122	198.7193	20TH & PIONEERS - SW7TH & PLEASANT HILL 115KV CKT 1
FDNS	09G13_002		0 13G	G13_002	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2		43	0.18121	128.3437	20TH & PIONEERS - SW7TH & PLEASANT HILL 115KV CKT 1
FDNS	14ALL		0 13G	G13_002	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2		43	0.18121	107.0614	20TH & PIONEERS - SW7TH & PLEASANT HILL 115KV CKT 1
FDNS	14		0 13G	G13_002	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2		43	0.1812	105.5263	20TH & PIONEERS - SW7TH & PLEASANT HILL 115KV CKT 1
FDNS	8		0 13G	G13_002	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2		43	0.18118	106.5848	20TH & PIONEERS - SW7TH & PLEASANT HILL 115KV CKT 1
FDNS	08ALL		0 13G	G13_002	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2		43	0.18118	108.3921	20TH & PIONEERS - SW7TH & PLEASANT HILL 115KV CKT 1
FDNS	03ALL		0 13G	G13_002	TO->FROM	BENTON - WICHITA 345KV CKT 1		932	0.04232	107.4489	HUNTERS7 345.00 - WOODRING 345KV CKT 1
FDNS	03ALL		0 13G	G13_002	TO->FROM	BENTON - WICHITA 345KV CKT 1		932	0.04232	105.1622	HUNTERS7 345.00 - VIOLA 7 345.00 345KV CKT 1
FDNS	09ALLBPSON		0 13G	G13_002	TO->FROM	NEB CITY U SYR SUB - SUB 970 69KV CKT 1		47	0.03309	108.9912	MOORE (MOORE T1) 345/115/13.8KV TRANSFORMER CKT 1
FDNS	09G13_002BPSON		0 13G	G13_002	TO->FROM	NEB CITY U SYR SUB - SUB 970 69KV CKT 1		47	0.03306	101.6606	MOORE (MOORE T1) 345/115/13.8KV TRANSFORMER CKT 1
FDNS	06ALL		2 13G	G13_002	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2		43	0.26277	204.9004	SHELDON - SW7TH & PLEASANT HILL 115KV CKT 1
FDNS	06ALL		2 13G	G13_002	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2		43	0.21009	140.1033	FIRTH - SHELDON 115KV CKT 1
FDNS	06ALL		2 13G	G13_002	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2		43	0.20883	141.3899	103RD & ROKEBY - MOORE 345KV CKT 1
FDNS	06ALL		2 13G	G13_002	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2		43	0.20543	158.2734	MOORE - NW68TH & HOLDREGE 345KV CKT 1
FDNS	6		2 13G	G13_002	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2		43	0.20506	124.9118	LN-WAPA2
FDNS	6		2 13G	G13_002	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2		43	0.20506	124.5359	LN-1094
FDNS	6		2 13G	G13_002	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2		43	0.20506	124.1222	LN-WAPA4
FDNS	6		2 13G	G13_002	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2		43	0.20506	121.6021	LN-MALONEY
FDNS	06ALL		2 13G	G13_002	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2		43	0.20506	142.0664	GEN645001 1-FORT CALHOUN 1
FDNS	06ALL		2 13G	G13_002	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2		43	0.20506	140.3239	GEN645012 2-NEBRASKA CITY 2
FDNS	06ALL		2 13G	G13_002	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2		43	0.20506	132.994	BASE CASE
FDNS	06ALL		2 13G	G13_002	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2		43	0.20506	125.7305	LN-WAPA2
FDNS	06ALL		2 13G	G13_002	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2		43	0.20506	125.3625	LN-1094
FDNS	06ALL		2 13G	G13_002	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2		43	0.20506	124.9498	LN-WAPA4
FDNS	06ALL		2 13G	G13_002	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2		43	0.20506	122.4333	LN-MALONEY
FDNS	06ALL		2 13G	G13_002	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2		43	0.20506	121.4637	NEB02WAPAB2
FDNS	06ALL		2 13G	G13_002	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2		43	0.20506	116.5515	GEN640019 1-SHELDON STATION UNIT 1
FDNS	06ALL		2 13G	G13_002	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2		43	0.20506	112.0772	GEN640020 2-SHELDON STATION UNIT 2
FDNS	6		2 13G	G13_002	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2		43	0.20505	120.6511	NEB02WAPAB2
FDNS	06ALL		2 13G	G13_002	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2		43	0.20504	142.2813	STEGALL - STEGALL TRANSFORMER 230KV CKT 1
FDNS	06ALL		2 13G	G13_002	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2		43	0.20504	142.2672	TRF-STEGALL
FNSL	06ALL		2 13G	G13_002	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2		43	0.20504	142.2069	NEB01WAPAB3
FNSL	06ALL		2 13G	G13_002	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2		43	0.20504	142.0729	STEGALL - STEGALL TY 345KV CKT 1
FDNS	06ALL		2 13G	G13_002	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2		43	0.20356	160.686	103RD & ROKEBY - WAGENER 345KV CKT 1
FDNS	06ALL		2 13G	G13_002	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2		43	0.20149	145.7141	84TH & LEIGHTON - WAGENER 115KV CKT 1
FDNS	06ALL		2 13G	G13_002	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2		43	0.2002	149.0924	WAGENER (T852) 345/115/13.8KV TRANSFORMER CKT 2
FDNS	06ALL		2 13G	G13_002	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2		43	0.19976	150.5604	WAGENER (T851) 345/115/13.8KV TRANSFORMER CKT 1
FDNS	6		2 13G	G13_002	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2		43	0.19351	166.9075	NW68TH & HOLDREGE (T141) 345/115/13.8KV TRANSFORMER CKT 1
FDNS	06ALL		2 13G	G13_002	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2		43	0.19351	167.7262	NW68TH & HOLDREGE (T141) 345/115/13.8KV TRANSFORMER CKT 1
FDNS	6		2 13G	G13_002	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2		43	0.18121	105.071	20TH & PIONEERS - SW7TH & PLEASANT HILL 115KV CKT 1
FDNS	06ALL		2 13G	G13_002	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2		43	0.18121	105.7059	20TH & PIONEERS - SW7TH & PLEASANT HILL 115KV CKT 1
FDNS	06ALL		3 13G	G13_002	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2		43	0.26277	204.9136	SHELDON - SW7TH & PLEASANT HILL 115KV CKT 1
FDNS	06ALL		3 13G	G13_002	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2		43	0.21009	140.101	FIRTH - SHELDON 115KV CKT 1
FDNS	06ALL		3 13G	G13_002	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2		43	0.20883	141.4017	103RD & ROKEBY - MOORE 345KV CKT 1
FDNS	06ALL		3 13G	G13_002	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2		43	0.20543	157.8316	MOORE - NW68TH & HOLDREGE 345KV CKT 1
FDNS	6		3 13G	G13_002	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2		43	0.20506	124.9166	LN-WAPA2
FDNS	6		3 13G	G13_002	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2		43	0.20506	124.5406	LN-1094
FDNS	6		3 13G	G13_002	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2		43	0.20506	124.127	LN-WAPA4
FDNS	6		3 13G	G13_002	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2		43	0.20506	121.6069	LN-MALONEY
FDNS	06ALL		3 13G	G13_002	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2		43	0.20506	142.0635	GEN645001 1-FORT CALHOUN 1
FDNS	06ALL		3 13G	G13_002	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2		43	0.20506	140.3215	GEN645012 2-NEBRASKA CITY 2
FDNS	06ALL		3 13G	G13_002	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2		43	0.20506	132.9894	BASE CASE
FDNS	06ALL		3 13G	G13_002	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2		43	0.20506	125.7365	LN-WAPA2
FDNS	06ALL		3 13G	G13_002	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2		43	0.20506	125.3684	LN-1094
FDNS	06ALL		3 13G	G13_002	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2		43	0.20506	124.9557	LN-WAPA4
FDNS	06ALL		3 13G	G13_002	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2		43	0.20506	122.4392	LN-MALONEY
FDNS	06ALL		3 13G	G13_002	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2		43	0.20506	121.4695	NEB02WAPAB2
FDNS	06ALL		3 13G	G13_002	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2		43	0.20506	116.5489	GEN640019 1-SHELDON STATION UNIT 1
FDNS	06ALL		3 13G	G13_002	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2		43	0.20506	112.0834	GEN640020 2-SHELDON STATION UNIT 2
FDNS	6		3 13G	G13_002	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2		43	0.20505	120.6463	NEB02WAPAB2
FDNS	06ALL		3 13G	G13_002	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2		43	0.20504	142.2912	STEGALL - STEGALL TRANSFORMER 230KV CKT 1
FDNS	06ALL		3 13G	G13_002	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2		43	0.20504	142.2771	TRF-STEGALL
FNSL	06ALL		3 13G	G13_002	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2		43	0.20504	142.2169	NEB01WAPAB3
FNSL	06ALL		3 13G	G13_002	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2		43	0.20504	142.0829	STEGALL - STEGALL TY 345KV CKT 1
FDNS	06ALL		3 13G	G13_002	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2		43	0.20356	160.6953	103RD & ROKEBY - WAGENER 345KV CKT 1
FDNS	06ALL		3 13G	G13_002	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2		43	0.20149	145.7117	84TH & LEIGHTON - WAGENER 115KV CKT 1
FDNS	06ALL		3 13G	G13_002	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2		43	0.2002	149.0901	WAGENER (T852) 345/115/13.8KV TRANSFORMER CKT 2

SOLUTION	GROUP	SCENARIO	SEASON	SOURCE	DIRECTION	MONITORED ELEMENT	RATEB		TC%LOADING		CONTINGENCY
							(MVA)	TDF	(% MVA)		
FDNS	06ALL		3 13G	G13_002	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2		43	0.19976	150.558	WAGENER (T851) 345/115/13.8KV TRANSFORMER CKT 1
FDNS	6		3 13G	G13_002	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2		43	0.19351	166.9838	NW68TH & HOLDREGE (T141) 345/115/13.8KV TRANSFORMER CKT 1
FDNS	06ALL		3 13G	G13_002	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2		43	0.19351	167.7246	NW68TH & HOLDREGE (T141) 345/115/13.8KV TRANSFORMER CKT 1
FDNS	6		3 13G	G13_002	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2		43	0.18121	105.0414	20TH & PIONEERS - SW7TH & PLEASANT HILL 115KV CKT 1
FDNS	06ALL		3 13G	G13_002	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2		43	0.18121	105.7035	20TH & PIONEERS - SW7TH & PLEASANT HILL 115KV CKT 1
FDNS	06ALL		4 13G	G13_002	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2		43	0.26277	204.9173	SHELDON - SW7TH & PLEASANT HILL 115KV CKT 1
FDNS	06ALL		4 13G	G13_002	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2		43	0.21009	140.1034	FIRTH - SHELDON 115KV CKT 1
FDNS	06ALL		4 13G	G13_002	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2		43	0.20883	141.4046	I03RD & ROKEBY - MOORE 345KV CKT 1
FDNS	06ALL		4 13G	G13_002	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2		43	0.20543	157.8327	MOORE - NW68TH & HOLDREGE 345KV CKT 1
FDNS	6		4 13G	G13_002	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2		43	0.20506	124.9173	LN-WAPA2
FDNS	6		4 13G	G13_002	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2		43	0.20506	124.5413	LN-1094
FDNS	6		4 13G	G13_002	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2		43	0.20506	124.1278	LN-WAPA4
FDNS	6		4 13G	G13_002	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2		43	0.20506	121.6078	LN-MALONEY
FDNS	06ALL		4 13G	G13_002	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2		43	0.20506	142.0658	GEN645001 1-FORT CALHOUN 1
FDNS	06ALL		4 13G	G13_002	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2		43	0.20506	140.3237	GEN645012 2-NEBRASKA CITY 2
FDNS	06ALL		4 13G	G13_002	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2		43	0.20506	132.9937	BASE CASE
FDNS	06ALL		4 13G	G13_002	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2		43	0.20506	125.7372	LN-WAPA2
FDNS	06ALL		4 13G	G13_002	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2		43	0.20506	125.3692	LN-1094
FDNS	06ALL		4 13G	G13_002	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2		43	0.20506	124.9564	LN-WAPA4
FDNS	06ALL		4 13G	G13_002	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2		43	0.20506	122.44	LN-MALONEY
FDNS	06ALL		4 13G	G13_002	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2		43	0.20506	121.4702	NEB02WAPAB2
FDNS	06ALL		4 13G	G13_002	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2		43	0.20506	116.5511	GEN640019 1-SHELDON STATION UNIT 1
FDNS	06ALL		4 13G	G13_002	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2		43	0.20506	112.0856	GEN640020 2-SHELDON STATION UNIT 2
FDNS	6		4 13G	G13_002	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2		43	0.20505	120.6565	NEB02WAPAB2
FDNS	06ALL		4 13G	G13_002	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2		43	0.20504	142.2937	STEGALL - STEGALL TRANSFORMER 230KV CKT 1
FDNS	06ALL		4 13G	G13_002	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2		43	0.20504	142.2796	TRF-STEGALL
FNLS	06ALL		4 13G	G13_002	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2		43	0.20504	142.2194	NEB01WAPAB3
FNLS	06ALL		4 13G	G13_002	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2		43	0.20504	142.0854	STEGALL - STEGALL TY 345KV CKT 1
FDNS	06ALL		4 13G	G13_002	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2		43	0.20356	160.6972	I03RD & ROKEBY - WAGENER 345KV CKT 1
FDNS	06ALL		4 13G	G13_002	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2		43	0.20149	145.7139	B4TH & LEIGHTON - WAGENER 115KV CKT 1
FDNS	06ALL		4 13G	G13_002	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2		43	0.2002	149.0923	WAGENER (T852) 345/115/13.8KV TRANSFORMER CKT 2
FDNS	06ALL		4 13G	G13_002	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2		43	0.19976	150.5602	WAGENER (T851) 345/115/13.8KV TRANSFORMER CKT 1
FDNS	6		4 13G	G13_002	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2		43	0.19351	166.9189	NW68TH & HOLDREGE (T141) 345/115/13.8KV TRANSFORMER CKT 1
FDNS	06ALL		4 13G	G13_002	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2		43	0.19351	167.7269	NW68TH & HOLDREGE (T141) 345/115/13.8KV TRANSFORMER CKT 1
FDNS	6		4 13G	G13_002	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2		43	0.18121	105.0808	20TH & PIONEERS - SW7TH & PLEASANT HILL 115KV CKT 1
FDNS	06ALL		4 13G	G13_002	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2		43	0.18121	105.7053	20TH & PIONEERS - SW7TH & PLEASANT HILL 115KV CKT 1
FDNS	0		0 13WP	G13_003	FROM->TO	HARPER - MILAN TAP 138KV CKT 1		95.6	0.03315	121.2052	DBL-WICH-THI
FDNS	0		0 18WP	G13_003	FROM->TO	HARPER - MILAN TAP 138KV CKT 1		95.6	0.03283	123.8656	DBL-WICH-THI
FDNS	0		0 18WP	G13_003	TO->FROM	CLEARWATER - MILAN TAP 138KV CKT 1		110	0.03283	100	DBL-WICH-THI
FDNS	0		2 13WP	G13_003	FROM->TO	HARPER - MILAN TAP 138KV CKT 1		95.6	0.03315	121.1673	DBL-WICH-THI
FDNS	0		2 13WP	G13_003	FROM->TO	HARPER - MILAN TAP 138KV CKT 1		95.6	0.03315	121.1414	DBL-WICH-THI
FDNS	0		2 18WP	G13_003	FROM->TO	HARPER - MILAN TAP 138KV CKT 1		95.6	0.03283	123.8327	DBL-WICH-THI
FDNS	0		2 18WP	G13_003	FROM->TO	HARPER - MILAN TAP 138KV CKT 1		95.6	0.03283	123.8046	DBL-WICH-THI
FDNS	0		2 18WP	G13_003	TO->FROM	CLEARWATER - MILAN TAP 138KV CKT 1		110	0.03283	100	DBL-WICH-THI
FDNS	0		2 18WP	G13_003	TO->FROM	CLEARWATER - MILAN TAP 138KV CKT 1		110	0.03283	99.9	DBL-WICH-THI
FDNS	0		3 13WP	G13_003	FROM->TO	HARPER - MILAN TAP 138KV CKT 1		95.6	0.03315	121.1673	DBL-WICH-THI
FDNS	0		3 18WP	G13_003	FROM->TO	HARPER - MILAN TAP 138KV CKT 1		95.6	0.03283	123.8327	DBL-WICH-THI
FDNS	0		3 18WP	G13_003	TO->FROM	CLEARWATER - MILAN TAP 138KV CKT 1		110	0.03283	100	DBL-WICH-THI
FNLS-Blown up	03ALL		0 13G	G13_004		Non-converged Contingency		0	0.05732	-	DBL-THIS-CLR
FNLS-Blown up	00G13_004		2 18WP	G13_004		Non-converged Contingency		0	0.03745	-	ATC_B2_W-8_G
FDNS	09ALL		0 13G	G13_004	TO->FROM	FT RANDAL - G12_005T 230.00 230KV CKT 1		320	1	127.5175	KELLY - MADISONCO 230.00 230KV CKT 1
FDNS	09ALL		0 13G	G13_004	TO->FROM	G12_005T 230.00 - MADISONCO 230.00 230KV CKT 1		320	1	104.9747	KELLY - MADISONCO 230.00 230KV CKT 1
FDNS	09ALL		0 13G	G13_004	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1		320	1	127.4997	FT RANDAL - G12_005T 230.00 230KV CKT 1
FDNS	09ALLBPSON		0 13G	G13_004	TO->FROM	FT RANDAL - G12_005T 230.00 230KV CKT 1		320	1	127.7744	KELLY - MADISONCO 230.00 230KV CKT 1
FDNS	09ALLBPSON		0 13G	G13_004	TO->FROM	G12_005T 230.00 - MADISONCO 230.00 230KV CKT 1		320	1	105.3265	KELLY - MADISONCO 230.00 230KV CKT 1
FDNS	09ALLBPSON		0 13G	G13_004	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1		320	1	127.9705	FT RANDAL - G12_005T 230.00 230KV CKT 1
FDNS	09ALLBPSON		0 13G	G13_004	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1		320	1	103.3944	G12_005T 230.00 - MADISONCO 230.00 230KV CKT 1
FDNS	00G13_004		0 13SP	G13_004	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1		320	0.78466	123.7147	DAK02WAPAB2
FDNS	09ALL		0 13G	G13_004	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1		320	0.78448	109.0804	DAK02WAPAB2
FDNS	09ALLBPSON		0 13G	G13_004	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1		320	0.78447	108.5239	DAK02WAPAB2
FDNS	09G13_004		0 13G	G13_004	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1		320	0.78447	110.8493	DAK02WAPAB2
FDNS	09G13_004BPSON		0 13G	G13_004	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1		320	0.78447	107.5358	DAK02WAPAB2
FDNS	09ALL		0 13G	G13_004	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1		320	0.78423	109.062	FT RANDAL - UTICA JCT 230KV CKT 1
FDNS	09ALLBPSON		0 13G	G13_004	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1		320	0.78422	108.4868	FT RANDAL - UTICA JCT 230KV CKT 1
FDNS	00G13_004		0 13WP	G13_004	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1		320	0.78413	113.6169	DAK02WAPAB2
FDNS	00G13_004		0 18SP	G13_004	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1		320	0.78377	119.0206	DAK02WAPAB2
FDNS	00G13_004		0 18WP	G13_004	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1		320	0.78337	109.6617	DAK02WAPAB2
FDNS	00G13_004		0 23SP	G13_004	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1		320	0.78256	123.3253	DAK02WAPAB2
FDNS	09ALL		0 13G	G13_004	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1		320	0.78177	106.871	FT RANDAL - SIOUX CITY 230KV CKT 1
FDNS	09ALLBPSON		0 13G	G13_004	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1		320	0.78177	106.277	FT RANDAL - SIOUX CITY 230KV CKT 1
FDNS	09ALL		0 13G	G13_004	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1		320	0.78042	100.1172	FT THOMPSON - LAKE PLATT 230KV CKT 1
FDNS	09ALL		0 13G	G13_004	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1		320	0.77718	102.3173	RASMUSN - UTICA JCT 230KV CKT 1
FDNS	09ALLBPSON		0 13G	G13_004	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1		320	0.77718	101.5708	RASMUSN - UTICA JCT 230KV CKT 1
FDNS	09ALL		0 13G	G13_004	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1		320	0.77689	103.8189	FT THOMPSON - GRAND ISLAND 345KV CKT 1
FDNS	09ALLBPSON		0 13G	G13_004	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1		320	0.77688	103.1363	FT THOMPSON - GRAND ISLAND 345KV CKT 1
FDNS	09ALL		0 13G	G13_004	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1		320	0.77619	102.9161	UTICA JCT - VFODNES 230KV CKT 1
FDNS	09ALL		0 13G	G13_004	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1		320	0.77619	102.3421	SIOUX FALLS - VFODNES 230KV CKT 1
FDNS	0										

SOLUTION	GROUP	SCENARIO	SEASON	SOURCE	DIRECTION	MONITORED ELEMENT	RATEB (MVA)	TDF	TC%LOADING (% MVA)	CONTINGENCY
FDNS	09ALLBPSON		0 13G	G13_004	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77618	101.6387	SIoux FALLS - VFODNES 230KV CKT 1
FDNS	00G13_004		0 13SP	G13_004	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77599	117.3088	LN-WAPA6
FDNS	00G13_004		0 13SP	G13_004	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77599	117.3088	NEB001NPPB2
FDNS	09ALL		0 13G	G13_004	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77583	102.5356	SIoux FALLS - SPLIT ROCK 230KV CKT 1
FDNS	09ALLBPSON		0 13G	G13_004	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77582	101.8352	SIoux FALLS - SPLIT ROCK 230KV CKT 1
FDNS	00G13_004		0 13SP	G13_004	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.7757	111.9651	LN-1090
FDNS	09ALL		0 13G	G13_004	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77555	102.0969	RASMUSN - SIOUX CITY 230KV CKT 1
FDNS	09ALLBPSON		0 13G	G13_004	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77554	101.4013	RASMUSN - SIOUX CITY 230KV CKT 1
FDNS	00G13_004		0 13SP	G13_004	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77544	114.6348	ATC_B2_8E2
FDNS	00G13_004		0 13WP	G13_004	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.7754	105.6297	LN-WAPA6
FDNS	00G13_004		0 13WP	G13_004	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.7754	105.6297	NEB001NPPB2
FDNS	00G13_004		0 13SP	G13_004	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77536	114.088	ROCH OPG
FDNS	09ALL		0 13G	G13_004	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.7752	102.2544	ATC_B2_8E2
FDNS	09ALLBPSON		0 13G	G13_004	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77519	101.6027	ATC_B2_8E2
FDNS	09G13_004		0 13G	G13_004	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77519	103.6948	ATC_B2_8E2
FDNS	09G13_004BPSON		0 13G	G13_004	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77519	100.4569	ATC_B2_8E2
FDNS	00G13_004		0 13SP	G13_004	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77518	114.4944	DAK01WAPAB2
FDNS	00G13_004		0 13SP	G13_004	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77506	114.6192	NEB02WAPAB2
FDNS	09ALL		0 13G	G13_004	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77502	100.1016	GAVINS POINT - YANKON JCT 115KV CKT 1
FDNS	00G13_004		0 18SP	G13_004	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77499	113.9238	LN-WAPA6
FDNS	00G13_004		0 18SP	G13_004	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77499	113.9238	NEB001NPPB2
FDNS	00G13_004		0 13WP	G13_004	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77494	104.6915	ATC_B2_8E2
FDNS	09ALL		0 13G	G13_004	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77493	102.2522	DAK01WAPAB2
FDNS	09ALLBPSON		0 13G	G13_004	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77493	101.5781	DAK01WAPAB2
FDNS	09G13_004		0 13G	G13_004	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77493	103.6019	DAK01WAPAB2
FDNS	00G13_004		0 13SP	G13_004	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77492	114.1861	LN-1164
FDNS	09G13_004BPSON		0 13G	G13_004	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77492	100.4679	DAK01WAPAB2
FDNS	09ALL		0 13G	G13_004	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.7749	102.4051	KEYSTONE - SIDNEY 345KV CKT 1
FDNS	09ALLBPSON		0 13G	G13_004	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77489	101.6988	KEYSTONE - SIDNEY 345KV CKT 1
FDNS	09ALL		0 13G	G13_004	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77488	102.5142	HANLON - STORLA 230KV CKT 1
FDNS	09ALL		0 13G	G13_004	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77487	100	ATCHSNT3 345.00 - COOPER 345KV CKT 1
FDNS	09ALLBPSON		0 13G	G13_004	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77487	101.8333	HANLON - STORLA 230KV CKT 1
FDNS	09ALL		0 13G	G13_004	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77481	102.563	NEB02WAPAB2
FDNS	09ALL		0 13G	G13_004	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77481	102.3873	GAVINS POINT - HARTINGTON 115KV CKT 1
FDNS	09ALLBPSON		0 13G	G13_004	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77481	101.8374	NEB02WAPAB2
FDNS	09ALLBPSON		0 13G	G13_004	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77481	101.691	GAVINS POINT - HARTINGTON 115KV CKT 1
FDNS	09G13_004		0 13G	G13_004	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77481	104.5676	NEB02WAPAB2
FDNS	09G13_004BPSON		0 13G	G13_004	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.7748	100.6411	NEB02WAPAB2
FDNS	09ALL		0 13G	G13_004	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77478	102.1205	FT THOMPSON - LETCHER 230KV CKT 1
FDNS	09ALLBPSON		0 13G	G13_004	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77478	101.4414	FT THOMPSON - LETCHER 230KV CKT 1
FDNS	09ALL		0 13G	G13_004	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77467	103.0239	GEN640009 1-COOPER NUCLEAR STATION
FDNS	09ALL		0 13G	G13_004	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77467	102.4965	GEN645012 2-NEBRASKA CITY 2
FDNS	09ALL		0 13G	G13_004	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77467	102.3943	GEN640028 1-COLUMCOGENERATION
FDNS	09ALL		0 13G	G13_004	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77467	102.3833	GEN532751 1-WOLF CREEK GENERATING STATION UNIT 1
FDNS	09ALL		0 13G	G13_004	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77467	102.3677	GEN645011 1-NEBRASKA CITY 1
FDNS	09ALL		0 13G	G13_004	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77467	101.0723	BASE CASE
FDNS	09ALL		0 13G	G13_004	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77467	101.0723	NC1_GEN-NEBRASKA CITY 1
FDNS	09ALL		0 13G	G13_004	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77467	100	GEN640418 1-ELKHORN RIDGE WIND
FDNS	09ALL		0 13G	G13_004	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77467	99.9	GEN652457 1-GARRISON
FDNS	09ALL		0 13G	G13_004	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77467	99.9	GEN652458 2-GARRISON
FDNS	09ALL		0 13G	G13_004	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77467	99.9	GEN652459 3-GARRISON
FDNS	09ALL		0 13G	G13_004	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77467	99.9	GEN659296 1-SDPRAIRWIND1W0.6900
FDNS	09ALLBPSON		0 13G	G13_004	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77466	102.409	GEN640009 1-COOPER NUCLEAR STATION
FDNS	09ALLBPSON		0 13G	G13_004	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77466	101.858	GEN640028 1-COLUMCOGENERATION
FDNS	09ALLBPSON		0 13G	G13_004	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77466	101.8261	GEN645012 2-NEBRASKA CITY 2
FDNS	09ALLBPSON		0 13G	G13_004	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77466	101.694	GEN645011 1-NEBRASKA CITY 1
FDNS	09ALLBPSON		0 13G	G13_004	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77466	101.6829	GEN532751 1-WOLF CREEK GENERATING STATION UNIT 1
FDNS	09ALLBPSON		0 13G	G13_004	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77466	100.3284	BASE CASE
FDNS	09ALLBPSON		0 13G	G13_004	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77466	100.3284	NC1_GEN-NEBRASKA CITY 1
FDNS	00G13_004		0 13WP	G13_004	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77462	104.5845	DAK01WAPAB2
FDNS	00G13_004		0 18WP	G13_004	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77453	102.5847	LN-WAPA6
FDNS	00G13_004		0 18WP	G13_004	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77453	102.5847	NEB001NPPB2
FDNS	00G13_004		0 13WP	G13_004	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77448	104.8101	NEB02WAPAB2
FDNS	09ALL		0 13G	G13_004	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77444	100.0894	FALLOW 3 345.00 - GRIMES 345KV CKT 1
FDNS	00G13_004		0 18SP	G13_004	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77437	110.8613	ATC_B2_8E2_G
FDNS	00G13_004		0 18SP	G13_004	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77436	110.8076	ATC_B2_8E2
FDNS	09ALL		0 13G	G13_004	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77426	102.8744	PETERSBRG.N7115.00 - PETERSBURG 115KV CKT 1
FDNS	09ALL		0 13G	G13_004	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77426	102.8432	ALBION - PETERSBURG 115KV CKT 1
FDNS	09ALLBPSON		0 13G	G13_004	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77425	102.1777	PETERSBRG.N7115.00 - PETERSBURG 115KV CKT 1
FDNS	09ALLBPSON		0 13G	G13_004	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77425	102.1463	ALBION - PETERSBURG 115KV CKT 1
FDNS	00G13_004		0 18SP	G13_004	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77424	110.7026	DAK01WAPAB2
FDNS	00G13_004		0 18SP	G13_004	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77407	111.134	NEB02WAPAB2
FDNS	00G13_004		0 23SP	G13_004	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77396	117.6272	LN-WAPA6
FDNS	00G13_004		0 23SP	G13_004	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77396	117.6272	NEB001NPPB2
FDNS	00G13_004		0 18WP	G13_004	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77382	101.0668	ATC_B2_8E2_G
FDNS	00G13_004		0 18WP	G13_004	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77382	101.0526	ATC_B2_8E2
FDNS	00G13_004		0 18WP	G13_004	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77381	101.2725	DAK01WAPAB2
FDNS	00G13_004		0 18WP	G13_004	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77363	101.6127	NEB02WAPAB2

SOLUTION	GROUP	SCENARIO	SEASON	SOURCE	DIRECTION	MONITORED ELEMENT	RATEB (MVA)	TDF	TC%LOADING (% MVA)	CONTINGENCY
FDNS	00G13_004		0	23SP	G13_004	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77316	114.5286	DAK01WAPAB2
FDNS	09ALL		0	13G	G13_004	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77313	102.148	ALBION - GENOA 115KV CKT 1
FDNS	09ALLBPSON		0	13G	G13_004	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77312	101.3875	ALBION - GENOA 115KV CKT 1
FDNS	00G13_004		0	23SP	G13_004	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77298	114.8749	NEB02WAPAB2
FDNS	09ALL		0	13G	G13_004	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77293	100	COLUMBUS - SCHUYLER 115KV CKT 1
FDNS	09ALL		0	13G	G13_004	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77266	102.8142	G10-51T 230.00 - HOSKINS 230KV CKT 1
FDNS	09ALLBPSON		0	13G	G13_004	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77265	102.0816	G10-51T 230.00 - HOSKINS 230KV CKT 1
FDNS	00G13_004		0	13SP	G13_004	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.76841	111.0833	TRF-KELLY
FDNS	09G13_004		0	13G	G13_004	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.76816	101.041	TRF-KELLY
FDNS	00G13_004		0	13WP	G13_004	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.76784	101.4116	TRF-KELLY
FDNS	00G13_004		0	18SP	G13_004	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.76743	107.7391	TRF-KELLY
FDNS	00G13_004		0	23SP	G13_004	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.76647	111.4295	TRF-KELLY
FDNS	00G13_004		0	13SP	G13_004	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.76577	114.3184	TRF-HOSKINS
FDNS	09G13_004		0	13G	G13_004	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.76543	100.7173	TRF-HOSKINS
FDNS	00G13_004		0	18SP	G13_004	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.76465	110.8047	TRF-HOSKINS
FDNS	00G13_004		0	23SP	G13_004	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.76454	115.6405	TRF-HOSKINS
FDNS	09ALL		0	13G	G13_004	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.75938	100.5991	COLUMEAST - NW68TH & HOLDREGE 345KV CKT 1
FDNS	03ALL		0	13G	G13_004	TO->FROM BENTON - WICHITA 345KV CKT 1	932	0.04064	107.4489	HUNTERS7 345.00 - WOODRING 345KV CKT 1
FDNS	03ALL		0	13G	G13_004	TO->FROM BENTON - WICHITA 345KV CKT 1	932	0.04064	105.1622	HUNTERS7 345.00 - VIOLA 7 345.00 345KV CKT 1
FDNS	09ALL		2	13G	G13_004	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77468	101.1146	MADISONCO 230.00 - S_NORFOLK 230.00 230KV CKT 1
FDNS	09ALL		2	13G	G13_004	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77468	100.9114	S_NORFOLK 345.00 (SNORFOLKT) 345/230/13.8KV TRANSFORMER CKT 1
FDNS	09ALLBPSON		2	13G	G13_004	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77467	100.3015	MADISONCO 230.00 - S_NORFOLK 230.00 230KV CKT 1
FDNS	09ALLBPSON		2	13G	G13_004	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77467	100.0976	S_NORFOLK 345.00 (SNORFOLKT) 345/230/13.8KV TRANSFORMER CKT 1
FNLS-Blown up	03ALL		0	13G	G13_005	Non-converged Contingency	0	0.05732	-	DBL-THIS-CLR
FNLS-Blown up	00G13_005		2	18WP	G13_005	Non-converged Contingency	0	0.03745	-	ATC_B2_W-8_G
FDNS	09ALL		0	13G	G13_005	TO->FROM FT RANDAL - G12_005T 230.00 230KV CKT 1	320	1	127.5175	KELLY - MADISONCO 230.00 230KV CKT 1
FDNS	09ALL		0	13G	G13_005	TO->FROM G12_005T 230.00 - MADISONCO 230.00 230KV CKT 1	320	1	104.9747	KELLY - MADISONCO 230.00 230KV CKT 1
FDNS	09ALL		0	13G	G13_005	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	1	127.4997	FT RANDAL - G12_005T 230.00 230KV CKT 1
FDNS	09ALLBPSON		0	13G	G13_005	TO->FROM FT RANDAL - G12_005T 230.00 230KV CKT 1	320	1	127.7744	KELLY - MADISONCO 230.00 230KV CKT 1
FDNS	09ALLBPSON		0	13G	G13_005	TO->FROM G12_005T 230.00 - MADISONCO 230.00 230KV CKT 1	320	1	105.3265	KELLY - MADISONCO 230.00 230KV CKT 1
FDNS	09ALLBPSON		0	13G	G13_005	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	1	127.9705	FT RANDAL - G12_005T 230.00 230KV CKT 1
FDNS	09ALLBPSON		0	13G	G13_005	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	1	103.3944	G12_005T 230.00 - MADISONCO 230.00 230KV CKT 1
FDNS	00G13_005		0	13SP	G13_005	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.78466	123.7147	DAK02WAPAB2
FDNS	09ALL		0	13G	G13_005	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.78448	109.0804	DAK02WAPAB2
FDNS	09ALLBPSON		0	13G	G13_005	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.78447	108.5239	DAK02WAPAB2
FDNS	09G13_005		0	13G	G13_005	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.78447	110.8493	DAK02WAPAB2
FDNS	09G13_005BPSON		0	13G	G13_005	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.78447	107.5359	DAK02WAPAB2
FDNS	09ALL		0	13G	G13_005	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.78423	109.062	FT RANDAL - UTICA JCT 230KV CKT 1
FDNS	09ALLBPSON		0	13G	G13_005	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.78422	108.4868	FT RANDAL - UTICA JCT 230KV CKT 1
FDNS	00G13_005		0	13WP	G13_005	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.78413	113.6169	DAK02WAPAB2
FDNS	00G13_005		0	18SP	G13_005	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.78377	119.0206	DAK02WAPAB2
FDNS	00G13_005		0	18WP	G13_005	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.78337	109.6617	DAK02WAPAB2
FDNS	00G13_005		0	23SP	G13_005	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.78256	123.3253	DAK02WAPAB2
FDNS	09ALL		0	13G	G13_005	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.78177	106.871	FT RANDAL - SIOUX CITY 230KV CKT 1
FDNS	09ALLBPSON		0	13G	G13_005	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.78177	106.277	FT RANDAL - SIOUX CITY 230KV CKT 1
FDNS	09ALL		0	13G	G13_005	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.78042	100.1172	FT THOMPSON - LAKE PLATT 230KV CKT 1
FDNS	09ALL		0	13G	G13_005	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77718	102.3173	RASMUSN - UTICA JCT 230KV CKT 1
FDNS	09ALLBPSON		0	13G	G13_005	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77718	101.5708	RASMUSN - UTICA JCT 230KV CKT 1
FDNS	09ALL		0	13G	G13_005	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77689	103.8189	FT THOMPSON - GRAND ISLAND 345KV CKT 1
FDNS	09ALLBPSON		0	13G	G13_005	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77688	103.1363	FT THOMPSON - GRAND ISLAND 345KV CKT 1
FDNS	09ALL		0	13G	G13_005	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77619	102.9161	UTICA JCT - VFODNES 230KV CKT 1
FDNS	09ALL		0	13G	G13_005	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77619	102.3421	SIOUX FALLS - VFODNES 230KV CKT 1
FDNS	09ALLBPSON		0	13G	G13_005	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77618	102.2194	UTICA JCT - VFODNES 230KV CKT 1
FDNS	09ALLBPSON		0	13G	G13_005	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77618	101.6387	SIOUX FALLS - VFODNES 230KV CKT 1
FDNS	00G13_005		0	13SP	G13_005	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77599	117.3088	LN-WAPA6
FDNS	00G13_005		0	13SP	G13_005	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77599	117.3088	NEB001NPPB2
FDNS	09ALL		0	13G	G13_005	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77583	102.5356	SIOUX FALLS - SPLIT ROCK 230KV CKT 1
FDNS	09ALLBPSON		0	13G	G13_005	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77582	101.8352	SIOUX FALLS - SPLIT ROCK 230KV CKT 1
FDNS	00G13_005		0	13SP	G13_005	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.7757	111.9651	LN-1090
FDNS	09ALL		0	13G	G13_005	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77555	102.0969	RASMUSN - SIOUX CITY 230KV CKT 1
FDNS	09ALLBPSON		0	13G	G13_005	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77554	101.4013	RASMUSN - SIOUX CITY 230KV CKT 1
FDNS	00G13_005		0	13SP	G13_005	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77544	114.6348	ATC_B2_8E2
FDNS	00G13_005		0	13WP	G13_005	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.7754	105.6297	LN-WAPA6
FDNS	00G13_005		0	13WP	G13_005	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.7754	105.6297	NEB001NPPB2
FDNS	00G13_005		0	13SP	G13_005	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77536	114.088	ROCH OPG
FDNS	09ALL		0	13G	G13_005	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.7752	102.2544	ATC_B2_8E2
FDNS	09ALLBPSON		0	13G	G13_005	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77519	101.6027	ATC_B2_8E2
FDNS	09G13_005		0	13G	G13_005	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77519	103.6948	ATC_B2_8E2
FDNS	09G13_005BPSON		0	13G	G13_005	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77519	100.4566	ATC_B2_8E2
FDNS	00G13_005		0	13SP	G13_005	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77518	114.4944	DAK01WAPAB2
FDNS	00G13_005		0	13SP	G13_005	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77506	114.6192	NEB02WAPAB2
FDNS	09ALL		0	13G	G13_005	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77502	100.1016	GAVINS POINT - YANKON JCT 115KV CKT 1
FDNS	00G13_005		0	18SP	G13_005	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77499	113.9238	LN-WAPA6
FDNS	00G13_005		0	18SP	G13_005	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77499	113.9238	NEB001NPPB2
FDNS	00G13_005		0	13WP	G13_005	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77494	104.6915	ATC_B2_8E2
FDNS	09ALL		0	13G	G13_005	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77493	102.2522	DAK01WAPAB2
FDNS	09ALLBPSON		0	13G	G13_005	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77493	101.5781	DAK01WAPAB2
FDNS	09G13_005		0	13G	G13_005	TO->FROM KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77493	103.6019	DAK01WAPAB2

SOLUTION	GROUP	SCENARIO	SEASON	SOURCE	DIRECTION	MONITORED ELEMENT	RATEB (MVA)	TDF	TC%LOADING (% MVA)	CONTINGENCY
FDNS	00G13_005		0 13SP	G13_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77492	114.1861	LN-1164
FDNS	09G13_005BPSON		0 13G	G13_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77492	100.468	DAK01WAPAB2
FDNS	09ALL		0 13G	G13_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.7749	102.4051	KEYSTONE - SIDNEY 345KV CKT 1
FDNS	09ALLBPSON		0 13G	G13_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77489	101.6988	KEYSTONE - SIDNEY 345KV CKT 1
FDNS	09ALL		0 13G	G13_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77488	102.5142	HANLON - STORLA 230KV CKT 1
FDNS	09ALL		0 13G	G13_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77487	100	ATCHSNT3 345.00 - COOPER 345KV CKT 1
FDNS	09ALLBPSON		0 13G	G13_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77487	101.8333	HANLON - STORLA 230KV CKT 1
FDNS	09ALL		0 13G	G13_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77481	102.563	NEB02WAPAB2
FDNS	09ALL		0 13G	G13_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77481	102.3873	GAVINS POINT - HARTINGTON 115KV CKT 1
FDNS	09ALLBPSON		0 13G	G13_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77481	101.8374	NEB02WAPAB2
FDNS	09ALLBPSON		0 13G	G13_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77481	101.691	GAVINS POINT - HARTINGTON 115KV CKT 1
FDNS	09G13_005		0 13G	G13_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77481	104.5676	NEB02WAPAB2
FDNS	09G13_005BPSON		0 13G	G13_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.7748	100.6411	NEB02WAPAB2
FDNS	09ALL		0 13G	G13_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77478	102.1205	FT THOMPSON - LETCHER 230KV CKT 1
FDNS	09ALLBPSON		0 13G	G13_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77478	101.4414	FT THOMPSON - LETCHER 230KV CKT 1
FDNS	09ALL		0 13G	G13_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77467	103.0239	GEN640009 1-COOPER NUCLEAR STATION
FDNS	09ALL		0 13G	G13_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77467	102.4965	GEN645012 2-NEBRASKA CITY 2
FDNS	09ALL		0 13G	G13_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77467	102.3943	GEN640028 1-COLUMCOGENERATION
FDNS	09ALL		0 13G	G13_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77467	102.3833	GEN532751 1-WOLF CREEK GENERATING STATION UNIT 1
FDNS	09ALL		0 13G	G13_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77467	102.3677	GEN645011 1-NEBRASKA CITY 1
FDNS	09ALL		0 13G	G13_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77467	101.0723	BASE CASE
FDNS	09ALL		0 13G	G13_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77467	101.0723	NC1_GEN-NEBRASKA CITY 1
FDNS	09ALL		0 13G	G13_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77467	100	GEN640418 1-ELKHORN RIDGE WIND
FDNS	09ALL		0 13G	G13_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77467	99.9	GEN652457 1-GARRISON
FDNS	09ALL		0 13G	G13_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77467	99.9	GEN652458 2-GARRISON
FDNS	09ALL		0 13G	G13_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77467	99.9	GEN652459 3-GARRISON
FDNS	09ALL		0 13G	G13_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77467	99.9	GEN659296 1-SDPRAIRWIND1W0.6900
FDNS	09ALLBPSON		0 13G	G13_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77466	102.409	GEN640009 1-COOPER NUCLEAR STATION
FDNS	09ALLBPSON		0 13G	G13_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77466	101.858	GEN640028 1-COLUMCOGENERATION
FDNS	09ALLBPSON		0 13G	G13_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77466	101.8261	GEN645012 2-NEBRASKA CITY 2
FDNS	09ALLBPSON		0 13G	G13_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77466	101.694	GEN645011 1-NEBRASKA CITY 1
FDNS	09ALLBPSON		0 13G	G13_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77466	101.6829	GEN532751 1-WOLF CREEK GENERATING STATION UNIT 1
FDNS	09ALLBPSON		0 13G	G13_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77466	100.3284	BASE CASE
FDNS	09ALLBPSON		0 13G	G13_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77466	100.3284	NC1_GEN-NEBRASKA CITY 1
FDNS	00G13_005		0 13WP	G13_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77462	104.5845	DAK01WAPAB2
FDNS	00G13_005		0 18WP	G13_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77453	102.5847	LN-WAPAG
FDNS	00G13_005		0 18WP	G13_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77453	102.5847	NEB001NPPB2
FDNS	00G13_005		0 13WP	G13_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77448	104.8101	NEB02WAPAB2
FDNS	09ALL		0 13G	G13_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77444	100.0894	FALLOW 3 345.00 - GRIMES 345KV CKT 1
FDNS	00G13_005		0 18SP	G13_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77437	110.8613	ATC_B2_8E2_G
FDNS	00G13_005		0 18SP	G13_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77436	110.8076	ATC_B2_8E2
FDNS	09ALL		0 13G	G13_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77426	102.8744	PETERSBRG.N7115.00 - PETERSBURG 115KV CKT 1
FDNS	09ALL		0 13G	G13_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77426	102.8432	ALBION - PETERSBURG 115KV CKT 1
FDNS	09ALLBPSON		0 13G	G13_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77425	102.1777	PETERSBRG.N7115.00 - PETERSBURG 115KV CKT 1
FDNS	09ALLBPSON		0 13G	G13_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77425	102.1463	ALBION - PETERSBURG 115KV CKT 1
FDNS	00G13_005		0 18SP	G13_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77424	110.7026	DAK01WAPAB2
FDNS	00G13_005		0 18SP	G13_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77407	111.134	NEB02WAPAB2
FDNS	00G13_005		0 23SP	G13_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77396	117.6272	LN-WAPAG
FDNS	00G13_005		0 23SP	G13_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77396	117.6272	NEB001NPPB2
FDNS	00G13_005		0 18WP	G13_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77382	101.0668	ATC_B2_8E2_G
FDNS	00G13_005		0 18WP	G13_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77382	101.0526	ATC_B2_8E2
FDNS	00G13_005		0 18WP	G13_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77381	101.2725	DAK01WAPAB2
FDNS	00G13_005		0 18WP	G13_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77363	101.6127	NEB02WAPAB2
FDNS	00G13_005		0 23SP	G13_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77316	114.5286	DAK01WAPAB2
FDNS	09ALL		0 13G	G13_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77313	102.148	ALBION - GENOA 115KV CKT 1
FDNS	09ALLBPSON		0 13G	G13_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77312	101.3875	ALBION - GENOA 115KV CKT 1
FDNS	00G13_005		0 23SP	G13_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77298	114.8749	NEB02WAPAB2
FDNS	09ALL		0 13G	G13_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77293	100	COLUMBUS - SCHUYLER 115KV CKT 1
FDNS	09ALL		0 13G	G13_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77266	102.8142	G10-51T 230.00 - HOSKINS 230KV CKT 1
FDNS	09ALLBPSON		0 13G	G13_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77265	102.0816	G10-51T 230.00 - HOSKINS 230KV CKT 1
FDNS	00G13_005		0 13SP	G13_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.76841	111.0833	TRF-KELLY
FDNS	09G13_005		0 13G	G13_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.76816	101.041	TRF-KELLY
FDNS	00G13_005		0 13WP	G13_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.76784	101.4116	TRF-KELLY
FDNS	00G13_005		0 18SP	G13_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.76743	107.7391	TRF-KELLY
FDNS	00G13_005		0 23SP	G13_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.76647	111.4295	TRF-KELLY
FDNS	00G13_005		0 13SP	G13_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.76577	114.3184	TRF-HOSKINS
FDNS	09G13_005		0 13G	G13_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.76543	100.7173	TRF-HOSKINS
FDNS	00G13_005		0 18SP	G13_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.76465	110.8047	TRF-HOSKINS
FDNS	00G13_005		0 23SP	G13_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.76454	115.6405	TRF-HOSKINS
FDNS	09ALL		0 13G	G13_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.75938	100.5991	COLUMEAST - NW68TH & HOLDREGE 345KV CKT 1
FDNS	03ALL		0 13G	G13_005	TO->FROM	BENTON - WICHITA 345KV CKT 1	932	0.04064	107.4489	HUNTERS7 345.00 - WOODRING 345KV CKT 1
FDNS	03ALL		0 13G	G13_005	TO->FROM	BENTON - WICHITA 345KV CKT 1	932	0.04064	105.1622	HUNTERS7 345.00 - VIOLA 7 345.00 345KV CKT 1
FDNS	09ALL		2 13G	G13_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77468	101.1146	MADISONCO 230.00 - S_NORFOLK 230.00 230KV CKT 1
FDNS	09ALL		2 13G	G13_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77468	100.9114	S_NORFOLK 345.00 (SNORFOLKT) 345/230/13.8KV TRANSFORMER CKT 1
FDNS	09ALLBPSON		2 13G	G13_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77467	100.3015	MADISONCO 230.00 - S_NORFOLK 230.00 230KV CKT 1
FDNS	09ALLBPSON		2 13G	G13_005	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77467	100.0976	S_NORFOLK 345.00 (SNORFOLKT) 345/230/13.8KV TRANSFORMER CKT 1
FNSL-Blown up	03ALL		0 13G	G13_006		Non-converged Contingency	0	0.05732	-	DBL-THIS-CLR
FNSL-Blown up	00G13_006		2 18WP	G13_006		Non-converged Contingency	0	0.03745	-	ATC_B2_W-8_G

SOLUTION	GROUP	SCENARIO	SEASON	SOURCE	DIRECTION	MONITORED ELEMENT	RATEB (MVA)	TDF	TC%LOADING (% MVA)	CONTINGENCY
FDNS	09ALL		0 13G	G13_006	TO->FROM	FT RANDAL - G12_005T 230.00 230KV CKT 1	320	1	127.5175	KELLY - MADISONCO 230.00 230KV CKT 1
FDNS	09ALL		0 13G	G13_006	TO->FROM	G12_005T 230.00 - MADISONCO 230.00 230KV CKT 1	320	1	104.9747	KELLY - MADISONCO 230.00 230KV CKT 1
FDNS	09ALL		0 13G	G13_006	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	1	127.4997	FT RANDAL - G12_005T 230.00 230KV CKT 1
FDNS	09ALLBPSON		0 13G	G13_006	TO->FROM	FT RANDAL - G12_005T 230.00 230KV CKT 1	320	1	127.7744	KELLY - MADISONCO 230.00 230KV CKT 1
FDNS	09ALLBPSON		0 13G	G13_006	TO->FROM	G12_005T 230.00 - MADISONCO 230.00 230KV CKT 1	320	1	105.3265	KELLY - MADISONCO 230.00 230KV CKT 1
FDNS	09ALLBPSON		0 13G	G13_006	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	1	127.9705	FT RANDAL - G12_005T 230.00 230KV CKT 1
FDNS	09ALLBPSON		0 13G	G13_006	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	1	103.3944	G12_005T 230.00 - MADISONCO 230.00 230KV CKT 1
FDNS	00G13_006		0 13SP	G13_006	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.78466	123.7147	DAK02WAPAB2
FDNS	09ALL		0 13G	G13_006	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.78448	109.0804	DAK02WAPAB2
FDNS	09ALLBPSON		0 13G	G13_006	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.78447	108.5239	DAK02WAPAB2
FDNS	09G13_006		0 13G	G13_006	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.78447	110.8493	DAK02WAPAB2
FDNS	09G13_006BPSON		0 13G	G13_006	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.78447	107.5358	DAK02WAPAB2
FDNS	09ALL		0 13G	G13_006	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.78423	109.062	FT RANDAL - UTICA JCT 230KV CKT 1
FDNS	09ALLBPSON		0 13G	G13_006	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.78422	108.4868	FT RANDAL - UTICA JCT 230KV CKT 1
FDNS	00G13_006		0 13WP	G13_006	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.78413	113.6169	DAK02WAPAB2
FDNS	00G13_006		0 18SP	G13_006	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.78377	119.0206	DAK02WAPAB2
FDNS	00G13_006		0 18WP	G13_006	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.78337	109.6617	DAK02WAPAB2
FDNS	00G13_006		0 23SP	G13_006	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.78256	123.3253	DAK02WAPAB2
FDNS	09ALL		0 13G	G13_006	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.78177	106.871	FT RANDAL - SIOUX CITY 230KV CKT 1
FDNS	09ALLBPSON		0 13G	G13_006	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.78177	106.277	FT RANDAL - SIOUX CITY 230KV CKT 1
FDNS	09ALL		0 13G	G13_006	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.78042	100.1172	FT THOMPSON - LAKE PLATT 230KV CKT 1
FDNS	09ALL		0 13G	G13_006	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77718	102.3173	RASMUSN - UTICA JCT 230KV CKT 1
FDNS	09ALLBPSON		0 13G	G13_006	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77718	101.5708	RASMUSN - UTICA JCT 230KV CKT 1
FDNS	09ALL		0 13G	G13_006	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77689	103.8189	FT THOMPSON - GRAND ISLAND 345KV CKT 1
FDNS	09ALLBPSON		0 13G	G13_006	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77688	103.1363	FT THOMPSON - GRAND ISLAND 345KV CKT 1
FDNS	09ALL		0 13G	G13_006	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77619	102.9161	UTICA JCT - VFODNES 230KV CKT 1
FDNS	09ALL		0 13G	G13_006	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77619	102.3421	SIOUX FALLS - VFODNES 230KV CKT 1
FDNS	09ALLBPSON		0 13G	G13_006	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77618	102.2194	UTICA JCT - VFODNES 230KV CKT 1
FDNS	09ALLBPSON		0 13G	G13_006	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77618	101.6387	SIOUX FALLS - VFODNES 230KV CKT 1
FDNS	00G13_006		0 13SP	G13_006	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77599	117.3088	LN-WAPA6
FDNS	00G13_006		0 13SP	G13_006	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77599	117.3088	NEB001NPPB2
FDNS	09ALL		0 13G	G13_006	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77583	102.5356	SIOUX FALLS - SPLIT ROCK 230KV CKT 1
FDNS	09ALLBPSON		0 13G	G13_006	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77582	101.8352	SIOUX FALLS - SPLIT ROCK 230KV CKT 1
FDNS	00G13_006		0 13SP	G13_006	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.7757	111.9651	LN-1090
FDNS	09ALL		0 13G	G13_006	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77555	102.0969	RASMUSN - SIOUX CITY 230KV CKT 1
FDNS	09ALLBPSON		0 13G	G13_006	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77554	101.4013	RASMUSN - SIOUX CITY 230KV CKT 1
FDNS	00G13_006		0 13SP	G13_006	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77544	114.6348	ATC_B2_8E2
FDNS	00G13_006		0 13WP	G13_006	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.7754	105.6297	LN-WAPA6
FDNS	00G13_006		0 13WP	G13_006	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.7754	105.6297	NEB001NPPB2
FDNS	00G13_006		0 13SP	G13_006	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77536	114.088	ROCH OPG
FDNS	09ALL		0 13G	G13_006	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.7752	102.2544	ATC_B2_8E2
FDNS	09ALLBPSON		0 13G	G13_006	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77519	101.6027	ATC_B2_8E2
FDNS	09G13_006		0 13G	G13_006	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77519	103.6948	ATC_B2_8E2
FDNS	09G13_006BPSON		0 13G	G13_006	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77519	100.4569	ATC_B2_8E2
FDNS	00G13_006		0 13SP	G13_006	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77518	114.4944	DAK01WAPAB2
FDNS	00G13_006		0 13SP	G13_006	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77506	114.6192	NEB02WAPAB2
FDNS	09ALL		0 13G	G13_006	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77502	100.1016	GAVINS POINT - YANKON JCT 115KV CKT 1
FDNS	00G13_006		0 18SP	G13_006	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77499	113.9238	LN-WAPA6
FDNS	00G13_006		0 18SP	G13_006	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77499	113.9238	NEB001NPPB2
FDNS	00G13_006		0 13WP	G13_006	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77494	104.6915	ATC_B2_8E2
FDNS	09ALL		0 13G	G13_006	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77493	102.2522	DAK01WAPAB2
FDNS	09ALLBPSON		0 13G	G13_006	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77493	101.5781	DAK01WAPAB2
FDNS	09G13_006		0 13G	G13_006	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77493	103.6019	DAK01WAPAB2
FDNS	00G13_006		0 13SP	G13_006	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77492	114.1861	LN-1164
FDNS	09G13_006BPSON		0 13G	G13_006	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77492	100.4679	DAK01WAPAB2
FDNS	09ALL		0 13G	G13_006	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.7749	102.4051	KEYSTONE - SIDNEY 345KV CKT 1
FDNS	09ALLBPSON		0 13G	G13_006	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77489	101.6988	KEYSTONE - SIDNEY 345KV CKT 1
FDNS	09ALL		0 13G	G13_006	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77488	102.5142	HANLON - STORLA 230KV CKT 1
FDNS	09ALL		0 13G	G13_006	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77487	100	ATCHSNT3 345.00 - COOPER 345KV CKT 1
FDNS	09ALLBPSON		0 13G	G13_006	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77487	101.8333	HANLON - STORLA 230KV CKT 1
FDNS	09ALL		0 13G	G13_006	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77481	102.563	NEB02WAPAB2
FDNS	09ALL		0 13G	G13_006	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77481	102.3873	GAVINS POINT - HARTINGTON 115KV CKT 1
FDNS	09ALLBPSON		0 13G	G13_006	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77481	101.8374	NEB02WAPAB2
FDNS	09ALLBPSON		0 13G	G13_006	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77481	101.691	GAVINS POINT - HARTINGTON 115KV CKT 1
FDNS	09G13_006		0 13G	G13_006	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77481	104.5676	NEB02WAPAB2
FDNS	09G13_006BPSON		0 13G	G13_006	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.7748	100.6411	NEB02WAPAB2
FDNS	09ALL		0 13G	G13_006	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77478	102.1205	FT THOMPSON - LETCHER 230KV CKT 1
FDNS	09ALLBPSON		0 13G	G13_006	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77478	101.4414	FT THOMPSON - LETCHER 230KV CKT 1
FDNS	09ALL		0 13G	G13_006	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77467	103.0239	GEN640009 1-COOPER NUCLEAR STATION
FDNS	09ALL		0 13G	G13_006	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77467	102.4965	GEN645012 2-NEBRASKA CITY 2
FDNS	09ALL		0 13G	G13_006	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77467	102.3943	GEN640028 1-COLUMBOGENERATION
FDNS	09ALL		0 13G	G13_006	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77467	102.3833	GEN532751 1-WOLF CREEK GENERATING STATION UNIT 1
FDNS	09ALL		0 13G	G13_006	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77467	102.3677	GEN645011 1-NEBRASKA CITY 1
FDNS	09ALL		0 13G	G13_006	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77467	101.0723	BASE CASE
FDNS	09ALL		0 13G	G13_006	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77467	101.0723	NC1_GEN-NEBRASKA CITY 1
FDNS	09ALL		0 13G	G13_006	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77467	100	GEN640418 1-ELKHORN RIDGE WIND
FDNS	09ALL		0 13G	G13_006	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77467	99.9	GEN652457 1-GARRISON
FDNS	09ALL		0 13G	G13_006	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77467	99.9	GEN652458 2-GARRISON

SOLUTION	GROUP	SCENARIO	SEASON	SOURCE	DIRECTION	MONITORED ELEMENT	RATEB (MVA)	TDF	TC%LOADING (% MVA)	CONTINGENCY
FDNS	09ALL		0 13G	G13_006	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77467	99.9	GEN652459 3-GARRISON
FDNS	09ALL		0 13G	G13_006	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77467	99.9	GEN659296 1-SDPRAIRWND1W0.6900
FDNS	09ALLBPSON		0 13G	G13_006	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77466	102.409	GEN640009 1-COOPER NUCLEAR STATION
FDNS	09ALLBPSON		0 13G	G13_006	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77466	101.858	GEN640028 1-COLUMCOGENERATION
FDNS	09ALLBPSON		0 13G	G13_006	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77466	101.8261	GEN645012 2-NEBRASKA CITY 2
FDNS	09ALLBPSON		0 13G	G13_006	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77466	101.694	GEN645011 1-NEBRASKA CITY 1
FDNS	09ALLBPSON		0 13G	G13_006	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77466	101.6829	GEN532751 1-WOLF CREEK GENERATING STATION UNIT 1
FDNS	09ALLBPSON		0 13G	G13_006	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77466	100.3284	BASE CASE
FDNS	09ALLBPSON		0 13G	G13_006	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77466	100.3284	NC1_GEN-NEBRASKA CITY 1
FDNS	00G13_006		0 13WP	G13_006	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77462	104.5845	DAK01WAPAB2
FDNS	00G13_006		0 18WP	G13_006	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77453	102.5847	LN-WAPA6
FDNS	00G13_006		0 18WP	G13_006	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77453	102.5847	NEB001NPPB2
FDNS	00G13_006		0 13WP	G13_006	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77448	104.8101	NEB02WAPAB2
FDNS	09ALL		0 13G	G13_006	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77444	100.0894	FALLOW 3 345.00 - GRIMES 345KV CKT 1
FDNS	00G13_006		0 18SP	G13_006	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77437	110.8613	ATC_B2_8E2_G
FDNS	00G13_006		0 18SP	G13_006	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77436	110.8076	ATC_B2_8E2
FDNS	09ALL		0 13G	G13_006	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77426	102.8744	PETERSBRG.N7115.00 - PETERSBURG 115KV CKT 1
FDNS	09ALL		0 13G	G13_006	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77426	102.8432	ALBION - PETERSBURG 115KV CKT 1
FDNS	09ALLBPSON		0 13G	G13_006	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77425	102.1777	PETERSBRG.N7115.00 - PETERSBURG 115KV CKT 1
FDNS	09ALLBPSON		0 13G	G13_006	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77425	102.1463	ALBION - PETERSBURG 115KV CKT 1
FDNS	00G13_006		0 18SP	G13_006	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77424	110.7026	DAK01WAPAB2
FDNS	00G13_006		0 18SP	G13_006	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77407	111.134	NEB02WAPAB2
FDNS	00G13_006		0 23SP	G13_006	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77396	117.6272	LN-WAPA6
FDNS	00G13_006		0 23SP	G13_006	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77396	117.6272	NEB001NPPB2
FDNS	00G13_006		0 18WP	G13_006	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77382	101.0668	ATC_B2_8E2_G
FDNS	00G13_006		0 18WP	G13_006	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77382	101.0526	ATC_B2_8E2
FDNS	00G13_006		0 18WP	G13_006	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77381	101.2725	DAK01WAPAB2
FDNS	00G13_006		0 18WP	G13_006	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77363	101.6127	NEB02WAPAB2
FDNS	00G13_006		0 23SP	G13_006	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77316	114.5286	DAK01WAPAB2
FDNS	09ALL		0 13G	G13_006	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77313	102.148	ALBION - GENOA 115KV CKT 1
FDNS	09ALLBPSON		0 13G	G13_006	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77312	101.3875	ALBION - GENOA 115KV CKT 1
FDNS	00G13_006		0 23SP	G13_006	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77298	114.8749	NEB02WAPAB2
FDNS	09ALL		0 13G	G13_006	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77293	100	COLUMBUS - SCHUYLER 115KV CKT 1
FDNS	09ALL		0 13G	G13_006	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77266	102.8142	G10-51T 230.00 - HOSKINS 230KV CKT 1
FDNS	09ALLBPSON		0 13G	G13_006	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77265	102.0816	G10-51T 230.00 - HOSKINS 230KV CKT 1
FDNS	00G13_006		0 13SP	G13_006	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.76841	111.0833	TRF-KELLY
FDNS	09G13_006		0 13G	G13_006	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.76816	101.041	TRF-KELLY
FDNS	00G13_006		0 13WP	G13_006	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.76784	101.4116	TRF-KELLY
FDNS	00G13_006		0 18SP	G13_006	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.76743	107.7391	TRF-KELLY
FDNS	00G13_006		0 23SP	G13_006	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.76647	111.4295	TRF-KELLY
FDNS	00G13_006		0 13SP	G13_006	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.76577	114.3184	TRF-HOSKINS
FDNS	09G13_006		0 13G	G13_006	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.76543	100.7173	TRF-HOSKINS
FDNS	00G13_006		0 18SP	G13_006	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.76465	110.8047	TRF-HOSKINS
FDNS	00G13_006		0 23SP	G13_006	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.76454	115.6405	TRF-HOSKINS
FDNS	09ALL		0 13G	G13_006	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.75938	100.5991	COLUMEAST - NW68TH & HOLDREGE 345KV CKT 1
FDNS	03ALL		0 13G	G13_006	TO->FROM	BENTON - WICHITA 345KV CKT 1	932	0.04064	107.4489	HUNTER57 345.00 - WOODRING 345KV CKT 1
FDNS	03ALL		0 13G	G13_006	TO->FROM	BENTON - WICHITA 345KV CKT 1	932	0.04064	105.1622	HUNTER57 345.00 - VIOLA 7 345.00 345KV CKT 1
FDNS	09ALL		2 13G	G13_006	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77468	101.1146	MADISONCO 230.00 - S_NORFOLK 230.00 230KV CKT 1
FDNS	09ALL		2 13G	G13_006	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77468	100.9114	S_NORFOLK 345.00 (SNORFOLKT) 345/230/13.8KV TRANSFORMER CKT 1
FDNS	09ALLBPSON		2 13G	G13_006	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77467	100.3015	MADISONCO 230.00 - S_NORFOLK 230.00 230KV CKT 1
FDNS	09ALLBPSON		2 13G	G13_006	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.77467	100.0976	S_NORFOLK 345.00 (SNORFOLKT) 345/230/13.8KV TRANSFORMER CKT 1
FDNS	06ALL		2 13G	G13_007	FROM->TO	LAWEASOKLUNI	425	0.07085	148.3	BASE CASE
FDNS	6		2 13G	G13_007	FROM->TO	LAWEASOKLUNI	425	0.06956	128.4	BASE CASE
FDNS	06ALL		3 13G	G13_007	FROM->TO	LAWEASOKLUNI	425	0.07079	148.1	BASE CASE
FDNS	6		3 13G	G13_007	FROM->TO	LAWEASOKLUNI	425	0.06952	128.2	BASE CASE
FDNS	06ALL		4 13G	G13_007	FROM->TO	LAWEASOKLUNI	425	0.07079	148.1	BASE CASE
FDNS	6		4 13G	G13_007	FROM->TO	LAWEASOKLUNI	425	0.06951	128.2	BASE CASE
FDNS	09ALLBPSON		0 13G	G13_008	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.13996	294.5695	MOORE (MOORE T1) 345/115/13.8KV TRANSFORMER CKT 1
FDNS	09BPSON		0 13G	G13_008	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.13995	261.3835	MOORE (MOORE T1) 345/115/13.8KV TRANSFORMER CKT 1
FDNS	9		0 13G	G13_008	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.13992	143.9592	MOORE (MOORE T1) 345/115/13.8KV TRANSFORMER CKT 1
FDNS	09G13_008BPSON		0 13G	G13_008	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.13978	321.2527	MOORE (MOORE T1) 345/115/13.8KV TRANSFORMER CKT 1
FDNS	09G13_008		0 13G	G13_008	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.13976	149.8546	MOORE (MOORE T1) 345/115/13.8KV TRANSFORMER CKT 1
FDNS	09ALLBPSON		0 13G	G13_008	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.10798	346.1206	SHELDON - SW7TH & PLEASANT HILL 115KV CKT 1
FDNS	09BPSON		0 13G	G13_008	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.10797	323.0332	SHELDON - SW7TH & PLEASANT HILL 115KV CKT 1
FDNS	09ALL		0 13G	G13_008	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.10796	258.2818	SHELDON - SW7TH & PLEASANT HILL 115KV CKT 1
FDNS	9		0 13G	G13_008	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.10794	234.7203	SHELDON - SW7TH & PLEASANT HILL 115KV CKT 1
FDNS	09G13_008BPSON		0 13G	G13_008	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.10784	367.3603	SHELDON - SW7TH & PLEASANT HILL 115KV CKT 1
FDNS	09G13_008		0 13G	G13_008	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.10781	238.9458	SHELDON - SW7TH & PLEASANT HILL 115KV CKT 1
FDNS	09ALLBPSON		0 13G	G13_008	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.0958	240.596	KNOB HILL - STEELE CITY 115KV CKT 1
FDNS	09BPSON		0 13G	G13_008	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.09579	222.5181	KNOB HILL - STEELE CITY 115KV CKT 1
FDNS	09ALL		0 13G	G13_008	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.09578	179.7569	KNOB HILL - STEELE CITY 115KV CKT 1
FDNS	09G13_008BPSON		0 13G	G13_008	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.09571	252.817	KNOB HILL - STEELE CITY 115KV CKT 1
FDNS	09ALLBPSON		0 13G	G13_008	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.07737	235.5512	SPW-WERE-49B
FDNS	09ALLBPSON		0 13G	G13_008	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.07737	235.509	MARSHALL3 115.00 - SMITTYVILLE N.M. COOP (NEMAHA MARSHALL R.E. 115KV CKT 1
FDNS	09ALLBPSON		0 13G	G13_008	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.07737	235.3778	BAILEYVILLE N.M. STATION (NEMAHA MARSHALL R - SMITTYVILLE N.M. COOP (NEMAHA MARSHALL R.E. 115KV CKT 1
FDNS	09ALLBPSON		0 13G	G13_008	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.07737	235.3033	BAILEYVILLE N.M. STATION (NEMAHA MARSHALL R - SOUTH SENECA 115KV CKT 1
FDNS	09ALLBPSON		0 13G	G13_008	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.07735	239.1308	BEATRICE - STEINAUER 115KV CKT 1

SOLUTION	GROUP	SCENARIO	SEASON	SOURCE	DIRECTION	MONITORED ELEMENT	RATEB (MVA)	TDF	TC%LOADING (% MVA)	CONTINGENCY
FDNS	09ALLBPSON		0 13G	G13_008	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.07735	238.5469	HUMBOLDT - STEINAUER 115KV CKT 1
FDNS	09ALLBPSON		0 13G	G13_008	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.07735	238.4994	LN-1176
FDNS	09ALLBPSON		0 13G	G13_008	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.07735	236.8819	HUMBOLDT (HUMBOLDT T2) 161/115/13.8KV TRANSFORMER CKT 1
FDNS	09BPSON		0 13G	G13_008	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.07734	221.8065	BEATRICE - STEINAUER 115KV CKT 1
FDNS	09BPSON		0 13G	G13_008	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.07734	221.5559	HUMBOLDT - STEINAUER 115KV CKT 1
FDNS	09BPSON		0 13G	G13_008	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.07734	221.3036	LN-1176
FDNS	09BPSON		0 13G	G13_008	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.07734	219.9795	HUMBOLDT (HUMBOLDT T2) 161/115/13.8KV TRANSFORMER CKT 1
FDNS	09G13_008BPSON		0 13G	G13_008	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.07725	251.8766	BEATRICE - STEINAUER 115KV CKT 1
FDNS	09G13_008BPSON		0 13G	G13_008	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.07725	251.6252	HUMBOLDT - STEINAUER 115KV CKT 1
FDNS	09G13_008BPSON		0 13G	G13_008	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.07725	251.2556	LN-1176
FDNS	09G13_008BPSON		0 13G	G13_008	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.07725	249.6538	HUMBOLDT (HUMBOLDT T2) 161/115/13.8KV TRANSFORMER CKT 1
FDNS	09ALLBPSON		0 13G	G13_008	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.07291	239.7699	103RD & ROKEBY - MOORE 345KV CKT 1
FDNS	09ALL		0 13G	G13_008	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.0729	181.5014	103RD & ROKEBY - MOORE 345KV CKT 1
FDNS	09BPSON		0 13G	G13_008	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.0729	221.9739	103RD & ROKEBY - MOORE 345KV CKT 1
FDNS	9		0 13G	G13_008	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.07288	163.1911	103RD & ROKEBY - MOORE 345KV CKT 1
FDNS	09G13_008BPSON		0 13G	G13_008	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.07279	252.9176	103RD & ROKEBY - MOORE 345KV CKT 1
FDNS	09G13_008		0 13G	G13_008	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.07277	166.0508	103RD & ROKEBY - MOORE 345KV CKT 1
FDNS	09ALLBPSON		0 13G	G13_008	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.07276	239.5779	G08-123N 115.00 - PAULINE 115KV CKT 1
FDNS	09BPSON		0 13G	G13_008	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.07275	220.7039	G08-123N 115.00 - PAULINE 115KV CKT 1
FDNS	09ALL		0 13G	G13_008	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.07274	182.9788	G08-123N 115.00 - PAULINE 115KV CKT 1
FDNS	9		0 13G	G13_008	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.07273	163.144	G08-123N 115.00 - PAULINE 115KV CKT 1
FDNS	09G13_008BPSON		0 13G	G13_008	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.07267	249.3452	G08-123N 115.00 - PAULINE 115KV CKT 1
FDNS	09G13_008		0 13G	G13_008	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.07265	166.0717	G08-123N 115.00 - PAULINE 115KV CKT 1
FDNS	09ALLBPSON		0 13G	G13_008	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.07079	242.5081	MOORE - NW68TH & HOLDREGE 345KV CKT 1
FDNS	09ALL		0 13G	G13_008	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.07077	185.6642	MOORE - NW68TH & HOLDREGE 345KV CKT 1
FDNS	09BPSON		0 13G	G13_008	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.07077	228.3077	MOORE - NW68TH & HOLDREGE 345KV CKT 1
FDNS	9		0 13G	G13_008	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.07076	170.9099	MOORE - NW68TH & HOLDREGE 345KV CKT 1
FDNS	09G13_008BPSON		0 13G	G13_008	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.07069	257.1265	MOORE - NW68TH & HOLDREGE 345KV CKT 1
FDNS	09ALLBPSON		0 13G	G13_008	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.07068	239.1213	G13_018T 69.000 - HYDROCARBON TAP 69KV CKT 1
FDNS	09ALLBPSON		0 13G	G13_008	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.07068	239.1209	ENRONTAP
FDNS	09ALLBPSON		0 13G	G13_008	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.07068	239.1148	HYDROCARBON TAP - SUB 970 69KV CKT 1
FDNS	09ALLBPSON		0 13G	G13_008	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.07068	238.2697	NEB CITY U SYR SUB - SUB 970 69KV CKT 1
FDNS	09ALLBPSON		0 13G	G13_008	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.07068	237.6113	NEB CITY U SYR SUB - SUB 971 69KV CKT 1
FDNS	09BPSON		0 13G	G13_008	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.07067	221.9915	ENRONTAP
FDNS	09BPSON		0 13G	G13_008	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.07067	221.9912	G13_018T 69.000 - HYDROCARBON TAP 69KV CKT 1
FDNS	09BPSON		0 13G	G13_008	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.07067	221.9867	HYDROCARBON TAP - SUB 970 69KV CKT 1
FDNS	09BPSON		0 13G	G13_008	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.07067	221.0159	NEB CITY U SYR SUB - SUB 970 69KV CKT 1
FDNS	09BPSON		0 13G	G13_008	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.07067	220.5622	NEB CITY U SYR SUB - SUB 971 69KV CKT 1
FDNS	09G13_008		0 13G	G13_008	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.07067	173.7333	MOORE - NW68TH & HOLDREGE 345KV CKT 1
FDNS	09ALL		0 13G	G13_008	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.07066	182.1494	ENRONTAP
FDNS	09ALL		0 13G	G13_008	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.07066	182.1489	G13_018T 69.000 - HYDROCARBON TAP 69KV CKT 1
FDNS	09ALL		0 13G	G13_008	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.07066	182.1441	HYDROCARBON TAP - SUB 970 69KV CKT 1
FDNS	09ALL		0 13G	G13_008	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.07066	181.2945	NEB CITY U SYR SUB - SUB 970 69KV CKT 1
FDNS	09ALL		0 13G	G13_008	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.07066	180.8261	NEB CITY U SYR SUB - SUB 971 69KV CKT 1
FDNS	9		0 13G	G13_008	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.07065	164.3642	ENRONTAP
FDNS	9		0 13G	G13_008	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.07065	164.3637	G13_018T 69.000 - HYDROCARBON TAP 69KV CKT 1
FDNS	9		0 13G	G13_008	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.07065	164.3589	HYDROCARBON TAP - SUB 970 69KV CKT 1
FDNS	9		0 13G	G13_008	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.07065	163.4615	NEB CITY U SYR SUB - SUB 970 69KV CKT 1
FDNS	9		0 13G	G13_008	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.07065	163.007	NEB CITY U SYR SUB - SUB 971 69KV CKT 1
FDNS	09G13_008BPSON		0 13G	G13_008	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.07058	250.9526	ENRONTAP
FDNS	09G13_008BPSON		0 13G	G13_008	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.07058	250.9523	G13_018T 69.000 - HYDROCARBON TAP 69KV CKT 1
FDNS	09G13_008BPSON		0 13G	G13_008	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.07058	250.9478	HYDROCARBON TAP - SUB 970 69KV CKT 1
FDNS	09G13_008BPSON		0 13G	G13_008	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.07058	249.9958	NEB CITY U SYR SUB - SUB 970 69KV CKT 1
FDNS	09G13_008BPSON		0 13G	G13_008	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.07058	249.5412	NEB CITY U SYR SUB - SUB 971 69KV CKT 1
FDNS	09G13_008		0 13G	G13_008	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.07056	167.1714	ENRONTAP
FDNS	09G13_008		0 13G	G13_008	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.07056	167.1711	G13_018T 69.000 - HYDROCARBON TAP 69KV CKT 1
FDNS	09G13_008		0 13G	G13_008	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.07056	167.1663	HYDROCARBON TAP - SUB 970 69KV CKT 1
FDNS	09G13_008		0 13G	G13_008	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.07056	166.2543	NEB CITY U SYR SUB - SUB 970 69KV CKT 1
FDNS	09G13_008		0 13G	G13_008	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.07056	165.7971	NEB CITY U SYR SUB - SUB 971 69KV CKT 1
FDNS	09ALLBPSON		0 13G	G13_008	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.0697	236.4326	GEN645001 1-FORT CALHOUN 1
FDNS	09ALLBPSON		0 13G	G13_008	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.0697	227.9028	BASE CASE
FDNS	09ALLBPSON		0 13G	G13_008	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.0697	220.6224	GEN560756 1-G13_018_3 0.5750
FDNS	09ALLBPSON		0 13G	G13_008	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.0697	220.4277	LN-WAPA2
FDNS	09ALLBPSON		0 13G	G13_008	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.0697	219.9022	LN-1094
FDNS	09ALLBPSON		0 13G	G13_008	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.0697	219.5301	LN-WAPA4
FDNS	09ALLBPSON		0 13G	G13_008	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.0697	216.9703	LN-MALONEY
FDNS	09ALLBPSON		0 13G	G13_008	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.0697	216.6179	GEN562029 1-G11_018_3 0.6900
FDNS	09ALLBPSON		0 13G	G13_008	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.0697	216.5905	NEB02WAPAB2
FDNS	09ALLBPSON		0 13G	G13_008	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.0697	210.6269	GEN560711 1-G10_044_3 0.6900
FDNS	09ALLBPSON		0 13G	G13_008	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.0697	209.3218	GEN640022 1-BEATRICE POWER STATION UNIT 1
FDNS	09ALLBPSON		0 13G	G13_008	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.0697	209.3214	GEN640023 2-BEATRICE POWER STATION UNIT 2
FDNS	09ALLBPSON		0 13G	G13_008	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.0697	206.9995	GEN640024 3-BEATRICE POWER STATION UNIT 3
FDNS	09ALLBPSON		0 13G	G13_008	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.0697	204.331	GEN560749 1-G13_002_3 0.6900
FDNS	09ALLBPSON		0 13G	G13_008	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.0697	191.8155	GEN640020 2-SHELDON STATION UNIT 2
FDNS	09BPSON		0 13G	G13_008	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.06969	220.7343	GEN645001 1-FORT CALHOUN 1
FDNS	09BPSON		0 13G	G13_008	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.06969	212.1281	BASE CASE
FDNS	09BPSON		0 13G	G13_008	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.06969	204.691	LN-WAPA2
FDNS	09BPSON		0 13G	G13_008	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.06969	204.3375	LN-1094

SOLUTION	GROUP	SCENARIO	SEASON	SOURCE	DIRECTION	MONITORED ELEMENT	RATEB		TC%LOADING		CONTINGENCY
							(MVA)	TDF	(% MVA)		
FDNS	09BPSON		0 13G	G13_008	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CRT 2		43	0.06969	203.8636	LN-WAPA4
FDNS	09BPSON		0 13G	G13_008	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CRT 2		43	0.06969	203.1045	GEN562029 1-G11_018_3 0.6900
FDNS	09BPSON		0 13G	G13_008	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CRT 2		43	0.06969	201.3003	LN-MALONEY
FDNS	09BPSON		0 13G	G13_008	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CRT 2		43	0.06969	200.8202	NEB02WAPAB2
FDNS	09BPSON		0 13G	G13_008	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CRT 2		43	0.06969	198.1552	GEN560711 1-G10_044_3 0.6900
FDNS	09BPSON		0 13G	G13_008	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CRT 2		43	0.06969	193.6881	GEN640022 1-BEATRICE POWER STATION UNIT 1
FDNS	09BPSON		0 13G	G13_008	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CRT 2		43	0.06969	193.6877	GEN640023 2-BEATRICE POWER STATION UNIT 2
FDNS	09BPSON		0 13G	G13_008	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CRT 2		43	0.06969	193.0857	GEN560749 1-G13_002_3 0.6900
FDNS	09BPSON		0 13G	G13_008	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CRT 2		43	0.06969	191.3777	GEN640024 3-BEATRICE POWER STATION UNIT 3
FDNS	09BPSON		0 13G	G13_008	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CRT 2		43	0.06969	179.8797	GEN640020 2-SHELDON STATION UNIT 2
FDNS	09ALL		0 13G	G13_008	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CRT 2		43	0.06968	180.1153	GEN645001 1-FORT CALHOUN 1
FDNS	09ALL		0 13G	G13_008	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CRT 2		43	0.06968	171.5652	BASE CASE
FDNS	09ALL		0 13G	G13_008	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CRT 2		43	0.06968	164.2405	GEN560756 1-G13_018_3 0.5750
FDNS	09ALL		0 13G	G13_008	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CRT 2		43	0.06968	164.0118	LN-WAPA2
FDNS	09ALL		0 13G	G13_008	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CRT 2		43	0.06968	163.8091	LN-1094
FDNS	09ALL		0 13G	G13_008	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CRT 2		43	0.06968	163.16	LN-WAPA4
FDNS	09ALL		0 13G	G13_008	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CRT 2		43	0.06968	160.6067	LN-MALONEY
FDNS	09ALL		0 13G	G13_008	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CRT 2		43	0.06968	160.0672	GEN562029 1-G11_018_3 0.6900
FDNS	09ALL		0 13G	G13_008	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CRT 2		43	0.06968	160.0519	NEB02WAPAB2
FDNS	09ALL		0 13G	G13_008	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CRT 2		43	0.06968	153.7606	GEN560711 1-G10_044_3 0.6900
FDNS	09ALL		0 13G	G13_008	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CRT 2		43	0.06968	146.9539	GEN560749 1-G13_002_3 0.6900
FDNS	09ALL		0 13G	G13_008	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CRT 2		43	0.06968	136.9382	GEN640020 2-SHELDON STATION UNIT 2
FDNS	9		0 13G	G13_008	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CRT 2		43	0.06967	163.9777	GEN645001 1-FORT CALHOUN 1
FDNS	9		0 13G	G13_008	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CRT 2		43	0.06967	155.3322	BASE CASE
FDNS	9		0 13G	G13_008	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CRT 2		43	0.06967	148.4728	LN-STOCKVILL
FDNS	9		0 13G	G13_008	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CRT 2		43	0.06967	147.7665	LN-WAPA2
FDNS	9		0 13G	G13_008	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CRT 2		43	0.06967	147.4362	LN-1094
FDNS	9		0 13G	G13_008	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CRT 2		43	0.06967	146.9595	LN-WAPA4
FDNS	9		0 13G	G13_008	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CRT 2		43	0.06967	146.1905	GEN562029 1-G11_018_3 0.6900
FDNS	9		0 13G	G13_008	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CRT 2		43	0.06967	144.4199	LN-MALONEY
FDNS	9		0 13G	G13_008	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CRT 2		43	0.06967	143.8886	NEB02WAPAB2
FDNS	9		0 13G	G13_008	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CRT 2		43	0.06967	141.0792	GEN560711 1-G10_044_3 0.6900
FDNS	9		0 13G	G13_008	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CRT 2		43	0.06967	135.9302	GEN560749 1-G13_002_3 0.6900
FDNS	9		0 13G	G13_008	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CRT 2		43	0.06967	124.2271	GEN640020 2-SHELDON STATION UNIT 2
FDNS	09ALLBPSON		0 13G	G13_008	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CRT 2		43	0.06966	239.7124	KELLY - MADISONCO 230.00 230KV CRT 1
FDNS	09ALL		0 13G	G13_008	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CRT 2		43	0.06964	183.4902	KELLY - MADISONCO 230.00 230KV CRT 1
FDNS	09BPSON		0 13G	G13_008	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CRT 2		43	0.06964	220.5345	KELLY - MADISONCO 230.00 230KV CRT 1
FDNS	9		0 13G	G13_008	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CRT 2		43	0.06963	163.5575	KELLY - MADISONCO 230.00 230KV CRT 1
FDNS	09G13_008BPSON		0 13G	G13_008	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CRT 2		43	0.06961	249.5735	GEN645001 1-FORT CALHOUN 1
FDNS	09G13_008BPSON		0 13G	G13_008	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CRT 2		43	0.06961	247.8355	GEN645012 2-NEBRASKA CITY 2
FDNS	09G13_008BPSON		0 13G	G13_008	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CRT 2		43	0.06961	240.6942	BASE CASE
FDNS	09G13_008BPSON		0 13G	G13_008	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CRT 2		43	0.06961	233.2902	LN-WAPA2
FDNS	09G13_008BPSON		0 13G	G13_008	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CRT 2		43	0.06961	233.1898	LN-1094
FDNS	09G13_008BPSON		0 13G	G13_008	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CRT 2		43	0.06961	232.4742	LN-WAPA4
FDNS	09G13_008BPSON		0 13G	G13_008	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CRT 2		43	0.06961	229.9226	LN-MALONEY
FDNS	09G13_008BPSON		0 13G	G13_008	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CRT 2		43	0.06961	229.5146	GEN562029 1-G11_018_3 0.6900
FDNS	09G13_008BPSON		0 13G	G13_008	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CRT 2		43	0.06961	226.781	GEN560711 1-G10_044_3 0.6900
FDNS	09G13_008BPSON		0 13G	G13_008	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CRT 2		43	0.06961	223.3277	GEN640019 1-SHELDON STATION UNIT 1
FDNS	09G13_008BPSON		0 13G	G13_008	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CRT 2		43	0.06961	222.3004	GEN640022 1-BEATRICE POWER STATION UNIT 1
FDNS	09G13_008BPSON		0 13G	G13_008	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CRT 2		43	0.06961	222.3	GEN640023 2-BEATRICE POWER STATION UNIT 2
FDNS	09G13_008BPSON		0 13G	G13_008	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CRT 2		43	0.06961	221.6898	GEN560749 1-G13_002_3 0.6900
FDNS	09G13_008BPSON		0 13G	G13_008	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CRT 2		43	0.06961	219.995	GEN640024 3-BEATRICE POWER STATION UNIT 3
FDNS	09G13_008BPSON		0 13G	G13_008	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CRT 2		43	0.06961	200.3762	GEN640020 2-SHELDON STATION UNIT 2
FDNS	09G13_008BPSON		0 13G	G13_008	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CRT 2		43	0.0696	247.8788	NEB01WAPAB3
FDNS	09G13_008BPSON		0 13G	G13_008	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CRT 2		43	0.0696	229.3905	NEB02WAPAB2
FDNS	09G13_008		0 13G	G13_008	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CRT 2		43	0.06959	166.7476	GEN645001 1-FORT CALHOUN 1
FDNS	09G13_008		0 13G	G13_008	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CRT 2		43	0.06959	158.0763	BASE CASE
FDNS	09G13_008		0 13G	G13_008	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CRT 2		43	0.06959	151.217	LN-STOCKVILL
FDNS	09G13_008		0 13G	G13_008	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CRT 2		43	0.06959	150.5134	LN-WAPA2
FDNS	09G13_008		0 13G	G13_008	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CRT 2		43	0.06959	150.1821	LN-1094
FDNS	09G13_008		0 13G	G13_008	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CRT 2		43	0.06959	149.7049	LN-WAPA4
FDNS	09G13_008		0 13G	G13_008	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CRT 2		43	0.06959	147.1644	LN-MALONEY
FDNS	09G13_008		0 13G	G13_008	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CRT 2		43	0.06959	146.7252	GEN562029 1-G11_018_3 0.6900
FDNS	09G13_008		0 13G	G13_008	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CRT 2		43	0.06959	146.631	NEB02WAPAB2
FDNS	09G13_008		0 13G	G13_008	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CRT 2		43	0.06959	143.85	GEN560711 1-G10_044_3 0.6900
FDNS	09G13_008		0 13G	G13_008	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CRT 2		43	0.06959	138.6389	GEN560749 1-G13_002_3 0.6900
FDNS	09G13_008		0 13G	G13_008	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CRT 2		43	0.06959	126.4794	GEN640020 2-SHELDON STATION UNIT 2
FDNS	09G13_008BPSON		0 13G	G13_008	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CRT 2		43	0.06956	249.0965	KELLY - MADISONCO 230.00 230KV CRT 1
FDNS	09G13_008		0 13G	G13_008	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CRT 2		43	0.06954	166.3776	KELLY - MADISONCO 230.00 230KV CRT 1
FDNS	09ALLBPSON		0 13G	G13_008	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CRT 2		43	0.06946	249.3823	103RD & ROKEBY - WAGENER 345KV CRT 1
FDNS	09ALL		0 13G	G13_008	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CRT 2		43	0.06944	193.4729	103RD & ROKEBY - WAGENER 345KV CRT 1
FDNS	09BPSON		0 13G	G13_008	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CRT 2		43	0.06944	234.5556	103RD & ROKEBY - WAGENER 345KV CRT 1
FDNS	9		0 13G	G13_008	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CRT 2		43	0.06942	178.365	103RD & ROKEBY - WAGENER 345KV CRT 1
FDNS	09G13_008BPSON		0 13G	G13_008	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CRT 2		43	0.06937	262.5664	103RD & ROKEBY - WAGENER 345KV CRT 1
FDNS	09G13_008		0 13G	G13_008	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CRT 2		43	0.06935	181.0856	103RD & ROKEBY - WAGENER 345KV CRT 1
FDNS	09ALLBPSON		0 13G	G13_008	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CRT 2		43	0.06861	216.4957	COOPER - SUB 3458 NEB CTY 345KV CRT 1
FDNS	09BPSON		0 13G	G13_008	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CRT 2		43	0.0686	202.1837	COOPER - SUB 3458 NEB CTY 345KV CRT 1
FDNS	09ALL		0 13G	G13_008	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CRT 2		43	0.06859	161.092	COOPER - SUB 3458 NEB CTY 345KV CRT 1

SOLUTION	GROUP	SCENARIO	SEASON	SOURCE	DIRECTION	MONITORED ELEMENT	RATEB (MVA)	TDF	TC%LOADING (% MVA)	CONTINGENCY	
FDNS	9		0	13G	G13_008	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.06858	146.1202	COOPER - SUB 3458 NEB CTY 345KV CKT 1
FDNS	09G13_008BPSON		0	13G	G13_008	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.06855	228.9813	COOPER - SUB 3458 NEB CTY 345KV CKT 1
FDNS	09G13_008		0	13G	G13_008	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.06853	148.8348	COOPER - SUB 3458 NEB CTY 345KV CKT 1
FDNS	09ALLBPSON		0	13G	G13_008	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.06796	237.0714	84TH & LEIGHTON - WAGENER 115KV CKT 1
FDNS	09BPSON		0	13G	G13_008	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.06795	221.9173	84TH & LEIGHTON - WAGENER 115KV CKT 1
FDNS	09ALL		0	13G	G13_008	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.06794	182.1048	84TH & LEIGHTON - WAGENER 115KV CKT 1
FDNS	9		0	13G	G13_008	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.06793	166.5724	84TH & LEIGHTON - WAGENER 115KV CKT 1
FDNS	09G13_008BPSON		0	13G	G13_008	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.06787	249.6684	84TH & LEIGHTON - WAGENER 115KV CKT 1
FDNS	09G13_008		0	13G	G13_008	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.06785	169.2079	84TH & LEIGHTON - WAGENER 115KV CKT 1
FDNS	09ALLBPSON		0	13G	G13_008	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.06735	239.3161	WAGENER (T852) 345/115/13.8KV TRANSFORMER CKT 2
FDNS	09BPSON		0	13G	G13_008	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.06734	224.3901	WAGENER (T852) 345/115/13.8KV TRANSFORMER CKT 2
FDNS	09ALL		0	13G	G13_008	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.06733	184.8724	WAGENER (T852) 345/115/13.8KV TRANSFORMER CKT 2
FDNS	9		0	13G	G13_008	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.06732	169.5521	WAGENER (T852) 345/115/13.8KV TRANSFORMER CKT 2
FDNS	09G13_008BPSON		0	13G	G13_008	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.06726	251.8485	WAGENER (T852) 345/115/13.8KV TRANSFORMER CKT 2
FDNS	09G13_008		0	13G	G13_008	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.06724	172.1637	WAGENER (T852) 345/115/13.8KV TRANSFORMER CKT 2
FDNS	09ALLBPSON		0	13G	G13_008	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.06713	240.3499	WAGENER (T851) 345/115/13.8KV TRANSFORMER CKT 1
FDNS	09ALL		0	13G	G13_008	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.06712	186.0786	WAGENER (T851) 345/115/13.8KV TRANSFORMER CKT 1
FDNS	09BPSON		0	13G	G13_008	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.06712	225.5019	WAGENER (T851) 345/115/13.8KV TRANSFORMER CKT 1
FDNS	9		0	13G	G13_008	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.06711	170.8377	WAGENER (T851) 345/115/13.8KV TRANSFORMER CKT 1
FDNS	09G13_008BPSON		0	13G	G13_008	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.06705	252.8592	WAGENER (T851) 345/115/13.8KV TRANSFORMER CKT 1
FDNS	09G13_008		0	13G	G13_008	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.06703	173.4391	WAGENER (T851) 345/115/13.8KV TRANSFORMER CKT 1
FDNS	09ALLBPSON		0	13G	G13_008	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.06419	254.5339	NW68TH & HOLDREGE (T141) 345/115/13.8KV TRANSFORMER CKT 1
FDNS	09ALL		0	13G	G13_008	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.06417	202.6756	NW68TH & HOLDREGE (T141) 345/115/13.8KV TRANSFORMER CKT 1
FDNS	09BPSON		0	13G	G13_008	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.06417	239.9993	NW68TH & HOLDREGE (T141) 345/115/13.8KV TRANSFORMER CKT 1
FDNS	9		0	13G	G13_008	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.06416	187.837	NW68TH & HOLDREGE (T141) 345/115/13.8KV TRANSFORMER CKT 1
FDNS	09G13_008BPSON		0	13G	G13_008	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.0641	266.2408	NW68TH & HOLDREGE (T141) 345/115/13.8KV TRANSFORMER CKT 1
FDNS	09G13_008		0	13G	G13_008	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.06408	190.3441	NW68TH & HOLDREGE (T141) 345/115/13.8KV TRANSFORMER CKT 1
FDNS	09ALLBPSON		0	13G	G13_008	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.0638	214.4687	ROKEBY - SW7TH & PLEASANT HILL 115KV CKT 1
FDNS	09BPSON		0	13G	G13_008	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.06379	199.7952	ROKEBY - SW7TH & PLEASANT HILL 115KV CKT 1
FDNS	09ALL		0	13G	G13_008	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.06378	163.0475	ROKEBY - SW7TH & PLEASANT HILL 115KV CKT 1
FDNS	9		0	13G	G13_008	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.06377	147.9661	ROKEBY - SW7TH & PLEASANT HILL 115KV CKT 1
FDNS	09G13_008BPSON		0	13G	G13_008	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.06371	225.9589	ROKEBY - SW7TH & PLEASANT HILL 115KV CKT 1
FDNS	09G13_008		0	13G	G13_008	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.06369	150.4723	ROKEBY - SW7TH & PLEASANT HILL 115KV CKT 1
FDNS	09ALLBPSON		0	13G	G13_008	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.0628	220.2773	BEATRICE POWER STATION - SHELDON 115KV CKT 1
FDNS	09BPSON		0	13G	G13_008	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.06279	204.6262	BEATRICE POWER STATION - SHELDON 115KV CKT 1
FDNS	09G13_008BPSON		0	13G	G13_008	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.06271	233.3343	BEATRICE POWER STATION - SHELDON 115KV CKT 1
FDNS	09ALLBPSON		0	13G	G13_008	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.05834	185.4449	20TH & PIONEERS - SW7TH & PLEASANT HILL 115KV CKT 1
FDNS	09BPSON		0	13G	G13_008	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.05834	172.217	20TH & PIONEERS - SW7TH & PLEASANT HILL 115KV CKT 1
FDNS	09ALL		0	13G	G13_008	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.05833	138.003	20TH & PIONEERS - SW7TH & PLEASANT HILL 115KV CKT 1
FDNS	9		0	13G	G13_008	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.05832	124.294	20TH & PIONEERS - SW7TH & PLEASANT HILL 115KV CKT 1
FDNS	09G13_008BPSON		0	13G	G13_008	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.05827	196.0557	20TH & PIONEERS - SW7TH & PLEASANT HILL 115KV CKT 1
FDNS	09G13_008		0	13G	G13_008	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.05825	126.5904	20TH & PIONEERS - SW7TH & PLEASANT HILL 115KV CKT 1
FDNS	09ALL		0	13G	G13_008	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.04944	162.7338	BEATRICE - HARBINE 115KV CKT 1
FDNS	9		0	13G	G13_008	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.04943	148.0065	BEATRICE - HARBINE 115KV CKT 1
FDNS	09G13_008		0	13G	G13_008	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.04935	150.086	BEATRICE - HARBINE 115KV CKT 1
FDNS	09ALLBPSON		0	13G	G13_008	TO->FROM	G13_002T 115.00 - SHELDON 115KV CKT 2	43	0.13996	177.8794	MOORE (MOORE T1) 345/115/13.8KV TRANSFORMER CKT 1
FDNS	09BPSON		0	13G	G13_008	TO->FROM	G13_002T 115.00 - SHELDON 115KV CKT 2	43	0.13995	166.73	MOORE (MOORE T1) 345/115/13.8KV TRANSFORMER CKT 1
FDNS	09G13_008BPSON		0	13G	G13_008	TO->FROM	G13_002T 115.00 - SHELDON 115KV CKT 2	43	0.13978	227.3747	MOORE (MOORE T1) 345/115/13.8KV TRANSFORMER CKT 1
FDNS	09ALLBPSON		0	13G	G13_008	TO->FROM	G13_002T 115.00 - SHELDON 115KV CKT 2	43	0.10798	230.7683	SHELDON - SW7TH & PLEASANT HILL 115KV CKT 1
FDNS	09BPSON		0	13G	G13_008	TO->FROM	G13_002T 115.00 - SHELDON 115KV CKT 2	43	0.10797	229.7195	SHELDON - SW7TH & PLEASANT HILL 115KV CKT 1
FDNS	09ALL		0	13G	G13_008	TO->FROM	G13_002T 115.00 - SHELDON 115KV CKT 2	43	0.10796	145.44	SHELDON - SW7TH & PLEASANT HILL 115KV CKT 1
FDNS	9		0	13G	G13_008	TO->FROM	G13_002T 115.00 - SHELDON 115KV CKT 2	43	0.10794	143.4868	SHELDON - SW7TH & PLEASANT HILL 115KV CKT 1
FDNS	09G13_008BPSON		0	13G	G13_008	TO->FROM	G13_002T 115.00 - SHELDON 115KV CKT 2	43	0.10784	274.394	SHELDON - SW7TH & PLEASANT HILL 115KV CKT 1
FDNS	09G13_008		0	13G	G13_008	TO->FROM	G13_002T 115.00 - SHELDON 115KV CKT 2	43	0.10781	147.3886	SHELDON - SW7TH & PLEASANT HILL 115KV CKT 1
FDNS	09ALLBPSON		0	13G	G13_008	TO->FROM	G13_002T 115.00 - SHELDON 115KV CKT 2	43	0.0958	124.6765	KNOB HILL - STEELE CITY 115KV CKT 1
FDNS	09BPSON		0	13G	G13_008	TO->FROM	G13_002T 115.00 - SHELDON 115KV CKT 2	43	0.09579	128.7968	KNOB HILL - STEELE CITY 115KV CKT 1
FDNS	09G13_008BPSON		0	13G	G13_008	TO->FROM	G13_002T 115.00 - SHELDON 115KV CKT 2	43	0.09571	159.4005	KNOB HILL - STEELE CITY 115KV CKT 1
FDNS	09ALLBPSON		0	13G	G13_008	TO->FROM	G13_002T 115.00 - SHELDON 115KV CKT 2	43	0.07737	119.7928	SPP-WERE-49B
FDNS	09ALLBPSON		0	13G	G13_008	TO->FROM	G13_002T 115.00 - SHELDON 115KV CKT 2	43	0.07737	119.7525	MARSHALL3 115.00 - SMITTYVILLE N.M. COOP (NEMAHA MARSHALL R.E. 115KV CKT 1
FDNS	09ALLBPSON		0	13G	G13_008	TO->FROM	G13_002T 115.00 - SHELDON 115KV CKT 2	43	0.07737	119.6295	BAILEYVILLE N.M. STATION (NEMAHA MARSHALL R - SMITTYVILLE N.M. COOP (NEMAHA MARSHALL R.E. 115KV CKT 1
FDNS	09ALLBPSON		0	13G	G13_008	TO->FROM	G13_002T 115.00 - SHELDON 115KV CKT 2	43	0.07737	119.5603	BAILEYVILLE N.M. STATION (NEMAHA MARSHALL R - SOUTH SENECA 115KV CKT 1
FDNS	09ALLBPSON		0	13G	G13_008	TO->FROM	G13_002T 115.00 - SHELDON 115KV CKT 2	43	0.07735	123.1737	BEATRICE - STEINAUER 115KV CKT 1
FDNS	09ALLBPSON		0	13G	G13_008	TO->FROM	G13_002T 115.00 - SHELDON 115KV CKT 2	43	0.07735	122.6097	HUMBOLDT - STEINAUER 115KV CKT 1
FDNS	09ALLBPSON		0	13G	G13_008	TO->FROM	G13_002T 115.00 - SHELDON 115KV CKT 2	43	0.07735	122.5479	LN-1176
FDNS	09ALLBPSON		0	13G	G13_008	TO->FROM	G13_002T 115.00 - SHELDON 115KV CKT 2	43	0.07735	121.0182	HUMBOLDT (HUMBOLDT T2) 161/115/13.8KV TRANSFORMER CKT 1
FDNS	09BPSON		0	13G	G13_008	TO->FROM	G13_002T 115.00 - SHELDON 115KV CKT 2	43	0.07734	128.0272	BEATRICE - STEINAUER 115KV CKT 1
FDNS	09BPSON		0	13G	G13_008	TO->FROM	G13_002T 115.00 - SHELDON 115KV CKT 2	43	0.07734	127.7869	HUMBOLDT - STEINAUER 115KV CKT 1
FDNS	09BPSON		0	13G	G13_008	TO->FROM	G13_002T 115.00 - SHELDON 115KV CKT 2	43	0.07734	127.5232	LN-1176
FDNS	09BPSON		0	13G	G13_008	TO->FROM	G13_002T 115.00 - SHELDON 115KV CKT 2	43	0.07734	126.2715	HUMBOLDT (HUMBOLDT T2) 161/115/13.8KV TRANSFORMER CKT 1
FDNS	09G13_008BPSON		0	13G	G13_008	TO->FROM	G13_002T 115.00 - SHELDON 115KV CKT 2	43	0.07725	158.4029	BEATRICE - STEINAUER 115KV CKT 1
FDNS	09G13_008BPSON		0	13G	G13_008	TO->FROM	G13_002T 115.00 - SHELDON 115KV CKT 2	43	0.07725	158.1595	HUMBOLDT - STEINAUER 115KV CKT 1
FDNS	09G13_008BPSON		0	13G	G13_008	TO->FROM	G13_002T 115.00 - SHELDON 115KV CKT 2	43	0.07725	157.7793	LN-1176
FDNS	09G13_008BPSON		0	13G	G13_008	TO->FROM	G13_002T 115.00 - SHELDON 115KV CKT 2	43	0.07725	156.2397	HUMBOLDT (HUMBOLDT T2) 161/115/13.8KV TRANSFORMER CKT 1
FDNS	09ALLBPSON		0	13G	G13_008	TO->FROM	G13_002T 115.00 - SHELDON 115KV CKT 2	43	0.07291	124.1108	103RD & ROKEBY - MOORE 345KV CKT 1
FDNS	09BPSON		0	13G	G13_008	TO->FROM	G13_002T 115.00 - SHELDON 115KV CKT 2	43	0.0729	128.4945	103RD & ROKEBY - MOORE 345KV CKT 1
FDNS	09G13_008BPSON		0	13G	G13_008	TO->FROM	G13_002T 115.00 - SHELDON 115KV CKT 2	43	0.07279	159.7577	103RD & ROKEBY - MOORE 345KV CKT 1

SOLUTION	GROUP	SCENARIO	SEASON	SOURCE	DIRECTION	MONITORED ELEMENT	RATEB (MVA)	TDF	TC%LOADING (% MVA)	CONTINGENCY
FDNS	09BPSON		0 13G	G13_008	TO->FROM	G13_002T 115.00 - SHELDON 115KV CKT 2	43	0.07275	126.8969	G08-123N 115.00 - PAULINE 115KV CKT 1
FDNS	09G13_008BPSON		0 13G	G13_008	TO->FROM	G13_002T 115.00 - SHELDON 115KV CKT 2	43	0.07267	155.8833	G08-123N 115.00 - PAULINE 115KV CKT 1
FDNS	09ALLBPSON		0 13G	G13_008	TO->FROM	G13_002T 115.00 - SHELDON 115KV CKT 2	43	0.07079	127.2824	MOORE - NW68TH & HOLDREGE 345KV CKT 1
FDNS	09BPSON		0 13G	G13_008	TO->FROM	G13_002T 115.00 - SHELDON 115KV CKT 2	43	0.07077	135.1566	MOORE - NW68TH & HOLDREGE 345KV CKT 1
FDNS	09G13_008BPSON		0 13G	G13_008	TO->FROM	G13_002T 115.00 - SHELDON 115KV CKT 2	43	0.07069	164.283	MOORE - NW68TH & HOLDREGE 345KV CKT 1
FDNS	09ALLBPSON		0 13G	G13_008	TO->FROM	G13_002T 115.00 - SHELDON 115KV CKT 2	43	0.07068	123.3266	G13_018T 69.000 - HYDROCARBON TAP 69KV CKT 1
FDNS	09ALLBPSON		0 13G	G13_008	TO->FROM	G13_002T 115.00 - SHELDON 115KV CKT 2	43	0.07068	123.3262	ENRRONTAP
FDNS	09ALLBPSON		0 13G	G13_008	TO->FROM	G13_002T 115.00 - SHELDON 115KV CKT 2	43	0.07068	123.3211	HYDROCARBON TAP - SUB 970 69KV CKT 1
FDNS	09ALLBPSON		0 13G	G13_008	TO->FROM	G13_002T 115.00 - SHELDON 115KV CKT 2	43	0.07068	122.503	NEB CITY U SYR SUB - SUB 970 69KV CKT 1
FDNS	09ALLBPSON		0 13G	G13_008	TO->FROM	G13_002T 115.00 - SHELDON 115KV CKT 2	43	0.07068	121.8682	NEB CITY U SYR SUB - SUB 971 69KV CKT 1
FDNS	09BPSON		0 13G	G13_008	TO->FROM	G13_002T 115.00 - SHELDON 115KV CKT 2	43	0.07067	128.3604	ENRRONTAP
FDNS	09BPSON		0 13G	G13_008	TO->FROM	G13_002T 115.00 - SHELDON 115KV CKT 2	43	0.07067	128.36	G13_018T 69.000 - HYDROCARBON TAP 69KV CKT 1
FDNS	09BPSON		0 13G	G13_008	TO->FROM	G13_002T 115.00 - SHELDON 115KV CKT 2	43	0.07067	128.3563	HYDROCARBON TAP - SUB 970 69KV CKT 1
FDNS	09BPSON		0 13G	G13_008	TO->FROM	G13_002T 115.00 - SHELDON 115KV CKT 2	43	0.07067	127.4018	NEB CITY U SYR SUB - SUB 970 69KV CKT 1
FDNS	09BPSON		0 13G	G13_008	TO->FROM	G13_002T 115.00 - SHELDON 115KV CKT 2	43	0.07067	126.9578	NEB CITY U SYR SUB - SUB 971 69KV CKT 1
FDNS	09G13_008BPSON		0 13G	G13_008	TO->FROM	G13_002T 115.00 - SHELDON 115KV CKT 2	43	0.07058	157.6602	ENRRONTAP
FDNS	09G13_008BPSON		0 13G	G13_008	TO->FROM	G13_002T 115.00 - SHELDON 115KV CKT 2	43	0.07058	157.6598	G13_018T 69.000 - HYDROCARBON TAP 69KV CKT 1
FDNS	09G13_008BPSON		0 13G	G13_008	TO->FROM	G13_002T 115.00 - SHELDON 115KV CKT 2	43	0.07058	157.656	HYDROCARBON TAP - SUB 970 69KV CKT 1
FDNS	09G13_008BPSON		0 13G	G13_008	TO->FROM	G13_002T 115.00 - SHELDON 115KV CKT 2	43	0.07058	156.7174	NEB CITY U SYR SUB - SUB 970 69KV CKT 1
FDNS	09G13_008BPSON		0 13G	G13_008	TO->FROM	G13_002T 115.00 - SHELDON 115KV CKT 2	43	0.07058	156.2708	NEB CITY U SYR SUB - SUB 971 69KV CKT 1
FDNS	09ALLBPSON		0 13G	G13_008	TO->FROM	G13_002T 115.00 - SHELDON 115KV CKT 2	43	0.0697	204.3599	GEN560749 1-G13_002_3 0.6900
FDNS	09ALLBPSON		0 13G	G13_008	TO->FROM	G13_002T 115.00 - SHELDON 115KV CKT 2	43	0.0697	120.9797	GEN645001 1-FORT CALHOUN 1
FDNS	09ALLBPSON		0 13G	G13_008	TO->FROM	G13_002T 115.00 - SHELDON 115KV CKT 2	43	0.0697	112.5219	BASE CASE
FDNS	09ALLBPSON		0 13G	G13_008	TO->FROM	G13_002T 115.00 - SHELDON 115KV CKT 2	43	0.0697	105.2652	LN-WAPA2
FDNS	09ALLBPSON		0 13G	G13_008	TO->FROM	G13_002T 115.00 - SHELDON 115KV CKT 2	43	0.0697	104.7561	LN-1094
FDNS	09ALLBPSON		0 13G	G13_008	TO->FROM	G13_002T 115.00 - SHELDON 115KV CKT 2	43	0.0697	104.3854	LN-WAPA4
FDNS	09ALLBPSON		0 13G	G13_008	TO->FROM	G13_002T 115.00 - SHELDON 115KV CKT 2	43	0.0697	101.9022	GEN562029 1-G11_018_3 0.6900
FDNS	09ALLBPSON		0 13G	G13_008	TO->FROM	G13_002T 115.00 - SHELDON 115KV CKT 2	43	0.0697	101.8781	LN-MALONEY
FDNS	09ALLBPSON		0 13G	G13_008	TO->FROM	G13_002T 115.00 - SHELDON 115KV CKT 2	43	0.0697	101.5107	NEB02WAPAB2
FDNS	09BPSON		0 13G	G13_008	TO->FROM	G13_002T 115.00 - SHELDON 115KV CKT 2	43	0.06969	193.1198	GEN560749 1-G13_002_3 0.6900
FDNS	09BPSON		0 13G	G13_008	TO->FROM	G13_002T 115.00 - SHELDON 115KV CKT 2	43	0.06969	127.3882	GEN645001 1-FORT CALHOUN 1
FDNS	09BPSON		0 13G	G13_008	TO->FROM	G13_002T 115.00 - SHELDON 115KV CKT 2	43	0.06969	118.7497	BASE CASE
FDNS	09BPSON		0 13G	G13_008	TO->FROM	G13_002T 115.00 - SHELDON 115KV CKT 2	43	0.06969	111.4418	LN-WAPA2
FDNS	09BPSON		0 13G	G13_008	TO->FROM	G13_002T 115.00 - SHELDON 115KV CKT 2	43	0.06969	111.0933	LN-1094
FDNS	09BPSON		0 13G	G13_008	TO->FROM	G13_002T 115.00 - SHELDON 115KV CKT 2	43	0.06969	110.6343	LN-WAPA4
FDNS	09BPSON		0 13G	G13_008	TO->FROM	G13_002T 115.00 - SHELDON 115KV CKT 2	43	0.06969	110.1482	GEN562029 1-G11_018_3 0.6900
FDNS	09BPSON		0 13G	G13_008	TO->FROM	G13_002T 115.00 - SHELDON 115KV CKT 2	43	0.06969	108.1032	LN-MALONEY
FDNS	09BPSON		0 13G	G13_008	TO->FROM	G13_002T 115.00 - SHELDON 115KV CKT 2	43	0.06969	107.6383	NEB02WAPAB2
FDNS	09BPSON		0 13G	G13_008	TO->FROM	G13_002T 115.00 - SHELDON 115KV CKT 2	43	0.06969	105.4875	GEN560711 1-G10_044_3 0.6900
FDNS	09BPSON		0 13G	G13_008	TO->FROM	G13_002T 115.00 - SHELDON 115KV CKT 2	43	0.06969	101.2788	GEN640022 1-BEATRICE POWER STATION UNIT 1
FDNS	09BPSON		0 13G	G13_008	TO->FROM	G13_002T 115.00 - SHELDON 115KV CKT 2	43	0.06969	101.2784	GEN640023 2-BEATRICE POWER STATION UNIT 2
FDNS	09ALL		0 13G	G13_008	TO->FROM	G13_002T 115.00 - SHELDON 115KV CKT 2	43	0.06968	146.9823	GEN560749 1-G13_002_3 0.6900
FDNS	9		0 13G	G13_008	TO->FROM	G13_002T 115.00 - SHELDON 115KV CKT 2	43	0.06967	135.9865	GEN560749 1-G13_002_3 0.6900
FDNS	09ALLBPSON		0 13G	G13_008	TO->FROM	G13_002T 115.00 - SHELDON 115KV CKT 2	43	0.06966	123.9207	KELLY - MADISONCO 230.00 230KV CKT 1
FDNS	09BPSON		0 13G	G13_008	TO->FROM	G13_002T 115.00 - SHELDON 115KV CKT 2	43	0.06964	126.9908	KELLY - MADISONCO 230.00 230KV CKT 1
FDNS	09G13_008BPSON		0 13G	G13_008	TO->FROM	G13_002T 115.00 - SHELDON 115KV CKT 2	43	0.06961	221.7185	GEN560749 1-G13_002_3 0.6900
FDNS	09G13_008BPSON		0 13G	G13_008	TO->FROM	G13_002T 115.00 - SHELDON 115KV CKT 2	43	0.06961	156.57	GEN645001 1-FORT CALHOUN 1
FDNS	09G13_008BPSON		0 13G	G13_008	TO->FROM	G13_002T 115.00 - SHELDON 115KV CKT 2	43	0.06961	154.6615	GEN645012 2-NEBRASKA CITY 2
FDNS	09G13_008BPSON		0 13G	G13_008	TO->FROM	G13_002T 115.00 - SHELDON 115KV CKT 2	43	0.06961	147.6155	BASE CASE
FDNS	09G13_008BPSON		0 13G	G13_008	TO->FROM	G13_002T 115.00 - SHELDON 115KV CKT 2	43	0.06961	140.3479	LN-WAPA2
FDNS	09G13_008BPSON		0 13G	G13_008	TO->FROM	G13_002T 115.00 - SHELDON 115KV CKT 2	43	0.06961	140.2626	LN-1094
FDNS	09G13_008BPSON		0 13G	G13_008	TO->FROM	G13_002T 115.00 - SHELDON 115KV CKT 2	43	0.06961	139.5542	LN-WAPA4
FDNS	09G13_008BPSON		0 13G	G13_008	TO->FROM	G13_002T 115.00 - SHELDON 115KV CKT 2	43	0.06961	137.0365	LN-MALONEY
FDNS	09G13_008BPSON		0 13G	G13_008	TO->FROM	G13_002T 115.00 - SHELDON 115KV CKT 2	43	0.06961	136.866	GEN562029 1-G11_018_3 0.6900
FDNS	09G13_008BPSON		0 13G	G13_008	TO->FROM	G13_002T 115.00 - SHELDON 115KV CKT 2	43	0.06961	134.28	GEN560711 1-G10_044_3 0.6900
FDNS	09G13_008BPSON		0 13G	G13_008	TO->FROM	G13_002T 115.00 - SHELDON 115KV CKT 2	43	0.06961	129.9998	GEN640022 1-BEATRICE POWER STATION UNIT 1
FDNS	09G13_008BPSON		0 13G	G13_008	TO->FROM	G13_002T 115.00 - SHELDON 115KV CKT 2	43	0.06961	129.9994	GEN640023 2-BEATRICE POWER STATION UNIT 2
FDNS	09G13_008BPSON		0 13G	G13_008	TO->FROM	G13_002T 115.00 - SHELDON 115KV CKT 2	43	0.06961	129.697	GEN640019 1-SHELDON STATION UNIT 1
FDNS	09G13_008BPSON		0 13G	G13_008	TO->FROM	G13_002T 115.00 - SHELDON 115KV CKT 2	43	0.06961	127.8065	GEN640024 3-BEATRICE POWER STATION UNIT 3
FDNS	09G13_008BPSON		0 13G	G13_008	TO->FROM	G13_002T 115.00 - SHELDON 115KV CKT 2	43	0.06961	106.9965	GEN640020 2-SHELDON STATION UNIT 2
FDNS	09G13_008BPSON		0 13G	G13_008	TO->FROM	G13_002T 115.00 - SHELDON 115KV CKT 2	43	0.0696	154.6974	NEB01WAPAB3
FDNS	09G13_008BPSON		0 13G	G13_008	TO->FROM	G13_002T 115.00 - SHELDON 115KV CKT 2	43	0.0696	136.5162	NEB02WAPAB2
FDNS	09G13_008		0 13G	G13_008	TO->FROM	G13_002T 115.00 - SHELDON 115KV CKT 2	43	0.06959	138.6965	GEN560749 1-G13_002_3 0.6900
FDNS	09G13_008BPSON		0 13G	G13_008	TO->FROM	G13_002T 115.00 - SHELDON 115KV CKT 2	43	0.06956	155.8715	KELLY - MADISONCO 230.00 230KV CKT 1
FDNS	09ALLBPSON		0 13G	G13_008	TO->FROM	G13_002T 115.00 - SHELDON 115KV CKT 2	43	0.06946	134.4593	103RD & ROKEBY - WAGENER 345KV CKT 1
FDNS	09BPSON		0 13G	G13_008	TO->FROM	G13_002T 115.00 - SHELDON 115KV CKT 2	43	0.06944	141.6622	103RD & ROKEBY - WAGENER 345KV CKT 1
FDNS	09G13_008BPSON		0 13G	G13_008	TO->FROM	G13_002T 115.00 - SHELDON 115KV CKT 2	43	0.06937	169.9653	103RD & ROKEBY - WAGENER 345KV CKT 1
FDNS	09ALLBPSON		0 13G	G13_008	TO->FROM	G13_002T 115.00 - SHELDON 115KV CKT 2	43	0.06861	101.3441	COOPER - SUB 3458 NEB CTY 345KV CKT 1
FDNS	09BPSON		0 13G	G13_008	TO->FROM	G13_002T 115.00 - SHELDON 115KV CKT 2	43	0.0686	109.0209	COOPER - SUB 3458 NEB CTY 345KV CKT 1
FDNS	09G13_008BPSON		0 13G	G13_008	TO->FROM	G13_002T 115.00 - SHELDON 115KV CKT 2	43	0.06855	136.1102	COOPER - SUB 3458 NEB CTY 345KV CKT 1
FDNS	09ALLBPSON		0 13G	G13_008	TO->FROM	G13_002T 115.00 - SHELDON 115KV CKT 2	43	0.06796	122.1059	84TH & LEIGHTON - WAGENER 115KV CKT 1
FDNS	09BPSON		0 13G	G13_008	TO->FROM	G13_002T 115.00 - SHELDON 115KV CKT 2	43	0.06795	128.9639	84TH & LEIGHTON - WAGENER 115KV CKT 1
FDNS	09G13_008BPSON		0 13G	G13_008	TO->FROM	G13_002T 115.00 - SHELDON 115KV CKT 2	43	0.06787	156.9974	84TH & LEIGHTON - WAGENER 115KV CKT 1
FDNS	09ALLBPSON		0 13G	G13_008	TO->FROM	G13_002T 115.00 - SHELDON 115KV CKT 2	43	0.06735	124.3294	WAGENER (T852) 345/115/13.8KV TRANSFORMER CKT 2
FDNS	09BPSON		0 13G	G13_008	TO->FROM	G13_002T 115.00 - SHELDON 115KV CKT 2	43	0.06734	131.4032	WAGENER (T852) 345/115/13.8KV TRANSFORMER CKT 2
FDNS	09G13_008BPSON		0 13G	G13_008	TO->FROM	G13_002T 115.00 - SHELDON 115KV CKT 2	43	0.06726	159.1607	WAGENER (T852) 345/115/13.8KV TRANSFORMER CKT 2
FDNS	09ALLBPSON		0 13G	G13_008	TO->FROM	G13_002T 115.00 - SHELDON 115KV CKT 2	43	0.06713	125.4046	WAGENER (T851) 345/115/13.8KV TRANSFORMER CKT 1
FDNS	09BPSON		0 13G	G13_008	TO->FROM	G13_002T 115.00 - SHELDON 115KV CKT 2	43	0.06712	132.556	WAGENER (T851) 345/115/13.8KV TRANSFORMER CKT 1

SOLUTION	GROUP	SCENARIO	SEASON	SOURCE	DIRECTION	MONITORED ELEMENT	RATEB (MVA)	TDF	TC%LOADING (% MVA)	CONTINGENCY
FDNS	09G13_008BPSON		0 13G	G13_008	TO->FROM	G13_002T 115.00 - SHELDON 115KV CKT 2	43	0.06705	160.2115	WAGENER (T851) 345/115/13.8KV TRANSFORMER CKT 1
FDNS	09ALLBPSON		0 13G	G13_008	TO->FROM	G13_002T 115.00 - SHELDON 115KV CKT 2	43	0.06419	140.0207	NW68TH & HOLDREGE (T141) 345/115/13.8KV TRANSFORMER CKT 1
FDNS	09BPSON		0 13G	G13_008	TO->FROM	G13_002T 115.00 - SHELDON 115KV CKT 2	43	0.06417	147.544	NW68TH & HOLDREGE (T141) 345/115/13.8KV TRANSFORMER CKT 1
FDNS	9		0 13G	G13_008	TO->FROM	G13_002T 115.00 - SHELDON 115KV CKT 2	43	0.06416	100.3761	NW68TH & HOLDREGE (T141) 345/115/13.8KV TRANSFORMER CKT 1
FDNS	09G13_008BPSON		0 13G	G13_008	TO->FROM	G13_002T 115.00 - SHELDON 115KV CKT 2	43	0.0641	174.0634	NW68TH & HOLDREGE (T141) 345/115/13.8KV TRANSFORMER CKT 1
FDNS	09G13_008		0 13G	G13_008	TO->FROM	G13_002T 115.00 - SHELDON 115KV CKT 2	43	0.06408	102.4107	NW68TH & HOLDREGE (T141) 345/115/13.8KV TRANSFORMER CKT 1
FDNS	09BPSON		0 13G	G13_008	TO->FROM	G13_002T 115.00 - SHELDON 115KV CKT 2	43	0.06379	106.6787	ROKEBY - SW7TH & PLEASANT HILL 115KV CKT 1
FDNS	09G13_008BPSON		0 13G	G13_008	TO->FROM	G13_002T 115.00 - SHELDON 115KV CKT 2	43	0.06371	133.1324	ROKEBY - SW7TH & PLEASANT HILL 115KV CKT 1
FDNS	09ALLBPSON		0 13G	G13_008	TO->FROM	G13_002T 115.00 - SHELDON 115KV CKT 2	43	0.0628	103.5917	BEATRICE POWER STATION - SHELDON 115KV CKT 1
FDNS	09BPSON		0 13G	G13_008	TO->FROM	G13_002T 115.00 - SHELDON 115KV CKT 2	43	0.06279	110.4425	BEATRICE POWER STATION - SHELDON 115KV CKT 1
FDNS	09G13_008BPSON		0 13G	G13_008	TO->FROM	G13_002T 115.00 - SHELDON 115KV CKT 2	43	0.06271	139.67	BEATRICE POWER STATION - SHELDON 115KV CKT 1
FDNS	09G13_008BPSON		0 13G	G13_008	TO->FROM	G13_002T 115.00 - SHELDON 115KV CKT 2	43	0.05827	103.7776	20TH & PIONEERS - SW7TH & PLEASANT HILL 115KV CKT 1
FDNS	08ALL		0 13G	G13_009	FROM->TO	VINITA JUNCTION (VINITAJC) 138/69/13.8KV TRANSFORMER CKT 1	62	0.25957	104.6602	SUB 404 - HOCKERVILLE - VINITA JUNCTION 138KV CKT 1
FDNS	08ALL		0 13G	G13_009	FROM->TO	VINITA JUNCTION (VINITAJC) 138/69/13.8KV TRANSFORMER CKT 1	62	0.25957	104.6546	SUB 404 - HOCKERVILLE (HOCK 138) 161/138/12.5KV TRANSFORMER CKT 1
FDNS	08ALL		0 13G	G13_009	FROM->TO	VINITA JUNCTION (VINITAJC) 138/69/13.8KV TRANSFORMER CKT 1	62	0.25957	104.0557	SUB 404 - HOCKERVILLE (HOCK 138) 161/138/12.5KV TRANSFORMER CKT 1
FDNS	08ALL		0 13G	G13_009	FROM->TO	VINITA JUNCTION (VINITAJC) 138/69/13.8KV TRANSFORMER CKT 1	62	0.25957	104.0539	SUB 404 - HOCKERVILLE - VINITA JUNCTION 138KV CKT 1
FDNS	00G13_009		0 23SP	G13_009	FROM->TO	SILOAM CITY - SILOAM SPRINGS 161KV CKT 1	317	0.03372	114.1414	FLINT CREEK - SILOAM SPRINGS TAP 345KV CKT 1
FDNS	0		0 23SP	G13_009	FROM->TO	SILOAM CITY - SILOAM SPRINGS 161KV CKT 1	317	0.03371	113.9796	FLINT CREEK - SILOAM SPRINGS TAP 345KV CKT 1
FDNS	00G13_009		0 18SP	G13_009	FROM->TO	SILOAM CITY - SILOAM SPRINGS 161KV CKT 1	317	0.03363	102.1468	FLINT CREEK - SILOAM SPRINGS TAP 345KV CKT 1
FDNS	0		0 18SP	G13_009	FROM->TO	SILOAM CITY - SILOAM SPRINGS 161KV CKT 1	317	0.03362	101.3304	FLINT CREEK - SILOAM SPRINGS TAP 345KV CKT 1
FDNS	0		0 13SP	G13_009	TO->FROM	TERRA NITROGEN TAP - VERDIGRIS 138KV CKT 1	136	0.11103	103.1223	SPP-AEPW-41
FDNS	00G13_009		0 13SP	G13_009	TO->FROM	TERRA NITROGEN TAP - VERDIGRIS 138KV CKT 1	136	0.11103	110.4321	SPP-AEPW-41
FDNS	00G13_009		0 13SP	G13_009	TO->FROM	TERRA NITROGEN TAP - VERDIGRIS 138KV CKT 1	136	0.11063	107.6635	SPP-AEPW-31
FDNS	00G13_009		0 13SP	G13_009	TO->FROM	TERRA NITROGEN TAP - VERDIGRIS 138KV CKT 1	136	0.11063	107.1268	NORTHEAST STATION - OWASSO SOUTH 138KV CKT 1
FDNS	00G13_009		0 13SP	G13_009	TO->FROM	TERRA NITROGEN TAP - VERDIGRIS 138KV CKT 1	136	0.11063	101.8756	OWASSO SOUTH - PORT OF CATOOSA TAP 138KV CKT 1
FDNS	0		0 13SP	G13_009	TO->FROM	TERRA NITROGEN TAP - VERDIGRIS 138KV CKT 1	136	0.11062	100.372	SPP-AEPW-31
FDNS	00G13_009		0 13SP	G13_009	TO->FROM	TERRA NITROGEN TAP - VERDIGRIS 138KV CKT 1	136	0.10446	100.5515	40OLOGAH 138.00 - NORTHEAST STATION 138KV CKT 1
FDNS	00G13_009		0 13SP	G13_009	TO->FROM	TERRA NITROGEN TAP - VERDIGRIS 138KV CKT 1	136	0.10446	99.9	40OLOGAH 138.00 - CLAREMORE 138KV CKT 1
FDNS	00G13_009		0 13SP	G13_009	TO->FROM	TERRA NITROGEN TAP - VERDIGRIS 138KV CKT 1	136	0.10446	99.9	CLAREMORE (CLRAUTO4) 161/138/13.8KV TRANSFORMER CKT 1
FDNS	00G13_009		0 23SP	G13_009	TO->FROM	SUB 110 - ORONOGO ICT. - SUB 452 - RIVERTON 161KV CKT 1	223	0.0743	108.403	SUB 145 - JOPLIN WEST 7TH - SUB 439 - STATELINE 161KV CKT 1
FDNS	0		0 23SP	G13_009	TO->FROM	SUB 110 - ORONOGO ICT. - SUB 452 - RIVERTON 161KV CKT 1	223	0.07427	106.175	SUB 145 - JOPLIN WEST 7TH - SUB 439 - STATELINE 161KV CKT 1
FDNS	00NR		0 13SP	G13_009	TO->FROM	CATOOSA - TERRA NITROGEN TAP 138KV CKT 1	136	0.06896	108.9967	SPP-AEPW-41
FDNS	00NR		0 13SP	G13_009	TO->FROM	TERRA NITROGEN TAP - VERDIGRIS 138KV CKT 1	136	0.06896	120.1661	SPP-AEPW-41
FDNS	00NR		0 13SP	G13_009	TO->FROM	TERRA NITROGEN TAP - VERDIGRIS 138KV CKT 1	136	0.06895	115.6468	SPP-AEPW-31
FDNS	00NR		0 13SP	G13_009	TO->FROM	TERRA NITROGEN TAP - VERDIGRIS 138KV CKT 1	136	0.06428	104.6071	SPP-AEPW-39
FDNS	0		0 13SP	G13_009	TO->FROM	ARCADIA - REDBUD 345KV CKT 2	1195	0.05657	100.123	ARCADIA - REDBUD 345KV CKT 1
FDNS	0		0 13WP	G13_009	TO->FROM	ARCADIA - REDBUD 345KV CKT 2	1195	0.05436	100.7689	ARCADIA - REDBUD 345KV CKT 1
FDNS	0		0 13WP	G13_009	TO->FROM	ARCADIA - REDBUD 345KV CKT 1	1195	0.05421	100.5075	ARCADIA - REDBUD 345KV CKT 2
FDNS	00G13_009		2 18WP	G13_009	FROM->TO	EASTERN STATE HOSPITAL TAP - VINITA NEO TAP 69KV CKT 1	48	0.18305	103.9951	SUB 404 - HOCKERVILLE (HOCK 138) 161/138/12.5KV TRANSFORMER CKT 1
FDNS	00G13_009		2 18WP	G13_009	FROM->TO	EASTERN STATE HOSPITAL TAP - VINITA NEO TAP 69KV CKT 1	48	0.18305	103.9916	SUB 404 - HOCKERVILLE - VINITA JUNCTION 138KV CKT 1
FDNS	06ALL		2 13G	G13_009	FROM->TO	LAWEASOKLUNI	425	0.03885	148.3	BASE CASE
FDNS	6		2 13G	G13_009	FROM->TO	LAWEASOKLUNI	425	0.03756	128.4	BASE CASE
FDNS	00G13_009		2 23SP	G13_009	FROM->TO	SILOAM CITY - SILOAM SPRINGS 161KV CKT 1	317	0.03472	114.2223	FLINT CREEK - SILOAM SPRINGS TAP 345KV CKT 1
FDNS	0		2 23SP	G13_009	FROM->TO	SILOAM CITY - SILOAM SPRINGS 161KV CKT 1	317	0.0347	114.0455	FLINT CREEK - SILOAM SPRINGS TAP 345KV CKT 1
FDNS	00G13_009		2 18SP	G13_009	FROM->TO	SILOAM CITY - SILOAM SPRINGS 161KV CKT 1	317	0.03463	102.2223	FLINT CREEK - SILOAM SPRINGS TAP 345KV CKT 1
FDNS	0		2 18SP	G13_009	FROM->TO	SILOAM CITY - SILOAM SPRINGS 161KV CKT 1	317	0.03461	101.3872	FLINT CREEK - SILOAM SPRINGS TAP 345KV CKT 1
FDNS	00NR		2 23SP	G13_009	FROM->TO	KANSAS TAP - WEST SILOAM SPRINGS 161KV CKT 1	307	0.03391	101.0814	GRDA-OPGD-05
FDNS	0		2 23SP	G13_009	FROM->TO	SILOAM CITY - SILOAM SPRINGS 161KV CKT 1	317	0.03371	113.9717	FLINT CREEK - SILOAM SPRINGS TAP 345KV CKT 1
FDNS	0		2 18SP	G13_009	FROM->TO	SILOAM CITY - SILOAM SPRINGS 161KV CKT 1	317	0.03362	101.3248	FLINT CREEK - SILOAM SPRINGS TAP 345KV CKT 1
FDNS	00NR		2 23SP	G13_009	FROM->TO	412SUB - KANSAS TAP 161KV CKT 1	335	0.03055	101.3016	GRDA-OPGD-05
FDNS	0		2 23SP	G13_009	FROM->TO	KANSAS TAP - WEST SILOAM SPRINGS 161KV CKT 1	307	0.03025	100.5328	GRDA1 - SILOAM SPRINGS TAP 345KV CKT 1
FDNS	00G13_009		2 23SP	G13_009	FROM->TO	KANSAS TAP - WEST SILOAM SPRINGS 161KV CKT 1	307	0.03025	100.858	GRDA1 - SILOAM SPRINGS TAP 345KV CKT 1
FDNS	00G13_009		2 18WP	G13_009	TO->FROM	EASTERN STATE HOSPITAL TAP - VINITA 69KV CKT 1	48	0.18305	106.3838	SUB 404 - HOCKERVILLE (HOCK 138) 161/138/12.5KV TRANSFORMER CKT 1
FDNS	00G13_009		2 18WP	G13_009	TO->FROM	EASTERN STATE HOSPITAL TAP - VINITA 69KV CKT 1	48	0.18305	106.3799	SUB 404 - HOCKERVILLE - VINITA JUNCTION 138KV CKT 1
FDNS	00G13_009		2 18WP	G13_009	TO->FROM	J6 - VINITA NEO TAP 69KV CKT 1	48	0.18305	101.7063	SUB 404 - HOCKERVILLE (HOCK 138) 161/138/12.5KV TRANSFORMER CKT 1
FDNS	00G13_009		2 18WP	G13_009	TO->FROM	J6 - VINITA NEO TAP 69KV CKT 1	48	0.18305	101.7031	SUB 404 - HOCKERVILLE - VINITA JUNCTION 138KV CKT 1
FDNS	0		2 13SP	G13_009	TO->FROM	TERRA NITROGEN TAP - VERDIGRIS 138KV CKT 1	136	0.11103	103.1226	SPP-AEPW-41
FDNS	0		2 13SP	G13_009	TO->FROM	TERRA NITROGEN TAP - VERDIGRIS 138KV CKT 1	136	0.11062	100.3727	SPP-AEPW-31
FDNS	0		2 13SP	G13_009	TO->FROM	TERRA NITROGEN TAP - VERDIGRIS 138KV CKT 1	136	0.10753	102.4815	SPP-AEPW-41
FDNS	00G13_009		2 13SP	G13_009	TO->FROM	TERRA NITROGEN TAP - VERDIGRIS 138KV CKT 1	136	0.10753	109.501	SPP-AEPW-41
FDNS	00G13_009		2 13SP	G13_009	TO->FROM	TERRA NITROGEN TAP - VERDIGRIS 138KV CKT 1	136	0.10723	106.7735	SPP-AEPW-31
FDNS	00G13_009		2 13SP	G13_009	TO->FROM	TERRA NITROGEN TAP - VERDIGRIS 138KV CKT 1	136	0.10723	106.2305	NORTHEAST STATION - OWASSO SOUTH 138KV CKT 1
FDNS	00G13_009		2 13SP	G13_009	TO->FROM	TERRA NITROGEN TAP - VERDIGRIS 138KV CKT 1	136	0.10723	100.9945	OWASSO SOUTH - PORT OF CATOOSA TAP 138KV CKT 1
FDNS	00NR		2 23SP	G13_009	TO->FROM	TERRA NITROGEN TAP - VERDIGRIS 138KV CKT 1	136	0.10154	100.8174	SPP-AEPW-41
FDNS	00NR		2 13SP	G13_009	TO->FROM	CATOOSA - TERRA NITROGEN TAP 138KV CKT 1	136	0.09127	110.6169	SPP-AEPW-41
FDNS	00NR		2 13SP	G13_009	TO->FROM	TERRA NITROGEN TAP - VERDIGRIS 138KV CKT 1	136	0.09127	121.7865	SPP-AEPW-41
FDNS	00NR		2 13SP	G13_009	TO->FROM	TERRA NITROGEN TAP - VERDIGRIS 138KV CKT 1	136	0.09126	117.2444	SPP-AEPW-31
FDNS	00NR		2 13SP	G13_009	TO->FROM	TERRA NITROGEN TAP - VERDIGRIS 138KV CKT 1	136	0.08508	106.0867	SPP-AEPW-39
FDNS	0		2 23SP	G13_009	TO->FROM	SUB 110 - ORONOGO ICT. - SUB 452 - RIVERTON 161KV CKT 1	223	0.07427	106.1701	SUB 145 - JOPLIN WEST 7TH - SUB 439 - STATELINE 161KV CKT 1
FDNS	00G13_009		2 23SP	G13_009	TO->FROM	SUB 110 - ORONOGO ICT. - SUB 452 - RIVERTON 161KV CKT 1	223	0.07327	108.2241	SUB 145 - JOPLIN WEST 7TH - SUB 439 - STATELINE 161KV CKT 1
FDNS	0		2 23SP	G13_009	TO->FROM	SUB 110 - ORONOGO ICT. - SUB 452 - RIVERTON 161KV CKT 1	223	0.07324	105.9285	SUB 145 - JOPLIN WEST 7TH - SUB 439 - STATELINE 161KV CKT 1
FDNS	00NR		2 23SP	G13_009	TO->FROM	412SUB - KERR 161KV CKT 1	335	0.03055	102.4739	GRDA-OPGD-05
FDNS	06ALL		3 13G	G13_009	FROM->TO	LAWEASOKLUNI	425	0.03878	148.1	BASE CASE
FDNS	6		3 13G	G13_009	FROM->TO	LAWEASOKLUNI	425	0.03751	128.2	BASE CASE
FDNS	00NR		3 23SP	G13_009	FROM->TO	KANSAS TAP - WEST SILOAM SPRINGS 161KV CKT 1	307	0.03017	101.1641	GRDA-OPGD-05
FDNS	06ALL		4 13G	G13_009	FROM->TO	LAWEASOKLUNI	425	0.03878	148.1	BASE CASE
FDNS	6		4 13G	G13_009	FROM->TO	LAWEASOKLUNI	425	0.0375	128.2	BASE CASE
FDNS	00NR		4 23SP	G13_009	FROM->TO	KANSAS TAP - WEST SILOAM SPRINGS 161KV CKT 1	307	0.03017	101.1747	GRDA-OPGD-05

SOLUTION	GROUP	SCENARIO	SEASON	SOURCE	DIRECTION	MONITORED ELEMENT	RATEB (MVA)	TDF	TC%LOADING (% MVA)	CONTINGENCY
FNLS-Blown up	03ALL		0 13G	G13_010		Non-converged Contingency	0	0.21698	-	DBL-THIS-CLR
FDNS	03ALL		0 13G	G13_010	FROM->TO	SMOKYHL6 230.00 - SUMMIT 230KV CKT 1	330	0.12673	104.9967233	AXTELL - POST ROCK 345KV CKT 1
FDNS	03ALL		0 13G	G13_010	FROM->TO	SMOKYHL6 230.00 - SUMMIT 230KV CKT 1	330	0.10468	113.6821267	DBL-SPRVL-MU
FDNS	03ALL		0 13G	G13_010	FROM->TO	SMOKYHL6 230.00 - SUMMIT 230KV CKT 1	330	0.10468	113.39203	DBL-MUL-RENO
FDNS	3		0 13G	G13_010	FROM->TO	HAYS PLANT - VINE STREET 115KV CKT 1	88	0.05721	106.7084	KNOLL 230 - POSTROCK6 230.00 230KV CKT 1
FDNS	03G13_010		0 13G	G13_010	FROM->TO	HAYS PLANT - VINE STREET 115KV CKT 1	88	0.05721	113.4214	KNOLL 230 - POSTROCK6 230.00 230KV CKT 1
FDNS	03ALL		0 13G	G13_010	FROM->TO	HAYS PLANT - VINE STREET 115KV CKT 1	88	0.057	128.7855	KNOLL 230 - POSTROCK6 230.00 230KV CKT 1
FDNS	3		0 13G	G13_010	FROM->TO	EVANS ENERGY CENTER NORTH - MAIZEW 4 138.00 138KV CKT 1	382	0.04393	102.2124	BENTON - WICHITA 345KV CKT 1
FDNS	03G13_010		0 13G	G13_010	FROM->TO	EVANS ENERGY CENTER NORTH - MAIZEW 4 138.00 138KV CKT 1	382	0.04393	104.0486	BENTON - WICHITA 345KV CKT 1
FDNS	03ALL		0 13G	G13_010	FROM->TO	EVANS ENERGY CENTER NORTH - MAIZEW 4 138.00 138KV CKT 1	382	0.04366	104.9967233	BENTON - WICHITA 345KV CKT 1
FDNS	03ALL		0 13G	G13_010	FROM->TO	WICHITA (WICHT12X) 345/138/13.8KV TRANSFORMER CKT 1	440	0.04185	107.3382	BENTON - WICHITA 345KV CKT 1
FDNS	03ALL		0 13G	G13_010	FROM->TO	WICHITA (WICHT12X) 345/138/13.8KV TRANSFORMER CKT 1	440	0.04185	107.3148	BENTON - WICHITA 345KV CKT 1
FDNS	03G13_010		0 13G	G13_010	FROM->TO	MOUNDRIDGE (MOUND10X) 138/115/13.8KV TRANSFORMER CKT 1	110	0.03443	131.997	RENO COUNTY - WICHITA 345KV CKT 1
FDNS	03G13_010		0 13G	G13_010	FROM->TO	MOUNDRIDGE (MOUND10X) 138/115/13.8KV TRANSFORMER CKT 1	110	0.03443	131.7923	RENO COUNTY - WICHITA 345KV CKT 1
FDNS	3		0 13G	G13_010	FROM->TO	MOUNDRIDGE (MOUND10X) 138/115/13.8KV TRANSFORMER CKT 1	110	0.03442	127.1749	RENO COUNTY - WICHITA 345KV CKT 1
FDNS	3		0 13G	G13_010	FROM->TO	MOUNDRIDGE (MOUND10X) 138/115/13.8KV TRANSFORMER CKT 1	110	0.03442	126.968	RENO COUNTY - WICHITA 345KV CKT 1
FDNS	03ALL		0 13G	G13_010	FROM->TO	MOUNDRIDGE (MOUND10X) 138/115/13.8KV TRANSFORMER CKT 1	110	0.03426	155.2488	RENO COUNTY - WICHITA 345KV CKT 1
FDNS	03ALL		0 13G	G13_010	FROM->TO	MOUNDRIDGE (MOUND10X) 138/115/13.8KV TRANSFORMER CKT 1	110	0.03426	154.7126	RENO COUNTY - WICHITA 345KV CKT 1
FDNS	03ALL		0 13G	G13_010	TO->FROM	BENTON - WICHITA 345KV CKT 1	932	0.14852	107.4489	HUNTERS7 345.00 - WOODRING 345KV CKT 1
FDNS	03ALL		0 13G	G13_010	TO->FROM	BENTON - WICHITA 345KV CKT 1	932	0.14852	105.1622	HUNTERS7 345.00 - VIOLA 7 345.00 345KV CKT 1
FDNS	03ALL		0 13G	G13_010	TO->FROM	BENTON - WICHITA 345KV CKT 1	932	0.13605	113.2277	DBL-TGA-MATT
FDNS	03ALL		0 13G	G13_010	TO->FROM	BENTON - WICHITA 345KV CKT 1	932	0.13605	107.2142	G11_051T 345.00 - TATONGA7 345.00 345KV CKT 1
FDNS	03ALL		0 13G	G13_010	TO->FROM	BENTON - WICHITA 345KV CKT 1	932	0.13605	106.7982	G11_051T 345.00 - WOODWARD DISTRICT EHV 345KV CKT 1
FDNS	03ALL		0 13G	G13_010	TO->FROM	BENTON - WICHITA 345KV CKT 1	932	0.12744	101.9926	MAIZE - MAIZEW 4 138.00 138KV CKT 1
FDNS	03ALL		0 13G	G13_010	TO->FROM	BENTON - WICHITA 345KV CKT 1	932	0.12744	101.9901	EVANS ENERGY CENTER NORTH - MAIZEW 4 138.00 138KV CKT 1
FDNS	03ALL		0 13G	G13_010	TO->FROM	BENTON - WICHITA 345KV CKT 1	932	0.12744	101.9873	SPP-WERE-91
FDNS	03ALL		0 13G	G13_010	TO->FROM	BENTON - WICHITA 345KV CKT 1	932	0.12744	101.4901	MAIZE - MAIZEE 4 138.00 138KV CKT 1
FDNS	03ALL		0 13G	G13_010	TO->FROM	BENTON - WICHITA 345KV CKT 1	932	0.12744	101.4845	CHISHOLM - MAIZEE 4 138.00 138KV CKT 1
FDNS	03ALL		0 13G	G13_010	TO->FROM	BENTON - WICHITA 345KV CKT 1	932	0.12744	101.4834	SPP-WERE-90
FDNS	03ALL		0 13G	G13_010	TO->FROM	BENTON - WICHITA 345KV CKT 1	932	0.12497	100.5024	WRTOD400
FDNS	03ALL		0 13G	G13_010	TO->FROM	BENTON - WICHITA 345KV CKT 1	932	0.12471	100	HOYT - JEFFREY ENERGY CENTER 345KV CKT 1
FDNS	3		0 13G	G13_010	TO->FROM	BENTON - WICHITA 345KV CKT 1	932	0.1215	102.1055	GENS32751 1-WOLF CREEK GENERATING STATION UNIT 1
FDNS	03G13_010		0 13G	G13_010	TO->FROM	BENTON - WICHITA 345KV CKT 1	932	0.12146	104.2035	GENS32751 1-WOLF CREEK GENERATING STATION UNIT 1
FDNS	03ALL		0 13G	G13_010	TO->FROM	BENTON - WICHITA 345KV CKT 1	932	0.12053	118.7235	GENS32751 1-WOLF CREEK GENERATING STATION UNIT 1
FDNS	03ALL		0 13G	G13_010	TO->FROM	MULLERGRN - SPEARVILLE 230KV CKT 1	355.3	0.08219	125.8779	G12-11T 345.00 - POST ROCK 345KV CKT 1
FDNS	3		0 13G	G13_010	TO->FROM	MULLERGRN - SPEARVILLE 230KV CKT 1	355.3	0.08183	104.8971	G12-11T 345.00 - POST ROCK 345KV CKT 1
FDNS	03G13_010		0 13G	G13_010	TO->FROM	MULLERGRN - SPEARVILLE 230KV CKT 1	355.3	0.08178	108.9547	G12-11T 345.00 - POST ROCK 345KV CKT 1
FDNS	03ALL		0 13G	G13_010	TO->FROM	CIRCLE - MULLERGRN 230KV CKT 1	319	0.06871	122.0803	DBL-SPRVL-MU
FDNS	03ALL		0 13G	G13_010	TO->FROM	CIRCLE - MULLERGRN 230KV CKT 1	319	0.06871	120.837	DBL-MUL-RENO
FDNS	03G13_010		0 13G	G13_010	TO->FROM	HAYS PLANT - SOUTH HAYS 115KV CKT 1	99	0.05721	121.3516	KNOLL 230 - POSTROCK6 230.00 230KV CKT 1
FDNS	03ALL		0 13G	G13_010	TO->FROM	HAYS PLANT - SOUTH HAYS 115KV CKT 1	99	0.057	134.9868	KNOLL 230 - POSTROCK6 230.00 230KV CKT 1
FDNS	03ALL		0 13G	G13_010	TO->FROM	N HAYS3 115.00 115KV CKT 1	99	0.057	102.9311	KNOLL 230 - POSTROCK6 230.00 230KV CKT 1
FDNS	03ALL		0 13G	G13_010	TO->FROM	N HAYS3 115.00 - VINE STREET 115KV CKT 1	99	0.057	107.3693	KNOLL 230 - POSTROCK6 230.00 230KV CKT 1
FDNS	03G13_010		0 13G	G13_010	TO->FROM	CHISHOLM - MAIZEE 4 138.00 138KV CKT 1	382	0.04393	101.3179	BENTON - WICHITA 345KV CKT 1
FDNS	0		0 23SP	G13_011	FROM->TO	GRIMES 345/138KV TRANSFORMER CKT 1	525	0.0441	100.0869	GRIMES 345/138KV TRANSFORMER CKT 2
FDNS	0		0 23SP	G13_011	FROM->TO	GRIMES 345/138KV TRANSFORMER CKT 2	525	0.0441	100.0869	GRIMES 345/138KV TRANSFORMER CKT 1
FDNS	0		2 23SP	G13_011	FROM->TO	GRIMES 345/138KV TRANSFORMER CKT 1	525	0.0441	100.0833	GRIMES 345/138KV TRANSFORMER CKT 2
FDNS	0		2 23SP	G13_011	FROM->TO	GRIMES 345/138KV TRANSFORMER CKT 2	525	0.0441	100.0833	GRIMES 345/138KV TRANSFORMER CKT 1
FDNS	06ALL		0 13G	G13_013	FROM->TO	TOLK STATION (ABBXL844501) 345/230/13.2KV TRANSFORMER CKT 1	557	1	99.9	EDDY COUNTY INTERCHANGE (ABB AEM30711) 345/230/13.2KV TRANSFORMER CKT 1
FDNS	06G13_013		0 13G	G13_013	FROM->TO	CHAVESCO 345.00 - EDDY COUNTY INTERCHANGE 345KV CKT 1	557	1	100	G13_013T 345.00 - TOLK STATION 345KV CKT 1
FDNS	06G13_013		0 13G	G13_013	FROM->TO	TOLK STATION (ABBXL844501) 345/230/13.2KV TRANSFORMER CKT 1	557	1	99.9	EDDY COUNTY INTERCHANGE (ABB AEM30711) 345/230/13.2KV TRANSFORMER CKT 1
FDNS	6		0 13G	G13_013	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.1015	103.6354	TOLK STATION EAST - TUCO INTERCHANGE 230KV CKT 1
FDNS	6		0 13G	G13_013	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.1015	103.6066	TOLK STATION EAST - TUCO INTERCHANGE 230KV CKT 1
FDNS	06G13_013		0 13G	G13_013	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.10129	110.467	TOLK STATION EAST - TUCO INTERCHANGE 230KV CKT 1
FDNS	06G13_013		0 13G	G13_013	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.10129	110.231	TOLK STATION EAST - TUCO INTERCHANGE 230KV CKT 1
FDNS	06ALL		0 13G	G13_013	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.10077	116.8478	TOLK STATION EAST - TUCO INTERCHANGE 230KV CKT 1
FDNS	06ALL		0 13G	G13_013	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.10077	116.1042	TOLK STATION EAST - TUCO INTERCHANGE 230KV CKT 1
FDNS	6		0 13G	G13_013	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.1001	102.9913	DEAF SMITH COUNTY INTERCHANGE - PLANT X STATION 230KV CKT 1
FDNS	6		0 13G	G13_013	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.1001	102.9464	DEAF SMITH COUNTY INTERCHANGE - PLANT X STATION 230KV CKT 1
FDNS	06G13_013		0 13G	G13_013	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.09989	109.1983	DEAF SMITH COUNTY INTERCHANGE - PLANT X STATION 230KV CKT 1
FDNS	06G13_013		0 13G	G13_013	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.09989	109.1518	DEAF SMITH COUNTY INTERCHANGE - PLANT X STATION 230KV CKT 1
FDNS	06ALL		0 13G	G13_013	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.0994	118.1282	DEAF SMITH COUNTY INTERCHANGE - PLANT X STATION 230KV CKT 1
FDNS	06ALL		0 13G	G13_013	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.0994	118.0809	DEAF SMITH COUNTY INTERCHANGE - PLANT X STATION 230KV CKT 1
FDNS	06G13_013		0 13G	G13_013	FROM->TO	ELK CITY 230KV (ELKCTY-6) 230/138/13.8KV TRANSFORMER CKT 1	287	0.0933	104.8043	LAWTON EASTSIDE - OKLAUNION 345KV CKT 1
FDNS	06G13_013		0 13G	G13_013	FROM->TO	ELK CITY 230KV (ELKCTY-6) 230/138/13.8KV TRANSFORMER CKT 1	287	0.0933	103.7095	LAWTON EASTSIDE - OKLAUNION 345KV CKT 1
FDNS	06ALL		0 13G	G13_013	FROM->TO	ELK CITY 230KV (ELKCTY-6) 230/138/13.8KV TRANSFORMER CKT 1	287	0.09269	107.024	SPP-AEPW-32
FDNS	06ALL		0 13G	G13_013	FROM->TO	ELK CITY 230KV (ELKCTY-6) 230/138/13.8KV TRANSFORMER CKT 1	287	0.09269	105.9984	G13_017T 345.00 - OKLAUNION 345KV CKT 1
FDNS	06ALL		0 13G	G13_013	FROM->TO	ELK CITY 230KV (ELKCTY-6) 230/138/13.8KV TRANSFORMER CKT 1	287	0.09269	105.4993	SPP-AEPW-32
FDNS	06ALL		0 13G	G13_013	FROM->TO	ELK CITY 230KV (ELKCTY-6) 230/138/13.8KV TRANSFORMER CKT 1	287	0.09269	104.5697	G13_017T 345.00 - OKLAUNION 345KV CKT 1
FDNS	06ALL		0 13G	G13_013	FROM->TO	WOLFFORTH INTERCHANGE - YUMA INTERCHANGE 115KV CKT 1	154	0.08948	101.7305	TOLK STATION EAST - TUCO INTERCHANGE 230KV CKT 1
FDNS	06ALL		0 13G	G13_013	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.0868	105.919	PLANT X STATION - POTTER COUNTY INTERCHANGE 230KV CKT 1
FDNS	06ALL		0 13G	G13_013	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.0868	105.8747	PLANT X STATION - POTTER COUNTY INTERCHANGE 230KV CKT 1
FDNS	06ALL		0 13G	G13_013	FROM->TO	ELK CITY 230KV (ELKCTY-6) 230/138/13.8KV TRANSFORMER CKT 1	287	0.08666	102.2973	DBL-HTCH-BVR
FDNS	06ALL		0 13G	G13_013	FROM->TO	ELK CITY 230KV (ELKCTY-6) 230/138/13.8KV TRANSFORMER CKT 1	287	0.08666	101.3981	DBL-HTCH-BVR
FDNS	06ALL		0 13G	G13_013	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.08286	102.0296	LAMB COUNTY INTERCHANGE - PLANT X STATION 115KV CKT 1
FDNS	06ALL		0 13G	G13_013	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.08286	101.9812	LAMB COUNTY INTERCHANGE - PLANT X STATION 115KV CKT 1
FDNS	06ALL		0 13G	G13_013	FROM->TO	DEAF SMITH COUNTY INTERCHANGE - Panda Energy Substation Hereford 115KV CKT 1	96	0.08226	108.4723	BUFFALO 230.00 - BUSHLAND INTERCHANGE 230KV CKT 1
FDNS	6		0 13G	G13_013	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.08107	106.7494	LAMB COUNTY INTERCHANGE - TOLK STATION WEST 230KV CKT 1

SOLUTION	GROUP	SCENARIO	SEASON	SOURCE	DIRECTION	MONITORED ELEMENT	RATEB (MVA)	TDF	TC%LOADING (% MVA)	CONTINGENCY	
FDNS	6		0	13G	G13_013	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.08107	106.7353	LAMB COUNTY INTERCHANGE (WH ALM20172) 230/115/13.2KV TRANSFORMER CKT 1
FDNS	6		0	13G	G13_013	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.08107	106.7353	SPP-SWPS-K37
FDNS	6		0	13G	G13_013	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.08107	106.7021	LAMB COUNTY INTERCHANGE - TOLK STATION WEST 230KV CKT 1
FDNS	6		0	13G	G13_013	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.08107	106.688	LAMB COUNTY INTERCHANGE (WH ALM20172) 230/115/13.2KV TRANSFORMER CKT 1
FDNS	6		0	13G	G13_013	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.08107	106.688	SPP-SWPS-K37
FDNS	06G13_013		0	13G	G13_013	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.0809	111.5925	LAMB COUNTY INTERCHANGE - TOLK STATION WEST 230KV CKT 1
FDNS	06G13_013		0	13G	G13_013	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.0809	111.5772	LAMB COUNTY INTERCHANGE (WH ALM20172) 230/115/13.2KV TRANSFORMER CKT 1
FDNS	06G13_013		0	13G	G13_013	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.0809	111.5772	SPP-SWPS-K37
FDNS	06G13_013		0	13G	G13_013	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.0809	111.5442	LAMB COUNTY INTERCHANGE - TOLK STATION WEST 230KV CKT 1
FDNS	06G13_013		0	13G	G13_013	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.0809	111.5289	LAMB COUNTY INTERCHANGE (WH ALM20172) 230/115/13.2KV TRANSFORMER CKT 1
FDNS	06G13_013		0	13G	G13_013	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.0809	111.5289	SPP-SWPS-K37
FDNS	06ALL		0	13G	G13_013	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.0805	116.4386	LAMB COUNTY INTERCHANGE - TOLK STATION WEST 230KV CKT 1
FDNS	06ALL		0	13G	G13_013	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.0805	116.4236	LAMB COUNTY INTERCHANGE (WH ALM20172) 230/115/13.2KV TRANSFORMER CKT 1
FDNS	06ALL		0	13G	G13_013	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.0805	116.4236	SPP-SWPS-K37
FDNS	06ALL		0	13G	G13_013	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.0805	116.3339	LAMB COUNTY INTERCHANGE - TOLK STATION WEST 230KV CKT 1
FDNS	06ALL		0	13G	G13_013	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.0805	116.3193	LAMB COUNTY INTERCHANGE (WH ALM20172) 230/115/13.2KV TRANSFORMER CKT 1
FDNS	06ALL		0	13G	G13_013	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.0805	116.3193	SPP-SWPS-K37
FDNS	06ALL		0	13G	G13_013	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.07127	100.6658	PLANT X STATION - SUNDOWN INTERCHANGE 230KV CKT 1
FDNS	06ALL		0	13G	G13_013	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.07127	100.6214	PLANT X STATION - SUNDOWN INTERCHANGE 230KV CKT 1
FDNS	06G13_013		0	13G	G13_013	FROM->TO	CURRY COUNTY INTERCHANGE - DEAF SMITH REC-#20 115KV CKT 1	96	0.06013	102.5833	DEAF SMITH COUNTY INTERCHANGE - PLANT X STATION 230KV CKT 1
FDNS	06ALL		0	13G	G13_013	FROM->TO	DEAF SMITH REC-#20 - DEAF SMITH REC-#24 115KV CKT 1	99	0.05986	111.862	DEAF SMITH COUNTY INTERCHANGE - PLANT X STATION 230KV CKT 1
FDNS	06ALL		0	13G	G13_013	FROM->TO	DEAF SMITH REC-#24 - PARMER COUNTY SUB 115KV CKT 1	99	0.05986	105.6146	DEAF SMITH COUNTY INTERCHANGE - PLANT X STATION 230KV CKT 1
FDNS	06ALL		0	13G	G13_013	FROM->TO	CURRY COUNTY INTERCHANGE - DEAF SMITH REC-#20 115KV CKT 1	96	0.05986	124.2496	DEAF SMITH COUNTY INTERCHANGE - PLANT X STATION 230KV CKT 1
FDNS	00NR		0	13SP	G13_013	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	252	0.05506	115.1624	SPP-SWPS-K37
FDNS	00NR		0	13SP	G13_013	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	252	0.05506	113.0462	SPP-SWPS-K37
FDNS	00NR		0	13SP	G13_013	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	252	0.05406	116.7713	SPP-SWPS-K37
FDNS	00NR		0	13SP	G13_013	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	252	0.05406	114.6221	SPP-SWPS-K37
FDNS	06NR		0	13G	G13_013	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.04761	107.7906	SPP-SWPS-K37
FDNS	06NR		0	13G	G13_013	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.04761	107.7427	SPP-SWPS-K37
FDNS	06NR		0	13G	G13_013	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.04663	112.5085	SPP-SWPS-K37
FDNS	06NR		0	13G	G13_013	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.04663	112.4603	SPP-SWPS-K37
FDNS	00NR		0	23SP	G13_013	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.03594	109.1784	SPP-SWPS-K37
FDNS	00NR		0	23SP	G13_013	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.03594	108.112	SPP-SWPS-K37
FDNS	00NR		0	13SP	G13_013	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	252	0.03531	100.1366	SPP-SWPS-T04
FDNS	00NR		0	13SP	G13_013	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	252	0.03458	102.2045	SPP-SWPS-T04
FDNS	06ALL		0	13G	G13_013	TO->FROM	PLANT X STATION - TOLK STATION WEST 230KV CKT 1	502	0.39404	127.9008	PLANT X STATION - TOLK STATION EAST 230KV CKT 2
FDNS	06ALL		0	13G	G13_013	TO->FROM	PLANT X STATION - TOLK STATION EAST 230KV CKT 2	502	0.38833	126.7856	PLANT X STATION - TOLK STATION WEST 230KV CKT 1
FDNS	06ALL		0	13G	G13_013	TO->FROM	DEAF SMITH COUNTY INTERCHANGE - PLANT X STATION 230KV CKT 1	351	0.21704	101.5196	PLANT X STATION - POTTER COUNTY INTERCHANGE 230KV CKT 1
FDNS	06ALL		0	13G	G13_013	TO->FROM	DEAF SMITH COUNTY INTERCHANGE - PLANT X STATION 230KV CKT 1	351	0.18623	103.3563	G13_017T 345.00 - OKLAUNION 345KV CKT 1
FDNS	06ALL		0	13G	G13_013	TO->FROM	DEAF SMITH COUNTY INTERCHANGE - PLANT X STATION 230KV CKT 1	351	0.18623	102.5937	SPP-AEPW-32
FDNS	06ALL		0	13G	G13_013	TO->FROM	DEAF SMITH COUNTY INTERCHANGE - PLANT X STATION 230KV CKT 1	351	0.18329	101.1754	BORDER 7345.00 - WOODWARD DISTRICT EHV 345KV CKT 1
FDNS	06NR		0	13G	G13_013	TO->FROM	DEAF SMITH COUNTY INTERCHANGE - PLANT X STATION 230KV CKT 1	351	0.08266	101.9946	SPP-AEPW-32
FDNS	06ALL		0	13G	G13_013	TO->FROM	DAWN SUB - Panda Energy Substation Hereford 115KV CKT 1	96	0.08226	103.8101	BUFFALO 230.00 - BUSHLAND INTERCHANGE 230KV CKT 1
FDNS	06ALL		0	13G	G13_013	TO->FROM	CANYON WEST SUB - DAWN SUB 115KV CKT 1	96	0.08226	100.6987	BUFFALO 230.00 - BUSHLAND INTERCHANGE 230KV CKT 1
FDNS	06ALL		0	13G	G13_013	TO->FROM	CARGILL SUB - PARMER COUNTY SUB 115KV CKT 1	96	0.05986	101.0831	DEAF SMITH COUNTY INTERCHANGE - PLANT X STATION 230KV CKT 1
FDNS	6		0	13G	G13_013	TO->FROM	FPL SWITCH - WOODWARD 138KV CKT 1	153	0.04988	139.1328	DBL-WWRD-G12
FDNS	06G13_013		0	13G	G13_013	TO->FROM	FPL SWITCH - WOODWARD 138KV CKT 1	153	0.04974	144.1018	DBL-WWRD-G12
FDNS	06ALL		0	13G	G13_013	TO->FROM	FPL SWITCH - WOODWARD 138KV CKT 1	153	0.0494	156.6884	DBL-WWRD-G12
FDNS	6		0	13G	G13_013	TO->FROM	FPL SWITCH - WOODWARD 138KV CKT 1	153	0.0334	108.8453	G12-016 TAP 345.00 - WOODWARD DISTRICT EHV 345KV CKT 1
FDNS	06G13_013		0	13G	G13_013	TO->FROM	FPL SWITCH - WOODWARD 138KV CKT 1	153	0.03331	112.1019	G12-016 TAP 345.00 - WOODWARD DISTRICT EHV 345KV CKT 1
FDNS	06ALL		0	13G	G13_013	TO->FROM	FPL SWITCH - WOODWARD 138KV CKT 1	153	0.0331	120.1814	G12-016 TAP 345.00 - WOODWARD DISTRICT EHV 345KV CKT 1
FDNS	00G13_013		2	13SP	G13_013	FROM->TO	CHAVESCO 345.00 - EDDY COUNTY INTERCHANGE 345KV CKT 1	557	1	100	G13_013T 345.00 - TOLK STATION 345KV CKT 1
FDNS	00G13_013		2	13WP	G13_013	FROM->TO	CHAVESCO 345.00 - EDDY COUNTY INTERCHANGE 345KV CKT 1	557	1	100	G13_013T 345.00 - TOLK STATION 345KV CKT 1
FDNS	00G13_013		2	13WP	G13_013	FROM->TO	TOLK STATION (ABXN844501) 345/230/13.2KV TRANSFORMER CKT 1	557	1	100	EDDY COUNTY INTERCHANGE (ABB AEM30711) 345/230/13.2KV TRANSFORMER CKT 1
FDNS	00G13_013		2	13WP	G13_013	FROM->TO	TOLK STATION (ABXN844501) 345/230/13.2KV TRANSFORMER CKT 1	557	1	99.9	CHAVESCO 345.00 - EDDY COUNTY INTERCHANGE 345KV CKT 1
FDNS	00G13_013		2	18SP	G13_013	FROM->TO	CHAVESCO 345.00 - EDDY COUNTY INTERCHANGE 345KV CKT 1	557	1	100.8333	G13_013T 345.00 - TOLK STATION 345KV CKT 1
FDNS	00G13_013		2	18SP	G13_013	FROM->TO	CHAVESCO 345.00 - EDDY COUNTY INTERCHANGE 345KV CKT 1	557	1	100	TOLK STATION (ABXN844501) 345/230/13.2KV TRANSFORMER CKT 1
FDNS	00G13_013		2	18WP	G13_013	FROM->TO	CHAVESCO 345.00 - EDDY COUNTY INTERCHANGE 345KV CKT 1	557	1	100.6271	G13_013T 345.00 - TOLK STATION 345KV CKT 1
FDNS	00G13_013		2	18WP	G13_013	FROM->TO	CHAVESCO 345.00 - EDDY COUNTY INTERCHANGE 345KV CKT 1	557	1	99.9	TOLK STATION (ABXN844501) 345/230/13.2KV TRANSFORMER CKT 1
FDNS	00G13_013		2	23SP	G13_013	FROM->TO	CHAVESCO 345.00 - EDDY COUNTY INTERCHANGE 345KV CKT 1	557	1	102.0611	G13_013T 345.00 - TOLK STATION 345KV CKT 1
FDNS	00G13_013		2	23SP	G13_013	FROM->TO	CHAVESCO 345.00 - EDDY COUNTY INTERCHANGE 345KV CKT 1	557	1	100.7681	TOLK STATION (ABXN844501) 345/230/13.2KV TRANSFORMER CKT 1
FDNS	06ALL		2	13G	G13_013	FROM->TO	TOLK STATION (ABXN844501) 345/230/13.2KV TRANSFORMER CKT 1	557	1	99.9	EDDY COUNTY INTERCHANGE (ABB AEM30711) 345/230/13.2KV TRANSFORMER CKT 1
FDNS	06G13_013		2	13G	G13_013	FROM->TO	CHAVESCO 345.00 - EDDY COUNTY INTERCHANGE 345KV CKT 1	557	1	100	G13_013T 345.00 - TOLK STATION 345KV CKT 1
FDNS	06G13_013		2	13G	G13_013	FROM->TO	TOLK STATION (ABXN844501) 345/230/13.2KV TRANSFORMER CKT 1	557	1	99.9	EDDY COUNTY INTERCHANGE (ABB AEM30711) 345/230/13.2KV TRANSFORMER CKT 1
FDNS	00G13_013		2	13SP	G13_013	FROM->TO	WOLFFORTH INTERCHANGE - YUMA INTERCHANGE 115KV CKT 1	154	0.12901	127.6981	LUBBOCK SOUTH INTERCHANGE - WOLFFORTH INTERCHANGE 230KV CKT 1
FDNS	06ALL		2	13G	G13_013	FROM->TO	WOLFFORTH INTERCHANGE - YUMA INTERCHANGE 115KV CKT 1	154	0.12536	102.0657	LUBBOCK SOUTH INTERCHANGE - WOLFFORTH INTERCHANGE 230KV CKT 1
FDNS	00G13_013		2	13SP	G13_013	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	252	0.10885	104.2849	TOLK STATION EAST - TUCO INTERCHANGE 230KV CKT 1
FDNS	00G13_013		2	13SP	G13_013	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	252	0.10885	102.6829	TOLK STATION EAST - TUCO INTERCHANGE 230KV CKT 1
FDNS	00G13_013		2	13SP	G13_013	FROM->TO	WOLFFORTH INTERCHANGE - YUMA INTERCHANGE 115KV CKT 1	154	0.10689	121.8797	G13_013T 345.00 - TOLK STATION 345KV CKT 1
FDNS	00G13_013		2	13SP	G13_013	FROM->TO	WOLFFORTH INTERCHANGE - YUMA INTERCHANGE 115KV CKT 1	154	0.10689	121.8713	TOLK STATION (ABXN844501) 345/230/13.2KV TRANSFORMER CKT 1
FDNS	00G13_013		2	18SP	G13_013	FROM->TO	ELK CITY 230KV (ELKCTY-6) 230/138/13.8KV TRANSFORMER CKT 1	287	0.10411	103.3135	ELKCTY7 345.00 - GRACEMONT 345KV CKT 1
FDNS	00G13_013		2	18SP	G13_013	FROM->TO	ELK CITY 230KV (ELKCTY-6) 230/138/13.8KV TRANSFORMER CKT 1	287	0.10411	103.1811	ELKCTY7 345.00 - GRACEMONT 345KV CKT 1
FDNS	6		2	13G	G13_013	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.1038	105.0547	TOLK STATION EAST - TUCO INTERCHANGE 230KV CKT 1
FDNS	6		2	13G	G13_013	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.1038	105.0094	TOLK STATION EAST - TUCO INTERCHANGE 230KV CKT 1
FDNS	06G13_013		2	13G	G13_013	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.1036	111.8129	TOLK STATION EAST - TUCO INTERCHANGE 230KV CKT 1
FDNS	06G13_013		2	13G	G13_013	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.1036	111.6421	TOLK STATION EAST - TUCO INTERCHANGE 230KV CKT 1
FDNS	00G13_013		2	13SP	G13_013	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	252	0.1034	110.7086	DEAF SMITH COUNTY INTERCHANGE - PLANT X STATION 230KV CKT 1
FDNS	00G13_013		2	13SP	G13_013	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	252	0.1034	108.2536	DEAF SMITH COUNTY INTERCHANGE - PLANT X STATION 230KV CKT 1

SOLUTION	GROUP	SCENARIO	SEASON	SOURCE	DIRECTION	MONITORED ELEMENT	RATEB (MVA)	TDF	TC%LOADING (% MVA)	CONTINGENCY	
FDNS	06ALL		2	13G	G13_013	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.10311	118.213	TOLK STATION EAST - TUCO INTERCHANGE 230KV CKT 1
FDNS	06ALL		2	13G	G13_013	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.10311	117.6187	TOLK STATION EAST - TUCO INTERCHANGE 230KV CKT 1
FDNS	00G13_013		2	18WP	G13_013	FROM->TO	ELK CITY 230KV (ELKCTY-6) 230/138/13.8KV TRANSFORMER CKT 1	287	0.10222	120.9704	ELKCTY7 345.00 - GRACEMONT 345KV CKT 1
FDNS	00G13_013		2	18WP	G13_013	FROM->TO	ELK CITY 230KV (ELKCTY-6) 230/138/13.8KV TRANSFORMER CKT 1	287	0.10222	120.963	ELKCTY7 345.00 - GRACEMONT 345KV CKT 1
FDNS	6		2	13G	G13_013	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.0987	100.9008	DEAF SMITH COUNTY INTERCHANGE - PLANT X STATION 230KV CKT 1
FDNS	6		2	13G	G13_013	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.0987	100.8563	DEAF SMITH COUNTY INTERCHANGE - PLANT X STATION 230KV CKT 1
FDNS	06G13_013		2	13G	G13_013	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.09852	106.8856	DEAF SMITH COUNTY INTERCHANGE - PLANT X STATION 230KV CKT 1
FDNS	06G13_013		2	13G	G13_013	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.09852	106.8398	DEAF SMITH COUNTY INTERCHANGE - PLANT X STATION 230KV CKT 1
FDNS	06ALL		2	13G	G13_013	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.09807	114.56	DEAF SMITH COUNTY INTERCHANGE - PLANT X STATION 230KV CKT 1
FDNS	06ALL		2	13G	G13_013	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.09807	114.5132	DEAF SMITH COUNTY INTERCHANGE - PLANT X STATION 230KV CKT 1
FDNS	0		2	13SP	G13_013	FROM->TO	WOLFFORTH INTERCHANGE - YUMA INTERCHANGE 115KV CKT 1	154	0.09677	102.1137	TOLK STATION EAST - TUCO INTERCHANGE 230KV CKT 1
FDNS	00G13_013		2	13SP	G13_013	FROM->TO	WOLFFORTH INTERCHANGE - YUMA INTERCHANGE 115KV CKT 1	154	0.09639	143.0287	TOLK STATION EAST - TUCO INTERCHANGE 230KV CKT 1
FDNS	06ALL		2	13G	G13_013	FROM->TO	WOLFFORTH INTERCHANGE - YUMA INTERCHANGE 115KV CKT 1	154	0.09326	107.0641	TOLK STATION EAST - TUCO INTERCHANGE 230KV CKT 1
FDNS	00G13_013		2	13SP	G13_013	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	252	0.08674	107.1099	LAMB COUNTY INTERCHANGE - TOLK STATION WEST 230KV CKT 1
FDNS	00G13_013		2	13SP	G13_013	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	252	0.08674	107.1015	LAMB COUNTY INTERCHANGE (WH ALM20172) 230/115/13.2KV TRANSFORMER CKT 1
FDNS	00G13_013		2	13SP	G13_013	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	252	0.08674	107.1015	SPP-SWPS-K37
FDNS	00G13_013		2	13SP	G13_013	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	252	0.08674	104.9925	LAMB COUNTY INTERCHANGE - TOLK STATION WEST 230KV CKT 1
FDNS	00G13_013		2	13SP	G13_013	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	252	0.08674	104.985	LAMB COUNTY INTERCHANGE (WH ALM20172) 230/115/13.2KV TRANSFORMER CKT 1
FDNS	00G13_013		2	13SP	G13_013	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	252	0.08674	104.985	SPP-SWPS-K37
FDNS	06ALL		2	13G	G13_013	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.08621	103.3998	PLANT X STATION - POTTER COUNTY INTERCHANGE 230KV CKT 1
FDNS	06ALL		2	13G	G13_013	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.08621	103.3548	PLANT X STATION - POTTER COUNTY INTERCHANGE 230KV CKT 1
FDNS	00G13_013		2	18WP	G13_013	FROM->TO	ELK CITY 230KV (ELKCTY-6) 230/138/13.8KV TRANSFORMER CKT 1	287	0.0855	108.0409	LAWTON EASTSIDE - OKLAUNION 345KV CKT 1
FDNS	00G13_013		2	18WP	G13_013	FROM->TO	ELK CITY 230KV (ELKCTY-6) 230/138/13.8KV TRANSFORMER CKT 1	287	0.0855	107.0706	LAWTON EASTSIDE - OKLAUNION 345KV CKT 1
FDNS	06ALL		2	13G	G13_013	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.08326	101.0981	LAMB COUNTY INTERCHANGE - TOLK STATION WEST 230KV CKT 1
FDNS	06ALL		2	13G	G13_013	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.08326	101.0503	LAMB COUNTY INTERCHANGE - PLANT X STATION 115KV CKT 1
FDNS	6		2	13G	G13_013	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.08201	106.8895	LAMB COUNTY INTERCHANGE - TOLK STATION WEST 230KV CKT 1
FDNS	6		2	13G	G13_013	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.08201	106.8734	SPP-SWPS-K37
FDNS	6		2	13G	G13_013	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.08201	106.8733	LAMB COUNTY INTERCHANGE (WH ALM20172) 230/115/13.2KV TRANSFORMER CKT 1
FDNS	6		2	13G	G13_013	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.08201	106.8421	LAMB COUNTY INTERCHANGE - TOLK STATION WEST 230KV CKT 1
FDNS	6		2	13G	G13_013	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.08201	106.826	LAMB COUNTY INTERCHANGE (WH ALM20172) 230/115/13.2KV TRANSFORMER CKT 1
FDNS	6		2	13G	G13_013	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.08201	106.826	SPP-SWPS-K37
FDNS	06G13_013		2	13G	G13_013	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.08186	111.6566	LAMB COUNTY INTERCHANGE - TOLK STATION WEST 230KV CKT 1
FDNS	06G13_013		2	13G	G13_013	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.08186	111.6512	LAMB COUNTY INTERCHANGE (WH ALM20172) 230/115/13.2KV TRANSFORMER CKT 1
FDNS	06G13_013		2	13G	G13_013	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.08186	111.6511	SPP-SWPS-K37
FDNS	06G13_013		2	13G	G13_013	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.08186	111.6078	LAMB COUNTY INTERCHANGE - TOLK STATION WEST 230KV CKT 1
FDNS	06G13_013		2	13G	G13_013	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.08186	111.6048	LAMB COUNTY INTERCHANGE (WH ALM20172) 230/115/13.2KV TRANSFORMER CKT 1
FDNS	06G13_013		2	13G	G13_013	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.08186	111.6048	SPP-SWPS-K37
FDNS	06ALL		2	13G	G13_013	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.08149	116.1793	LAMB COUNTY INTERCHANGE - TOLK STATION WEST 230KV CKT 1
FDNS	06ALL		2	13G	G13_013	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.08149	116.1661	LAMB COUNTY INTERCHANGE (WH ALM20172) 230/115/13.2KV TRANSFORMER CKT 1
FDNS	06ALL		2	13G	G13_013	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.08149	116.1661	SPP-SWPS-K37
FDNS	06ALL		2	13G	G13_013	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.08149	116.1297	LAMB COUNTY INTERCHANGE - TOLK STATION WEST 230KV CKT 1
FDNS	06ALL		2	13G	G13_013	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.08149	116.1165	LAMB COUNTY INTERCHANGE (WH ALM20172) 230/115/13.2KV TRANSFORMER CKT 1
FDNS	06ALL		2	13G	G13_013	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.08149	116.1165	SPP-SWPS-K37
FDNS	00G13_013		2	18SP	G13_013	FROM->TO	WOLFFORTH INTERCHANGE - YUMA INTERCHANGE 115KV CKT 1	154	0.0749	104.6536	TOLK STATION EAST - TUCO INTERCHANGE 230KV CKT 1
FDNS	00G13_013		2	13SP	G13_013	FROM->TO	WOLFFORTH INTERCHANGE - YUMA INTERCHANGE 115KV CKT 1	154	0.07481	130.2089	JONES STATION - TUCO INTERCHANGE 230KV CKT 1
FDNS	06ALL		2	13G	G13_013	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.07277	101.2624	PLANT X STATION - SUNDOWN INTERCHANGE 230KV CKT 1
FDNS	06ALL		2	13G	G13_013	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.07277	101.2179	PLANT X STATION - SUNDOWN INTERCHANGE 230KV CKT 1
FDNS	00G13_013		2	13SP	G13_013	FROM->TO	WOLFFORTH INTERCHANGE - YUMA INTERCHANGE 115KV CKT 1	154	0.07156	115.4227	TOLK STATION EAST - TOLK STATION TAP 230KV CKT 1
FDNS	00G13_013		2	13SP	G13_013	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	252	0.07096	101.717	GEN525493 1-PLANT X GEN #3
FDNS	00G13_013		2	13SP	G13_013	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	252	0.07096	101.0871	GEN525492 1-PLANT X GEN #2
FDNS	00G13_013		2	13SP	G13_013	FROM->TO	WOLFFORTH INTERCHANGE - YUMA INTERCHANGE 115KV CKT 1	154	0.0705	120.7119	PLANT X STATION - POTTER COUNTY INTERCHANGE 230KV CKT 1
FDNS	00G13_013		2	13SP	G13_013	FROM->TO	WOLFFORTH INTERCHANGE - YUMA INTERCHANGE 115KV CKT 1	154	0.0703	117.835	BUFFALO 230.00 - BUSHLAND INTERCHANGE 230KV CKT 1
FDNS	00G13_013		2	13SP	G13_013	FROM->TO	WOLFFORTH INTERCHANGE - YUMA INTERCHANGE 115KV CKT 1	154	0.0703	116.991	BUFFALO 230.00 - DEAF SMITH COUNTY INTERCHANGE 230KV CKT 1
FDNS	00G13_013		2	13SP	G13_013	FROM->TO	WOLFFORTH INTERCHANGE - YUMA INTERCHANGE 115KV CKT 1	154	0.06906	122.3421	DEAF SMITH COUNTY INTERCHANGE - PLANT X STATION 230KV CKT 1
FDNS	00G13_013		2	13SP	G13_013	FROM->TO	WOLFFORTH INTERCHANGE - YUMA INTERCHANGE 115KV CKT 1	154	0.06592	116.1294	SPP-SWPS-04
FDNS	00G13_013		2	13SP	G13_013	FROM->TO	WOLFFORTH INTERCHANGE - YUMA INTERCHANGE 115KV CKT 1	154	0.06592	115.2233	Hitchland Interchange - POTTER COUNTY INTERCHANGE 345KV CKT 1
FDNS	00G13_013		2	13SP	G13_013	FROM->TO	WOLFFORTH INTERCHANGE - YUMA INTERCHANGE 115KV CKT 1	154	0.06592	114.7485	POTTER COUNTY INTERCHANGE (WAUK 90343-A) 345/230/13.2KV TRANSFORMER CKT 1
FDNS	00G13_013		2	13SP	G13_013	FROM->TO	WOLFFORTH INTERCHANGE - YUMA INTERCHANGE 115KV CKT 1	154	0.06575	114.4172	DBL-HTCH-BVR
FDNS	00G13_013		2	13SP	G13_013	FROM->TO	WOLFFORTH INTERCHANGE - YUMA INTERCHANGE 115KV CKT 1	154	0.06476	116.8213	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1
FDNS	00G13_013		2	13SP	G13_013	FROM->TO	WOLFFORTH INTERCHANGE - YUMA INTERCHANGE 115KV CKT 1	154	0.06447	115.9347	HALE CO INTERCHANGE - PLANT X STATION 115KV CKT 1
FDNS	00G13_013		2	13SP	G13_013	FROM->TO	WOLFFORTH INTERCHANGE - YUMA INTERCHANGE 115KV CKT 1	154	0.06456	117.5414	LAMB COUNTY REC-SOUTH OLTON - PLANT X STATION 115KV CKT 1
FDNS	00G13_013		2	13SP	G13_013	FROM->TO	WOLFFORTH INTERCHANGE - YUMA INTERCHANGE 115KV CKT 1	154	0.06456	116.9305	SPP-SWPS-25
FDNS	00G13_013		2	13SP	G13_013	FROM->TO	WOLFFORTH INTERCHANGE - YUMA INTERCHANGE 115KV CKT 1	154	0.06456	116.9074	LAMB COUNTY REC-SOUTH OLTON - LAMTON INTERCHANGE 115KV CKT 1
FDNS	0		2	13SP	G13_013	FROM->TO	WOLFFORTH INTERCHANGE - YUMA INTERCHANGE 115KV CKT 1	154	0.06438	104.3908	LUBBOCK SOUTH INTERCHANGE (ABB LLM60043) 230/115/13.2KV TRANSFORMER CKT 1
FDNS	00G13_013		2	13SP	G13_013	FROM->TO	WOLFFORTH INTERCHANGE - YUMA INTERCHANGE 115KV CKT 1	154	0.06412	131.4281	LUBBOCK SOUTH INTERCHANGE (ABB LLM60043) 230/115/13.2KV TRANSFORMER CKT 1
FDNS	00G13_013		2	13SP	G13_013	FROM->TO	WOLFFORTH INTERCHANGE - YUMA INTERCHANGE 115KV CKT 1	154	0.06393	114.5226	DBL-BVR-WWRD
FDNS	00G13_013		2	13SP	G13_013	FROM->TO	WOLFFORTH INTERCHANGE - YUMA INTERCHANGE 115KV CKT 1	154	0.06356	114.8656	SPP-SWPS-03
FDNS	00G13_013		2	13SP	G13_013	FROM->TO	WOLFFORTH INTERCHANGE - YUMA INTERCHANGE 115KV CKT 1	154	0.06355	108.5756	SUNDOWN INTERCHANGE (WH XDS70381) 230/115/13.8KV TRANSFORMER CKT 1
FDNS	00G13_013		2	13SP	G13_013	FROM->TO	WOLFFORTH INTERCHANGE - YUMA INTERCHANGE 115KV CKT 1	154	0.06353	114.4168	GRAPEVINE INTERCHANGE - STATELINE INTERCHANGE 230KV CKT 1
FDNS	00G13_013		2	13SP	G13_013	FROM->TO	WOLFFORTH INTERCHANGE - YUMA INTERCHANGE 115KV CKT 1	154	0.06307	123.4389	Jones Station Bus#2 - LUBBOCK EAST INTERCHANGE 230KV CKT 1
FDNS	00G13_013		2	13SP	G13_013	FROM->TO	WOLFFORTH INTERCHANGE - YUMA INTERCHANGE 115KV CKT 1	154	0.06305	114.51	GRAPEVINE INTERCHANGE - NICHOLS STATION 230KV CKT 1
FDNS	00G13_013		2	13SP	G13_013	FROM->TO	WOLFFORTH INTERCHANGE - YUMA INTERCHANGE 115KV CKT 1	154	0.06299	120.4176	LUBBOCK EAST INTERCHANGE (ENRC 136162) 230/115/13.2KV TRANSFORMER CKT 1
FDNS	00G13_013		2	13SP	G13_013	FROM->TO	WOLFFORTH INTERCHANGE - YUMA INTERCHANGE 115KV CKT 1	154	0.06294	117.6341	LUBBOCK POWER & LIGHT-MILWAUKEE (M-E C0681251) 230/69/13.5KV TRANSFORMER CKT 1
FDNS	00G13_013		2	13SP	G13_013	FROM->TO	WOLFFORTH INTERCHANGE - YUMA INTERCHANGE 115KV CKT 1	154	0.06294	117.6298	LUBBOCK POWER & LIGHT-MILWAUKEE - LUBBOCK POWER & LIGHT-VICKSBURG 69KV CKT 1
FDNS	0		2	13SP	G13_013	FROM->TO	WOLFFORTH INTERCHANGE - YUMA INTERCHANGE 115KV CKT 1	154	0.06261	110.7067	BASE CASE
FDNS	00G13_013		2	13SP	G13_013	FROM->TO	WOLFFORTH INTERCHANGE - YUMA INTERCHANGE 115KV CKT 1	154	0.06256	114.983	LUBBOCK POWER & LIGHT-SOUTHEAST - LUBBOCK SOUTH INTERCHANGE 230KV CKT 1
FDNS	00G13_013		2	13SP	G13_013	FROM->TO	WOLFFORTH INTERCHANGE - YUMA INTERCHANGE 115KV CKT 1	154	0.06254	114.8765	BAILEY COUNTY REC-EARTH INTERCHANGE - PLANT X STATION 115KV CKT 1
FDNS	00G13_013		2	13SP	G13_013	FROM->TO	WOLFFORTH INTERCHANGE - YUMA INTERCHANGE 115KV CKT 1	154	0.06239	116.5119	SPP-SWPS-V49

SOLUTION	GROUP	SCENARIO	SEASON	SOURCE	DIRECTION	MONITORED ELEMENT	RATEB (MVA)	TDF	TC%LOADING (% MVA)	CONTINGENCY	
FNSL	00G13_013		2	13SP	G13_013	FROM->TO	WOLFFORTH INTERCHANGE - YUMA INTERCHANGE 115KV CKT 1	154	0.06237	115.6368	GRASSLAND INTERCHANGE (PENN 0105951) 230/115/13.2KV TRANSFORMER CKT 1
FNSL	00G13_013		2	13SP	G13_013	FROM->TO	WOLFFORTH INTERCHANGE - YUMA INTERCHANGE 115KV CKT 1	154	0.06237	115.318	GRASSLAND INTERCHANGE - Jones Station Bus#2 230KV CKT 1
FDNS	00G13_013		2	13SP	G13_013	FROM->TO	WOLFFORTH INTERCHANGE - YUMA INTERCHANGE 115KV CKT 1	154	0.06236	144.5012	BASE CASE
FDNS	00G13_013		2	13SP	G13_013	FROM->TO	WOLFFORTH INTERCHANGE - YUMA INTERCHANGE 115KV CKT 1	154	0.06236	114.9145	GEN562308 1-G12-037 18.000
FDNS	00G13_013		2	13SP	G13_013	FROM->TO	WOLFFORTH INTERCHANGE - YUMA INTERCHANGE 115KV CKT 1	154	0.06236	114.8568	GEN560738 1-G13_016_2 18.000
FDNS	00G13_013		2	13SP	G13_013	FROM->TO	WOLFFORTH INTERCHANGE - YUMA INTERCHANGE 115KV CKT 1	154	0.06236	109.827	GEN525492 1-PLANT X GEN #2
FDNS	00G13_013		2	13SP	G13_013	FROM->TO	WOLFFORTH INTERCHANGE - YUMA INTERCHANGE 115KV CKT 1	154	0.06236	109.7326	GEN525493 1-PLANT X GEN #3
FDNS	00G13_013		2	13SP	G13_013	FROM->TO	WOLFFORTH INTERCHANGE - YUMA INTERCHANGE 115KV CKT 1	154	0.06236	109.1876	GEN523973 1-HARRINGTON GEN #3 24 KV
FDNS	00G13_013		2	13SP	G13_013	FROM->TO	WOLFFORTH INTERCHANGE - YUMA INTERCHANGE 115KV CKT 1	154	0.06236	109.1691	GEN523972 1-HARRINGTON GEN #2 24 KV
FDNS	00G13_013		2	13SP	G13_013	FROM->TO	WOLFFORTH INTERCHANGE - YUMA INTERCHANGE 115KV CKT 1	154	0.06236	109.1674	GEN523971 1-HARRINGTON GEN #1 24 KV
FDNS	00G13_013		2	13SP	G13_013	FROM->TO	WOLFFORTH INTERCHANGE - YUMA INTERCHANGE 115KV CKT 1	154	0.06236	108.6352	GEN526334 1-JONES_4 116.500
FDNS	00G13_013		2	13SP	G13_013	FROM->TO	WOLFFORTH INTERCHANGE - YUMA INTERCHANGE 115KV CKT 1	154	0.06236	108.6319	GEN526333 1-JONES GEN #3 21 KV
FDNS	00G13_013		2	13SP	G13_013	FROM->TO	WOLFFORTH INTERCHANGE - YUMA INTERCHANGE 115KV CKT 1	154	0.06236	107.4062	GEN526331 1-JONES GEN #1 22 KV
FDNS	00G13_013		2	13SP	G13_013	FROM->TO	WOLFFORTH INTERCHANGE - YUMA INTERCHANGE 115KV CKT 1	154	0.06236	107.3941	GEN526332 1-JONES GEN #2 21 KV
FDNS	00G13_013		2	13SP	G13_013	FROM->TO	WOLFFORTH INTERCHANGE - YUMA INTERCHANGE 115KV CKT 1	154	0.06236	105.8442	GEN527883 1-CUNNINGHAM GEN #3 22 KV
FDNS	00G13_013		2	13SP	G13_013	FROM->TO	WOLFFORTH INTERCHANGE - YUMA INTERCHANGE 115KV CKT 1	154	0.06236	105.7955	GEN525494 1-PLANT X GEN #4 20 KV
FDNS	00G13_013		2	13SP	G13_013	FROM->TO	WOLFFORTH INTERCHANGE - YUMA INTERCHANGE 115KV CKT 1	154	0.06236	104.2945	GEN528361 1-MADDOX GEN #1
FDNS	00G13_013		2	13SP	G13_013	FROM->TO	WOLFFORTH INTERCHANGE - YUMA INTERCHANGE 115KV CKT 1	154	0.06236	104.0409	GEN527165 1-Mustang Gen #5
FDNS	00G13_013		2	13SP	G13_013	FROM->TO	WOLFFORTH INTERCHANGE - YUMA INTERCHANGE 115KV CKT 1	154	0.06236	102.5843	GEN527902 1-HOBBS PLANT #2 (CT)
FDNS	00G13_013		2	13SP	G13_013	FROM->TO	WOLFFORTH INTERCHANGE - YUMA INTERCHANGE 115KV CKT 1	154	0.06236	102.5136	GEN527901 1-HOBBS PLANT #1 (CT)
FDNS	00G13_013		2	13SP	G13_013	FROM->TO	WOLFFORTH INTERCHANGE - YUMA INTERCHANGE 115KV CKT 1	154	0.06236	102.0351	GEN527164 1-MUSTANG GEN #4 22 KV
FDNS	00G13_013		2	13SP	G13_013	FROM->TO	WOLFFORTH INTERCHANGE - YUMA INTERCHANGE 115KV CKT 1	154	0.06236	101.7918	GEN560729 1-G13_013_3 0.6900
FDNS	00G13_013		2	13SP	G13_013	FROM->TO	WOLFFORTH INTERCHANGE - YUMA INTERCHANGE 115KV CKT 1	154	0.06236	101.2806	GEN527163 1-MUSTANG GEN #3 22 KV
FDNS	00G13_013		2	13SP	G13_013	FROM->TO	WOLFFORTH INTERCHANGE - YUMA INTERCHANGE 115KV CKT 1	154	0.06236	100.6796	GEN527161 1-MUSTANG GEN #1
FDNS	00G13_013		2	13SP	G13_013	FROM->TO	WOLFFORTH INTERCHANGE - YUMA INTERCHANGE 115KV CKT 1	154	0.06236	100.6791	GEN527162 1-MUSTANG GEN #2
FDNS	00G13_013		2	13SP	G13_013	FROM->TO	WOLFFORTH INTERCHANGE - YUMA INTERCHANGE 115KV CKT 1	154	0.06236	100.0713	GEN527882 1-CUNNINGHAM GEN #2 20 KV
FDNS	00G13_013		2	13SP	G13_013	FROM->TO	WOLFFORTH INTERCHANGE - YUMA INTERCHANGE 115KV CKT 1	154	0.06231	114.49	SPP-SWPS-T14
FDNS	0		2	13SP	G13_013	FROM->TO	WOLFFORTH INTERCHANGE - YUMA INTERCHANGE 115KV CKT 1	154	0.06223	115.3705	ALLEN SUB - LUBBOCK SOUTH INTERCHANGE 115KV CKT 1
FDNS	0		2	13SP	G13_013	FROM->TO	WOLFFORTH INTERCHANGE - YUMA INTERCHANGE 115KV CKT 1	154	0.06223	100.3774	ALLEN SUB - SOUTH PLAINS REC-QUAKER 115KV CKT 1
FDNS	00G13_013		2	13SP	G13_013	FROM->TO	WOLFFORTH INTERCHANGE - YUMA INTERCHANGE 115KV CKT 1	154	0.06211	115.1622	SPP-SWPS-V55
FDNS	00G13_013		2	13SP	G13_013	FROM->TO	WOLFFORTH INTERCHANGE - YUMA INTERCHANGE 115KV CKT 1	154	0.06211	109.182	AMOCO TAP - SUNDOWN INTERCHANGE 115KV CKT 1
FDNS	00G13_013		2	13SP	G13_013	FROM->TO	WOLFFORTH INTERCHANGE - YUMA INTERCHANGE 115KV CKT 1	154	0.06197	141.6825	ALLEN SUB - LUBBOCK SOUTH INTERCHANGE 115KV CKT 1
FDNS	00G13_013		2	13SP	G13_013	FROM->TO	WOLFFORTH INTERCHANGE - YUMA INTERCHANGE 115KV CKT 1	154	0.06197	126.725	ALLEN SUB - SOUTH PLAINS REC-QUAKER 115KV CKT 1
FDNS	00G13_013		2	13SP	G13_013	FROM->TO	WOLFFORTH INTERCHANGE - YUMA INTERCHANGE 115KV CKT 1	154	0.06197	121.4612	SOUTH PLAINS REC-QUAKER - South Plains REC-Frankford Sub 115KV CKT 1
FDNS	00G13_013		2	13SP	G13_013	FROM->TO	WOLFFORTH INTERCHANGE - YUMA INTERCHANGE 115KV CKT 1	154	0.06197	116.2654	MURPHY SUB - South Plains REC-Frankford Sub 115KV CKT 1
FDNS	00G13_013		2	13SP	G13_013	FROM->TO	WOLFFORTH INTERCHANGE - YUMA INTERCHANGE 115KV CKT 1	154	0.06189	109.5267	MUSTANG STATION N. - SEAGRAVES INTERCHANGE 115KV CKT 1
FDNS	00G13_013		2	13SP	G13_013	FROM->TO	WOLFFORTH INTERCHANGE - YUMA INTERCHANGE 115KV CKT 1	154	0.06155	110.1437	LAMB COUNTY INTERCHANGE - TOLK STATION WEST 230KV CKT 1
FDNS	00G13_013		2	13SP	G13_013	FROM->TO	WOLFFORTH INTERCHANGE - YUMA INTERCHANGE 115KV CKT 1	154	0.06155	110.1395	LAMB COUNTY INTERCHANGE (WH ALM20172) 230/115/13.2KV TRANSFORMER CKT 1
FDNS	00G13_013		2	13SP	G13_013	FROM->TO	WOLFFORTH INTERCHANGE - YUMA INTERCHANGE 115KV CKT 1	154	0.06155	110.1395	SPP-SWPS-K37
FDNS	00G13_013		2	13SP	G13_013	FROM->TO	WOLFFORTH INTERCHANGE - YUMA INTERCHANGE 115KV CKT 1	154	0.06144	114.6704	SPP-SWPS-T31
FDNS	00G13_013		2	13SP	G13_013	FROM->TO	WOLFFORTH INTERCHANGE - YUMA INTERCHANGE 115KV CKT 1	154	0.06144	114.6602	Lamb County REC-Opdyke Sub - SUNDOWN INTERCHANGE 115KV CKT 1
FDNS	00G13_013		2	13SP	G13_013	FROM->TO	WOLFFORTH INTERCHANGE - YUMA INTERCHANGE 115KV CKT 1	154	0.06144	109.3002	HOCKLEY COUNTY INTERCHANGE - LAMB COUNTY INTERCHANGE 115KV CKT 1
FDNS	00G13_013		2	13SP	G13_013	FROM->TO	WOLFFORTH INTERCHANGE - YUMA INTERCHANGE 115KV CKT 1	154	0.06141	109.71	SWISHER COUNTY INTERCHANGE - TUCO INTERCHANGE 230KV CKT 1
FDNS	00G13_013		2	13SP	G13_013	FROM->TO	WOLFFORTH INTERCHANGE - YUMA INTERCHANGE 115KV CKT 1	154	0.06102	114.4111	TUCO INTERCHANGE (ENRCO 136401) 230/115/13.2KV TRANSFORMER CKT 2
FDNS	00G13_013		2	13SP	G13_013	FROM->TO	WOLFFORTH INTERCHANGE - YUMA INTERCHANGE 115KV CKT 1	154	0.06092	114.5479	TUCO INTERCHANGE (GE M102345) 230/115/13.2KV TRANSFORMER CKT 1
FDNS	00G13_013		2	13SP	G13_013	FROM->TO	WOLFFORTH INTERCHANGE - YUMA INTERCHANGE 115KV CKT 1	154	0.06091	110.5328	SULPHUR INTERCHANGE - TERRY COUNTY INTERCHANGE 115KV CKT 1
FDNS	00G13_013		2	13SP	G13_013	FROM->TO	WOLFFORTH INTERCHANGE - YUMA INTERCHANGE 115KV CKT 1	154	0.06091	107.8038	SEAGRAVES INTERCHANGE - SULPHUR INTERCHANGE 115KV CKT 1
FDNS	00G13_013		2	13SP	G13_013	FROM->TO	WOLFFORTH INTERCHANGE - YUMA INTERCHANGE 115KV CKT 1	154	0.06076	110.3005	SPP-SWPS-T35
FDNS	00G13_013		2	13SP	G13_013	FROM->TO	WOLFFORTH INTERCHANGE - YUMA INTERCHANGE 115KV CKT 1	154	0.06076	109.5335	PRENTICE SUB - TERRY COUNTY INTERCHANGE 115KV CKT 1
FDNS	00G13_013		2	13SP	G13_013	FROM->TO	WOLFFORTH INTERCHANGE - YUMA INTERCHANGE 115KV CKT 1	154	0.06076	108.0884	PRENTICE SUB - YOAKUM COUNTY INTERCHANGE 115KV CKT 1
FDNS	00G13_013		2	13SP	G13_013	FROM->TO	WOLFFORTH INTERCHANGE - YUMA INTERCHANGE 115KV CKT 1	154	0.06074	110.2626	AMARILLO SOUTH INTERCHANGE - G07-48T 230.00 230KV CKT 1
FDNS	00G13_013		2	13SP	G13_013	FROM->TO	WOLFFORTH INTERCHANGE - YUMA INTERCHANGE 115KV CKT 1	154	0.06028	110.4797	LEA COUNTY INTERCHANGE - YOAKUM COUNTY INTERCHANGE 230KV CKT 1
FDNS	00G13_013		2	13SP	G13_013	FROM->TO	WOLFFORTH INTERCHANGE - YUMA INTERCHANGE 115KV CKT 1	154	0.05958	106.2292	DENVER CITY INTERCHANGE N. - TERRY COUNTY INTERCHANGE 115KV CKT 1
FDNS	00G13_013		2	13SP	G13_013	FROM->TO	WOLFFORTH INTERCHANGE - YUMA INTERCHANGE 115KV CKT 1	154	0.05899	114.4376	CUNNINGHAM STATION - EDDY COUNTY INTERCHANGE 230KV CKT 1
FDNS	00G13_013		2	13SP	G13_013	FROM->TO	WOLFFORTH INTERCHANGE - YUMA INTERCHANGE 115KV CKT 1	154	0.05882	108.9344	G13_017T 345.00 - TUCO INTERCHANGE 345KV CKT 1
FDNS	00G13_013		2	13SP	G13_013	FROM->TO	WOLFFORTH INTERCHANGE - YUMA INTERCHANGE 115KV CKT 1	154	0.05882	108.8674	SPP-APWP-32
FDNS	00G13_013		2	13SP	G13_013	FROM->TO	WOLFFORTH INTERCHANGE - YUMA INTERCHANGE 115KV CKT 1	154	0.05882	108.615	G13_017T 345.00 - OKLAUNION 345KV CKT 1
FDNS	00G13_013		2	13SP	G13_013	FROM->TO	WOLFFORTH INTERCHANGE - YUMA INTERCHANGE 115KV CKT 1	154	0.05882	106.4377	LAWTON EASTSIDE - OKLAUNION 345KV CKT 1
FDNS	00G13_013		2	13SP	G13_013	FROM->TO	CURRY COUNTY INTERCHANGE - DEAF SMITH REC-#20 115KV CKT 1	96	0.05778	112.9787	DEAF SMITH COUNTY INTERCHANGE - PLANT X STATION 230KV CKT 1
FDNS	00G13_013		2	13SP	G13_013	FROM->TO	WOLFFORTH INTERCHANGE - YUMA INTERCHANGE 115KV CKT 1	154	0.05704	106.1886	PLANT X STATION - SUNDOWN INTERCHANGE 230KV CKT 1
FDNS	00G13_013		2	13SP	G13_013	FROM->TO	WOLFFORTH INTERCHANGE - YUMA INTERCHANGE 115KV CKT 1	154	0.05701	108.4827	SUNDOWN INTERCHANGE - WOLFFORTH INTERCHANGE 230KV CKT 1
FDNS	06ALL		2	13G	G13_013	FROM->TO	DEAF SMITH REC-#20 - DEAF SMITH REC-#24 115KV CKT 1	99	0.05654	101.1271	DEAF SMITH COUNTY INTERCHANGE - PLANT X STATION 230KV CKT 1
FDNS	06ALL		2	13G	G13_013	FROM->TO	CURRY COUNTY INTERCHANGE - DEAF SMITH REC-#20 115KV CKT 1	96	0.05654	113.0161	DEAF SMITH COUNTY INTERCHANGE - PLANT X STATION 230KV CKT 1
FDNS	00G13_013		2	13SP	G13_013	FROM->TO	WOLFFORTH INTERCHANGE - YUMA INTERCHANGE 115KV CKT 1	154	0.05565	117.0766	STANTON SUB - TUCO INTERCHANGE 115KV CKT 1
FDNS	00G13_013		2	13SP	G13_013	FROM->TO	WOLFFORTH INTERCHANGE - YUMA INTERCHANGE 115KV CKT 1	154	0.05565	104.2281	INDIANA SUB - SOUTH PLAINS REC-ERSKINE 115KV CKT 1
FDNS	00G13_013		2	13SP	G13_013	FROM->TO	WOLFFORTH INTERCHANGE - YUMA INTERCHANGE 115KV CKT 1	154	0.05565	101.7374	CARLISLE INTERCHANGE - SOUTH PLAINS REC-ERSKINE 115KV CKT 1
FDNS	00G13_013		2	13SP	G13_013	FROM->TO	WOLFFORTH INTERCHANGE - YUMA INTERCHANGE 115KV CKT 1	154	0.05565	101.1451	SPP-SWPS-V62
FDNS	00NR		2	13SP	G13_013	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	252	0.0553	115.176	SPP-SWPS-K37
FDNS	00NR		2	13SP	G13_013	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	252	0.0553	113.0333	SPP-SWPS-K37
FDNS	00G13_013		2	18SP	G13_013	FROM->TO	WOLFFORTH INTERCHANGE - YUMA INTERCHANGE 115KV CKT 1	154	0.05398	104.5319	LUBBOCK SOUTH INTERCHANGE (ABB LLM60043) 230/115/13.2KV TRANSFORMER CKT 1
FDNS	00G13_013		2	13SP	G13_013	FROM->TO	WOLFFORTH INTERCHANGE - YUMA INTERCHANGE 115KV CKT 1	154	0.05319	104.2314	DBL-TUCO-STW
FDNS	00G13_013		2	18SP	G13_013	FROM->TO	WOLFFORTH INTERCHANGE - YUMA INTERCHANGE 115KV CKT 1	154	0.05264	111.2681	BASE CASE
FDNS	00G13_013		2	18SP	G13_013	FROM->TO	WOLFFORTH INTERCHANGE - YUMA INTERCHANGE 115KV CKT 1	154	0.0522	116.4999	ALLEN SUB - LUBBOCK SOUTH INTERCHANGE 115KV CKT 1
FDNS	00G13_013		2	18SP	G13_013	FROM->TO	WOLFFORTH INTERCHANGE - YUMA INTERCHANGE 115KV CKT 1	154	0.0522	100	ALLEN SUB - SOUTH PLAINS REC-QUAKER 115KV CKT 1
FDNS	00G13_013		2	13SP	G13_013	FROM->TO	BAILEY COUNTY REC-EARTH INTERCHANGE - CASTRO COUNTY INTERCHANGE 115KV CKT 1	160	0.05098	102.6327	DEAF SMITH COUNTY INTERCHANGE - PLANT X STATION 230KV CKT 1
FDNS	00G13_013		2	13SP	G13_013	FROM->TO	WOLFFORTH INTERCHANGE - YUMA INTERCHANGE 115KV CKT 1	154	0.04965	107.3602	EDDY COUNTY INTERCHANGE - EDDY_NORTH 6230.00 230KV CKT 1
FDNS	0		2	13SP	G13_013	FROM->TO	WOLFFORTH INTERCHANGE - YUMA INTERCHANGE 115KV CKT 1	154	0.0496	119.6145	CARLISLE INTERCHANGE - TUCO INTERCHANGE 230KV CKT 1
FDNS	00G13_013		2	13SP	G13_013	FROM->TO	WOLFFORTH INTERCHANGE - YUMA INTERCHANGE 115KV CKT 1	154	0.04942	139.2051	CARLISLE INTERCHANGE - TUCO INTERCHANGE 230KV CKT 1

SOLUTION	GROUP	SCENARIO	SEASON	SOURCE	DIRECTION	MONITORED ELEMENT	RATEB (MVA)	TDF	TC%LOADING (% MVA)	CONTINGENCY	
FDNS	00G13_013		2	13SP	G13_013	FROM->TO	WOLFFORTH INTERCHANGE - YUMA INTERCHANGE 115KV CKT 1	154	0.04714	103.1265	EDDY COUNTY INTERCHANGE (ABB AEM30711) 345/230/13.2KV TRANSFORMER CKT 1
FDNS	00G13_013		2	13SP	G13_013	FROM->TO	WOLFFORTH INTERCHANGE - YUMA INTERCHANGE 115KV CKT 1	154	0.04714	103.1236	CHAVESCO 345.00 - EDDY COUNTY INTERCHANGE 345KV CKT 1
FDNS	06NR		2	13G	G13_013	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.04708	112.3167	SPP-SWPS-K37
FDNS	06NR		2	13G	G13_013	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.04708	112.2683	SPP-SWPS-K37
FDNS	00G13_013		2	23SP	G13_013	FROM->TO	WOLFFORTH INTERCHANGE - YUMA INTERCHANGE 115KV CKT 1	154	0.04221	114.6202	CARLISLE INTERCHANGE - TUCO INTERCHANGE 230KV CKT 1
FDNS	0		2	18SP	G13_013	FROM->TO	WOLFFORTH INTERCHANGE - YUMA INTERCHANGE 115KV CKT 1	154	0.0417	105.4768	CARLISLE INTERCHANGE - TUCO INTERCHANGE 230KV CKT 1
FDNS	00G13_013		2	18SP	G13_013	FROM->TO	WOLFFORTH INTERCHANGE - YUMA INTERCHANGE 115KV CKT 1	154	0.04157	121.9051	CARLISLE INTERCHANGE - TUCO INTERCHANGE 230KV CKT 1
FDNS	00G13_013		2	13SP	G13_013	FROM->TO	CURRY COUNTY INTERCHANGE - DEAF SMITH REC-#20 115KV CKT 1	96	0.03812	101.51	BAILEY COUNTY REC-EARTH INTERCHANGE - PLANT X STATION 115KV CKT 1
FDNS	00NR		2	13SP	G13_013	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	252	0.03565	101.0932	SPP-SWPS-T04
FDNS	0		2	13SP	G13_013	FROM->TO	OASIS INTERCHANGE (ABB LLM60041) 230/115/13.2KV TRANSFORMER CKT 1	252	0.03292	116.5221	ROOSEVELT COUNTY INTERCHANGE (ABB LMM60042) 230/115/13.2KV TRANSFORMER CKT 1
FDNS	0		2	13SP	G13_013	FROM->TO	OASIS INTERCHANGE (ABB LLM60041) 230/115/13.2KV TRANSFORMER CKT 1	252	0.03292	114.9367	ROOSEVELT COUNTY INTERCHANGE (ABB LMM60042) 230/115/13.2KV TRANSFORMER CKT 1
FDNS	00G13_013		2	13SP	G13_013	FROM->TO	OASIS INTERCHANGE (ABB LLM60041) 230/115/13.2KV TRANSFORMER CKT 1	252	0.03282	124.0014	ROOSEVELT COUNTY INTERCHANGE (ABB LMM60042) 230/115/13.2KV TRANSFORMER CKT 1
FDNS	00G13_013		2	13SP	G13_013	FROM->TO	OASIS INTERCHANGE (ABB LLM60041) 230/115/13.2KV TRANSFORMER CKT 1	252	0.03282	122.4377	ROOSEVELT COUNTY INTERCHANGE (ABB LMM60042) 230/115/13.2KV TRANSFORMER CKT 1
FDNS	0		2	13SP	G13_013	FROM->TO	ROOSEVELT COUNTY INTERCHANGE (ABB LMM60042) 230/115/13.2KV TRANSFORMER CKT 1	252	0.03274	120.1493	OASIS INTERCHANGE (ABB LLM60041) 230/115/13.2KV TRANSFORMER CKT 1
FDNS	0		2	13SP	G13_013	FROM->TO	ROOSEVELT COUNTY INTERCHANGE (ABB LMM60042) 230/115/13.2KV TRANSFORMER CKT 1	252	0.03274	118.4726	OASIS INTERCHANGE (ABB LLM60041) 230/115/13.2KV TRANSFORMER CKT 1
FDNS	00G13_013		2	13SP	G13_013	FROM->TO	ROOSEVELT COUNTY INTERCHANGE (ABB LMM60042) 230/115/13.2KV TRANSFORMER CKT 1	252	0.03264	127.6342	OASIS INTERCHANGE (ABB LLM60041) 230/115/13.2KV TRANSFORMER CKT 1
FDNS	00G13_013		2	13SP	G13_013	FROM->TO	ROOSEVELT COUNTY INTERCHANGE (ABB LMM60042) 230/115/13.2KV TRANSFORMER CKT 1	252	0.03264	125.8168	OASIS INTERCHANGE (ABB LLM60041) 230/115/13.2KV TRANSFORMER CKT 1
FDNS	06ALL		2	13G	G13_013	TO->FROM	PLANT X STATION - TOLK STATION WEST 230KV CKT 1	502	0.38206	118.9947	PLANT X STATION - TOLK STATION EAST 230KV CKT 2
FDNS	06ALL		2	13G	G13_013	TO->FROM	PLANT X STATION - TOLK STATION EAST 230KV CKT 2	502	0.37631	117.731	PLANT X STATION - TOLK STATION WEST 230KV CKT 1
FDNS	00G13_013		2	13SP	G13_013	TO->FROM	DEAF SMITH COUNTY INTERCHANGE - PLANT X STATION 230KV CKT 1	351	0.18829	111.7764	DBL-TUCO-STW
FDNS	00G13_013		2	13SP	G13_013	TO->FROM	DEAF SMITH COUNTY INTERCHANGE - PLANT X STATION 230KV CKT 1	351	0.16803	102.1106	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1
FDNS	00G13_013		2	13SP	G13_013	TO->FROM	DEAF SMITH COUNTY INTERCHANGE - PLANT X STATION 230KV CKT 1	351	0.16695	105.5806	LAWTON EASTSIDE - OKLAUNION 345KV CKT 1
FDNS	00G13_013		2	13SP	G13_013	TO->FROM	DEAF SMITH COUNTY INTERCHANGE - PLANT X STATION 230KV CKT 1	351	0.16364	117.0501	BAILEY COUNTY REC-EARTH INTERCHANGE - PLANT X STATION 115KV CKT 1
FDNS	00G13_013		2	13SP	G13_013	TO->FROM	DEAF SMITH COUNTY INTERCHANGE - PLANT X STATION 230KV CKT 1	351	0.16364	104.7791	BAILEY COUNTY REC-EARTH INTERCHANGE - CASTRO COUNTY INTERCHANGE 115KV CKT 1
FDNS	00G13_013		2	13SP	G13_013	TO->FROM	DEAF SMITH COUNTY INTERCHANGE - PLANT X STATION 230KV CKT 1	351	0.16364	104.7447	SPP-SWPS-26
FDNS	00G13_013		2	13SP	G13_013	TO->FROM	SP-WOLF_TP 3115.00 - YUMA INTERCHANGE 115KV CKT 1	175	0.09639	108.001	TOLK STATION EAST - TUCO INTERCHANGE 230KV CKT 1
FDNS	00G13_013		2	13SP	G13_013	TO->FROM	LP-DOUD_TP 3115.00 - SP-WOLF_TP 3115.00 115KV CKT 1	175	0.09639	100.3485	TOLK STATION EAST - TUCO INTERCHANGE 230KV CKT 1
FDNS	00G13_013		2	13SP	G13_013	TO->FROM	SP-WOLF_TP 3115.00 - YUMA INTERCHANGE 115KV CKT 1	175	0.06197	106.1423	ALLEN SUB - LUBBOCK SOUTH INTERCHANGE 115KV CKT 1
FDNS	0		2	13SP	G13_013	TO->FROM	BAILEY COUNTY REC-EARTH INTERCHANGE - PLANT X STATION 115KV CKT 1	160	0.05117	111.5231	DEAF SMITH COUNTY INTERCHANGE - PLANT X STATION 230KV CKT 1
FDNS	00G13_013		2	13SP	G13_013	TO->FROM	BAILEY COUNTY REC-EARTH INTERCHANGE - PLANT X STATION 115KV CKT 1	160	0.05098	132.9231	DEAF SMITH COUNTY INTERCHANGE - PLANT X STATION 230KV CKT 1
FDNS	00G13_013		2	13SP	G13_013	TO->FROM	SP-WOLF_TP 3115.00 - YUMA INTERCHANGE 115KV CKT 1	175	0.04942	102.0004	CARLISLE INTERCHANGE - TUCO INTERCHANGE 230KV CKT 1
FDNS	6		2	13G	G13_013	TO->FROM	FPL SWITCH - WOODWARD 138KV CKT 1	153	0.04323	123.226	DBL-WWRD-G12
FDNS	06G13_013		2	13G	G13_013	TO->FROM	FPL SWITCH - WOODWARD 138KV CKT 1	153	0.04312	127.3962	DBL-WWRD-G12
FDNS	06ALL		2	13G	G13_013	TO->FROM	FPL SWITCH - WOODWARD 138KV CKT 1	153	0.04284	137.5001	DBL-WWRD-G12
FDNS	00G13_013		2	18SP	G13_013	TO->FROM	SP-WOLF_TP 3115.00 - YUMA INTERCHANGE 115KV CKT 1	175	0.04157	100.4467	CARLISLE INTERCHANGE - TUCO INTERCHANGE 230KV CKT 1
FDNS	00G13_013		2	18SP	G13_013	TO->FROM	BAILEY COUNTY REC-EARTH INTERCHANGE - PLANT X STATION 115KV CKT 1	160	0.04148	100.9378	DEAF SMITH COUNTY INTERCHANGE - PLANT X STATION 230KV CKT 1
FDNS	00G13_013		3	13SP	G13_013	FROM->TO	CHAVESCO 345.00 - EDDY COUNTY INTERCHANGE 345KV CKT 1	557	1	100	G13_013T 345.00 - TOLK STATION 345KV CKT 1
FDNS	00G13_013		3	13WP	G13_013	FROM->TO	CHAVESCO 345.00 - EDDY COUNTY INTERCHANGE 345KV CKT 1	557	1	100	G13_013T 345.00 - TOLK STATION 345KV CKT 1
FDNS	00G13_013		3	13WP	G13_013	FROM->TO	TOLK STATION (ABBXNL844501) 345/230/13.2KV TRANSFORMER CKT 1	557	1	100	EDDY COUNTY INTERCHANGE (ABB AEM30711) 345/230/13.2KV TRANSFORMER CKT 1
FDNS	00G13_013		3	13WP	G13_013	FROM->TO	TOLK STATION (ABBXNL844501) 345/230/13.2KV TRANSFORMER CKT 1	557	1	99.9	CHAVESCO 345.00 - EDDY COUNTY INTERCHANGE 345KV CKT 1
FDNS	00G13_013		3	18SP	G13_013	FROM->TO	CHAVESCO 345.00 - EDDY COUNTY INTERCHANGE 345KV CKT 1	557	1	100.8515	G13_013T 345.00 - TOLK STATION 345KV CKT 1
FDNS	00G13_013		3	18SP	G13_013	FROM->TO	CHAVESCO 345.00 - EDDY COUNTY INTERCHANGE 345KV CKT 1	557	1	100.0523	TOLK STATION (ABBXNL844501) 345/230/13.2KV TRANSFORMER CKT 1
FDNS	00G13_013		3	18WP	G13_013	FROM->TO	CHAVESCO 345.00 - EDDY COUNTY INTERCHANGE 345KV CKT 1	557	1	100.6313	G13_013T 345.00 - TOLK STATION 345KV CKT 1
FDNS	00G13_013		3	18WP	G13_013	FROM->TO	CHAVESCO 345.00 - EDDY COUNTY INTERCHANGE 345KV CKT 1	557	1	99.9	TOLK STATION (ABBXNL844501) 345/230/13.2KV TRANSFORMER CKT 1
FDNS	00G13_013		3	23SP	G13_013	FROM->TO	CHAVESCO 345.00 - EDDY COUNTY INTERCHANGE 345KV CKT 1	557	1	102.07	G13_013T 345.00 - TOLK STATION 345KV CKT 1
FDNS	00G13_013		3	23SP	G13_013	FROM->TO	CHAVESCO 345.00 - EDDY COUNTY INTERCHANGE 345KV CKT 1	557	1	100.7676	TOLK STATION (ABBXNL844501) 345/230/13.2KV TRANSFORMER CKT 1
FDNS	06ALL		3	13G	G13_013	FROM->TO	TOLK STATION (ABBXNL844501) 345/230/13.2KV TRANSFORMER CKT 1	557	1	99.9	EDDY COUNTY INTERCHANGE (ABB AEM30711) 345/230/13.2KV TRANSFORMER CKT 1
FDNS	06G13_013		3	13G	G13_013	FROM->TO	CHAVESCO 345.00 - EDDY COUNTY INTERCHANGE 345KV CKT 1	557	1	100	G13_013T 345.00 - TOLK STATION 345KV CKT 1
FDNS	00G13_013		3	13SP	G13_013	FROM->TO	WOLFFORTH INTERCHANGE - YUMA INTERCHANGE 115KV CKT 1	154	0.12917	127.7748	LUBBOCK SOUTH INTERCHANGE - WOLFFORTH INTERCHANGE 230KV CKT 1
FDNS	06ALL		3	13G	G13_013	FROM->TO	WOLFFORTH INTERCHANGE - YUMA INTERCHANGE 115KV CKT 1	154	0.12552	102.2376	LUBBOCK SOUTH INTERCHANGE - WOLFFORTH INTERCHANGE 230KV CKT 1
FDNS	00G13_013		3	13SP	G13_013	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	252	0.1137	107.3497	TOLK STATION EAST - TUCO INTERCHANGE 230KV CKT 1
FDNS	00G13_013		3	13SP	G13_013	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	252	0.1137	105.1507	TOLK STATION EAST - TUCO INTERCHANGE 230KV CKT 1
FDNS	6		3	13G	G13_013	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.10855	107.4508	TOLK STATION EAST - TUCO INTERCHANGE 230KV CKT 1
FDNS	6		3	13G	G13_013	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.10855	107.405	TOLK STATION EAST - TUCO INTERCHANGE 230KV CKT 1
FDNS	06G13_013		3	13G	G13_013	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.10834	114.2886	TOLK STATION EAST - TUCO INTERCHANGE 230KV CKT 1
FDNS	06G13_013		3	13G	G13_013	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.10834	114.2413	TOLK STATION EAST - TUCO INTERCHANGE 230KV CKT 1
FDNS	06ALL		3	13G	G13_013	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.10785	120.7563	TOLK STATION EAST - TUCO INTERCHANGE 230KV CKT 1
FDNS	06ALL		3	13G	G13_013	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.10785	120.5699	TOLK STATION EAST - TUCO INTERCHANGE 230KV CKT 1
FDNS	00G13_013		3	13SP	G13_013	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	252	0.10766	112.9391	DEAF SMITH COUNTY INTERCHANGE - PLANT X STATION 230KV CKT 1
FDNS	00G13_013		3	13SP	G13_013	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	252	0.10766	110.4368	DEAF SMITH COUNTY INTERCHANGE - PLANT X STATION 230KV CKT 1
FDNS	00G13_013		3	13SP	G13_013	FROM->TO	WOLFFORTH INTERCHANGE - YUMA INTERCHANGE 115KV CKT 1	154	0.10688	121.8843	G13_013T 345.00 - TOLK STATION 345KV CKT 1
FDNS	00G13_013		3	13SP	G13_013	FROM->TO	WOLFFORTH INTERCHANGE - YUMA INTERCHANGE 115KV CKT 1	154	0.10688	121.8758	TOLK STATION (ABBXNL844501) 345/230/13.2KV TRANSFORMER CKT 1
FDNS	00G13_013		3	18SP	G13_013	FROM->TO	ELK CITY 230KV (ELKCTY-6) 230/138/13.8KV TRANSFORMER CKT 1	287	0.10405	103.2987	ELKCTY7 345.00 - GRACEMONT 345KV CKT 1
FDNS	00G13_013		3	18SP	G13_013	FROM->TO	ELK CITY 230KV (ELKCTY-6) 230/138/13.8KV TRANSFORMER CKT 1	287	0.10405	103.1654	ELKCTY7 345.00 - GRACEMONT 345KV CKT 1
FDNS	6		3	13G	G13_013	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.10288	102.9925	DEAF SMITH COUNTY INTERCHANGE - PLANT X STATION 230KV CKT 1
FDNS	6		3	13G	G13_013	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.10288	102.9476	DEAF SMITH COUNTY INTERCHANGE - PLANT X STATION 230KV CKT 1
FDNS	06G13_013		3	13G	G13_013	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.10269	109.1965	DEAF SMITH COUNTY INTERCHANGE - PLANT X STATION 230KV CKT 1
FDNS	06G13_013		3	13G	G13_013	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.10269	109.1503	DEAF SMITH COUNTY INTERCHANGE - PLANT X STATION 230KV CKT 1
FDNS	06ALL		3	13G	G13_013	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.10224	117.1693	DEAF SMITH COUNTY INTERCHANGE - PLANT X STATION 230KV CKT 1
FDNS	06ALL		3	13G	G13_013	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.10224	117.122	DEAF SMITH COUNTY INTERCHANGE - PLANT X STATION 230KV CKT 1
FDNS	00G13_013		3	18WP	G13_013	FROM->TO	ELK CITY 230KV (ELKCTY-6) 230/138/13.8KV TRANSFORMER CKT 1	287	0.10216	120.8953	ELKCTY7 345.00 - GRACEMONT 345KV CKT 1
FDNS	00G13_013		3	18WP	G13_013	FROM->TO	ELK CITY				

SOLUTION	GROUP	SCENARIO	SEASON	SOURCE	DIRECTION	MONITORED ELEMENT	RATEB (MVA)	TDF	TC%LOADING (% MVA)	CONTINGENCY	
FDNS	00G13_013		3	13SP	G13_013	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	252	0.08954	108.993	LAMB COUNTY INTERCHANGE (WH ALM20172) 230/115/13.2KV TRANSFORMER CKT 1
FDNS	00G13_013		3	13SP	G13_013	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	252	0.08954	108.993	SPP-SWPS-K37
FDNS	00G13_013		3	13SP	G13_013	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	252	0.08954	106.5879	LAMB COUNTY INTERCHANGE - TOLK STATION WEST 230KV CKT 1
FDNS	00G13_013		3	13SP	G13_013	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	252	0.08954	106.5747	LAMB COUNTY INTERCHANGE (WH ALM20172) 230/115/13.2KV TRANSFORMER CKT 1
FDNS	00G13_013		3	13SP	G13_013	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	252	0.08954	106.5747	SPP-SWPS-K37
FDNS	06ALL		3	13G	G13_013	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.0855	102.4721	LAMB COUNTY INTERCHANGE - PLANT X STATION 115KV CKT 1
FDNS	06ALL		3	13G	G13_013	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.0855	102.4245	LAMB COUNTY INTERCHANGE - PLANT X STATION 115KV CKT 1
FDNS	00G13_013		3	18WP	G13_013	FROM->TO	ELK CITY 230KV (ELKCTY-6) 230/138/13.8KV TRANSFORMER CKT 1	287	0.08541	107.9891	LAWTON EASTSIDE - OKLAUNION 345KV CKT 1
FDNS	00G13_013		3	18WP	G13_013	FROM->TO	ELK CITY 230KV (ELKCTY-6) 230/138/13.8KV TRANSFORMER CKT 1	287	0.08541	107.0306	LAWTON EASTSIDE - OKLAUNION 345KV CKT 1
FDNS	6		3	13G	G13_013	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.08475	108.3547	LAMB COUNTY INTERCHANGE - TOLK STATION WEST 230KV CKT 1
FDNS	6		3	13G	G13_013	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.08475	108.3408	LAMB COUNTY INTERCHANGE (WH ALM20172) 230/115/13.2KV TRANSFORMER CKT 1
FDNS	6		3	13G	G13_013	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.08475	108.3408	SPP-SWPS-K37
FDNS	6		3	13G	G13_013	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.08475	108.3077	LAMB COUNTY INTERCHANGE - TOLK STATION WEST 230KV CKT 1
FDNS	6		3	13G	G13_013	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.08475	108.2939	LAMB COUNTY INTERCHANGE (WH ALM20172) 230/115/13.2KV TRANSFORMER CKT 1
FDNS	6		3	13G	G13_013	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.08475	108.2939	SPP-SWPS-K37
FDNS	06G13_013		3	13G	G13_013	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.0846	113.2943	LAMB COUNTY INTERCHANGE (WH ALM20172) 230/115/13.2KV TRANSFORMER CKT 1
FDNS	06G13_013		3	13G	G13_013	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.0846	113.2943	SPP-SWPS-K37
FDNS	06G13_013		3	13G	G13_013	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.0846	113.2669	LAMB COUNTY INTERCHANGE - TOLK STATION WEST 230KV CKT 1
FDNS	06G13_013		3	13G	G13_013	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.0846	113.246	LAMB COUNTY INTERCHANGE (WH ALM20172) 230/115/13.2KV TRANSFORMER CKT 1
FDNS	06G13_013		3	13G	G13_013	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.0846	113.2459	SPP-SWPS-K37
FDNS	06G13_013		3	13G	G13_013	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.0846	113.2185	LAMB COUNTY INTERCHANGE - TOLK STATION WEST 230KV CKT 1
FDNS	06ALL		3	13G	G13_013	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.08422	117.9672	LAMB COUNTY INTERCHANGE - TOLK STATION WEST 230KV CKT 1
FDNS	06ALL		3	13G	G13_013	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.08422	117.9539	LAMB COUNTY INTERCHANGE (WH ALM20172) 230/115/13.2KV TRANSFORMER CKT 1
FDNS	06ALL		3	13G	G13_013	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.08422	117.9539	SPP-SWPS-K37
FDNS	06ALL		3	13G	G13_013	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.08422	117.9177	LAMB COUNTY INTERCHANGE - TOLK STATION WEST 230KV CKT 1
FDNS	06ALL		3	13G	G13_013	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.08422	117.9044	LAMB COUNTY INTERCHANGE (WH ALM20172) 230/115/13.2KV TRANSFORMER CKT 1
FDNS	06ALL		3	13G	G13_013	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.08422	117.9044	SPP-SWPS-K37
FDNS	06ALL		3	13G	G13_013	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.08361	100.7193	SUNDOWN INTERCHANGE - WOLFFORTH INTERCHANGE 230KV CKT 1
FDNS	06ALL		3	13G	G13_013	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.08361	100.6748	SUNDOWN INTERCHANGE - WOLFFORTH INTERCHANGE 230KV CKT 1
FDNS	06ALL		3	13G	G13_013	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.07731	103.7916	PLANT X STATION - SUNDOWN INTERCHANGE 230KV CKT 1
FDNS	06ALL		3	13G	G13_013	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.07731	103.7466	PLANT X STATION - SUNDOWN INTERCHANGE 230KV CKT 1
FDNS	00G13_013		3	13SP	G13_013	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	252	0.07529	104.2203	GEN525493 1-PLANT X GEN #3
FDNS	00G13_013		3	13SP	G13_013	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	252	0.07529	103.5882	GEN525492 1-PLANT X GEN #2
FDNS	00G13_013		3	13SP	G13_013	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	252	0.07529	101.902	GEN525493 1-PLANT X GEN #3
FDNS	00G13_013		3	13SP	G13_013	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	252	0.07529	101.2834	GEN525492 1-PLANT X GEN #2
FDNS	00G13_013		3	13SP	G13_013	FROM->TO	WOLFFORTH INTERCHANGE - YUMA INTERCHANGE 115KV CKT 1	154	0.07477	130.4509	JONES STATION - TUCO INTERCHANGE 230KV CKT 1
FDNS	00G13_013		3	18SP	G13_013	FROM->TO	WOLFFORTH INTERCHANGE - YUMA INTERCHANGE 115KV CKT 1	154	0.0736	103.4907	TOLK STATION EAST - TUCO INTERCHANGE 230KV CKT 1
FDNS	00G13_013		3	13SP	G13_013	FROM->TO	WOLFFORTH INTERCHANGE - YUMA INTERCHANGE 115KV CKT 1	154	0.0705	120.7224	PLANT X STATION - POTTER COUNTY INTERCHANGE 230KV CKT 1
FDNS	00G13_013		3	13SP	G13_013	FROM->TO	WOLFFORTH INTERCHANGE - YUMA INTERCHANGE 115KV CKT 1	154	0.07025	117.8313	BUFFALO 230.00 - BUSHLAND INTERCHANGE 230KV CKT 1
FDNS	00G13_013		3	13SP	G13_013	FROM->TO	WOLFFORTH INTERCHANGE - YUMA INTERCHANGE 115KV CKT 1	154	0.07025	116.8573	BUFFALO 230.00 - DEAF SMITH COUNTY INTERCHANGE 230KV CKT 1
FDNS	00G13_013		3	13SP	G13_013	FROM->TO	WOLFFORTH INTERCHANGE - YUMA INTERCHANGE 115KV CKT 1	154	0.06908	122.3396	DEAF SMITH COUNTY INTERCHANGE - PLANT X STATION 230KV CKT 1
FDNS	00G13_013		3	13SP	G13_013	FROM->TO	WOLFFORTH INTERCHANGE - YUMA INTERCHANGE 115KV CKT 1	154	0.06583	116.0705	SPP-SWPS-04
FDNS	00G13_013		3	13SP	G13_013	FROM->TO	WOLFFORTH INTERCHANGE - YUMA INTERCHANGE 115KV CKT 1	154	0.06583	115.1695	Hitchland Interchange - POTTER COUNTY INTERCHANGE 345KV CKT 1
FDNS	00G13_013		3	13SP	G13_013	FROM->TO	WOLFFORTH INTERCHANGE - YUMA INTERCHANGE 115KV CKT 1	154	0.06583	114.6914	POTTER COUNTY INTERCHANGE (WAUK 90344-A) 345/230/13.2KV TRANSFORMER CKT 1
FDNS	00G13_013		3	13SP	G13_013	FROM->TO	WOLFFORTH INTERCHANGE - YUMA INTERCHANGE 115KV CKT 1	154	0.06567	114.3662	DBL-HTCH-BVR
FDNS	00G13_013		3	13SP	G13_013	FROM->TO	WOLFFORTH INTERCHANGE - YUMA INTERCHANGE 115KV CKT 1	154	0.06479	116.8198	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1
FDNS	00G13_013		3	13SP	G13_013	FROM->TO	WOLFFORTH INTERCHANGE - YUMA INTERCHANGE 115KV CKT 1	154	0.06463	115.8911	HALE CO INTERCHANGE - PLANT X STATION 115KV CKT 1
FDNS	00G13_013		3	13SP	G13_013	FROM->TO	WOLFFORTH INTERCHANGE - YUMA INTERCHANGE 115KV CKT 1	154	0.06448	117.4952	LAMB COUNTY REC-SOUTH OLTON - PLANT X STATION 115KV CKT 1
FDNS	00G13_013		3	13SP	G13_013	FROM->TO	WOLFFORTH INTERCHANGE - YUMA INTERCHANGE 115KV CKT 1	154	0.06448	116.8866	SPP-SWPS-25
FDNS	00G13_013		3	13SP	G13_013	FROM->TO	WOLFFORTH INTERCHANGE - YUMA INTERCHANGE 115KV CKT 1	154	0.06448	116.856	LAMB COUNTY REC-SOUTH OLTON - LAMTON INTERCHANGE 115KV CKT 1
FDNS	0		3	13SP	G13_013	FROM->TO	WOLFFORTH INTERCHANGE - YUMA INTERCHANGE 115KV CKT 1	154	0.06428	104.3433	LUBBOCK SOUTH INTERCHANGE (ABB LLM60043) 230/115/13.2KV TRANSFORMER CKT 1
FDNS	00G13_013		3	13SP	G13_013	FROM->TO	WOLFFORTH INTERCHANGE - YUMA INTERCHANGE 115KV CKT 1	154	0.06402	131.3273	LUBBOCK SOUTH INTERCHANGE (ABB LLM60043) 230/115/13.2KV TRANSFORMER CKT 1
FDNS	00G13_013		3	13SP	G13_013	FROM->TO	WOLFFORTH INTERCHANGE - YUMA INTERCHANGE 115KV CKT 1	154	0.06384	114.43	DBL-BVR-WWRD
FDNS	00G13_013		3	13SP	G13_013	FROM->TO	WOLFFORTH INTERCHANGE - YUMA INTERCHANGE 115KV CKT 1	154	0.06346	114.7846	SPP-SWPS-03
FDNS	00G13_013		3	13SP	G13_013	FROM->TO	WOLFFORTH INTERCHANGE - YUMA INTERCHANGE 115KV CKT 1	154	0.06342	114.3468	GRAPEVINE INTERCHANGE - STATELINE INTERCHANGE 230KV CKT 1
FDNS	00G13_013		3	13SP	G13_013	FROM->TO	WOLFFORTH INTERCHANGE - YUMA INTERCHANGE 115KV CKT 1	154	0.06335	108.419	SUNDOWN INTERCHANGE (WH XDS70381) 230/115/13.8KV TRANSFORMER CKT 1
FDNS	00G13_013		3	13SP	G13_013	FROM->TO	WOLFFORTH INTERCHANGE - YUMA INTERCHANGE 115KV CKT 1	154	0.06296	123.3547	Jones Station Bus#2 - LUBBOCK EAST INTERCHANGE 230KV CKT 1
FDNS	00G13_013		3	13SP	G13_013	FROM->TO	WOLFFORTH INTERCHANGE - YUMA INTERCHANGE 115KV CKT 1	154	0.06295	114.4406	GRAPEVINE INTERCHANGE - NICHOLS STATION 230KV CKT 1
FDNS	00G13_013		3	13SP	G13_013	FROM->TO	WOLFFORTH INTERCHANGE - YUMA INTERCHANGE 115KV CKT 1	154	0.06287	120.4818	LUBBOCK EAST INTERCHANGE (ENRC 136162) 230/115/13.2KV TRANSFORMER CKT 1
FDNS	00G13_013		3	13SP	G13_013	FROM->TO	WOLFFORTH INTERCHANGE - YUMA INTERCHANGE 115KV CKT 1	154	0.06283	117.5631	LUBBOCK POWER & LIGHT-MILWAUKEE (M-E C0681251) 230/69/13.5KV TRANSFORMER CKT 1
FDNS	00G13_013		3	13SP	G13_013	FROM->TO	WOLFFORTH INTERCHANGE - YUMA INTERCHANGE 115KV CKT 1	154	0.06283	117.5594	LUBBOCK POWER & LIGHT-MILWAUKEE - LUBBOCK POWER & LIGHT-VICKSBURG 69KV CKT 1
FDNS	0		3	13SP	G13_013	FROM->TO	WOLFFORTH INTERCHANGE - YUMA INTERCHANGE 115KV CKT 1	154	0.0625	110.6726	BASE CASE
FDNS	00G13_013		3	13SP	G13_013	FROM->TO	WOLFFORTH INTERCHANGE - YUMA INTERCHANGE 115KV CKT 1	154	0.06245	114.9088	LUBBOCK POWER & LIGHT-SOUTHEAST - LUBBOCK SOUTH INTERCHANGE 230KV CKT 1
FDNS	00G13_013		3	13SP	G13_013	FROM->TO	WOLFFORTH INTERCHANGE - YUMA INTERCHANGE 115KV CKT 1	154	0.06243	114.946	BAILEY COUNTY REC-EARTH INTERCHANGE - PLANT X STATION 115KV CKT 1
FDNS	00G13_013		3	13SP	G13_013	FROM->TO	WOLFFORTH INTERCHANGE - YUMA INTERCHANGE 115KV CKT 1	154	0.06228	116.4398	SPP-SWPS-V49
FDNS	00G13_013		3	13SP	G13_013	FROM->TO	WOLFFORTH INTERCHANGE - YUMA INTERCHANGE 115KV CKT 1	154	0.06225	144.3957	BASE CASE
FNSL	00G13_013		3	13SP	G13_013	FROM->TO	WOLFFORTH INTERCHANGE - YUMA INTERCHANGE 115KV CKT 1	154	0.06225	115.438	GRASSLAND INTERCHANGE (PENN 0105951) 230/115/13.2KV TRANSFORMER CKT 1
FNSL	00G13_013		3	13SP	G13_013	FROM->TO	WOLFFORTH INTERCHANGE - YUMA INTERCHANGE 115KV CKT 1	154	0.06225	115.2113	GRASSLAND INTERCHANGE - Jones Station Bus#2 230KV CKT 1
FDNS	00G13_013		3	13SP	G13_013	FROM->TO	WOLFFORTH INTERCHANGE - YUMA INTERCHANGE 115KV CKT 1	154	0.06225	114.8123	GEN562308 1-G12-037 18.000
FDNS	00G13_013		3	13SP	G13_013	FROM->TO	WOLFFORTH INTERCHANGE - YUMA INTERCHANGE 115KV CKT 1	154	0.06225	114.7548	GEN560738 1-G13_016_2 18.000
FDNS	00G13_013		3	13SP	G13_013	FROM->TO	WOLFFORTH INTERCHANGE - YUMA INTERCHANGE 115KV CKT 1	154	0.06225	109.7598	GEN525492 1-PLANT X GEN #2
FDNS	00G13_013		3	13SP	G13_013	FROM->TO	WOLFFORTH INTERCHANGE - YUMA INTERCHANGE 115KV CKT 1	154	0.06225	109.6655	GEN525493 1-PLANT X GEN #3
FDNS	00G13_013		3	13SP	G13_013	FROM->TO	WOLFFORTH INTERCHANGE - YUMA INTERCHANGE 115KV CKT 1	154	0.06225	109.111	GEN523973 1-HARRINGTON GEN #3 24 KV
FDNS	00G13_013		3	13SP	G13_013	FROM->TO	WOLFFORTH INTERCHANGE - YUMA INTERCHANGE 115KV CKT 1	154	0.06225	109.0927	GEN523972 1-HARRINGTON GEN #2 24 KV
FDNS	00G13_013		3	13SP	G13_013	FROM->TO	WOLFFORTH INTERCHANGE - YUMA INTERCHANGE 115KV CKT 1	154	0.06225	109.0908	GEN523971 1-HARRINGTON GEN #1 24 KV
FDNS	00G13_013		3	13SP	G13_013	FROM->TO	WOLFFORTH INTERCHANGE - YUMA INTERCHANGE 115KV CKT 1	154	0.06225	108.5626	GEN526334 1-JONES_4 116.500
FDNS	00G13_013		3	13SP	G13_013	FROM->TO	WOLFFORTH INTERCHANGE - YUMA INTERCHANGE 115KV CKT 1	154	0.06225	108.5592	GEN526333 1-JONES GEN #3 21 KV
FDNS	00G13_013		3	13SP	G13_013	FROM->TO	WOLFFORTH INTERCHANGE - YUMA INTERCHANGE 115KV CKT 1	154	0.06225	107.329	GEN526331 1-JONES GEN #1 22 KV

SOLUTION	GROUP	SCENARIO	SEASON	SOURCE	DIRECTION	MONITORED ELEMENT	RATEB (MVA)	TDF	TC%LOADING (% MVA)	CONTINGENCY	
FDNS	00G13_013		3	13SP	G13_013	FROM->TO	WOLFFORTH INTERCHANGE - YUMA INTERCHANGE 115KV CKT 1	154	0.06225	107.3169	GEN526332 1-JONES GEN #2 21 KV
FDNS	00G13_013		3	13SP	G13_013	FROM->TO	WOLFFORTH INTERCHANGE - YUMA INTERCHANGE 115KV CKT 1	154	0.06225	105.7675	GEN527883 1-CUNNINGHAM GEN #3 22 KV
FDNS	00G13_013		3	13SP	G13_013	FROM->TO	WOLFFORTH INTERCHANGE - YUMA INTERCHANGE 115KV CKT 1	154	0.06225	105.6839	GEN525494 1-PLANT X GEN #4 20 KV
FDNS	00G13_013		3	13SP	G13_013	FROM->TO	WOLFFORTH INTERCHANGE - YUMA INTERCHANGE 115KV CKT 1	154	0.06225	104.216	GEN528361 1-MADDOX GEN #1
FDNS	00G13_013		3	13SP	G13_013	FROM->TO	WOLFFORTH INTERCHANGE - YUMA INTERCHANGE 115KV CKT 1	154	0.06225	103.9658	GEN527165 1-Mustang Gen #5
FDNS	00G13_013		3	13SP	G13_013	FROM->TO	WOLFFORTH INTERCHANGE - YUMA INTERCHANGE 115KV CKT 1	154	0.06225	102.5042	GEN527902 1-HOBBS PLANT #2 (CT)
FDNS	00G13_013		3	13SP	G13_013	FROM->TO	WOLFFORTH INTERCHANGE - YUMA INTERCHANGE 115KV CKT 1	154	0.06225	102.4336	GEN527901 1-HOBBS PLANT #1 (CT)
FDNS	00G13_013		3	13SP	G13_013	FROM->TO	WOLFFORTH INTERCHANGE - YUMA INTERCHANGE 115KV CKT 1	154	0.06225	101.958	GEN527164 1-MUSTANG GEN #4 22 KV
FDNS	00G13_013		3	13SP	G13_013	FROM->TO	WOLFFORTH INTERCHANGE - YUMA INTERCHANGE 115KV CKT 1	154	0.06225	101.708	GEN560729 1-G13_013_3_0.6900
FDNS	00G13_013		3	13SP	G13_013	FROM->TO	WOLFFORTH INTERCHANGE - YUMA INTERCHANGE 115KV CKT 1	154	0.06225	101.2042	GEN527163 1-MUSTANG GEN #3 22 KV
FDNS	00G13_013		3	13SP	G13_013	FROM->TO	WOLFFORTH INTERCHANGE - YUMA INTERCHANGE 115KV CKT 1	154	0.06225	100.6033	GEN527161 1-MUSTANG GEN #1
FDNS	00G13_013		3	13SP	G13_013	FROM->TO	WOLFFORTH INTERCHANGE - YUMA INTERCHANGE 115KV CKT 1	154	0.06225	100.6029	GEN527162 1-MUSTANG GEN #2
FDNS	00G13_013		3	13SP	G13_013	FROM->TO	WOLFFORTH INTERCHANGE - YUMA INTERCHANGE 115KV CKT 1	154	0.06225	100	GEN527882 1-CUNNINGHAM GEN #2 20 KV
FDNS	00G13_013		3	13SP	G13_013	FROM->TO	WOLFFORTH INTERCHANGE - YUMA INTERCHANGE 115KV CKT 1	154	0.0622	114.3149	SPP-SWPS-T14
FDNS	0		3	13SP	G13_013	FROM->TO	WOLFFORTH INTERCHANGE - YUMA INTERCHANGE 115KV CKT 1	154	0.06215	115.3424	ALLEN SUB - LUBBOCK SOUTH INTERCHANGE 115KV CKT 1
FDNS	0		3	13SP	G13_013	FROM->TO	WOLFFORTH INTERCHANGE - YUMA INTERCHANGE 115KV CKT 1	154	0.06215	100.3195	ALLEN SUB - SOUTH PLAINS REC-QUAKER 115KV CKT 1
FDNS	00G13_013		3	13SP	G13_013	FROM->TO	WOLFFORTH INTERCHANGE - YUMA INTERCHANGE 115KV CKT 1	154	0.06193	115.0299	SPP-SWPS-V55
FDNS	00G13_013		3	13SP	G13_013	FROM->TO	WOLFFORTH INTERCHANGE - YUMA INTERCHANGE 115KV CKT 1	154	0.06193	108.9925	AMOCO TAP - SUNDOWN INTERCHANGE 115KV CKT 1
FDNS	00G13_013		3	13SP	G13_013	FROM->TO	WOLFFORTH INTERCHANGE - YUMA INTERCHANGE 115KV CKT 1	154	0.0619	141.5871	ALLEN SUB - LUBBOCK SOUTH INTERCHANGE 115KV CKT 1
FDNS	00G13_013		3	13SP	G13_013	FROM->TO	WOLFFORTH INTERCHANGE - YUMA INTERCHANGE 115KV CKT 1	154	0.0619	126.6737	ALLEN SUB - SOUTH PLAINS REC-QUAKER 115KV CKT 1
FDNS	00G13_013		3	13SP	G13_013	FROM->TO	WOLFFORTH INTERCHANGE - YUMA INTERCHANGE 115KV CKT 1	154	0.0619	121.401	SOUTH PLAINS REC-QUAKER - South Plains REC-Frankford Sub 115KV CKT 1
FDNS	00G13_013		3	13SP	G13_013	FROM->TO	WOLFFORTH INTERCHANGE - YUMA INTERCHANGE 115KV CKT 1	154	0.0619	116.2278	MURPHY SUB - South Plains REC-Frankford Sub 115KV CKT 1
FDNS	00G13_013		3	13SP	G13_013	FROM->TO	WOLFFORTH INTERCHANGE - YUMA INTERCHANGE 115KV CKT 1	154	0.06178	109.4584	MUSTANG STATION N. - SEAGRAVES INTERCHANGE 115KV CKT 1
FDNS	00G13_013		3	13SP	G13_013	FROM->TO	WOLFFORTH INTERCHANGE - YUMA INTERCHANGE 115KV CKT 1	154	0.06152	110.1204	LAMB COUNTY INTERCHANGE (WH ALM20172) 230/115/13.2KV TRANSFORMER CKT 1
FDNS	00G13_013		3	13SP	G13_013	FROM->TO	WOLFFORTH INTERCHANGE - YUMA INTERCHANGE 115KV CKT 1	154	0.06152	110.1204	SPP-SWPS-K37
FDNS	00G13_013		3	13SP	G13_013	FROM->TO	WOLFFORTH INTERCHANGE - YUMA INTERCHANGE 115KV CKT 1	154	0.06152	110.1186	LAMB COUNTY INTERCHANGE - TOLK STATION WEST 230KV CKT 1
FDNS	00G13_013		3	13SP	G13_013	FROM->TO	WOLFFORTH INTERCHANGE - YUMA INTERCHANGE 115KV CKT 1	154	0.06139	114.6616	SPP-SWPS-T31
FDNS	00G13_013		3	13SP	G13_013	FROM->TO	WOLFFORTH INTERCHANGE - YUMA INTERCHANGE 115KV CKT 1	154	0.06139	114.6544	Lamb County REC-Opdyke Sub - SUNDOWN INTERCHANGE 115KV CKT 1
FDNS	00G13_013		3	13SP	G13_013	FROM->TO	WOLFFORTH INTERCHANGE - YUMA INTERCHANGE 115KV CKT 1	154	0.06139	109.2825	HOCKLEY COUNTY INTERCHANGE - LAMB COUNTY INTERCHANGE 115KV CKT 1
FDNS	00G13_013		3	13SP	G13_013	FROM->TO	WOLFFORTH INTERCHANGE - YUMA INTERCHANGE 115KV CKT 1	154	0.06136	109.6853	SWISHER COUNTY INTERCHANGE - TUCO INTERCHANGE 230KV CKT 1
FDNS	00G13_013		3	13SP	G13_013	FROM->TO	WOLFFORTH INTERCHANGE - YUMA INTERCHANGE 115KV CKT 1	154	0.06089	114.2951	TUCO INTERCHANGE (ENRCO 136401) 230/115/13.2KV TRANSFORMER CKT 2
FDNS	00G13_013		3	13SP	G13_013	FROM->TO	WOLFFORTH INTERCHANGE - YUMA INTERCHANGE 115KV CKT 1	154	0.06082	110.4876	SULPHUR INTERCHANGE - TERRY COUNTY INTERCHANGE 115KV CKT 1
FDNS	00G13_013		3	13SP	G13_013	FROM->TO	WOLFFORTH INTERCHANGE - YUMA INTERCHANGE 115KV CKT 1	154	0.06082	107.7181	SEAGRAVES INTERCHANGE - SULPHUR INTERCHANGE 115KV CKT 1
FDNS	00G13_013		3	13SP	G13_013	FROM->TO	WOLFFORTH INTERCHANGE - YUMA INTERCHANGE 115KV CKT 1	154	0.06079	114.4244	TUCO INTERCHANGE (GE M102345) 230/115/13.2KV TRANSFORMER CKT 1
FDNS	00G13_013		3	13SP	G13_013	FROM->TO	WOLFFORTH INTERCHANGE - YUMA INTERCHANGE 115KV CKT 1	154	0.06067	110.258	SPP-SWPS-T35
FDNS	00G13_013		3	13SP	G13_013	FROM->TO	WOLFFORTH INTERCHANGE - YUMA INTERCHANGE 115KV CKT 1	154	0.06067	110.2261	AMARILLO SOUTH INTERCHANGE - 607-48T 230.00 230KV CKT 1
FDNS	00G13_013		3	13SP	G13_013	FROM->TO	WOLFFORTH INTERCHANGE - YUMA INTERCHANGE 115KV CKT 1	154	0.06067	109.4502	PRENTICE SUB - TERRY COUNTY INTERCHANGE 115KV CKT 1
FDNS	00G13_013		3	13SP	G13_013	FROM->TO	WOLFFORTH INTERCHANGE - YUMA INTERCHANGE 115KV CKT 1	154	0.06067	108.0396	PRENTICE SUB - YOAKUM COUNTY INTERCHANGE 115KV CKT 1
FDNS	00G13_013		3	13SP	G13_013	FROM->TO	WOLFFORTH INTERCHANGE - YUMA INTERCHANGE 115KV CKT 1	154	0.06019	110.4273	LEA COUNTY INTERCHANGE - YOAKUM COUNTY INTERCHANGE 230KV CKT 1
FDNS	00G13_013		3	13SP	G13_013	FROM->TO	WOLFFORTH INTERCHANGE - YUMA INTERCHANGE 115KV CKT 1	154	0.05952	106.1979	DENVER CITY INTERCHANGE N. - TERRY COUNTY INTERCHANGE 115KV CKT 1
FDNS	00G13_013		3	13SP	G13_013	FROM->TO	WOLFFORTH INTERCHANGE - YUMA INTERCHANGE 115KV CKT 1	154	0.05891	114.3938	CUNNINGHAM STATION - EDDY COUNTY INTERCHANGE 230KV CKT 1
FDNS	00G13_013		3	13SP	G13_013	FROM->TO	WOLFFORTH INTERCHANGE - YUMA INTERCHANGE 115KV CKT 1	154	0.05872	108.7869	SPP-AEPW-32
FDNS	00G13_013		3	13SP	G13_013	FROM->TO	WOLFFORTH INTERCHANGE - YUMA INTERCHANGE 115KV CKT 1	154	0.05872	108.7775	G13_017T 345.00 - TUCO INTERCHANGE 345KV CKT 1
FDNS	00G13_013		3	13SP	G13_013	FROM->TO	WOLFFORTH INTERCHANGE - YUMA INTERCHANGE 115KV CKT 1	154	0.05872	108.5291	G13_017T 345.00 - OKLAUNION 345KV CKT 1
FDNS	00G13_013		3	13SP	G13_013	FROM->TO	WOLFFORTH INTERCHANGE - YUMA INTERCHANGE 115KV CKT 1	154	0.05872	106.2717	LAWTON EASTSIDE - OKLAUNION 345KV CKT 1
FDNS	00NR		3	13SP	G13_013	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	252	0.05711	116.9427	SPP-SWPS-K37
FDNS	00NR		3	13SP	G13_013	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	252	0.05711	114.3001	SPP-SWPS-K37
FDNS	00G13_013		3	13SP	G13_013	FROM->TO	WOLFFORTH INTERCHANGE - YUMA INTERCHANGE 115KV CKT 1	154	0.05687	108.3573	SUNDOWN INTERCHANGE - WOLFFORTH INTERCHANGE 230KV CKT 1
FDNS	00G13_013		3	13SP	G13_013	FROM->TO	CURRY COUNTY INTERCHANGE - DEAF SMITH REC-#20 115KV CKT 1	96	0.05676	111.6272	DEAF SMITH COUNTY INTERCHANGE - PLANT X STATION 230KV CKT 1
FDNS	00G13_013		3	13SP	G13_013	FROM->TO	WOLFFORTH INTERCHANGE - YUMA INTERCHANGE 115KV CKT 1	154	0.05637	105.6201	PLANT X STATION - SUNDOWN INTERCHANGE 230KV CKT 1
FDNS	00G13_013		3	13SP	G13_013	FROM->TO	WOLFFORTH INTERCHANGE - YUMA INTERCHANGE 115KV CKT 1	154	0.05557	116.9948	STANTON SUB - TUCO INTERCHANGE 115KV CKT 1
FDNS	00G13_013		3	13SP	G13_013	FROM->TO	WOLFFORTH INTERCHANGE - YUMA INTERCHANGE 115KV CKT 1	154	0.05557	104.1742	INDIANA SUB - SOUTH PLAINS REC-ERSKINE 115KV CKT 1
FDNS	00G13_013		3	13SP	G13_013	FROM->TO	WOLFFORTH INTERCHANGE - YUMA INTERCHANGE 115KV CKT 1	154	0.05557	101.6804	CARLISLE INTERCHANGE - SOUTH PLAINS REC-ERSKINE 115KV CKT 1
FDNS	00G13_013		3	13SP	G13_013	FROM->TO	WOLFFORTH INTERCHANGE - YUMA INTERCHANGE 115KV CKT 1	154	0.05557	101.0901	SPP-SWPS-V62
FDNS	06ALL		3	13G	G13_013	FROM->TO	CURRY COUNTY INTERCHANGE - DEAF SMITH REC-#20 115KV CKT 1	96	0.05554	111.5039	DEAF SMITH COUNTY INTERCHANGE - PLANT X STATION 230KV CKT 1
FDNS	00G13_013		3	18SP	G13_013	FROM->TO	WOLFFORTH INTERCHANGE - YUMA INTERCHANGE 115KV CKT 1	154	0.05363	104.2343	LUBBOCK SOUTH INTERCHANGE (ABB LLM60043) 230/115/13.2KV TRANSFORMER CKT 1
FDNS	00G13_013		3	13SP	G13_013	FROM->TO	WOLFFORTH INTERCHANGE - YUMA INTERCHANGE 115KV CKT 1	154	0.05311	104.1255	DBL-TUCO-STW
FDNS	00G13_013		3	18SP	G13_013	FROM->TO	WOLFFORTH INTERCHANGE - YUMA INTERCHANGE 115KV CKT 1	154	0.0523	110.9897	BASE CASE
FDNS	00G13_013		3	18SP	G13_013	FROM->TO	WOLFFORTH INTERCHANGE - YUMA INTERCHANGE 115KV CKT 1	154	0.0519	116.1231	ALLEN SUB - LUBBOCK SOUTH INTERCHANGE 115KV CKT 1
FDNS	00G13_013		3	13SP	G13_013	FROM->TO	BAILEY COUNTY REC-EARTH INTERCHANGE - CASTRO COUNTY INTERCHANGE 115KV CKT 1	160	0.05156	103.0505	DEAF SMITH COUNTY INTERCHANGE - PLANT X STATION 230KV CKT 1
FDNS	00G13_013		3	13SP	G13_013	FROM->TO	WOLFFORTH INTERCHANGE - YUMA INTERCHANGE 115KV CKT 1	154	0.04965	107.3769	EDDY COUNTY INTERCHANGE - EDDY_NORTH 6230.00 230KV CKT 1
FDNS	0		3	13SP	G13_013	FROM->TO	WOLFFORTH INTERCHANGE - YUMA INTERCHANGE 115KV CKT 1	154	0.04945	119.554	CARLISLE INTERCHANGE - TUCO INTERCHANGE 230KV CKT 1
FDNS	00G13_013		3	13SP	G13_013	FROM->TO	WOLFFORTH INTERCHANGE - YUMA INTERCHANGE 115KV CKT 1	154	0.04927	139.0529	CARLISLE INTERCHANGE - TUCO INTERCHANGE 230KV CKT 1
FDNS	06NR		3	13G	G13_013	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.04895	113.9773	SPP-SWPS-K37
FDNS	06NR		3	13G	G13_013	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.04895	113.929	SPP-SWPS-K37
FDNS	00G13_013		3	13SP	G13_013	FROM->TO	WOLFFORTH INTERCHANGE - YUMA INTERCHANGE 115KV CKT 1	154	0.0471	103.1077	EDDY COUNTY INTERCHANGE (ABB AEM30711) 345/230/13.2KV TRANSFORMER CKT 1
FDNS	00G13_013		3	13SP	G13_013	FROM->TO	WOLFFORTH INTERCHANGE - YUMA INTERCHANGE 115KV CKT 1	154	0.0471	103.1047	CHAVESCO 345.00 - EDDY COUNTY INTERCHANGE 345KV CKT 1
FDNS	00G13_013		3	23SP	G13_013	FROM->TO	WOLFFORTH INTERCHANGE - YUMA INTERCHANGE 115KV CKT 1	154	0.04186	114.4275	CARLISLE INTERCHANGE - TUCO INTERCHANGE 230KV CKT 1
FDNS	0		3	18SP	G13_013	FROM->TO	WOLFFORTH INTERCHANGE - YUMA INTERCHANGE 115KV CKT 1	154	0.04136	105.3339	CARLISLE INTERCHANGE - TUCO INTERCHANGE 230KV CKT 1
FDNS	00G13_013		3	18SP	G13_013	FROM->TO	WOLFFORTH INTERCHANGE - YUMA INTERCHANGE 115KV CKT 1	154	0.04123	121.6672	CARLISLE INTERCHANGE - TUCO INTERCHANGE 230KV CKT 1
FDNS	00NR		3	13SP	G13_013	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	252	0.03838	103.2904	SPP-SWPS-T04
FDNS	00NR		3	13SP	G13_013	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	252	0.03838	100.7385	SPP-SWPS-T04
FDNS	0		3	13SP	G13_013	FROM->TO	OASIS INTERCHANGE (ABB LLM60041) 230/115/13.2KV TRANSFORMER CKT 1	252	0.03143	116.0249	ROOSEVELT COUNTY INTERCHANGE (ABB LMM60042) 230/115/13.2KV TRANSFORMER CKT 1
FDNS	0		3	13SP	G13_013	FROM->TO	OASIS INTERCHANGE (ABB LLM60041) 230/115/13.2KV TRANSFORMER CKT 1	252	0.03143	114.5178	ROOSEVELT COUNTY INTERCHANGE (ABB LMM60042) 230/115/13.2KV TRANSFORMER CKT 1
FDNS	00G13_013		3	13SP	G13_013	FROM->TO	OASIS INTERCHANGE (ABB LLM60041) 230/115/13.2KV TRANSFORMER CKT 1	252	0.03134	123.2053	ROOSEVELT COUNTY INTERCHANGE (ABB LMM60042) 230/115/13.2KV TRANSFORMER CKT 1
FDNS	00G13_013		3	13SP	G13_013	FROM->TO	OASIS INTERCHANGE (ABB LLM60041) 230/115/13.2KV TRANSFORMER CKT 1	252	0.03134	121.7024	ROOSEVELT COUNTY INTERCHANGE (ABB LMM60042) 230/115/13.2KV TRANSFORMER CKT 1
FDNS	0		3	13SP	G13_013	FROM->TO	ROOSEVELT COUNTY INTERCHANGE (ABB LMM60042) 230/115/13.2KV TRANSFORMER CKT 1	252	0.03117	119.6668	OASIS INTERCHANGE (ABB LLM60041) 230/115/13.2KV TRANSFORMER CKT 1
FDNS	0		3	13SP	G13_013	FROM->TO	ROOSEVELT COUNTY INTERCHANGE (ABB LMM60042) 230/115/13.2KV TRANSFORMER CKT 1	252	0.03117	117.985	OASIS INTERCHANGE (ABB LLM60041) 230/115/13.2KV TRANSFORMER CKT 1

SOLUTION	GROUP	SCENARIO	SEASON	SOURCE	DIRECTION	MONITORED ELEMENT	RATEB (MVA)	TDF	TC%LOADING (% MVA)	CONTINGENCY	
FDNS	00G13_013		3	13SP	G13_013	FROM->TO	ROOSEVELT COUNTY INTERCHANGE (ABB LMM60042) 230/115/13.2KV TRANSFORMER CKT 1	252	0.03107	126.8174	OASIS INTERCHANGE (ABB LLM60041) 230/115/13.2KV TRANSFORMER CKT 1
FDNS	00G13_013		3	13SP	G13_013	FROM->TO	ROOSEVELT COUNTY INTERCHANGE (ABB LMM60042) 230/115/13.2KV TRANSFORMER CKT 1	252	0.03107	125.0025	OASIS INTERCHANGE (ABB LLM60041) 230/115/13.2KV TRANSFORMER CKT 1
FDNS	00G13_013		3	13SP	G13_013	TO->FROM	DEAF SMITH COUNTY INTERCHANGE - PLANT X STATION 230KV CKT 1	351	0.19147	113.1043	DBL-TUCO-STW
FDNS	00G13_013		3	13SP	G13_013	TO->FROM	DEAF SMITH COUNTY INTERCHANGE - PLANT X STATION 230KV CKT 1	351	0.17281	100.3487	CURRY COUNTY INTERCHANGE - DEAF SMITH REC-#20 115KV CKT 1
FDNS	00G13_013		3	13SP	G13_013	TO->FROM	DEAF SMITH COUNTY INTERCHANGE - PLANT X STATION 230KV CKT 1	351	0.17159	103.3316	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1
FDNS	00G13_013		3	13SP	G13_013	TO->FROM	DEAF SMITH COUNTY INTERCHANGE - PLANT X STATION 230KV CKT 1	351	0.17007	106.9269	LAWTON EASTSIDE - OKLAUNION 345KV CKT 1
FDNS	00G13_013		3	13SP	G13_013	TO->FROM	DEAF SMITH COUNTY INTERCHANGE - PLANT X STATION 230KV CKT 1	351	0.16673	118.424	BAILEY COUNTY REC-EARTH INTERCHANGE - PLANT X STATION 115KV CKT 1
FDNS	00G13_013		3	13SP	G13_013	TO->FROM	DEAF SMITH COUNTY INTERCHANGE - PLANT X STATION 230KV CKT 1	351	0.16673	105.9918	BAILEY COUNTY REC-EARTH INTERCHANGE - CASTRO COUNTY INTERCHANGE 115KV CKT 1
FDNS	00G13_013		3	13SP	G13_013	TO->FROM	DEAF SMITH COUNTY INTERCHANGE - PLANT X STATION 230KV CKT 1	351	0.16673	105.9056	SPP-SWPS-26
FDNS	00G13_013		3	13SP	G13_013	TO->FROM	DEAF SMITH COUNTY INTERCHANGE - PLANT X STATION 230KV CKT 1	351	0.15654	100.3194	BASE CASE
FDNS	00G13_013		3	13SP	G13_013	TO->FROM	SP-WOLF_TP 3115.00 - YUMA INTERCHANGE 115KV CKT 1	175	0.09534	107.4577	TOLK STATION EAST - TUCO INTERCHANGE 230KV CKT 1
FDNS	00G13_013		3	13SP	G13_013	TO->FROM	LP-DOUD_TP 3115.00 - SP-WOLF_TP 3115.00 115KV CKT 1	175	0.09534	99.9	TOLK STATION EAST - TUCO INTERCHANGE 230KV CKT 1
FDNS	00G13_013		3	13SP	G13_013	TO->FROM	SP-WOLF_TP 3115.00 - YUMA INTERCHANGE 115KV CKT 1	175	0.0619	106.0735	ALLEN SUB - LUBBOCK SOUTH INTERCHANGE 115KV CKT 1
FDNS	0		3	13SP	G13_013	TO->FROM	BAILEY COUNTY REC-EARTH INTERCHANGE - PLANT X STATION 115KV CKT 1	160	0.05175	111.7794	DEAF SMITH COUNTY INTERCHANGE - PLANT X STATION 230KV CKT 1
FDNS	00G13_013		3	13SP	G13_013	TO->FROM	BAILEY COUNTY REC-EARTH INTERCHANGE - PLANT X STATION 115KV CKT 1	160	0.05156	133.3268	DEAF SMITH COUNTY INTERCHANGE - PLANT X STATION 230KV CKT 1
FDNS	00G13_013		3	13SP	G13_013	TO->FROM	SP-WOLF_TP 3115.00 - YUMA INTERCHANGE 115KV CKT 1	175	0.04927	101.866	CARLISLE INTERCHANGE - TUCO INTERCHANGE 230KV CKT 1
FDNS	6		3	13G	G13_013	TO->FROM	FPL SWITCH - WOODWARD 138KV CKT 1	153	0.04322	123.2184	DBL-WWRD-G12
FDNS	06G13_013		3	13G	G13_013	TO->FROM	FPL SWITCH - WOODWARD 138KV CKT 1	153	0.04311	127.3824	DBL-WWRD-G12
FDNS	06ALL		3	13G	G13_013	TO->FROM	FPL SWITCH - WOODWARD 138KV CKT 1	153	0.04283	137.4852	DBL-WWRD-G12
FDNS	00G13_013		3	18SP	G13_013	TO->FROM	BAILEY COUNTY REC-EARTH INTERCHANGE - PLANT X STATION 115KV CKT 1	160	0.04167	101.0858	DEAF SMITH COUNTY INTERCHANGE - PLANT X STATION 230KV CKT 1
FDNS	00G13_013		3	18SP	G13_013	TO->FROM	SP-WOLF_TP 3115.00 - YUMA INTERCHANGE 115KV CKT 1	175	0.04123	100.2337	CARLISLE INTERCHANGE - TUCO INTERCHANGE 230KV CKT 1
FDNS	00G13_013		4	13SP	G13_013	FROM->TO	CHAVESCO 345.00 - EDDY COUNTY INTERCHANGE 345KV CKT 1	557	1	100	G13_013T 345.00 - TOLK STATION 345KV CKT 1
FDNS	00G13_013		4	13WP	G13_013	FROM->TO	CHAVESCO 345.00 - EDDY COUNTY INTERCHANGE 345KV CKT 1	557	1	100	G13_013T 345.00 - TOLK STATION 345KV CKT 1
FDNS	00G13_013		4	18SP	G13_013	FROM->TO	CHAVESCO 345.00 - EDDY COUNTY INTERCHANGE 345KV CKT 1	557	1	100.8516	G13_013T 345.00 - TOLK STATION 345KV CKT 1
FDNS	00G13_013		4	18WP	G13_013	FROM->TO	CHAVESCO 345.00 - EDDY COUNTY INTERCHANGE 345KV CKT 1	557	1	100.6313	G13_013T 345.00 - TOLK STATION 345KV CKT 1
FDNS	00G13_013		4	23SP	G13_013	FROM->TO	CHAVESCO 345.00 - EDDY COUNTY INTERCHANGE 345KV CKT 1	557	1	102.0429	G13_013T 345.00 - TOLK STATION 345KV CKT 1
FDNS	06G13_013		4	13G	G13_013	FROM->TO	CHAVESCO 345.00 - EDDY COUNTY INTERCHANGE 345KV CKT 1	557	1	100	G13_013T 345.00 - TOLK STATION 345KV CKT 1
FDNS	00G13_013		4	13SP	G13_013	FROM->TO	WOLFFORTH INTERCHANGE - YUMA INTERCHANGE 115KV CKT 1	154	0.12514	126.8474	LUBBOCK SOUTH INTERCHANGE - WOLFFORTH INTERCHANGE 230KV CKT 1
FDNS	06ALL		4	13G	G13_013	FROM->TO	WOLFFORTH INTERCHANGE - YUMA INTERCHANGE 115KV CKT 1	154	0.1215	101.5045	LUBBOCK SOUTH INTERCHANGE - WOLFFORTH INTERCHANGE 230KV CKT 1
FDNS	00G13_013		4	13SP	G13_013	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	252	0.11562	107.591	TOLK STATION EAST - TUCO INTERCHANGE 230KV CKT 1
FDNS	00G13_013		4	13SP	G13_013	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	252	0.11562	105.3924	TOLK STATION EAST - TUCO INTERCHANGE 230KV CKT 1
FDNS	6		4	13G	G13_013	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.11047	107.6501	TOLK STATION EAST - TUCO INTERCHANGE 230KV CKT 1
FDNS	6		4	13G	G13_013	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.11047	107.6042	TOLK STATION EAST - TUCO INTERCHANGE 230KV CKT 1
FDNS	06G13_013		4	13G	G13_013	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.11025	114.5548	TOLK STATION EAST - TUCO INTERCHANGE 230KV CKT 1
FDNS	06G13_013		4	13G	G13_013	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.11025	114.5075	TOLK STATION EAST - TUCO INTERCHANGE 230KV CKT 1
FDNS	06ALL		4	13G	G13_013	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.10976	121.0584	TOLK STATION EAST - TUCO INTERCHANGE 230KV CKT 1
FDNS	06ALL		4	13G	G13_013	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.10976	120.8634	TOLK STATION EAST - TUCO INTERCHANGE 230KV CKT 1
FDNS	00G13_013		4	13SP	G13_013	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	252	0.10933	113.1461	DEAF SMITH COUNTY INTERCHANGE - PLANT X STATION 230KV CKT 1
FDNS	00G13_013		4	13SP	G13_013	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	252	0.10933	110.6393	DEAF SMITH COUNTY INTERCHANGE - PLANT X STATION 230KV CKT 1
FDNS	00G13_013		4	13SP	G13_013	FROM->TO	WOLFFORTH INTERCHANGE - YUMA INTERCHANGE 115KV CKT 1	154	0.10688	121.8838	G13_013T 345.00 - TOLK STATION 345KV CKT 1
FDNS	6		4	13G	G13_013	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.10455	103.1737	DEAF SMITH COUNTY INTERCHANGE - PLANT X STATION 230KV CKT 1
FDNS	6		4	13G	G13_013	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.10455	103.1287	DEAF SMITH COUNTY INTERCHANGE - PLANT X STATION 230KV CKT 1
FDNS	06G13_013		4	13G	G13_013	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.10436	109.4518	DEAF SMITH COUNTY INTERCHANGE - PLANT X STATION 230KV CKT 1
FDNS	06G13_013		4	13G	G13_013	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.10436	109.4055	DEAF SMITH COUNTY INTERCHANGE - PLANT X STATION 230KV CKT 1
FDNS	00G13_013		4	18SP	G13_013	FROM->TO	ELK CITY 230KV (ELKCTY-6) 230/138/13.8KV TRANSFORMER CKT 1	287	0.10404	103.2922	ELKCTY7 345.00 - GRACEMONT 345KV CKT 1
FDNS	00G13_013		4	18SP	G13_013	FROM->TO	ELK CITY 230KV (ELKCTY-6) 230/138/13.8KV TRANSFORMER CKT 1	287	0.10404	103.1587	ELKCTY7 345.00 - GRACEMONT 345KV CKT 1
FDNS	06ALL		4	13G	G13_013	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.1039	117.4169	DEAF SMITH COUNTY INTERCHANGE - PLANT X STATION 230KV CKT 1
FDNS	06ALL		4	13G	G13_013	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.1039	117.3695	DEAF SMITH COUNTY INTERCHANGE - PLANT X STATION 230KV CKT 1
FDNS	00G13_013		4	18WP	G13_013	FROM->TO	ELK CITY 230KV (ELKCTY-6) 230/138/13.8KV TRANSFORMER CKT 1	287	0.10214	120.8955	ELKCTY7 345.00 - GRACEMONT 345KV CKT 1
FDNS	00G13_013		4	18WP	G13_013	FROM->TO	ELK CITY 230KV (ELKCTY-6) 230/138/13.8KV TRANSFORMER CKT 1	287	0.10214	120.8954	ELKCTY7 345.00 - GRACEMONT 345KV CKT 1
FDNS	0		4	13SP	G13_013	FROM->TO	WOLFFORTH INTERCHANGE - YUMA INTERCHANGE 115KV CKT 1	154	0.09388	101.8477	TOLK STATION EAST - TUCO INTERCHANGE 230KV CKT 1
FDNS	00G13_013		4	13SP	G13_013	FROM->TO	WOLFFORTH INTERCHANGE - YUMA INTERCHANGE 115KV CKT 1	154	0.09351	141.8074	TOLK STATION EAST - TUCO INTERCHANGE 230KV CKT 1
FDNS	00G13_013		4	13SP	G13_013	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	252	0.09173	109.3214	LAMB COUNTY INTERCHANGE - TOLK STATION WEST 230KV CKT 1
FDNS	00G13_013		4	13SP	G13_013	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	252	0.09173	109.3079	LAMB COUNTY INTERCHANGE (WH ALM20172) 230/115/13.2KV TRANSFORMER CKT 1
FDNS	00G13_013		4	13SP	G13_013	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	252	0.09173	109.3079	SPP-SWPS-K37
FDNS	00G13_013		4	13SP	G13_013	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	252	0.09173	106.8939	LAMB COUNTY INTERCHANGE - TOLK STATION WEST 230KV CKT 1
FDNS	00G13_013		4	13SP	G13_013	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	252	0.09173	106.8807	LAMB COUNTY INTERCHANGE (WH ALM20172) 230/115/13.2KV TRANSFORMER CKT 1
FDNS	00G13_013		4	13SP	G13_013	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	252	0.09173	106.8807	SPP-SWPS-K37
FDNS	06ALL		4	13G	G13_013	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.09167	106.1675	PLANT X STATION - POTTER COUNTY INTERCHANGE 230KV CKT 1
FDNS	06ALL		4	13G	G13_013	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.09167	106.1219	PLANT X STATION - POTTER COUNTY INTERCHANGE 230KV CKT 1
FDNS	06ALL		4	13G	G13_013	FROM->TO	WOLFFORTH INTERCHANGE - YUMA INTERCHANGE 115KV CKT 1	154	0.09041	105.4754	TOLK STATION EAST - TUCO INTERCHANGE 230KV CKT 1
FDNS	6		4	13G	G13_013	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.08695	108.6101	LAMB COUNTY INTERCHANGE - TOLK STATION WEST 230KV CKT 1
FDNS	6		4	13G	G13_013	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.08695	108.5964	LAMB COUNTY INTERCHANGE (WH ALM20172) 230/115/13.2KV TRANSFORMER CKT 1
FDNS	6		4	13G	G13_013	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.08695	108.5964	SPP-SWPS-K37
FDNS	6		4	13G	G13_013	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.08695	108.5627	LAMB COUNTY INTERCHANGE - TOLK STATION WEST 230KV CKT 1
FDNS	6		4	13G	G13_013	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.08695	108.549	LAMB COUNTY INTERCHANGE (WH ALM20172) 230/115/13.2KV TRANSFORMER CKT 1
FDNS	6		4	13G	G13_013	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.08695	108.549	SPP-SWPS-K37
FDNS	06G13_013		4	13G	G13_013	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.08679	113.6048	LAMB COUNTY INTERCHANGE (WH ALM20172) 230/115/13.2KV TRANSFORMER CKT 1
FDNS	06G13_013		4	13G	G13_013	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.08679	113.6048	SPP-SWPS-K37
FDNS	06G13_013		4	13G	G13_013	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.08679	113.5757	LAMB COUNTY INTERCHANGE - TOLK STATION WEST 230KV CKT 1
FDNS	06G13_013		4	13G	G13_013	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.08679	113.5565	LAMB COUNTY INTERCHANGE (WH ALM20172) 230/115/13.2KV TRANSFORMER CKT 1
FDNS	06G13_013		4	13G	G13_013	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.08679	113.5565	SPP-SWPS-K37
FDNS	06G13_013		4	13G	G13_013	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.08679	113.5274	LAMB COUNTY INTERCHANGE - TOLK STATION WEST 230KV CKT 1
FDNS	06ALL		4	13G	G13_013	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.0866	102.6196	LAMB COUNTY INTERCHANGE - PLANT X STATION 115KV CKT 1
FDNS	06ALL		4	13G	G13_013	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.0866	102.5751	LAMB COUNTY INTERCHANGE - PLANT X STATION 115KV CKT 1
FDNS	06ALL		4	13G	G13_013	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.08641	118.2951	LAMB COUNTY INTERCHANGE - TOLK STATION WEST 230KV CKT 1
FDNS	06ALL		4	13G	G13_013	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.08641	118.2819	LAMB COUNTY INTERCHANGE (WH ALM20172) 230/115/13.2KV TRANSFORMER CKT 1
FDNS	06ALL		4	13G	G13_013	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.08641	118.2819	SPP-SWPS

SOLUTION	GROUP	SCENARIO	SEASON	SOURCE	DIRECTION	MONITORED ELEMENT	RATEB (MVA)	TDF	TC%LOADING (% MVA)	CONTINGENCY
FDNS	06ALL		4 13G	G13_013	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.08641	118.2457	LAMB COUNTY INTERCHANGE - TOLK STATION WEST 230KV CKT 1
FDNS	06ALL		4 13G	G13_013	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.08641	118.2326	LAMB COUNTY INTERCHANGE (WH ALM20172) 230/115/13.2KV TRANSFORMER CKT 1
FDNS	06ALL		4 13G	G13_013	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.08641	118.2325	SPP-SWPS-K37
FDNS	00G13_013		4 18WP	G13_013	FROM->TO	ELK CITY 230KV (ELKCTY-6) 230/138/13.8KV TRANSFORMER CKT 1	287	0.08538	107.9851	LAWTON EASTSIDE - OKLAUNION 345KV CKT 1
FDNS	00G13_013		4 18WP	G13_013	FROM->TO	ELK CITY 230KV (ELKCTY-6) 230/138/13.8KV TRANSFORMER CKT 1	287	0.08538	107.0275	LAWTON EASTSIDE - OKLAUNION 345KV CKT 1
FDNS	06ALL		4 13G	G13_013	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.08476	100.888	SUNDOWN INTERCHANGE - WOLFFORTH INTERCHANGE 230KV CKT 1
FDNS	06ALL		4 13G	G13_013	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.08476	100.8435	SUNDOWN INTERCHANGE - WOLFFORTH INTERCHANGE 230KV CKT 1
FDNS	06G13_013		4 13G	G13_013	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.07995	100.1499	PLANT X STATION - SUNDOWN INTERCHANGE 230KV CKT 1
FDNS	06G13_013		4 13G	G13_013	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.07995	100.1059	PLANT X STATION - SUNDOWN INTERCHANGE 230KV CKT 1
FDNS	06ALL		4 13G	G13_013	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.07961	104.1303	PLANT X STATION - SUNDOWN INTERCHANGE 230KV CKT 1
FDNS	06ALL		4 13G	G13_013	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.07961	104.0851	PLANT X STATION - SUNDOWN INTERCHANGE 230KV CKT 1
FDNS	00G13_013		4 13SP	G13_013	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	252	0.0767	104.386	GEN525493 1-PLANT X GEN #3
FDNS	00G13_013		4 13SP	G13_013	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	252	0.0767	103.754	GEN525492 1-PLANT X GEN #2
FDNS	00G13_013		4 13SP	G13_013	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	252	0.0767	102.0643	GEN525493 1-PLANT X GEN #3
FDNS	00G13_013		4 13SP	G13_013	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	252	0.0767	101.4457	GEN525492 1-PLANT X GEN #2
FDNS	00G13_013		4 13SP	G13_013	FROM->TO	WOLFFORTH INTERCHANGE - YUMA INTERCHANGE 115KV CKT 1	154	0.07206	129.8344	JONES STATION - TUCO INTERCHANGE 230KV CKT 1
FDNS	00G13_013		4 18SP	G13_013	FROM->TO	WOLFFORTH INTERCHANGE - YUMA INTERCHANGE 115KV CKT 1	154	0.07152	103.0704	TOLK STATION EAST - TUCO INTERCHANGE 230KV CKT 1
FDNS	00G13_013		4 13SP	G13_013	FROM->TO	WOLFFORTH INTERCHANGE - YUMA INTERCHANGE 115KV CKT 1	154	0.06821	120.2306	PLANT X STATION - POTTER COUNTY INTERCHANGE 230KV CKT 1
FDNS	00G13_013		4 13SP	G13_013	FROM->TO	WOLFFORTH INTERCHANGE - YUMA INTERCHANGE 115KV CKT 1	154	0.06794	117.3245	BUFFALO 230.00 - BUSHLAND INTERCHANGE 230KV CKT 1
FDNS	00G13_013		4 13SP	G13_013	FROM->TO	WOLFFORTH INTERCHANGE - YUMA INTERCHANGE 115KV CKT 1	154	0.06794	116.3506	BUFFALO 230.00 - DEAF SMITH COUNTY INTERCHANGE 230KV CKT 1
FDNS	00G13_013		4 13SP	G13_013	FROM->TO	WOLFFORTH INTERCHANGE - YUMA INTERCHANGE 115KV CKT 1	154	0.06679	121.8546	DEAF SMITH COUNTY INTERCHANGE - PLANT X STATION 230KV CKT 1
FDNS	00G13_013		4 13SP	G13_013	FROM->TO	WOLFFORTH INTERCHANGE - YUMA INTERCHANGE 115KV CKT 1	154	0.06349	115.5618	SPP-SWPS-04
FDNS	00G13_013		4 13SP	G13_013	FROM->TO	WOLFFORTH INTERCHANGE - YUMA INTERCHANGE 115KV CKT 1	154	0.06349	114.6274	Hitchland Interchange - POTTER COUNTY INTERCHANGE 345KV CKT 1
FDNS	00G13_013		4 13SP	G13_013	FROM->TO	WOLFFORTH INTERCHANGE - YUMA INTERCHANGE 115KV CKT 1	154	0.06349	114.157	POTTER COUNTY INTERCHANGE (WAUK 90343-A) 345/230/13.2KV TRANSFORMER CKT 1
FDNS	00G13_013		4 13SP	G13_013	FROM->TO	WOLFFORTH INTERCHANGE - YUMA INTERCHANGE 115KV CKT 1	154	0.06249	116.3188	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1
FDNS	00G13_013		4 13SP	G13_013	FROM->TO	WOLFFORTH INTERCHANGE - YUMA INTERCHANGE 115KV CKT 1	154	0.06231	115.6011	HALE CO INTERCHANGE - PLANT X STATION 115KV CKT 1
FDNS	00G13_013		4 13SP	G13_013	FROM->TO	WOLFFORTH INTERCHANGE - YUMA INTERCHANGE 115KV CKT 1	154	0.06216	116.9845	LAMB COUNTY REC-SOUTH OLTON - PLANT X STATION 115KV CKT 1
FDNS	00G13_013		4 13SP	G13_013	FROM->TO	WOLFFORTH INTERCHANGE - YUMA INTERCHANGE 115KV CKT 1	154	0.06216	116.3718	SPP-SWPS-25
FDNS	00G13_013		4 13SP	G13_013	FROM->TO	WOLFFORTH INTERCHANGE - YUMA INTERCHANGE 115KV CKT 1	154	0.06216	116.2996	LAMB COUNTY REC-SOUTH OLTON - LAMTON INTERCHANGE 115KV CKT 1
FDNS	0		4 13SP	G13_013	FROM->TO	WOLFFORTH INTERCHANGE - YUMA INTERCHANGE 115KV CKT 1	154	0.06187	104.4087	LUBBOCK SOUTH INTERCHANGE (ABB LLM60043) 230/115/13.2KV TRANSFORMER CKT 1
FDNS	00G13_013		4 13SP	G13_013	FROM->TO	WOLFFORTH INTERCHANGE - YUMA INTERCHANGE 115KV CKT 1	154	0.06162	130.8032	LUBBOCK SOUTH INTERCHANGE (ABB LLM60043) 230/115/13.2KV TRANSFORMER CKT 1
FDNS	00G13_013		4 13SP	G13_013	FROM->TO	WOLFFORTH INTERCHANGE - YUMA INTERCHANGE 115KV CKT 1	154	0.0615	114.1279	DBL-BVR-WWRD
FDNS	00G13_013		4 13SP	G13_013	FROM->TO	WOLFFORTH INTERCHANGE - YUMA INTERCHANGE 115KV CKT 1	154	0.06111	114.2384	SPP-SWPS-03
FDNS	00G13_013		4 13SP	G13_013	FROM->TO	WOLFFORTH INTERCHANGE - YUMA INTERCHANGE 115KV CKT 1	154	0.06108	113.7997	GRAPEVINE INTERCHANGE - STATELINE INTERCHANGE 230KV CKT 1
FDNS	00G13_013		4 13SP	G13_013	FROM->TO	WOLFFORTH INTERCHANGE - YUMA INTERCHANGE 115KV CKT 1	154	0.06091	107.8848	SUNDOWN INTERCHANGE (WH XDS70381) 230/115/13.8KV TRANSFORMER CKT 1
FDNS	00G13_013		4 13SP	G13_013	FROM->TO	WOLFFORTH INTERCHANGE - YUMA INTERCHANGE 115KV CKT 1	154	0.0606	114.116	GRAPEVINE INTERCHANGE - NICHOLS STATION 230KV CKT 1
FDNS	00G13_013		4 13SP	G13_013	FROM->TO	WOLFFORTH INTERCHANGE - YUMA INTERCHANGE 115KV CKT 1	154	0.06058	122.7965	Jones Station Bus#2 - LUBBOCK EAST INTERCHANGE 230KV CKT 1
FDNS	00G13_013		4 13SP	G13_013	FROM->TO	WOLFFORTH INTERCHANGE - YUMA INTERCHANGE 115KV CKT 1	154	0.06049	119.9268	LUBBOCK EAST INTERCHANGE (ENRC 136162) 230/115/13.2KV TRANSFORMER CKT 1
FDNS	00G13_013		4 13SP	G13_013	FROM->TO	WOLFFORTH INTERCHANGE - YUMA INTERCHANGE 115KV CKT 1	154	0.06046	117.0407	LUBBOCK POWER & LIGHT-MILWAUKEE (M-E C0681251) 230/69/13.5KV TRANSFORMER CKT 1
FDNS	00G13_013		4 13SP	G13_013	FROM->TO	WOLFFORTH INTERCHANGE - YUMA INTERCHANGE 115KV CKT 1	154	0.06046	117.0362	LUBBOCK POWER & LIGHT-MILWAUKEE - LUBBOCK POWER & LIGHT-VICKSBURG 69KV CKT 1
FDNS	0		4 13SP	G13_013	FROM->TO	WOLFFORTH INTERCHANGE - YUMA INTERCHANGE 115KV CKT 1	154	0.06015	110.7478	BASE CASE
FDNS	00G13_013		4 13SP	G13_013	FROM->TO	WOLFFORTH INTERCHANGE - YUMA INTERCHANGE 115KV CKT 1	154	0.0601	114.5928	LUBBOCK POWER & LIGHT-SOUTHEAST - LUBBOCK SOUTH INTERCHANGE 230KV CKT 1
FDNS	00G13_013		4 13SP	G13_013	FROM->TO	WOLFFORTH INTERCHANGE - YUMA INTERCHANGE 115KV CKT 1	154	0.06008	114.4328	BAILEY COUNTY REC-EARTH INTERCHANGE - PLANT X STATION 115KV CKT 1
FDNS	00G13_013		4 13SP	G13_013	FROM->TO	WOLFFORTH INTERCHANGE - YUMA INTERCHANGE 115KV CKT 1	154	0.05992	115.8973	SPP-SWPS-V49
FDNS	00G13_013		4 13SP	G13_013	FROM->TO	WOLFFORTH INTERCHANGE - YUMA INTERCHANGE 115KV CKT 1	154	0.0599	143.7293	BASE CASE
FNSL	00G13_013		4 13SP	G13_013	FROM->TO	WOLFFORTH INTERCHANGE - YUMA INTERCHANGE 115KV CKT 1	154	0.0599	114.9094	GRASSLAND INTERCHANGE - Jones Station Bus#2 230KV CKT 1
FDNS	00G13_013		4 13SP	G13_013	FROM->TO	WOLFFORTH INTERCHANGE - YUMA INTERCHANGE 115KV CKT 1	154	0.0599	114.9062	GRASSLAND INTERCHANGE (PENN 0105951) 230/115/13.2KV TRANSFORMER CKT 1
FDNS	00G13_013		4 13SP	G13_013	FROM->TO	WOLFFORTH INTERCHANGE - YUMA INTERCHANGE 115KV CKT 1	154	0.0599	114.283	GEN562308 1-G12-037 18.000
FDNS	00G13_013		4 13SP	G13_013	FROM->TO	WOLFFORTH INTERCHANGE - YUMA INTERCHANGE 115KV CKT 1	154	0.0599	114.2254	GEN560738 1-G13_016_2 18.000
FDNS	00G13_013		4 13SP	G13_013	FROM->TO	WOLFFORTH INTERCHANGE - YUMA INTERCHANGE 115KV CKT 1	154	0.0599	109.2246	GEN525492 1-PLANT X GEN #2
FDNS	00G13_013		4 13SP	G13_013	FROM->TO	WOLFFORTH INTERCHANGE - YUMA INTERCHANGE 115KV CKT 1	154	0.0599	109.1302	GEN525493 1-PLANT X GEN #3
FDNS	00G13_013		4 13SP	G13_013	FROM->TO	WOLFFORTH INTERCHANGE - YUMA INTERCHANGE 115KV CKT 1	154	0.0599	108.5728	GEN523973 1-HARRINGTON GEN #3 24 KV
FDNS	00G13_013		4 13SP	G13_013	FROM->TO	WOLFFORTH INTERCHANGE - YUMA INTERCHANGE 115KV CKT 1	154	0.0599	108.5545	GEN523972 1-HARRINGTON GEN #2 24 KV
FDNS	00G13_013		4 13SP	G13_013	FROM->TO	WOLFFORTH INTERCHANGE - YUMA INTERCHANGE 115KV CKT 1	154	0.0599	108.5525	GEN523971 1-HARRINGTON GEN #1 24 KV
FDNS	00G13_013		4 13SP	G13_013	FROM->TO	WOLFFORTH INTERCHANGE - YUMA INTERCHANGE 115KV CKT 1	154	0.0599	108.0362	GEN526334 1-JONES 4 116.50V
FDNS	00G13_013		4 13SP	G13_013	FROM->TO	WOLFFORTH INTERCHANGE - YUMA INTERCHANGE 115KV CKT 1	154	0.0599	108.0327	GEN526333 1-JONES GEN #3 21 KV
FDNS	00G13_013		4 13SP	G13_013	FROM->TO	WOLFFORTH INTERCHANGE - YUMA INTERCHANGE 115KV CKT 1	154	0.0599	106.8039	GEN526331 1-JONES GEN #1 22 KV
FDNS	00G13_013		4 13SP	G13_013	FROM->TO	WOLFFORTH INTERCHANGE - YUMA INTERCHANGE 115KV CKT 1	154	0.0599	106.7917	GEN526332 1-JONES GEN #2 21 KV
FDNS	00G13_013		4 13SP	G13_013	FROM->TO	WOLFFORTH INTERCHANGE - YUMA INTERCHANGE 115KV CKT 1	154	0.0599	105.272	GEN527883 1-CUNNINGHAM GEN #3 22 KV
FDNS	00G13_013		4 13SP	G13_013	FROM->TO	WOLFFORTH INTERCHANGE - YUMA INTERCHANGE 115KV CKT 1	154	0.0599	105.1401	GEN525494 1-PLANT X GEN #4 20 KV
FDNS	00G13_013		4 13SP	G13_013	FROM->TO	WOLFFORTH INTERCHANGE - YUMA INTERCHANGE 115KV CKT 1	154	0.0599	103.7199	GEN528361 1-MADDOX GEN #1
FDNS	00G13_013		4 13SP	G13_013	FROM->TO	WOLFFORTH INTERCHANGE - YUMA INTERCHANGE 115KV CKT 1	154	0.0599	103.4535	GEN527165 1-Mustang Gen #5
FDNS	00G13_013		4 13SP	G13_013	FROM->TO	WOLFFORTH INTERCHANGE - YUMA INTERCHANGE 115KV CKT 1	154	0.0599	102.0158	GEN527902 1-HOBBS PLANT #2 (CT)
FDNS	00G13_013		4 13SP	G13_013	FROM->TO	WOLFFORTH INTERCHANGE - YUMA INTERCHANGE 115KV CKT 1	154	0.0599	101.9455	GEN527901 1-HOBBS PLANT #1 (CT)
FDNS	00G13_013		4 13SP	G13_013	FROM->TO	WOLFFORTH INTERCHANGE - YUMA INTERCHANGE 115KV CKT 1	154	0.0599	101.4998	GEN560729 1-G13_013_3 0.6900
FDNS	00G13_013		4 13SP	G13_013	FROM->TO	WOLFFORTH INTERCHANGE - YUMA INTERCHANGE 115KV CKT 1	154	0.0599	101.4507	GEN527164 1-MUSTANG GEN #4 22 KV
FDNS	00G13_013		4 13SP	G13_013	FROM->TO	WOLFFORTH INTERCHANGE - YUMA INTERCHANGE 115KV CKT 1	154	0.0599	100.697	GEN527163 1-MUSTANG GEN #3 22 KV
FDNS	00G13_013		4 13SP	G13_013	FROM->TO	WOLFFORTH INTERCHANGE - YUMA INTERCHANGE 115KV CKT 1	154	0.0599	100.0976	GEN527161 1-MUSTANG GEN #1
FDNS	00G13_013		4 13SP	G13_013	FROM->TO	WOLFFORTH INTERCHANGE - YUMA INTERCHANGE 115KV CKT 1	154	0.0599	100.0972	GEN527162 1-MUSTANG GEN #2
FDNS	0		4 13SP	G13_013	FROM->TO	WOLFFORTH INTERCHANGE - YUMA INTERCHANGE 115KV CKT 1	154	0.05988	115.4072	ALLEN SUB - LUBBOCK SOUTH INTERCHANGE 115KV CKT 1
FDNS	0		4 13SP	G13_013	FROM->TO	WOLFFORTH INTERCHANGE - YUMA INTERCHANGE 115KV CKT 1	154	0.05988	100.4194	ALLEN SUB - SOUTH PLAINS REC-QUAKER 115KV CKT 1
FDNS	00G13_013		4 13SP	G13_013	FROM->TO	WOLFFORTH INTERCHANGE - YUMA INTERCHANGE 115KV CKT 1	154	0.05963	141.0877	ALLEN SUB - LUBBOCK SOUTH INTERCHANGE 115KV CKT 1
FDNS	00G13_013		4 13SP	G13_013	FROM->TO	WOLFFORTH INTERCHANGE - YUMA INTERCHANGE 115KV CKT 1	154	0.05963	126.1227	ALLEN SUB - SOUTH PLAINS REC-QUAKER 115KV CKT 1
FDNS	00G13_013		4 13SP	G13_013	FROM->TO	WOLFFORTH INTERCHANGE - YUMA INTERCHANGE 115KV CKT 1	154	0.05963	120.8858	SOUTH PLAINS REC-QUAKER - South Plains REC-Frankford Sub 115KV CKT 1
FDNS	00G13_013		4 13SP	G13_013	FROM->TO	WOLFFORTH INTERCHANGE - YUMA INTERCHANGE 115KV CKT 1	154	0.05963	115.7086	MURPHY SUB - South Plains REC-Frankford Sub 115KV CKT 1
FDNS	00G13_013		4 13SP	G13_013	FROM->TO	WOLFFORTH INTERCHANGE - YUMA INTERCHANGE 115KV CKT 1	154	0.05949	108.9493	MUSTANG STATION N. - SEAGRAVES INTERCHANGE 115KV CKT 1
FDNS	00G13_013		4 13SP	G13_013	FROM->TO	WOLFFORTH INTERCHANGE - YUMA INTERCHANGE 115KV CKT 1	154	0.05929	114.4391	SPP

SOLUTION	GROUP	SCENARIO	SEASON	SOURCE	DIRECTION	MONITORED ELEMENT	RATEB (MVA)	TDF	TC%LOADING (% MVA)	CONTINGENCY	
FDNS	00NR		4	13SP	G13_013	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	252	0.05918	117.0196	SPP-SWPS-K37
FDNS	00NR		4	13SP	G13_013	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	252	0.05918	114.3761	SPP-SWPS-K37
FDNS	00G13_013		4	13SP	G13_013	FROM->TO	WOLFFORTH INTERCHANGE - YUMA INTERCHANGE 115KV CKT 1	154	0.05913	109.5896	LAMB COUNTY INTERCHANGE (WH ALM20172) 230/115/13.2KV TRANSFORMER CKT 1
FDNS	00G13_013		4	13SP	G13_013	FROM->TO	WOLFFORTH INTERCHANGE - YUMA INTERCHANGE 115KV CKT 1	154	0.05913	109.5896	SPP-SWPS-K37
FDNS	00G13_013		4	13SP	G13_013	FROM->TO	WOLFFORTH INTERCHANGE - YUMA INTERCHANGE 115KV CKT 1	154	0.05913	109.5878	LAMB COUNTY INTERCHANGE - TOLK STATION WEST 230KV CKT 1
FDNS	00G13_013		4	13SP	G13_013	FROM->TO	WOLFFORTH INTERCHANGE - YUMA INTERCHANGE 115KV CKT 1	154	0.05904	109.1667	SWISHER COUNTY INTERCHANGE - TUCO INTERCHANGE 230KV CKT 1
FDNS	00G13_013		4	13SP	G13_013	FROM->TO	WOLFFORTH INTERCHANGE - YUMA INTERCHANGE 115KV CKT 1	154	0.05881	114.086	SPP-SWPS-T31
FDNS	00G13_013		4	13SP	G13_013	FROM->TO	WOLFFORTH INTERCHANGE - YUMA INTERCHANGE 115KV CKT 1	154	0.05881	114.0695	Lamb County REC-Opdyke Sub - SUNDOWN INTERCHANGE 115KV CKT 1
FDNS	00G13_013		4	13SP	G13_013	FROM->TO	WOLFFORTH INTERCHANGE - YUMA INTERCHANGE 115KV CKT 1	154	0.05881	108.682	HOCKLEY COUNTY INTERCHANGE - LAMB COUNTY INTERCHANGE 115KV CKT 1
FDNS	00G13_013		4	13SP	G13_013	FROM->TO	WOLFFORTH INTERCHANGE - YUMA INTERCHANGE 115KV CKT 1	154	0.0586	107.2262	SEAGRAVES INTERCHANGE - SULPHUR INTERCHANGE 115KV CKT 1
FDNS	00G13_013		4	13SP	G13_013	FROM->TO	WOLFFORTH INTERCHANGE - YUMA INTERCHANGE 115KV CKT 1	154	0.05856	114.003	TUCO INTERCHANGE (ENRC 136401) 230/115/13.2KV TRANSFORMER CKT 2
FDNS	00G13_013		4	13SP	G13_013	FROM->TO	WOLFFORTH INTERCHANGE - YUMA INTERCHANGE 115KV CKT 1	154	0.05846	113.911	TUCO INTERCHANGE (GE M102345) 230/115/13.2KV TRANSFORMER CKT 1
FDNS	00G13_013		4	13SP	G13_013	FROM->TO	WOLFFORTH INTERCHANGE - YUMA INTERCHANGE 115KV CKT 1	154	0.05844	109.7615	SPP-SWPS-T35
FDNS	00G13_013		4	13SP	G13_013	FROM->TO	WOLFFORTH INTERCHANGE - YUMA INTERCHANGE 115KV CKT 1	154	0.05844	108.964	PRENTICE SUB - TERRY COUNTY INTERCHANGE 115KV CKT 1
FDNS	00G13_013		4	13SP	G13_013	FROM->TO	WOLFFORTH INTERCHANGE - YUMA INTERCHANGE 115KV CKT 1	154	0.05844	107.7591	PRENTICE SUB - YOAKUM COUNTY INTERCHANGE 115KV CKT 1
FDNS	00G13_013		4	13SP	G13_013	FROM->TO	WOLFFORTH INTERCHANGE - YUMA INTERCHANGE 115KV CKT 1	154	0.05834	109.7064	AMARILLO SOUTH INTERCHANGE - G07-48T 230.00 230KV CKT 1
FDNS	00G13_013		4	13SP	G13_013	FROM->TO	WOLFFORTH INTERCHANGE - YUMA INTERCHANGE 115KV CKT 1	154	0.05812	109.9598	LEA COUNTY INTERCHANGE - YOAKUM COUNTY INTERCHANGE 230KV CKT 1
FDNS	00G13_013		4	13SP	G13_013	FROM->TO	WOLFFORTH INTERCHANGE - YUMA INTERCHANGE 115KV CKT 1	154	0.05743	105.6827	DENVER CITY INTERCHANGE N. - TERRY COUNTY INTERCHANGE 115KV CKT 1
FDNS	00G13_013		4	13SP	G13_013	FROM->TO	WOLFFORTH INTERCHANGE - YUMA INTERCHANGE 115KV CKT 1	154	0.05695	114.2315	CUNNINGHAM STATION - EDDY COUNTY INTERCHANGE 230KV CKT 1
FDNS	00G13_013		4	13SP	G13_013	FROM->TO	WOLFFORTH INTERCHANGE - YUMA INTERCHANGE 115KV CKT 1	154	0.05637	108.2641	SPP-AEPW-32
FDNS	00G13_013		4	13SP	G13_013	FROM->TO	WOLFFORTH INTERCHANGE - YUMA INTERCHANGE 115KV CKT 1	154	0.05637	108.2588	G13_017T 345.00 - TUCO INTERCHANGE 345KV CKT 1
FDNS	00G13_013		4	13SP	G13_013	FROM->TO	WOLFFORTH INTERCHANGE - YUMA INTERCHANGE 115KV CKT 1	154	0.05637	108.0085	G13_017T 345.00 - OKLAUNION 345KV CKT 1
FDNS	00G13_013		4	13SP	G13_013	FROM->TO	WOLFFORTH INTERCHANGE - YUMA INTERCHANGE 115KV CKT 1	154	0.05637	105.7524	LAWTON EASTSIDE - OKLAUNION 345KV CKT 1
FDNS	00G13_013		4	13SP	G13_013	FROM->TO	CURRY COUNTY INTERCHANGE - DEAF SMITH REC-#20 115KV CKT 1	96	0.05621	111.4376	DEAF SMITH COUNTY INTERCHANGE - PLANT X STATION 230KV CKT 1
FDNS	06ALL		4	13G	G13_013	FROM->TO	CURRY COUNTY INTERCHANGE - DEAF SMITH REC-#20 115KV CKT 1	96	0.05499	111.3055	DEAF SMITH COUNTY INTERCHANGE - PLANT X STATION 230KV CKT 1
FDNS	00G13_013		4	13SP	G13_013	FROM->TO	WOLFFORTH INTERCHANGE - YUMA INTERCHANGE 115KV CKT 1	154	0.0546	107.863	SUNDOWN INTERCHANGE - WOLFFORTH INTERCHANGE 230KV CKT 1
FDNS	00G13_013		4	13SP	G13_013	FROM->TO	WOLFFORTH INTERCHANGE - YUMA INTERCHANGE 115KV CKT 1	154	0.05351	116.5223	STANTON SUB - TUCO INTERCHANGE 115KV CKT 1
FDNS	00G13_013		4	13SP	G13_013	FROM->TO	WOLFFORTH INTERCHANGE - YUMA INTERCHANGE 115KV CKT 1	154	0.05351	103.6944	INDIANA SUB - SOUTH PLAINS REC-ERSKINE 115KV CKT 1
FDNS	00G13_013		4	13SP	G13_013	FROM->TO	WOLFFORTH INTERCHANGE - YUMA INTERCHANGE 115KV CKT 1	154	0.05351	101.2074	CARLISLE INTERCHANGE - SOUTH PLAINS REC-ERSKINE 115KV CKT 1
FDNS	00G13_013		4	13SP	G13_013	FROM->TO	WOLFFORTH INTERCHANGE - YUMA INTERCHANGE 115KV CKT 1	154	0.05351	100.6169	SPP-SWPS-V62
FDNS	00G13_013		4	13SP	G13_013	FROM->TO	WOLFFORTH INTERCHANGE - YUMA INTERCHANGE 115KV CKT 1	154	0.05326	104.9572	PLANT X STATION - SUNDOWN INTERCHANGE 230KV CKT 1
FDNS	00G13_013		4	13SP	G13_013	FROM->TO	BAILEY COUNTY REC-EARTH INTERCHANGE - CASTRO COUNTY INTERCHANGE 115KV CKT 1	160	0.05194	103.1323	DEAF SMITH COUNTY INTERCHANGE - PLANT X STATION 230KV CKT 1
FDNS	00G13_013		4	18SP	G13_013	FROM->TO	WOLFFORTH INTERCHANGE - YUMA INTERCHANGE 115KV CKT 1	154	0.05114	103.7141	LUBBOCK SOUTH INTERCHANGE (ABB LLM60043) 230/115/13.2KV TRANSFORMER CKT 1
FDNS	06NR		4	13G	G13_013	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.05101	114.2764	SPP-SWPS-K37
FDNS	06NR		4	13G	G13_013	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.05101	114.2281	SPP-SWPS-K37
FDNS	00G13_013		4	13SP	G13_013	FROM->TO	WOLFFORTH INTERCHANGE - YUMA INTERCHANGE 115KV CKT 1	154	0.05077	103.6021	DBL-TUCO-STW
FDNS	00G13_013		4	18SP	G13_013	FROM->TO	WOLFFORTH INTERCHANGE - YUMA INTERCHANGE 115KV CKT 1	154	0.04986	110.2856	BASE CASE
FDNS	00G13_013		4	18SP	G13_013	FROM->TO	WOLFFORTH INTERCHANGE - YUMA INTERCHANGE 115KV CKT 1	154	0.04954	115.622	ALLEN SUB - LUBBOCK SOUTH INTERCHANGE 115KV CKT 1
FDNS	00G13_013		4	13SP	G13_013	FROM->TO	WOLFFORTH INTERCHANGE - YUMA INTERCHANGE 115KV CKT 1	154	0.04896	107.2226	EDDY COUNTY INTERCHANGE - EDDY_NORTH 6230.00 230KV CKT 1
FDNS	0		4	13SP	G13_013	FROM->TO	WOLFFORTH INTERCHANGE - YUMA INTERCHANGE 115KV CKT 1	154	0.0475	119.6107	CARLISLE INTERCHANGE - TUCO INTERCHANGE 230KV CKT 1
FDNS	00G13_013		4	13SP	G13_013	FROM->TO	WOLFFORTH INTERCHANGE - YUMA INTERCHANGE 115KV CKT 1	154	0.04731	138.6279	CARLISLE INTERCHANGE - TUCO INTERCHANGE 230KV CKT 1
FDNS	00G13_013		4	13SP	G13_013	FROM->TO	WOLFFORTH INTERCHANGE - YUMA INTERCHANGE 115KV CKT 1	154	0.0471	103.0912	EDDY COUNTY INTERCHANGE (ABB AEM30711) 345/230/13.2KV TRANSFORMER CKT 1
FDNS	00G13_013		4	13SP	G13_013	FROM->TO	WOLFFORTH INTERCHANGE - YUMA INTERCHANGE 115KV CKT 1	154	0.0471	103.0888	CHAVESCO 345.00 - EDDY COUNTY INTERCHANGE 345KV CKT 1
FDNS	00G13_013		4	23SP	G13_013	FROM->TO	WOLFFORTH INTERCHANGE - YUMA INTERCHANGE 115KV CKT 1	154	0.03984	114.168	CARLISLE INTERCHANGE - TUCO INTERCHANGE 230KV CKT 1
FDNS	00NR		4	13SP	G13_013	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	252	0.03963	103.339	SPP-SWPS-T04
FDNS	00NR		4	13SP	G13_013	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	252	0.03963	100.7865	SPP-SWPS-T04
FDNS	0		4	18SP	G13_013	FROM->TO	WOLFFORTH INTERCHANGE - YUMA INTERCHANGE 115KV CKT 1	154	0.03933	105.4104	CARLISLE INTERCHANGE - TUCO INTERCHANGE 230KV CKT 1
FDNS	00G13_013		4	18SP	G13_013	FROM->TO	WOLFFORTH INTERCHANGE - YUMA INTERCHANGE 115KV CKT 1	154	0.0392	121.2787	CARLISLE INTERCHANGE - TUCO INTERCHANGE 230KV CKT 1
FDNS	0		4	13SP	G13_013	FROM->TO	ROOSEVELT COUNTY INTERCHANGE (ABB LMM60042) 230/115/13.2KV TRANSFORMER CKT 1	252	0.03063	119.6752	OASIS INTERCHANGE (ABB LLM60041) 230/115/13.2KV TRANSFORMER CKT 1
FDNS	0		4	13SP	G13_013	FROM->TO	ROOSEVELT COUNTY INTERCHANGE (ABB LMM60042) 230/115/13.2KV TRANSFORMER CKT 1	252	0.03063	117.9933	OASIS INTERCHANGE (ABB LLM60041) 230/115/13.2KV TRANSFORMER CKT 1
FDNS	0		4	13SP	G13_013	FROM->TO	OASIS INTERCHANGE (ABB LLM60041) 230/115/13.2KV TRANSFORMER CKT 1	252	0.03053	116.0415	ROOSEVELT COUNTY INTERCHANGE (ABB LMM60042) 230/115/13.2KV TRANSFORMER CKT 1
FDNS	0		4	13SP	G13_013	FROM->TO	OASIS INTERCHANGE (ABB LLM60041) 230/115/13.2KV TRANSFORMER CKT 1	252	0.03053	114.5344	ROOSEVELT COUNTY INTERCHANGE (ABB LMM60042) 230/115/13.2KV TRANSFORMER CKT 1
FDNS	00G13_013		4	13SP	G13_013	FROM->TO	ROOSEVELT COUNTY INTERCHANGE (ABB LMM60042) 230/115/13.2KV TRANSFORMER CKT 1	252	0.03053	126.7436	OASIS INTERCHANGE (ABB LLM60041) 230/115/13.2KV TRANSFORMER CKT 1
FDNS	00G13_013		4	13SP	G13_013	FROM->TO	ROOSEVELT COUNTY INTERCHANGE (ABB LMM60042) 230/115/13.2KV TRANSFORMER CKT 1	252	0.03053	124.9288	OASIS INTERCHANGE (ABB LLM60041) 230/115/13.2KV TRANSFORMER CKT 1
FDNS	00G13_013		4	13SP	G13_013	FROM->TO	OASIS INTERCHANGE (ABB LLM60041) 230/115/13.2KV TRANSFORMER CKT 1	252	0.03044	123.0869	ROOSEVELT COUNTY INTERCHANGE (ABB LMM60042) 230/115/13.2KV TRANSFORMER CKT 1
FDNS	00G13_013		4	13SP	G13_013	FROM->TO	OASIS INTERCHANGE (ABB LLM60041) 230/115/13.2KV TRANSFORMER CKT 1	252	0.03044	121.5836	ROOSEVELT COUNTY INTERCHANGE (ABB LMM60042) 230/115/13.2KV TRANSFORMER CKT 1
FDNS	00G13_013		4	13SP	G13_013	TO->FROM	SP-WOLF_TP 3115.00 - YUMA INTERCHANGE 115KV CKT 1	175	0.09351	107.1228	TOLK STATION EAST - TUCO INTERCHANGE 230KV CKT 1
FDNS	00G13_013		4	13SP	G13_013	TO->FROM	SP-WOLF_TP 3115.00 - YUMA INTERCHANGE 115KV CKT 1	175	0.05963	105.6255	ALLEN SUB - LUBBOCK SOUTH INTERCHANGE 115KV CKT 1
FDNS	0		4	13SP	G13_013	TO->FROM	BAILEY COUNTY REC-EARTH INTERCHANGE - PLANT X STATION 115KV CKT 1	160	0.05213	111.7666	DEAF SMITH COUNTY INTERCHANGE - PLANT X STATION 230KV CKT 1
FDNS	00G13_013		4	13SP	G13_013	TO->FROM	BAILEY COUNTY REC-EARTH INTERCHANGE - PLANT X STATION 115KV CKT 1	160	0.05194	133.4071	DEAF SMITH COUNTY INTERCHANGE - PLANT X STATION 230KV CKT 1
FDNS	00G13_013		4	13SP	G13_013	TO->FROM	SP-WOLF_TP 3115.00 - YUMA INTERCHANGE 115KV CKT 1	175	0.04731	101.481	CARLISLE INTERCHANGE - TUCO INTERCHANGE 230KV CKT 1
FDNS	6		4	13G	G13_013	TO->FROM	FPL SWITCH - WOODWARD 138KV CKT 1	153	0.04322	123.214	DBL-WWRD-G12
FDNS	06G13_013		4	13G	G13_013	TO->FROM	FPL SWITCH - WOODWARD 138KV CKT 1	153	0.0431	127.3815	DBL-WWRD-G12
FDNS	06ALL		4	13G	G13_013	TO->FROM	FPL SWITCH - WOODWARD 138KV CKT 1	153	0.04282	137.4858	DBL-WWRD-G12
FDNS	00G13_013		4	18SP	G13_013	TO->FROM	BAILEY COUNTY REC-EARTH INTERCHANGE - PLANT X STATION 115KV CKT 1	160	0.04187	101.1239	DEAF SMITH COUNTY INTERCHANGE - PLANT X STATION 230KV CKT 1
FDNS	00G13_013		4	18SP	G13_013	TO->FROM	SP-WOLF_TP 3115.00 - YUMA INTERCHANGE 115KV CKT 1	175	0.0392	99.9	CARLISLE INTERCHANGE - TUCO INTERCHANGE 230KV CKT 1
FNSL-Blown up	03ALL		0	13G	G13_014		Non-converged Contingency	0	0.08162	-	DBL-THIS-CLR
FDNS	09ALLBPSON		0	13G	G13_014	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.05625	239.5779	G08-123N 115.00 - PAULINE 115KV CKT 1
FDNS	09BPSON		0	13G	G13_014	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.05624	220.7039	G08-123N 115.00 - PAULINE 115KV CKT 1
FDNS	09ALL		0	13G	G13_014	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.05623	182.9788	G08-123N 115.00 - PAULINE 115KV CKT 1
FDNS	9		0	13G	G13_014	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.05622	163.144	G08-123N 115.00 - PAULINE 115KV CKT 1
FDNS	09G13_014BPSON		0	13G	G13_014	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.05616	240.7496	G08-123N 115.00 - PAULINE 115KV CKT 1
FDNS	09G13_014		0	13G	G13_014	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.05614	188.7634	G08-123N 115.00 - PAULINE 115KV CKT 1
FDNS	03ALL		0	13G	G13_014	FROM->TO	SMOKYH6 230.00 - SUMMIT 230KV CKT 1	330	0.03474	113.6821267	DBL-SPRVL-MU
FDNS	03ALL		0	13G	G13_014	FROM->TO	SMOKYH6 230.00 - SUMMIT 230KV CKT 1	330	0.03474	113.39203	DBL-MUL-RENO
FDNS	03ALL		0	13G	G13_014	TO->FROM	BENTON - WICHITA 345KV CKT 1	932	0.06199	107.4489	HUNTERS7 345.00 - WOODRING 345KV CKT 1
FDNS	03ALL		0	13G	G13_014	TO->FROM	BENTON - WICHITA 345KV CKT 1	932	0.06199	105.1622	HUNTERS7 345.00 - VIOLA 7 345.00 345KV CKT 1
FDNS	09ALLBPSON		0	13G	G13_014	TO->FROM	G13_002T 115.00 - SHELDON 115KV CKT 2	43	0.05625	123.4123	G08-123N 115.00 - PAULINE 115KV CKT 1

SOLUTION	GROUP	SCENARIO	SEASON	SOURCE	DIRECTION	MONITORED ELEMENT	RATEB (MVA)	TDF	TC%LOADING (% MVA)	CONTINGENCY
FDNS	09BPSON		0 13G	G13_014	TO->FROM	G13_002T 115.00 - SHELDON 115KV CKT 2	43	0.05624	126.8969	G08-123N 115.00 - PAULINE 115KV CKT 1
FDNS	09G13_014BPSON		0 13G	G13_014	TO->FROM	G13_002T 115.00 - SHELDON 115KV CKT 2	43	0.05616	147.3704	G08-123N 115.00 - PAULINE 115KV CKT 1
FDNS	03ALL		0 13G	G13_014	TO->FROM	BENTON - WICHITA 345KV CKT 1	932	0.04906	113.2277	DBL-TGA-MATT
FDNS	03ALL		0 13G	G13_014	TO->FROM	BENTON - WICHITA 345KV CKT 1	932	0.04906	107.2142	G11_051T 345.00 - TATONGA7 345.00 345KV CKT 1
FDNS	03ALL		0 13G	G13_014	TO->FROM	BENTON - WICHITA 345KV CKT 1	932	0.04906	106.7982	G11_051T 345.00 - WOODWARD DISTRICT EHV 345KV CKT 1
FDNS	03ALL		0 13G	G13_014	TO->FROM	BENTON - WICHITA 345KV CKT 1	932	0.04413	101.9926	MAIZE - MAIZEW 4 138.00 138KV CKT 1
FDNS	03ALL		0 13G	G13_014	TO->FROM	BENTON - WICHITA 345KV CKT 1	932	0.04413	101.9901	EVANS ENERGY CENTER NORTH - MAIZEW 4 138.00 138KV CKT 1
FDNS	03ALL		0 13G	G13_014	TO->FROM	BENTON - WICHITA 345KV CKT 1	932	0.04413	101.9873	SPP-WERE-91
FDNS	03ALL		0 13G	G13_014	TO->FROM	BENTON - WICHITA 345KV CKT 1	932	0.04413	101.4901	MAIZE - MAIZEE 4 138.00 138KV CKT 1
FDNS	03ALL		0 13G	G13_014	TO->FROM	BENTON - WICHITA 345KV CKT 1	932	0.04413	101.4845	CHISHOLM - MAIZEE 4 138.00 138KV CKT 1
FDNS	03ALL		0 13G	G13_014	TO->FROM	BENTON - WICHITA 345KV CKT 1	932	0.04413	101.4834	SPP-WERE-90
FDNS	3		0 13G	G13_014	TO->FROM	BENTON - WICHITA 345KV CKT 1	932	0.04272	102.1055	GEN532751 1-WOLF CREEK GENERATING STATION UNIT 1
FDNS	03ALL		0 13G	G13_014	TO->FROM	BENTON - WICHITA 345KV CKT 1	932	0.04176	118.7235	GEN532751 1-WOLF CREEK GENERATING STATION UNIT 1
FDNS	03ALL		0 13G	G13_014	TO->FROM	BENTON - WICHITA 345KV CKT 1	932	0.03714	100	HOYT - JEFFREY ENERGY CENTER 345KV CKT 1
FDNS	03ALL		0 13G	G13_014	TO->FROM	BENTON - WICHITA 345KV CKT 1	932	0.03682	100.5024	WRTOD400
FNSL-Blown up	03ALL		0 13G	G13_015		Non-converged Contingency	0	0.08763	-	DBL-THIS-CLR
FNSL-Blown up	00G13_015		0 13WP	G13_015		Non-converged Contingency	0	0.0382	-	TRF-STEGALL
FDNS	09ALL		0 13G	G13_015	FROM->TO	G13_015T 115.00 - PAULINE 115KV CKT 1	137	1	101.5404	G13_015T 115.00 - HILDRETH 115KV CKT 1
FDNS	03ALL		0 13G	G13_015	FROM->TO	SMOKYH6 230.00 - SUMMIT 230KV CKT 1	330	0.03874	113.6821267	DBL-SPRVL-MU
FDNS	03ALL		0 13G	G13_015	FROM->TO	SMOKYH6 230.00 - SUMMIT 230KV CKT 1	330	0.03874	113.39203	DBL-MUL-RENO
FDNS	03ALL		0 13G	G13_015	TO->FROM	BENTON - WICHITA 345KV CKT 1	932	0.06622	107.4489	HUNTERS7 345.00 - WOODRING 345KV CKT 1
FDNS	03ALL		0 13G	G13_015	TO->FROM	BENTON - WICHITA 345KV CKT 1	932	0.06622	105.1622	HUNTERS7 345.00 - VIOLA 7 345.00 345KV CKT 1
FDNS	03ALL		0 13G	G13_015	TO->FROM	BENTON - WICHITA 345KV CKT 1	932	0.05374	113.2277	DBL-TGA-MATT
FDNS	03ALL		0 13G	G13_015	TO->FROM	BENTON - WICHITA 345KV CKT 1	932	0.05374	107.2142	G11_051T 345.00 - TATONGA7 345.00 345KV CKT 1
FDNS	03ALL		0 13G	G13_015	TO->FROM	BENTON - WICHITA 345KV CKT 1	932	0.05374	106.7982	G11_051T 345.00 - WOODWARD DISTRICT EHV 345KV CKT 1
FDNS	03ALL		0 13G	G13_015	TO->FROM	BENTON - WICHITA 345KV CKT 1	932	0.04842	101.9926	MAIZE - MAIZEW 4 138.00 138KV CKT 1
FDNS	03ALL		0 13G	G13_015	TO->FROM	BENTON - WICHITA 345KV CKT 1	932	0.04842	101.9901	EVANS ENERGY CENTER NORTH - MAIZEW 4 138.00 138KV CKT 1
FDNS	03ALL		0 13G	G13_015	TO->FROM	BENTON - WICHITA 345KV CKT 1	932	0.04842	101.9873	SPP-WERE-91
FDNS	03ALL		0 13G	G13_015	TO->FROM	BENTON - WICHITA 345KV CKT 1	932	0.04842	101.4901	MAIZE - MAIZEE 4 138.00 138KV CKT 1
FDNS	03ALL		0 13G	G13_015	TO->FROM	BENTON - WICHITA 345KV CKT 1	932	0.04842	101.4845	CHISHOLM - MAIZEE 4 138.00 138KV CKT 1
FDNS	03ALL		0 13G	G13_015	TO->FROM	BENTON - WICHITA 345KV CKT 1	932	0.04842	101.4834	SPP-WERE-90
FDNS	3		0 13G	G13_015	TO->FROM	BENTON - WICHITA 345KV CKT 1	932	0.04679	102.1055	GEN532751 1-WOLF CREEK GENERATING STATION UNIT 1
FDNS	03ALL		0 13G	G13_015	TO->FROM	BENTON - WICHITA 345KV CKT 1	932	0.04583	118.7235	GEN532751 1-WOLF CREEK GENERATING STATION UNIT 1
FDNS	03ALL		0 13G	G13_015	TO->FROM	BENTON - WICHITA 345KV CKT 1	932	0.0417	100	HOYT - JEFFREY ENERGY CENTER 345KV CKT 1
FDNS	03ALL		0 13G	G13_015	TO->FROM	BENTON - WICHITA 345KV CKT 1	932	0.04143	100.5024	WRTOD400
FDNS	0	2 23SP	G13_016	FROM->TO	TUCO INTERCHANGE (GE M102345) 230/115/13.2KV TRANSFORMER CKT 1	252	0.04597	110.9723	TUCO INTERCHANGE (ENRCO 136401) 230/115/13.2KV TRANSFORMER CKT 2	
FDNS	0	2 23SP	G13_016	FROM->TO	TUCO INTERCHANGE (GE M102345) 230/115/13.2KV TRANSFORMER CKT 1	252	0.04597	107.7203	TUCO INTERCHANGE (ENRCO 136401) 230/115/13.2KV TRANSFORMER CKT 2	
FDNS	0	3 23SP	G13_016	FROM->TO	TUCO INTERCHANGE (GE M102345) 230/115/13.2KV TRANSFORMER CKT 1	252	0.04589	110.762	TUCO INTERCHANGE (ENRCO 136401) 230/115/13.2KV TRANSFORMER CKT 2	
FDNS	0	3 23SP	G13_016	FROM->TO	TUCO INTERCHANGE (GE M102345) 230/115/13.2KV TRANSFORMER CKT 1	252	0.04589	107.5337	TUCO INTERCHANGE (ENRCO 136401) 230/115/13.2KV TRANSFORMER CKT 2	
FDNS	0	4 23SP	G13_016	FROM->TO	TUCO INTERCHANGE (GE M102345) 230/115/13.2KV TRANSFORMER CKT 1	252	0.04589	110.7102	TUCO INTERCHANGE (ENRCO 136401) 230/115/13.2KV TRANSFORMER CKT 2	
FDNS	0	4 23SP	G13_016	FROM->TO	TUCO INTERCHANGE (GE M102345) 230/115/13.2KV TRANSFORMER CKT 1	252	0.04589	107.4828	TUCO INTERCHANGE (ENRCO 136401) 230/115/13.2KV TRANSFORMER CKT 2	
FDNS	06G13_017		0 13G	G13_017	FROM->TO	ELK CITY 230KV (ELKCTY-6) 230/138/13.8KV TRANSFORMER CKT 1	287	0.07752	101.5889	LAWTON EASTSIDE - OKLAUNION 345KV CKT 1
FDNS	06G13_017		0 13G	G13_017	FROM->TO	ELK CITY 230KV (ELKCTY-6) 230/138/13.8KV TRANSFORMER CKT 1	287	0.07752	100.7296	LAWTON EASTSIDE - OKLAUNION 345KV CKT 1
FDNS	06ALL		0 13G	G13_017	FROM->TO	ELK CITY 230KV (ELKCTY-6) 230/138/13.8KV TRANSFORMER CKT 1	287	0.07674	107.024	SPP-AEPW-32
FDNS	06ALL		0 13G	G13_017	FROM->TO	ELK CITY 230KV (ELKCTY-6) 230/138/13.8KV TRANSFORMER CKT 1	287	0.07674	105.9984	G13_017T 345.00 - OKLAUNION 345KV CKT 1
FDNS	06ALL		0 13G	G13_017	FROM->TO	ELK CITY 230KV (ELKCTY-6) 230/138/13.8KV TRANSFORMER CKT 1	287	0.07674	105.4993	SPP-AEPW-32
FDNS	06ALL		0 13G	G13_017	FROM->TO	ELK CITY 230KV (ELKCTY-6) 230/138/13.8KV TRANSFORMER CKT 1	287	0.07674	104.5697	G13_017T 345.00 - OKLAUNION 345KV CKT 1
FDNS	00NR		0 23SP	G13_017	FROM->TO	HITCHLAND INTERCHANGE (H TP80148301) 230/115/13.2KV TRANSFORMER CKT 1	250	0.05387	110.6053	SPP-SWPS-04
FDNS	00NR		0 23SP	G13_017	FROM->TO	HITCHLAND INTERCHANGE (H TP80148301) 230/115/13.2KV TRANSFORMER CKT 1	250	0.05387	108.9175	SPP-SWPS-04
FDNS	00NR		0 23SP	G13_017	FROM->TO	HITCHLAND INTERCHANGE (H TP80148301) 230/115/13.2KV TRANSFORMER CKT 1	250	0.04634	117.9818	SPP-SWPS-K31
FDNS	00NR		0 23SP	G13_017	FROM->TO	HITCHLAND INTERCHANGE (H TP80148301) 230/115/13.2KV TRANSFORMER CKT 1	250	0.04634	115.2313	SPP-SWPS-K31
FDNS	06ALL		0 13G	G13_017	FROM->TO	ELK CITY 230KV (ELKCTY-6) 230/138/13.8KV TRANSFORMER CKT 1	287	0.03388	102.2973	DBL-HTCH-BVR
FDNS	06ALL		0 13G	G13_017	FROM->TO	ELK CITY 230KV (ELKCTY-6) 230/138/13.8KV TRANSFORMER CKT 1	287	0.03388	101.3981	DBL-HTCH-BVR
FDNS	06ALL		0 13G	G13_017	TO->FROM	DEAF SMITH COUNTY INTERCHANGE - PLANT X STATION 230KV CKT 1	351	0.09405	103.3563	G13_017T 345.00 - OKLAUNION 345KV CKT 1
FDNS	06ALL		0 13G	G13_017	TO->FROM	DEAF SMITH COUNTY INTERCHANGE - PLANT X STATION 230KV CKT 1	351	0.09405	102.5937	SPP-AEPW-32
FDNS	06ALL		0 13G	G13_017	TO->FROM	DEAF SMITH COUNTY INTERCHANGE - PLANT X STATION 230KV CKT 1	351	0.07124	101.1754	BORDER 7345.00 - WOODWARD DISTRICT EHV 345KV CKT 1
FDNS	06ALL		0 13G	G13_017	TO->FROM	DEAF SMITH COUNTY INTERCHANGE - PLANT X STATION 230KV CKT 1	351	0.06141	101.5196	PLANT X STATION - POTTER COUNTY INTERCHANGE 230KV CKT 1
FDNS	06G13_017		0 13G	G13_017	TO->FROM	PLANT X STATION - TOLK STATION EAST 230KV CKT 2	502	0.05041	100.0533	PLANT X STATION - TOLK STATION WEST 230KV CKT 1
FDNS	6		0 13G	G13_017	TO->FROM	PLANT X STATION - TOLK STATION WEST 230KV CKT 1	502	0.04955	100	PLANT X STATION - TOLK STATION EAST 230KV CKT 2
FDNS	06G13_017		0 13G	G13_017	TO->FROM	PLANT X STATION - TOLK STATION WEST 230KV CKT 1	502	0.04936	101.1421	PLANT X STATION - TOLK STATION EAST 230KV CKT 2
FDNS	06ALL		0 13G	G13_017	TO->FROM	PLANT X STATION - TOLK STATION WEST 230KV CKT 2	502	0.04799	126.7856	PLANT X STATION - TOLK STATION WEST 230KV CKT 1
FDNS	06ALL		0 13G	G13_017	TO->FROM	PLANT X STATION - TOLK STATION WEST 230KV CKT 1	502	0.04696	127.9008	PLANT X STATION - TOLK STATION EAST 230KV CKT 2
FDNS	6		0 13G	G13_017	TO->FROM	FPL SWITCH - WOODWARD 138KV CKT 1	153	0.042	139.1328	DBL-WWRD-G12
FDNS	06G13_017		0 13G	G13_017	TO->FROM	FPL SWITCH - WOODWARD 138KV CKT 1	153	0.04196	140.9774	DBL-WWRD-G12
FDNS	06ALL		0 13G	G13_017	TO->FROM	FPL SWITCH - WOODWARD 138KV CKT 1	153	0.04153	156.6884	DBL-WWRD-G12
FDNS	00G13_017		2 18WP	G13_017	FROM->TO	ELK CITY 230KV (ELKCTY-6) 230/138/13.8KV TRANSFORMER CKT 1	287	0.07583	105.862	ELKCTY7 345.00 - GRACEMONT 345KV CKT 1
FDNS	00G13_017		2 18WP	G13_017	FROM->TO	ELK CITY 230KV (ELKCTY-6) 230/138/13.8KV TRANSFORMER CKT 1	287	0.07583	105.7108	ELKCTY7 345.00 - GRACEMONT 345KV CKT 1
FDNS	00G13_017		2 23SP	G13_017	FROM->TO	TUCO INTERCHANGE (GE M102345) 230/115/13.2KV TRANSFORMER CKT 1	252	0.03982	112.7414	TUCO INTERCHANGE (ENRCO 136401) 230/115/13.2KV TRANSFORMER CKT 2
FDNS	00G13_017		2 23SP	G13_017	FROM->TO	TUCO INTERCHANGE (GE M102345) 230/115/13.2KV TRANSFORMER CKT 1	252	0.03982	109.4601	TUCO INTERCHANGE (ENRCO 136401) 230/115/13.2KV TRANSFORMER CKT 2
FDNS	0	2 23SP	G13_017	FROM->TO	TUCO INTERCHANGE (GE M102345) 230/115/13.2KV TRANSFORMER CKT 1	252	0.03978	110.9723	TUCO INTERCHANGE (ENRCO 136401) 230/115/13.2KV TRANSFORMER CKT 2	
FDNS	0	2 23SP	G13_017	FROM->TO	TUCO INTERCHANGE (GE M102345) 230/115/13.2KV TRANSFORMER CKT 1	252	0.03978	107.7203	TUCO INTERCHANGE (ENRCO 136401) 230/115/13.2KV TRANSFORMER CKT 2	
FDNS	6		2 13G	G13_017	TO->FROM	FPL SWITCH - WOODWARD 138KV CKT 1	153	0.03734	123.226	DBL-WWRD-G12
FDNS	06G13_017		2 13G	G13_017	TO->FROM	FPL SWITCH - WOODWARD 138KV CKT 1	153	0.03731	124.7682	DBL-WWRD-G12
FDNS	06ALL		2 13G	G13_017	TO->FROM	FPL SWITCH - WOODWARD 138KV CKT 1	153	0.03694	137.5001	DBL-WWRD-G12
FDNS	06ALL		2 13G	G13_017	TO->FROM	PLANT X STATION - TOLK STATION EAST 230KV CKT 2	502	0.03596	117.731	PLANT X STATION - TOLK STATION WEST 230KV CKT 1
FDNS	06ALL		2 13G	G13_017	TO->FROM	PLANT X STATION - TOLK STATION WEST 230KV CKT 1	502	0.03496	118.9947	PLANT X STATION - TOLK STATION EAST 230KV CKT 2
FDNS	00G13_017		3 18WP	G13_017	FROM->TO	ELK CITY 230KV (ELKCTY-6) 230/138/13.8KV TRANSFORMER CKT 1	287	0.07583	105.845	ELKCTY7 345.00 - GRACEMONT 345KV CKT 1
FDNS	00G13_017		3 18WP	G13_017	FROM->TO	ELK CITY 230KV (ELKCTY-6) 230/138/13.8KV TRANSFORMER CKT 1	287	0.07583	105.693	ELKCTY7 345.00 - GRACEMONT 345KV CKT 1

SOLUTION	GROUP	SCENARIO	SEASON	SOURCE	DIRECTION	MONITORED ELEMENT	RATEB (MVA)	TDF	TC%LOADING (% MVA)	CONTINGENCY	
FDNS	00G13_017		3	23SP	G13_017	FROM->TO	TUCO INTERCHANGE (GE M102345) 230/115/13.2KV TRANSFORMER CKT 1	252	0.03977	112.5244	TUCO INTERCHANGE (ENRCO 136401) 230/115/13.2KV TRANSFORMER CKT 2
FDNS	00G13_017		3	23SP	G13_017	FROM->TO	TUCO INTERCHANGE (GE M102345) 230/115/13.2KV TRANSFORMER CKT 1	252	0.03977	109.2674	TUCO INTERCHANGE (ENRCO 136401) 230/115/13.2KV TRANSFORMER CKT 2
FDNS	0		3	23SP	G13_017	FROM->TO	TUCO INTERCHANGE (GE M102345) 230/115/13.2KV TRANSFORMER CKT 1	252	0.03973	110.762	TUCO INTERCHANGE (ENRCO 136401) 230/115/13.2KV TRANSFORMER CKT 2
FDNS	0		3	23SP	G13_017	FROM->TO	TUCO INTERCHANGE (GE M102345) 230/115/13.2KV TRANSFORMER CKT 1	252	0.03973	107.5337	TUCO INTERCHANGE (ENRCO 136401) 230/115/13.2KV TRANSFORMER CKT 2
FDNS	6		3	13G	G13_017	TO->FROM	FPL SWITCH - WOODWARD 138KV CKT 1	153	0.03734	123.2184	DBL-WWRD-G12
FDNS	06G13_017		3	13G	G13_017	TO->FROM	FPL SWITCH - WOODWARD 138KV CKT 1	153	0.0373	124.76	DBL-WWRD-G12
FDNS	06ALL		3	13G	G13_017	TO->FROM	FPL SWITCH - WOODWARD 138KV CKT 1	153	0.03694	137.4852	DBL-WWRD-G12
FDNS	00G13_017		4	18WP	G13_017	FROM->TO	ELK CITY 230KV (ELKCTY-6) 230/138/13.8KV TRANSFORMER CKT 1	287	0.07583	105.8462	ELKCTY7 345.00 - GRACEMONT 345KV CKT 1
FDNS	00G13_017		4	18WP	G13_017	FROM->TO	ELK CITY 230KV (ELKCTY-6) 230/138/13.8KV TRANSFORMER CKT 1	287	0.07583	105.6943	ELKCTY7 345.00 - GRACEMONT 345KV CKT 1
FDNS	00G13_017		4	23SP	G13_017	FROM->TO	TUCO INTERCHANGE (GE M102345) 230/115/13.2KV TRANSFORMER CKT 1	252	0.03976	112.4727	TUCO INTERCHANGE (ENRCO 136401) 230/115/13.2KV TRANSFORMER CKT 2
FDNS	00G13_017		4	23SP	G13_017	FROM->TO	TUCO INTERCHANGE (GE M102345) 230/115/13.2KV TRANSFORMER CKT 1	252	0.03976	109.2166	TUCO INTERCHANGE (ENRCO 136401) 230/115/13.2KV TRANSFORMER CKT 2
FDNS	0		4	23SP	G13_017	FROM->TO	TUCO INTERCHANGE (GE M102345) 230/115/13.2KV TRANSFORMER CKT 1	252	0.03972	110.7102	TUCO INTERCHANGE (ENRCO 136401) 230/115/13.2KV TRANSFORMER CKT 2
FDNS	0		4	23SP	G13_017	FROM->TO	TUCO INTERCHANGE (GE M102345) 230/115/13.2KV TRANSFORMER CKT 1	252	0.03972	107.4828	TUCO INTERCHANGE (ENRCO 136401) 230/115/13.2KV TRANSFORMER CKT 2
FDNS	6		4	13G	G13_017	TO->FROM	FPL SWITCH - WOODWARD 138KV CKT 1	153	0.03734	123.214	DBL-WWRD-G12
FDNS	06G13_017		4	13G	G13_017	TO->FROM	FPL SWITCH - WOODWARD 138KV CKT 1	153	0.0373	124.7595	DBL-WWRD-G12
FDNS	06ALL		4	13G	G13_017	TO->FROM	FPL SWITCH - WOODWARD 138KV CKT 1	153	0.03694	137.4858	DBL-WWRD-G12
FNSL-Blown up	03ALL		0	13G	G13_018		Non-converged Contingency	0	0.04909	-	DBL-THIS-CLR
FDNS	00G13_018		0	18WP	G13_018	FROM->TO	STERLING 115/69KV TRANSFORMER CKT 1	56	0.67837	108.1321	ENRONTAP
FDNS	00G13_018		0	23SP	G13_018	FROM->TO	STERLING 115/69KV TRANSFORMER CKT 1	56	0.67835	111.8953	ENRONTAP
FDNS	00G13_018		0	18SP	G13_018	FROM->TO	STERLING 115/69KV TRANSFORMER CKT 1	56	0.67883	112.1491	ENRONTAP
FDNS	00G13_018		0	13WP	G13_018	FROM->TO	STERLING 115/69KV TRANSFORMER CKT 1	56	0.67772	105.9506	ENRONTAP
FDNS	00G13_018		0	13SP	G13_018	FROM->TO	STERLING 115/69KV TRANSFORMER CKT 1	56	0.67766	109.169	ENRONTAP
FDNS	09G13_018		0	13G	G13_018	FROM->TO	STERLING 115/69KV TRANSFORMER CKT 1	56	0.67698	102.0597	ENRONTAP
FDNS	00G13_018		0	23SP	G13_018	FROM->TO	HYDROCARBON TAP - SUB 970 69KV CKT 1	64	0.55464	104.5922	LN-FIRTH
FDNS	00G13_018		0	23SP	G13_018	FROM->TO	G13_018T 69.000 - HYDROCARBON TAP 69KV CKT 1	57	0.55464	117.4731	LN-FIRTH
FDNS	00G13_018		0	18WP	G13_018	FROM->TO	HYDROCARBON TAP - SUB 970 69KV CKT 1	64	0.55457	100.1375	LN-FIRTH
FDNS	00G13_018		0	18WP	G13_018	FROM->TO	G13_018T 69.000 - HYDROCARBON TAP 69KV CKT 1	57	0.55457	112.5455	LN-FIRTH
FDNS	00G13_018		0	18SP	G13_018	FROM->TO	HYDROCARBON TAP - SUB 970 69KV CKT 1	64	0.55456	102.6316	LN-FIRTH
FDNS	00G13_018		0	18SP	G13_018	FROM->TO	G13_018T 69.000 - HYDROCARBON TAP 69KV CKT 1	57	0.55456	115.2724	LN-FIRTH
FDNS	09ALLBPSON		0	13G	G13_018	FROM->TO	G13_018T 69.000 - HYDROCARBON TAP 69KV CKT 1	57	0.55441	101.6909	FIRTH - STERLING 115KV CKT 1
FDNS	09ALLBPSON		0	13G	G13_018	FROM->TO	G13_018T 69.000 - HYDROCARBON TAP 69KV CKT 1	57	0.55441	101.6663	STERLING 115/69KV TRANSFORMER CKT 1
FDNS	09ALLBPSON		0	13G	G13_018	FROM->TO	G13_018T 69.000 - HYDROCARBON TAP 69KV CKT 1	57	0.55441	101.6662	LN-FIRTH
FDNS	09ALL		0	13G	G13_018	FROM->TO	G13_018T 69.000 - HYDROCARBON TAP 69KV CKT 1	57	0.5544	101.4182	LN-FIRTH
FDNS	09ALL		0	13G	G13_018	FROM->TO	G13_018T 69.000 - HYDROCARBON TAP 69KV CKT 1	57	0.5544	101.4177	STERLING 115/69KV TRANSFORMER CKT 1
FDNS	09ALL		0	13G	G13_018	FROM->TO	G13_018T 69.000 - HYDROCARBON TAP 69KV CKT 1	57	0.5544	101.4098	FIRTH - STERLING 115KV CKT 1
FDNS	00G13_018		0	13SP	G13_018	FROM->TO	HYDROCARBON TAP - SUB 970 69KV CKT 1	64	0.55439	100.1489	LN-FIRTH
FDNS	00G13_018		0	13SP	G13_018	FROM->TO	G13_018T 69.000 - HYDROCARBON TAP 69KV CKT 1	57	0.55439	112.4857	LN-FIRTH
FDNS	00G13_018		0	13WP	G13_018	FROM->TO	G13_018T 69.000 - HYDROCARBON TAP 69KV CKT 1	57	0.55436	110.1314	LN-FIRTH
FDNS	09G13_018		0	13G	G13_018	FROM->TO	G13_018T 69.000 - HYDROCARBON TAP 69KV CKT 1	57	0.55431	104.6226	LN-FIRTH
FDNS	09G13_018BPSON		0	13G	G13_018	FROM->TO	G13_018T 69.000 - HYDROCARBON TAP 69KV CKT 1	57	0.55431	104.837	LN-FIRTH
FDNS	09ALL		0	13G	G13_018	FROM->TO	G13_018T 69.000 - HYDROCARBON TAP 69KV CKT 1	57	0.38938	108.1723	SUB 968 - SUB 969 69KV CKT 1
FDNS	09ALL		0	13G	G13_018	FROM->TO	G13_018T 69.000 - HYDROCARBON TAP 69KV CKT 1	57	0.38938	107.8527	S968LINBUS
FDNS	09ALL		0	13G	G13_018	FROM->TO	G13_018T 69.000 - HYDROCARBON TAP 69KV CKT 1	57	0.38938	104.8516	SUB 967 - SUB 968 69KV CKT 1
FDNS	09ALL		0	13G	G13_018	FROM->TO	G13_018T 69.000 - HYDROCARBON TAP 69KV CKT 1	57	0.38938	103.3862	SUB 967 - WEST BROCK 69KV CKT 1
FDNS	09ALLBPSON		0	13G	G13_018	FROM->TO	HYDROCARBON TAP - SUB 970 69KV CKT 1	64	0.38938	103.1985	SUB 968 - SUB 969 69KV CKT 1
FDNS	09ALLBPSON		0	13G	G13_018	FROM->TO	HYDROCARBON TAP - SUB 970 69KV CKT 1	64	0.38938	102.916	S968LINBUS
FDNS	09ALLBPSON		0	13G	G13_018	FROM->TO	HYDROCARBON TAP - SUB 970 69KV CKT 1	64	0.38938	100.245	SUB 967 - SUB 968 69KV CKT 1
FDNS	09ALLBPSON		0	13G	G13_018	FROM->TO	G13_018T 69.000 - HYDROCARBON TAP 69KV CKT 1	57	0.38938	115.92	SUB 968 - SUB 969 69KV CKT 1
FDNS	09ALLBPSON		0	13G	G13_018	FROM->TO	G13_018T 69.000 - HYDROCARBON TAP 69KV CKT 1	57	0.38938	115.6029	S968LINBUS
FDNS	09ALLBPSON		0	13G	G13_018	FROM->TO	G13_018T 69.000 - HYDROCARBON TAP 69KV CKT 1	57	0.38938	112.6035	SUB 967 - SUB 968 69KV CKT 1
FDNS	09ALLBPSON		0	13G	G13_018	FROM->TO	G13_018T 69.000 - HYDROCARBON TAP 69KV CKT 1	57	0.38938	111.1493	SUB 967 - WEST BROCK 69KV CKT 1
FDNS	09G13_018		0	13G	G13_018	FROM->TO	G13_018T 69.000 - HYDROCARBON TAP 69KV CKT 1	57	0.38936	107.8437	S968LINBUS
FDNS	09G13_018BPSON		0	13G	G13_018	FROM->TO	HYDROCARBON TAP - SUB 970 69KV CKT 1	64	0.38936	103.3162	S968LINBUS
FDNS	09G13_018BPSON		0	13G	G13_018	FROM->TO	G13_018T 69.000 - HYDROCARBON TAP 69KV CKT 1	57	0.38936	116.0529	S968LINBUS
FDNS	00G13_018		0	13SP	G13_018	FROM->TO	HYDROCARBON TAP - SUB 970 69KV CKT 1	64	0.38881	101.8776	S968LINBUS
FDNS	00G13_018		0	13SP	G13_018	FROM->TO	G13_018T 69.000 - HYDROCARBON TAP 69KV CKT 1	57	0.38881	114.4299	S968LINBUS
FDNS	00G13_018		0	13WP	G13_018	FROM->TO	G13_018T 69.000 - HYDROCARBON TAP 69KV CKT 1	57	0.3887	111.3764	S968LINBUS
FDNS	00G13_018		0	23SP	G13_018	FROM->TO	HYDROCARBON TAP - SUB 970 69KV CKT 1	64	0.38846	106.2776	S968LINBUS
FDNS	00G13_018		0	23SP	G13_018	FROM->TO	G13_018T 69.000 - HYDROCARBON TAP 69KV CKT 1	57	0.38846	119.4142	S968LINBUS
FDNS	00G13_018		0	18SP	G13_018	FROM->TO	HYDROCARBON TAP - SUB 970 69KV CKT 1	64	0.38841	103.3543	S968LINBUS
FDNS	00G13_018		0	18SP	G13_018	FROM->TO	G13_018T 69.000 - HYDROCARBON TAP 69KV CKT 1	57	0.38841	116.0868	S968LINBUS
FDNS	00G13_018		0	18WP	G13_018	FROM->TO	HYDROCARBON TAP - SUB 970 69KV CKT 1	64	0.38835	100.4689	S968LINBUS
FDNS	00G13_018		0	18WP	G13_018	FROM->TO	G13_018T 69.000 - HYDROCARBON TAP 69KV CKT 1	57	0.38835	112.9275	S968LINBUS
FDNS	09ALL		0	13G	G13_018	FROM->TO	G13_018T 69.000 - HYDROCARBON TAP 69KV CKT 1	57	0.37787	107.8669	S1263T1 AUTO
FDNS	09ALLBPSON		0	13G	G13_018	FROM->TO	HYDROCARBON TAP - SUB 970 69KV CKT 1	64	0.37787	102.6531	S1263T1 AUTO
FDNS	09ALLBPSON		0	13G	G13_018	FROM->TO	G13_018T 69.000 - HYDROCARBON TAP 69KV CKT 1	57	0.37787	115.3033	S1263T1 AUTO
FDNS	09BPSON		0	13G	G13_018	FROM->TO	G13_018T 69.000 - HYDROCARBON TAP 69KV CKT 1	57	0.37787	100.165	S1263T1 AUTO
FDNS	09G13_018		0	13G	G13_018	FROM->TO	G13_018T 69.000 - HYDROCARBON TAP 69KV CKT 1	57	0.37773	112.0316	S1263T1 AUTO
FDNS	09G13_018BPSON		0	13G	G13_018	FROM->TO	HYDROCARBON TAP - SUB 970 69KV CKT 1	64	0.37772	106.522	S1263T1 AUTO
FDNS	09G13_018BPSON		0	13G	G13_018	FROM->TO	G13_018T 69.000 - HYDROCARBON TAP 69KV CKT 1	57	0.37772	119.6484	S1263T1 AUTO
FDNS	00G13_018		0	13SP	G13_018	FROM->TO	HYDROCARBON TAP - SUB 970 69KV CKT 1	64	0.37726	107.4032	S1263T1 AUTO
FDNS	00G13_018		0	13SP	G13_018	FROM->TO	G13_018T 69.000 - HYDROCARBON TAP 69KV CKT 1	57	0.37726	120.6329	S1263T1 AUTO
FDNS	00G13_018		0	13WP	G13_018	FROM->TO	HYDROCARBON TAP - SUB 970 69KV CKT 1	64	0.37711	104.5072	S1263T1 AUTO
FDNS	00G13_018		0	13WP	G13_018	FROM->TO	G13_018T 69.000 - HYDROCARBON TAP 69KV CKT 1	57	0.37711	117.5061	S1263T1 AUTO
FDNS	00G13_018		0	23SP	G13_018	FROM->TO	HYDROCARBON TAP - SUB 970 69KV CKT 1	64	0.37695	112.8912	S1263T1 AUTO
FDNS	00G13_018		0	23SP	G13_018	FROM->TO	G13_018T 69.000 - HYDROCARBON TAP 69KV CKT 1	57	0.37695	126.8429	S1263T1 AUTO
FDNS	00G13_018		0	18SP	G13_018	FROM->TO	HYDROCARBON TAP - SUB 970 69KV CKT 1	64	0.37689	109.3873	S1263T1 AUTO
FDNS	00G13_018		0	18SP	G13_018	FROM->TO	G13_018T 69.000 - HYDROCARBON TAP 69KV CKT 1	57	0.37689	122.8617	S1263T1 AUTO

SOLUTION	GROUP	SCENARIO	SEASON	SOURCE	DIRECTION	MONITORED ELEMENT	RATEB (MVA)	TDF	TC%LOADING (% MVA)	CONTINGENCY
FDNS	00G13_018		0 18WP	G13_018	FROM->TO	HYDROCARBON TAP - SUB 970 69KV CKT 1	64	0.37679	106.4558	S1263T1 AUTO
FDNS	00G13_018		0 18WP	G13_018	FROM->TO	G13_018T 69.000 - HYDROCARBON TAP 69KV CKT 1	57	0.37679	119.6699	S1263T1 AUTO
FDNS	09ALLBPSON		0 13G	G13_018	FROM->TO	G13_018T 69.000 - HYDROCARBON TAP 69KV CKT 1	57	0.30794	100	SUB 963 - WEST BROCK 69KV CKT 1
FDNS	09ALLBPSON		0 13G	G13_018	FROM->TO	G13_018T 69.000 - HYDROCARBON TAP 69KV CKT 1	57	0.28774	103.5121	SUB 963 - SUB 977 69KV CKT 1
FDNS	09ALLBPSON		0 13G	G13_018	FROM->TO	G13_018T 69.000 - HYDROCARBON TAP 69KV CKT 1	57	0.28774	102.8967	NEB CITY U SUB 903 - SUB 977 69KV CKT 1
FDNS	09ALLBPSON		0 13G	G13_018	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.13377	294.5695	MOORE (MOORE T1) 345/115/13.8KV TRANSFORMER CKT 1
FDNS	09BPSON		0 13G	G13_018	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.13375	261.3835	MOORE (MOORE T1) 345/115/13.8KV TRANSFORMER CKT 1
FDNS	9		0 13G	G13_018	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.13373	143.9592	MOORE (MOORE T1) 345/115/13.8KV TRANSFORMER CKT 1
FDNS	03ALL		0 13G	G13_018	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.13366	112.6777	MOORE (MOORE T1) 345/115/13.8KV TRANSFORMER CKT 1
FDNS	09G13_018BPSON		0 13G	G13_018	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.13356	312.5217	MOORE (MOORE T1) 345/115/13.8KV TRANSFORMER CKT 1
FDNS	09G13_018		0 13G	G13_018	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.13353	189.5833	MOORE (MOORE T1) 345/115/13.8KV TRANSFORMER CKT 1
FDNS	09ALLBPSON		0 13G	G13_018	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.09956	346.1206	SHELDON - SW7TH & PLEASANT HILL 115KV CKT 1
FDNS	09BPSON		0 13G	G13_018	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.09954	323.0332	SHELDON - SW7TH & PLEASANT HILL 115KV CKT 1
FDNS	09ALL		0 13G	G13_018	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.09953	258.2818	SHELDON - SW7TH & PLEASANT HILL 115KV CKT 1
FDNS	9		0 13G	G13_018	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.09951	234.7203	SHELDON - SW7TH & PLEASANT HILL 115KV CKT 1
FDNS	03ALL		0 13G	G13_018	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.09947	237.9318	SHELDON - SW7TH & PLEASANT HILL 115KV CKT 1
FDNS	3		0 13G	G13_018	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.09946	221.2259	SHELDON - SW7TH & PLEASANT HILL 115KV CKT 1
FDNS	09G13_018BPSON		0 13G	G13_018	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.09939	362.2025	SHELDON - SW7TH & PLEASANT HILL 115KV CKT 1
FDNS	14		0 13G	G13_018	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.09938	204.3452	SHELDON - SW7TH & PLEASANT HILL 115KV CKT 1
FDNS	14ALL		0 13G	G13_018	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.09938	207.3528	SHELDON - SW7TH & PLEASANT HILL 115KV CKT 1
FDNS	09G13_018		0 13G	G13_018	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.09936	272.9474	SHELDON - SW7TH & PLEASANT HILL 115KV CKT 1
FDNS	08ALL		0 13G	G13_018	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.09934	209.6905	SHELDON - SW7TH & PLEASANT HILL 115KV CKT 1
FDNS	8		0 13G	G13_018	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.09933	206.3613	SHELDON - SW7TH & PLEASANT HILL 115KV CKT 1
FDNS	09ALLBPSON		0 13G	G13_018	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.09434	239.1213	G13_018T 69.000 - HYDROCARBON TAP 69KV CKT 1
FDNS	09ALLBPSON		0 13G	G13_018	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.09434	239.1209	ENRONTAP
FDNS	09ALLBPSON		0 13G	G13_018	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.09434	239.1148	HYDROCARBON TAP - SUB 970 69KV CKT 1
FDNS	09ALLBPSON		0 13G	G13_018	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.09434	238.2697	NEB CITY U SYR SUB - SUB 970 69KV CKT 1
FDNS	09ALLBPSON		0 13G	G13_018	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.09434	237.6113	NEB CITY U SYR SUB - SUB 971 69KV CKT 1
FDNS	09BPSON		0 13G	G13_018	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.09433	221.9915	ENRONTAP
FDNS	09BPSON		0 13G	G13_018	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.09433	221.9912	G13_018T 69.000 - HYDROCARBON TAP 69KV CKT 1
FDNS	09BPSON		0 13G	G13_018	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.09433	221.9867	HYDROCARBON TAP - SUB 970 69KV CKT 1
FDNS	09BPSON		0 13G	G13_018	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.09433	221.0159	NEB CITY U SYR SUB - SUB 970 69KV CKT 1
FDNS	09BPSON		0 13G	G13_018	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.09433	220.5622	NEB CITY U SYR SUB - SUB 971 69KV CKT 1
FDNS	09ALL		0 13G	G13_018	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.09432	182.1494	ENRONTAP
FDNS	09ALL		0 13G	G13_018	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.09432	182.1489	G13_018T 69.000 - HYDROCARBON TAP 69KV CKT 1
FDNS	09ALL		0 13G	G13_018	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.09432	182.1441	HYDROCARBON TAP - SUB 970 69KV CKT 1
FDNS	09ALL		0 13G	G13_018	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.09432	181.2945	NEB CITY U SYR SUB - SUB 970 69KV CKT 1
FDNS	09ALL		0 13G	G13_018	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.09432	180.8261	NEB CITY U SYR SUB - SUB 971 69KV CKT 1
FDNS	9		0 13G	G13_018	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.09431	164.3642	ENRONTAP
FDNS	9		0 13G	G13_018	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.09431	164.3637	G13_018T 69.000 - HYDROCARBON TAP 69KV CKT 1
FDNS	9		0 13G	G13_018	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.09431	164.3589	HYDROCARBON TAP - SUB 970 69KV CKT 1
FDNS	9		0 13G	G13_018	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.09431	163.4615	NEB CITY U SYR SUB - SUB 970 69KV CKT 1
FDNS	9		0 13G	G13_018	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.09431	163.007	NEB CITY U SYR SUB - SUB 971 69KV CKT 1
FDNS	09G13_018BPSON		0 13G	G13_018	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.09422	248.7836	ENRONTAP
FDNS	09G13_018BPSON		0 13G	G13_018	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.09422	248.7832	G13_018T 69.000 - HYDROCARBON TAP 69KV CKT 1
FDNS	09G13_018BPSON		0 13G	G13_018	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.09422	248.7788	HYDROCARBON TAP - SUB 970 69KV CKT 1
FDNS	09G13_018BPSON		0 13G	G13_018	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.09422	247.9389	NEB CITY U SYR SUB - SUB 970 69KV CKT 1
FDNS	09G13_018BPSON		0 13G	G13_018	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.09422	247.2185	NEB CITY U SYR SUB - SUB 971 69KV CKT 1
FDNS	09G13_018		0 13G	G13_018	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.09421	190.166	ENRONTAP
FDNS	09G13_018		0 13G	G13_018	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.09421	190.1656	G13_018T 69.000 - HYDROCARBON TAP 69KV CKT 1
FDNS	09G13_018		0 13G	G13_018	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.09421	190.1614	HYDROCARBON TAP - SUB 970 69KV CKT 1
FDNS	09G13_018		0 13G	G13_018	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.09421	189.3345	NEB CITY U SYR SUB - SUB 970 69KV CKT 1
FDNS	09G13_018		0 13G	G13_018	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.09421	188.8735	NEB CITY U SYR SUB - SUB 971 69KV CKT 1
FDNS	03ALL		0 13G	G13_018	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.06765	147.1502	LN-FRIEND
FDNS	03ALL		0 13G	G13_018	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.06765	147.0266	FRIEND - GENEVA 115KV CKT 1
FDNS	09ALLBPSON		0 13G	G13_018	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.06662	240.596	KNOB HILL - STEELE CITY 115KV CKT 1
FDNS	09BPSON		0 13G	G13_018	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.06661	222.5181	KNOB HILL - STEELE CITY 115KV CKT 1
FDNS	09ALL		0 13G	G13_018	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.0666	179.7569	KNOB HILL - STEELE CITY 115KV CKT 1
FDNS	09G13_018BPSON		0 13G	G13_018	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.06651	248.4223	KNOB HILL - STEELE CITY 115KV CKT 1
FDNS	09ALL		0 13G	G13_018	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.06602	162.7338	BEATRICE - HARBINE 115KV CKT 1
FDNS	9		0 13G	G13_018	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.06601	148.0065	BEATRICE - HARBINE 115KV CKT 1
FDNS	09G13_018		0 13G	G13_018	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.06591	172.5975	BEATRICE - HARBINE 115KV CKT 1
FDNS	09ALLBPSON		0 13G	G13_018	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.06515	220.2773	BEATRICE POWER STATION - SHELDON 115KV CKT 1
FDNS	09BPSON		0 13G	G13_018	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.06513	204.6262	BEATRICE POWER STATION - SHELDON 115KV CKT 1
FDNS	09G13_018BPSON		0 13G	G13_018	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.06504	230.0966	BEATRICE POWER STATION - SHELDON 115KV CKT 1
FDNS	09ALLBPSON		0 13G	G13_018	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.06497	239.7699	103RD & ROKEBY - MOORE 345KV CKT 1
FDNS	09BPSON		0 13G	G13_018	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.06496	221.9739	103RD & ROKEBY - MOORE 345KV CKT 1
FDNS	09ALL		0 13G	G13_018	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.06495	181.5014	103RD & ROKEBY - MOORE 345KV CKT 1
FDNS	9		0 13G	G13_018	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.06494	163.1911	103RD & ROKEBY - MOORE 345KV CKT 1
FDNS	3		0 13G	G13_018	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.06487	158.5291	103RD & ROKEBY - MOORE 345KV CKT 1
FDNS	03ALL		0 13G	G13_018	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.06486	173.3787	103RD & ROKEBY - MOORE 345KV CKT 1
FDNS	09ALLBPSON		0 13G	G13_018	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.06483	239.1308	BEATRICE - STEINAUER 115KV CKT 1
FDNS	09ALLBPSON		0 13G	G13_018	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.06483	238.5469	HUMBOLDT - STEINAUER 115KV CKT 1
FDNS	09ALLBPSON		0 13G	G13_018	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.06483	238.4994	LN-1176
FDNS	09ALLBPSON		0 13G	G13_018	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.06483	236.8819	HUMBOLDT (HUMBOLDT T2) 161/115/13.8KV TRANSFORMER CKT 1
FDNS	09G13_018BPSON		0 13G	G13_018	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.06483	249.7906	103RD & ROKEBY - MOORE 345KV CKT 1
FDNS	09BPSON		0 13G	G13_018	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.06482	221.8065	BEATRICE - STEINAUER 115KV CKT 1
FDNS	09BPSON		0 13G	G13_018	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.06482	221.5559	HUMBOLDT - STEINAUER 115KV CKT 1

SOLUTION	GROUP	SCENARIO	SEASON	SOURCE	DIRECTION	MONITORED ELEMENT	RATEB (MVA)	TDF	TC%LOADING (% MVA)	CONTINGENCY
FDNS	09BPSON		0 13G	G13_018	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.06482	221.3036	LN-1176
FDNS	09BPSON		0 13G	G13_018	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.06482	219.9795	HUMBOLDT (HUMBOLDT T2) 161/115/13.8KV TRANSFORMER CKT 1
FDNS	09G13_018		0 13G	G13_018	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.06481	190.0093	I03RD & ROKEBY - MOORE 345KV CKT 1
FDNS	08ALL		0 13G	G13_018	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.0648	143.6215	I03RD & ROKEBY - MOORE 345KV CKT 1
FDNS	09ALLBPSON		0 13G	G13_018	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.0648	239.5779	G08-123N 115.00 - PAULINE 115KV CKT 1
FDNS	09BPSON		0 13G	G13_018	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.06479	220.7039	G08-123N 115.00 - PAULINE 115KV CKT 1
FDNS	09ALL		0 13G	G13_018	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.06478	182.9788	G08-123N 115.00 - PAULINE 115KV CKT 1
FDNS	9		0 13G	G13_018	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.06477	163.144	G08-123N 115.00 - PAULINE 115KV CKT 1
FDNS	09G13_018BPSON		0 13G	G13_018	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.06471	248.0204	BEATRICE - STEINAUER 115KV CKT 1
FDNS	09G13_018BPSON		0 13G	G13_018	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.06471	247.77	HUMBOLDT - STEINAUER 115KV CKT 1
FDNS	09G13_018BPSON		0 13G	G13_018	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.06471	247.4312	LN-1176
FDNS	09G13_018BPSON		0 13G	G13_018	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.06471	245.8455	HUMBOLDT (HUMBOLDT T2) 161/115/13.8KV TRANSFORMER CKT 1
FDNS	09G13_018BPSON		0 13G	G13_018	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.06469	245.9299	G08-123N 115.00 - PAULINE 115KV CKT 1
FDNS	09G13_018		0 13G	G13_018	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.06468	187.4635	G08-123N 115.00 - PAULINE 115KV CKT 1
FDNS	09ALLBPSON		0 13G	G13_018	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.06435	235.5512	SPP-WERE-49B
FDNS	09ALLBPSON		0 13G	G13_018	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.06435	235.509	MARSHALL3 115.00 - SMITTYVILLE N.M. COOP (NEMAHA MARSHALL R.E. 115KV CKT 1
FDNS	09ALLBPSON		0 13G	G13_018	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.06435	235.3778	BAILEYVILLE N.M. STATION (NEMAHA MARSHALL R - SMITTYVILLE N.M. COOP (NEMAHA MARSHALL R.E. 115KV CKT 1
FDNS	09ALLBPSON		0 13G	G13_018	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.06435	235.3033	BAILEYVILLE N.M. STATION (NEMAHA MARSHALL R - SOUTH SENECA 115KV CKT 1
FDNS	09ALLBPSON		0 13G	G13_018	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.06426	236.4326	GEN645001 1-FORT CALHOUN 1
FDNS	09ALLBPSON		0 13G	G13_018	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.06426	227.9028	BASE CASE
FDNS	09ALLBPSON		0 13G	G13_018	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.06426	220.6224	GEN560756 1-G13_018_3 0.5750
FDNS	09ALLBPSON		0 13G	G13_018	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.06426	220.4277	LN-WAPA2
FDNS	09ALLBPSON		0 13G	G13_018	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.06426	219.9022	LN-1094
FDNS	09ALLBPSON		0 13G	G13_018	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.06426	219.5301	LN-WAPA4
FDNS	09ALLBPSON		0 13G	G13_018	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.06426	216.9703	LN-MALONEY
FDNS	09ALLBPSON		0 13G	G13_018	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.06426	216.6179	GEN562029 1-G11_018_3 0.6900
FDNS	09ALLBPSON		0 13G	G13_018	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.06426	210.6269	GEN560711 1-G10_044_3 0.6900
FDNS	09ALLBPSON		0 13G	G13_018	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.06426	209.3218	GEN640022 1-BEATRICE POWER STATION UNIT 1
FDNS	09ALLBPSON		0 13G	G13_018	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.06426	209.3214	GEN640023 2-BEATRICE POWER STATION UNIT 2
FDNS	09ALLBPSON		0 13G	G13_018	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.06426	206.9995	GEN640024 3-BEATRICE POWER STATION UNIT 3
FDNS	09ALLBPSON		0 13G	G13_018	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.06426	204.331	GEN560749 1-G13_002_3 0.6900
FDNS	09ALLBPSON		0 13G	G13_018	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.06426	191.8155	GEN640020 2-SHELDON STATION UNIT 2
FDNS	09ALLBPSON		0 13G	G13_018	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.06425	216.5905	NEB02WAPAB2
FDNS	09BPSON		0 13G	G13_018	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.06425	220.7343	GEN645001 1-FORT CALHOUN 1
FDNS	09BPSON		0 13G	G13_018	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.06425	212.1281	BASE CASE
FDNS	09BPSON		0 13G	G13_018	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.06425	204.691	LN-WAPA2
FDNS	09BPSON		0 13G	G13_018	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.06425	204.3375	LN-1094
FDNS	09BPSON		0 13G	G13_018	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.06425	203.8636	LN-WAPA4
FDNS	09BPSON		0 13G	G13_018	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.06425	203.1045	GEN562029 1-G11_018_3 0.6900
FDNS	09BPSON		0 13G	G13_018	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.06425	201.3003	LN-MALONEY
FDNS	09BPSON		0 13G	G13_018	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.06425	198.1552	GEN560711 1-G10_044_3 0.6900
FDNS	09BPSON		0 13G	G13_018	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.06425	193.6881	GEN640022 1-BEATRICE POWER STATION UNIT 1
FDNS	09BPSON		0 13G	G13_018	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.06425	193.6877	GEN640023 2-BEATRICE POWER STATION UNIT 2
FDNS	09BPSON		0 13G	G13_018	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.06425	193.0857	GEN560749 1-G13_002_3 0.6900
FDNS	09BPSON		0 13G	G13_018	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.06425	191.3777	GEN640024 3-BEATRICE POWER STATION UNIT 3
FDNS	09BPSON		0 13G	G13_018	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.06425	179.8797	GEN640020 2-SHELDON STATION UNIT 2
FDNS	09ALL		0 13G	G13_018	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.06424	180.1153	GEN645001 1-FORT CALHOUN 1
FDNS	09ALL		0 13G	G13_018	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.06424	171.5652	BASE CASE
FDNS	09ALL		0 13G	G13_018	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.06424	164.2405	GEN560756 1-G13_018_3 0.5750
FDNS	09ALL		0 13G	G13_018	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.06424	164.0118	LN-WAPA2
FDNS	09ALL		0 13G	G13_018	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.06424	163.8091	LN-1094
FDNS	09ALL		0 13G	G13_018	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.06424	163.16	LN-WAPA4
FDNS	09ALL		0 13G	G13_018	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.06424	160.6067	LN-MALONEY
FDNS	09ALL		0 13G	G13_018	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.06424	160.0672	GEN562029 1-G11_018_3 0.6900
FDNS	09ALL		0 13G	G13_018	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.06424	160.0519	NEB02WAPAB2
FDNS	09ALL		0 13G	G13_018	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.06424	153.7606	GEN560711 1-G10_044_3 0.6900
FDNS	09ALL		0 13G	G13_018	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.06424	146.9539	GEN560749 1-G13_002_3 0.6900
FDNS	09ALL		0 13G	G13_018	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.06424	136.9382	GEN640020 2-SHELDON STATION UNIT 2
FDNS	09BPSON		0 13G	G13_018	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.06424	200.8202	NEB02WAPAB2
FDNS	9		0 13G	G13_018	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.06423	163.9777	GEN645001 1-FORT CALHOUN 1
FDNS	9		0 13G	G13_018	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.06423	155.3322	BASE CASE
FDNS	9		0 13G	G13_018	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.06423	148.4728	LN-STOCKWILL
FDNS	9		0 13G	G13_018	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.06423	147.7665	LN-WAPA2
FDNS	9		0 13G	G13_018	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.06423	147.4362	LN-1094
FDNS	9		0 13G	G13_018	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.06423	146.9595	LN-WAPA4
FDNS	9		0 13G	G13_018	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.06423	146.1905	GEN562029 1-G11_018_3 0.6900
FDNS	9		0 13G	G13_018	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.06423	144.4199	LN-MALONEY
FDNS	9		0 13G	G13_018	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.06423	143.8886	NEB02WAPAB2
FDNS	9		0 13G	G13_018	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.06423	141.0792	GEN560711 1-G10_044_3 0.6900
FDNS	9		0 13G	G13_018	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.06423	135.9302	GEN560749 1-G13_002_3 0.6900
FDNS	9		0 13G	G13_018	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.06423	124.2271	GEN640020 2-SHELDON STATION UNIT 2
FDNS	03ALL		0 13G	G13_018	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.06423	162.129	DBL-TGA-MATT
FDNS	09ALLBPSON		0 13G	G13_018	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.06422	239.7124	KELLY - MADISONCO 230.00 230KV CKT 1
FDNS	03ALL		0 13G	G13_018	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.06421	162.0548	DBL-BVR-WWRD
FDNS	09BPSON		0 13G	G13_018	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.06421	220.5345	KELLY - MADISONCO 230.00 230KV CKT 1

SOLUTION	GROUP	SCENARIO	SEASON	SOURCE	DIRECTION	MONITORED ELEMENT	RATEB (MVA)	TDF	TC%LOADING (% MVA)	CONTINGENCY
FDNS	3		0 13G	G13_018	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CRT 2	43	0.0642	136.3533	LN-1094
FDNS	3		0 13G	G13_018	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CRT 2	43	0.0642	136.3103	LN-WAPA2
FDNS	3		0 13G	G13_018	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CRT 2	43	0.0642	135.691	LN-WAPA4
FDNS	3		0 13G	G13_018	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CRT 2	43	0.0642	133.0495	LN-MALONEY
FDNS	3		0 13G	G13_018	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CRT 2	43	0.0642	132.0543	NEB02WAPAB2
FDNS	3		0 13G	G13_018	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CRT 2	43	0.0642	128.1979	GEN640019 1-SHELDON STATION UNIT 1
FDNS	3		0 13G	G13_018	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CRT 2	43	0.0642	117.6797	GEN640020 2-SHELDON STATION UNIT 2
FDNS	03ALL		0 13G	G13_018	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CRT 2	43	0.0642	167.2303	DBL-SPRVL-MU
FDNS	03ALL		0 13G	G13_018	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CRT 2	43	0.0642	167.0267	DBL-MUL-RENO
FDNS	03ALL		0 13G	G13_018	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CRT 2	43	0.0642	164.3742	DBL-WICH-THI
FDNS	03ALL		0 13G	G13_018	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CRT 2	43	0.0642	162.6887	GEN645001 1-FORT CALHOUN 1
FDNS	03ALL		0 13G	G13_018	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CRT 2	43	0.0642	154.4343	BASE CASE
FDNS	03ALL		0 13G	G13_018	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CRT 2	43	0.0642	147.1631	LN-WAPA2
FDNS	03ALL		0 13G	G13_018	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CRT 2	43	0.0642	147.0607	LN-1094
FDNS	03ALL		0 13G	G13_018	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CRT 2	43	0.0642	146.411	LN-WAPA4
FDNS	03ALL		0 13G	G13_018	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CRT 2	43	0.0642	144.1138	LN-MALONEY
FDNS	03ALL		0 13G	G13_018	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CRT 2	43	0.0642	142.7372	NEB02WAPAB2
FDNS	03ALL		0 13G	G13_018	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CRT 2	43	0.0642	139.176	GEN640019 1-SHELDON STATION UNIT 1
FDNS	03ALL		0 13G	G13_018	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CRT 2	43	0.0642	123.514	GEN640020 2-SHELDON STATION UNIT 2
FDNS	09ALL		0 13G	G13_018	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CRT 2	43	0.0642	183.4902	KELLY - MADISONCO 230.00 230KV CRT 1
FDNS	9		0 13G	G13_018	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CRT 2	43	0.06419	163.5575	KELLY - MADISONCO 230.00 230KV CRT 1
FDNS	03ALL		0 13G	G13_018	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CRT 2	43	0.06418	162.3419	STEGALL - WAYSIDE 230KV CRT 1
FDNS	14		0 13G	G13_018	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CRT 2	43	0.06415	141.8702	GEN645001 1-FORT CALHOUN 1
FDNS	14		0 13G	G13_018	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CRT 2	43	0.06415	139.9563	GEN645012 2-NEBRASKA CITY 2
FDNS	14		0 13G	G13_018	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CRT 2	43	0.06415	132.6273	BASE CASE
FDNS	14		0 13G	G13_018	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CRT 2	43	0.06415	124.5091	LN-WAPA4
FDNS	14		0 13G	G13_018	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CRT 2	43	0.06415	121.9839	LN-MALONEY
FDNS	14		0 13G	G13_018	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CRT 2	43	0.06415	115.2085	GEN640019 1-SHELDON STATION UNIT 1
FDNS	14		0 13G	G13_018	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CRT 2	43	0.06415	108.3077	GEN640020 2-SHELDON STATION UNIT 2
FDNS	09G13_018BPSON		0 13G	G13_018	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CRT 2	43	0.06415	246.3063	GEN645001 1-FORT CALHOUN 1
FDNS	09G13_018BPSON		0 13G	G13_018	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CRT 2	43	0.06415	244.5643	GEN645012 2-NEBRASKA CITY 2
FDNS	09G13_018BPSON		0 13G	G13_018	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CRT 2	43	0.06415	237.37	BASE CASE
FDNS	09G13_018BPSON		0 13G	G13_018	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CRT 2	43	0.06415	230.1794	GEN560756 1-G13_018_3 0.5750
FDNS	09G13_018BPSON		0 13G	G13_018	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CRT 2	43	0.06415	230.007	LN-WAPA2
FDNS	09G13_018BPSON		0 13G	G13_018	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CRT 2	43	0.06415	229.603	LN-1094
FDNS	09G13_018BPSON		0 13G	G13_018	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CRT 2	43	0.06415	229.1681	LN-WAPA4
FDNS	09G13_018BPSON		0 13G	G13_018	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CRT 2	43	0.06415	228.366	GEN562029 1-G11_018_3 0.6900
FDNS	09G13_018BPSON		0 13G	G13_018	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CRT 2	43	0.06415	226.622	LN-MALONEY
FDNS	09G13_018BPSON		0 13G	G13_018	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CRT 2	43	0.06415	225.9547	NEB02WAPAB2
FDNS	09G13_018BPSON		0 13G	G13_018	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CRT 2	43	0.06415	223.4249	GEN560711 1-G10_044_3 0.6900
FDNS	09G13_018BPSON		0 13G	G13_018	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CRT 2	43	0.06415	220.0668	GEN640019 1-SHELDON STATION UNIT 1
FDNS	09G13_018BPSON		0 13G	G13_018	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CRT 2	43	0.06415	218.9781	GEN640022 1-BEATRICE POWER STATION UNIT 1
FDNS	09G13_018BPSON		0 13G	G13_018	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CRT 2	43	0.06415	218.9777	GEN640023 2-BEATRICE POWER STATION UNIT 2
FDNS	09G13_018BPSON		0 13G	G13_018	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CRT 2	43	0.06415	218.3705	GEN560749 1-G13_002_3 0.6900
FDNS	09G13_018BPSON		0 13G	G13_018	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CRT 2	43	0.06415	216.6726	GEN640024 3-BEATRICE POWER STATION UNIT 3
FDNS	09G13_018BPSON		0 13G	G13_018	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CRT 2	43	0.06415	202.5827	GEN640020 2-SHELDON STATION UNIT 2
FDNS	14ALL		0 13G	G13_018	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CRT 2	43	0.06415	143.691	GEN645001 1-FORT CALHOUN 1
FDNS	14ALL		0 13G	G13_018	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CRT 2	43	0.06415	141.787	GEN645012 2-NEBRASKA CITY 2
FDNS	14ALL		0 13G	G13_018	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CRT 2	43	0.06415	134.452	BASE CASE
FDNS	14ALL		0 13G	G13_018	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CRT 2	43	0.06415	127.2829	LN-WAPA2
FDNS	14ALL		0 13G	G13_018	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CRT 2	43	0.06415	126.9266	LN-1094
FDNS	14ALL		0 13G	G13_018	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CRT 2	43	0.06415	126.4923	LN-WAPA4
FDNS	14ALL		0 13G	G13_018	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CRT 2	43	0.06415	123.9658	LN-MALONEY
FDNS	14ALL		0 13G	G13_018	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CRT 2	43	0.06415	117.1245	GEN640019 1-SHELDON STATION UNIT 1
FDNS	14ALL		0 13G	G13_018	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CRT 2	43	0.06415	109.8235	GEN640020 2-SHELDON STATION UNIT 2
FDNS	14		0 13G	G13_018	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CRT 2	43	0.06414	125.2977	LN-WAPA2
FDNS	14		0 13G	G13_018	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CRT 2	43	0.06414	124.9549	LN-1094
FDNS	14		0 13G	G13_018	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CRT 2	43	0.06414	121.2326	NEB02WAPAB2
FDNS	14ALL		0 13G	G13_018	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CRT 2	43	0.06414	123.0399	NEB02WAPAB2
FDNS	09G13_018		0 13G	G13_018	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CRT 2	43	0.06413	188.5491	GEN645001 1-FORT CALHOUN 1
FDNS	09G13_018		0 13G	G13_018	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CRT 2	43	0.06413	186.9012	GEN645012 2-NEBRASKA CITY 2
FDNS	09G13_018		0 13G	G13_018	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CRT 2	43	0.06413	179.6463	BASE CASE
FDNS	09G13_018		0 13G	G13_018	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CRT 2	43	0.06413	172.5281	GEN560756 1-G13_018_3 0.5750
FDNS	09G13_018		0 13G	G13_018	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CRT 2	43	0.06413	172.3151	LN-WAPA2
FDNS	09G13_018		0 13G	G13_018	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CRT 2	43	0.06413	171.9403	LN-1094
FDNS	09G13_018		0 13G	G13_018	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CRT 2	43	0.06413	171.4952	LN-WAPA4
FDNS	09G13_018		0 13G	G13_018	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CRT 2	43	0.06413	170.6005	GEN562029 1-G11_018_3 0.6900
FDNS	09G13_018		0 13G	G13_018	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CRT 2	43	0.06413	168.9738	LN-MALONEY
FDNS	09G13_018		0 13G	G13_018	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CRT 2	43	0.06413	168.3039	NEB02WAPAB2
FDNS	09G13_018		0 13G	G13_018	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CRT 2	43	0.06413	165.5504	GEN560711 1-G10_044_3 0.6900
FDNS	09G13_018		0 13G	G13_018	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CRT 2	43	0.06413	162.2979	GEN640019 1-SHELDON STATION UNIT 1
FDNS	09G13_018		0 13G	G13_018	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CRT 2	43	0.06413	160.7296	GEN560749 1-G13_002_3 0.6900
FDNS	09G13_018		0 13G	G13_018	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CRT 2	43	0.06413	146.0443	GEN640020 2-SHELDON STATION UNIT 2
FDNS	8		0 13G	G13_018	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CRT 2	43	0.06412	142.6506	GEN645001 1-FORT CALHOUN 1
FDNS	8		0 13G	G13_018	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CRT 2	43	0.06412	133.9199	BASE CASE
FDNS	8		0 13G	G13_018	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CRT 2	43	0.06412	126.6007	LN-WAPA2
FDNS	8		0 13G	G13_018	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CRT 2	43	0.06412	125.8119	LN-WAPA4
FDNS	8		0 13G	G13_018	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CRT 2	43	0.06412	123.2797	LN-MALONEY

SOLUTION	GROUP	SCENARIO	SEASON	SOURCE	DIRECTION	MONITORED ELEMENT	RATEB (MVA)	TDF	TC%LOADING (% MVA)	CONTINGENCY	
FDNS	8		0	13G	G13_018	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.06412	117.3888	GEN640019 1-SHELDON STATION UNIT 1
FDNS	8		0	13G	G13_018	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.06412	110.9367	GEN640020 2-SHELDON STATION UNIT 2
FDNS	08ALL		0	13G	G13_018	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.06412	144.8741	GEN645001 1-FORT CALHOUN 1
FDNS	08ALL		0	13G	G13_018	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.06412	136.0912	BASE CASE
FDNS	08ALL		0	13G	G13_018	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.06412	128.7952	LN-WAPA2
FDNS	08ALL		0	13G	G13_018	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.06412	128.4475	LN-1094
FDNS	08ALL		0	13G	G13_018	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.06412	127.9979	LN-WAPA4
FDNS	08ALL		0	13G	G13_018	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.06412	125.463	LN-MALONEY
FDNS	08ALL		0	13G	G13_018	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.06412	124.5462	NEB02WAPAB2
FDNS	08ALL		0	13G	G13_018	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.06412	120.1357	GEN640019 1-SHELDON STATION UNIT 1
FDNS	08ALL		0	13G	G13_018	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.06412	113.1338	GEN640020 2-SHELDON STATION UNIT 2
FDNS	8		0	13G	G13_018	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.06411	126.2683	LN-1094
FDNS	8		0	13G	G13_018	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.06411	122.5195	NEB02WAPAB2
FDNS	09G13_018BPSON		0	13G	G13_018	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.06411	245.4658	KELLY - MADISONCO 230.00 230KV CKT 1
FDNS	09G13_018		0	13G	G13_018	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.06409	187.8219	KELLY - MADISONCO 230.00 230KV CKT 1
FDNS	03ALL		0	13G	G13_018	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.06403	161.6752	HOYT - STRANGER CREEK 345KV CKT 1
FDNS	09ALLBPSON		0	13G	G13_018	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.06403	242.5081	MOORE - NW68TH & HOLDREGE 345KV CKT 1
FDNS	09BPSON		0	13G	G13_018	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.06402	228.3077	MOORE - NW68TH & HOLDREGE 345KV CKT 1
FDNS	09ALL		0	13G	G13_018	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.06401	185.6642	MOORE - NW68TH & HOLDREGE 345KV CKT 1
FDNS	9		0	13G	G13_018	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.064	170.9099	MOORE - NW68TH & HOLDREGE 345KV CKT 1
FDNS	3		0	13G	G13_018	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.06398	171.0826	MOORE - NW68TH & HOLDREGE 345KV CKT 1
FDNS	03ALL		0	13G	G13_018	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.06398	184.1877	MOORE - NW68TH & HOLDREGE 345KV CKT 1
FDNS	09G13_018BPSON		0	13G	G13_018	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.06392	254.8394	MOORE - NW68TH & HOLDREGE 345KV CKT 1
FDNS	14ALL		0	13G	G13_018	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.06392	158.3154	MOORE - NW68TH & HOLDREGE 345KV CKT 1
FDNS	14		0	13G	G13_018	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.06391	155.2959	MOORE - NW68TH & HOLDREGE 345KV CKT 1
FDNS	09G13_018		0	13G	G13_018	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.0639	196.7792	MOORE - NW68TH & HOLDREGE 345KV CKT 1
FDNS	8		0	13G	G13_018	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.06389	157.1128	MOORE - NW68TH & HOLDREGE 345KV CKT 1
FDNS	08ALL		0	13G	G13_018	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.06389	160.6688	MOORE - NW68TH & HOLDREGE 345KV CKT 1
FDNS	03ALL		0	13G	G13_018	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.06359	161.4662	TAMORA - YORK 115KV CKT 1
FDNS	09ALLBPSON		0	13G	G13_018	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.0627	216.4957	COOPER - SUB 3458 NEB CTY 345KV CKT 1
FDNS	09BPSON		0	13G	G13_018	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.06269	202.1837	COOPER - SUB 3458 NEB CTY 345KV CKT 1
FDNS	09ALL		0	13G	G13_018	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.06268	161.092	COOPER - SUB 3458 NEB CTY 345KV CKT 1
FDNS	9		0	13G	G13_018	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.06267	146.1202	COOPER - SUB 3458 NEB CTY 345KV CKT 1
FDNS	09ALLBPSON		0	13G	G13_018	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.06266	249.3823	103RD & ROKEBY - WAGENER 345KV CKT 1
FDNS	09BPSON		0	13G	G13_018	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.06265	234.5556	103RD & ROKEBY - WAGENER 345KV CKT 1
FDNS	09ALL		0	13G	G13_018	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.06264	193.4729	103RD & ROKEBY - WAGENER 345KV CKT 1
FDNS	9		0	13G	G13_018	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.06263	178.365	103RD & ROKEBY - WAGENER 345KV CKT 1
FDNS	09G13_018BPSON		0	13G	G13_018	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.06263	226.0529	COOPER - SUB 3458 NEB CTY 345KV CKT 1
FDNS	3		0	13G	G13_018	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.06262	172.2059	103RD & ROKEBY - WAGENER 345KV CKT 1
FDNS	03ALL		0	13G	G13_018	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.06262	184.1057	103RD & ROKEBY - WAGENER 345KV CKT 1
FDNS	09ALLBPSON		0	13G	G13_018	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.0626	237.0714	84TH & LEIGHTON - WAGENER 115KV CKT 1
FDNS	09G13_018		0	13G	G13_018	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.0626	169.4867	COOPER - SUB 3458 NEB CTY 345KV CKT 1
FDNS	09BPSON		0	13G	G13_018	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.06259	221.9173	84TH & LEIGHTON - WAGENER 115KV CKT 1
FDNS	09ALL		0	13G	G13_018	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.06258	182.1048	84TH & LEIGHTON - WAGENER 115KV CKT 1
FDNS	9		0	13G	G13_018	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.06257	166.5724	84TH & LEIGHTON - WAGENER 115KV CKT 1
FDNS	09G13_018BPSON		0	13G	G13_018	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.06256	259.734	103RD & ROKEBY - WAGENER 345KV CKT 1
FDNS	14ALL		0	13G	G13_018	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.06256	161.7172	103RD & ROKEBY - WAGENER 345KV CKT 1
FDNS	14		0	13G	G13_018	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.06255	159.3124	103RD & ROKEBY - WAGENER 345KV CKT 1
FDNS	03ALL		0	13G	G13_018	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.06255	166.3277	84TH & LEIGHTON - WAGENER 115KV CKT 1
FDNS	3		0	13G	G13_018	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.06254	155.7637	84TH & LEIGHTON - WAGENER 115KV CKT 1
FDNS	09G13_018		0	13G	G13_018	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.06254	202.7122	103RD & ROKEBY - WAGENER 345KV CKT 1
FDNS	08ALL		0	13G	G13_018	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.06253	163.6216	103RD & ROKEBY - WAGENER 345KV CKT 1
FDNS	8		0	13G	G13_018	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.06252	160.848	103RD & ROKEBY - WAGENER 345KV CKT 1
FDNS	14		0	13G	G13_018	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.06249	145.3648	84TH & LEIGHTON - WAGENER 115KV CKT 1
FDNS	09G13_018BPSON		0	13G	G13_018	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.06249	246.4842	84TH & LEIGHTON - WAGENER 115KV CKT 1
FDNS	14ALL		0	13G	G13_018	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.06249	147.1466	84TH & LEIGHTON - WAGENER 115KV CKT 1
FDNS	09G13_018		0	13G	G13_018	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.06248	190.2961	84TH & LEIGHTON - WAGENER 115KV CKT 1
FDNS	08ALL		0	13G	G13_018	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.06247	148.7677	84TH & LEIGHTON - WAGENER 115KV CKT 1
FDNS	8		0	13G	G13_018	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.06246	146.5583	84TH & LEIGHTON - WAGENER 115KV CKT 1
FDNS	09ALLBPSON		0	13G	G13_018	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.06195	239.3161	WAGENER (T852) 345/115/13.8KV TRANSFORMER CKT 2
FDNS	09BPSON		0	13G	G13_018	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.06194	224.3901	WAGENER (T852) 345/115/13.8KV TRANSFORMER CKT 2
FDNS	09ALL		0	13G	G13_018	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.06193	184.8724	WAGENER (T852) 345/115/13.8KV TRANSFORMER CKT 2
FDNS	9		0	13G	G13_018	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.06192	169.5521	WAGENER (T852) 345/115/13.8KV TRANSFORMER CKT 2
FDNS	3		0	13G	G13_018	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.0619	158.9759	WAGENER (T852) 345/115/13.8KV TRANSFORMER CKT 2
FDNS	03ALL		0	13G	G13_018	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.0619	169.4529	WAGENER (T852) 345/115/13.8KV TRANSFORMER CKT 2
FDNS	09G13_018BPSON		0	13G	G13_018	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.06185	248.7205	WAGENER (T852) 345/115/13.8KV TRANSFORMER CKT 2
FDNS	14ALL		0	13G	G13_018	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.06185	150.5248	WAGENER (T852) 345/115/13.8KV TRANSFORMER CKT 2
FDNS	14		0	13G	G13_018	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.06184	148.7301	WAGENER (T852) 345/115/13.8KV TRANSFORMER CKT 2
FDNS	09G13_018		0	13G	G13_018	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.06183	193.0313	WAGENER (T852) 345/115/13.8KV TRANSFORMER CKT 2
FDNS	08ALL		0	13G	G13_018	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.06182	152.142	WAGENER (T852) 345/115/13.8KV TRANSFORMER CKT 2
FDNS	8		0	13G	G13_018	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.06181	149.9215	WAGENER (T852) 345/115/13.8KV TRANSFORMER CKT 2
FDNS	09ALLBPSON		0	13G	G13_018	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.06174	240.3499	WAGENER (T851) 345/115/13.8KV TRANSFORMER CKT 1
FDNS	09BPSON		0	13G	G13_018	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.06173	225.5019	WAGENER (T851) 345/115/13.8KV TRANSFORMER CKT 1
FDNS	09ALL		0	13G	G13_018	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.06172	186.0786	WAGENER (T851) 345/115/13.8KV TRANSFORMER CKT 1
FDNS	9		0	13G	G13_018	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.06171	170.8377	WAGENER (T851) 345/115/13.8KV TRANSFORMER CKT 1
FDNS	03ALL		0	13G	G13_018	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.0617	170.8215	WAGENER (T851) 345/115/13.8KV TRANSFORMER CKT 1
FDNS	3		0	13G	G13_018	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.06169	160.3801	

SOLUTION	GROUP	SCENARIO	SEASON	SOURCE	DIRECTION	MONITORED ELEMENT	RATEB (MVA)	TDF	TC%LOADING (% MVA)	CONTINGENCY
FDNS	14ALL		0 13G	G13_018	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.06164	151.9943	WAGENER (T851) 345/115/13.8KV TRANSFORMER CKT 1
FDNS	14		0 13G	G13_018	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.06163	150.1983	WAGENER (T851) 345/115/13.8KV TRANSFORMER CKT 1
FDNS	09G13_018		0 13G	G13_018	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.06162	194.2478	WAGENER (T851) 345/115/13.8KV TRANSFORMER CKT 1
FDNS	08ALL		0 13G	G13_018	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.06161	153.6041	WAGENER (T851) 345/115/13.8KV TRANSFORMER CKT 1
FDNS	8		0 13G	G13_018	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.0616	151.3841	WAGENER (T851) 345/115/13.8KV TRANSFORMER CKT 1
FDNS	09ALLBPSON		0 13G	G13_018	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.05864	254.5339	NW68TH & HOLDREGE (T141) 345/115/13.8KV TRANSFORMER CKT 1
FDNS	09ALL		0 13G	G13_018	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.05862	202.6756	NW68TH & HOLDREGE (T141) 345/115/13.8KV TRANSFORMER CKT 1
FDNS	09BPSON		0 13G	G13_018	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.05862	239.9993	NW68TH & HOLDREGE (T141) 345/115/13.8KV TRANSFORMER CKT 1
FDNS	9		0 13G	G13_018	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.05861	187.837	NW68TH & HOLDREGE (T141) 345/115/13.8KV TRANSFORMER CKT 1
FDNS	03ALL		0 13G	G13_018	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.05859	188.0386	NW68TH & HOLDREGE (T141) 345/115/13.8KV TRANSFORMER CKT 1
FDNS	09ALLBPSON		0 13G	G13_018	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.05859	214.4687	ROKEBY - SW7TH & PLEASANT HILL 115KV CKT 1
FDNS	3		0 13G	G13_018	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.05858	177.844	NW68TH & HOLDREGE (T141) 345/115/13.8KV TRANSFORMER CKT 1
FDNS	09ALL		0 13G	G13_018	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.05858	163.0475	ROKEBY - SW7TH & PLEASANT HILL 115KV CKT 1
FDNS	09BPSON		0 13G	G13_018	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.05858	199.7952	ROKEBY - SW7TH & PLEASANT HILL 115KV CKT 1
FDNS	9		0 13G	G13_018	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.05857	147.9661	ROKEBY - SW7TH & PLEASANT HILL 115KV CKT 1
FDNS	03ALL		0 13G	G13_018	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.05854	147.0891	ROKEBY - SW7TH & PLEASANT HILL 115KV CKT 1
FDNS	09G13_018BPSON		0 13G	G13_018	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.05854	263.1797	NW68TH & HOLDREGE (T141) 345/115/13.8KV TRANSFORMER CKT 1
FDNS	14		0 13G	G13_018	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.05853	167.0667	NW68TH & HOLDREGE (T141) 345/115/13.8KV TRANSFORMER CKT 1
FDNS	14ALL		0 13G	G13_018	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.05853	168.9382	NW68TH & HOLDREGE (T141) 345/115/13.8KV TRANSFORMER CKT 1
FDNS	09G13_018		0 13G	G13_018	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.05852	210.2966	NW68TH & HOLDREGE (T141) 345/115/13.8KV TRANSFORMER CKT 1
FDNS	08ALL		0 13G	G13_018	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.05851	170.536	NW68TH & HOLDREGE (T141) 345/115/13.8KV TRANSFORMER CKT 1
FDNS	8		0 13G	G13_018	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.0585	168.3876	NW68TH & HOLDREGE (T141) 345/115/13.8KV TRANSFORMER CKT 1
FDNS	09G13_018BPSON		0 13G	G13_018	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.05849	222.9026	ROKEBY - SW7TH & PLEASANT HILL 115KV CKT 1
FDNS	09G13_018		0 13G	G13_018	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.05848	170.2239	ROKEBY - SW7TH & PLEASANT HILL 115KV CKT 1
FDNS	09ALLBPSON		0 13G	G13_018	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.05408	185.4449	20TH & PIONEERS - SW7TH & PLEASANT HILL 115KV CKT 1
FDNS	09ALL		0 13G	G13_018	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.05407	138.003	20TH & PIONEERS - SW7TH & PLEASANT HILL 115KV CKT 1
FDNS	09BPSON		0 13G	G13_018	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.05407	172.217	20TH & PIONEERS - SW7TH & PLEASANT HILL 115KV CKT 1
FDNS	9		0 13G	G13_018	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.05406	124.294	20TH & PIONEERS - SW7TH & PLEASANT HILL 115KV CKT 1
FDNS	03ALL		0 13G	G13_018	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.05404	123.0495	20TH & PIONEERS - SW7TH & PLEASANT HILL 115KV CKT 1
FDNS	3		0 13G	G13_018	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.05403	114.1382	20TH & PIONEERS - SW7TH & PLEASANT HILL 115KV CKT 1
FDNS	14		0 13G	G13_018	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.05399	105.5263	20TH & PIONEERS - SW7TH & PLEASANT HILL 115KV CKT 1
FDNS	09G13_018BPSON		0 13G	G13_018	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.05399	193.3031	20TH & PIONEERS - SW7TH & PLEASANT HILL 115KV CKT 1
FDNS	14ALL		0 13G	G13_018	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.05399	107.0614	20TH & PIONEERS - SW7TH & PLEASANT HILL 115KV CKT 1
FDNS	09G13_018		0 13G	G13_018	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.05398	144.9766	20TH & PIONEERS - SW7TH & PLEASANT HILL 115KV CKT 1
FDNS	08ALL		0 13G	G13_018	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.05397	108.3921	20TH & PIONEERS - SW7TH & PLEASANT HILL 115KV CKT 1
FDNS	8		0 13G	G13_018	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.05396	106.5848	20TH & PIONEERS - SW7TH & PLEASANT HILL 115KV CKT 1
FDNS	00G13_018		0 23SP	G13_018	TO->FROM	NEB CITY U SYR SUB - SUB 970 69KV CKT 1	47	0.55464	126.0349	LN-FIRTH
FDNS	00G13_018		0 18WP	G13_018	TO->FROM	NEB CITY U SYR SUB - SUB 970 69KV CKT 1	47	0.55457	123.5121	LN-FIRTH
FDNS	00G13_018		0 18SP	G13_018	TO->FROM	NEB CITY U SYR SUB - SUB 970 69KV CKT 1	47	0.55456	124.9008	LN-FIRTH
FDNS	09ALLBPSON		0 13G	G13_018	TO->FROM	NEB CITY U SYR SUB - SUB 970 69KV CKT 1	47	0.55441	115.1425	FIRTH - STERLING 115KV CKT 1
FDNS	09ALLBPSON		0 13G	G13_018	TO->FROM	NEB CITY U SYR SUB - SUB 970 69KV CKT 1	47	0.55441	115.1211	STERLING 115/69KV TRANSFORMER CKT 1
FDNS	09ALLBPSON		0 13G	G13_018	TO->FROM	NEB CITY U SYR SUB - SUB 970 69KV CKT 1	47	0.55441	115.1208	LN-FIRTH
FDNS	09ALL		0 13G	G13_018	TO->FROM	NEB CITY U SYR SUB - SUB 970 69KV CKT 1	47	0.5544	114.8279	LN-FIRTH
FDNS	09ALL		0 13G	G13_018	TO->FROM	NEB CITY U SYR SUB - SUB 970 69KV CKT 1	47	0.5544	114.8077	FIRTH - STERLING 115KV CKT 1
FDNS	09ALL		0 13G	G13_018	TO->FROM	NEB CITY U SYR SUB - SUB 970 69KV CKT 1	47	0.5544	114.8009	STERLING 115/69KV TRANSFORMER CKT 1
FDNS	00G13_018		0 13SP	G13_018	TO->FROM	NEB CITY U SYR SUB - SUB 970 69KV CKT 1	47	0.55439	122.8852	LN-FIRTH
FDNS	00G13_018		0 13WP	G13_018	TO->FROM	NEB CITY U SYR SUB - SUB 970 69KV CKT 1	47	0.55436	122.053	LN-FIRTH
FDNS	09G13_018		0 13G	G13_018	TO->FROM	NEB CITY U SYR SUB - SUB 970 69KV CKT 1	47	0.55431	118.7166	LN-FIRTH
FDNS	09G13_018BPSON		0 13G	G13_018	TO->FROM	NEB CITY U SYR SUB - SUB 970 69KV CKT 1	47	0.55431	118.9715	LN-FIRTH
FDNS	9		0 13G	G13_018	TO->FROM	NEB CITY U SYR SUB - SUB 970 69KV CKT 1	47	0.38938	103.0645	S968LINBUS
FDNS	09ALL		0 13G	G13_018	TO->FROM	NEB CITY U SYR SUB - SUB 970 69KV CKT 1	47	0.38938	123.0071	SUB 968 - SUB 969 69KV CKT 1
FDNS	09ALL		0 13G	G13_018	TO->FROM	NEB CITY U SYR SUB - SUB 970 69KV CKT 1	47	0.38938	122.527	S968LINBUS
FDNS	09ALL		0 13G	G13_018	TO->FROM	NEB CITY U SYR SUB - SUB 970 69KV CKT 1	47	0.38938	118.994	SUB 967 - SUB 968 69KV CKT 1
FDNS	09ALL		0 13G	G13_018	TO->FROM	NEB CITY U SYR SUB - SUB 970 69KV CKT 1	47	0.38938	117.2196	SUB 967 - WEST BROCK 69KV CKT 1
FDNS	09ALLBPSON		0 13G	G13_018	TO->FROM	NEB CITY U SYR SUB - SUB 970 69KV CKT 1	47	0.38938	132.3842	SUB 968 - SUB 969 69KV CKT 1
FDNS	09ALLBPSON		0 13G	G13_018	TO->FROM	NEB CITY U SYR SUB - SUB 970 69KV CKT 1	47	0.38938	132.0068	S968LINBUS
FDNS	09ALLBPSON		0 13G	G13_018	TO->FROM	NEB CITY U SYR SUB - SUB 970 69KV CKT 1	47	0.38938	128.377	SUB 967 - SUB 968 69KV CKT 1
FDNS	09ALLBPSON		0 13G	G13_018	TO->FROM	NEB CITY U SYR SUB - SUB 970 69KV CKT 1	47	0.38938	126.6169	SUB 967 - WEST BROCK 69KV CKT 1
FDNS	09BPSON		0 13G	G13_018	TO->FROM	NEB CITY U SYR SUB - SUB 970 69KV CKT 1	47	0.38938	112.4934	S968LINBUS
FDNS	09G13_018		0 13G	G13_018	TO->FROM	NEB CITY U SYR SUB - SUB 970 69KV CKT 1	47	0.38936	122.5415	S968LINBUS
FDNS	09G13_018BPSON		0 13G	G13_018	TO->FROM	NEB CITY U SYR SUB - SUB 970 69KV CKT 1	47	0.38936	132.5615	S968LINBUS
FDNS	00G13_018		0 13SP	G13_018	TO->FROM	NEB CITY U SYR SUB - SUB 970 69KV CKT 1	47	0.38881	125.3288	S968LINBUS
FDNS	00G13_018		0 13WP	G13_018	TO->FROM	NEB CITY U SYR SUB - SUB 970 69KV CKT 1	47	0.38887	123.4865	S968LINBUS
FDNS	00G13_018		0 23SP	G13_018	TO->FROM	NEB CITY U SYR SUB - SUB 970 69KV CKT 1	47	0.38846	128.4233	S968LINBUS
FDNS	00G13_018		0 18SP	G13_018	TO->FROM	NEB CITY U SYR SUB - SUB 970 69KV CKT 1	47	0.38841	126.0113	S968LINBUS
FDNS	00G13_018		0 18WP	G13_018	TO->FROM	NEB CITY U SYR SUB - SUB 970 69KV CKT 1	47	0.38835	124.0368	S968LINBUS
FDNS	9		0 13G	G13_018	TO->FROM	NEB CITY U SYR SUB - SUB 970 69KV CKT 1	47	0.37787	104.2576	S1263T1 AUTO
FDNS	09ALL		0 13G	G13_018	TO->FROM	NEB CITY U SYR SUB - SUB 970 69KV CKT 1	47	0.37787	122.5194	S1263T1 AUTO
FDNS	09ALLBPSON		0 13G	G13_018	TO->FROM	NEB CITY U SYR SUB - SUB 970 69KV CKT 1	47	0.37787	131.5264	S1263T1 AUTO
FDNS	09BPSON		0 13G	G13_018	TO->FROM	NEB CITY U SYR SUB - SUB 970 69KV CKT 1	47	0.37787	113.1257	S1263T1 AUTO
FDNS	09G13_018		0 13G	G13_018	TO->FROM	NEB CITY U SYR SUB - SUB 970 69KV CKT 1	47	0.37773	127.4946	S1263T1 AUTO
FDNS	09G13_018BPSON		0 13G	G13_018	TO->FROM	NEB CITY U SYR SUB - SUB 970 69KV CKT 1	47	0.37772	136.7959	S1263T1 AUTO
FDNS	00G13_018		0 13SP	G13_018	TO->FROM	NEB CITY U SYR SUB - SUB 970 69KV CKT 1	47	0.37726	132.5569	S1263T1 AUTO
FDNS	00G13_018		0 13WP	G13_018	TO->FROM	NEB CITY U SYR SUB - SUB 970 69KV CKT 1	47	0.37711	130.6831	S1263T1 AUTO
FDNS	00G13_018		0 23SP	G13_018	TO->FROM	NEB CITY U SYR SUB - SUB 970 69KV CKT 1	47	0.37695	137.0521	S1263T1 AUTO
FDNS	00G13_018		0 18SP	G13_018	TO->FROM	NEB CITY U SYR SUB - SUB 970 69KV CKT 1	47	0.37689	133.9071	S1263T1 AUTO
FDNS	00G13_018		0 18WP	G13_018	TO->FROM	NEB CITY U SYR SUB - SUB 970 69KV CKT 1	47	0.37679	131.9179	S1263T1 AUTO
FDNS	09ALLBPSON		0 13G	G13_018	TO->FROM	NEB CITY U SYR SUB - SUB 970 69KV CKT 1	47	0.32056	108.9912	MOORE (MOORE T1) 345/115/13.8KV TRANSFORMER CKT 1

SOLUTION	GROUP	SCENARIO	SEASON	SOURCE	DIRECTION	MONITORED ELEMENT	RATEB (MVA)	TDF	TC%LOADING (% MVA)	CONTINGENCY
FDNS	09ALLBPSON		0 13G	G13_018	TO->FROM	NEB CITY U SYR SUB - SUB 970 69KV CKT 1	47	0.31215	101.9047	BASE CASE
FDNS	09ALL		0 13G	G13_018	TO->FROM	NEB CITY U SYR SUB - SUB 970 69KV CKT 1	47	0.30794	106.1499	SUB 963 - WEST BROCK 69KV CKT 1
FDNS	09ALLBPSON		0 13G	G13_018	TO->FROM	NEB CITY U SYR SUB - SUB 970 69KV CKT 1	47	0.30794	113.0079	SUB 963 - WEST BROCK 69KV CKT 1
FDNS	09ALLBPSON		0 13G	G13_018	TO->FROM	NEB CITY U SYR SUB - SUB 970 69KV CKT 1	47	0.28774	117.0411	SUB 963 - SUB 977 69KV CKT 1
FDNS	09ALLBPSON		0 13G	G13_018	TO->FROM	NEB CITY U SYR SUB - SUB 970 69KV CKT 1	47	0.28774	116.318	NEB CITY U SUB 903 - SUB 977 69KV CKT 1
FDNS	09ALL		0 13G	G13_018	TO->FROM	NEB CITY U SYR SUB - SUB 970 69KV CKT 1	47	0.28773	110.5178	SUB 963 - SUB 977 69KV CKT 1
FDNS	09ALL		0 13G	G13_018	TO->FROM	NEB CITY U SYR SUB - SUB 970 69KV CKT 1	47	0.28773	109.6188	NEB CITY U SUB 903 - SUB 977 69KV CKT 1
FDNS	09ALLBPSON		0 13G	G13_018	TO->FROM	G13_002T 115.00 - SHELDON 115KV CKT 2	43	0.13377	177.8794	MOORE (MOORE T1) 345/115/13.8KV TRANSFORMER CKT 1
FDNS	09BPSON		0 13G	G13_018	TO->FROM	G13_002T 115.00 - SHELDON 115KV CKT 2	43	0.13375	166.73	MOORE (MOORE T1) 345/115/13.8KV TRANSFORMER CKT 1
FDNS	09G13_018BPSON		0 13G	G13_018	TO->FROM	G13_002T 115.00 - SHELDON 115KV CKT 2	43	0.13356	218.5737	MOORE (MOORE T1) 345/115/13.8KV TRANSFORMER CKT 1
FDNS	09ALLBPSON		0 13G	G13_018	TO->FROM	G13_002T 115.00 - SHELDON 115KV CKT 2	43	0.09956	230.7683	SHELDON - SW7TH & PLEASANT HILL 115KV CKT 1
FDNS	09BPSON		0 13G	G13_018	TO->FROM	G13_002T 115.00 - SHELDON 115KV CKT 2	43	0.09954	229.7195	SHELDON - SW7TH & PLEASANT HILL 115KV CKT 1
FDNS	09ALL		0 13G	G13_018	TO->FROM	G13_002T 115.00 - SHELDON 115KV CKT 2	43	0.09953	145.44	SHELDON - SW7TH & PLEASANT HILL 115KV CKT 1
FDNS	9		0 13G	G13_018	TO->FROM	G13_002T 115.00 - SHELDON 115KV CKT 2	43	0.09951	143.4868	SHELDON - SW7TH & PLEASANT HILL 115KV CKT 1
FDNS	03ALL		0 13G	G13_018	TO->FROM	G13_002T 115.00 - SHELDON 115KV CKT 2	43	0.09947	213.2214	SHELDON - SW7TH & PLEASANT HILL 115KV CKT 1
FDNS	3		0 13G	G13_018	TO->FROM	G13_002T 115.00 - SHELDON 115KV CKT 2	43	0.09946	196.6655	SHELDON - SW7TH & PLEASANT HILL 115KV CKT 1
FDNS	09G13_018BPSON		0 13G	G13_018	TO->FROM	G13_002T 115.00 - SHELDON 115KV CKT 2	43	0.09939	269.2297	SHELDON - SW7TH & PLEASANT HILL 115KV CKT 1
FDNS	14		0 13G	G13_018	TO->FROM	G13_002T 115.00 - SHELDON 115KV CKT 2	43	0.09938	179.9103	SHELDON - SW7TH & PLEASANT HILL 115KV CKT 1
FDNS	14ALL		0 13G	G13_018	TO->FROM	G13_002T 115.00 - SHELDON 115KV CKT 2	43	0.09938	182.8905	SHELDON - SW7TH & PLEASANT HILL 115KV CKT 1
FDNS	09G13_018		0 13G	G13_018	TO->FROM	G13_002T 115.00 - SHELDON 115KV CKT 2	43	0.09936	180.6599	SHELDON - SW7TH & PLEASANT HILL 115KV CKT 1
FDNS	08ALL		0 13G	G13_018	TO->FROM	G13_002T 115.00 - SHELDON 115KV CKT 2	43	0.09934	185.1519	SHELDON - SW7TH & PLEASANT HILL 115KV CKT 1
FDNS	8		0 13G	G13_018	TO->FROM	G13_002T 115.00 - SHELDON 115KV CKT 2	43	0.09933	181.8797	SHELDON - SW7TH & PLEASANT HILL 115KV CKT 1
FDNS	09ALLBPSON		0 13G	G13_018	TO->FROM	G13_002T 115.00 - SHELDON 115KV CKT 2	43	0.09434	123.3266	G13_018T 69.000 - HYDROCARBON TAP 69KV CKT 1
FDNS	09ALLBPSON		0 13G	G13_018	TO->FROM	G13_002T 115.00 - SHELDON 115KV CKT 2	43	0.09434	123.3262	ENRONTAP
FDNS	09ALLBPSON		0 13G	G13_018	TO->FROM	G13_002T 115.00 - SHELDON 115KV CKT 2	43	0.09434	123.3211	HYDROCARBON TAP - SUB 970 69KV CKT 1
FDNS	09ALLBPSON		0 13G	G13_018	TO->FROM	G13_002T 115.00 - SHELDON 115KV CKT 2	43	0.09434	122.503	NEB CITY U SYR SUB - SUB 970 69KV CKT 1
FDNS	09ALLBPSON		0 13G	G13_018	TO->FROM	G13_002T 115.00 - SHELDON 115KV CKT 2	43	0.09434	121.8682	NEB CITY U SYR SUB - SUB 971 69KV CKT 1
FDNS	09BPSON		0 13G	G13_018	TO->FROM	G13_002T 115.00 - SHELDON 115KV CKT 2	43	0.09433	128.3604	ENRONTAP
FDNS	09BPSON		0 13G	G13_018	TO->FROM	G13_002T 115.00 - SHELDON 115KV CKT 2	43	0.09433	128.36	G13_018T 69.000 - HYDROCARBON TAP 69KV CKT 1
FDNS	09BPSON		0 13G	G13_018	TO->FROM	G13_002T 115.00 - SHELDON 115KV CKT 2	43	0.09433	128.3563	HYDROCARBON TAP - SUB 970 69KV CKT 1
FDNS	09BPSON		0 13G	G13_018	TO->FROM	G13_002T 115.00 - SHELDON 115KV CKT 2	43	0.09433	127.4018	NEB CITY U SYR SUB - SUB 970 69KV CKT 1
FDNS	09BPSON		0 13G	G13_018	TO->FROM	G13_002T 115.00 - SHELDON 115KV CKT 2	43	0.09433	126.9578	NEB CITY U SYR SUB - SUB 971 69KV CKT 1
FDNS	09G13_018BPSON		0 13G	G13_018	TO->FROM	G13_002T 115.00 - SHELDON 115KV CKT 2	43	0.09422	155.4098	ENRONTAP
FDNS	09G13_018BPSON		0 13G	G13_018	TO->FROM	G13_002T 115.00 - SHELDON 115KV CKT 2	43	0.09422	155.4093	G13_018T 69.000 - HYDROCARBON TAP 69KV CKT 1
FDNS	09G13_018BPSON		0 13G	G13_018	TO->FROM	G13_002T 115.00 - SHELDON 115KV CKT 2	43	0.09422	155.4055	HYDROCARBON TAP - SUB 970 69KV CKT 1
FDNS	09G13_018BPSON		0 13G	G13_018	TO->FROM	G13_002T 115.00 - SHELDON 115KV CKT 2	43	0.09422	154.5824	NEB CITY U SYR SUB - SUB 970 69KV CKT 1
FDNS	09G13_018BPSON		0 13G	G13_018	TO->FROM	G13_002T 115.00 - SHELDON 115KV CKT 2	43	0.09422	153.8723	NEB CITY U SYR SUB - SUB 971 69KV CKT 1
FDNS	03ALL		0 13G	G13_018	TO->FROM	G13_002T 115.00 - SHELDON 115KV CKT 2	43	0.06765	122.3326	LN-FRIEND
FDNS	03ALL		0 13G	G13_018	TO->FROM	G13_002T 115.00 - SHELDON 115KV CKT 2	43	0.06765	122.2106	FRIEND - GENEVA 115KV CKT 1
FDNS	09ALLBPSON		0 13G	G13_018	TO->FROM	G13_002T 115.00 - SHELDON 115KV CKT 2	43	0.06662	124.6765	KNOB HILL - STEELE CITY 115KV CKT 1
FDNS	09BPSON		0 13G	G13_018	TO->FROM	G13_002T 115.00 - SHELDON 115KV CKT 2	43	0.06661	128.7968	KNOB HILL - STEELE CITY 115KV CKT 1
FDNS	09G13_018BPSON		0 13G	G13_018	TO->FROM	G13_002T 115.00 - SHELDON 115KV CKT 2	43	0.06651	155.0325	KNOB HILL - STEELE CITY 115KV CKT 1
FDNS	09ALLBPSON		0 13G	G13_018	TO->FROM	G13_002T 115.00 - SHELDON 115KV CKT 2	43	0.06515	103.5917	BEATRICE POWER STATION - SHELDON 115KV CKT 1
FDNS	09BPSON		0 13G	G13_018	TO->FROM	G13_002T 115.00 - SHELDON 115KV CKT 2	43	0.06513	110.4425	BEATRICE POWER STATION - SHELDON 115KV CKT 1
FDNS	09G13_018BPSON		0 13G	G13_018	TO->FROM	G13_002T 115.00 - SHELDON 115KV CKT 2	43	0.06504	136.4294	BEATRICE POWER STATION - SHELDON 115KV CKT 1
FDNS	09ALLBPSON		0 13G	G13_018	TO->FROM	G13_002T 115.00 - SHELDON 115KV CKT 2	43	0.06497	124.1108	103RD & ROKEBY - MOORE 345KV CKT 1
FDNS	09BPSON		0 13G	G13_018	TO->FROM	G13_002T 115.00 - SHELDON 115KV CKT 2	43	0.06496	128.4945	103RD & ROKEBY - MOORE 345KV CKT 1
FDNS	3		0 13G	G13_018	TO->FROM	G13_002T 115.00 - SHELDON 115KV CKT 2	43	0.06487	133.5693	103RD & ROKEBY - MOORE 345KV CKT 1
FDNS	03ALL		0 13G	G13_018	TO->FROM	G13_002T 115.00 - SHELDON 115KV CKT 2	43	0.06486	148.1617	103RD & ROKEBY - MOORE 345KV CKT 1
FDNS	09ALLBPSON		0 13G	G13_018	TO->FROM	G13_002T 115.00 - SHELDON 115KV CKT 2	43	0.06483	123.1737	BEATRICE - STEINAUER 115KV CKT 1
FDNS	09ALLBPSON		0 13G	G13_018	TO->FROM	G13_002T 115.00 - SHELDON 115KV CKT 2	43	0.06483	122.6097	HUMBOLDT - STEINAUER 115KV CKT 1
FDNS	09ALLBPSON		0 13G	G13_018	TO->FROM	G13_002T 115.00 - SHELDON 115KV CKT 2	43	0.06483	122.5479	LN-1176
FDNS	09ALLBPSON		0 13G	G13_018	TO->FROM	G13_002T 115.00 - SHELDON 115KV CKT 2	43	0.06483	121.0182	HUMBOLDT (HUMBOLDT T2) 161/115/13.8KV TRANSFORMER CKT 1
FDNS	09G13_018BPSON		0 13G	G13_018	TO->FROM	G13_002T 115.00 - SHELDON 115KV CKT 2	43	0.06483	156.6383	103RD & ROKEBY - MOORE 345KV CKT 1
FDNS	09BPSON		0 13G	G13_018	TO->FROM	G13_002T 115.00 - SHELDON 115KV CKT 2	43	0.06482	128.0272	BEATRICE - STEINAUER 115KV CKT 1
FDNS	09BPSON		0 13G	G13_018	TO->FROM	G13_002T 115.00 - SHELDON 115KV CKT 2	43	0.06482	127.7869	HUMBOLDT - STEINAUER 115KV CKT 1
FDNS	09BPSON		0 13G	G13_018	TO->FROM	G13_002T 115.00 - SHELDON 115KV CKT 2	43	0.06482	127.5232	LN-1176
FDNS	09BPSON		0 13G	G13_018	TO->FROM	G13_002T 115.00 - SHELDON 115KV CKT 2	43	0.06482	126.2715	HUMBOLDT (HUMBOLDT T2) 161/115/13.8KV TRANSFORMER CKT 1
FDNS	08ALL		0 13G	G13_018	TO->FROM	G13_002T 115.00 - SHELDON 115KV CKT 2	43	0.0648	118.8996	103RD & ROKEBY - MOORE 345KV CKT 1
FDNS	09ALLBPSON		0 13G	G13_018	TO->FROM	G13_002T 115.00 - SHELDON 115KV CKT 2	43	0.0648	123.4123	G08-123N 115.00 - PAULINE 115KV CKT 1
FDNS	09BPSON		0 13G	G13_018	TO->FROM	G13_002T 115.00 - SHELDON 115KV CKT 2	43	0.06479	126.8969	G08-123N 115.00 - PAULINE 115KV CKT 1
FDNS	09G13_018BPSON		0 13G	G13_018	TO->FROM	G13_002T 115.00 - SHELDON 115KV CKT 2	43	0.06471	154.5599	BEATRICE - STEINAUER 115KV CKT 1
FDNS	09G13_018BPSON		0 13G	G13_018	TO->FROM	G13_002T 115.00 - SHELDON 115KV CKT 2	43	0.06471	154.3184	HUMBOLDT - STEINAUER 115KV CKT 1
FDNS	09G13_018BPSON		0 13G	G13_018	TO->FROM	G13_002T 115.00 - SHELDON 115KV CKT 2	43	0.06471	153.9678	LN-1176
FDNS	09G13_018BPSON		0 13G	G13_018	TO->FROM	G13_002T 115.00 - SHELDON 115KV CKT 2	43	0.06471	152.4449	HUMBOLDT (HUMBOLDT T2) 161/115/13.8KV TRANSFORMER CKT 1
FDNS	09G13_018BPSON		0 13G	G13_018	TO->FROM	G13_002T 115.00 - SHELDON 115KV CKT 2	43	0.06469	152.4737	G08-123N 115.00 - PAULINE 115KV CKT 1
FDNS	09ALLBPSON		0 13G	G13_018	TO->FROM	G13_002T 115.00 - SHELDON 115KV CKT 2	43	0.06435	119.7928	SPP-WERE-49B
FDNS	09ALLBPSON		0 13G	G13_018	TO->FROM	G13_002T 115.00 - SHELDON 115KV CKT 2	43	0.06435	119.7525	MARSHALL3 115.00 - SMITTYVILLE N.M. COOP (NEMAHA MARSHALL R.E. 115KV CKT 1
FDNS	09ALLBPSON		0 13G	G13_018	TO->FROM	G13_002T 115.00 - SHELDON 115KV CKT 2	43	0.06435	119.6295	BAILEYVILLE N.M. STATION (NEMAHA MARSHALL R - SMITTYVILLE N.M. COOP (NEMAHA MARSHALL R.E. 115KV CKT 1
FDNS	09ALLBPSON		0 13G	G13_018	TO->FROM	G13_002T 115.00 - SHELDON 115KV CKT 2	43	0.06435	119.5603	BAILEYVILLE N.M. STATION (NEMAHA MARSHALL R - SOUTH SENECA 115KV CKT 1
FDNS	09ALLBPSON		0 13G	G13_018	TO->FROM	G13_002T 115.00 - SHELDON 115KV CKT 2	43	0.06426	204.3599	GEN560749 1-G13_002_3 0.6900
FDNS	09ALLBPSON		0 13G	G13_018	TO->FROM	G13_002T 115.00 - SHELDON 115KV CKT 2	43	0.06426	120.9797	GEN645001 1-FORT CALHOUN 1
FDNS	09ALLBPSON		0 13G	G13_018	TO->FROM	G13_002T 115.00 - SHELDON 115KV CKT 2	43	0.06426	112.5219	BASE CASE
FDNS	09ALLBPSON		0 13G	G13_018	TO->FROM	G13_002T 115.00 - SHELDON 115KV CKT 2	43	0.06426	105.2652	LN-WAPA2
FDNS	09ALLBPSON		0 13G	G13_018	TO->FROM	G13_002T 115.00 - SHELDON 115KV CKT 2	43	0.06426	104.7561	LN-1094
FDNS	09ALLBPSON		0 13G	G13_018	TO->FROM	G13_002T 115.00 - SHELDON 115KV CKT 2	43	0.06426	104.3854	LN-WAPA4
FDNS	09ALLBPSON		0 13G	G13_018	TO->FROM	G13_002T 115.00 - SHELDON 115KV CKT 2	43	0.06426	101.9022	GEN562029 1-G11_018_3 0.6900

SOLUTION	GROUP	SCENARIO	SEASON	SOURCE	DIRECTION	MONITORED ELEMENT		RATEB (MVA)	TDF	TC%LOADING (% MVA)	CONTINGENCY
FDNS	09ALLBPSON		0 13G	G13_018	TO->FROM	G13_002T	115.00 - SHELDON 115KV CKT 2	43	0.06426	101.8781	LN-MALONEY
FDNS	09ALLBPSON		0 13G	G13_018	TO->FROM	G13_002T	115.00 - SHELDON 115KV CKT 2	43	0.06425	101.5107	NEB02WAPAB2
FDNS	09BPSON		0 13G	G13_018	TO->FROM	G13_002T	115.00 - SHELDON 115KV CKT 2	43	0.06425	193.1198	GEN560749 1-G13_002_3 0.6900
FDNS	09BPSON		0 13G	G13_018	TO->FROM	G13_002T	115.00 - SHELDON 115KV CKT 2	43	0.06425	127.3882	GEN645001 1-FORT CALHOUN 1
FDNS	09BPSON		0 13G	G13_018	TO->FROM	G13_002T	115.00 - SHELDON 115KV CKT 2	43	0.06425	118.7497	BASE CASE
FDNS	09BPSON		0 13G	G13_018	TO->FROM	G13_002T	115.00 - SHELDON 115KV CKT 2	43	0.06425	111.4418	LN-WAPA2
FDNS	09BPSON		0 13G	G13_018	TO->FROM	G13_002T	115.00 - SHELDON 115KV CKT 2	43	0.06425	111.0933	LN-1094
FDNS	09BPSON		0 13G	G13_018	TO->FROM	G13_002T	115.00 - SHELDON 115KV CKT 2	43	0.06425	110.6343	LN-WAPA4
FDNS	09BPSON		0 13G	G13_018	TO->FROM	G13_002T	115.00 - SHELDON 115KV CKT 2	43	0.06425	110.1482	GEN562029 1-G11_018_3 0.6900
FDNS	09BPSON		0 13G	G13_018	TO->FROM	G13_002T	115.00 - SHELDON 115KV CKT 2	43	0.06425	108.1032	LN-MALONEY
FDNS	09BPSON		0 13G	G13_018	TO->FROM	G13_002T	115.00 - SHELDON 115KV CKT 2	43	0.06425	105.4875	GEN560711 1-G10_044_3 0.6900
FDNS	09BPSON		0 13G	G13_018	TO->FROM	G13_002T	115.00 - SHELDON 115KV CKT 2	43	0.06425	101.2788	GEN640022 1-BEATRICE POWER STATION UNIT 1
FDNS	09BPSON		0 13G	G13_018	TO->FROM	G13_002T	115.00 - SHELDON 115KV CKT 2	43	0.06425	101.2784	GEN640023 2-BEATRICE POWER STATION UNIT 2
FDNS	09ALL		0 13G	G13_018	TO->FROM	G13_002T	115.00 - SHELDON 115KV CKT 2	43	0.06424	146.9823	GEN560749 1-G13_002_3 0.6900
FDNS	09BPSON		0 13G	G13_018	TO->FROM	G13_002T	115.00 - SHELDON 115KV CKT 2	43	0.06424	107.6383	NEB02WAPAB2
FDNS	9		0 13G	G13_018	TO->FROM	G13_002T	115.00 - SHELDON 115KV CKT 2	43	0.06423	135.9865	GEN560749 1-G13_002_3 0.6900
FDNS	03ALL		0 13G	G13_018	TO->FROM	G13_002T	115.00 - SHELDON 115KV CKT 2	43	0.06423	137.143	DBL-TGA-MATT
FDNS	09ALLBPSON		0 13G	G13_018	TO->FROM	G13_002T	115.00 - SHELDON 115KV CKT 2	43	0.06422	123.9207	KELLY - MADISONCO 230.00 230KV CKT 1
FDNS	03ALL		0 13G	G13_018	TO->FROM	G13_002T	115.00 - SHELDON 115KV CKT 2	43	0.06421	137.0847	DBL-BVR-WWRD
FDNS	09BPSON		0 13G	G13_018	TO->FROM	G13_002T	115.00 - SHELDON 115KV CKT 2	43	0.06421	126.9908	KELLY - MADISONCO 230.00 230KV CKT 1
FDNS	3		0 13G	G13_018	TO->FROM	G13_002T	115.00 - SHELDON 115KV CKT 2	43	0.0642	138.5715	GEN560749 1-G13_002_3 0.6900
FDNS	3		0 13G	G13_018	TO->FROM	G13_002T	115.00 - SHELDON 115KV CKT 2	43	0.0642	127.452	GEN645001 1-FORT CALHOUN 1
FDNS	3		0 13G	G13_018	TO->FROM	G13_002T	115.00 - SHELDON 115KV CKT 2	43	0.0642	118.8412	BASE CASE
FDNS	3		0 13G	G13_018	TO->FROM	G13_002T	115.00 - SHELDON 115KV CKT 2	43	0.0642	111.6991	LN-1094
FDNS	3		0 13G	G13_018	TO->FROM	G13_002T	115.00 - SHELDON 115KV CKT 2	43	0.0642	111.6639	LN-WAPA2
FDNS	3		0 13G	G13_018	TO->FROM	G13_002T	115.00 - SHELDON 115KV CKT 2	43	0.0642	111.0426	LN-WAPA4
FDNS	3		0 13G	G13_018	TO->FROM	G13_002T	115.00 - SHELDON 115KV CKT 2	43	0.0642	108.43	LN-MALONEY
FDNS	3		0 13G	G13_018	TO->FROM	G13_002T	115.00 - SHELDON 115KV CKT 2	43	0.0642	107.4465	NEB02WAPAB2
FDNS	3		0 13G	G13_018	TO->FROM	G13_002T	115.00 - SHELDON 115KV CKT 2	43	0.0642	103.2437	GEN640019 1-SHELDON STATION UNIT 1
FDNS	03ALL		0 13G	G13_018	TO->FROM	G13_002T	115.00 - SHELDON 115KV CKT 2	43	0.0642	149.3944	GEN560749 1-G13_002_3 0.6900
FDNS	03ALL		0 13G	G13_018	TO->FROM	G13_002T	115.00 - SHELDON 115KV CKT 2	43	0.0642	142.0733	DBL-SPRVL-MU
FDNS	03ALL		0 13G	G13_018	TO->FROM	G13_002T	115.00 - SHELDON 115KV CKT 2	43	0.0642	141.8729	DBL-MUL-RENO
FDNS	03ALL		0 13G	G13_018	TO->FROM	G13_002T	115.00 - SHELDON 115KV CKT 2	43	0.0642	139.2905	DBL-WICH-THI
FDNS	03ALL		0 13G	G13_018	TO->FROM	G13_002T	115.00 - SHELDON 115KV CKT 2	43	0.0642	137.7977	GEN645001 1-FORT CALHOUN 1
FDNS	03ALL		0 13G	G13_018	TO->FROM	G13_002T	115.00 - SHELDON 115KV CKT 2	43	0.0642	129.5485	BASE CASE
FDNS	03ALL		0 13G	G13_018	TO->FROM	G13_002T	115.00 - SHELDON 115KV CKT 2	43	0.0642	122.3545	LN-WAPA2
FDNS	03ALL		0 13G	G13_018	TO->FROM	G13_002T	115.00 - SHELDON 115KV CKT 2	43	0.0642	122.2512	LN-1094
FDNS	03ALL		0 13G	G13_018	TO->FROM	G13_002T	115.00 - SHELDON 115KV CKT 2	43	0.0642	121.6104	LN-WAPA4
FDNS	03ALL		0 13G	G13_018	TO->FROM	G13_002T	115.00 - SHELDON 115KV CKT 2	43	0.0642	119.3281	LN-MALONEY
FDNS	03ALL		0 13G	G13_018	TO->FROM	G13_002T	115.00 - SHELDON 115KV CKT 2	43	0.0642	117.9665	NEB02WAPAB2
FDNS	03ALL		0 13G	G13_018	TO->FROM	G13_002T	115.00 - SHELDON 115KV CKT 2	43	0.0642	113.9053	GEN640019 1-SHELDON STATION UNIT 1
FDNS	03ALL		0 13G	G13_018	TO->FROM	G13_002T	115.00 - SHELDON 115KV CKT 2	43	0.06418	137.3685	STEGALL - WAYSIDE 230KV CKT 1
FDNS	14		0 13G	G13_018	TO->FROM	G13_002T	115.00 - SHELDON 115KV CKT 2	43	0.06415	127.6637	GEN560749 1-G13_002_3 0.6900
FDNS	14		0 13G	G13_018	TO->FROM	G13_002T	115.00 - SHELDON 115KV CKT 2	43	0.06415	117.2305	GEN645001 1-FORT CALHOUN 1
FDNS	14		0 13G	G13_018	TO->FROM	G13_002T	115.00 - SHELDON 115KV CKT 2	43	0.06415	115.2212	GEN645012 2-NEBRASKA CITY 2
FDNS	14		0 13G	G13_018	TO->FROM	G13_002T	115.00 - SHELDON 115KV CKT 2	43	0.06415	108.0332	BASE CASE
FDNS	14		0 13G	G13_018	TO->FROM	G13_002T	115.00 - SHELDON 115KV CKT 2	43	0.06415	100	LN-WAPA4
FDNS	09G13_018BPSON		0 13G	G13_018	TO->FROM	G13_002T	115.00 - SHELDON 115KV CKT 2	43	0.06415	218.3995	GEN560749 1-G13_002_3 0.6900
FDNS	09G13_018BPSON		0 13G	G13_018	TO->FROM	G13_002T	115.00 - SHELDON 115KV CKT 2	43	0.06415	153.3013	GEN645001 1-FORT CALHOUN 1
FDNS	09G13_018BPSON		0 13G	G13_018	TO->FROM	G13_002T	115.00 - SHELDON 115KV CKT 2	43	0.06415	151.382	GEN645012 2-NEBRASKA CITY 2
FDNS	09G13_018BPSON		0 13G	G13_018	TO->FROM	G13_002T	115.00 - SHELDON 115KV CKT 2	43	0.06415	144.2864	BASE CASE
FDNS	09G13_018BPSON		0 13G	G13_018	TO->FROM	G13_002T	115.00 - SHELDON 115KV CKT 2	43	0.06415	137.0525	LN-WAPA2
FDNS	09G13_018BPSON		0 13G	G13_018	TO->FROM	G13_002T	115.00 - SHELDON 115KV CKT 2	43	0.06415	136.6427	LN-1094
FDNS	09G13_018BPSON		0 13G	G13_018	TO->FROM	G13_002T	115.00 - SHELDON 115KV CKT 2	43	0.06415	136.2281	LN-WAPA4
FDNS	09G13_018BPSON		0 13G	G13_018	TO->FROM	G13_002T	115.00 - SHELDON 115KV CKT 2	43	0.06415	135.6284	GEN562029 1-G11_018_3 0.6900
FDNS	09G13_018BPSON		0 13G	G13_018	TO->FROM	G13_002T	115.00 - SHELDON 115KV CKT 2	43	0.06415	133.7095	LN-MALONEY
FDNS	09G13_018BPSON		0 13G	G13_018	TO->FROM	G13_002T	115.00 - SHELDON 115KV CKT 2	43	0.06415	133.0567	NEB02WAPAB2
FDNS	09G13_018BPSON		0 13G	G13_018	TO->FROM	G13_002T	115.00 - SHELDON 115KV CKT 2	43	0.06415	130.9179	GEN560711 1-G10_044_3 0.6900
FDNS	09G13_018BPSON		0 13G	G13_018	TO->FROM	G13_002T	115.00 - SHELDON 115KV CKT 2	43	0.06415	126.6781	GEN640022 1-BEATRICE POWER STATION UNIT 1
FDNS	09G13_018BPSON		0 13G	G13_018	TO->FROM	G13_002T	115.00 - SHELDON 115KV CKT 2	43	0.06415	126.6777	GEN640023 2-BEATRICE POWER STATION UNIT 2
FDNS	09G13_018BPSON		0 13G	G13_018	TO->FROM	G13_002T	115.00 - SHELDON 115KV CKT 2	43	0.06415	126.4232	GEN640019 1-SHELDON STATION UNIT 1
FDNS	09G13_018BPSON		0 13G	G13_018	TO->FROM	G13_002T	115.00 - SHELDON 115KV CKT 2	43	0.06415	124.4859	GEN640024 3-BEATRICE POWER STATION UNIT 3
FDNS	09G13_018BPSON		0 13G	G13_018	TO->FROM	G13_002T	115.00 - SHELDON 115KV CKT 2	43	0.06415	109.079	GEN640020 2-SHELDON STATION UNIT 2
FDNS	14ALL		0 13G	G13_018	TO->FROM	G13_002T	115.00 - SHELDON 115KV CKT 2	43	0.06415	129.4839	GEN560749 1-G13_002_3 0.6900
FDNS	14ALL		0 13G	G13_018	TO->FROM	G13_002T	115.00 - SHELDON 115KV CKT 2	43	0.06415	119.0243	GEN645001 1-FORT CALHOUN 1
FDNS	14ALL		0 13G	G13_018	TO->FROM	G13_002T	115.00 - SHELDON 115KV CKT 2	43	0.06415	117.0252	GEN645012 2-NEBRASKA CITY 2
FDNS	14ALL		0 13G	G13_018	TO->FROM	G13_002T	115.00 - SHELDON 115KV CKT 2	43	0.06415	109.8288	BASE CASE
FDNS	14ALL		0 13G	G13_018	TO->FROM	G13_002T	115.00 - SHELDON 115KV CKT 2	43	0.06415	102.7355	LN-WAPA2
FDNS	14ALL		0 13G	G13_018	TO->FROM	G13_002T	115.00 - SHELDON 115KV CKT 2	43	0.06415	102.3827	LN-1094
FDNS	14ALL		0 13G	G13_018	TO->FROM	G13_002T	115.00 - SHELDON 115KV CKT 2	43	0.06415	101.953	LN-WAPA4
FDNS	14		0 13G	G13_018	TO->FROM	G13_002T	115.00 - SHELDON 115KV CKT 2	43	0.06414	100.7841	LN-WAPA2
FDNS	14		0 13G	G13_018	TO->FROM	G13_002T	115.00 - SHELDON 115KV CKT 2	43	0.06414	100.4452	LN-1094
FDNS	09G13_018		0 13G	G13_018	TO->FROM	G13_002T	115.00 - SHELDON 115KV CKT 2	43	0.06413	160.7553	GEN560749 1-G13_002_3 0.6900
FDNS	8		0 13G	G13_018	TO->FROM	G13_002T	115.00 - SHELDON 115KV CKT 2	43	0.06412	128.9464	GEN560749 1-G13_002_3 0.6900
FDNS	8		0 13G	G13_018	TO->FROM	G13_002T	115.00 - SHELDON 115KV CKT 2	43	0.06412	117.9666	GEN645001 1-FORT CALHOUN 1
FDNS	8		0 13G	G13_018	TO->FROM	G13_002T	115.00 - SHELDON 115KV CKT 2	43	0.06412	109.2755	BASE CASE
FDNS	8		0 13G	G13_018	TO->FROM	G13_002T	115.00 - SHELDON 115KV CKT 2	43	0.06412	102.0289	LN-WAPA2
FDNS	8		0 13G	G13_018	TO->FROM	G13_002T	115.00 - SHELDON 115KV CKT 2	43	0.06412	101.248	LN-WAPA4

SOLUTION	GROUP	SCENARIO	SEASON	SOURCE	DIRECTION	MONITORED ELEMENT		RATEB (MVA)	TDF	TC%LOADING (% MVA)	CONTINGENCY
FDNS	08ALL		0 13G	G13_018	TO->FROM	G13_002T	115.00 - SHELDON 115KV CKT 2	43	0.06412	131.1082	GEN560749 1-G13_002_3 0.6900
FDNS	08ALL		0 13G	G13_018	TO->FROM	G13_002T	115.00 - SHELDON 115KV CKT 2	43	0.06412	120.1646	GEN645001 1-FORT CALHOUN 1
FDNS	08ALL		0 13G	G13_018	TO->FROM	G13_002T	115.00 - SHELDON 115KV CKT 2	43	0.06412	111.3856	BASE CASE
FDNS	08ALL		0 13G	G13_018	TO->FROM	G13_002T	115.00 - SHELDON 115KV CKT 2	43	0.06412	104.1558	LN-WAPA2
FDNS	08ALL		0 13G	G13_018	TO->FROM	G13_002T	115.00 - SHELDON 115KV CKT 2	43	0.06412	103.8114	LN-1094
FDNS	08ALL		0 13G	G13_018	TO->FROM	G13_002T	115.00 - SHELDON 115KV CKT 2	43	0.06412	103.3657	LN-WAPA4
FDNS	08ALL		0 13G	G13_018	TO->FROM	G13_002T	115.00 - SHELDON 115KV CKT 2	43	0.06412	100.8542	LN-MALONEY
FDNS	08ALL		0 13G	G13_018	TO->FROM	G13_002T	115.00 - SHELDON 115KV CKT 2	43	0.06412	99.9	NEB02WAPAB2
FDNS	8		0 13G	G13_018	TO->FROM	G13_002T	115.00 - SHELDON 115KV CKT 2	43	0.06411	101.6996	LN-1094
FDNS	09G13_018BPSON		0 13G	G13_018	TO->FROM	G13_002T	115.00 - SHELDON 115KV CKT 2	43	0.06411	152.246	KELLY - MADISONCO 230.00 230KV CKT 1
FDNS	03ALL		0 13G	G13_018	TO->FROM	G13_002T	115.00 - SHELDON 115KV CKT 2	43	0.06403	136.6667	HOYT - STRANGER CREEK 345KV CKT 1
FDNS	09ALLBPSON		0 13G	G13_018	TO->FROM	G13_002T	115.00 - SHELDON 115KV CKT 2	43	0.06403	127.2824	MOORE - NW68TH & HOLDREGE 345KV CKT 1
FDNS	09BPSON		0 13G	G13_018	TO->FROM	G13_002T	115.00 - SHELDON 115KV CKT 2	43	0.06402	135.1566	MOORE - NW68TH & HOLDREGE 345KV CKT 1
FDNS	3		0 13G	G13_018	TO->FROM	G13_002T	115.00 - SHELDON 115KV CKT 2	43	0.06398	146.2495	MOORE - NW68TH & HOLDREGE 345KV CKT 1
FDNS	03ALL		0 13G	G13_018	TO->FROM	G13_002T	115.00 - SHELDON 115KV CKT 2	43	0.06398	159.1126	MOORE - NW68TH & HOLDREGE 345KV CKT 1
FDNS	09G13_018BPSON		0 13G	G13_018	TO->FROM	G13_002T	115.00 - SHELDON 115KV CKT 2	43	0.06392	161.9953	MOORE - NW68TH & HOLDREGE 345KV CKT 1
FDNS	14ALL		0 13G	G13_018	TO->FROM	G13_002T	115.00 - SHELDON 115KV CKT 2	43	0.06392	133.6229	MOORE - NW68TH & HOLDREGE 345KV CKT 1
FDNS	14		0 13G	G13_018	TO->FROM	G13_002T	115.00 - SHELDON 115KV CKT 2	43	0.06391	130.662	MOORE - NW68TH & HOLDREGE 345KV CKT 1
FDNS	09G13_018		0 13G	G13_018	TO->FROM	G13_002T	115.00 - SHELDON 115KV CKT 2	43	0.0639	104.8714	MOORE - NW68TH & HOLDREGE 345KV CKT 1
FDNS	8		0 13G	G13_018	TO->FROM	G13_002T	115.00 - SHELDON 115KV CKT 2	43	0.06389	132.4091	MOORE - NW68TH & HOLDREGE 345KV CKT 1
FDNS	08ALL		0 13G	G13_018	TO->FROM	G13_002T	115.00 - SHELDON 115KV CKT 2	43	0.06389	135.9281	MOORE - NW68TH & HOLDREGE 345KV CKT 1
FDNS	03ALL		0 13G	G13_018	TO->FROM	G13_002T	115.00 - SHELDON 115KV CKT 2	43	0.06359	136.4678	TAMORA - YORK 115KV CKT 1
FDNS	09ALLBPSON		0 13G	G13_018	TO->FROM	G13_002T	115.00 - SHELDON 115KV CKT 2	43	0.0627	101.3441	COOPER - SUB 3458 NEB CTY 345KV CKT 1
FDNS	09BPSON		0 13G	G13_018	TO->FROM	G13_002T	115.00 - SHELDON 115KV CKT 2	43	0.06269	109.0209	COOPER - SUB 3458 NEB CTY 345KV CKT 1
FDNS	09ALLBPSON		0 13G	G13_018	TO->FROM	G13_002T	115.00 - SHELDON 115KV CKT 2	43	0.06266	134.4593	103RD & ROKEBY - WAGENER 345KV CKT 1
FDNS	09BPSON		0 13G	G13_018	TO->FROM	G13_002T	115.00 - SHELDON 115KV CKT 2	43	0.06265	141.6622	103RD & ROKEBY - WAGENER 345KV CKT 1
FDNS	09G13_018BPSON		0 13G	G13_018	TO->FROM	G13_002T	115.00 - SHELDON 115KV CKT 2	43	0.06263	133.1785	COOPER - SUB 3458 NEB CTY 345KV CKT 1
FDNS	3		0 13G	G13_018	TO->FROM	G13_002T	115.00 - SHELDON 115KV CKT 2	43	0.06262	147.4915	103RD & ROKEBY - WAGENER 345KV CKT 1
FDNS	03ALL		0 13G	G13_018	TO->FROM	G13_002T	115.00 - SHELDON 115KV CKT 2	43	0.06262	159.1967	103RD & ROKEBY - WAGENER 345KV CKT 1
FDNS	09ALLBPSON		0 13G	G13_018	TO->FROM	G13_002T	115.00 - SHELDON 115KV CKT 2	43	0.0626	122.1059	84TH & LEIGHTON - WAGENER 115KV CKT 1
FDNS	09BPSON		0 13G	G13_018	TO->FROM	G13_002T	115.00 - SHELDON 115KV CKT 2	43	0.06259	128.9639	84TH & LEIGHTON - WAGENER 115KV CKT 1
FDNS	09G13_018BPSON		0 13G	G13_018	TO->FROM	G13_002T	115.00 - SHELDON 115KV CKT 2	43	0.06256	167.1353	103RD & ROKEBY - WAGENER 345KV CKT 1
FDNS	14ALL		0 13G	G13_018	TO->FROM	G13_002T	115.00 - SHELDON 115KV CKT 2	43	0.06256	137.1727	103RD & ROKEBY - WAGENER 345KV CKT 1
FDNS	14		0 13G	G13_018	TO->FROM	G13_002T	115.00 - SHELDON 115KV CKT 2	43	0.06255	134.7989	103RD & ROKEBY - WAGENER 345KV CKT 1
FDNS	03ALL		0 13G	G13_018	TO->FROM	G13_002T	115.00 - SHELDON 115KV CKT 2	43	0.06255	141.5751	84TH & LEIGHTON - WAGENER 115KV CKT 1
FDNS	3		0 13G	G13_018	TO->FROM	G13_002T	115.00 - SHELDON 115KV CKT 2	43	0.06254	131.166	84TH & LEIGHTON - WAGENER 115KV CKT 1
FDNS	09G13_018		0 13G	G13_018	TO->FROM	G13_002T	115.00 - SHELDON 115KV CKT 2	43	0.06254	111.1428	103RD & ROKEBY - WAGENER 345KV CKT 1
FDNS	08ALL		0 13G	G13_018	TO->FROM	G13_002T	115.00 - SHELDON 115KV CKT 2	43	0.06253	139.0185	103RD & ROKEBY - WAGENER 345KV CKT 1
FDNS	8		0 13G	G13_018	TO->FROM	G13_002T	115.00 - SHELDON 115KV CKT 2	43	0.06252	136.2901	103RD & ROKEBY - WAGENER 345KV CKT 1
FDNS	14		0 13G	G13_018	TO->FROM	G13_002T	115.00 - SHELDON 115KV CKT 2	43	0.06249	120.9044	84TH & LEIGHTON - WAGENER 115KV CKT 1
FDNS	09G13_018BPSON		0 13G	G13_018	TO->FROM	G13_002T	115.00 - SHELDON 115KV CKT 2	43	0.06249	153.8151	84TH & LEIGHTON - WAGENER 115KV CKT 1
FDNS	14ALL		0 13G	G13_018	TO->FROM	G13_002T	115.00 - SHELDON 115KV CKT 2	43	0.06249	122.6356	84TH & LEIGHTON - WAGENER 115KV CKT 1
FDNS	08ALL		0 13G	G13_018	TO->FROM	G13_002T	115.00 - SHELDON 115KV CKT 2	43	0.06247	124.2001	84TH & LEIGHTON - WAGENER 115KV CKT 1
FDNS	8		0 13G	G13_018	TO->FROM	G13_002T	115.00 - SHELDON 115KV CKT 2	43	0.06246	122.0289	84TH & LEIGHTON - WAGENER 115KV CKT 1
FDNS	09ALLBPSON		0 13G	G13_018	TO->FROM	G13_002T	115.00 - SHELDON 115KV CKT 2	43	0.06195	124.3294	WAGENER (T852) 345/115/13.8KV TRANSFORMER CKT 2
FDNS	09BPSON		0 13G	G13_018	TO->FROM	G13_002T	115.00 - SHELDON 115KV CKT 2	43	0.06194	131.4032	WAGENER (T852) 345/115/13.8KV TRANSFORMER CKT 2
FDNS	3		0 13G	G13_018	TO->FROM	G13_002T	115.00 - SHELDON 115KV CKT 2	43	0.0619	134.3182	WAGENER (T852) 345/115/13.8KV TRANSFORMER CKT 2
FDNS	03ALL		0 13G	G13_018	TO->FROM	G13_002T	115.00 - SHELDON 115KV CKT 2	43	0.0619	144.6462	WAGENER (T852) 345/115/13.8KV TRANSFORMER CKT 2
FDNS	09G13_018BPSON		0 13G	G13_018	TO->FROM	G13_002T	115.00 - SHELDON 115KV CKT 2	43	0.06185	156.0316	WAGENER (T852) 345/115/13.8KV TRANSFORMER CKT 2
FDNS	14ALL		0 13G	G13_018	TO->FROM	G13_002T	115.00 - SHELDON 115KV CKT 2	43	0.06185	125.9494	WAGENER (T852) 345/115/13.8KV TRANSFORMER CKT 2
FDNS	14		0 13G	G13_018	TO->FROM	G13_002T	115.00 - SHELDON 115KV CKT 2	43	0.06184	124.203	WAGENER (T852) 345/115/13.8KV TRANSFORMER CKT 2
FDNS	09G13_018		0 13G	G13_018	TO->FROM	G13_002T	115.00 - SHELDON 115KV CKT 2	43	0.06183	101.407	WAGENER (T852) 345/115/13.8KV TRANSFORMER CKT 2
FDNS	08ALL		0 13G	G13_018	TO->FROM	G13_002T	115.00 - SHELDON 115KV CKT 2	43	0.06182	127.5142	WAGENER (T852) 345/115/13.8KV TRANSFORMER CKT 2
FDNS	8		0 13G	G13_018	TO->FROM	G13_002T	115.00 - SHELDON 115KV CKT 2	43	0.06181	125.3293	WAGENER (T852) 345/115/13.8KV TRANSFORMER CKT 2
FDNS	09ALLBPSON		0 13G	G13_018	TO->FROM	G13_002T	115.00 - SHELDON 115KV CKT 2	43	0.06174	125.4046	WAGENER (T851) 345/115/13.8KV TRANSFORMER CKT 1
FDNS	09BPSON		0 13G	G13_018	TO->FROM	G13_002T	115.00 - SHELDON 115KV CKT 2	43	0.06173	132.556	WAGENER (T851) 345/115/13.8KV TRANSFORMER CKT 1
FDNS	03ALL		0 13G	G13_018	TO->FROM	G13_002T	115.00 - SHELDON 115KV CKT 2	43	0.0617	146.0261	WAGENER (T851) 345/115/13.8KV TRANSFORMER CKT 1
FDNS	3		0 13G	G13_018	TO->FROM	G13_002T	115.00 - SHELDON 115KV CKT 2	43	0.06169	135.7335	WAGENER (T851) 345/115/13.8KV TRANSFORMER CKT 1
FDNS	09G13_018BPSON		0 13G	G13_018	TO->FROM	G13_002T	115.00 - SHELDON 115KV CKT 2	43	0.06164	157.1007	WAGENER (T851) 345/115/13.8KV TRANSFORMER CKT 1
FDNS	14ALL		0 13G	G13_018	TO->FROM	G13_002T	115.00 - SHELDON 115KV CKT 2	43	0.06164	127.4299	WAGENER (T851) 345/115/13.8KV TRANSFORMER CKT 1
FDNS	14		0 13G	G13_018	TO->FROM	G13_002T	115.00 - SHELDON 115KV CKT 2	43	0.06163	125.6825	WAGENER (T851) 345/115/13.8KV TRANSFORMER CKT 1
FDNS	09G13_018		0 13G	G13_018	TO->FROM	G13_002T	115.00 - SHELDON 115KV CKT 2	43	0.06162	102.6634	WAGENER (T851) 345/115/13.8KV TRANSFORMER CKT 1
FDNS	08ALL		0 13G	G13_018	TO->FROM	G13_002T	115.00 - SHELDON 115KV CKT 2	43	0.06161	128.9871	WAGENER (T851) 345/115/13.8KV TRANSFORMER CKT 1
FDNS	8		0 13G	G13_018	TO->FROM	G13_002T	115.00 - SHELDON 115KV CKT 2	43	0.0616	126.8028	WAGENER (T851) 345/115/13.8KV TRANSFORMER CKT 1
FDNS	09ALLBPSON		0 13G	G13_018	TO->FROM	G13_002T	115.00 - SHELDON 115KV CKT 2	43	0.05864	140.0207	NW68TH & HOLDREGE (T141) 345/115/13.8KV TRANSFORMER CKT 1
FDNS	09BPSON		0 13G	G13_018	TO->FROM	G13_002T	115.00 - SHELDON 115KV CKT 2	43	0.05862	147.544	NW68TH & HOLDREGE (T141) 345/115/13.8KV TRANSFORMER CKT 1
FDNS	9		0 13G	G13_018	TO->FROM	G13_002T	115.00 - SHELDON 115KV CKT 2	43	0.05861	100.3761	NW68TH & HOLDREGE (T141) 345/115/13.8KV TRANSFORMER CKT 1
FDNS	03ALL		0 13G	G13_018	TO->FROM	G13_002T	115.00 - SHELDON 115KV CKT 2	43	0.05859	163.3198	NW68TH & HOLDREGE (T141) 345/115/13.8KV TRANSFORMER CKT 1
FDNS	3		0 13G	G13_018	TO->FROM	G13_002T	115.00 - SHELDON 115KV CKT 2	43	0.05858	153.2952	NW68TH & HOLDREGE (T141) 345/115/13.8KV TRANSFORMER CKT 1
FDNS	09BPSON		0 13G	G13_018	TO->FROM	G13_002T	115.00 - SHELDON 115KV CKT 2	43	0.05858	106.6787	ROKEBY - SW7TH & PLEASANT HILL 115KV CKT 1
FDNS	03ALL		0 13G	G13_018	TO->FROM	G13_002T	115.00 - SHELDON 115KV CKT 2	43	0.05854	122.2191	ROKEBY - SW7TH & PLEASANT HILL 115KV CKT 1
FDNS	09G13_018BPSON		0 13G	G13_018	TO->FROM	G13_002T	115.00 - SHELDON 115KV CKT 2	43	0.05854	171.0182	NW68TH & HOLDREGE (T141) 345/115/13.8KV TRANSFORMER CKT 1
FDNS	14		0 13G	G13_018	TO->FROM	G13_002T	115.00 - SHELDON 115KV CKT 2	43	0.05853	142.7175	NW68TH & HOLDREGE (T141) 345/115/13.8KV TRANSFORMER CKT 1
FDNS	14ALL		0 13G	G13_018	TO->FROM	G13_002T	115.00 - SHELDON 115KV CKT 2	43	0.05853	144.5604	NW68TH & HOLDREGE (T141) 345/115/13.8KV TRANSFORMER CKT 1
FDNS	09G13_018		0 13G	G13_018	TO->FROM	G13_002T	115.00 - SHELDON 115KV CKT 2	43	0.05852	119.1739	NW68TH & HOLDREGE (T141) 345/115/13.8KV TRANSFORMER CKT 1
FDNS	08ALL		0 13G	G13_018	TO->FROM	G13_002T	115.00 - SHELDON 115KV CKT 2	43	0.05851	146.101	NW68TH & HOLDREGE (T141) 345/115/13.8KV TRANSFORMER CKT 1
FDNS	8		0 13G	G13_018	TO->FROM	G13_002T	115.00 - SHELDON 115KV CKT 2	43	0.0585	143.9939	NW68TH & HOLDREGE (T141) 345/115/13.8KV TRANSFORMER CKT 1
FDNS	09G13_018BPSON		0 13G	G13_018	TO->FROM	G13_002T	115.00 - SHELDON 115KV CKT 2	43	0.05849	130.0768	ROKEBY - SW7TH & PLEASANT HILL 115KV CKT 1

SOLUTION	GROUP	SCENARIO	SEASON	SOURCE	DIRECTION	MONITORED ELEMENT	RATEB (MVA)	TDF	TC%LOADING (% MVA)	CONTINGENCY
FDNS	09G13_018BPSON		0 13G	G13_018	TO->FROM	G13_002T 115.00 - SHELDON 115KV CKT 2	43	0.05399	101.038	20TH & PIONEERS - SW7TH & PLEASANT HILL 115KV CKT 1
FDNS	03ALL		0 13G	G13_018	TO->FROM	BENTON - WICHITA 345KV CKT 1	932	0.03876	107.4489	HUNTERS7 345.00 - WOODRING 345KV CKT 1
FDNS	03ALL		0 13G	G13_018	TO->FROM	BENTON - WICHITA 345KV CKT 1	932	0.03876	105.1622	HUNTERS7 345.00 - VIOLA 7 345.00 345KV CKT 1
FDNS	06ALL		2 13G	G13_018	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.09939	204.9004	SHELDON - SW7TH & PLEASANT HILL 115KV CKT 1
FDNS	6		2 13G	G13_018	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.09938	203.6561	SHELDON - SW7TH & PLEASANT HILL 115KV CKT 1
FDNS	6		2 13G	G13_018	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.06482	139.7881	103RD & ROKEBY - MOORE 345KV CKT 1
FDNS	06ALL		2 13G	G13_018	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.06482	141.3899	103RD & ROKEBY - MOORE 345KV CKT 1
FDNS	6		2 13G	G13_018	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.06415	141.5115	GEN645001 1-FORT CALHOUN 1
FDNS	6		2 13G	G13_018	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.06415	139.685	GEN645012 2-NEBRASKA CITY 2
FDNS	6		2 13G	G13_018	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.06415	132.1799	BASE CASE
FDNS	6		2 13G	G13_018	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.06415	124.9118	LN-WAPA2
FDNS	6		2 13G	G13_018	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.06415	124.5359	LN-1094
FDNS	6		2 13G	G13_018	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.06415	124.1222	LN-WAPA4
FDNS	6		2 13G	G13_018	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.06415	121.6021	LN-MALONEY
FDNS	6		2 13G	G13_018	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.06415	115.4253	GEN640019 1-SHELDON STATION UNIT 1
FDNS	6		2 13G	G13_018	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.06415	111.4131	GEN640020 2-SHELDON STATION UNIT 2
FDNS	06ALL		2 13G	G13_018	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.06415	142.0664	GEN645001 1-FORT CALHOUN 1
FDNS	06ALL		2 13G	G13_018	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.06415	140.3239	GEN645012 2-NEBRASKA CITY 2
FDNS	06ALL		2 13G	G13_018	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.06415	132.994	BASE CASE
FDNS	06ALL		2 13G	G13_018	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.06415	125.7305	LN-WAPA2
FDNS	06ALL		2 13G	G13_018	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.06415	125.3625	LN-1094
FDNS	06ALL		2 13G	G13_018	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.06415	124.9498	LN-WAPA4
FDNS	06ALL		2 13G	G13_018	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.06415	122.4333	LN-MALONEY
FDNS	06ALL		2 13G	G13_018	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.06415	121.4637	NEB02WAPAB2
FDNS	06ALL		2 13G	G13_018	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.06415	116.5515	GEN640019 1-SHELDON STATION UNIT 1
FDNS	06ALL		2 13G	G13_018	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.06415	112.0772	GEN640020 2-SHELDON STATION UNIT 2
FDNS	6		2 13G	G13_018	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.06414	120.6511	NEB02WAPAB2
FDNS	06ALL		2 13G	G13_018	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.06412	142.2813	STEGALL - STEGALL TRANSFORMER 230KV CKT 1
FDNS	06ALL		2 13G	G13_018	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.06412	142.2672	TRF-STEAGALL
FNSL	06ALL		2 13G	G13_018	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.06412	142.2069	NEB01WAPAB3
FNSL	06ALL		2 13G	G13_018	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.06412	142.0729	STEGALL - STEGALL TY 345KV CKT 1
FDNS	6		2 13G	G13_018	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.06392	156.7654	MOORE - NW68TH & HOLDREGE 345KV CKT 1
FDNS	06ALL		2 13G	G13_018	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.06392	158.2734	MOORE - NW68TH & HOLDREGE 345KV CKT 1
FDNS	6		2 13G	G13_018	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.06256	159.698	103RD & ROKEBY - WAGENER 345KV CKT 1
FDNS	06ALL		2 13G	G13_018	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.06256	160.686	103RD & ROKEBY - WAGENER 345KV CKT 1
FDNS	6		2 13G	G13_018	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.06249	144.9512	84TH & LEIGHTON - WAGENER 115KV CKT 1
FDNS	06ALL		2 13G	G13_018	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.06249	145.7141	84TH & LEIGHTON - WAGENER 115KV CKT 1
FDNS	6		2 13G	G13_018	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.06185	148.3434	WAGENER (T852) 345/115/13.8KV TRANSFORMER CKT 2
FDNS	06ALL		2 13G	G13_018	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.06185	149.0924	WAGENER (T852) 345/115/13.8KV TRANSFORMER CKT 2
FDNS	6		2 13G	G13_018	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.06164	149.8171	WAGENER (T851) 345/115/13.8KV TRANSFORMER CKT 1
FDNS	06ALL		2 13G	G13_018	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.06164	150.5604	WAGENER (T851) 345/115/13.8KV TRANSFORMER CKT 1
FDNS	6		2 13G	G13_018	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.05853	166.9075	NW68TH & HOLDREGE (T141) 345/115/13.8KV TRANSFORMER CKT 1
FDNS	06ALL		2 13G	G13_018	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.05853	167.7262	NW68TH & HOLDREGE (T141) 345/115/13.8KV TRANSFORMER CKT 1
FDNS	6		2 13G	G13_018	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.05399	105.071	20TH & PIONEERS - SW7TH & PLEASANT HILL 115KV CKT 1
FDNS	06ALL		2 13G	G13_018	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.05399	105.7059	20TH & PIONEERS - SW7TH & PLEASANT HILL 115KV CKT 1
FDNS	06ALL		2 13G	G13_018	TO->FROM	G13_002T 115.00 - SHELDON 115KV CKT 2	43	0.09939	180.4147	SHELDON - SW7TH & PLEASANT HILL 115KV CKT 1
FDNS	6		2 13G	G13_018	TO->FROM	G13_002T 115.00 - SHELDON 115KV CKT 2	43	0.09938	179.1803	SHELDON - SW7TH & PLEASANT HILL 115KV CKT 1
FDNS	6		2 13G	G13_018	TO->FROM	G13_002T 115.00 - SHELDON 115KV CKT 2	43	0.06482	115.1096	103RD & ROKEBY - MOORE 345KV CKT 1
FDNS	06ALL		2 13G	G13_018	TO->FROM	G13_002T 115.00 - SHELDON 115KV CKT 2	43	0.06482	116.6776	103RD & ROKEBY - MOORE 345KV CKT 1
FDNS	6		2 13G	G13_018	TO->FROM	G13_002T 115.00 - SHELDON 115KV CKT 2	43	0.06415	127.2086	GEN560749 1-G13_002_3 0.6900
FDNS	6		2 13G	G13_018	TO->FROM	G13_002T 115.00 - SHELDON 115KV CKT 2	43	0.06415	116.8623	GEN645001 1-FORT CALHOUN 1
FDNS	6		2 13G	G13_018	TO->FROM	G13_002T 115.00 - SHELDON 115KV CKT 2	43	0.06415	114.9444	GEN645012 2-NEBRASKA CITY 2
FDNS	6		2 13G	G13_018	TO->FROM	G13_002T 115.00 - SHELDON 115KV CKT 2	43	0.06415	107.5455	BASE CASE
FDNS	6		2 13G	G13_018	TO->FROM	G13_002T 115.00 - SHELDON 115KV CKT 2	43	0.06415	100.3513	LN-WAPA2
FDNS	6		2 13G	G13_018	TO->FROM	G13_002T 115.00 - SHELDON 115KV CKT 2	43	0.06415	100	LN-1094
FDNS	06ALL		2 13G	G13_018	TO->FROM	G13_002T 115.00 - SHELDON 115KV CKT 2	43	0.06415	128.0196	GEN560749 1-G13_002_3 0.6900
FDNS	06ALL		2 13G	G13_018	TO->FROM	G13_002T 115.00 - SHELDON 115KV CKT 2	43	0.06415	117.3846	GEN645001 1-FORT CALHOUN 1
FDNS	06ALL		2 13G	G13_018	TO->FROM	G13_002T 115.00 - SHELDON 115KV CKT 2	43	0.06415	115.5627	GEN645012 2-NEBRASKA CITY 2
FDNS	06ALL		2 13G	G13_018	TO->FROM	G13_002T 115.00 - SHELDON 115KV CKT 2	43	0.06415	108.3487	BASE CASE
FDNS	06ALL		2 13G	G13_018	TO->FROM	G13_002T 115.00 - SHELDON 115KV CKT 2	43	0.06415	101.1587	LN-WAPA2
FDNS	06ALL		2 13G	G13_018	TO->FROM	G13_002T 115.00 - SHELDON 115KV CKT 2	43	0.06415	100.7937	LN-1094
FDNS	06ALL		2 13G	G13_018	TO->FROM	G13_002T 115.00 - SHELDON 115KV CKT 2	43	0.06415	100.386	LN-WAPA4
FDNS	06ALL		2 13G	G13_018	TO->FROM	G13_002T 115.00 - SHELDON 115KV CKT 2	43	0.06412	117.5296	STEGALL - STEGALL TRANSFORMER 230KV CKT 1
FDNS	06ALL		2 13G	G13_018	TO->FROM	G13_002T 115.00 - SHELDON 115KV CKT 2	43	0.06412	117.5157	TRF-STEAGALL
FNSL	06ALL		2 13G	G13_018	TO->FROM	G13_002T 115.00 - SHELDON 115KV CKT 2	43	0.06412	117.4558	NEB01WAPAB3
FNSL	06ALL		2 13G	G13_018	TO->FROM	G13_002T 115.00 - SHELDON 115KV CKT 2	43	0.06412	117.3231	STEGALL - STEGALL TY 345KV CKT 1
FDNS	6		2 13G	G13_018	TO->FROM	G13_002T 115.00 - SHELDON 115KV CKT 2	43	0.06392	132.0661	MOORE - NW68TH & HOLDREGE 345KV CKT 1
FDNS	06ALL		2 13G	G13_018	TO->FROM	G13_002T 115.00 - SHELDON 115KV CKT 2	43	0.06392	133.549	MOORE - NW68TH & HOLDREGE 345KV CKT 1
FDNS	6		2 13G	G13_018	TO->FROM	G13_002T 115.00 - SHELDON 115KV CKT 2	43	0.06256	135.1437	103RD & ROKEBY - WAGENER 345KV CKT 1
FDNS	06ALL		2 13G	G13_018	TO->FROM	G13_002T 115.00 - SHELDON 115KV CKT 2	43	0.06256	136.1143	103RD & ROKEBY - WAGENER 345KV CKT 1
FDNS	6		2 13G	G13_018	TO->FROM	G13_002T 115.00 - SHELDON 115KV CKT 2	43	0.06249	120.4535	84TH & LEIGHTON - WAGENER 115KV CKT 1
FDNS	06ALL		2 13G	G13_018	TO->FROM	G13_002T 115.00 - SHELDON 115KV CKT 2	43	0.06249	121.2051	84TH & LEIGHTON - WAGENER 115KV CKT 1
FDNS	6		2 13G	G13_018	TO->FROM	G13_002T 115.00 - SHELDON 115KV CKT 2	43	0.06185	123.7782	WAGENER (T852) 345/115/13.8KV TRANSFORMER CKT 2
FDNS	06ALL		2 13G	G13_018	TO->FROM	G13_002T 115.00 - SHELDON 115KV CKT 2	43	0.06185	124.5173	WAGENER (T852) 345/115/13.8KV TRANSFORMER CKT 2
FDNS	6		2 13G	G13_018	TO->FROM	G13_002T 115.00 - SHELDON 115KV CKT 2	43	0.06164	125.263	WAGENER (T851) 345/115/13.8KV TRANSFORMER CKT 1
FDNS	06ALL		2 13G	G13_018	TO->FROM	G13_002T 115.00 - SHELDON 115KV CKT 2	43	0.06164	125.996	WAGENER (T851) 345/115/13.8KV TRANSFORMER CKT 1
FDNS	6		2 13G	G13_018	TO->FROM	G13_002T 115.00 - SHELDON 115KV CKT 2	43	0.05853	142.5296	NW68TH & HOLDREGE (T141) 345/115/13.8KV TRANSFORMER CKT 1
FDNS	06ALL		2 13G	G13_018	TO->FROM	G13_002T 115.00 - SHELDON 115KV CKT 2	43	0.05853	143.3333	NW68TH & HOLDREGE (T141) 345/115/13.8KV TRANSFORMER CKT 1

SOLUTION	GROUP	SCENARIO	SEASON	SOURCE	DIRECTION	MONITORED ELEMENT	RATEB		TC%LOADING		CONTINGENCY	
							(MVA)	TDF	(% MVA)			
FDNS	06ALL		3	13G	G13_018	FROM->TO	G13_002T	115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.09939	204.9136	SHELDON - SW7TH & PLEASANT HILL 115KV CKT 1
FDNS	6		3	13G	G13_018	FROM->TO	G13_002T	115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.09938	203.6718	SHELDON - SW7TH & PLEASANT HILL 115KV CKT 1
FDNS	06ALL		3	13G	G13_018	FROM->TO	G13_002T	115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.06482	139.8012	I03RD & ROKEBY - MOORE 345KV CKT 1
FDNS	06ALL		3	13G	G13_018	FROM->TO	G13_002T	115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.06482	141.4017	I03RD & ROKEBY - MOORE 345KV CKT 1
FDNS	6		3	13G	G13_018	FROM->TO	G13_002T	115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.06415	141.5204	GEN645001 1-FORT CALHOUN 1
FDNS	6		3	13G	G13_018	FROM->TO	G13_002T	115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.06415	139.6938	GEN645012 2-NEBRASKA CITY 2
FDNS	6		3	13G	G13_018	FROM->TO	G13_002T	115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.06415	132.1895	BASE CASE
FDNS	6		3	13G	G13_018	FROM->TO	G13_002T	115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.06415	124.9166	LN-WAPA2
FDNS	6		3	13G	G13_018	FROM->TO	G13_002T	115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.06415	124.5406	LN-1094
FDNS	6		3	13G	G13_018	FROM->TO	G13_002T	115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.06415	124.127	LN-WAPA4
FDNS	6		3	13G	G13_018	FROM->TO	G13_002T	115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.06415	121.6069	LN-MALONEY
FDNS	6		3	13G	G13_018	FROM->TO	G13_002T	115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.06415	115.4341	GEN640019 1-SHELDON STATION UNIT 1
FDNS	6		3	13G	G13_018	FROM->TO	G13_002T	115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.06415	111.422	GEN640020 2-SHELDON STATION UNIT 2
FDNS	06ALL		3	13G	G13_018	FROM->TO	G13_002T	115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.06415	142.0635	GEN645001 1-FORT CALHOUN 1
FDNS	06ALL		3	13G	G13_018	FROM->TO	G13_002T	115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.06415	140.3215	GEN645012 2-NEBRASKA CITY 2
FDNS	06ALL		3	13G	G13_018	FROM->TO	G13_002T	115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.06415	132.9894	BASE CASE
FDNS	06ALL		3	13G	G13_018	FROM->TO	G13_002T	115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.06415	125.7365	LN-WAPA2
FDNS	06ALL		3	13G	G13_018	FROM->TO	G13_002T	115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.06415	125.3684	LN-1094
FDNS	06ALL		3	13G	G13_018	FROM->TO	G13_002T	115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.06415	124.9557	LN-WAPA4
FDNS	06ALL		3	13G	G13_018	FROM->TO	G13_002T	115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.06415	122.4392	LN-MALONEY
FDNS	06ALL		3	13G	G13_018	FROM->TO	G13_002T	115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.06415	121.4695	NEB02WAPAB2
FDNS	06ALL		3	13G	G13_018	FROM->TO	G13_002T	115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.06415	116.5489	GEN640019 1-SHELDON STATION UNIT 1
FDNS	06ALL		3	13G	G13_018	FROM->TO	G13_002T	115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.06415	112.0834	GEN640020 2-SHELDON STATION UNIT 2
FDNS	6		3	13G	G13_018	FROM->TO	G13_002T	115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.06414	120.6463	NEB02WAPAB2
FDNS	06ALL		3	13G	G13_018	FROM->TO	G13_002T	115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.06412	142.2912	STEGALL - STEGALL TRANSFORMER 230KV CKT 1
FDNS	06ALL		3	13G	G13_018	FROM->TO	G13_002T	115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.06412	142.2771	TRF-STEGALL
FNSL	06ALL		3	13G	G13_018	FROM->TO	G13_002T	115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.06412	142.2169	NEB01WAPAB3
FNSL	06ALL		3	13G	G13_018	FROM->TO	G13_002T	115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.06412	142.0829	STEGALL - STEGALL TY 345KV CKT 1
FDNS	6		3	13G	G13_018	FROM->TO	G13_002T	115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.06392	156.7718	MOORE - NW68TH & HOLDREGE 345KV CKT 1
FDNS	06ALL		3	13G	G13_018	FROM->TO	G13_002T	115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.06392	157.8316	MOORE - NW68TH & HOLDREGE 345KV CKT 1
FDNS	6		3	13G	G13_018	FROM->TO	G13_002T	115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.06256	159.7068	I03RD & ROKEBY - WAGENER 345KV CKT 1
FDNS	06ALL		3	13G	G13_018	FROM->TO	G13_002T	115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.06256	160.6953	I03RD & ROKEBY - WAGENER 345KV CKT 1
FDNS	6		3	13G	G13_018	FROM->TO	G13_002T	115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.06249	144.8486	84TH & LEIGHTON - WAGENER 115KV CKT 1
FDNS	06ALL		3	13G	G13_018	FROM->TO	G13_002T	115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.06249	145.7117	84TH & LEIGHTON - WAGENER 115KV CKT 1
FDNS	6		3	13G	G13_018	FROM->TO	G13_002T	115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.06185	148.4926	WAGENER (T852) 345/115/13.8KV TRANSFORMER CKT 2
FDNS	06ALL		3	13G	G13_018	FROM->TO	G13_002T	115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.06185	149.0901	WAGENER (T852) 345/115/13.8KV TRANSFORMER CKT 2
FDNS	6		3	13G	G13_018	FROM->TO	G13_002T	115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.06164	149.9794	WAGENER (T851) 345/115/13.8KV TRANSFORMER CKT 1
FDNS	06ALL		3	13G	G13_018	FROM->TO	G13_002T	115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.06164	150.558	WAGENER (T851) 345/115/13.8KV TRANSFORMER CKT 1
FDNS	6		3	13G	G13_018	FROM->TO	G13_002T	115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.05853	166.9838	NW68TH & HOLDREGE (T141) 345/115/13.8KV TRANSFORMER CKT 1
FDNS	06ALL		3	13G	G13_018	FROM->TO	G13_002T	115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.05853	167.7246	NW68TH & HOLDREGE (T141) 345/115/13.8KV TRANSFORMER CKT 1
FDNS	6		3	13G	G13_018	FROM->TO	G13_002T	115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.05399	105.0414	20TH & PIONEERS - SW7TH & PLEASANT HILL 115KV CKT 1
FDNS	06ALL		3	13G	G13_018	FROM->TO	G13_002T	115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.05399	105.7035	20TH & PIONEERS - SW7TH & PLEASANT HILL 115KV CKT 1
FDNS	06ALL		3	13G	G13_018	TO->FROM	G13_002T	115.00 - SHELDON 115KV CKT 2	43	0.09939	180.4279	SHELDON - SW7TH & PLEASANT HILL 115KV CKT 1
FDNS	6		3	13G	G13_018	TO->FROM	G13_002T	115.00 - SHELDON 115KV CKT 2	43	0.09938	179.1959	SHELDON - SW7TH & PLEASANT HILL 115KV CKT 1
FDNS	6		3	13G	G13_018	TO->FROM	G13_002T	115.00 - SHELDON 115KV CKT 2	43	0.06482	115.1225	I03RD & ROKEBY - MOORE 345KV CKT 1
FDNS	06ALL		3	13G	G13_018	TO->FROM	G13_002T	115.00 - SHELDON 115KV CKT 2	43	0.06482	116.6892	I03RD & ROKEBY - MOORE 345KV CKT 1
FDNS	6		3	13G	G13_018	TO->FROM	G13_002T	115.00 - SHELDON 115KV CKT 2	43	0.06415	127.2176	GEN560749 1-G13_002_3 0.6900
FDNS	6		3	13G	G13_018	TO->FROM	G13_002T	115.00 - SHELDON 115KV CKT 2	43	0.06415	116.8711	GEN645001 1-FORT CALHOUN 1
FDNS	6		3	13G	G13_018	TO->FROM	G13_002T	115.00 - SHELDON 115KV CKT 2	43	0.06415	114.9532	GEN645012 2-NEBRASKA CITY 2
FDNS	6		3	13G	G13_018	TO->FROM	G13_002T	115.00 - SHELDON 115KV CKT 2	43	0.06415	107.5551	BASE CASE
FDNS	6		3	13G	G13_018	TO->FROM	G13_002T	115.00 - SHELDON 115KV CKT 2	43	0.06415	100.356	LN-WAPA2
FDNS	6		3	13G	G13_018	TO->FROM	G13_002T	115.00 - SHELDON 115KV CKT 2	43	0.06415	100	LN-1094
FDNS	06ALL		3	13G	G13_018	TO->FROM	G13_002T	115.00 - SHELDON 115KV CKT 2	43	0.06415	128.017	GEN560749 1-G13_002_3 0.6900
FDNS	06ALL		3	13G	G13_018	TO->FROM	G13_002T	115.00 - SHELDON 115KV CKT 2	43	0.06415	117.3815	GEN645001 1-FORT CALHOUN 1
FDNS	06ALL		3	13G	G13_018	TO->FROM	G13_002T	115.00 - SHELDON 115KV CKT 2	43	0.06415	115.5603	GEN645012 2-NEBRASKA CITY 2
FDNS	06ALL		3	13G	G13_018	TO->FROM	G13_002T	115.00 - SHELDON 115KV CKT 2	43	0.06415	108.3438	BASE CASE
FDNS	06ALL		3	13G	G13_018	TO->FROM	G13_002T	115.00 - SHELDON 115KV CKT 2	43	0.06415	101.1647	LN-WAPA2
FDNS	06ALL		3	13G	G13_018	TO->FROM	G13_002T	115.00 - SHELDON 115KV CKT 2	43	0.06415	100.7994	LN-1094
FDNS	06ALL		3	13G	G13_018	TO->FROM	G13_002T	115.00 - SHELDON 115KV CKT 2	43	0.06415	100.3918	LN-WAPA4
FDNS	06ALL		3	13G	G13_018	TO->FROM	G13_002T	115.00 - SHELDON 115KV CKT 2	43	0.06412	117.5393	STEGALL - STEGALL TRANSFORMER 230KV CKT 1
FDNS	06ALL		3	13G	G13_018	TO->FROM	G13_002T	115.00 - SHELDON 115KV CKT 2	43	0.06412	117.5255	TRF-STEGALL
FNSL	06ALL		3	13G	G13_018	TO->FROM	G13_002T	115.00 - SHELDON 115KV CKT 2	43	0.06412	117.4657	NEB01WAPAB3
FNSL	06ALL		3	13G	G13_018	TO->FROM	G13_002T	115.00 - SHELDON 115KV CKT 2	43	0.06412	117.333	STEGALL - STEGALL TY 345KV CKT 1
FDNS	6		3	13G	G13_018	TO->FROM	G13_002T	115.00 - SHELDON 115KV CKT 2	43	0.06392	132.0723	MOORE - NW68TH & HOLDREGE 345KV CKT 1
FDNS	06ALL		3	13G	G13_018	TO->FROM	G13_002T	115.00 - SHELDON 115KV CKT 2	43	0.06392	133.1107	MOORE - NW68TH & HOLDREGE 345KV CKT 1
FDNS	6		3	13G	G13_018	TO->FROM	G13_002T	115.00 - SHELDON 115KV CKT 2	43	0.06256	135.1522	I03RD & ROKEBY - WAGENER 345KV CKT 1
FDNS	06ALL		3	13G	G13_018	TO->FROM	G13_002T	115.00 - SHELDON 115KV CKT 2	43	0.06256	136.1236	I03RD & ROKEBY - WAGENER 345KV CKT 1
FDNS	6		3	13G	G13_018	TO->FROM	G13_002T	115.00 - SHELDON 115KV CKT 2	43	0.06249	120.3467	84TH & LEIGHTON - WAGENER 115KV CKT 1
FDNS	06ALL		3	13G	G13_018	TO->FROM	G13_002T	115.00 - SHELDON 115KV CKT 2	43	0.06249	121.2026	84TH & LEIGHTON - WAGENER 115KV CKT 1
FDNS	6		3	13G	G13_018	TO->FROM	G13_002T	115.00 - SHELDON 115KV CKT 2	43	0.06185	123.9272	WAGENER (T852) 345/115/13.8KV TRANSFORMER CKT 2
FDNS	06ALL		3	13G	G13_018	TO->FROM	G13_002T	115.00 - SHELDON 115KV CKT 2	43	0.06185	124.5144	WAGENER (T852) 345/115/13.8KV TRANSFORMER CKT 2
FDNS	6		3	13G	G13_018	TO->FROM	G13_002T	115.00 - SHELDON 115KV CKT 2	43	0.06164	125.4252	WAGENER (T851) 345/115/13.8KV TRANSFORMER CKT 1
FDNS	06ALL		3	13G	G13_018	TO->FROM	G13_002T	115.00 - SHELDON 115KV CKT 2	43	0.06164	125.9937	WAGENER (T851) 345/115/13.8KV TRANSFORMER CKT 1
FDNS	6		3	13G	G13_018	TO->FROM	G13_002T	115.00 - SHELDON 115KV CKT 2	43	0.05853	142.6043	NW68TH & HOLDREGE (T141) 345/115/13.8KV TRANSFORMER CKT 1
FDNS	06ALL		3	13G	G13_018	TO->FROM	G13_002T	115.00 - SHELDON 115KV CKT 2	43	0.05853	143.3317	NW68TH & HOLDREGE (T141) 345/115/13.8KV TRANSFORMER CKT 1
FDNS	06ALL		4	13G	G13_018	FROM->TO	G13_002T	115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.09939	204.9173	SHELDON - SW7TH & PLEASANT HILL 115KV CKT 1
FDNS	6		4	13G	G13_018	FROM->TO	G13_002T	115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.09938	203.6679	SHELDON - SW7TH & PLEASANT HILL 115KV CKT 1
FDNS	6		4	13G	G13_018	FROM->TO	G13_002T	115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.06482	139.7987	I03RD & ROKEBY - MOORE 345KV CKT 1

SOLUTION	GROUP	SCENARIO	SEASON	SOURCE	DIRECTION	MONITORED ELEMENT	RATEB (MVA)	TDF	TC%LOADING (% MVA)	CONTINGENCY
FDNS	06ALL		4 13G	G13_018	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.06482	141.4046	103RD & ROKEBY - MOORE 345KV CKT 1
FDNS	6		4 13G	G13_018	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.06415	141.5234	GEN645001 1-FORT CALHOUN 1
FDNS	6		4 13G	G13_018	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.06415	139.6968	GEN645012 2-NEBRASKA CITY 2
FDNS	6		4 13G	G13_018	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.06415	132.1918	BASE CASE
FDNS	6		4 13G	G13_018	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.06415	124.9173	LN-WAPA2
FDNS	6		4 13G	G13_018	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.06415	124.5413	LN-1094
FDNS	6		4 13G	G13_018	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.06415	124.1278	LN-WAPA4
FDNS	6		4 13G	G13_018	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.06415	121.6078	LN-MALONEY
FDNS	6		4 13G	G13_018	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.06415	115.4372	GEN640019 1-SHELDON STATION UNIT 1
FDNS	6		4 13G	G13_018	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.06415	111.4181	GEN640020 2-SHELDON STATION UNIT 2
FDNS	06ALL		4 13G	G13_018	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.06415	142.0658	GEN645001 1-FORT CALHOUN 1
FDNS	06ALL		4 13G	G13_018	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.06415	140.3237	GEN645012 2-NEBRASKA CITY 2
FDNS	06ALL		4 13G	G13_018	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.06415	132.9937	BASE CASE
FDNS	06ALL		4 13G	G13_018	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.06415	125.7372	LN-WAPA2
FDNS	06ALL		4 13G	G13_018	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.06415	125.3692	LN-1094
FDNS	06ALL		4 13G	G13_018	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.06415	124.9564	LN-WAPA4
FDNS	06ALL		4 13G	G13_018	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.06415	122.44	LN-MALONEY
FDNS	06ALL		4 13G	G13_018	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.06415	121.4702	NEB02WAPAB2
FDNS	06ALL		4 13G	G13_018	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.06415	116.5511	GEN640019 1-SHELDON STATION UNIT 1
FDNS	06ALL		4 13G	G13_018	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.06415	112.0856	GEN640020 2-SHELDON STATION UNIT 2
FDNS	6		4 13G	G13_018	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.06414	120.6565	NEB02WAPAB2
FDNS	06ALL		4 13G	G13_018	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.06412	142.2937	STEGALL - STEGALL TRANSFORMER 230KV CKT 1
FDNS	06ALL		4 13G	G13_018	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.06412	142.2796	TRF-STEGALL
FNSL	06ALL		4 13G	G13_018	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.06412	142.2194	NEB01WAPAB3
FNSL	06ALL		4 13G	G13_018	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.06412	142.0854	STEGALL - STEGALL TY 345KV CKT 1
FDNS	6		4 13G	G13_018	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.06392	156.7723	MOORE - NW68TH & HOLDREGE 345KV CKT 1
FDNS	06ALL		4 13G	G13_018	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.06392	157.8327	MOORE - NW68TH & HOLDREGE 345KV CKT 1
FDNS	6		4 13G	G13_018	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.06256	159.705	103RD & ROKEBY - WAGENER 345KV CKT 1
FDNS	06ALL		4 13G	G13_018	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.06256	160.6972	103RD & ROKEBY - WAGENER 345KV CKT 1
FDNS	6		4 13G	G13_018	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.06249	144.9628	84TH & LEIGHTON - WAGENER 115KV CKT 1
FDNS	06ALL		4 13G	G13_018	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.06249	145.7139	84TH & LEIGHTON - WAGENER 115KV CKT 1
FDNS	6		4 13G	G13_018	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.06185	148.3549	WAGENER (T852) 345/115/13.8KV TRANSFORMER CKT 2
FDNS	06ALL		4 13G	G13_018	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.06185	149.0923	WAGENER (T852) 345/115/13.8KV TRANSFORMER CKT 2
FDNS	6		4 13G	G13_018	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.06164	149.8285	WAGENER (T851) 345/115/13.8KV TRANSFORMER CKT 1
FDNS	06ALL		4 13G	G13_018	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.06164	150.5602	WAGENER (T851) 345/115/13.8KV TRANSFORMER CKT 1
FDNS	6		4 13G	G13_018	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.05853	166.9189	NW68TH & HOLDREGE (T141) 345/115/13.8KV TRANSFORMER CKT 1
FDNS	06ALL		4 13G	G13_018	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.05853	167.7269	NW68TH & HOLDREGE (T141) 345/115/13.8KV TRANSFORMER CKT 1
FDNS	6		4 13G	G13_018	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.05399	105.0808	20TH & PIONEERS - SW7TH & PLEASANT HILL 115KV CKT 1
FDNS	06ALL		4 13G	G13_018	FROM->TO	G13_002T 115.00 - SW7TH & PLEASANT HILL 115KV CKT 2	43	0.05399	105.7053	20TH & PIONEERS - SW7TH & PLEASANT HILL 115KV CKT 1
FDNS	06ALL		4 13G	G13_018	TO->FROM	G13_002T 115.00 - SHELDON 115KV CKT 2	43	0.09939	180.4316	SHELDON - SW7TH & PLEASANT HILL 115KV CKT 1
FDNS	6		4 13G	G13_018	TO->FROM	G13_002T 115.00 - SHELDON 115KV CKT 2	43	0.09938	179.1921	SHELDON - SW7TH & PLEASANT HILL 115KV CKT 1
FDNS	6		4 13G	G13_018	TO->FROM	G13_002T 115.00 - SHELDON 115KV CKT 2	43	0.06482	115.12	103RD & ROKEBY - MOORE 345KV CKT 1
FDNS	06ALL		4 13G	G13_018	TO->FROM	G13_002T 115.00 - SHELDON 115KV CKT 2	43	0.06482	116.6921	103RD & ROKEBY - MOORE 345KV CKT 1
FDNS	6		4 13G	G13_018	TO->FROM	G13_002T 115.00 - SHELDON 115KV CKT 2	43	0.06415	127.2206	GEN560749 1-G13_002_3 0.6900
FDNS	6		4 13G	G13_018	TO->FROM	G13_002T 115.00 - SHELDON 115KV CKT 2	43	0.06415	116.874	GEN645001 1-FORT CALHOUN 1
FDNS	6		4 13G	G13_018	TO->FROM	G13_002T 115.00 - SHELDON 115KV CKT 2	43	0.06415	114.9561	GEN645012 2-NEBRASKA CITY 2
FDNS	6		4 13G	G13_018	TO->FROM	G13_002T 115.00 - SHELDON 115KV CKT 2	43	0.06415	107.5572	BASE CASE
FDNS	6		4 13G	G13_018	TO->FROM	G13_002T 115.00 - SHELDON 115KV CKT 2	43	0.06415	100.3568	LN-WAPA2
FDNS	6		4 13G	G13_018	TO->FROM	G13_002T 115.00 - SHELDON 115KV CKT 2	43	0.06415	100	LN-1094
FDNS	06ALL		4 13G	G13_018	TO->FROM	G13_002T 115.00 - SHELDON 115KV CKT 2	43	0.06415	128.0193	GEN560749 1-G13_002_3 0.6900
FDNS	06ALL		4 13G	G13_018	TO->FROM	G13_002T 115.00 - SHELDON 115KV CKT 2	43	0.06415	117.3837	GEN645001 1-FORT CALHOUN 1
FDNS	06ALL		4 13G	G13_018	TO->FROM	G13_002T 115.00 - SHELDON 115KV CKT 2	43	0.06415	115.5625	GEN645012 2-NEBRASKA CITY 2
FDNS	06ALL		4 13G	G13_018	TO->FROM	G13_002T 115.00 - SHELDON 115KV CKT 2	43	0.06415	108.3485	BASE CASE
FDNS	06ALL		4 13G	G13_018	TO->FROM	G13_002T 115.00 - SHELDON 115KV CKT 2	43	0.06415	101.1654	LN-WAPA2
FDNS	06ALL		4 13G	G13_018	TO->FROM	G13_002T 115.00 - SHELDON 115KV CKT 2	43	0.06415	100.8002	LN-1094
FDNS	06ALL		4 13G	G13_018	TO->FROM	G13_002T 115.00 - SHELDON 115KV CKT 2	43	0.06415	100.3925	LN-WAPA4
FDNS	06ALL		4 13G	G13_018	TO->FROM	G13_002T 115.00 - SHELDON 115KV CKT 2	43	0.06412	117.5418	STEGALL - STEGALL TRANSFORMER 230KV CKT 1
FDNS	06ALL		4 13G	G13_018	TO->FROM	G13_002T 115.00 - SHELDON 115KV CKT 2	43	0.06412	117.528	TRF-STEGALL
FNSL	06ALL		4 13G	G13_018	TO->FROM	G13_002T 115.00 - SHELDON 115KV CKT 2	43	0.06412	117.4682	NEB01WAPAB3
FNSL	06ALL		4 13G	G13_018	TO->FROM	G13_002T 115.00 - SHELDON 115KV CKT 2	43	0.06412	117.3354	STEGALL - STEGALL TY 345KV CKT 1
FDNS	6		4 13G	G13_018	TO->FROM	G13_002T 115.00 - SHELDON 115KV CKT 2	43	0.06392	132.0729	MOORE - NW68TH & HOLDREGE 345KV CKT 1
FDNS	06ALL		4 13G	G13_018	TO->FROM	G13_002T 115.00 - SHELDON 115KV CKT 2	43	0.06392	133.1117	MOORE - NW68TH & HOLDREGE 345KV CKT 1
FDNS	6		4 13G	G13_018	TO->FROM	G13_002T 115.00 - SHELDON 115KV CKT 2	43	0.06256	135.1504	103RD & ROKEBY - WAGENER 345KV CKT 1
FDNS	06ALL		4 13G	G13_018	TO->FROM	G13_002T 115.00 - SHELDON 115KV CKT 2	43	0.06256	136.1254	103RD & ROKEBY - WAGENER 345KV CKT 1
FDNS	6		4 13G	G13_018	TO->FROM	G13_002T 115.00 - SHELDON 115KV CKT 2	43	0.06249	120.4649	84TH & LEIGHTON - WAGENER 115KV CKT 1
FDNS	06ALL		4 13G	G13_018	TO->FROM	G13_002T 115.00 - SHELDON 115KV CKT 2	43	0.06249	121.2048	84TH & LEIGHTON - WAGENER 115KV CKT 1
FDNS	6		4 13G	G13_018	TO->FROM	G13_002T 115.00 - SHELDON 115KV CKT 2	43	0.06185	123.7895	WAGENER (T852) 345/115/13.8KV TRANSFORMER CKT 2
FDNS	06ALL		4 13G	G13_018	TO->FROM	G13_002T 115.00 - SHELDON 115KV CKT 2	43	0.06185	124.5166	WAGENER (T852) 345/115/13.8KV TRANSFORMER CKT 2
FDNS	6		4 13G	G13_018	TO->FROM	G13_002T 115.00 - SHELDON 115KV CKT 2	43	0.06164	125.2743	WAGENER (T851) 345/115/13.8KV TRANSFORMER CKT 1
FDNS	06ALL		4 13G	G13_018	TO->FROM	G13_002T 115.00 - SHELDON 115KV CKT 2	43	0.06164	125.9959	WAGENER (T851) 345/115/13.8KV TRANSFORMER CKT 1
FDNS	6		4 13G	G13_018	TO->FROM	G13_002T 115.00 - SHELDON 115KV CKT 2	43	0.05853	142.5408	NW68TH & HOLDREGE (T141) 345/115/13.8KV TRANSFORMER CKT 1
FDNS	06ALL		4 13G	G13_018	TO->FROM	G13_002T 115.00 - SHELDON 115KV CKT 2	43	0.05853	143.3339	NW68TH & HOLDREGE (T141) 345/115/13.8KV TRANSFORMER CKT 1

I: Power Flow Analysis (Constraints from Category C Contingencies)

See next page.

SOLUTION	GROUP	SCENARIO	SEASON	SOURCE	DIRECTION	MONITORED ELEMENT	RATEB (MVA)	TDF	TC%LOADING (% MVA)	CONTINGENCY
FDNS	06ALL		1 13G	ASGI_13_001	FROM->TO	SUNDOWN INTERCHANGE - WOLFFORTH INTERCHANGE 230KV CKT 1	351	0.04011	111.0597	TOLK STATION EAST - TUCO INTERCHANGE 230KV CKT 1 &G13_017T 345.00 - G13_017_1 345.00 345KV CKT 1
FDNS	06ALL		1 13G	ASGI_13_001	FROM->TO	SUNDOWN INTERCHANGE - WOLFFORTH INTERCHANGE 230KV CKT 1	351	0.03984	108.4075	TOLK STATION EAST - TUCO INTERCHANGE 230KV CKT 1 &G13_017T 345.00 - G13_017_1 345.00 345KV CKT 1
FDNS	06ALL		1 13G	ASGI_13_002	FROM->TO	SUNDOWN INTERCHANGE - WOLFFORTH INTERCHANGE 230KV CKT 1	351	0.26565	103.8099	BUFFALO 230.00 - BUSHLAND INTERCHANGE 230KV CKT 1 &TOLK STATION EAST - TUCO INTERCHANGE 230KV CKT 1
FDNS	06ALL		1 13G	ASGI_13_002	FROM->TO	SUNDOWN INTERCHANGE - WOLFFORTH INTERCHANGE 230KV CKT 1	351	0.26565	99.9	BUFFALO 230.00 - DEAF SMITH COUNTY INTERCHANGE 230KV CKT 1 &TOLK STATION EAST - TUCO INTERCHANGE 230KV CKT 1
FDNS	06ALL		1 13G	ASGI_13_002	FROM->TO	SUNDOWN INTERCHANGE - WOLFFORTH INTERCHANGE 230KV CKT 1	351	0.2577	107.4583	PLANT X STATION - POTTER COUNTY INTERCHANGE 230KV CKT 1 &TOLK STATION EAST - TUCO INTERCHANGE 230KV CKT 1
FDNS	06ALL		1 13G	ASGI_13_002	FROM->TO	SUNDOWN INTERCHANGE - WOLFFORTH INTERCHANGE 230KV CKT 1	351	0.24098	107.3793	DEAF SMITH COUNTY INTERCHANGE - PLANT X STATION 230KV CKT 1 &TOLK STATION EAST - TUCO INTERCHANGE 230KV CKT 1
FDNS	06ALL		1 13G	ASGI_13_002	FROM->TO	SUNDOWN INTERCHANGE - WOLFFORTH INTERCHANGE 230KV CKT 1	351	0.21613	108.4075	TOLK STATION EAST - TUCO INTERCHANGE 230KV CKT 1 &G13_017T 345.00 - G13_017_1 345.00 345KV CKT 1
FDNS	06ALL		1 13G	ASGI_13_002	FROM->TO	TERRY COUNTY INTERCHANGE - WOLFFORTH INTERCHANGE 115KV CKT 1	138	0.15332	167.1252	TOLK STATION EAST - TUCO INTERCHANGE 230KV CKT 1 &SUNDOWN INTERCHANGE - WOLFFORTH INTERCHANGE 230KV CKT 1
FDNS	06ALL		1 13G	ASGI_13_002	FROM->TO	DEAF SMITH COUNTY INTERCHANGE - Panda Energy Substation Hereford 115KV CKT 1	96	0.1391	140.0349	PLANT X STATION - POTTER COUNTY INTERCHANGE 230KV CKT 1 &BUFFALO 230.00 - BUSHLAND INTERCHANGE 230KV CKT 1
FDNS	06ALL		1 13G	ASGI_13_002	FROM->TO	DEAF SMITH COUNTY INTERCHANGE - Panda Energy Substation Hereford 115KV CKT 1	96	0.1391	124.4249	PLANT X STATION - POTTER COUNTY INTERCHANGE 230KV CKT 1 &BUFFALO 230.00 - DEAF SMITH COUNTY INTERCHANGE 230KV CKT 1
FDNS	06ALL		1 13G	ASGI_13_002	FROM->TO	DEAF SMITH COUNTY INTERCHANGE - Panda Energy Substation Hereford 115KV CKT 1	96	0.12837	133.8534	BUFFALO 230.00 - BUSHLAND INTERCHANGE 230KV CKT 1 &TOLK STATION EAST - TUCO INTERCHANGE 230KV CKT 1
FDNS	06ALL		1 13G	ASGI_13_002	FROM->TO	DEAF SMITH COUNTY INTERCHANGE - Panda Energy Substation Hereford 115KV CKT 1	96	0.12837	120.0996	BUFFALO 230.00 - DEAF SMITH COUNTY INTERCHANGE 230KV CKT 1 &TOLK STATION EAST - TUCO INTERCHANGE 230KV CKT 1
FDNS	06ALL		1 13G	ASGI_13_002	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.1251	144.6563	TOLK STATION EAST - TUCO INTERCHANGE 230KV CKT 1 &SUNDOWN INTERCHANGE - WOLFFORTH INTERCHANGE 230KV CKT 1
FDNS	06ALL		1 13G	ASGI_13_002	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.1251	144.4054	TOLK STATION EAST - TUCO INTERCHANGE 230KV CKT 1 &SUNDOWN INTERCHANGE - WOLFFORTH INTERCHANGE 230KV CKT 1
FDNS	06ALL		1 13G	ASGI_13_002	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.1229	157.1556	DEAF SMITH COUNTY INTERCHANGE - PLANT X STATION 230KV CKT 1 &TOLK STATION EAST - TUCO INTERCHANGE 230KV CKT 1
FDNS	06ALL		1 13G	ASGI_13_002	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.1229	156.4511	DEAF SMITH COUNTY INTERCHANGE - PLANT X STATION 230KV CKT 1 &TOLK STATION EAST - TUCO INTERCHANGE 230KV CKT 1
FDNS	06ALL		1 13G	ASGI_13_002	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.12183	143.7292	PLANT X STATION - POTTER COUNTY INTERCHANGE 230KV CKT 1 &TOLK STATION EAST - TUCO INTERCHANGE 230KV CKT 1
FDNS	06ALL		1 13G	ASGI_13_002	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.12183	143.3279	PLANT X STATION - POTTER COUNTY INTERCHANGE 230KV CKT 1 &TOLK STATION EAST - TUCO INTERCHANGE 230KV CKT 1
FDNS	06ALL		1 13G	ASGI_13_002	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.11548	134.8192	TOLK STATION EAST - TUCO INTERCHANGE 230KV CKT 1 &LUBBOCK SOUTH INTERCHANGE - WOLFFORTH INTERCHANGE 230KV CKT 1
FDNS	06ALL		1 13G	ASGI_13_002	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.11548	134.1962	TOLK STATION EAST - TUCO INTERCHANGE 230KV CKT 1 &LUBBOCK SOUTH INTERCHANGE - WOLFFORTH INTERCHANGE 230KV CKT 1
FDNS	06ALL		1 13G	ASGI_13_002	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.11372	152.1273	TOLK STATION EAST - TUCO INTERCHANGE 230KV CKT 1 &LAMB COUNTY INTERCHANGE - TOLK STATION WEST 230KV CKT 1
FDNS	06ALL		1 13G	ASGI_13_002	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.11372	151.6105	TOLK STATION EAST - TUCO INTERCHANGE 230KV CKT 1 &LAMB COUNTY INTERCHANGE - TOLK STATION WEST 230KV CKT 1
FDNS	06ALL		1 13G	ASGI_13_002	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.11319	141.7831	PLANT X STATION - SUNDOWN INTERCHANGE 230KV CKT 1 &TOLK STATION EAST - TUCO INTERCHANGE 230KV CKT 1
FDNS	06ALL		1 13G	ASGI_13_002	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.11319	141.6107	PLANT X STATION - SUNDOWN INTERCHANGE 230KV CKT 1 &TOLK STATION EAST - TUCO INTERCHANGE 230KV CKT 1
FDNS	06ALL		1 13G	ASGI_13_002	FROM->TO	DEAF SMITH COUNTY INTERCHANGE - Panda Energy Substation Hereford 115KV CKT 1	96	0.11166	102.2889	BUFFALO 230.00 - BUSHLAND INTERCHANGE 230KV CKT 1 &SUNDOWN INTERCHANGE - WOLFFORTH INTERCHANGE 230KV CKT 1
FDNS	06ALL		1 13G	ASGI_13_002	FROM->TO	DEAF SMITH COUNTY INTERCHANGE - Panda Energy Substation Hereford 115KV CKT 1	96	0.11072	103.3764	BUFFALO 230.00 - BUSHLAND INTERCHANGE 230KV CKT 1 &G13_017T 345.00 - TUCO INTERCHANGE 345KV CKT 1
FDNS	06ALL		1 13G	ASGI_13_002	FROM->TO	DEAF SMITH COUNTY INTERCHANGE - Panda Energy Substation Hereford 115KV CKT 1	96	0.11005	104.059	BUFFALO 230.00 - BUSHLAND INTERCHANGE 230KV CKT 1 &AMARILLO SOUTH INTERCHANGE - G07-48T 230.00 230KV CKT 1
FDNS	06ALL		1 13G	ASGI_13_002	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.10842	144.9497	PLANT X STATION - POTTER COUNTY INTERCHANGE 230KV CKT 1 &DEAF SMITH COUNTY INTERCHANGE - PLANT X STATION 230KV CKT 1
FDNS	06ALL		1 13G	ASGI_13_002	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.10842	144.5337	PLANT X STATION - POTTER COUNTY INTERCHANGE 230KV CKT 1 &DEAF SMITH COUNTY INTERCHANGE - PLANT X STATION 230KV CKT 1
FDNS	06ALL		1 13G	ASGI_13_002	FROM->TO	DEAF SMITH COUNTY INTERCHANGE - Panda Energy Substation Hereford 115KV CKT 1	96	0.10369	124.9398	BUFFALO 230.00 - BUSHLAND INTERCHANGE 230KV CKT 1 &G12-020 230.00 - TUCO INTERCHANGE 230KV CKT 1
FDNS	06ALL		1 13G	ASGI_13_002	FROM->TO	DEAF SMITH COUNTY INTERCHANGE - Panda Energy Substation Hereford 115KV CKT 1	96	0.10369	112.0449	BUFFALO 230.00 - DEAF SMITH COUNTY INTERCHANGE 230KV CKT 1 &G12-020 230.00 - TUCO INTERCHANGE 230KV CKT 1
FDNS	06ALL		1 13G	ASGI_13_002	FROM->TO	DEAF SMITH COUNTY INTERCHANGE - Panda Energy Substation Hereford 115KV CKT 1	96	0.10369	106.2158	BUFFALO 230.00 - BUSHLAND INTERCHANGE 230KV CKT 1 &G13_017T 345.00 - G13_017_1 345.00 345KV CKT 1
FDNS	06ALL		1 13G	ASGI_13_002	FROM->TO	DEAF SMITH COUNTY INTERCHANGE - Panda Energy Substation Hereford 115KV CKT 1	96	0.10369	101.1772	FINNEY SWITCHING STATION - G08-18 345.00 345KV CKT 1 &BUFFALO 230.00 - BUSHLAND INTERCHANGE 230KV CKT 1
FDNS	06ALL		1 13G	ASGI_13_002	FROM->TO	DEAF SMITH COUNTY INTERCHANGE - Panda Energy Substation Hereford 115KV CKT 1	96	0.10369	100.4959	G10-14 345.00 - Hitchland Interchange 345KV CKT 1 &BUFFALO 230.00 - BUSHLAND INTERCHANGE 230KV CKT 1
FDNS	06ALL		1 13G	ASGI_13_002	FROM->TO	DEAF SMITH COUNTY INTERCHANGE - Panda Energy Substation Hereford 115KV CKT 1	96	0.10369	100	G08-51 345.00 - POTTER COUNTY INTERCHANGE 345KV CKT 1 &BUFFALO 230.00 - BUSHLAND INTERCHANGE 230KV CKT 1
FDNS	06ALL		1 13G	ASGI_13_002	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.10317	128.6303	BUFFALO 230.00 - BUSHLAND INTERCHANGE 230KV CKT 1 &TOLK STATION EAST - TUCO INTERCHANGE 230KV CKT 1

SOLUTION	GROUP	SCENARIO	SEASON	SOURCE	DIRECTION	MONITORED ELEMENT	RATEB (MVA)	TDF	TC%LOADING (% MVA)	CONTINGENCY
FDNS	06ALL		1 13G	ASGI_13_002	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.09152	122.0161	SAN JUAN MESA TAP - SAN JUAN MESA WIND GEN 230KV CKT 1 &TOLK STATION EAST - TUCO INTERCHANGE 230KV CKT 1
FDNS	06ALL		1 13G	ASGI_13_002	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.09152	121.9229	TOLK STATION EAST - TUCO INTERCHANGE 230KV CKT 1 &G13_013T 345.00 - G13_013_1 345.00 345KV CKT 1
FDNS	06ALL		1 13G	ASGI_13_002	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.09152	121.7055	TOLK STATION EAST - TUCO INTERCHANGE 230KV CKT 1 &G13_013T 345.00 - G13_013_1 345.00 345KV CKT 1
FDNS	06ALL		1 13G	ASGI_13_002	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.09152	121.4815	G08-09 230.00 - SAN JUAN MESA TAP 230KV CKT 1 &TOLK STATION EAST - TUCO INTERCHANGE 230KV CKT 1
FDNS	06ALL		1 13G	ASGI_13_002	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.09152	121.2792	G08-09 230.00 - SAN JUAN MESA TAP 230KV CKT 1 &TOLK STATION EAST - TUCO INTERCHANGE 230KV CKT 1
FDNS	06ALL		1 13G	ASGI_13_002	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.09152	121.2234	Jones Station Bus#2 - LUBBOCK POWER & LIGHT-HOLLY PLANT 230KV CKT 1 &TOLK STATION EAST - TUCO INTERCHANGE 230KV CKT 1
FDNS	06ALL		1 13G	ASGI_13_002	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.09152	121.0565	TOLK STATION EAST - TUCO INTERCHANGE 230KV CKT 1 &HOBBS INTERCHANGE - NEF 230.00 230KV CKT 1
FDNS	06ALL		1 13G	ASGI_13_002	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.09152	121.0564	TOLK STATION EAST - TUCO INTERCHANGE 230KV CKT 1 &G10-46 230.00 - TUCO INTERCHANGE 230KV CKT 1
FDNS	06ALL		1 13G	ASGI_13_002	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.09152	121.0564	TOLK STATION EAST - TUCO INTERCHANGE 230KV CKT 1 &G13_016_1 345.00 - TUCO INTERCHANGE 345KV CKT 1
FDNS	06ALL		1 13G	ASGI_13_002	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.09152	121.0564	TOLK STATION EAST - TUCO INTERCHANGE 230KV CKT 1 &G12-037 345.00 - TUCO INTERCHANGE 345KV CKT 1
FDNS	06ALL		1 13G	ASGI_13_002	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.09152	121.0563	TOLK STATION EAST - TUCO INTERCHANGE 230KV CKT 1 &ANTELOPE 1 - TUCO INTERCHANGE 230KV CKT 1
FDNS	06ALL		1 13G	ASGI_13_002	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.09152	121.0563	TOLK STATION EAST - TUCO INTERCHANGE 230KV CKT 1 &Golden Spread REC - Mustang Interchange 230 kV Generation Bus - MUSTANG STATION 23
FDNS	06ALL		1 13G	ASGI_13_002	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.09152	121.0508	HARRINGTON STATION - Harrington Station Mid Bus 230KV CKT 1 &TOLK STATION EAST - TUCO INTERCHANGE 230KV CKT 1
FDNS	06ALL		1 13G	ASGI_13_002	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.09152	121.0143	Jones Station Bus#2 - LUBBOCK POWER & LIGHT-HOLLY PLANT 230KV CKT 1 &TOLK STATION EAST - TUCO INTERCHANGE 230KV CKT 1
FDNS	06ALL		1 13G	ASGI_13_002	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.09152	120.8616	TOLK STATION EAST - TUCO INTERCHANGE 230KV CKT 1 &HOBBS INTERCHANGE - NEF 230.00 230KV CKT 1
FDNS	06ALL		1 13G	ASGI_13_002	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.09152	120.8614	TOLK STATION EAST - TUCO INTERCHANGE 230KV CKT 1 &ANTELOPE 1 - TUCO INTERCHANGE 230KV CKT 1
FDNS	06ALL		1 13G	ASGI_13_002	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.09152	120.8614	TOLK STATION EAST - TUCO INTERCHANGE 230KV CKT 1 &G10-46 230.00 - TUCO INTERCHANGE 230KV CKT 1
FDNS	06ALL		1 13G	ASGI_13_002	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.09152	120.8614	TOLK STATION EAST - TUCO INTERCHANGE 230KV CKT 1 &G13_016_1 345.00 - TUCO INTERCHANGE 345KV CKT 1
FDNS	06ALL		1 13G	ASGI_13_002	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.09152	120.8614	TOLK STATION EAST - TUCO INTERCHANGE 230KV CKT 1 &G12-037 345.00 - TUCO INTERCHANGE 345KV CKT 1
FDNS	06ALL		1 13G	ASGI_13_002	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.09152	120.8613	TOLK STATION EAST - TUCO INTERCHANGE 230KV CKT 1 &Golden Spread REC - Mustang Interchange 230 kV Generation Bus - MUSTANG STATION 23
FDNS	06ALL		1 13G	ASGI_13_002	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.09152	120.8556	HARRINGTON STATION - Harrington Station Mid Bus 230KV CKT 1 &TOLK STATION EAST - TUCO INTERCHANGE 230KV CKT 1
FDNS	06ALL		1 13G	ASGI_13_002	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.09151	121.1408	LUBBOCK EAST INTERCHANGE - LUBBOCK POWER & LIGHT-WADSWORTH 230KV CKT 1 &TOLK STATION EAST - TUCO INTERCHANGE 230KV CKT 1
FDNS	06ALL		1 13G	ASGI_13_002	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.09151	121.0941	TOLK STATION EAST - TUCO INTERCHANGE 230KV CKT 1 &GRASSLAND INTERCHANGE - Jones Station Bus#2 230KV CKT 1
FDNS	06ALL		1 13G	ASGI_13_002	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.09151	121.0618	TOLK STATION EAST - TUCO INTERCHANGE 230KV CKT 1 &MUSTANG STATION - SEMINOLE 230KV CKT 1
FDNS	06ALL		1 13G	ASGI_13_002	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.09151	120.9422	LUBBOCK EAST INTERCHANGE - LUBBOCK POWER & LIGHT-WADSWORTH 230KV CKT 1 &TOLK STATION EAST - TUCO INTERCHANGE 230KV CKT 1
FDNS	06ALL		1 13G	ASGI_13_002	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.09151	120.8937	TOLK STATION EAST - TUCO INTERCHANGE 230KV CKT 1 &GRASSLAND INTERCHANGE - Jones Station Bus#2 230KV CKT 1
FDNS	06ALL		1 13G	ASGI_13_002	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.09151	120.8753	TOLK STATION EAST - TUCO INTERCHANGE 230KV CKT 1 &MUSTANG STATION - SEMINOLE 230KV CKT 1
FDNS	06ALL		1 13G	ASGI_13_002	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.09145	121.0851	EAST PLANT INTERCHANGE - HARRINGTON STATION 230KV CKT 1 &TOLK STATION EAST - TUCO INTERCHANGE 230KV CKT 1
FDNS	06ALL		1 13G	ASGI_13_002	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.09145	120.9045	EAST PLANT INTERCHANGE - HARRINGTON STATION 230KV CKT 1 &TOLK STATION EAST - TUCO INTERCHANGE 230KV CKT 1
FDNS	06ALL		1 13G	ASGI_13_002	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.09143	121.0511	ROOSEVELT COUNTY INTERCHANGE - Roosevelt County Interchange SWITCH #4K33 230KV CKT 1 &TOLK STATION EAST - TUCO INTERCHANGE 230KV CKT
FDNS	06ALL		1 13G	ASGI_13_002	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.09143	120.8578	ROOSEVELT COUNTY INTERCHANGE - Roosevelt County Interchange SWITCH #4K33 230KV CKT 1 &TOLK STATION EAST - TUCO INTERCHANGE 230KV CKT
FDNS	06ALL		1 13G	ASGI_13_002	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.09134	121.2451	AMARILLO SOUTH INTERCHANGE - NICHOLS STATION 230KV CKT 1 &TOLK STATION EAST - TUCO INTERCHANGE 230KV CKT 1
FDNS	06ALL		1 13G	ASGI_13_002	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.09134	121.0513	AMARILLO SOUTH INTERCHANGE - NICHOLS STATION 230KV CKT 1 &TOLK STATION EAST - TUCO INTERCHANGE 230KV CKT 1
FDNS	06ALL		1 13G	ASGI_13_002	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.0912	121.5871	Harrington Station Mid Bus - RANDALL COUNTY INTERCHANGE 230KV CKT 1 &TOLK STATION EAST - TUCO INTERCHANGE 230KV CKT 1
FDNS	06ALL		1 13G	ASGI_13_002	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.0912	121.3753	Harrington Station Mid Bus - RANDALL COUNTY INTERCHANGE 230KV CKT 1 &TOLK STATION EAST - TUCO INTERCHANGE 230KV CKT 1
FDNS	06ALL		1 13G	ASGI_13_002	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.0911	120.7542	TOLK STATION EAST - TUCO INTERCHANGE 230KV CKT 1 &TUCO INTERCHANGE - TUCO2 345.00 345KV CKT 1

SOLUTION	GROUP	SCENARIO	SEASON	SOURCE	DIRECTION	MONITORED ELEMENT	RATEB (MVA)	TDF	TC%LOADING (% MVA)	CONTINGENCY
FDNS	06ALL	1	13G	ASGI_13_002	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.07302	121.4501	DEAF SMITH COUNTY INTERCHANGE - PLANT X STATION 230KV CKT 1 &BEAVER CO 345.00 - G10-01 345.00 345KV CKT 1
FDNS	06ALL	1	13G	ASGI_13_002	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.07302	121.4451	DEAF SMITH COUNTY INTERCHANGE - PLANT X STATION 230KV CKT 1 &BUFFALO 230.00 - G06-47 230.00 230KV CKT 1
FDNS	06ALL	1	13G	ASGI_13_002	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.07302	121.4169	DEAF SMITH COUNTY INTERCHANGE - PLANT X STATION 230KV CKT 1 &BEAVER CO 345.00 - G11_021_1 345.00 345KV CKT 1
FDNS	06ALL	1	13G	ASGI_13_002	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.07302	121.0477	BUSHLAND INTERCHANGE - WILDOR2_JUS6230.00 230KV CKT 1 &DEAF SMITH COUNTY INTERCHANGE - PLANT X STATION 230KV CKT 1
FDNS	06ALL	1	13G	ASGI_13_002	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.07302	120.9987	BUSHLAND INTERCHANGE - WILDOR2_JUS6230.00 230KV CKT 1 &DEAF SMITH COUNTY INTERCHANGE - PLANT X STATION 230KV CKT 1
FDNS	06ALL	1	13G	ASGI_13_002	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.07302	120.3142	DEAF SMITH COUNTY INTERCHANGE - PLANT X STATION 230KV CKT 1 &G12_001T 230.00 - GRASSLAND INTERCHANGE 230KV CKT 1
FDNS	06ALL	1	13G	ASGI_13_002	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.07302	120.3127	DEAF SMITH COUNTY INTERCHANGE - PLANT X STATION 230KV CKT 1 &G12_001T 230.00 - G12_001_1 230.00 230KV CKT 1
FDNS	06ALL	1	13G	ASGI_13_002	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.07302	120.2653	DEAF SMITH COUNTY INTERCHANGE - PLANT X STATION 230KV CKT 1 &G12_001T 230.00 - GRASSLAND INTERCHANGE 230KV CKT 1
FDNS	06ALL	1	13G	ASGI_13_002	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.07302	120.2638	DEAF SMITH COUNTY INTERCHANGE - PLANT X STATION 230KV CKT 1 &G12_001T 230.00 - G12_001_1 230.00 230KV CKT 1
FDNS	06ALL	1	13G	ASGI_13_002	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.07302	120.1926	DEAF SMITH COUNTY INTERCHANGE - PLANT X STATION 230KV CKT 1 &BEAVER CO 345.00 - G11_014_1 345.00 345KV CKT 1
FDNS	06ALL	1	13G	ASGI_13_002	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.07302	120.144	DEAF SMITH COUNTY INTERCHANGE - PLANT X STATION 230KV CKT 1 &BEAVER CO 345.00 - G11_014_1 345.00 345KV CKT 1
FDNS	06ALL	1	13G	ASGI_13_002	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.07302	119.8336	WILDOR2_JUS6230.00 - WILDORADO WIND GEN 230KV CKT 1 &DEAF SMITH COUNTY INTERCHANGE - PLANT X STATION 230KV CKT 1
FDNS	06ALL	1	13G	ASGI_13_002	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.07302	119.7852	WILDOR2_JUS6230.00 - WILDORADO WIND GEN 230KV CKT 1 &DEAF SMITH COUNTY INTERCHANGE - PLANT X STATION 230KV CKT 1
FDNS	06ALL	1	13G	ASGI_13_002	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.07302	119.098	DEAF SMITH COUNTY INTERCHANGE - PLANT X STATION 230KV CKT 1 &CHAVESCO 345.00 - G08-22 345.00 345KV CKT 1
FDNS	06ALL	1	13G	ASGI_13_002	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.07302	119.0497	DEAF SMITH COUNTY INTERCHANGE - PLANT X STATION 230KV CKT 1 &CHAVESCO 345.00 - G08-22 345.00 345KV CKT 1
FDNS	06ALL	1	13G	ASGI_13_002	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.07302	118.8542	DEAF SMITH COUNTY INTERCHANGE - PLANT X STATION 230KV CKT 1 &G11_012T 230.00 - G11_012_1 230.00 230KV CKT 1
FDNS	06ALL	1	13G	ASGI_13_002	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.07302	118.806	DEAF SMITH COUNTY INTERCHANGE - PLANT X STATION 230KV CKT 1 &G11_012T 230.00 - G11_012_1 230.00 230KV CKT 1
FDNS	06ALL	1	13G	ASGI_13_002	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.07302	118.5777	DEAF SMITH COUNTY INTERCHANGE - PLANT X STATION 230KV CKT 1 &SAN JUAN MESA TAP - SAN JUAN MESA WIND GEN 230KV CKT 1
FDNS	06ALL	1	13G	ASGI_13_002	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.07302	118.5294	DEAF SMITH COUNTY INTERCHANGE - PLANT X STATION 230KV CKT 1 &SAN JUAN MESA TAP - SAN JUAN MESA WIND GEN 230KV CKT 1
FDNS	06ALL	1	13G	ASGI_13_002	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.07302	118.0771	DEAF SMITH COUNTY INTERCHANGE - PLANT X STATION 230KV CKT 1 &G13_013T 345.00 - G13_013_1 345.00 345KV CKT 1
FDNS	06ALL	1	13G	ASGI_13_002	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.07302	118.0289	DEAF SMITH COUNTY INTERCHANGE - PLANT X STATION 230KV CKT 1 &G13_013T 345.00 - G13_013_1 345.00 345KV CKT 1
FDNS	06ALL	1	13G	ASGI_13_002	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.07302	117.8393	DEAF SMITH COUNTY INTERCHANGE - PLANT X STATION 230KV CKT 1 &G08-09 230.00 - SAN JUAN MESA TAP 230KV CKT 1
FDNS	06ALL	1	13G	ASGI_13_002	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.07302	117.791	DEAF SMITH COUNTY INTERCHANGE - PLANT X STATION 230KV CKT 1 &G08-09 230.00 - SAN JUAN MESA TAP 230KV CKT 1
FDNS	06ALL	1	13G	ASGI_13_002	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.07302	117.594	Jones Station Bus#2 - LUBBOCK POWER & LIGHT-HOLLY PLANT 230KV CKT 1 &DEAF SMITH COUNTY INTERCHANGE - PLANT X STATION 230KV CKT 1
FDNS	06ALL	1	13G	ASGI_13_002	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.07302	117.546	Jones Station Bus#2 - LUBBOCK POWER & LIGHT-HOLLY PLANT 230KV CKT 1 &DEAF SMITH COUNTY INTERCHANGE - PLANT X STATION 230KV CKT 1
FDNS	06ALL	1	13G	ASGI_13_002	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.07302	117.4581	HARRINGTON STATION - NICHOLS STATION 230KV CKT 1 &DEAF SMITH COUNTY INTERCHANGE - PLANT X STATION 230KV CKT 1
FDNS	06ALL	1	13G	ASGI_13_002	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.07302	117.4538	Harrington Station Mid Bus - NICHOLS STATION 230KV CKT 2 &DEAF SMITH COUNTY INTERCHANGE - PLANT X STATION 230KV CKT 1
FDNS	06ALL	1	13G	ASGI_13_002	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.07302	117.4378	AMARILLO SOUTH INTERCHANGE - RANDALL COUNTY INTERCHANGE 230KV CKT 1 &DEAF SMITH COUNTY INTERCHANGE - PLANT X STATION 230KV CKT 1
FDNS	06ALL	1	13G	ASGI_13_002	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.07302	117.4201	HARRINGTON STATION - Harrington Station Mid Bus 230KV CKT 1 &DEAF SMITH COUNTY INTERCHANGE - PLANT X STATION 230KV CKT 1
FDNS	06ALL	1	13G	ASGI_13_002	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.07302	117.4188	DEAF SMITH COUNTY INTERCHANGE - PLANT X STATION 230KV CKT 1 &HOBBS INTERCHANGE - NEF 230.00 230KV CKT 1
FDNS	06ALL	1	13G	ASGI_13_002	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.07302	117.4187	DEAF SMITH COUNTY INTERCHANGE - PLANT X STATION 230KV CKT 1 &G10-46 230.00 - TUCO INTERCHANGE 230KV CKT 1
FDNS	06ALL	1	13G	ASGI_13_002	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.07302	117.4187	DEAF SMITH COUNTY INTERCHANGE - PLANT X STATION 230KV CKT 1 &G12-037 345.00 - TUCO INTERCHANGE 345KV CKT 1
FDNS	06ALL	1	13G	ASGI_13_002	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.07302	117.4186	DEAF SMITH COUNTY INTERCHANGE - PLANT X STATION 230KV CKT 1 &ANTELOPE 1 - TUCO INTERCHANGE 230KV CKT 1
FDNS	06ALL	1	13G	ASGI_13_002	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.07302	117.4186	DEAF SMITH COUNTY INTERCHANGE - PLANT X STATION 230KV CKT 1 &G13_016_1 345.00 - TUCO INTERCHANGE 345KV CKT 1
FDNS	06ALL	1	13G	ASGI_13_002	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.07302	117.4186	DEAF SMITH COUNTY INTERCHANGE - PLANT X STATION 230KV CKT 1 &Golden Spread REC - Mustang Interchange 230 kV Generation Bus - MUSTANG
FDNS	06ALL	1	13G	ASGI_13_002	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.07302	117.4161	DEAF SMITH COUNTY INTERCHANGE - PLANT X STATION 230KV CKT 1 &JONES STATION - Jones Station Bus#2 230KV CKT 1

SOLUTION	GROUP	SCENARIO	SEASON	SOURCE	DIRECTION	MONITORED ELEMENT	RATEB (MVA)	TDF	TC%LOADING (% MVA)	CONTINGENCY
FDNS	06ALL		1 13G	ASGI_13_002	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.07302	117.4108	HARRINGTON STATION - NICHOLS STATION 230KV CKT 1 &DEAF SMITH COUNTY INTERCHANGE - PLANT X STATION 230KV CKT 1
FDNS	06ALL		1 13G	ASGI_13_002	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.07302	117.4064	Harrington Station Mid Bus - NICHOLS STATION 230KV CKT 2 &DEAF SMITH COUNTY INTERCHANGE - PLANT X STATION 230KV CKT 1
FDNS	06ALL		1 13G	ASGI_13_002	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.07302	117.3905	AMARILLO SOUTH INTERCHANGE - RANDALL COUNTY INTERCHANGE 230KV CKT 1 &DEAF SMITH COUNTY INTERCHANGE - PLANT X STATION 230KV CKT 1
FDNS	06ALL		1 13G	ASGI_13_002	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.07302	117.3727	HARRINGTON STATION - Harrington Station Mid Bus 230KV CKT 1 &DEAF SMITH COUNTY INTERCHANGE - PLANT X STATION 230KV CKT 1
FDNS	06ALL		1 13G	ASGI_13_002	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.07302	117.3714	DEAF SMITH COUNTY INTERCHANGE - PLANT X STATION 230KV CKT 1 &HOBBS INTERCHANGE - NEF 230.00 230KV CKT 1
FDNS	06ALL		1 13G	ASGI_13_002	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.07302	117.3713	DEAF SMITH COUNTY INTERCHANGE - PLANT X STATION 230KV CKT 1 &ANTELOPE 1 - TUCO INTERCHANGE 230KV CKT 1
FDNS	06ALL		1 13G	ASGI_13_002	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.07302	117.3713	DEAF SMITH COUNTY INTERCHANGE - PLANT X STATION 230KV CKT 1 &G10-46 230.00 - TUCO INTERCHANGE 230KV CKT 1
FDNS	06ALL		1 13G	ASGI_13_002	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.07302	117.3713	DEAF SMITH COUNTY INTERCHANGE - PLANT X STATION 230KV CKT 1 &G13_016_1 345.00 - TUCO INTERCHANGE 345KV CKT 1
FDNS	06ALL		1 13G	ASGI_13_002	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.07302	117.3713	DEAF SMITH COUNTY INTERCHANGE - PLANT X STATION 230KV CKT 1 &G12-037 345.00 - TUCO INTERCHANGE 345KV CKT 1
FDNS	06ALL		1 13G	ASGI_13_002	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.07302	117.3712	DEAF SMITH COUNTY INTERCHANGE - PLANT X STATION 230KV CKT 1 &Golden Spread REC - Mustang Interchange 230 kV Generation Bus - MUSTANG
FDNS	06ALL		1 13G	ASGI_13_002	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.07302	117.3688	DEAF SMITH COUNTY INTERCHANGE - PLANT X STATION 230KV CKT 1 &JONES STATION - Jones Station Bus#2 230KV CKT 1
FDNS	06ALL		1 13G	ASGI_13_002	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.07301	117.4737	LUBBOCK EAST INTERCHANGE - LUBBOCK POWER & LIGHT-WADSWORTH 230KV CKT 1 &DEAF SMITH COUNTY INTERCHANGE - PLANT X STATION 230KV CKT 1
FDNS	06ALL		1 13G	ASGI_13_002	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.07301	117.4635	DEAF SMITH COUNTY INTERCHANGE - PLANT X STATION 230KV CKT 1 &MUSTANG STATION - SEMINOLE 230KV CKT 1
FDNS	06ALL		1 13G	ASGI_13_002	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.07301	117.4258	LUBBOCK EAST INTERCHANGE - LUBBOCK POWER & LIGHT-WADSWORTH 230KV CKT 1 &DEAF SMITH COUNTY INTERCHANGE - PLANT X STATION 230KV CKT 1
FDNS	06ALL		1 13G	ASGI_13_002	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.07301	117.4161	DEAF SMITH COUNTY INTERCHANGE - PLANT X STATION 230KV CKT 1 &MUSTANG STATION - SEMINOLE 230KV CKT 1
FDNS	06ALL		1 13G	ASGI_13_002	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.07301	117.3891	DEAF SMITH COUNTY INTERCHANGE - PLANT X STATION 230KV CKT 1 &GRASSLAND INTERCHANGE - Jones Station Bus#2 230KV CKT 1
FDNS	06ALL		1 13G	ASGI_13_002	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.07301	117.3419	DEAF SMITH COUNTY INTERCHANGE - PLANT X STATION 230KV CKT 1 &GRASSLAND INTERCHANGE - Jones Station Bus#2 230KV CKT 1
FDNS	06ALL		1 13G	ASGI_13_002	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.07299	117.3574	HUTCHINSON COUNTY INTERCHANGE - NICHOLS STATION 230KV CKT 1 &DEAF SMITH COUNTY INTERCHANGE - PLANT X STATION 230KV CKT 1
FDNS	06ALL		1 13G	ASGI_13_002	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.07299	117.31	HUTCHINSON COUNTY INTERCHANGE - NICHOLS STATION 230KV CKT 1 &DEAF SMITH COUNTY INTERCHANGE - PLANT X STATION 230KV CKT 1
FDNS	06ALL		1 13G	ASGI_13_002	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.07297	117.8097	Harrington Station East Bus - Harrington Station Mid Bus 230KV CKT 1 &DEAF SMITH COUNTY INTERCHANGE - PLANT X STATION 230KV CKT 1
FDNS	06ALL		1 13G	ASGI_13_002	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.07297	117.7623	Harrington Station East Bus - Harrington Station Mid Bus 230KV CKT 1 &DEAF SMITH COUNTY INTERCHANGE - PLANT X STATION 230KV CKT 1
FDNS	06ALL		1 13G	ASGI_13_002	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.07296	117.4876	HITCHLAND INTERCHANGE - OCHILTREE 230KV CKT 1 &DEAF SMITH COUNTY INTERCHANGE - PLANT X STATION 230KV CKT 1
FDNS	06ALL		1 13G	ASGI_13_002	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.07296	117.4397	HITCHLAND INTERCHANGE - OCHILTREE 230KV CKT 1 &DEAF SMITH COUNTY INTERCHANGE - PLANT X STATION 230KV CKT 1
FDNS	06ALL		1 13G	ASGI_13_002	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.07295	117.3897	Harrington Station East Bus - PRINGLE INTERCHANGE 230KV CKT 1 &DEAF SMITH COUNTY INTERCHANGE - PLANT X STATION 230KV CKT 1
FDNS	06ALL		1 13G	ASGI_13_002	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.07295	117.3424	Harrington Station East Bus - PRINGLE INTERCHANGE 230KV CKT 1 &DEAF SMITH COUNTY INTERCHANGE - PLANT X STATION 230KV CKT 1
FDNS	06ALL		1 13G	ASGI_13_002	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.07295	106.2374	PLANT X STATION - POTTER COUNTY INTERCHANGE 230KV CKT 1 &TOLK STATION EAST - TOLK STATION TAP 230KV CKT 1
FDNS	06ALL		1 13G	ASGI_13_002	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.07295	106.1923	PLANT X STATION - POTTER COUNTY INTERCHANGE 230KV CKT 1 &TOLK STATION EAST - TOLK STATION TAP 230KV CKT 1
FDNS	06ALL		1 13G	ASGI_13_002	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.07294	117.5674	EAST PLANT INTERCHANGE - HARRINGTON STATION 230KV CKT 1 &DEAF SMITH COUNTY INTERCHANGE - PLANT X STATION 230KV CKT 1
FDNS	06ALL		1 13G	ASGI_13_002	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.07294	117.5194	EAST PLANT INTERCHANGE - HARRINGTON STATION 230KV CKT 1 &DEAF SMITH COUNTY INTERCHANGE - PLANT X STATION 230KV CKT 1
FDNS	06ALL		1 13G	ASGI_13_002	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.07294	106.041	PLANT X STATION - POTTER COUNTY INTERCHANGE 230KV CKT 1 &HOBBS INTERCHANGE - LEA COUNTY INTERCHANGE 230KV CKT 1
FDNS	06ALL		1 13G	ASGI_13_002	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.07294	105.9959	PLANT X STATION - POTTER COUNTY INTERCHANGE 230KV CKT 1 &HOBBS INTERCHANGE - LEA COUNTY INTERCHANGE 230KV CKT 1
FNSL	06ALL		1 13G	ASGI_13_002	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.07292	100.4362	CARLISLE INTERCHANGE - LUBBOCK POWER & LIGHT-MILWAUKEE 230KV CKT 1 &PLANT X STATION - POTTER COUNTY INTERCHANGE 230KV CKT 1
FNSL	06ALL		1 13G	ASGI_13_002	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.07292	100.3918	CARLISLE INTERCHANGE - LUBBOCK POWER & LIGHT-MILWAUKEE 230KV CKT 1 &PLANT X STATION - POTTER COUNTY INTERCHANGE 230KV CKT 1
FDNS	06ALL		1 13G	ASGI_13_002	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.07292	106.151	PLANT X STATION - POTTER COUNTY INTERCHANGE 230KV CKT 1 &CHERRY1 - HARRINGTON STATION 230KV CKT 1
FDNS	06ALL		1 13G	ASGI_13_002	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.07292	106.1059	PLANT X STATION - POTTER COUNTY INTERCHANGE 230KV CKT 1 &CHERRY1 - HARRINGTON STATION 230KV CKT 1
FDNS	06ALL		1 13G	ASGI_13_002	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.07291	106.0895	Harrington Station East Bus - POTTER COUNTY INTERCHANGE 230KV CKT 1 &PLANT X STATION - POTTER COUNTY INTERCHANGE 230KV CKT 1

SOLUTION	GROUP	SCENARIO	SEASON	SOURCE	DIRECTION	MONITORED ELEMENT	RATEB (MVA)	TDF	TC%LOADING (% MVA)	CONTINGENCY
FDNS	06ALL		1 13G	ASGI_13_002	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.06658	100.8417	ANTELOPE 1 - TUCO INTERCHANGE 230KV CKT 1 &SUNDOWN INTERCHANGE - WOLFFORTH INTERCHANGE 230KV CKT 1
FDNS	06ALL		1 13G	ASGI_13_002	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.06658	100.8417	G10-46 230.00 - TUCO INTERCHANGE 230KV CKT 1 &SUNDOWN INTERCHANGE - WOLFFORTH INTERCHANGE 230KV CKT 1
FDNS	06ALL		1 13G	ASGI_13_002	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.06658	100.8417	G13_016_1 345.00 - TUCO INTERCHANGE 345KV CKT 1 &SUNDOWN INTERCHANGE - WOLFFORTH INTERCHANGE 230KV CKT 1
FDNS	06ALL		1 13G	ASGI_13_002	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.06658	100.8417	G12-037 345.00 - TUCO INTERCHANGE 345KV CKT 1 &SUNDOWN INTERCHANGE - WOLFFORTH INTERCHANGE 230KV CKT 1
FDNS	06ALL		1 13G	ASGI_13_002	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.06658	100.8417	SUNDOWN INTERCHANGE - WOLFFORTH INTERCHANGE 230KV CKT 1 &Golden Spread REC - Mustang Interchange 230 kV Generation Bus - MUSTANG STA
FDNS	06ALL		1 13G	ASGI_13_002	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.06658	100.8417	SUNDOWN INTERCHANGE - WOLFFORTH INTERCHANGE 230KV CKT 1 &HOBBS INTERCHANGE - NEF 230.00 230KV CKT 1
FDNS	06ALL		1 13G	ASGI_13_002	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.06658	100.8368	HARRINGTON STATION - Harrington Station Mid Bus 230KV CKT 1 &SUNDOWN INTERCHANGE - WOLFFORTH INTERCHANGE 230KV CKT 1
FDNS	06ALL		1 13G	ASGI_13_002	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.06657	100.9533	GRASSLAND INTERCHANGE - Jones Station Bus#2 230KV CKT 1 &SUNDOWN INTERCHANGE - WOLFFORTH INTERCHANGE 230KV CKT 1
FDNS	06ALL		1 13G	ASGI_13_002	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.06657	100.9088	GRASSLAND INTERCHANGE - Jones Station Bus#2 230KV CKT 1 &SUNDOWN INTERCHANGE - WOLFFORTH INTERCHANGE 230KV CKT 1
FDNS	06ALL		1 13G	ASGI_13_002	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.06656	100.8466	AMARILLO SOUTH INTERCHANGE - RANDALL COUNTY INTERCHANGE 230KV CKT 1 &SUNDOWN INTERCHANGE - WOLFFORTH INTERCHANGE 230KV CKT 1
FDNS	06ALL		1 13G	ASGI_13_002	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.06656	100.8021	AMARILLO SOUTH INTERCHANGE - RANDALL COUNTY INTERCHANGE 230KV CKT 1 &SUNDOWN INTERCHANGE - WOLFFORTH INTERCHANGE 230KV CKT 1
FDNS	06ALL		1 13G	ASGI_13_002	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.06655	100.9209	JONES STATION - Jones Station Bus#2 230KV CKT 1 &SUNDOWN INTERCHANGE - WOLFFORTH INTERCHANGE 230KV CKT 1
FDNS	06ALL		1 13G	ASGI_13_002	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.06655	100.8763	JONES STATION - Jones Station Bus#2 230KV CKT 1 &SUNDOWN INTERCHANGE - WOLFFORTH INTERCHANGE 230KV CKT 1
FDNS	06ALL		1 13G	ASGI_13_002	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.06652	100.9657	EAST PLANT INTERCHANGE - HARRINGTON STATION 230KV CKT 1 &SUNDOWN INTERCHANGE - WOLFFORTH INTERCHANGE 230KV CKT 1
FDNS	06ALL		1 13G	ASGI_13_002	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.06652	100.9211	EAST PLANT INTERCHANGE - HARRINGTON STATION 230KV CKT 1 &SUNDOWN INTERCHANGE - WOLFFORTH INTERCHANGE 230KV CKT 1
FDNS	06ALL		1 13G	ASGI_13_002	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.06651	101.6466	Jones Station Bus#2 - LUBBOCK EAST INTERCHANGE 230KV CKT 1 &SUNDOWN INTERCHANGE - WOLFFORTH INTERCHANGE 230KV CKT 1
FDNS	06ALL		1 13G	ASGI_13_002	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.06651	101.602	Jones Station Bus#2 - LUBBOCK EAST INTERCHANGE 230KV CKT 1 &SUNDOWN INTERCHANGE - WOLFFORTH INTERCHANGE 230KV CKT 1
FDNS	06ALL		1 13G	ASGI_13_002	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.0665	100.8845	ROOSEVELT COUNTY INTERCHANGE - Roosevelt County Interchange SWITCH #4K33 230KV CKT 1 &SUNDOWN INTERCHANGE - WOLFFORTH INTERCHANGE 23
FDNS	06ALL		1 13G	ASGI_13_002	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.0665	100.8401	ROOSEVELT COUNTY INTERCHANGE - Roosevelt County Interchange SWITCH #4K33 230KV CKT 1 &SUNDOWN INTERCHANGE - WOLFFORTH INTERCHANGE 23
FDNS	06ALL		1 13G	ASGI_13_002	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.06644	106.2632	PLANT X STATION - POTTER COUNTY INTERCHANGE 230KV CKT 1 &Roosevelt County Interchange SOUTH - Roosevelt County Interchange SWITCH #4
FDNS	06ALL		1 13G	ASGI_13_002	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.06644	106.2631	PLANT X STATION - POTTER COUNTY INTERCHANGE 230KV CKT 1 &Roosevelt County Interchange SOUTH - TOLK STATION EAST 230KV CKT 1
FDNS	06ALL		1 13G	ASGI_13_002	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.06644	106.2176	PLANT X STATION - POTTER COUNTY INTERCHANGE 230KV CKT 1 &Roosevelt County Interchange SOUTH - Roosevelt County Interchange SWITCH #4
FDNS	06ALL		1 13G	ASGI_13_002	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.06644	106.2175	PLANT X STATION - POTTER COUNTY INTERCHANGE 230KV CKT 1 &Roosevelt County Interchange SOUTH - TOLK STATION EAST 230KV CKT 1
FDNS	06ALL		1 13G	ASGI_13_002	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.06643	104.7053	PLANT X STATION - SUNDOWN INTERCHANGE 230KV CKT 1 &CUNNINGHAM STATION - LEA COUNTY INTERCHANGE 230KV CKT 1
FDNS	06ALL		1 13G	ASGI_13_002	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.06643	104.66	PLANT X STATION - SUNDOWN INTERCHANGE 230KV CKT 1 &CUNNINGHAM STATION - LEA COUNTY INTERCHANGE 230KV CKT 1
FDNS	06ALL		1 13G	ASGI_13_002	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.06643	101.2003	CARLISLE INTERCHANGE - TUCO INTERCHANGE 230KV CKT 1 &SUNDOWN INTERCHANGE - WOLFFORTH INTERCHANGE 230KV CKT 1
FDNS	06ALL		1 13G	ASGI_13_002	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.06643	101.1558	CARLISLE INTERCHANGE - TUCO INTERCHANGE 230KV CKT 1 &SUNDOWN INTERCHANGE - WOLFFORTH INTERCHANGE 230KV CKT 1
FDNS	06ALL		1 13G	ASGI_13_002	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.06639	105.1852	BUSHLAND INTERCHANGE - POTTER COUNTY INTERCHANGE 230KV CKT 1 &PLANT X STATION - SUNDOWN INTERCHANGE 230KV CKT 1
FDNS	06ALL		1 13G	ASGI_13_002	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.06639	105.1398	BUSHLAND INTERCHANGE - POTTER COUNTY INTERCHANGE 230KV CKT 1 &PLANT X STATION - SUNDOWN INTERCHANGE 230KV CKT 1
FDNS	06ALL		1 13G	ASGI_13_002	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.06639	101.0456	SWISHER COUNTY INTERCHANGE - TUCO INTERCHANGE 230KV CKT 1 &SUNDOWN INTERCHANGE - WOLFFORTH INTERCHANGE 230KV CKT 1
FDNS	06ALL		1 13G	ASGI_13_002	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.06639	101.0011	SWISHER COUNTY INTERCHANGE - TUCO INTERCHANGE 230KV CKT 1 &SUNDOWN INTERCHANGE - WOLFFORTH INTERCHANGE 230KV CKT 1
FDNS	06ALL		1 13G	ASGI_13_002	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.06637	101.0133	AMARILLO SOUTH INTERCHANGE - NICHOLS STATION 230KV CKT 1 &SUNDOWN INTERCHANGE - WOLFFORTH INTERCHANGE 230KV CKT 1
FDNS	06ALL		1 13G	ASGI_13_002	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.06637	100.9688	AMARILLO SOUTH INTERCHANGE - NICHOLS STATION 230KV CKT 1 &SUNDOWN INTERCHANGE - WOLFFORTH INTERCHANGE 230KV CKT 1
FDNS	06ALL		1 13G	ASGI_13_002	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.06636	104.0793	PLANT X STATION - SUNDOWN INTERCHANGE 230KV CKT 1 &CHAVES COUNTY INTERCHANGE - EDDY_NORTH 6230.00 230KV CKT 1
FDNS	06ALL		1 13G	ASGI_13_002	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.06636	104.0342	PLANT X STATION - SUNDOWN INTERCHANGE 230KV CKT 1 &CHAVES COUNTY INTERCHANGE - EDDY_NORTH 6230.00 230KV CKT 1
FDNS	06ALL		1 13G	ASGI_13_002	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.06635	100.8192	TUCO INTERCHANGE - TUCO2 230.00 230KV CKT 1 &SUNDOWN INTERCHANGE - WOLFFORTH INTERCHANGE 230KV CKT 1

SOLUTION	GROUP	SCENARIO	SEASON	SOURCE	DIRECTION	MONITORED ELEMENT	RATEB (MVA)	TDF	TC%LOADING (% MVA)	CONTINGENCY
FDNS	06ALL		1 13G	ASGI_13_002	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.05517	116.3276	LUBBOCK EAST INTERCHANGE - LUBBOCK POWER & LIGHT-WADSWORTH 230KV CKT 1 &G12-020 230.00 - TUCO INTERCHANGE 230KV CKT 1
FDNS	06ALL		1 13G	ASGI_13_002	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.05517	116.262	Jones Station Bus#2 - LUBBOCK POWER & LIGHT-HOLLY PLANT 230KV CKT 1 &G12-020 230.00 - TUCO INTERCHANGE 230KV CKT 1
FDNS	06ALL		1 13G	ASGI_13_002	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.05517	116.2233	LUBBOCK EAST INTERCHANGE - LUBBOCK POWER & LIGHT-WADSWORTH 230KV CKT 1 &G12-020 230.00 - TUCO INTERCHANGE 230KV CKT 1
FDNS	06ALL		1 13G	ASGI_13_002	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.05517	116.196	G12-020 230.00 - TUCO INTERCHANGE 230KV CKT 1 &GRASSLAND INTERCHANGE - Jones Station Bus#2 230KV CKT 1
FDNS	06ALL		1 13G	ASGI_13_002	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.05517	116.1926	HITCHLAND INTERCHANGE - OCHILTREE 230KV CKT 1 &G12-020 230.00 - TUCO INTERCHANGE 230KV CKT 1
FDNS	06ALL		1 13G	ASGI_13_002	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.05517	116.146	TOLK STATION EAST - TOLK STATION TAP 230KV CKT 1 &G12-020 230.00 - TUCO INTERCHANGE 230KV CKT 1
FDNS	06ALL		1 13G	ASGI_13_002	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.05517	116.1373	G12-020 230.00 - TUCO INTERCHANGE 230KV CKT 1 &MUSTANG STATION - SEMINOLE 230KV CKT 1 HUTCHINSON COUNTY INTERCHANGE - NICHOLS STATION 230KV CKT 1 &G12-020 230.00 - TUCO INTERCHANGE 230KV CKT 1
FDNS	06ALL		1 13G	ASGI_13_002	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.05517	116.136	G12-020 230.00 - TUCO INTERCHANGE 230KV CKT 1 &HOBBS INTERCHANGE - NEF 230.00 230KV CKT 1
FDNS	06ALL		1 13G	ASGI_13_002	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.05517	116.1228	G12-020 230.00 - TUCO INTERCHANGE 230KV CKT 1 &G13_016_1 345.00 - TUCO INTERCHANGE 345KV CKT 1
FDNS	06ALL		1 13G	ASGI_13_002	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.05517	116.1227	G12-020 230.00 - TUCO INTERCHANGE 230KV CKT 1 &G12-037 345.00 - TUCO INTERCHANGE 345KV CKT 1
FDNS	06ALL		1 13G	ASGI_13_002	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.05517	116.1227	ANTELOPE 1 - TUCO INTERCHANGE 230KV CKT 1 &G12-020 230.00 - TUCO INTERCHANGE 230KV CKT 1
FDNS	06ALL		1 13G	ASGI_13_002	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.05517	116.1226	G10-46 230.00 - TUCO INTERCHANGE 230KV CKT 1 &G12-020 230.00 - TUCO INTERCHANGE 230KV CKT 1
FDNS	06ALL		1 13G	ASGI_13_002	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.05517	116.1226	G12-020 230.00 - TUCO INTERCHANGE 230KV CKT 1 &Golden Spread REC - Mustang Interchange 230 kv Generation Bus - MUSTANG STATION 2
FDNS	06ALL		1 13G	ASGI_13_002	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.05517	116.1189	HARRINGTON STATION - Harrington Station Mid Bus 230KV CKT 1 &G12-020 230.00 - TUCO INTERCHANGE 230KV CKT 1
FDNS	06ALL		1 13G	ASGI_13_002	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.05517	116.1123	HITCHLAND INTERCHANGE - OCHILTREE 230KV CKT 1 &G12-020 230.00 - TUCO INTERCHANGE 230KV CKT 1
FDNS	06ALL		1 13G	ASGI_13_002	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.05517	116.1118	G12-020 230.00 - TUCO INTERCHANGE 230KV CKT 1 &GRASSLAND INTERCHANGE - Jones Station Bus#2 230KV CKT 1
FDNS	06ALL		1 13G	ASGI_13_002	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.05517	116.0707	TOLK STATION EAST - TOLK STATION TAP 230KV CKT 1 &G12-020 230.00 - TUCO INTERCHANGE 230KV CKT 1
FDNS	06ALL		1 13G	ASGI_13_002	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.05517	116.0686	G12-020 230.00 - TUCO INTERCHANGE 230KV CKT 1 &MUSTANG STATION - SEMINOLE 230KV CKT 1 HUTCHINSON COUNTY INTERCHANGE - NICHOLS STATION 230KV CKT 1 &G12-020 230.00 - TUCO INTERCHANGE 230KV CKT 1
FDNS	06ALL		1 13G	ASGI_13_002	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.05517	116.0593	G12-020 230.00 - TUCO INTERCHANGE 230KV CKT 1 &HOBBS INTERCHANGE - NEF 230.00 230KV CKT 1
FDNS	06ALL		1 13G	ASGI_13_002	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.05517	116.0463	ANTELOPE 1 - TUCO INTERCHANGE 230KV CKT 1 &G12-020 230.00 - TUCO INTERCHANGE 230KV CKT 1
FDNS	06ALL		1 13G	ASGI_13_002	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.05517	116.0462	G10-46 230.00 - TUCO INTERCHANGE 230KV CKT 1 &G12-020 230.00 - TUCO INTERCHANGE 230KV CKT 1
FDNS	06ALL		1 13G	ASGI_13_002	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.05517	116.0462	G12-020 230.00 - TUCO INTERCHANGE 230KV CKT 1 &G13_016_1 345.00 - TUCO INTERCHANGE 345KV CKT 1
FDNS	06ALL		1 13G	ASGI_13_002	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.05517	116.0462	G12-020 230.00 - TUCO INTERCHANGE 230KV CKT 1 &G12-037 345.00 - TUCO INTERCHANGE 345KV CKT 1
FDNS	06ALL		1 13G	ASGI_13_002	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.05517	116.0461	G12-020 230.00 - TUCO INTERCHANGE 230KV CKT 1 &Golden Spread REC - Mustang Interchange 230 kv Generation Bus - MUSTANG STATION 2
FDNS	06ALL		1 13G	ASGI_13_002	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.05517	116.0422	HARRINGTON STATION - Harrington Station Mid Bus 230KV CKT 1 &G12-020 230.00 - TUCO INTERCHANGE 230KV CKT 1
FDNS	06ALL		1 13G	ASGI_13_002	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.05517	107.0362	FINNEY SWITCHING STATION - G08-18 345.00 345KV CKT 1 &G13_017T 345.00 - G13_017_1 345.00 345KV CKT 1
FDNS	06ALL		1 13G	ASGI_13_002	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.05517	106.9905	FINNEY SWITCHING STATION - G08-18 345.00 345KV CKT 1 &G13_017T 345.00 - G13_017_1 345.00 345KV CKT 1
FDNS	06ALL		1 13G	ASGI_13_002	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.05517	106.5537	G10-14 345.00 - Hitchland Interchange 345KV CKT 1 &G13_017T 345.00 - G13_017_1 345.00 345KV CKT 1
FDNS	06ALL		1 13G	ASGI_13_002	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.05517	106.5081	G10-14 345.00 - Hitchland Interchange 345KV CKT 1 &G13_017T 345.00 - G13_017_1 345.00 345KV CKT 1
FDNS	06ALL		1 13G	ASGI_13_002	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.05517	106.0378	BEAVER CO 345.00 - G10-01 345.00 345KV CKT 1 &G13_017T 345.00 - G13_017_1 345.00 345KV CKT 1
FDNS	06ALL		1 13G	ASGI_13_002	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.05517	106.0373	BEAVER CO 345.00 - G08-47 345.00 345KV CKT 1 &G13_017T 345.00 - G13_017_1 345.00 345KV CKT 1
FDNS	06ALL		1 13G	ASGI_13_002	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.05517	106.0145	G13_017T 345.00 - G13_017_1 345.00 345KV CKT 1 &BEAVER CO 345.00 - G11_021_1 345.00 345KV CKT 1
FDNS	06ALL		1 13G	ASGI_13_002	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.05517	105.9922	BEAVER CO 345.00 - G10-01 345.00 345KV CKT 1 &G13_017T 345.00 - G13_017_1 345.00 345KV CKT 1
FDNS	06ALL		1 13G	ASGI_13_002	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.05517	105.9916	BEAVER CO 345.00 - G08-47 345.00 345KV CKT 1 &G13_017T 345.00 - G13_017_1 345.00 345KV CKT 1

SOLUTION	GROUP	SCENARIO	SEASON	SOURCE	DIRECTION	MONITORED ELEMENT	RATEB (MVA)	TDF	TC%LOADING (% MVA)	CONTINGENCY
FDNS	06ALL		1 13G	ASGI_13_002	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.05517	103.3358	G12-037 345.00 - TUCO INTERCHANGE 345KV CKT 1 &G13_017T 345.00 - G13_017_1 345.00 345KV CKT 1
FDNS	06ALL		1 13G	ASGI_13_002	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.05517	103.3358	Golden Spread REC - Mustang Interchange 230 kV Generation Bus - MUSTANG STATION 230KV CKT 1 &G13_017T 345.00 - G13_017_1 345.00
FDNS	06ALL		1 13G	ASGI_13_002	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.05517	103.3349	LUBBOCK EAST INTERCHANGE - LUBBOCK POWER & LIGHT-WADSWORTH 230KV CKT 1 &G13_017T 345.00 - G13_017_1 345.00 345KV CKT 1
FDNS	06ALL		1 13G	ASGI_13_002	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.05517	103.3317	HARRINGTON STATION - Harrington Station Mid Bus 230KV CKT 1 &G13_017T 345.00 - G13_017_1 345.00 345KV CKT 1
FDNS	06ALL		1 13G	ASGI_13_002	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.05517	103.3273	TOLK STATION EAST - TOLK STATION TAP 230KV CKT 1 &G13_017T 345.00 - G13_017_1 345.00 345KV CKT 1
FDNS	06ALL		1 13G	ASGI_13_002	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.05517	103.326	HITCHLAND INTERCHANGE - OCHILTREE 230KV CKT 1 &G13_017T 345.00 - G13_017_1 345.00 345KV CKT 1
FDNS	06ALL		1 13G	ASGI_13_002	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.05517	103.313	MUSTANG STATION - SEMINOLE 230KV CKT 1 &G13_017T 345.00 - G13_017_1 345.00 345KV CKT 1
FDNS	06ALL		1 13G	ASGI_13_002	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.05517	103.3066	GRASSLAND INTERCHANGE - Jones Station Bus#2 230KV CKT 1 &G13_017T 345.00 - G13_017_1 345.00 345KV CKT 1
FDNS	06ALL		1 13G	ASGI_13_002	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.05517	103.2962	HUTCHINSON COUNTY INTERCHANGE - NICHOLS STATION 230KV CKT 1 &G13_017T 345.00 - G13_017_1 345.00 345KV CKT 1
FDNS	06ALL		1 13G	ASGI_13_002	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.05517	103.291	HOBBS INTERCHANGE - NEF 230.00 230KV CKT 1 &G13_017T 345.00 - G13_017_1 345.00 345KV CKT 1
FDNS	06ALL		1 13G	ASGI_13_002	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.05517	103.2909	ANTELOPE 1 - TUCO INTERCHANGE 230KV CKT 1 &G13_017T 345.00 - G13_017_1 345.00 345KV CKT 1
FDNS	06ALL		1 13G	ASGI_13_002	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.05517	103.2908	G10-46 230.00 - TUCO INTERCHANGE 230KV CKT 1 &G13_017T 345.00 - G13_017_1 345.00 345KV CKT 1
FDNS	06ALL		1 13G	ASGI_13_002	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.05517	103.2908	G13_016_1 345.00 - TUCO INTERCHANGE 345KV CKT 1 &G13_017T 345.00 - G13_017_1 345.00 345KV CKT 1
FDNS	06ALL		1 13G	ASGI_13_002	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.05517	103.2908	G12-037 345.00 - TUCO INTERCHANGE 345KV CKT 1 &G13_017T 345.00 - G13_017_1 345.00 345KV CKT 1
FDNS	06ALL		1 13G	ASGI_13_002	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.05517	103.2908	Golden Spread REC - Mustang Interchange 230 kV Generation Bus - MUSTANG STATION 230KV CKT 1 &G13_017T 345.00 - G13_017_1 345.00
FDNS	06ALL		1 13G	ASGI_13_002	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.05517	103.2898	LUBBOCK EAST INTERCHANGE - LUBBOCK POWER & LIGHT-WADSWORTH 230KV CKT 1 &G13_017T 345.00 - G13_017_1 345.00 345KV CKT 1
FDNS	06ALL		1 13G	ASGI_13_002	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.05517	103.2867	HARRINGTON STATION - Harrington Station Mid Bus 230KV CKT 1 &G13_017T 345.00 - G13_017_1 345.00 345KV CKT 1
FDNS	06ALL		1 13G	ASGI_13_002	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.05517	103.2822	TOLK STATION EAST - TOLK STATION TAP 230KV CKT 1 &G13_017T 345.00 - G13_017_1 345.00 345KV CKT 1
FDNS	06ALL		1 13G	ASGI_13_002	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.05517	103.2616	GRASSLAND INTERCHANGE - Jones Station Bus#2 230KV CKT 1 &G13_017T 345.00 - G13_017_1 345.00 345KV CKT 1
FDNS	06ALL		1 13G	ASGI_13_002	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.05517	101.5111	G10-14 345.00 - Hitchland Interchange 345KV CKT 1 &FINNEY SWITCHING STATION - G08-18 345.00 345KV CKT 1
FDNS	06ALL		1 13G	ASGI_13_002	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.05517	101.4665	G10-14 345.00 - Hitchland Interchange 345KV CKT 1 &FINNEY SWITCHING STATION - G08-18 345.00 345KV CKT 1
FDNS	06ALL		1 13G	ASGI_13_002	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.05517	101.0079	FINNEY SWITCHING STATION - G08-18 345.00 345KV CKT 1 &BEAVER CO 345.00 - G08-47 345.00 345KV CKT 1
FDNS	06ALL		1 13G	ASGI_13_002	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.05517	100.9993	FINNEY SWITCHING STATION - G08-18 345.00 345KV CKT 1 &BEAVER CO 345.00 - G10-01 345.00 345KV CKT 1
FDNS	06ALL		1 13G	ASGI_13_002	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.05517	100.9768	FINNEY SWITCHING STATION - G08-18 345.00 345KV CKT 1 &BEAVER CO 345.00 - G11_021_1 345.00 345KV CKT 1
FDNS	06ALL		1 13G	ASGI_13_002	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.05517	100.9631	FINNEY SWITCHING STATION - G08-18 345.00 345KV CKT 1 &BEAVER CO 345.00 - G08-47 345.00 345KV CKT 1
FDNS	06ALL		1 13G	ASGI_13_002	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.05517	100.9548	FINNEY SWITCHING STATION - G08-18 345.00 345KV CKT 1 &BEAVER CO 345.00 - G10-01 345.00 345KV CKT 1
FDNS	06ALL		1 13G	ASGI_13_002	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.05517	100.937	FINNEY SWITCHING STATION - G08-18 345.00 345KV CKT 1 &G08-51 345.00 - POTTER COUNTY INTERCHANGE 345KV CKT 1
FDNS	06ALL		1 13G	ASGI_13_002	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.05517	100.9323	FINNEY SWITCHING STATION - G08-18 345.00 345KV CKT 1 &BEAVER CO 345.00 - G11_021_1 345.00 345KV CKT 1
FDNS	06ALL		1 13G	ASGI_13_002	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.05517	100.9305	G11_022_1 345.00 - Hitchland Interchange 345KV CKT 1 &FINNEY SWITCHING STATION - G08-18 345.00 345KV CKT 1
FDNS	06ALL		1 13G	ASGI_13_002	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.05517	100.8925	FINNEY SWITCHING STATION - G08-18 345.00 345KV CKT 1 &G08-51 345.00 - POTTER COUNTY INTERCHANGE 345KV CKT 1
FDNS	06ALL		1 13G	ASGI_13_002	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.05517	100.8861	G11_022_1 345.00 - Hitchland Interchange 345KV CKT 1 &FINNEY SWITCHING STATION - G08-18 345.00 345KV CKT 1
FDNS	06ALL		1 13G	ASGI_13_002	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.05517	100.6817	FINNEY SWITCHING STATION - G08-18 345.00 345KV CKT 1 &G12_001T 230.00 - GRASSLAND INTERCHANGE 230KV CKT 1
FDNS	06ALL		1 13G	ASGI_13_002	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.05517	100.6805	FINNEY SWITCHING STATION - G08-18 345.00 345KV CKT 1 &G12_001T 230.00 - G12_001_1 230.00 230KV CKT 1
FDNS	06ALL		1 13G	ASGI_13_002	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.05517	100.6371	FINNEY SWITCHING STATION - G08-18 345.00 345KV CKT 1 &G12_001T 230.00 - GRASSLAND INTERCHANGE 230KV CKT 1
FDNS	06ALL		1 13G	ASGI_13_002	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.05517	100.6359	FINNEY SWITCHING STATION - G08-18 345.00 345KV CKT 1 &G12_001T 230.00 - G12_001_1 230.00 230KV CKT 1
FDNS	06ALL		1 13G	ASGI_13_002	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.05517	100.565	G10-14 345.00 - Hitchland Interchange 345KV CKT 1 &BEAVER CO 345.00 - G08-47 345.00 345KV CKT 1

SOLUTION	GROUP	SCENARIO	SEASON	SOURCE	DIRECTION	MONITORED ELEMENT	RATEB (MVA)	TDF	TC%LOADING (% MVA)	CONTINGENCY
FDNS	06ALL		1 13G	ASGI_13_002	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.04744	117.1181	DEAF SMITH COUNTY INTERCHANGE - PLANT X STATION 230KV CKT 1 &BUFFALO 230.00 - DEAF SMITH COUNTY INTERCHANGE 230KV CKT 1
FDNS	06ALL		1 13G	ASGI_13_002	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.04744	114.1924	BUFFALO 230.00 - BUSHLAND INTERCHANGE 230KV CKT 1 &DEAF SMITH COUNTY INTERCHANGE - PLANT X STATION 230KV CKT 1
FDNS	06ALL		1 13G	ASGI_13_002	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.04744	114.1455	BUFFALO 230.00 - BUSHLAND INTERCHANGE 230KV CKT 1 &DEAF SMITH COUNTY INTERCHANGE - PLANT X STATION 230KV CKT 1
FDNS	06ALL		1 13G	ASGI_13_003	FROM->TO	SUNDOWN INTERCHANGE - WOLFFORTH INTERCHANGE 230KV CKT 1	351	0.2669	103.8099	BUFFALO 230.00 - BUSHLAND INTERCHANGE 230KV CKT 1 &TOLK STATION EAST - TUCO INTERCHANGE 230KV CKT 1
FDNS	06ALL		1 13G	ASGI_13_003	FROM->TO	SUNDOWN INTERCHANGE - WOLFFORTH INTERCHANGE 230KV CKT 1	351	0.2669	99.9	BUFFALO 230.00 - DEAF SMITH COUNTY INTERCHANGE 230KV CKT 1 &TOLK STATION EAST - TUCO INTERCHANGE 230KV CKT 1
FDNS	06ALL		1 13G	ASGI_13_003	FROM->TO	SUNDOWN INTERCHANGE - WOLFFORTH INTERCHANGE 230KV CKT 1	351	0.26015	107.4583	PLANT X STATION - POTTER COUNTY INTERCHANGE 230KV CKT 1 &TOLK STATION EAST - TUCO INTERCHANGE 230KV CKT 1
FDNS	06ALL		1 13G	ASGI_13_003	FROM->TO	SUNDOWN INTERCHANGE - WOLFFORTH INTERCHANGE 230KV CKT 1	351	0.24455	107.3793	DEAF SMITH COUNTY INTERCHANGE - PLANT X STATION 230KV CKT 1 &TOLK STATION EAST - TUCO INTERCHANGE 230KV CKT 1
FDNS	06ALL		1 13G	ASGI_13_003	FROM->TO	SUNDOWN INTERCHANGE - WOLFFORTH INTERCHANGE 230KV CKT 1	351	0.21804	108.4075	TOLK STATION EAST - TUCO INTERCHANGE 230KV CKT 1 &G13_017T 345.00 - G13_017_1 345.00 345KV CKT 1
FDNS	06ALL		1 13G	ASGI_13_003	FROM->TO	TERRY COUNTY INTERCHANGE - WOLFFORTH INTERCHANGE 115KV CKT 1	138	0.15493	167.1252	TOLK STATION EAST - TUCO INTERCHANGE 230KV CKT 1 &SUNDOWN INTERCHANGE - WOLFFORTH INTERCHANGE 230KV CKT 1
FDNS	06ALL		1 13G	ASGI_13_003	FROM->TO	DEAF SMITH COUNTY INTERCHANGE - Panda Energy Substation Hereford 115KV CKT 1	96	0.13626	140.0349	PLANT X STATION - POTTER COUNTY INTERCHANGE 230KV CKT 1 &BUFFALO 230.00 - BUSHLAND INTERCHANGE 230KV CKT 1
FDNS	06ALL		1 13G	ASGI_13_003	FROM->TO	DEAF SMITH COUNTY INTERCHANGE - Panda Energy Substation Hereford 115KV CKT 1	96	0.13626	124.4249	PLANT X STATION - POTTER COUNTY INTERCHANGE 230KV CKT 1 &DEAF SMITH COUNTY INTERCHANGE 230KV CKT 1
FDNS	06ALL		1 13G	ASGI_13_003	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.12795	144.6563	TOLK STATION EAST - TUCO INTERCHANGE 230KV CKT 1 &SUNDOWN INTERCHANGE - WOLFFORTH INTERCHANGE 230KV CKT 1
FDNS	06ALL		1 13G	ASGI_13_003	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.12795	144.4054	TOLK STATION EAST - TUCO INTERCHANGE 230KV CKT 1 &SUNDOWN INTERCHANGE - WOLFFORTH INTERCHANGE 230KV CKT 1
FDNS	06ALL		1 13G	ASGI_13_003	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.12755	157.1556	DEAF SMITH COUNTY INTERCHANGE - PLANT X STATION 230KV CKT 1 &TOLK STATION EAST - TUCO INTERCHANGE 230KV CKT 1
FDNS	06ALL		1 13G	ASGI_13_003	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.12755	156.4511	DEAF SMITH COUNTY INTERCHANGE - PLANT X STATION 230KV CKT 1 &TOLK STATION EAST - TUCO INTERCHANGE 230KV CKT 1
FDNS	06ALL		1 13G	ASGI_13_003	FROM->TO	DEAF SMITH COUNTY INTERCHANGE - Panda Energy Substation Hereford 115KV CKT 1	96	0.12548	133.8534	BUFFALO 230.00 - BUSHLAND INTERCHANGE 230KV CKT 1 &TOLK STATION EAST - TUCO INTERCHANGE 230KV CKT 1
FDNS	06ALL		1 13G	ASGI_13_003	FROM->TO	DEAF SMITH COUNTY INTERCHANGE - Panda Energy Substation Hereford 115KV CKT 1	96	0.12548	120.0996	BUFFALO 230.00 - DEAF SMITH COUNTY INTERCHANGE 230KV CKT 1 &TOLK STATION EAST - TUCO INTERCHANGE 230KV CKT 1
FDNS	06ALL		1 13G	ASGI_13_003	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.12478	143.7292	PLANT X STATION - POTTER COUNTY INTERCHANGE 230KV CKT 1 &TOLK STATION EAST - TUCO INTERCHANGE 230KV CKT 1
FDNS	06ALL		1 13G	ASGI_13_003	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.12478	143.3279	PLANT X STATION - POTTER COUNTY INTERCHANGE 230KV CKT 1 &TOLK STATION EAST - TUCO INTERCHANGE 230KV CKT 1
FDNS	06ALL		1 13G	ASGI_13_003	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.11826	134.8192	TOLK STATION EAST - TUCO INTERCHANGE 230KV CKT 1 &LUBBOCK SOUTH INTERCHANGE - WOLFFORTH INTERCHANGE 230KV CKT 1
FDNS	06ALL		1 13G	ASGI_13_003	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.11826	134.1962	TOLK STATION EAST - TUCO INTERCHANGE 230KV CKT 1 &LUBBOCK SOUTH INTERCHANGE - WOLFFORTH INTERCHANGE 230KV CKT 1
FDNS	06ALL		1 13G	ASGI_13_003	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.11665	152.1273	TOLK STATION EAST - TUCO INTERCHANGE 230KV CKT 1 &LAMB COUNTY INTERCHANGE - TOLK STATION WEST 230KV CKT 1
FDNS	06ALL		1 13G	ASGI_13_003	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.11665	151.6105	TOLK STATION EAST - TUCO INTERCHANGE 230KV CKT 1 &LAMB COUNTY INTERCHANGE - TOLK STATION WEST 230KV CKT 1
FDNS	06ALL		1 13G	ASGI_13_003	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.11576	141.7831	PLANT X STATION - SUNDOWN INTERCHANGE 230KV CKT 1 &TOLK STATION EAST - TUCO INTERCHANGE 230KV CKT 1
FDNS	06ALL		1 13G	ASGI_13_003	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.11576	141.6107	PLANT X STATION - SUNDOWN INTERCHANGE 230KV CKT 1 &TOLK STATION EAST - TUCO INTERCHANGE 230KV CKT 1
FDNS	06ALL		1 13G	ASGI_13_003	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.1133	144.9497	PLANT X STATION - POTTER COUNTY INTERCHANGE 230KV CKT 1 &DEAF SMITH COUNTY INTERCHANGE - PLANT X STATION 230KV CKT 1
FDNS	06ALL		1 13G	ASGI_13_003	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.1133	144.5337	PLANT X STATION - POTTER COUNTY INTERCHANGE 230KV CKT 1 &DEAF SMITH COUNTY INTERCHANGE - PLANT X STATION 230KV CKT 1
FDNS	06ALL		1 13G	ASGI_13_003	FROM->TO	DEAF SMITH COUNTY INTERCHANGE - Panda Energy Substation Hereford 115KV CKT 1	96	0.1087	102.2889	BUFFALO 230.00 - BUSHLAND INTERCHANGE 230KV CKT 1 &SUNDOWN INTERCHANGE - WOLFFORTH INTERCHANGE 230KV CKT 1
FDNS	06ALL		1 13G	ASGI_13_003	FROM->TO	DEAF SMITH COUNTY INTERCHANGE - Panda Energy Substation Hereford 115KV CKT 1	96	0.10774	103.3764	BUFFALO 230.00 - BUSHLAND INTERCHANGE 230KV CKT 1 &G13_017T 345.00 - TUCO INTERCHANGE 345KV CKT 1
FDNS	06ALL		1 13G	ASGI_13_003	FROM->TO	DEAF SMITH COUNTY INTERCHANGE - Panda Energy Substation Hereford 115KV CKT 1	96	0.10714	104.059	BUFFALO 230.00 - BUSHLAND INTERCHANGE 230KV CKT 1 &AMARILLO SOUTH INTERCHANGE - G07-48T 230.00 230KV CKT 1
FDNS	06ALL		1 13G	ASGI_13_003	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.10556	128.6303	BUFFALO 230.00 - BUSHLAND INTERCHANGE 230KV CKT 1 &TOLK STATION EAST - TUCO INTERCHANGE 230KV CKT 1
FDNS	06ALL		1 13G	ASGI_13_003	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.10556	128.1937	BUFFALO 230.00 - BUSHLAND INTERCHANGE 230KV CKT 1 &TOLK STATION EAST - TUCO INTERCHANGE 230KV CKT 1
FDNS	06ALL		1 13G	ASGI_13_003	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.10556	127.0144	BUFFALO 230.00 - DEAF SMITH COUNTY INTERCHANGE 230KV CKT 1 &TOLK STATION EAST - TUCO INTERCHANGE 230KV CKT 1
FDNS	06ALL		1 13G	ASGI_13_003	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.10556	126.524	BUFFALO 230.00 - DEAF SMITH COUNTY INTERCHANGE 230KV CKT 1 &TOLK STATION EAST - TUCO INTERCHANGE 230KV CKT 1
FDNS	06ALL		1 13G	ASGI_13_003	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.10108	126.8951	TOLK STATION EAST - TUCO INTERCHANGE 230KV CKT 1 &JONES STATION - TUCO INTERCHANGE 230KV CKT 1
FDNS	06ALL		1 13G	ASGI_13_003	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.10108	126.5786	TOLK STATION EAST - TUCO INTERCHANGE 230KV CKT 1 &JONES STATION - TUCO INTERCHANGE 230KV CKT 1

SOLUTION	GROUP	SCENARIO	SEASON	SOURCE	DIRECTION	MONITORED ELEMENT	RATEB		TC%LOADING	CONTINGENCY
							(MVA)	TDF		
FDNS	06ALL		1 13G	ASGI_13_003	FROM->TO	DEAF SMITH COUNTY INTERCHANGE - Panda Energy Substation Hereford 115KV CKT 1	96	0.10069	124.9398	BUFFALO 230.00 - BUSHLAND INTERCHANGE 230KV CKT 1 &G12-020 230.00 - TUCO INTERCHANGE 230KV CKT 1
FDNS	06ALL		1 13G	ASGI_13_003	FROM->TO	DEAF SMITH COUNTY INTERCHANGE - Panda Energy Substation Hereford 115KV CKT 1	96	0.10069	112.0449	BUFFALO 230.00 - DEAF SMITH COUNTY INTERCHANGE 230KV CKT 1 &G12-020 230.00 - TUCO INTERCHANGE 230KV CKT 1
FDNS	06ALL		1 13G	ASGI_13_003	FROM->TO	DEAF SMITH COUNTY INTERCHANGE - Panda Energy Substation Hereford 115KV CKT 1	96	0.10069	106.2158	BUFFALO 230.00 - BUSHLAND INTERCHANGE 230KV CKT 1 &G13_017T 345.00 - G13_017_1 345.00 345KV CKT 1
FDNS	06ALL		1 13G	ASGI_13_003	FROM->TO	DEAF SMITH COUNTY INTERCHANGE - Panda Energy Substation Hereford 115KV CKT 1	96	0.10069	101.1772	FINNEY SWITCHING STATION - G08-18 345.00 345KV CKT 1 &BUFFALO 230.00 - BUSHLAND INTERCHANGE 230KV CKT 1
FDNS	06ALL		1 13G	ASGI_13_003	FROM->TO	DEAF SMITH COUNTY INTERCHANGE - Panda Energy Substation Hereford 115KV CKT 1	96	0.10069	100.4959	G10-14 345.00 - Hitchland Interchange 345KV CKT 1 &BUFFALO 230.00 - BUSHLAND INTERCHANGE 230KV CKT 1
FDNS	06ALL		1 13G	ASGI_13_003	FROM->TO	DEAF SMITH COUNTY INTERCHANGE - Panda Energy Substation Hereford 115KV CKT 1	96	0.10069	100	G08-51 345.00 - POTTER COUNTY INTERCHANGE 345KV CKT 1 &BUFFALO 230.00 - BUSHLAND INTERCHANGE 230KV CKT 1
FDNS	06ALL		1 13G	ASGI_13_003	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.09894	124.9173	TOLK STATION EAST - TUCO INTERCHANGE 230KV CKT 1 &TOLK STATION WEST - YOAKUM COUNTY INTERCHANGE 230KV CKT 1
FDNS	06ALL		1 13G	ASGI_13_003	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.09894	124.5716	TOLK STATION EAST - TUCO INTERCHANGE 230KV CKT 1 &TOLK STATION WEST - YOAKUM COUNTY INTERCHANGE 230KV CKT 1
FDNS	06ALL		1 13G	ASGI_13_003	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.09857	126.447	TOLK STATION EAST - TUCO INTERCHANGE 230KV CKT 1 &EDDY COUNTY INTERCHANGE - EDDY_NORTH 6230.00 230KV CKT 1
FDNS	06ALL		1 13G	ASGI_13_003	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.09857	126.0707	TOLK STATION EAST - TUCO INTERCHANGE 230KV CKT 1 &EDDY COUNTY INTERCHANGE - EDDY_NORTH 6230.00 230KV CKT 1
FDNS	06ALL		1 13G	ASGI_13_003	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.09843	126.1184	Hitchland Interchange - POTTER COUNTY INTERCHANGE 345KV CKT 1 &TOLK STATION EAST - TUCO INTERCHANGE 230KV CKT 1
FDNS	06ALL		1 13G	ASGI_13_003	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.09843	125.901	Hitchland Interchange - POTTER COUNTY INTERCHANGE 345KV CKT 1 &TOLK STATION EAST - TUCO INTERCHANGE 230KV CKT 1
FDNS	06ALL		1 13G	ASGI_13_003	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.09818	124.2044	BUSHLAND INTERCHANGE - POTTER COUNTY INTERCHANGE 230KV CKT 1 &TOLK STATION EAST - TUCO INTERCHANGE 230KV CKT 1
FDNS	06ALL		1 13G	ASGI_13_003	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.09818	123.7261	BUSHLAND INTERCHANGE - POTTER COUNTY INTERCHANGE 230KV CKT 1 &TOLK STATION EAST - TUCO INTERCHANGE 230KV CKT 1
FDNS	06ALL		1 13G	ASGI_13_003	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.09655	122.0704	CHAVES COUNTY INTERCHANGE - SAN JUAN MESA TAP 230KV CKT 1 &TOLK STATION EAST - TUCO INTERCHANGE 230KV CKT 1
FDNS	06ALL		1 13G	ASGI_13_003	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.09655	121.8303	CHAVES COUNTY INTERCHANGE - SAN JUAN MESA TAP 230KV CKT 1 &TOLK STATION EAST - TUCO INTERCHANGE 230KV CKT 1
FDNS	06ALL		1 13G	ASGI_13_003	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.09625	124.8628	TOLK STATION EAST - TUCO INTERCHANGE 230KV CKT 1 &AMOCO SWITCHING STATION - YOAKUM COUNTY INTERCHANGE 230KV CKT 1
FDNS	06ALL		1 13G	ASGI_13_003	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.09625	124.3599	TOLK STATION EAST - TUCO INTERCHANGE 230KV CKT 1 &AMOCO SWITCHING STATION - YOAKUM COUNTY INTERCHANGE 230KV CKT 1
FDNS	06ALL		1 13G	ASGI_13_003	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.09625	122.2358	TOLK STATION EAST - TUCO INTERCHANGE 230KV CKT 1 &AMOCO SWITCHING STATION - SUNDOWN INTERCHANGE 230KV CKT 1
FDNS	06ALL		1 13G	ASGI_13_003	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.09625	121.9729	TOLK STATION EAST - TUCO INTERCHANGE 230KV CKT 1 &AMOCO SWITCHING STATION - SUNDOWN INTERCHANGE 230KV CKT 1
FDNS	06ALL		1 13G	ASGI_13_003	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.09612	122.0563	TOLK STATION EAST - TOLK STATION TAP 230KV CKT 1 &TOLK STATION EAST - TUCO INTERCHANGE 230KV CKT 1
FDNS	06ALL		1 13G	ASGI_13_003	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.09612	121.8248	TOLK STATION EAST - TOLK STATION TAP 230KV CKT 1 &TOLK STATION EAST - TUCO INTERCHANGE 230KV CKT 1
FDNS	06ALL		1 13G	ASGI_13_003	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.09555	121.092	TOLK STATION EAST - TUCO INTERCHANGE 230KV CKT 1 &CUNNINGHAM STATION - EDDY COUNTY INTERCHANGE 230KV CKT 1
FDNS	06ALL		1 13G	ASGI_13_003	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.09555	120.896	TOLK STATION EAST - TUCO INTERCHANGE 230KV CKT 1 &CUNNINGHAM STATION - EDDY COUNTY INTERCHANGE 230KV CKT 1
FDNS	06ALL		1 13G	ASGI_13_003	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.09542	123.0083	TOLK STATION EAST - TUCO INTERCHANGE 230KV CKT 1 &TOLK STATION TAP - TOLK STATION WEST 230KV CKT 1
FDNS	06ALL		1 13G	ASGI_13_003	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.09542	122.7034	TOLK STATION EAST - TUCO INTERCHANGE 230KV CKT 1 &TOLK STATION TAP - TOLK STATION WEST 230KV CKT 1
FDNS	06ALL		1 13G	ASGI_13_003	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.09538	120.6808	TOLK STATION EAST - TUCO INTERCHANGE 230KV CKT 1 &CARLISLE INTERCHANGE - TUCO INTERCHANGE 230KV CKT 1
FDNS	06ALL		1 13G	ASGI_13_003	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.09538	120.4826	TOLK STATION EAST - TUCO INTERCHANGE 230KV CKT 1 &CARLISLE INTERCHANGE - TUCO INTERCHANGE 230KV CKT 1
FDNS	06ALL		1 13G	ASGI_13_003	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.09537	121.4669	TOLK STATION EAST - TUCO INTERCHANGE 230KV CKT 1 &CUNNINGHAM STATION - LEA COUNTY INTERCHANGE 230KV CKT 1
FDNS	06ALL		1 13G	ASGI_13_003	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.09537	121.2511	TOLK STATION EAST - TUCO INTERCHANGE 230KV CKT 1 &CUNNINGHAM STATION - LEA COUNTY INTERCHANGE 230KV CKT 1
FDNS	06ALL		1 13G	ASGI_13_003	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.09516	120.9284	TOLK STATION EAST - TUCO INTERCHANGE 230KV CKT 1 &CHAVES COUNTY INTERCHANGE - EDDY_NORTH 6230.00 230KV CKT 1
FDNS	06ALL		1 13G	ASGI_13_003	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.09516	120.7407	TOLK STATION EAST - TUCO INTERCHANGE 230KV CKT 1 &CHAVES COUNTY INTERCHANGE - EDDY_NORTH 6230.00 230KV CKT 1
FDNS	06ALL		1 13G	ASGI_13_003	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.09515	122.6902	GRAPEVINE INTERCHANGE - STATELINE INTERCHANGE 230KV CKT 1 &TOLK STATION EAST - TUCO INTERCHANGE 230KV CKT 1
FDNS	06ALL		1 13G	ASGI_13_003	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.09515	122.4926	GRAPEVINE INTERCHANGE - STATELINE INTERCHANGE 230KV CKT 1 &TOLK STATION EAST - TUCO INTERCHANGE 230KV CKT 1
FDNS	06ALL		1 13G	ASGI_13_003	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.09515	122.079	STATELINE INTERCHANGE - STLN-DEMAR6 230KV CKT 1 &TOLK STATION EAST - TUCO INTERCHANGE 230KV CKT 1
FDNS	06ALL		1 13G	ASGI_13_003	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.09515	121.8889	STATELINE INTERCHANGE - STLN-DEMAR6 230KV CKT 1 &TOLK STATION EAST - TUCO INTERCHANGE 230KV CKT 1

SOLUTION	GROUP	SCENARIO	SEASON	SOURCE	DIRECTION	MONITORED ELEMENT	RATEB (MVA)	TDF	TC%LOADING (% MVA)	CONTINGENCY
FDNS	06ALL		1 13G	ASGI_13_003	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.07698	121.4451	DEAF SMITH COUNTY INTERCHANGE - PLANT X STATION 230KV CKT 1 &BUFFALO 230.00 - G06-47 230.00 230KV CKT 1
FDNS	06ALL		1 13G	ASGI_13_003	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.07698	121.4169	DEAF SMITH COUNTY INTERCHANGE - PLANT X STATION 230KV CKT 1 &BEAVER CO 345.00 - G11_021_1 345.00 345KV CKT 1
FDNS	06ALL		1 13G	ASGI_13_003	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.07698	121.0477	BUSHLAND INTERCHANGE - WILDOR2_JUS6230.00 230KV CKT 1 &DEAF SMITH COUNTY INTERCHANGE - PLANT X STATION 230KV CKT 1
FDNS	06ALL		1 13G	ASGI_13_003	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.07698	120.9987	BUSHLAND INTERCHANGE - WILDOR2_JUS6230.00 230KV CKT 1 &DEAF SMITH COUNTY INTERCHANGE - PLANT X STATION 230KV CKT 1
FDNS	06ALL		1 13G	ASGI_13_003	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.07698	120.3142	DEAF SMITH COUNTY INTERCHANGE - PLANT X STATION 230KV CKT 1 &G12_001T 230.00 - GRASSLAND INTERCHANGE 230KV CKT 1
FDNS	06ALL		1 13G	ASGI_13_003	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.07698	120.3127	DEAF SMITH COUNTY INTERCHANGE - PLANT X STATION 230KV CKT 1 &G12_001T 230.00 - G12_001_1 230.00 230KV CKT 1
FDNS	06ALL		1 13G	ASGI_13_003	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.07698	120.2653	DEAF SMITH COUNTY INTERCHANGE - PLANT X STATION 230KV CKT 1 &G12_001T 230.00 - GRASSLAND INTERCHANGE 230KV CKT 1
FDNS	06ALL		1 13G	ASGI_13_003	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.07698	120.2638	DEAF SMITH COUNTY INTERCHANGE - PLANT X STATION 230KV CKT 1 &G12_001T 230.00 - G12_001_1 230.00 230KV CKT 1
FDNS	06ALL		1 13G	ASGI_13_003	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.07698	120.1926	DEAF SMITH COUNTY INTERCHANGE - PLANT X STATION 230KV CKT 1 &BEAVER CO 345.00 - G11_014_1 345.00 345KV CKT 1
FDNS	06ALL		1 13G	ASGI_13_003	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.07698	120.144	DEAF SMITH COUNTY INTERCHANGE - PLANT X STATION 230KV CKT 1 &BEAVER CO 345.00 - G11_014_2 345.00 345KV CKT 1
FDNS	06ALL		1 13G	ASGI_13_003	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.07698	119.8336	WILDOR2_JUS6230.00 - WILDORADO WIND GEN 230KV CKT 1 &DEAF SMITH COUNTY INTERCHANGE - PLANT X STATION 230KV CKT 1
FDNS	06ALL		1 13G	ASGI_13_003	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.07698	119.7852	WILDOR2_JUS6230.00 - WILDORADO WIND GEN 230KV CKT 1 &DEAF SMITH COUNTY INTERCHANGE - PLANT X STATION 230KV CKT 1
FDNS	06ALL		1 13G	ASGI_13_003	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.07698	119.098	DEAF SMITH COUNTY INTERCHANGE - PLANT X STATION 230KV CKT 1 &CHAVESCO 345.00 - G08-22 345.00 345KV CKT 1
FDNS	06ALL		1 13G	ASGI_13_003	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.07698	119.0497	DEAF SMITH COUNTY INTERCHANGE - PLANT X STATION 230KV CKT 1 &CHAVESCO 345.00 - G08-22 345.00 345KV CKT 1
FDNS	06ALL		1 13G	ASGI_13_003	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.07698	118.8542	DEAF SMITH COUNTY INTERCHANGE - PLANT X STATION 230KV CKT 1 &G11_012T 230.00 - G11_012_1 230.00 230KV CKT 1
FDNS	06ALL		1 13G	ASGI_13_003	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.07698	118.806	DEAF SMITH COUNTY INTERCHANGE - PLANT X STATION 230KV CKT 1 &G11_012T 230.00 - G11_012_1 230.00 230KV CKT 1
FDNS	06ALL		1 13G	ASGI_13_003	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.07698	118.5777	DEAF SMITH COUNTY INTERCHANGE - PLANT X STATION 230KV CKT 1 &SAN JUAN MESA TAP - SAN JUAN MESA WIND GEN 230KV CKT 1
FDNS	06ALL		1 13G	ASGI_13_003	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.07698	118.5294	DEAF SMITH COUNTY INTERCHANGE - PLANT X STATION 230KV CKT 1 &SAN JUAN MESA TAP - SAN JUAN MESA WIND GEN 230KV CKT 1
FDNS	06ALL		1 13G	ASGI_13_003	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.07698	118.0771	DEAF SMITH COUNTY INTERCHANGE - PLANT X STATION 230KV CKT 1 &G13_013T 345.00 - G13_013_1 345.00 345KV CKT 1
FDNS	06ALL		1 13G	ASGI_13_003	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.07698	118.0289	DEAF SMITH COUNTY INTERCHANGE - PLANT X STATION 230KV CKT 1 &G13_013T 345.00 - G13_013_1 345.00 345KV CKT 1
FDNS	06ALL		1 13G	ASGI_13_003	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.07698	117.8393	DEAF SMITH COUNTY INTERCHANGE - PLANT X STATION 230KV CKT 1 &G08-09 230.00 - SAN JUAN MESA TAP 230KV CKT 1
FDNS	06ALL		1 13G	ASGI_13_003	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.07698	117.791	DEAF SMITH COUNTY INTERCHANGE - PLANT X STATION 230KV CKT 1 &G08-09 230.00 - SAN JUAN MESA TAP 230KV CKT 1
FDNS	06ALL		1 13G	ASGI_13_003	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.07698	117.594	Jones Station Bus#2 - LUBBOCK POWER & LIGHT-HOLLY PLANT 230KV CKT 1 &DEAF SMITH COUNTY INTERCHANGE - PLANT X STATION 230KV CKT 1
FDNS	06ALL		1 13G	ASGI_13_003	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.07698	117.546	Jones Station Bus#2 - LUBBOCK POWER & LIGHT-HOLLY PLANT 230KV CKT 1 &DEAF SMITH COUNTY INTERCHANGE - PLANT X STATION 230KV CKT 1
FDNS	06ALL		1 13G	ASGI_13_003	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.07698	117.4737	LUBBOCK EAST INTERCHANGE - LUBBOCK POWER & LIGHT-WADSWORTH 230KV CKT 1 &DEAF SMITH COUNTY INTERCHANGE - PLANT X STATION 230KV CKT 1
FDNS	06ALL		1 13G	ASGI_13_003	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.07698	117.4635	DEAF SMITH COUNTY INTERCHANGE - PLANT X STATION 230KV CKT 1 &MUSTANG STATION - SEMINOLE 230KV CKT 1
FDNS	06ALL		1 13G	ASGI_13_003	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.07698	117.4581	HARRINGTON STATION - NICHOLS STATION 230KV CKT 1 &DEAF SMITH COUNTY INTERCHANGE - PLANT X STATION 230KV CKT 1
FDNS	06ALL		1 13G	ASGI_13_003	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.07698	117.4538	Harrington Station Mid Bus - NICHOLS STATION 230KV CKT 2 &DEAF SMITH COUNTY INTERCHANGE - PLANT X STATION 230KV CKT 1
FDNS	06ALL		1 13G	ASGI_13_003	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.07698	117.4378	AMARILLO SOUTH INTERCHANGE - RANDALL COUNTY INTERCHANGE 230KV CKT 1 &DEAF SMITH COUNTY INTERCHANGE - PLANT X STATION 230KV CKT 1
FDNS	06ALL		1 13G	ASGI_13_003	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.07698	117.4258	LUBBOCK EAST INTERCHANGE - LUBBOCK POWER & LIGHT-WADSWORTH 230KV CKT 1 &DEAF SMITH COUNTY INTERCHANGE - PLANT X STATION 230KV CKT 1
FDNS	06ALL		1 13G	ASGI_13_003	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.07698	117.4201	HARRINGTON STATION - Harrington Station Mid Bus 230KV CKT 1 &DEAF SMITH COUNTY INTERCHANGE - PLANT X STATION 230KV CKT 1
FDNS	06ALL		1 13G	ASGI_13_003	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.07698	117.4188	DEAF SMITH COUNTY INTERCHANGE - PLANT X STATION 230KV CKT 1 &HOBBS INTERCHANGE - NEF 230.00 230KV CKT 1
FDNS	06ALL		1 13G	ASGI_13_003	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.07698	117.4187	DEAF SMITH COUNTY INTERCHANGE - PLANT X STATION 230KV CKT 1 &G10-46 230.00 - TUCO INTERCHANGE 230KV CKT 1
FDNS	06ALL		1 13G	ASGI_13_003	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.07698	117.4187	DEAF SMITH COUNTY INTERCHANGE - PLANT X STATION 230KV CKT 1 &G12-037 345.00 - TUCO INTERCHANGE 345KV CKT 1
FDNS	06ALL		1 13G	ASGI_13_003	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.07698	117.4186	DEAF SMITH COUNTY INTERCHANGE - PLANT X STATION 230KV CKT 1 &ANTELOPE 1 - TUCO INTERCHANGE 230KV CKT 1
FDNS	06ALL		1 13G	ASGI_13_003	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.07698	117.4186	DEAF SMITH COUNTY INTERCHANGE - PLANT X STATION 230KV CKT 1 &G13_016_1 345.00 - TUCO INTERCHANGE 345KV CKT 1

SOLUTION	GROUP	SCENARIO	SEASON	SOURCE	DIRECTION	MONITORED ELEMENT	RATEB (MVA)	TDF	TC%LOADING (% MVA)	CONTINGENCY
FDNS	06ALL		1 13G	ASGI_13_003	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.06712	104.1287	PLANT X STATION - SUNDOWN INTERCHANGE 230KV CKT 1 &Golden Spread REC - Mustang Interchange 230 kV Generation Bus - MUSTANG STATION 2
FDNS	06ALL		1 13G	ASGI_13_003	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.06712	104.1237	HARRINGTON STATION - Harrington Station Mid Bus 230KV CKT 1 &PLANT X STATION - SUNDOWN INTERCHANGE 230KV CKT 1
FDNS	06ALL		1 13G	ASGI_13_003	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.06712	104.1026	PLANT X STATION - SUNDOWN INTERCHANGE 230KV CKT 1 &OXYBRU_TP 6230.00 - YOAKUM COUNTY INTERCHANGE 230KV CKT 1
FDNS	06ALL		1 13G	ASGI_13_003	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.06712	104.1019	PLANT X STATION - SUNDOWN INTERCHANGE 230KV CKT 1 &AMOCO WASSON SWITCHING STATION - OXYBRU_TP 6230.00 230KV CKT 1
FDNS	06ALL		1 13G	ASGI_13_003	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.06712	104.097	PLANT X STATION - SUNDOWN INTERCHANGE 230KV CKT 1 &MUSTANG STATION - YOAKUM COUNTY INTERCHANGE 230KV CKT 1
FDNS	06ALL		1 13G	ASGI_13_003	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.06712	104.092	PLANT X STATION - SUNDOWN INTERCHANGE 230KV CKT 1 &MUSTANG STATION - SEMINOLE 230KV CKT 1
FDNS	06ALL		1 13G	ASGI_13_003	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.06712	104.0888	PLANT X STATION - SUNDOWN INTERCHANGE 230KV CKT 1 &AMOCO WASSON SWITCHING STATION - MUSTANG STATION 230KV CKT 1
FDNS	06ALL		1 13G	ASGI_13_003	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.06712	104.0886	PLANT X STATION - SUNDOWN INTERCHANGE 230KV CKT 1 &TOLK STATION EAST - TOLK STATION TAP 230KV CKT 1
FDNS	06ALL		1 13G	ASGI_13_003	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.06712	104.0837	PLANT X STATION - SUNDOWN INTERCHANGE 230KV CKT 1 &G10-46 230.00 - TUCO INTERCHANGE 230KV CKT 1
FDNS	06ALL		1 13G	ASGI_13_003	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.06712	104.0836	PLANT X STATION - SUNDOWN INTERCHANGE 230KV CKT 1 &ANTELOPE 1 - TUCO INTERCHANGE 230KV CKT 1
FDNS	06ALL		1 13G	ASGI_13_003	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.06712	104.0836	PLANT X STATION - SUNDOWN INTERCHANGE 230KV CKT 1 &G13_016_1 345.00 - TUCO INTERCHANGE 345KV CKT 1
FDNS	06ALL		1 13G	ASGI_13_003	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.06712	104.0836	PLANT X STATION - SUNDOWN INTERCHANGE 230KV CKT 1 &G12-037 345.00 - TUCO INTERCHANGE 345KV CKT 1
FDNS	06ALL		1 13G	ASGI_13_003	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.06712	104.0836	PLANT X STATION - SUNDOWN INTERCHANGE 230KV CKT 1 &Golden Spread REC - Mustang Interchange 230 kV Generation Bus - MUSTANG STATION 2
FDNS	06ALL		1 13G	ASGI_13_003	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.06712	104.0836	PLANT X STATION - SUNDOWN INTERCHANGE 230KV CKT 1 &HOBBS INTERCHANGE - NEF 230.00 230KV CKT 1
FDNS	06ALL		1 13G	ASGI_13_003	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.06712	104.0786	HARRINGTON STATION - Harrington Station Mid Bus 230KV CKT 1 &PLANT X STATION - SUNDOWN INTERCHANGE 230KV CKT 1
FDNS	06ALL		1 13G	ASGI_13_003	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.06711	104.1636	LUBBOCK EAST INTERCHANGE - LUBBOCK POWER & LIGHT-WADSWORTH 230KV CKT 1 &PLANT X STATION - SUNDOWN INTERCHANGE 230KV CKT 1
FDNS	06ALL		1 13G	ASGI_13_003	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.06711	104.1429	PLANT X STATION - SUNDOWN INTERCHANGE 230KV CKT 1 &GRASSLAND INTERCHANGE - Jones Station Bus#2 230KV CKT 1
FDNS	06ALL		1 13G	ASGI_13_003	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.06711	104.1184	LUBBOCK EAST INTERCHANGE - LUBBOCK POWER & LIGHT-WADSWORTH 230KV CKT 1 &PLANT X STATION - SUNDOWN INTERCHANGE 230KV CKT 1
FDNS	06ALL		1 13G	ASGI_13_003	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.06711	104.0978	PLANT X STATION - SUNDOWN INTERCHANGE 230KV CKT 1 &GRASSLAND INTERCHANGE - Jones Station Bus#2 230KV CKT 1
FDNS	06ALL		1 13G	ASGI_13_003	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.0671	104.6975	Harrington Station East Bus - Harrington Station Mid Bus 230KV CKT 1 &PLANT X STATION - SUNDOWN INTERCHANGE 230KV CKT 1
FDNS	06ALL		1 13G	ASGI_13_003	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.0671	104.6523	Harrington Station East Bus - Harrington Station Mid Bus 230KV CKT 1 &PLANT X STATION - SUNDOWN INTERCHANGE 230KV CKT 1
FDNS	06ALL		1 13G	ASGI_13_003	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.06708	104.0877	AMARILLO SOUTH INTERCHANGE - RANDALL COUNTY INTERCHANGE 230KV CKT 1 &PLANT X STATION - SUNDOWN INTERCHANGE 230KV CKT 1
FDNS	06ALL		1 13G	ASGI_13_003	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.06708	104.0426	AMARILLO SOUTH INTERCHANGE - RANDALL COUNTY INTERCHANGE 230KV CKT 1 &PLANT X STATION - SUNDOWN INTERCHANGE 230KV CKT 1
FDNS	06ALL		1 13G	ASGI_13_003	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.06706	117.4169	DEAF SMITH COUNTY INTERCHANGE - PLANT X STATION 230KV CKT 1 &ROOSEVELT COUNTY INTERCHANGE - TOLK STATION WEST 230KV CKT 2
FDNS	06ALL		1 13G	ASGI_13_003	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.06706	117.3688	DEAF SMITH COUNTY INTERCHANGE - PLANT X STATION 230KV CKT 1 &ROOSEVELT COUNTY INTERCHANGE - TOLK STATION WEST 230KV CKT 2
FDNS	06ALL		1 13G	ASGI_13_003	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.06706	104.1542	PLANT X STATION - SUNDOWN INTERCHANGE 230KV CKT 1 &JONES STATION - Jones Station Bus#2 230KV CKT 1
FDNS	06ALL		1 13G	ASGI_13_003	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.06706	104.1091	PLANT X STATION - SUNDOWN INTERCHANGE 230KV CKT 1 &JONES STATION - Jones Station Bus#2 230KV CKT 1
FDNS	06ALL		1 13G	ASGI_13_003	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.06705	104.2073	EAST PLANT INTERCHANGE - HARRINGTON STATION 230KV CKT 1 &PLANT X STATION - SUNDOWN INTERCHANGE 230KV CKT 1
FDNS	06ALL		1 13G	ASGI_13_003	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.06705	104.1622	EAST PLANT INTERCHANGE - HARRINGTON STATION 230KV CKT 1 &PLANT X STATION - SUNDOWN INTERCHANGE 230KV CKT 1
FDNS	06ALL		1 13G	ASGI_13_003	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.06689	104.2595	AMARILLO SOUTH INTERCHANGE - NICHOLS STATION 230KV CKT 1 &PLANT X STATION - SUNDOWN INTERCHANGE 230KV CKT 1
FDNS	06ALL		1 13G	ASGI_13_003	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.06689	104.2143	AMARILLO SOUTH INTERCHANGE - NICHOLS STATION 230KV CKT 1 &PLANT X STATION - SUNDOWN INTERCHANGE 230KV CKT 1
FDNS	06ALL		1 13G	ASGI_13_003	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.06688	104.0633	PLANT X STATION - SUNDOWN INTERCHANGE 230KV CKT 1 &TUCO INTERCHANGE - TUCO2 230.00 230KV CKT 1
FDNS	06ALL		1 13G	ASGI_13_003	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.06688	104.0631	PLANT X STATION - SUNDOWN INTERCHANGE 230KV CKT 1 &TUCO INTERCHANGE - TUCO2 345KV CKT 1
FDNS	06ALL		1 13G	ASGI_13_003	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.06688	104.0182	PLANT X STATION - SUNDOWN INTERCHANGE 230KV CKT 1 &TUCO INTERCHANGE - TUCO2 230.00 230KV CKT 1
FDNS	06ALL		1 13G	ASGI_13_003	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.06688	104.0179	PLANT X STATION - SUNDOWN INTERCHANGE 230KV CKT 1 &TUCO INTERCHANGE - TUCO2 345.00 345KV CKT 1
FDNS	06ALL		1 13G	ASGI_13_003	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.06688	104.0179	PLANT X STATION - SUNDOWN INTERCHANGE 230KV CKT 1 &CARLISLE INTERCHANGE - TUCO INTERCHANGE 230KV CKT 1
FNSL	06ALL		1 13G	ASGI_13_003	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.06686	104.577	PLANT X STATION - SUNDOWN INTERCHANGE 230KV CKT 1 &CARLISLE INTERCHANGE - TUCO INTERCHANGE 230KV CKT 1

SOLUTION	GROUP	SCENARIO	SEASON	SOURCE	DIRECTION	MONITORED ELEMENT	RATEB		TC%LOADING		CONTINGENCY
							(MVA)	TDF	(% MVA)		
FDNS	03ALL		1 13G	G13_010	FROM->TO	MOUNDRIDGE (MOUND10X) 138/115/13.8KV TRANSFORMER CKT 1	110	0.03538	164.2408	EMPORIA ENERGY CENTER - LANG 345KV CKT 1 &RENO COUNTY - WICHITA 345KV CKT 1	
FDNS	03ALL		1 13G	G13_010	FROM->TO	MOUNDRIDGE (MOUND10X) 138/115/13.8KV TRANSFORMER CKT 1	110	0.03538	164.2309	EMPORIA ENERGY CENTER - LANG 345KV CKT 1 &RENO COUNTY - WICHITA 345KV CKT 1	
FDNS	03ALL		1 13G	G13_010	FROM->TO	MOUNDRIDGE (MOUND10X) 138/115/13.8KV TRANSFORMER CKT 1	110	0.03531	174.9581	RENO COUNTY - WICHITA 345KV CKT 1 &CIRCLE - EAST MCPHERSON 230KV CKT 1	
FDNS	03ALL		1 13G	G13_010	FROM->TO	MOUNDRIDGE (MOUND10X) 138/115/13.8KV TRANSFORMER CKT 1	110	0.03531	174.9298	RENO COUNTY - WICHITA 345KV CKT 1 &CIRCLE - EAST MCPHERSON 230KV CKT 1	
FDNS	03ALL		1 13G	G13_010	FROM->TO	MOUNDRIDGE (MOUND10X) 138/115/13.8KV TRANSFORMER CKT 1	110	0.03506	172.2773	RENO COUNTY - WICHITA 345KV CKT 1 &MORRIS COUNTY - SWISSVALE 230KV CKT 1	
FDNS	03ALL		1 13G	G13_010	FROM->TO	MOUNDRIDGE (MOUND10X) 138/115/13.8KV TRANSFORMER CKT 1	110	0.03506	172.217	RENO COUNTY - WICHITA 345KV CKT 1 &MORRIS COUNTY - SWISSVALE 230KV CKT 1	
FDNS	03ALL		1 13G	G13_010	FROM->TO	MOUNDRIDGE (MOUND10X) 138/115/13.8KV TRANSFORMER CKT 1	110	0.03495	174.4216	RENO COUNTY - WICHITA 345KV CKT 1 &87th STREET - STRANGER CREEK 345KV CKT 1	
FDNS	03ALL		1 13G	G13_010	FROM->TO	MOUNDRIDGE (MOUND10X) 138/115/13.8KV TRANSFORMER CKT 1	110	0.03495	174.3776	RENO COUNTY - WICHITA 345KV CKT 1 &87th STREET - STRANGER CREEK 345KV CKT 1	
FDNS	03ALL		1 13G	G13_010	FROM->TO	MOUNDRIDGE (MOUND10X) 138/115/13.8KV TRANSFORMER CKT 1	110	0.03478	171.2972	RENO COUNTY - WICHITA 345KV CKT 1 &AUBURN ROAD - SWISSVALE 230KV CKT 1	
FDNS	03ALL		1 13G	G13_010	FROM->TO	MOUNDRIDGE (MOUND10X) 138/115/13.8KV TRANSFORMER CKT 1	110	0.03478	171.2449	RENO COUNTY - WICHITA 345KV CKT 1 &AUBURN ROAD - SWISSVALE 230KV CKT 1	
FDNS	03ALL		1 13G	G13_010	FROM->TO	MOUNDRIDGE (MOUND10X) 138/115/13.8KV TRANSFORMER CKT 1	110	0.03477	168.6234	RENO COUNTY - WICHITA 345KV CKT 1 &EAST MANHATTAN - JEFFREY ENERGY CENTER 230KV CKT 1	
FDNS	03ALL		1 13G	G13_010	FROM->TO	MOUNDRIDGE (MOUND10X) 138/115/13.8KV TRANSFORMER CKT 1	110	0.03477	168.5779	RENO COUNTY - WICHITA 345KV CKT 1 &EAST MANHATTAN - JEFFREY ENERGY CENTER 230KV CKT 1	
FDNS	03ALL		1 13G	G13_010	FROM->TO	MOUNDRIDGE (MOUND10X) 138/115/13.8KV TRANSFORMER CKT 1	110	0.03476	173.7124	RENO COUNTY - WICHITA 345KV CKT 1 &AUBURN ROAD - JEFFREY ENERGY CENTER 230KV CKT 1	
FDNS	03ALL		1 13G	G13_010	FROM->TO	MOUNDRIDGE (MOUND10X) 138/115/13.8KV TRANSFORMER CKT 1	110	0.03476	173.6753	RENO COUNTY - WICHITA 345KV CKT 1 &AUBURN ROAD - JEFFREY ENERGY CENTER 230KV CKT 1	
FDNS	03ALL		1 13G	G13_010	FROM->TO	MOUNDRIDGE (MOUND10X) 138/115/13.8KV TRANSFORMER CKT 1	110	0.03475	171.3444	EMPORIA ENERGY CENTER - SWISSVALE 345KV CKT 1 &RENO COUNTY - WICHITA 345KV CKT 1	
FDNS	03ALL		1 13G	G13_010	FROM->TO	MOUNDRIDGE (MOUND10X) 138/115/13.8KV TRANSFORMER CKT 1	110	0.03475	171.2389	EMPORIA ENERGY CENTER - SWISSVALE 345KV CKT 1 &RENO COUNTY - WICHITA 345KV CKT 1	
FDNS	03ALL		1 13G	G13_010	FROM->TO	MOUNDRIDGE (MOUND10X) 138/115/13.8KV TRANSFORMER CKT 1	110	0.03468	169.7514	RENO COUNTY - WICHITA 345KV CKT 1 &LAWRENCE HILL - SWISSVALE 230KV CKT 1	
FDNS	03ALL		1 13G	G13_010	FROM->TO	MOUNDRIDGE (MOUND10X) 138/115/13.8KV TRANSFORMER CKT 1	110	0.03468	169.714	RENO COUNTY - WICHITA 345KV CKT 1 &LAWRENCE HILL - SWISSVALE 230KV CKT 1	
FDNS	03ALL		1 13G	G13_010	FROM->TO	MOUNDRIDGE (MOUND10X) 138/115/13.8KV TRANSFORMER CKT 1	110	0.03464	172.969	JEFFREY ENERGY CENTER - MORRIS COUNTY 345KV CKT 1 &RENO COUNTY - WICHITA 345KV CKT 1	
FDNS	03ALL		1 13G	G13_010	FROM->TO	MOUNDRIDGE (MOUND10X) 138/115/13.8KV TRANSFORMER CKT 1	110	0.03464	172.929	JEFFREY ENERGY CENTER - MORRIS COUNTY 345KV CKT 1 &RENO COUNTY - WICHITA 345KV CKT 1	
FDNS	03ALL		1 13G	G13_010	FROM->TO	MOUNDRIDGE (MOUND10X) 138/115/13.8KV TRANSFORMER CKT 1	110	0.03464	169.6264	RENO COUNTY - WICHITA 345KV CKT 1 &EAST MANHATTAN - NORTHWEST MANHATTAN 230KV CKT 1	
FDNS	03ALL		1 13G	G13_010	FROM->TO	MOUNDRIDGE (MOUND10X) 138/115/13.8KV TRANSFORMER CKT 1	110	0.03464	169.573	RENO COUNTY - WICHITA 345KV CKT 1 &EAST MANHATTAN - NORTHWEST MANHATTAN 230KV CKT 1	
FDNS	03ALL		1 13G	G13_010	FROM->TO	MOUNDRIDGE (MOUND10X) 138/115/13.8KV TRANSFORMER CKT 1	110	0.03463	169.4527	RENO COUNTY - WICHITA 345KV CKT 1 &MCDOWELL CREEK - MORRIS COUNTY 230KV CKT 1	
FDNS	03ALL		1 13G	G13_010	FROM->TO	MOUNDRIDGE (MOUND10X) 138/115/13.8KV TRANSFORMER CKT 1	110	0.03463	169.4376	RENO COUNTY - WICHITA 345KV CKT 1 &SWISSVALE - TECUMSEH HILL 230KV CKT 1	
FDNS	03ALL		1 13G	G13_010	FROM->TO	MOUNDRIDGE (MOUND10X) 138/115/13.8KV TRANSFORMER CKT 1	110	0.03463	169.4034	RENO COUNTY - WICHITA 345KV CKT 1 &MCDOWELL CREEK - MORRIS COUNTY 230KV CKT 1	
FDNS	03ALL		1 13G	G13_010	FROM->TO	MOUNDRIDGE (MOUND10X) 138/115/13.8KV TRANSFORMER CKT 1	110	0.03463	169.3838	RENO COUNTY - WICHITA 345KV CKT 1 &SWISSVALE - TECUMSEH HILL 230KV CKT 1	
FDNS	03ALL		1 13G	G13_010	FROM->TO	MOUNDRIDGE (MOUND10X) 138/115/13.8KV TRANSFORMER CKT 1	110	0.03462	169.9236	RENO COUNTY - WICHITA 345KV CKT 1 &LAWRENCE HILL - MIDLAND JUNCTION 230KV CKT 1	
FDNS	03ALL		1 13G	G13_010	FROM->TO	MOUNDRIDGE (MOUND10X) 138/115/13.8KV TRANSFORMER CKT 1	110	0.03462	169.8693	RENO COUNTY - WICHITA 345KV CKT 1 &LAWRENCE HILL - MIDLAND JUNCTION 230KV CKT 1	
FDNS	03ALL		1 13G	G13_010	FROM->TO	MOUNDRIDGE (MOUND10X) 138/115/13.8KV TRANSFORMER CKT 1	110	0.03461	176.3287	RENO COUNTY - WICHITA 345KV CKT 1 &FLTRDGESUB 345.00 - VIOLA 7 345.00 345KV CKT 1	
FDNS	03ALL		1 13G	G13_010	FROM->TO	MOUNDRIDGE (MOUND10X) 138/115/13.8KV TRANSFORMER CKT 1	110	0.03461	176.2586	RENO COUNTY - WICHITA 345KV CKT 1 &FLTRDGESUB 345.00 - VIOLA 7 345.00 345KV CKT 1	
FDNS	03ALL		1 13G	G13_010	FROM->TO	MOUNDRIDGE (MOUND10X) 138/115/13.8KV TRANSFORMER CKT 1	110	0.03461	173.0855	RENO COUNTY - WICHITA 345KV CKT 1 &ELKRV17 345.00 - LATHAMS7 345.00 345KV CKT 1	
FDNS	03ALL		1 13G	G13_010	FROM->TO	MOUNDRIDGE (MOUND10X) 138/115/13.8KV TRANSFORMER CKT 1	110	0.03461	173.0256	RENO COUNTY - WICHITA 345KV CKT 1 &ELKRV17 345.00 - LATHAMS7 345.00 345KV CKT 1	
FDNS	03ALL		1 13G	G13_010	FROM->TO	MOUNDRIDGE (MOUND10X) 138/115/13.8KV TRANSFORMER CKT 1	110	0.03461	172.4361	RENO COUNTY - WICHITA 345KV CKT 1 &FLTRDGESUB 345.00 - G10-05 345.00 345KV CKT 1	
FDNS	03ALL		1 13G	G13_010	FROM->TO	MOUNDRIDGE (MOUND10X) 138/115/13.8KV TRANSFORMER CKT 1	110	0.03461	172.3764	RENO COUNTY - WICHITA 345KV CKT 1 &FLTRDGESUB 345.00 - G10-05 345.00 345KV CKT 1	
FDNS	03ALL		1 13G	G13_010	FROM->TO	MOUNDRIDGE (MOUND10X) 138/115/13.8KV TRANSFORMER CKT 1	110	0.03461	171.3399	RENO COUNTY - WICHITA 345KV CKT 1 &CANEYRV7 345.00 - G05-13 345.00 345KV CKT 1	
FDNS	03ALL		1 13G	G13_010	FROM->TO	MOUNDRIDGE (MOUND10X) 138/115/13.8KV TRANSFORMER CKT 1	110	0.03461	171.2825	RENO COUNTY - WICHITA 345KV CKT 1 &CANEYRV7 345.00 - G05-13 345.00 345KV CKT 1	

SOLUTION	GROUP	SCENARIO	SEASON	SOURCE	DIRECTION	MONITORED ELEMENT	RATEB (MVA)	TDF	TC%LOADING (% MVA)	CONTINGENCY
FDNS	03ALL	1	13G	G13_010	FROM->TO	MOUNDRIDGE (MOUND10X) 138/115/13.8KV TRANSFORMER CKT 1	110	0.03461	170.7201	RENO COUNTY - WICHITA 345KV CKT 1 &FLTRDGESUB 345.00 - G12-023 345.00 345KV CKT 1
FDNS	03ALL	1	13G	G13_010	FROM->TO	MOUNDRIDGE (MOUND10X) 138/115/13.8KV TRANSFORMER CKT 1	110	0.03461	170.6646	RENO COUNTY - WICHITA 345KV CKT 1 &FLTRDGESUB 345.00 - G12-023 345.00 345KV CKT 1
FDNS	03ALL	1	13G	G13_010	FROM->TO	MOUNDRIDGE (MOUND10X) 138/115/13.8KV TRANSFORMER CKT 1	110	0.03461	170.2825	RENO COUNTY - WICHITA 345KV CKT 1 &ANDERSONCO 345.00 - G08-98 345.00 345KV CKT 1
FDNS	03ALL	1	13G	G13_010	FROM->TO	MOUNDRIDGE (MOUND10X) 138/115/13.8KV TRANSFORMER CKT 1	110	0.03461	170.2818	RENO COUNTY - WICHITA 345KV CKT 1 &ANDERSONCO 345.00 - G10-03 345.00 345KV CKT 1
FDNS	03ALL	1	13G	G13_010	FROM->TO	MOUNDRIDGE (MOUND10X) 138/115/13.8KV TRANSFORMER CKT 1	110	0.03461	170.228	RENO COUNTY - WICHITA 345KV CKT 1 &ANDERSONCO 345.00 - G08-98 345.00 345KV CKT 1
FDNS	03ALL	1	13G	G13_010	FROM->TO	MOUNDRIDGE (MOUND10X) 138/115/13.8KV TRANSFORMER CKT 1	110	0.03461	170.2273	RENO COUNTY - WICHITA 345KV CKT 1 &ANDERSONCO 345.00 - G10-03 345.00 345KV CKT 1
FDNS	03ALL	1	13G	G13_010	FROM->TO	MOUNDRIDGE (MOUND10X) 138/115/13.8KV TRANSFORMER CKT 1	110	0.03461	163.9387	RENO COUNTY - WICHITA 345KV CKT 1 &LAWRENCE ENERGY CENTER UNIT 5 - LAWRENCE HILL 230KV CKT 1
FDNS	03ALL	1	13G	G13_010	FROM->TO	MOUNDRIDGE (MOUND10X) 138/115/13.8KV TRANSFORMER CKT 1	110	0.03461	163.9021	RENO COUNTY - WICHITA 345KV CKT 1 &LAWRENCE ENERGY CENTER UNIT 5 - LAWRENCE HILL 230KV CKT 1
FDNS	03ALL	1	13G	G13_010	FROM->TO	MOUNDRIDGE (MOUND10X) 138/115/13.8KV TRANSFORMER CKT 1	110	0.03456	175.8896	RENO COUNTY - WICHITA 345KV CKT 1 &ROSE HILL - WOLF CREEK 345KV CKT 1
FDNS	03ALL	1	13G	G13_010	FROM->TO	MOUNDRIDGE (MOUND10X) 138/115/13.8KV TRANSFORMER CKT 1	110	0.03456	175.687	RENO COUNTY - WICHITA 345KV CKT 1 &ROSE HILL - WOLF CREEK 345KV CKT 1
FDNS	03ALL	1	13G	G13_010	FROM->TO	MOUNDRIDGE (MOUND10X) 138/115/13.8KV TRANSFORMER CKT 1	110	0.03444	167.2378	RENO COUNTY - WICHITA 345KV CKT 1 &BENTON - WICHITA 345KV CKT 1
FDNS	03ALL	1	13G	G13_010	FROM->TO	MOUNDRIDGE (MOUND10X) 138/115/13.8KV TRANSFORMER CKT 1	110	0.03444	167.0264	RENO COUNTY - WICHITA 345KV CKT 1 &BENTON - WICHITA 345KV CKT 1
FDNS	03ALL	1	13G	G13_010	FROM->TO	MOUNDRIDGE (MOUND10X) 138/115/13.8KV TRANSFORMER CKT 1	110	0.0343	173.9935	RENO COUNTY - WICHITA 345KV CKT 1 &BENTON - WOLF CREEK 345KV CKT 1
FDNS	03ALL	1	13G	G13_010	FROM->TO	MOUNDRIDGE (MOUND10X) 138/115/13.8KV TRANSFORMER CKT 1	110	0.0343	173.781	RENO COUNTY - WICHITA 345KV CKT 1 &BENTON - WOLF CREEK 345KV CKT 1
FDNS	03ALL	1	13G	G13_010	FROM->TO	MOUNDRIDGE (MOUND10X) 138/115/13.8KV TRANSFORMER CKT 1	110	0.03406	141.8174	RENO COUNTY - WICHITA 345KV CKT 1 &ANDERSONCO 345.00 - WOLF CREEK 345KV CKT 1
FDNS	03ALL	1	13G	G13_010	FROM->TO	MOUNDRIDGE (MOUND10X) 138/115/13.8KV TRANSFORMER CKT 1	110	0.03406	141.8172	RENO COUNTY - WICHITA 345KV CKT 1 &ANDERSONCO 345.00 - WOLF CREEK 345KV CKT 1
FDNS	03ALL	1	13G	G13_010	FROM->TO	MOUNDRIDGE (MOUND10X) 138/115/13.8KV TRANSFORMER CKT 1	110	0.03379	165.173	RENO COUNTY - WICHITA 345KV CKT 1 &BENTON - ROSE HILL 345KV CKT 1
FDNS	03ALL	1	13G	G13_010	FROM->TO	MOUNDRIDGE (MOUND10X) 138/115/13.8KV TRANSFORMER CKT 1	110	0.03379	165.0691	RENO COUNTY - WICHITA 345KV CKT 1 &BENTON - ROSE HILL 345KV CKT 1
FDNS	03ALL	1	13G	G13_010	FROM->TO	MOUNDRIDGE (MOUND10X) 138/115/13.8KV TRANSFORMER CKT 1	110	0.03347	161.9246	RENO COUNTY - WICHITA 345KV CKT 1 &LATHAMS7 345.00 - ROSE HILL 345KV CKT 1
FDNS	03ALL	1	13G	G13_010	FROM->TO	MOUNDRIDGE (MOUND10X) 138/115/13.8KV TRANSFORMER CKT 1	110	0.03347	161.8677	RENO COUNTY - WICHITA 345KV CKT 1 &LATHAMS7 345.00 - ROSE HILL 345KV CKT 1
FDNS	03ALL	1	13G	G13_010	FROM->TO	MOUNDRIDGE (MOUND10X) 138/115/13.8KV TRANSFORMER CKT 1	110	0.03347	159.4404	RENO COUNTY - WICHITA 345KV CKT 1 &CANEYRV7 345.00 - LATHAMS7 345.00 345KV CKT 1
FDNS	03ALL	1	13G	G13_010	FROM->TO	MOUNDRIDGE (MOUND10X) 138/115/13.8KV TRANSFORMER CKT 1	110	0.03347	159.3854	RENO COUNTY - WICHITA 345KV CKT 1 &CANEYRV7 345.00 - LATHAMS7 345.00 345KV CKT 1
FDNS	03ALL	1	13G	G13_010	FROM->TO	MOUNDRIDGE (MOUND10X) 138/115/13.8KV TRANSFORMER CKT 1	110	0.03347	158.1298	RENO COUNTY - WICHITA 345KV CKT 1 &CANEYRV7 345.00 - NEOSHO 345KV CKT 1
FDNS	03ALL	1	13G	G13_010	FROM->TO	MOUNDRIDGE (MOUND10X) 138/115/13.8KV TRANSFORMER CKT 1	110	0.03347	158.0735	RENO COUNTY - WICHITA 345KV CKT 1 &CANEYRV7 345.00 - NEOSHO 345KV CKT 1
FDNS	03ALL	1	13G	G13_010	FROM->TO	MOUNDRIDGE (MOUND10X) 138/115/13.8KV TRANSFORMER CKT 1	110	0.03301	165.617	RENO COUNTY - WICHITA 345KV CKT 1 &VIOLA 7 345.00 - WICHITA 345KV CKT 1
FDNS	03ALL	1	13G	G13_010	FROM->TO	MOUNDRIDGE (MOUND10X) 138/115/13.8KV TRANSFORMER CKT 1	110	0.03301	165.3641	RENO COUNTY - WICHITA 345KV CKT 1 &VIOLA 7 345.00 - WICHITA 345KV CKT 1
FDNS	06NR	1	13G	G13_013	FROM->TO	LEA COUNTY INTERCHANGE - YOAKUM COUNTY INTERCHANGE 230KV CKT 1	351	0.47255	109.8214	OASIS INTERCHANGE - SAN JUAN MESA TAP 230KV CKT 1 &G13_013T 345.00 - TOLK STATION 345KV CKT 1
FDNS	06ALL	1	13G	G13_013	FROM->TO	SUNDOWN INTERCHANGE - WOLFFORTH INTERCHANGE 230KV CKT 1	351	0.28129	107.4583	PLANT X STATION - POTTER COUNTY INTERCHANGE 230KV CKT 1 &TOLK STATION EAST - TUCO INTERCHANGE 230KV CKT 1
FDNS	06ALL	1	13G	G13_013	FROM->TO	SUNDOWN INTERCHANGE - WOLFFORTH INTERCHANGE 230KV CKT 1	351	0.27911	103.8099	BUFFALO 230.00 - BUSHLAND INTERCHANGE 230KV CKT 1 &TOLK STATION EAST - TUCO INTERCHANGE 230KV CKT 1
FDNS	06ALL	1	13G	G13_013	FROM->TO	SUNDOWN INTERCHANGE - WOLFFORTH INTERCHANGE 230KV CKT 1	351	0.27911	99.9	BUFFALO 230.00 - DEAF SMITH COUNTY INTERCHANGE 230KV CKT 1 &TOLK STATION EAST - TUCO INTERCHANGE 230KV CKT 1
FDNS	06ALL	1	13G	G13_013	FROM->TO	SUNDOWN INTERCHANGE - WOLFFORTH INTERCHANGE 230KV CKT 1	351	0.2741	107.3793	DEAF SMITH COUNTY INTERCHANGE - PLANT X STATION 230KV CKT 1 &TOLK STATION EAST - TUCO INTERCHANGE 230KV CKT 1
FDNS	06ALL	1	13G	G13_013	FROM->TO	SUNDOWN INTERCHANGE - WOLFFORTH INTERCHANGE 230KV CKT 1	351	0.23571	108.4075	TOLK STATION EAST - TUCO INTERCHANGE 230KV CKT 1 &G13_017T 345.00 - G13_017_1 345.00 345KV CKT 1
FDNS	06ALL	1	13G	G13_013	FROM->TO	TERRY COUNTY INTERCHANGE - WOLFFORTH INTERCHANGE 115KV CKT 1	138	0.18098	100.7128	G13_013T 345.00 - TOLK STATION 345KV CKT 1 &SUNDOWN INTERCHANGE - WOLFFORTH INTERCHANGE 230KV CKT 1
FDNS	06ALL	1	13G	G13_013	FROM->TO	TERRY COUNTY INTERCHANGE - WOLFFORTH INTERCHANGE 115KV CKT 1	138	0.1735	167.1252	TOLK STATION EAST - TUCO INTERCHANGE 230KV CKT 1 &SUNDOWN INTERCHANGE - WOLFFORTH INTERCHANGE 230KV CKT 1
FDNS	06ALL	1	13G	G13_013	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.15824	157.1556	DEAF SMITH COUNTY INTERCHANGE - PLANT X STATION 230KV CKT 1 &TOLK STATION EAST - TUCO INTERCHANGE 230KV CKT 1
FDNS	06ALL	1	13G	G13_013	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.15824	156.4511	DEAF SMITH COUNTY INTERCHANGE - PLANT X STATION 230KV CKT 1 &TOLK STATION EAST - TUCO INTERCHANGE 230KV CKT 1

SOLUTION	GROUP	SCENARIO	SEASON	SOURCE	DIRECTION	MONITORED ELEMENT	RATEB (MVA)	TDF	TC%LOADING (% MVA)	CONTINGENCY
FDNS	06ALL		1 13G	G13_013	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.10976	121.0564	TOLK STATION EAST - TUCO INTERCHANGE 230KV CKT 1 &G12-037 345KV CKT 1 345.00 - TUCO INTERCHANGE
FDNS	06ALL		1 13G	G13_013	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.10976	121.0563	TOLK STATION EAST - TUCO INTERCHANGE 230KV CKT 1 &ANTELOPE 1 - TUCO INTERCHANGE 230KV CKT 1
FDNS	06ALL		1 13G	G13_013	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.10976	121.0563	TOLK STATION EAST - TUCO INTERCHANGE 230KV CKT 1 &Golden Spread REC - Mustang Interchange 230 kV Generation Bus - MUSTANG STATION 23
FDNS	06ALL		1 13G	G13_013	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.10976	120.9937	AMARILLO SOUTH INTERCHANGE - RANDALL COUNTY INTERCHANGE 230KV CKT 1 &TOLK STATION EAST - TUCO INTERCHANGE 230KV CKT 1
FDNS	06ALL		1 13G	G13_013	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.10976	120.9422	LUBBOCK EAST INTERCHANGE - LUBBOCK POWER & LIGHT-WADSWORTH 230KV CKT 1 &TOLK STATION EAST - TUCO INTERCHANGE 230KV CKT 1
FDNS	06ALL		1 13G	G13_013	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.10976	120.8937	TOLK STATION EAST - TUCO INTERCHANGE 230KV CKT 1 &GRASSLAND INTERCHANGE - Jones Station Bus#2 230KV CKT 1
FDNS	06ALL		1 13G	G13_013	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.10976	120.8753	TOLK STATION EAST - TUCO INTERCHANGE 230KV CKT 1 &MUSTANG STATION - SEMINOLE 230KV CKT 1
FDNS	06ALL		1 13G	G13_013	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.10976	120.8616	TOLK STATION EAST - TUCO INTERCHANGE 230KV CKT 1 &HOBBS INTERCHANGE - NEF 230.00 230KV CKT 1
FDNS	06ALL		1 13G	G13_013	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.10976	120.8614	TOLK STATION EAST - TUCO INTERCHANGE 230KV CKT 1 &ANTELOPE 1 - TUCO INTERCHANGE 230KV CKT 1
FDNS	06ALL		1 13G	G13_013	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.10976	120.8614	TOLK STATION EAST - TUCO INTERCHANGE 230KV CKT 1 &G10-46 230.00 - TUCO INTERCHANGE 230KV CKT 1
FDNS	06ALL		1 13G	G13_013	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.10976	120.8614	TOLK STATION EAST - TUCO INTERCHANGE 230KV CKT 1 &G13_016_1 345.00 - TUCO INTERCHANGE 345KV CKT 1
FDNS	06ALL		1 13G	G13_013	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.10976	120.8614	TOLK STATION EAST - TUCO INTERCHANGE 230KV CKT 1 &G12-037 345.00 - TUCO INTERCHANGE 345KV CKT 1
FDNS	06ALL		1 13G	G13_013	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.10976	120.8613	TOLK STATION EAST - TUCO INTERCHANGE 230KV CKT 1 &Golden Spread REC - Mustang Interchange 230 kV Generation Bus - MUSTANG STATION 23
FDNS	06ALL		1 13G	G13_013	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.10976	120.7901	AMARILLO SOUTH INTERCHANGE - RANDALL COUNTY INTERCHANGE 230KV CKT 1 &TOLK STATION EAST - TUCO INTERCHANGE 230KV CKT 1
FDNS	06ALL		1 13G	G13_013	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.10971	121.1517	ROOSEVELT COUNTY INTERCHANGE - TOLK STATION WEST 230KV CKT 2 &TOLK STATION EAST - TUCO INTERCHANGE 230KV CKT 1
FDNS	06ALL		1 13G	G13_013	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.10971	121.0851	EAST PLANT INTERCHANGE - HARRINGTON STATION 230KV CKT 1 &TOLK STATION EAST - TUCO INTERCHANGE 230KV CKT 1
FDNS	06ALL		1 13G	G13_013	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.10971	120.9446	ROOSEVELT COUNTY INTERCHANGE - TOLK STATION WEST 230KV CKT 2 &TOLK STATION EAST - TUCO INTERCHANGE 230KV CKT 1
FDNS	06ALL		1 13G	G13_013	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.10971	120.9045	EAST PLANT INTERCHANGE - HARRINGTON STATION 230KV CKT 1 &TOLK STATION EAST - TUCO INTERCHANGE 230KV CKT 1
FDNS	06ALL		1 13G	G13_013	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.10957	121.2451	AMARILLO SOUTH INTERCHANGE - NICHOLS STATION 230KV CKT 1 &TOLK STATION EAST - TUCO INTERCHANGE 230KV CKT 1
FDNS	06ALL		1 13G	G13_013	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.10957	121.0513	AMARILLO SOUTH INTERCHANGE - NICHOLS STATION 230KV CKT 1 &TOLK STATION EAST - TUCO INTERCHANGE 230KV CKT 1
FDNS	06ALL		1 13G	G13_013	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.10946	121.5871	Harrington Station Mid Bus - RANDALL COUNTY INTERCHANGE 230KV CKT 1 &TOLK STATION EAST - TUCO INTERCHANGE 230KV CKT 1
FDNS	06ALL		1 13G	G13_013	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.10946	121.3753	Harrington Station Mid Bus - RANDALL COUNTY INTERCHANGE 230KV CKT 1 &TOLK STATION EAST - TUCO INTERCHANGE 230KV CKT 1
FDNS	06ALL		1 13G	G13_013	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.10938	120.7528	SWISHER COUNTY INTERCHANGE - TUCO INTERCHANGE 230KV CKT 1 &TOLK STATION EAST - TUCO INTERCHANGE 230KV CKT 1
FDNS	06ALL		1 13G	G13_013	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.10938	120.5665	SWISHER COUNTY INTERCHANGE - TUCO INTERCHANGE 230KV CKT 1 &TOLK STATION EAST - TUCO INTERCHANGE 230KV CKT 1
FDNS	06ALL		1 13G	G13_013	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.10937	122.7385	G07-48T 230.00 - SWISHER COUNTY INTERCHANGE 230KV CKT 1 &TOLK STATION EAST - TUCO INTERCHANGE 230KV CKT 1
FDNS	06ALL		1 13G	G13_013	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.10937	122.5552	G07-48T 230.00 - SWISHER COUNTY INTERCHANGE 230KV CKT 1 &TOLK STATION EAST - TUCO INTERCHANGE 230KV CKT 1
FDNS	06ALL		1 13G	G13_013	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.10937	120.1851	AMARILLO SOUTH INTERCHANGE - G07-48T 230.00 230KV CKT 1 &TOLK STATION EAST - TUCO INTERCHANGE 230KV CKT 1
FDNS	06ALL		1 13G	G13_013	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.10937	119.9765	AMARILLO SOUTH INTERCHANGE - G07-48T 230.00 230KV CKT 1 &TOLK STATION EAST - TUCO INTERCHANGE 230KV CKT 1
FDNS	06ALL		1 13G	G13_013	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.10935	120.9284	TOLK STATION EAST - TUCO INTERCHANGE 230KV CKT 1 &CHAVES COUNTY INTERCHANGE - EDDY_NORTH 6230.00 230KV CKT 1
FDNS	06ALL		1 13G	G13_013	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.10935	120.7407	TOLK STATION EAST - TUCO INTERCHANGE 230KV CKT 1 &CHAVES COUNTY INTERCHANGE - EDDY_NORTH 6230.00 230KV CKT 1
FDNS	06ALL		1 13G	G13_013	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.10933	120.7542	TOLK STATION EAST - TUCO INTERCHANGE 230KV CKT 1 &TUCO INTERCHANGE - TUCO2 345KV CKT 1
FDNS	06ALL		1 13G	G13_013	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.10933	120.754	TOLK STATION EAST - TUCO INTERCHANGE 230KV CKT 1 &TUCO INTERCHANGE - TUCO2 230.00 230KV CKT 1
FDNS	06ALL		1 13G	G13_013	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.10933	120.6199	OASIS INTERCHANGE - Roosevelt County Interchange SWITCH #4K33 230KV CKT 1 &TOLK STATION EAST - TUCO INTERCHANGE 230KV CKT 1
FDNS	06ALL		1 13G	G13_013	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.10933	120.5412	TOLK STATION EAST - TUCO INTERCHANGE 230KV CKT 1 &TUCO INTERCHANGE - TUCO2 345KV CKT 1
FDNS	06ALL		1 13G	G13_013	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.10933	120.541	TOLK STATION EAST - TUCO INTERCHANGE 230KV CKT 1 &TUCO INTERCHANGE - TUCO2 230.00 230KV CKT 1
FDNS	06ALL		1 13G	G13_013	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.10933	120.4367	OASIS INTERCHANGE - Roosevelt County Interchange SWITCH #4K33 230KV CKT 1 &TOLK STATION EAST - TUCO INTERCHANGE 230KV CKT 1

SOLUTION	GROUP	SCENARIO	SEASON	SOURCE	DIRECTION	MONITORED ELEMENT	RATEB (MVA)	TDF	TC%LOADING (% MVA)	CONTINGENCY
FDNS	06ALL		1 13G	G13_013	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.1036	117.4195	DEAF SMITH COUNTY INTERCHANGE - PLANT X STATION 230KV CKT 1 &G07-48T 230.00 - SWISHER COUNTY INTERCHANGE 230KV CKT 1
FDNS	06ALL		1 13G	G13_013	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.1036	117.3722	DEAF SMITH COUNTY INTERCHANGE - PLANT X STATION 230KV CKT 1 &G07-48T 230.00 - SWISHER COUNTY INTERCHANGE 230KV CKT 1
FDNS	06ALL		1 13G	G13_013	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.1036	117.1735	FINNEY SWITCHING STATION - Hitchland Interchange 345KV CKT 1 &DEAF SMITH COUNTY INTERCHANGE - PLANT X STATION 230KV CKT 1
FDNS	06ALL		1 13G	G13_013	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.1036	117.1257	FINNEY SWITCHING STATION - Hitchland Interchange 345KV CKT 1 &DEAF SMITH COUNTY INTERCHANGE - PLANT X STATION 230KV CKT 1
FDNS	06ALL		1 13G	G13_013	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.10359	117.7389	Harrington Station Mid Bus - RANDALL COUNTY INTERCHANGE 230KV CKT 1 &DEAF SMITH COUNTY INTERCHANGE - PLANT X STATION 230KV CKT 1
FDNS	06ALL		1 13G	G13_013	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.10359	117.6914	Harrington Station Mid Bus - RANDALL COUNTY INTERCHANGE 230KV CKT 1 &DEAF SMITH COUNTY INTERCHANGE - PLANT X STATION 230KV CKT 1
FDNS	06ALL		1 13G	G13_013	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.10354	117.2543	G11_012T 230.00 - MOORE COUNTY INTERCHANGE 230KV CKT 1 &DEAF SMITH COUNTY INTERCHANGE - PLANT X STATION 230KV CKT 1
FDNS	06ALL		1 13G	G13_013	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.10354	117.2152	G11_012T 230.00 - HITCHLAND INTERCHANGE 230KV CKT 1 &DEAF SMITH COUNTY INTERCHANGE - PLANT X STATION 230KV CKT 1
FDNS	06ALL		1 13G	G13_013	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.10354	117.207	G11_012T 230.00 - MOORE COUNTY INTERCHANGE 230KV CKT 1 &DEAF SMITH COUNTY INTERCHANGE - PLANT X STATION 230KV CKT 1
FDNS	06ALL		1 13G	G13_013	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.10354	117.168	G11_012T 230.00 - HITCHLAND INTERCHANGE 230KV CKT 1 &DEAF SMITH COUNTY INTERCHANGE - PLANT X STATION 230KV CKT 1
FDNS	06ALL		1 13G	G13_013	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.10352	117.1983	GRAPEVINE INTERCHANGE - NICHOLS STATION 230KV CKT 1 &DEAF SMITH COUNTY INTERCHANGE - PLANT X STATION 230KV CKT 1
FDNS	06ALL		1 13G	G13_013	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.10352	117.1503	GRAPEVINE INTERCHANGE - NICHOLS STATION 230KV CKT 1 &DEAF SMITH COUNTY INTERCHANGE - PLANT X STATION 230KV CKT 1
FDNS	06ALL		1 13G	G13_013	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.1035	117.7635	DEAF SMITH COUNTY INTERCHANGE - PLANT X STATION 230KV CKT 1 &CHAVES COUNTY INTERCHANGE - SAN JUAN MESA TAP 230KV CKT 1
FDNS	06ALL		1 13G	G13_013	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.1035	117.7162	DEAF SMITH COUNTY INTERCHANGE - PLANT X STATION 230KV CKT 1 &CHAVES COUNTY INTERCHANGE - SAN JUAN MESA TAP 230KV CKT 1
FDNS	06NR		1 13G	G13_013	FROM->TO	SUNDOWN INTERCHANGE - WOLFFORTH INTERCHANGE 230KV CKT 1	351	0.1034	118.2918	TOLK STATION EAST - TUCO INTERCHANGE 230KV CKT 1 &G12-020 230.00 - TUCO INTERCHANGE 230KV CKT 1
FDNS	06ALL		1 13G	G13_013	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.10338	116.9769	DEAF SMITH COUNTY INTERCHANGE - PLANT X STATION 230KV CKT 1 &OASIS INTERCHANGE - Roosevelt County Interchange SWITCH #4K33 230KV CKT
FDNS	06ALL		1 13G	G13_013	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.10338	116.929	DEAF SMITH COUNTY INTERCHANGE - PLANT X STATION 230KV CKT 1 &OASIS INTERCHANGE - Roosevelt County Interchange SWITCH #4K33 230KV CKT
FDNS	06ALL		1 13G	G13_013	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.10319	116.5883	STATELINE INTERCHANGE - STLN-DEMARC6 230KV CKT 1 &DEAF SMITH COUNTY INTERCHANGE - PLANT X STATION 230KV CKT 1
FDNS	06ALL		1 13G	G13_013	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.10319	116.541	STATELINE INTERCHANGE - STLN-DEMARC6 230KV CKT 1 &DEAF SMITH COUNTY INTERCHANGE - PLANT X STATION 230KV CKT 1
FDNS	06ALL		1 13G	G13_013	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.10319	116.3141	GRAPEVINE INTERCHANGE - STATELINE INTERCHANGE 230KV CKT 1 &DEAF SMITH COUNTY INTERCHANGE - PLANT X STATION 230KV CKT 1
FDNS	06ALL		1 13G	G13_013	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.10319	116.2668	GRAPEVINE INTERCHANGE - STATELINE INTERCHANGE 230KV CKT 1 &DEAF SMITH COUNTY INTERCHANGE - PLANT X STATION 230KV CKT 1
FDNS	06ALL		1 13G	G13_013	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.10262	117.263	Hitchland Interchange - POTTER COUNTY INTERCHANGE 345KV CKT 1 &DEAF SMITH COUNTY INTERCHANGE - PLANT X STATION 230KV CKT 1
FDNS	06ALL		1 13G	G13_013	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.10262	117.2151	Hitchland Interchange - POTTER COUNTY INTERCHANGE 345KV CKT 1 &DEAF SMITH COUNTY INTERCHANGE - PLANT X STATION 230KV CKT 1
FDNS	06ALL		1 13G	G13_013	FROM->TO	DEAF SMITH COUNTY INTERCHANGE - Panda Energy Substation Hereford 115KV CKT 1	96	0.10246	133.8534	BUFFALO 230.00 - BUSHLAND INTERCHANGE 230KV CKT 1 &TOLK STATION EAST - TUCO INTERCHANGE 230KV CKT 1
FDNS	06ALL		1 13G	G13_013	FROM->TO	DEAF SMITH COUNTY INTERCHANGE - Panda Energy Substation Hereford 115KV CKT 1	96	0.10246	120.0996	BUFFALO 230.00 - DEAF SMITH COUNTY INTERCHANGE 230KV CKT 1 &TOLK STATION EAST - TUCO INTERCHANGE 230KV CKT 1
FDNS	06ALL		1 13G	G13_013	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.10224	118.0841	PLANT X STATION - POTTER COUNTY INTERCHANGE 230KV CKT 1 &PLANT X STATION - SUNDOWN INTERCHANGE 230KV CKT 1
FDNS	06ALL		1 13G	G13_013	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.10224	118.0359	PLANT X STATION - POTTER COUNTY INTERCHANGE 230KV CKT 1 &PLANT X STATION - SUNDOWN INTERCHANGE 230KV CKT 1
FDNS	06ALL		1 13G	G13_013	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.10156	116.99	DEAF SMITH COUNTY INTERCHANGE - PLANT X STATION 230KV CKT 1 &TOLK STATION TAP - TOLK STATION WEST 230KV CKT 1
FDNS	06ALL		1 13G	G13_013	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.10156	116.9427	DEAF SMITH COUNTY INTERCHANGE - PLANT X STATION 230KV CKT 1 &TOLK STATION TAP - TOLK STATION WEST 230KV CKT 1
FDNS	06ALL		1 13G	G13_013	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.10013	109.758	PLANT X STATION - POTTER COUNTY INTERCHANGE 230KV CKT 1 &CHAVESCO 345.00 - EDDY COUNTY INTERCHANGE 345KV CKT 1
FDNS	06ALL		1 13G	G13_013	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.10013	109.7126	PLANT X STATION - POTTER COUNTY INTERCHANGE 230KV CKT 1 &CHAVESCO 345.00 - EDDY COUNTY INTERCHANGE 345KV CKT 1
FDNS	06ALL		1 13G	G13_013	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.10013	105.1326	PLANT X STATION - POTTER COUNTY INTERCHANGE 230KV CKT 1 &CHAVESCO 345.00 - G13_013T 345.00 345KV CKT 1
FDNS	06ALL		1 13G	G13_013	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.10013	105.0878	PLANT X STATION - POTTER COUNTY INTERCHANGE 230KV CKT 1 &CHAVESCO 345.00 - G13_013T 345.00 345KV CKT 1
FDNS	06ALL		1 13G	G13_013	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.0997	114.6896	DEAF SMITH COUNTY INTERCHANGE - PLANT X STATION 230KV CKT 1 &PLANT X STATION - TOLK STATION EAST 230KV CKT 2
FDNS	06ALL		1 13G	G13_013	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.0997	114.6428	DEAF SMITH COUNTY INTERCHANGE - PLANT X STATION 230KV CKT 1 &PLANT X STATION - TOLK STATION EAST 230KV CKT 2
FDNS	06ALL		1 13G	G13_013	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.09963	114.7951	DEAF SMITH COUNTY INTERCHANGE - PLANT X STATION 230KV CKT 1 &PLANT X STATION - TOLK STATION WEST 230KV CKT 1

SOLUTION	GROUP	SCENARIO	SEASON	SOURCE	DIRECTION	MONITORED ELEMENT	RATEB (MVA)	TDF	TC%LOADING (% MVA)	CONTINGENCY
FDNS	06ALL		1 13G	G13_013	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.09167	108.5409	PLANT X STATION - POTTER COUNTY INTERCHANGE 230KV CKT 1 & BEAVER CO 345.00 - G11_014_1 345.00 345KV CKT 1
FDNS	06ALL		1 13G	G13_013	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.09167	108.4948	PLANT X STATION - POTTER COUNTY INTERCHANGE 230KV CKT 1 & BUFFALO 230.00 - G06-47 230.00 230KV CKT 1
FDNS	06ALL		1 13G	G13_013	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.09167	107.8595	PLANT X STATION - POTTER COUNTY INTERCHANGE 230KV CKT 1 & WILDOR2_JUS6230.00 - WILDORADO WIND GEN 230KV CKT 1
FDNS	06ALL		1 13G	G13_013	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.09167	107.814	PLANT X STATION - POTTER COUNTY INTERCHANGE 230KV CKT 1 & WILDOR2_JUS6230.00 - WILDORADO WIND GEN 230KV CKT 1
FDNS	06ALL		1 13G	G13_013	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.09167	107.6766	PLANT X STATION - POTTER COUNTY INTERCHANGE 230KV CKT 1 & CHAVESCO 345.00 - G08-22 345.00 345KV CKT 1
FDNS	06ALL		1 13G	G13_013	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.09167	107.631	PLANT X STATION - POTTER COUNTY INTERCHANGE 230KV CKT 1 & CHAVESCO 345.00 - G08-22 345.00 345KV CKT 1
FDNS	06ALL		1 13G	G13_013	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.09167	107.3849	PLANT X STATION - POTTER COUNTY INTERCHANGE 230KV CKT 1 & G11_012T 230.00 - G11_012_1 230.00 230KV CKT 1
FDNS	06ALL		1 13G	G13_013	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.09167	107.3391	PLANT X STATION - POTTER COUNTY INTERCHANGE 230KV CKT 1 & G11_012T 230.00 - G11_012_1 230.00 230KV CKT 1
FDNS	06ALL		1 13G	G13_013	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.09167	107.0902	PLANT X STATION - POTTER COUNTY INTERCHANGE 230KV CKT 1 & SAN JUAN MESA TAP - SAN JUAN MESA WIND GEN 230KV CKT 1
FDNS	06ALL		1 13G	G13_013	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.09167	107.0444	PLANT X STATION - POTTER COUNTY INTERCHANGE 230KV CKT 1 & SAN JUAN MESA TAP - SAN JUAN MESA WIND GEN 230KV CKT 1
FDNS	06ALL		1 13G	G13_013	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.09167	106.743	PLANT X STATION - POTTER COUNTY INTERCHANGE 230KV CKT 1 & G13_013T 345.00 - G13_013_1 345.00 345KV CKT 1
FDNS	06ALL		1 13G	G13_013	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.09167	106.6976	PLANT X STATION - POTTER COUNTY INTERCHANGE 230KV CKT 1 & G13_013T 345.00 - G13_013_1 345.00 345KV CKT 1
FDNS	06ALL		1 13G	G13_013	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.09167	106.4683	PLANT X STATION - POTTER COUNTY INTERCHANGE 230KV CKT 1 & G08-09 230.00 - SAN JUAN MESA TAP 230KV CKT 1
FDNS	06ALL		1 13G	G13_013	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.09167	106.4226	PLANT X STATION - POTTER COUNTY INTERCHANGE 230KV CKT 1 & G08-09 230.00 - SAN JUAN MESA TAP 230KV CKT 1
FDNS	06ALL		1 13G	G13_013	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.09167	106.2041	PLANT X STATION - POTTER COUNTY INTERCHANGE 230KV CKT 1 & HARRINGTON STATION - NICHOLS STATION 230KV CKT 1
FDNS	06ALL		1 13G	G13_013	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.09167	106.1979	PLANT X STATION - POTTER COUNTY INTERCHANGE 230KV CKT 1 & Harrington Station Mid Bus - NICHOLS STATION 230KV CKT 2
FDNS	06ALL		1 13G	G13_013	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.09167	106.1898	PLANT X STATION - POTTER COUNTY INTERCHANGE 230KV CKT 1 & MUSTANG STATION - YOAKUM COUNTY INTERCHANGE 230KV CKT 1
FDNS	06ALL		1 13G	G13_013	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.09167	106.1897	PLANT X STATION - POTTER COUNTY INTERCHANGE 230KV CKT 1 & OXYBRU_TP 6230.00 - YOAKUM COUNTY INTERCHANGE 230KV CKT 1
FDNS	06ALL		1 13G	G13_013	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.09167	106.1872	LUBBOCK EAST INTERCHANGE - LUBBOCK POWER & LIGHT-WADSWORTH 230KV CKT 1 & PLANT X STATION - POTTER COUNTY INTERCHANGE 230KV CKT 1
FDNS	06ALL		1 13G	G13_013	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.09167	106.1867	PLANT X STATION - POTTER COUNTY INTERCHANGE 230KV CKT 1 & AMOCO WASSON SWITCHING STATION - OXYBRU_TP 6230.00 230KV CKT 1
FDNS	06ALL		1 13G	G13_013	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.09167	106.1754	PLANT X STATION - POTTER COUNTY INTERCHANGE 230KV CKT 1 & AMOCO WASSON SWITCHING STATION - MUSTANG STATION 230KV CKT 1
FDNS	06ALL		1 13G	G13_013	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.09167	106.1716	PLANT X STATION - POTTER COUNTY INTERCHANGE 230KV CKT 1 & HARRINGTON STATION - Harrington Station Mid Bus 230KV CKT 1
FDNS	06ALL		1 13G	G13_013	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.09167	106.1712	PLANT X STATION - POTTER COUNTY INTERCHANGE 230KV CKT 1 & HOBBS INTERCHANGE - NEF 230.00 230KV CKT 1
FDNS	06ALL		1 13G	G13_013	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.09167	106.171	PLANT X STATION - POTTER COUNTY INTERCHANGE 230KV CKT 1 & ANTELOPE 1 - TUCO INTERCHANGE 230KV CKT 1
FDNS	06ALL		1 13G	G13_013	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.09167	106.171	PLANT X STATION - POTTER COUNTY INTERCHANGE 230KV CKT 1 & G10-46 230.00 - TUCO INTERCHANGE 230KV CKT 1
FDNS	06ALL		1 13G	G13_013	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.09167	106.171	PLANT X STATION - POTTER COUNTY INTERCHANGE 230KV CKT 1 & G13_016_1 345.00 - TUCO INTERCHANGE 345KV CKT 1
FDNS	06ALL		1 13G	G13_013	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.09167	106.171	PLANT X STATION - POTTER COUNTY INTERCHANGE 230KV CKT 1 & G12-037 345.00 - TUCO INTERCHANGE 345KV CKT 1
FDNS	06ALL		1 13G	G13_013	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.09167	106.171	PLANT X STATION - POTTER COUNTY INTERCHANGE 230KV CKT 1 & Golden Spread REC - Mustang Interchange 230 kV Generation Bus - MUSTANG STA
FDNS	06ALL		1 13G	G13_013	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.09167	106.1699	PLANT X STATION - POTTER COUNTY INTERCHANGE 230KV CKT 1 & JONES STATION - Jones Station Bus#2 230KV CKT 1
FDNS	06ALL		1 13G	G13_013	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.09167	106.1585	PLANT X STATION - POTTER COUNTY INTERCHANGE 230KV CKT 1 & HARRINGTON STATION - NICHOLS STATION 230KV CKT 1
FDNS	06ALL		1 13G	G13_013	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.09167	106.1523	PLANT X STATION - POTTER COUNTY INTERCHANGE 230KV CKT 1 & Harrington Station Mid Bus - NICHOLS STATION 230KV CKT 2
FDNS	06ALL		1 13G	G13_013	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.09167	106.1443	PLANT X STATION - POTTER COUNTY INTERCHANGE 230KV CKT 1 & MUSTANG STATION - YOAKUM COUNTY INTERCHANGE 230KV CKT 1
FDNS	06ALL		1 13G	G13_013	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.09167	106.1442	PLANT X STATION - POTTER COUNTY INTERCHANGE 230KV CKT 1 & OXYBRU_TP 6230.00 - YOAKUM COUNTY INTERCHANGE 230KV CKT 1
FDNS	06ALL		1 13G	G13_013	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.09167	106.142	LUBBOCK EAST INTERCHANGE - LUBBOCK POWER & LIGHT-WADSWORTH 230KV CKT 1 & PLANT X STATION - POTTER COUNTY INTERCHANGE 230KV CKT 1
FDNS	06ALL		1 13G	G13_013	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.09167	106.1411	PLANT X STATION - POTTER COUNTY INTERCHANGE 230KV CKT 1 & AMOCO WASSON SWITCHING STATION - OXYBRU_TP 6230.00 230KV CKT 1
FDNS	06ALL		1 13G	G13_013	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.09167	106.1299	PLANT X STATION - POTTER COUNTY INTERCHANGE 230KV CKT 1 & AMOCO WASSON SWITCHING STATION - MUSTANG STATION 230KV CKT 1

SOLUTION	GROUP	SCENARIO	SEASON	SOURCE	DIRECTION	MONITORED ELEMENT	RATEB (MVA)	TDF	TC%LOADING (% MVA)	CONTINGENCY
FDNS	06ALL		1 13G	G13_013	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.07197	117.6277	G12-020 230.00 - TUCO INTERCHANGE 230KV CKT 1 & CHAVESCO 345.00 - G08-22 345.00 345KV CKT 1
FDNS	06ALL		1 13G	G13_013	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.07197	117.5613	WILDOR2_JUS6230.00 - WILDORADO WIND GEN 230KV CKT 1 & G12-020 230.00 - TUCO INTERCHANGE 230KV CKT 1
FDNS	06ALL		1 13G	G13_013	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.07197	117.4076	WILDOR2_JUS6230.00 - WILDORADO WIND GEN 230KV CKT 1 & G12-020 230.00 - TUCO INTERCHANGE 230KV CKT 1
FDNS	06ALL		1 13G	G13_013	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.07197	117.1972	G12-020 230.00 - TUCO INTERCHANGE 230KV CKT 1 & G11_012T 230.00 - G11_012_1 230.00 230KV CKT 1
FDNS	06ALL		1 13G	G13_013	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.07197	117.1015	SAN JUAN MESA TAP - SAN JUAN MESA WIND GEN 230KV CKT 1 & G12-020 230.00 - TUCO INTERCHANGE 230KV CKT 1
FDNS	06ALL		1 13G	G13_013	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.07197	117.0765	G12-020 230.00 - TUCO INTERCHANGE 230KV CKT 1 & G11_012T 230.00 - G11_012_1 230.00 230KV CKT 1
FDNS	06ALL		1 13G	G13_013	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.07197	117.001	SAN JUAN MESA TAP - SAN JUAN MESA WIND GEN 230KV CKT 1 & G12-020 230.00 - TUCO INTERCHANGE 230KV CKT 1
FDNS	06ALL		1 13G	G13_013	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.07197	116.8113	G12-020 230.00 - TUCO INTERCHANGE 230KV CKT 1 & G13_013T 345.00 - G13_013_1 345.00 345KV CKT 1
FDNS	06ALL		1 13G	G13_013	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.07197	116.696	G12-020 230.00 - TUCO INTERCHANGE 230KV CKT 1 & G13_013T 345.00 - G13_013_1 345.00 345KV CKT 1
FDNS	06ALL		1 13G	G13_013	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.07197	116.5085	G08-09 230.00 - SAN JUAN MESA TAP 230KV CKT 1 & G12-020 230.00 - TUCO INTERCHANGE 230KV CKT 1
FDNS	06ALL		1 13G	G13_013	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.07197	116.4178	G08-09 230.00 - SAN JUAN MESA TAP 230KV CKT 1 & G12-020 230.00 - TUCO INTERCHANGE 230KV CKT 1
FDNS	06ALL		1 13G	G13_013	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.07197	116.3624	Jones Station Bus#2 - LUBBOCK POWER & LIGHT-HOLLY PLANT 230KV CKT 1 & G12-020 230.00 - TUCO INTERCHANGE 230KV CKT 1
FDNS	06ALL		1 13G	G13_013	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.07197	116.262	Jones Station Bus#2 - LUBBOCK POWER & LIGHT-HOLLY PLANT 230KV CKT 1 & G12-020 230.00 - TUCO INTERCHANGE 230KV CKT 1
FDNS	06ALL		1 13G	G13_013	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.07197	116.2028	Harrington Station East Bus - PRINGLE INTERCHANGE 230KV CKT 1 & G12-020 230.00 - TUCO INTERCHANGE 230KV CKT 1
FDNS	06ALL		1 13G	G13_013	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.07197	116.1827	Harrington Station Mid Bus - NICHOLS STATION 230KV CKT 2 & G12-020 230.00 - TUCO INTERCHANGE 230KV CKT 1
FDNS	06ALL		1 13G	G13_013	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.07197	116.148	G12-020 230.00 - TUCO INTERCHANGE 230KV CKT 1 & OXYBRU_TP 6230.00 - YOAKUM COUNTY INTERCHANGE 230KV CKT 1
FDNS	06ALL		1 13G	G13_013	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.07197	116.1458	G12-020 230.00 - TUCO INTERCHANGE 230KV CKT 1 & AMOCO WASSON SWITCHING STATION - OXYBRU_TP 6230.00 230KV CKT 1
FDNS	06ALL		1 13G	G13_013	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.07197	116.136	HUTCHINSON COUNTY INTERCHANGE - NICHOLS STATION 230KV CKT 1 & G12-020 230.00 - TUCO INTERCHANGE 230KV CKT 1
FDNS	06ALL		1 13G	G13_013	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.07197	116.1355	G12-020 230.00 - TUCO INTERCHANGE 230KV CKT 1 & MUSTANG STATION - YOAKUM COUNTY INTERCHANGE 230KV CKT 1
FDNS	06ALL		1 13G	G13_013	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.07197	116.1258	Harrington Station East Bus - PRINGLE INTERCHANGE 230KV CKT 1 & G12-020 230.00 - TUCO INTERCHANGE 230KV CKT 1
FDNS	06ALL		1 13G	G13_013	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.07197	116.1246	ROOSEVELT COUNTY INTERCHANGE - Roosevelt County Interchange SWITCH #4K33 230KV CKT 1 & G12-020 230.00 - TUCO INTERCHANGE 230KV CK
FDNS	06ALL		1 13G	G13_013	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.07197	116.1228	G12-020 230.00 - TUCO INTERCHANGE 230KV CKT 1 & AMOCO WASSON SWITCHING STATION - MUSTANG STATION 230KV CKT 1
FDNS	06ALL		1 13G	G13_013	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.07197	116.1228	G12-020 230.00 - TUCO INTERCHANGE 230KV CKT 1 & HOBBS INTERCHANGE - NEF 230.00 230KV CKT 1
FDNS	06ALL		1 13G	G13_013	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.07197	116.1227	G12-020 230.00 - TUCO INTERCHANGE 230KV CKT 1 & G13_016_1 345.00 - TUCO INTERCHANGE 345KV CKT 1
FDNS	06ALL		1 13G	G13_013	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.07197	116.1227	G12-020 230.00 - TUCO INTERCHANGE 230KV CKT 1 & G12-037 345.00 - TUCO INTERCHANGE 345KV CKT 1
FDNS	06ALL		1 13G	G13_013	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.07197	116.1226	ANTELOPE 1 - TUCO INTERCHANGE 230KV CKT 1 & G12-020 230.00 - TUCO INTERCHANGE 230KV CKT 1
FDNS	06ALL		1 13G	G13_013	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.07197	116.1226	G10-46 230.00 - TUCO INTERCHANGE 230KV CKT 1 & G12-020 230.00 - TUCO INTERCHANGE 230KV CKT 1
FDNS	06ALL		1 13G	G13_013	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.07197	116.1226	G12-020 230.00 - TUCO INTERCHANGE 230KV CKT 1 & Golden Spread REC - Mustang Interchange 230 kv Generation Bus - MUSTANG STATION 2
FDNS	06ALL		1 13G	G13_013	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.07197	116.1189	HARRINGTON STATION - Harrington Station Mid Bus 230KV CKT 1 & G12-020 230.00 - TUCO INTERCHANGE 230KV CKT 1
FDNS	06ALL		1 13G	G13_013	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.07197	116.1061	Harrington Station Mid Bus - NICHOLS STATION 230KV CKT 2 & G12-020 230.00 - TUCO INTERCHANGE 230KV CKT 1
FDNS	06ALL		1 13G	G13_013	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.07197	116.0692	G12-020 230.00 - TUCO INTERCHANGE 230KV CKT 1 & OXYBRU_TP 6230.00 - YOAKUM COUNTY INTERCHANGE 230KV CKT 1
FDNS	06ALL		1 13G	G13_013	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.07197	116.0666	G12-020 230.00 - TUCO INTERCHANGE 230KV CKT 1 & AMOCO WASSON SWITCHING STATION - OXYBRU_TP 6230.00 230KV CKT 1
FDNS	06ALL		1 13G	G13_013	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.07197	116.0593	HUTCHINSON COUNTY INTERCHANGE - NICHOLS STATION 230KV CKT 1 & G12-020 230.00 - TUCO INTERCHANGE 230KV CKT 1
FDNS	06ALL		1 13G	G13_013	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.07197	116.0548	G12-020 230.00 - TUCO INTERCHANGE 230KV CKT 1 & MUSTANG STATION - YOAKUM COUNTY INTERCHANGE 230KV CKT 1
FDNS	06ALL		1 13G	G13_013	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.07197	116.0463	G12-020 230.00 - TUCO INTERCHANGE 230KV CKT 1 & HOBBS INTERCHANGE - NEF 230.00 230KV CKT 1
FDNS	06ALL		1 13G	G13_013	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.07197	116.0462	ANTELOPE 1 - TUCO INTERCHANGE 230KV CKT 1 & G12-020 230.00 - TUCO INTERCHANGE 230KV CKT 1

SOLUTION	GROUP	SCENARIO	SEASON	SOURCE	DIRECTION	MONITORED ELEMENT	RATEB		TC%LOADING		CONTINGENCY	
							(MVA)	TDF	(% MVA)			
FDNS	06ALL		1 13G	G13_013	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.07197	116.0462	G10-46 230.00 - TUCO INTERCHANGE 230KV CKT 1 &G12-020 230.00 - TUCO INTERCHANGE 230KV CKT 1		
FDNS	06ALL		1 13G	G13_013	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.07197	116.0462	G12-020 230.00 - TUCO INTERCHANGE 230KV CKT 1 &G13_016_1 345.00 - TUCO INTERCHANGE 345KV CKT 1		
FDNS	06ALL		1 13G	G13_013	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.07197	116.0462	G12-020 230.00 - TUCO INTERCHANGE 230KV CKT 1 &G12-037 345.00 - TUCO INTERCHANGE 345KV CKT 1		
FDNS	06ALL		1 13G	G13_013	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.07197	116.0461	G12-020 230.00 - TUCO INTERCHANGE 230KV CKT 1 &Golden Spread REC - Mustang Interchange 230 kV Generation Bus - MUSTANG STATION 2		
FDNS	06ALL		1 13G	G13_013	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.07197	116.046	ROOSEVELT COUNTY INTERCHANGE - Roosevelt County Interchange SWITCH #4K33 230KV CKT 1 &G12-020 230.00 - TUCO INTERCHANGE 230KV CKT 1		
FDNS	06ALL		1 13G	G13_013	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.07197	116.0422	HARRINGTON STATION - Harrington Station Mid Bus 230KV CKT 1 &G12-020 230.00 - TUCO INTERCHANGE 230KV CKT 1		
FDNS	06ALL		1 13G	G13_013	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.07197	116.0415	G12-020 230.00 - TUCO INTERCHANGE 230KV CKT 1 &AMOCO WASSON SWITCHING STATION - MUSTANG STATION 230KV CKT 1		
FDNS	06ALL		1 13G	G13_013	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.07197	107.0362	FINNEY SWITCHING STATION - G08-18 345.00 345KV CKT 1 &G13_017T 345.00 - G13_017_1 345.00 345KV CKT 1		
FDNS	06ALL		1 13G	G13_013	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.07197	106.9905	FINNEY SWITCHING STATION - G08-18 345.00 345KV CKT 1 &G13_017T 345.00 - G13_017_1 345.00 345KV CKT 1		
FDNS	06ALL		1 13G	G13_013	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.07197	106.5537	G10-14 345.00 - Hitchland Interchange 345KV CKT 1 &G13_017T 345.00 - G13_017_1 345.00 345KV CKT 1		
FDNS	06ALL		1 13G	G13_013	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.07197	106.5081	G10-14 345.00 - Hitchland Interchange 345KV CKT 1 &G13_017T 345.00 - G13_017_1 345.00 345KV CKT 1		
FDNS	06ALL		1 13G	G13_013	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.07197	106.0378	BEAVER CO 345.00 - G10-01 345.00 345KV CKT 1 &G13_017T 345.00 - G13_017_1 345.00 345KV CKT 1		
FDNS	06ALL		1 13G	G13_013	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.07197	106.0373	BEAVER CO 345.00 - G08-47 345.00 345KV CKT 1 &G13_017T 345.00 - G13_017_1 345.00 345KV CKT 1		
FDNS	06ALL		1 13G	G13_013	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.07197	106.0145	G13_017T 345.00 - G13_017_1 345.00 345KV CKT 1 &BEAVER CO 345.00 - G11_021_1 345.00 345KV CKT 1		
FDNS	06ALL		1 13G	G13_013	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.07197	105.9922	BEAVER CO 345.00 - G10-01 345.00 345KV CKT 1 &G13_017T 345.00 - G13_017_1 345.00 345KV CKT 1		
FDNS	06ALL		1 13G	G13_013	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.07197	105.9916	BEAVER CO 345.00 - G08-47 345.00 345KV CKT 1 &G13_017T 345.00 - G13_017_1 345.00 345KV CKT 1		
FDNS	06ALL		1 13G	G13_013	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.07197	105.9692	G08-51 345.00 - POTTER COUNTY INTERCHANGE 345KV CKT 1 &G13_017T 345.00 - G13_017_1 345.00 345KV CKT 1		
FDNS	06ALL		1 13G	G13_013	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.07197	105.9689	G13_017T 345.00 - G13_017_1 345.00 345KV CKT 1 &BEAVER CO 345.00 - G11_021_1 345.00 345KV CKT 1		
FDNS	06ALL		1 13G	G13_013	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.07197	105.9639	G11_022_1 345.00 - Hitchland Interchange 345KV CKT 1 &G13_017T 345.00 - G13_017_1 345.00 345KV CKT 1		
FDNS	06ALL		1 13G	G13_013	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.07197	105.9236	G08-51 345.00 - POTTER COUNTY INTERCHANGE 345KV CKT 1 &G13_017T 345.00 - G13_017_1 345.00 345KV CKT 1		
FDNS	06ALL		1 13G	G13_013	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.07197	105.9183	G11_022_1 345.00 - Hitchland Interchange 345KV CKT 1 &G13_017T 345.00 - G13_017_1 345.00 345KV CKT 1		
FDNS	06ALL		1 13G	G13_013	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.07197	105.7358	G12_001T 230.00 - GRASSLAND INTERCHANGE 230KV CKT 1 &G13_017T 345.00 - G13_017_1 345.00 345KV CKT 1		
FDNS	06ALL		1 13G	G13_013	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.07197	105.7345	G13_017T 345.00 - G13_017_1 345.00 345KV CKT 1 &G12_001T 230.00 - G12_001_1 230.00 230KV CKT 1		
FDNS	06ALL		1 13G	G13_013	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.07197	105.6903	G12_001T 230.00 - GRASSLAND INTERCHANGE 230KV CKT 1 &G13_017T 345.00 - G13_017_1 345.00 345KV CKT 1		
FDNS	06ALL		1 13G	G13_013	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.07197	105.689	G13_017T 345.00 - G13_017_1 345.00 345KV CKT 1 &G12_001T 230.00 - G12_001_1 230.00 230KV CKT 1		
FDNS	06ALL		1 13G	G13_013	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.07197	105.2227	BUSHLAND INTERCHANGE - WILDOR2_JUS6230.00 230KV CKT 1 &G13_017T 345.00 - G13_017_1 345.00 345KV CKT 1		
FDNS	06ALL		1 13G	G13_013	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.07197	105.1798	BUFFALO 230.00 - G06-47 230.00 230KV CKT 1 &G13_017T 345.00 - G13_017_1 345.00 345KV CKT 1		
FDNS	06ALL		1 13G	G13_013	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.07197	105.1774	BUSHLAND INTERCHANGE - WILDOR2_JUS6230.00 230KV CKT 1 &G13_017T 345.00 - G13_017_1 345.00 345KV CKT 1		
FDNS	06ALL		1 13G	G13_013	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.07197	105.1429	G13_017T 345.00 - G13_017_1 345.00 345KV CKT 1 &BEAVER CO 345.00 - G11_014_1 345.00 345KV CKT 1		
FDNS	06ALL		1 13G	G13_013	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.07197	105.1345	BUFFALO 230.00 - G06-47 230.00 230KV CKT 1 &G13_017T 345.00 - G13_017_1 345.00 345KV CKT 1		
FDNS	06ALL		1 13G	G13_013	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.07197	105.0973	G13_017T 345.00 - G13_017_1 345.00 345KV CKT 1 &BEAVER CO 345.00 - G11_014_1 345.00 345KV CKT 1		
FDNS	06ALL		1 13G	G13_013	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.07197	104.7539	CHAVESCO 345.00 - G08-22 345.00 345KV CKT 1 &G13_017T 345.00 - G13_017_1 345.00 345KV CKT 1		
FDNS	06ALL		1 13G	G13_013	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.07197	104.7086	CHAVESCO 345.00 - G08-22 345.00 345KV CKT 1 &G13_017T 345.00 - G13_017_1 345.00 345KV CKT 1		
FDNS	06ALL		1 13G	G13_013	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.07197	104.5802	WILDOR2_JUS6230.00 - WILDORADO WIND GEN 230KV CKT 1 &G13_017T 345.00 - G13_017_1 345.00 345KV CKT 1		
FDNS	06ALL		1 13G	G13_013	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.07197	104.5349	WILDOR2_JUS6230.00 - WILDORADO WIND GEN 230KV CKT 1 &G13_017T 345.00 - G13_017_1 345.00 345KV CKT 1		
FDNS	06ALL		1 13G	G13_013	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.07197	104.2351	G13_017T 345.00 - G13_017_1 345.00 345KV CKT 1 &G11_012T 230.00 - G11_012_1 230.00 230KV CKT 1		

SOLUTION	GROUP	SCENARIO	SEASON	SOURCE	DIRECTION	MONITORED ELEMENT	RATEB (MVA)	TDF	TC%LOADING (% MVA)	CONTINGENCY
FDNS	06ALL		1 13G	G13_013	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.07077	102.9701	TOLK STATION TAP - TOLK STATION WEST 230KV CKT 1 &G13_017T 345.00 - G13_017_1 345.00 345KV CKT 1
FDNS	06ALL		1 13G	G13_013	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.07065	112.5516	DEAF SMITH COUNTY INTERCHANGE - PLANT X STATION 230KV CKT 1 &G13_013T 345.00 - TOLK STATION 345KV CKT 1
FDNS	06ALL		1 13G	G13_013	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.07065	112.5054	DEAF SMITH COUNTY INTERCHANGE - PLANT X STATION 230KV CKT 1 &G13_013T 345.00 - TOLK STATION 345KV CKT 1
FDNS	06ALL		1 13G	G13_013	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.07038	116.9196	G07-48T 230.00 - SWISHER COUNTY INTERCHANGE 230KV CKT 1 &G12-020 230.00 - TUCO INTERCHANGE 230KV CKT 1
FDNS	06ALL		1 13G	G13_013	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.07038	116.8595	G07-48T 230.00 - SWISHER COUNTY INTERCHANGE 230KV CKT 1 &G12-020 230.00 - TUCO INTERCHANGE 230KV CKT 1
FDNS	06ALL		1 13G	G13_013	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.07038	115.4612	AMARILLO SOUTH INTERCHANGE - G07-48T 230.00 230KV CKT 1 &G12-020 230.00 - TUCO INTERCHANGE 230KV CKT 1
FDNS	06ALL		1 13G	G13_013	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.07038	115.3607	AMARILLO SOUTH INTERCHANGE - G07-48T 230.00 230KV CKT 1 &G12-020 230.00 - TUCO INTERCHANGE 230KV CKT 1
FDNS	06ALL		1 13G	G13_013	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.07038	103.559	G07-48T 230.00 - SWISHER COUNTY INTERCHANGE 230KV CKT 1 &G13_017T 345.00 - G13_017_1 345.00 345KV CKT 1
FDNS	06ALL		1 13G	G13_013	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.07038	103.514	G07-48T 230.00 - SWISHER COUNTY INTERCHANGE 230KV CKT 1 &G13_017T 345.00 - G13_017_1 345.00 345KV CKT 1
FDNS	06ALL		1 13G	G13_013	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.07038	102.2053	AMARILLO SOUTH INTERCHANGE - G07-48T 230.00 230KV CKT 1 &G13_017T 345.00 - G13_017_1 345.00 345KV CKT 1
FDNS	06ALL		1 13G	G13_013	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.07038	102.1606	AMARILLO SOUTH INTERCHANGE - G07-48T 230.00 230KV CKT 1 &G13_017T 345.00 - G13_017_1 345.00 345KV CKT 1
FDNS	06ALL		1 13G	G13_013	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.06765	112.4775	PLANT X STATION - TOLK STATION EAST 230KV CKT 2 &G12-020 230.00 - TUCO INTERCHANGE 230KV CKT 1
FDNS	06ALL		1 13G	G13_013	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.06765	112.119	PLANT X STATION - TOLK STATION EAST 230KV CKT 2 &G12-020 230.00 - TUCO INTERCHANGE 230KV CKT 1
FDNS	06ALL		1 13G	G13_013	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.06765	100.0508	PLANT X STATION - TOLK STATION EAST 230KV CKT 2 &G13_017T 345.00 - G13_017_1 345.00 345KV CKT 1
FDNS	06ALL		1 13G	G13_013	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.06765	100	PLANT X STATION - TOLK STATION EAST 230KV CKT 2 &G13_017T 345.00 - G13_017_1 345.00 345KV CKT 1
FDNS	06ALL		1 13G	G13_013	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.06763	113.0158	PLANT X STATION - TOLK STATION WEST 230KV CKT 1 &G12-020 230.00 - TUCO INTERCHANGE 230KV CKT 1
FDNS	06ALL		1 13G	G13_013	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.06763	113.0158	PLANT X STATION - TOLK STATION WEST 230KV CKT 2 &G12-020 230.00 - TUCO INTERCHANGE 230KV CKT 1
FDNS	06ALL		1 13G	G13_013	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.06763	112.6076	PLANT X STATION - TOLK STATION WEST 230KV CKT 1 &G12-020 230.00 - TUCO INTERCHANGE 230KV CKT 1
FDNS	06ALL		1 13G	G13_013	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.06763	112.6076	PLANT X STATION - TOLK STATION WEST 230KV CKT 2 &G12-020 230.00 - TUCO INTERCHANGE 230KV CKT 1
FDNS	06ALL		1 13G	G13_013	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.06763	100.3024	PLANT X STATION - TOLK STATION WEST 230KV CKT 1 &G13_017T 345.00 - G13_017_1 345.00 345KV CKT 1
FDNS	06ALL		1 13G	G13_013	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.06763	100.3024	PLANT X STATION - TOLK STATION WEST 230KV CKT 2 &G13_017T 345.00 - G13_017_1 345.00 345KV CKT 1
FDNS	06ALL		1 13G	G13_013	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.06763	100.2857	PLANT X STATION - TOLK STATION WEST 230KV CKT 1 &G13_017T 345.00 - G13_017_1 345.00 345KV CKT 1
FDNS	06ALL		1 13G	G13_013	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.06763	100.2857	PLANT X STATION - TOLK STATION WEST 230KV CKT 2 &G13_017T 345.00 - G13_017_1 345.00 345KV CKT 1
FDNS	06NR		1 13G	G13_013	FROM->TO	DEAF SMITH COUNTY INTERCHANGE - Panda Energy Substation Hereford 115KV CKT 1	96	0.06195	139.0123	PLANT X STATION - POTTER COUNTY INTERCHANGE 230KV CKT 1 &BUFFALO 230.00 - BUSHLAND INTERCHANGE 230KV CKT 1
FDNS	06NR		1 13G	G13_013	FROM->TO	DEAF SMITH COUNTY INTERCHANGE - Panda Energy Substation Hereford 115KV CKT 1	96	0.06195	123.1956	PLANT X STATION - POTTER COUNTY INTERCHANGE 230KV CKT 1 &BUFFALO 230.00 - DEAF SMITH COUNTY INTERCHANGE 230KV CKT 1
FDNS	06ALL		1 13G	G13_013	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.06155	101.7096	PLANT X STATION - POTTER COUNTY INTERCHANGE 230KV CKT 1 &G13_013T 345.00 - TOLK STATION 345KV CKT 1
FDNS	06ALL		1 13G	G13_013	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.06155	101.665	PLANT X STATION - POTTER COUNTY INTERCHANGE 230KV CKT 1 &G13_013T 345.00 - TOLK STATION 345KV CKT 1
FDNS	06NR		1 13G	G13_013	FROM->TO	TERRY COUNTY INTERCHANGE - WOLFFORTH INTERCHANGE 115KV CKT 1	138	0.06086	149.1052	TOLK STATION EAST - TUCO INTERCHANGE 230KV CKT 1 &SUNDOWN INTERCHANGE - WOLFFORTH INTERCHANGE 230KV CKT 1
FDNS	00NR		1 13SP	G13_013	FROM->TO	ROOSEVELT COUNTY INTERCHANGE (ABB LMM60042) 230/115/13.2KV TRANSFORMER CKT 1	252	0.05945	128.8277	OASIS INTERCHANGE - Roosevelt County Interchange SWITCH #4K33 230KV CKT 1 &CHAVESCO 345.00 - EDDY COUNTY INTERCHANGE 345KV CKT 1
FDNS	00NR		1 13SP	G13_013	FROM->TO	ROOSEVELT COUNTY INTERCHANGE (ABB LMM60042) 230/115/13.2KV TRANSFORMER CKT 1	252	0.05945	127.5683	OASIS INTERCHANGE - Roosevelt County Interchange SWITCH #4K33 230KV CKT 1 &CHAVESCO 345.00 - EDDY COUNTY INTERCHANGE 345KV CKT 1
FDNS	00NR		1 13SP	G13_013	FROM->TO	ROOSEVELT COUNTY INTERCHANGE (ABB LMM60042) 230/115/13.2KV TRANSFORMER CKT 1	252	0.05945	125.5901	OASIS INTERCHANGE - Roosevelt County Interchange SWITCH #4K33 230KV CKT 1 &CHAVESCO 345.00 - G13_013T 345.00 345KV CKT 1
FDNS	00NR		1 13SP	G13_013	FROM->TO	ROOSEVELT COUNTY INTERCHANGE (ABB LMM60042) 230/115/13.2KV TRANSFORMER CKT 1	252	0.05945	124.5821	OASIS INTERCHANGE - Roosevelt County Interchange SWITCH #4K33 230KV CKT 1 &CHAVESCO 345.00 - G13_013T 345.00 345KV CKT 1
FDNS	06NR		1 13G	G13_013	FROM->TO	DEAF SMITH COUNTY INTERCHANGE - Panda Energy Substation Hereford 115KV CKT 1	96	0.05438	130.2353	BUFFALO 230.00 - BUSHLAND INTERCHANGE 230KV CKT 1 &TOLK STATION EAST - TUCO INTERCHANGE 230KV CKT 1
FDNS	06NR		1 13G	G13_013	FROM->TO	DEAF SMITH COUNTY INTERCHANGE - Panda Energy Substation Hereford 115KV CKT 1	96	0.05438	116.7218	BUFFALO 230.00 - DEAF SMITH COUNTY INTERCHANGE 230KV CKT 1 &TOLK STATION EAST - TUCO INTERCHANGE 230KV CKT 1
FDNS	06NR		1 13G	G13_013	FROM->TO	DEAF SMITH COUNTY INTERCHANGE - Panda Energy Substation Hereford 115KV CKT 1	96	0.04856	104.992	BUFFALO 230.00 - BUSHLAND INTERCHANGE 230KV CKT 1 &AMARILLO SOUTH INTERCHANGE - G07-48T 230.00 230KV CKT 1
FDNS	06NR		1 13G	G13_013	FROM->TO	DEAF SMITH COUNTY INTERCHANGE - Panda Energy Substation Hereford 115KV CKT 1	96	0.0468	100.2304	BUFFALO 230.00 - BUSHLAND INTERCHANGE 230KV CKT 1 &SUNDOWN INTERCHANGE - WOLFFORTH INTERCHANGE 230KV CKT 1

SOLUTION	GROUP	SCENARIO	SEASON	SOURCE	DIRECTION	MONITORED ELEMENT	RATEB		TC%LOADING		CONTINGENCY	
							(MVA)	TDF	(% MVA)			
FDNS	06ALL		1 13G	G13_013	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.04403	112.1595	G13_013T	345.00 - TOLK STATION 345KV CKT 1 &G12-020	230.00 - TUCO INTERCHANGE 230KV CKT 1
FDNS	06ALL		1 13G	G13_013	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.04403	112.136	G13_013T	345.00 - TOLK STATION 345KV CKT 1 &G12-020	230.00 - TUCO INTERCHANGE 230KV CKT 1
FDNS	06NR		1 13G	G13_013	FROM->TO	DEAF SMITH COUNTY INTERCHANGE - Panda Energy Substation Hereford 115KV CKT 1	96	0.04391	103.0523	BUFFALO	230.00 - BUSHLAND INTERCHANGE 230KV CKT 1 &G13_017T	345.00 - TUCO INTERCHANGE 345KV CKT 1
FDNS	06NR		1 13G	G13_013	FROM->TO	DEAF SMITH COUNTY INTERCHANGE - Panda Energy Substation Hereford 115KV CKT 1	96	0.04294	117.0241	BUFFALO	230.00 - BUSHLAND INTERCHANGE 230KV CKT 1 &G12-020	230.00 - TUCO INTERCHANGE 230KV CKT 1
FDNS	06NR		1 13G	G13_013	FROM->TO	DEAF SMITH COUNTY INTERCHANGE - Panda Energy Substation Hereford 115KV CKT 1	96	0.04294	106.0688	BUFFALO	230.00 - BUSHLAND INTERCHANGE 230KV CKT 1 &G13_017T	345.00 - G13_017_1 345.00 345KV CKT 1
FDNS	06NR		1 13G	G13_013	FROM->TO	DEAF SMITH COUNTY INTERCHANGE - Panda Energy Substation Hereford 115KV CKT 1	96	0.04294	105.01	BUFFALO	230.00 - DEAF SMITH COUNTY INTERCHANGE 230KV CKT 1 &G12-020	230.00 - TUCO INTERCHANGE 230KV CKT 1
FDNS	06NR		1 13G	G13_013	FROM->TO	DEAF SMITH COUNTY INTERCHANGE - Panda Energy Substation Hereford 115KV CKT 1	96	0.04294	100.9854	FINNEY SWITCHING STATION - G08-18	345.00 345KV CKT 1 &BUFFALO	230.00 - BUSHLAND INTERCHANGE 230KV CKT 1
FDNS	06NR		1 13G	G13_013	FROM->TO	DEAF SMITH COUNTY INTERCHANGE - Panda Energy Substation Hereford 115KV CKT 1	96	0.04294	100.3778	G10-14	345.00 - Hitchland Interchange 345KV CKT 1 &BUFFALO	230.00 - BUSHLAND INTERCHANGE 230KV CKT 1
FDNS	06NR		1 13G	G13_013	FROM->TO	DEAF SMITH COUNTY INTERCHANGE - Panda Energy Substation Hereford 115KV CKT 1	96	0.04294	99.9	G08-51	345.00 - POTTER COUNTY INTERCHANGE 345KV CKT 1 &BUFFALO	230.00 - BUSHLAND INTERCHANGE 230KV CKT 1
FDNS	06ALL		1 13G	G13_013	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.04258	111.9514	LAMB COUNTY INTERCHANGE - TOLK STATION WEST 230KV CKT 1 &G13_013T	345.00 - TOLK STATION 345KV CKT 1	
FDNS	06ALL		1 13G	G13_013	FROM->TO	PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	239	0.04258	111.9046	LAMB COUNTY INTERCHANGE - TOLK STATION WEST 230KV CKT 1 &G13_013T	345.00 - TOLK STATION 345KV CKT 1	
FDNS	00NR		1 23SP	G13_013	FROM->TO	EDDY COUNTY INTERCHANGE (WH XHS70551) 230/115/13.2KV TRANSFORMER CKT 1	167	0.03111	101.9609	EDDY COUNTY INTERCHANGE - SEVEN RIVERS INTERCHANGE 230KV CKT 1 &PECOS INTERCHANGE - POTASH JUNCTION INTERCHANGE 230KV CKT 1		
FDNS	03ALL		1 13G	G13_014	FROM->TO	HITCHLAND INTERCHANGE (H TP80148301) 230/115/13.2KV TRANSFORMER CKT 1	250	0.04455	101.0943	Hitchland Interchange - POTTER COUNTY INTERCHANGE 345KV CKT 1 &G11_012T	230.00 - MOORE COUNTY INTERCHANGE 230KV CKT 1	
FDNS	03ALL		1 13G	G13_014	FROM->TO	HITCHLAND INTERCHANGE (H TP80148301) 230/115/13.2KV TRANSFORMER CKT 1	250	0.04455	100	Hitchland Interchange - POTTER COUNTY INTERCHANGE 345KV CKT 1 &G11_012T	230.00 - MOORE COUNTY INTERCHANGE 230KV CKT 1	
FDNS	03ALL		1 13G	G13_015	FROM->TO	HITCHLAND INTERCHANGE (H TP80148301) 230/115/13.2KV TRANSFORMER CKT 1	250	0.04525	101.0943	Hitchland Interchange - POTTER COUNTY INTERCHANGE 345KV CKT 1 &G11_012T	230.00 - MOORE COUNTY INTERCHANGE 230KV CKT 1	
FDNS	03ALL		1 13G	G13_015	FROM->TO	HITCHLAND INTERCHANGE (H TP80148301) 230/115/13.2KV TRANSFORMER CKT 1	250	0.04525	100	Hitchland Interchange - POTTER COUNTY INTERCHANGE 345KV CKT 1 &G11_012T	230.00 - MOORE COUNTY INTERCHANGE 230KV CKT 1	
FDNS	00NR		1 23SP	G13_017	FROM->TO	Jones Station Bus#2 - LUBBOCK SOUTH INTERCHANGE 230KV CKT 2	502	0.11109	101.0258	CARLISLE INTERCHANGE - TUCO INTERCHANGE 230KV CKT 1 &JONES STATION - LUBBOCK SOUTH INTERCHANGE 230KV CKT 1		
FDNS	00NR		1 18SP	G13_017	FROM->TO	Jones Station Bus#2 - LUBBOCK SOUTH INTERCHANGE 230KV CKT 2	502	0.10499	100.2334	CARLISLE INTERCHANGE - TUCO INTERCHANGE 230KV CKT 1 &JONES STATION - LUBBOCK SOUTH INTERCHANGE 230KV CKT 1		
FDNS	00NR		1 23SP	G13_017	FROM->TO	Jones Station Bus#2 - LUBBOCK SOUTH INTERCHANGE 230KV CKT 2	502	0.09034	113.406	JONES STATION - LUBBOCK SOUTH INTERCHANGE 230KV CKT 1 &Jones Station Bus#2 - LUBBOCK EAST INTERCHANGE 230KV CKT 1		
FDNS	00NR		1 23SP	G13_017	FROM->TO	TUCO INTERCHANGE (GE M102345) 230/115/13.2KV TRANSFORMER CKT 1	252	0.09024	101.1818	JONES STATION - LUBBOCK SOUTH INTERCHANGE 230KV CKT 1 &JONES STATION - Jones Station Bus#2 230KV CKT 1		
FDNS	00NR		1 18SP	G13_017	FROM->TO	Jones Station Bus#2 - LUBBOCK SOUTH INTERCHANGE 230KV CKT 2	502	0.08347	112.7235	JONES STATION - LUBBOCK SOUTH INTERCHANGE 230KV CKT 1 &Jones Station Bus#2 - LUBBOCK EAST INTERCHANGE 230KV CKT 1		
FDNS	00NR		1 18SP	G13_017	FROM->TO	WOLFFORTH INTERCHANGE (WH 7001668) 230/115/13.2KV TRANSFORMER CKT 1	168	0.04057	100.9628	CARLISLE INTERCHANGE - TUCO INTERCHANGE 230KV CKT 1 &SUNDOWN INTERCHANGE - WOLFFORTH INTERCHANGE 230KV CKT 1		
FDNS	03ALL		1 13G	G13_018	FROM->TO	HITCHLAND INTERCHANGE (H TP80148301) 230/115/13.2KV TRANSFORMER CKT 1	250	0.04149	101.0943	Hitchland Interchange - POTTER COUNTY INTERCHANGE 345KV CKT 1 &G11_012T	230.00 - MOORE COUNTY INTERCHANGE 230KV CKT 1	
FDNS	03ALL		1 13G	G13_018	FROM->TO	HITCHLAND INTERCHANGE (H TP80148301) 230/115/13.2KV TRANSFORMER CKT 1	250	0.04149	100	Hitchland Interchange - POTTER COUNTY INTERCHANGE 345KV CKT 1 &G11_012T	230.00 - MOORE COUNTY INTERCHANGE 230KV CKT 1	

J: Group 1 Dynamic Stability Analysis Report

See S&C Electric Company report on next page.



S&C ELECTRIC COMPANY

Excellence Through Innovation

DISIS-2013-001 (GROUP 1)

LITTLE ROCK, AR

SOUTHWEST POWER POOL (SPP)

DEFINITIVE INTERCONNECTION SYSTEM IMPACT STUDY

S&C PROJECT NUMBER: 7324

REVISION: 0

PRELIMINARY REPORT

CONFIDENTIAL

JULY 23, 2013



S&C ELECTRIC COMPANY

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TABLE OF CONTENTS

1. Executive Summary 4

2. Introduction 5

3. Transmission System and Study Area..... 6

4. Power Flow Base Cases 7

5. Power Flow Model 8

6. Transient Stability Analysis 9

 6.1. Stability Criteria 15

 6.2. Transient Stability Results..... 16

7. Conclusions and Recommendations..... 19

LIST OF APPENDICES

- Appendix A: Southwest Power Pool Disturbance Performance Requirements
- Appendix B: Transient Stability Plots For Summer 2014 Peak Case
- Appendix C: Transient Stability Plots For Winter 2014 Peak Case
- Appendix D: Transient Stability Plots For Summer 2023 Peak Case
- Appendix E: Generator Rotor Angle of Generators for Angular Oscillation Stability
- Appendix F: Voltage at the POI of the Study Projects for Transient Voltage Recovery Stability



1. EXECUTIVE SUMMARY

S&C Electric Company has performed a Definitive Impact Study DISIS-2013-001 (Group 1) in response to a request through the Southwest Power Pool (SPP) tariff studies. Group 1 includes one generation interconnection project. GEN-2013-003 is a 48 MW generation expansion in the existing generation facility GEN-2012-016.

Group 1 and prior-queued projects specified in the scope of work were studied at 100% output power using the 2014 Summer and Winter peak cases, and 2023 Summer peak case provided by SPP.

SPP requires that interconnection request projects meet a voltage schedule at the point of interconnection (POI) consistent with the voltage in the SPP base case or nominal voltage, whichever is higher. Transient stability analysis indicated that Group 1 is expected to successfully ride-through each N-1 and N-2 fault contingency specified by SPP and the nearby areas will retain angular, frequency and voltage stability. Group 1 is expected to successfully interconnect into the transmission system at the desired location without reduction in output power. Furthermore, the study project and nearby generators in the study area meet rotor angular damping and transient voltage recovery requirements as specified in Appendix A.



2. INTRODUCTION

S&C Electric Company has performed a Definitive Interconnection System Impact Study DISIS-2013-001 (Group 1) in response to a request through the Southwest Power Pool (SPP) Tariff studies. Group 1 includes projects listed in Table 1.

Table 1: Study Projects in Group 1

Project	Size	Generator Model	Point of Interconnection
GEN-2013-003	328 MW Summer 360 MW Winter (see note)	GENROU (583323 , 583326)	Tap Woodward (515375)-Thistle (539801) 345-kV line (562286)

NOTE: GEN-2013-003 is a 48MW increase to GEN-2012-016 (see Prior Queued Projects table).

Group 1 and prior-queued projects were studied at 100% output power using 2014 Summer and Winter peak cases, and 2023 Summer peak case provided by SPP.



3. TRANSMISSION SYSTEM AND STUDY AREA

The study projects in Group 1 will interconnect into Oklahoma Gas and Electric (OKGE). In addition to OKGE, the following areas were also monitored:

- AEP West (AEPW)
- Southwestern Public Service (SPS)
- Western Farmers Electric Cooperative (WFEC)
- Midwest Energy, Inc. (MIDW)
- Sunflower Electric Power Company (SUNC)
- Westar Energy, Inc. (WERE)



4. POWER FLOW BASE CASES

The following power flow base cases were provided by SPP:

MDWG12-14SP_DIS13-01_G01 – 2014 Summer peak case, which includes aggregate representation of interconnect requests for DISIS-2013-001 (Group 1) and prior-queued projects at 100% output power.

MDWG12-14W1_DIS13-01_G01 – 2014 Winter peak case, which includes aggregate representation of interconnect requests for DISIS-2013-001 (Group 1) and prior-queued projects at 100% output power.

MDWG12-23SP_DIS13-01_G01 – 2023 Summer peak case, which includes aggregate representation of interconnect requests for DISIS-2013-001 (Group 1) and prior-queued projects at 100% output power.



5. POWER FLOW MODEL

Definitive Impact Study DISIS-2013-001 (Group 1) and prior-queued projects were modeled as aggregates of generating units. The aggregate models were part of the base case supplied by SPP. Figure 1 depicts simplified one-line diagrams for the study project GEN-2013-003.

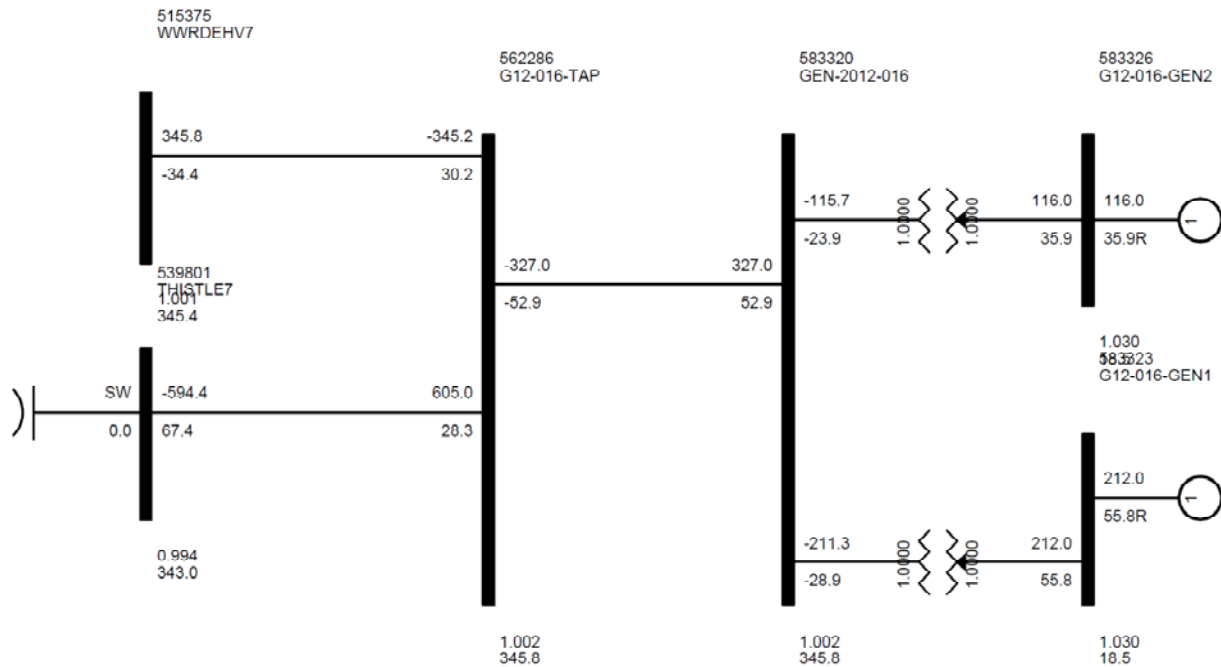


Fig.1. Simplified one-line diagrams for study projects GEN-2013-003.



6. TRANSIENT STABILITY ANALYSIS

Transient stability analysis was performed for the fault contingencies listed in Table 5, which were specified by SPP.

Table 5: SPP-specified fault contingencies

Cont. No.	Cont. Name	Description
1	FLT01-3PH	3 phase fault on the GEN-2012-016 (562286) to Woodward (515375) 345 kV line, near GEN-2012-016. a. Apply fault at the GEN-2012-016 345 kV bus. b. Clear fault after 5 cycles by tripping the faulted line. c. Wait 20 cycles, and then re-close the line in (b) back into the fault. d. Leave fault on for 5 cycles, then trip the line in (b) and remove fault.
2	FLT02-1PH	<i>Single phase fault and sequence like previous</i>
3	FLT03-3PH	3 phase fault on the GEN-2012-016 (562286) to Thistle (539801) 345 kV line, near GEN-2012-016. a. Apply fault at the GEN-2012-016 345 kV bus. b. Clear fault after 5 cycles by tripping the faulted line. c. Wait 20 cycles, and then re-close the line in (b) back into the fault. d. Leave fault on for 5 cycles, then trip the line in (b) and remove fault.
4	FLT04-1PH	<i>Single phase fault and sequence like previous</i>
5	FLT05-3PH	3 phase fault on the Woodward (515375) to Border (515458) 345 kV line, near Woodward. a. Apply fault at the Woodward 345 kV bus. b. Clear fault after 5 cycles by tripping the faulted line. c. Wait 20 cycles, and then re-close the line in (b) back into the fault. d. Leave fault on for 5 cycles, then trip the line in (b) and remove fault.
6	FLT06-1PH	<i>Single phase fault and sequence like previous</i>
7	FLT07-3PH	3 phase fault on the Woodward (515375) to Beaver County (580500) 345 kV ckt 1, near Woodward. a. Apply fault at the Woodward 345 kV bus. b. Clear fault after 5 cycles by tripping the faulted line. c. Wait 20 cycles, and then re-close the line in (b) back into the fault. d. Leave fault on for 5 cycles, then trip the line in (b) and remove fault.
8	FLT08-1PH	<i>Single phase fault and sequence like previous</i>
9	FLT09-3PH	3 phase fault on the GEN-2011-051 Tap (562075) to Woodward (515375) 345 kV line, near GEN-2011-051 Tap. a. Apply fault at the GEN-2011-051 Tap 345 kV bus. b. Clear fault after 5 cycles by tripping the faulted line. c. Wait 20 cycles, and then re-close the line in (b) back into the fault. d. Leave fault on for 5 cycles, then trip the line in (b) and remove fault.
10	FLT10-1PH	<i>Single phase fault and sequence like previous</i>
11	FLT11-3PH	3 phase fault on the GEN-2011-051 Tap (562075) to Tatonga (515407) 345 kV line, near GEN-2011-051 Tap. a. Apply fault at the GEN-2011-051 Tap 345 kV bus. b. Clear fault after 5 cycles by tripping the faulted line. c. Wait 20 cycles, and then re-close the line in (b) back into the fault. d. Leave fault on for 5 cycles, then trip the line in (b) and remove fault.
12	FLT12-1PH	<i>Single phase fault and sequence like previous</i>



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Cont. No.	Cont. Name	Description
13	FLT13-3PH	3 phase fault on the Tatonga (515407) to Mathewson (560368) 345 kV ckt 1, near Tatonga. a. Apply fault at the Tatonga 345 kV bus. b. Clear fault after 5 cycles by tripping the faulted line. c. Wait 20 cycles, and then re-close the line in (b) back into the fault. d. Leave fault on for 5 cycles, then trip the line in (b) and remove fault.
14	FLT14-1PH	<i>Single phase fault and sequence like previous</i>
15	FLT15-3PH	3 phase fault on the Wichita (532796) to Benton (532791) 345 kV line, near Wichita. a. Apply fault at the Wichita 345 kV bus. b. Clear fault after 5 cycles by tripping the faulted line. c. Wait 20 cycles, and then re-close the line in (b) back into the fault. d. Leave fault on for 5 cycles, then trip the line in (b) and remove fault.
16	FLT16-1PH	<i>Single phase fault and sequence like previous</i>
17	FLT17-3PH	3 phase fault on the Beaver (580500) to Hitchland (523097) 345 kV line, near Beaver. a. Apply fault at the Beaver 345 kV bus. b. Clear fault after 5 cycles by tripping the faulted line. c. Wait 20 cycles, and then re-close the line in (b) back into the fault. d. Leave fault on for 5 cycles, then trip the line in (b) and remove fault.
18	FLT18-1PH	<i>Single phase fault and sequence like previous</i>
19	FLT19-3PH	3 phase fault on the Beaver (580500) to Buckner (531501) 345 kV line, near Beaver. a. Apply fault at the Beaver 345 kV bus. b. Clear fault after 5 cycles by tripping the faulted line. c. Wait 20 cycles, and then re-close the line in (b) back into the fault. d. Leave fault on for 5 cycles, then trip the line in (b) and remove fault.
20	FLT20-1PH	<i>Single phase fault and sequence like previous</i>
21	FLT21-3PH	3 phase fault on the Wichita (532796) to Reno (532771) 345 kV line, near Wichita. a. Apply fault at the Wichita 345 kV bus. b. Clear fault after 5 cycles by tripping the faulted line. c. Wait 20 cycles, and then re-close the line in (b) back into the fault. d. Leave fault on for 5 cycles, then trip the line in (b) and remove fault.
22	FLT22-1PH	<i>Single phase fault and sequence like previous</i>
23	FLT23-3PH	3 phase fault on the Wichita (532796) to Viola (532798) 345 kV line, near Wichita. a. Apply fault at the Wichita 345 kV bus. b. Clear fault after 5 cycles by tripping the faulted line. c. Wait 20 cycles, and then re-close the line in (b) back into the fault. d. Leave fault on for 5 cycles, then trip the line in (b) and remove fault.
24	FLT24-1PH	<i>Single phase fault and sequence like previous</i>
25	FLT25-3PH	3 phase fault on the Thistle (539801) to Wichita (532796) 345 kV line ckt1, near Thistle. a. Apply fault at the Thistle 345 kV bus. b. Clear fault after 5 cycles by tripping the faulted line. c. Wait 20 cycles, and then re-close the line in (b) back into the fault. d. Leave fault on for 5 cycles, then trip the line in (b) and remove fault.
26	FLT26-1PH	<i>Single phase fault and sequence like previous</i>
27	FLT27-3PH	3 phase fault on the Thistle (539801) to Clark County (539800) 345 kV line ckt1, near Thistle. a. Apply fault at the Thistle 345 kV bus. b. Clear fault after 5 cycles by tripping the faulted line. c. Wait 20 cycles, and then re-close the line in (b) back into the fault. d. Leave fault on for 5 cycles, then trip the line in (b) and remove fault.



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Cont. No.	Cont. Name	Description
28	FLT28-1PH	<i>Single phase fault and sequence like previous</i>
29	FLT29-3PH	3 phase fault on the Clark County (539800) to Spearville (531469) 345 kV line ckt2, near Clark County. a. Apply fault at the Clark County 345 kV bus. b. Clear fault after 5 cycles by tripping the faulted line. c. Wait 20 cycles, and then re-close the line in (b) back into the fault. d. Leave fault on for 5 cycles, then trip the line in (b) and remove fault.
30	FLT30-1PH	<i>Single phase fault and sequence like previous</i>
31	FLT31-3PH	3 phase fault on the Woodward (515375) to Thistle (539801) 345 kV line ckt 2, near Woodward. a. Apply fault at the Woodward 345 kV bus. b. Clear fault after 5 cycles by tripping the faulted line. c. Wait 20 cycles, and then re-close the line in (b) back into the fault. d. Leave fault on for 5 cycles, then trip the line in (b) and remove fault.
32	FLT32-1PH	<i>Single phase fault and sequence like previous</i>
33	FLT33-3PH	3 phase fault on the Buckner (531501) to Spearville (531469) 345 kV line, near Buckner. a. Apply fault at the Buckner 345 kV bus. b. Clear fault after 5 cycles by tripping the faulted line. c. Wait 20 cycles, and then re-close the line in (b) back into the fault. d. Leave fault on for 5 cycles, then trip the line in (b) and remove fault.
34	FLT34-1PH	<i>Single phase fault and sequence like previous</i>
35	FLT35-3PH	3 phase fault on the Border (515458) to Sweetwater (562335) 345 kV line, near Border. a. Apply fault at the Border 345 kV bus. b. Clear fault after 5 cycles by tripping the faulted line. c. Wait 20 cycles, and then re-close the line in (b) back into the fault. d. Leave fault on for 5 cycles, then trip the line in (b) and remove fault.
36	FLT36-1PH	<i>Single phase fault and sequence like previous</i>
37	FLT37-3PH	3 phase fault on the TUCO (525832) to GEN-2012-038 Tap (562309) 345 kV line, near TUCO. a. Apply fault at the TUCO 345 kV bus. b. Clear fault after 5 cycles by tripping the faulted line. c. Wait 20 cycles, and then re-close the line in (b) back into the fault. d. Leave fault on for 5 cycles, then trip the line in (b) and remove fault.
38	FLT38-1PH	<i>Single phase fault and sequence like previous</i>
39	FLT39-3PH	3 phase fault on the Border (515458) to Sweetwater (562335) 345 kV line, near Border. a. Apply fault at the Border 345 kV bus. b. Clear fault after 5 cycles by tripping the faulted line. c. Wait 20 cycles, and then re-close the line in (b) back into the fault. d. Leave fault on for 5 cycles, then trip the line in (b) and remove fault.
40	FLT40-1PH	<i>Single phase fault and sequence like previous</i>
41	FLT41-3PH	3 phase fault on the Sweetwater (562335) to GEN-2012-038 Tap (562309) 345 kV line, near Sweetwater. a. Apply fault at the Sweetwater 345 kV bus. b. Clear fault after 5 cycles by tripping the faulted line. c. Wait 20 cycles, and then re-close the line in (b) back into the fault. d. Leave fault on for 5 cycles, then trip the line in (b) and remove fault.
42	FLT42-1PH	<i>Single phase fault and sequence like previous</i>



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Cont. No.	Cont. Name	Description
43	FLT43-3PH	3 phase fault on the Mooreland (520999) to Glass Mountain (514788) 138 kV line, near Mooreland. a. Apply fault at the Mooreland 138 kV bus. b. Clear fault after 5 cycles by tripping the faulted line. c. Wait 20 cycles, and then re-close the line in (b) back into the fault. d. Leave fault on for 5 cycles, then trip the line in (b) and remove fault.
44	FLT44-1PH	<i>Single phase fault and sequence like previous</i>
45	FLT45-3PH	3 phase fault on the Mooreland (520999) to Knob Hill (514795) 138 kV line, near Mooreland. a. Apply fault at the Mooreland 138 kV bus. b. Clear fault after 5 cycles by tripping the faulted line. c. Wait 20 cycles, and then re-close the line in (b) back into the fault. d. Leave fault on for 5 cycles, then trip the line in (b) and remove fault.
46	FLT46-1PH	<i>Single phase fault and sequence like previous</i>
47	FLT47-3PH	3 phase fault on the Mooreland (520999) to Wind Farm Tap (515785) 138 kV line, near Mooreland. a. Apply fault at the Mooreland 138 kV bus. b. Clear fault after 5 cycles by tripping the faulted line. c. Wait 20 cycles, and then re-close the line in (b) back into the fault. d. Leave fault on for 5 cycles, then trip the line in (b) and remove fault.
48	FLT48-1PH	<i>Single phase fault and sequence like previous</i>
49	FLT49-3PH	3 phase fault on the Mooreland (520999) to Cedardale (520848) 138 kV line, near Mooreland. a. Apply fault at the Mooreland 138 kV bus. b. Clear fault after 5 cycles by tripping the faulted line. c. Wait 20 cycles, and then re-close the line in (b) back into the fault. d. Leave fault on for 5 cycles, then trip the line in (b) and remove fault.
50	FLT50-1PH	<i>Single phase fault and sequence like previous</i>
51	FLT51-3PH	3 phase fault on the Mooreland (520999) to Iodine (520957) 138 kV line, near Mooreland. a. Apply fault at the Mooreland 138 kV bus. b. Clear fault after 5 cycles by tripping the faulted line. c. Wait 20 cycles, and then re-close the line in (b) back into the fault. d. Leave fault on for 5 cycles, then trip the line in (b) and remove fault.
52	FLT52-1PH	<i>Single phase fault and sequence like previous</i>
53	FLT53-3PH	3 phase fault on the Mooreland (520999) to Taloga (521065) 138 kV line, near Mooreland. a. Apply fault at the Mooreland 138 kV bus. b. Clear fault after 5 cycles by tripping the faulted line. c. Wait 20 cycles, and then re-close the line in (b) back into the fault. d. Leave fault on for 5 cycles, then trip the line in (b) and remove fault.
54	FLT54-1PH	<i>Single phase fault and sequence like previous</i>
55	FLT55-3PH	3 phase fault on the Mooreland (520999) to Nine Mile (521128) 138 kV line, near Mooreland. a. Apply fault at the Mooreland 138 kV bus. b. Clear fault after 5 cycles by tripping the faulted line. c. Wait 20 cycles, and then re-close the line in (b) back into the fault. d. Leave fault on for 5 cycles, then trip the line in (b) and remove fault.
56	FLT56-1PH	<i>Single phase fault and sequence like previous</i>



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Cont. No.	Cont. Name	Description
57	FLT57-3PH	3 phase double circuit fault on the Thistle (539801) to Wichita (532796) 345 kV lines, near Thistle. a. Apply double circuit fault at the Thistle 345 kV bus. b. Clear fault after 5 cycles by tripping the faulted line. c. Wait 20 cycles, and then re-close the line in (b) back into the fault. d. Leave fault on for 5 cycles, then trip the line in (b) and remove fault.
58	FLT58-3PH	3 phase double circuit fault on the Thistle (539801) to Clark County (539800) 345 kV lines, near Thistle. a. Apply double circuit fault at the Thistle 345 kV bus. b. Clear fault after 5 cycles by tripping the faulted line. c. Wait 20 cycles, and then re-close the line in (b) back into the fault. d. Leave fault on for 5 cycles, then trip the line in (b) and remove fault.
59	FLT59-3PH	3 phase double circuit fault on the Woodward (515375) to Beaver County (580500) 345 kV lines, near Woodward. a. Apply double circuit fault at the Woodward 345 kV bus. b. Clear fault after 5 cycles by tripping the faulted line. c. Wait 20 cycles, and then re-close the line in (b) back into the fault. d. Leave fault on for 5 cycles, then trip the line in (b) and remove fault.
60	FLT60-3PH	3 phase double circuit fault on the Clark County (539800) to Ironwood (539803) 345 kV lines, near Clark County. a. Apply double circuit fault at the Clark County 345 kV bus. b. Clear fault after 5 cycles by tripping the faulted line. c. Wait 20 cycles, and then re-close the line in (b) back into the fault. d. Leave fault on for 5 cycles, then trip the line in (b) and remove fault.
61	FLT61-3PH	3 phase fault on the Woodward 345 kV (515375) to Woodward 138 kV (515376)/13.8 kV (515795) transformer, near the 345 kV bus. a. Apply fault at the Woodward 345kV bus. b. Clear fault after 5 cycles by tripping the faulted transformer.
62	FLT62-3PH	3 phase fault on the Thistle (539801) 345 kV to Thistle (539804) 138 kV/(539802) 13.8 kV transformer, 345 kV bus. a. Apply fault at the Thistle 345kV bus. b. Clear fault after 5 cycles by tripping the faulted transformer.
63	FLT63-3PH	3 phase fault on Mooreland 138 kV (520999) to 69 kV (520995)/13.8 kV (521180) transformer, near the 138 kV bus. a. Apply fault at the Mooreland 138 kV bus. b. Clear fault after 5 cycles by tripping the faulted transformer.
64	FLT64-3PH	Prior Outage of the GEN-2012-016 (562286) to Woodward (515375) 345 kV line, then 3 phase fault on the Thistle (539801) – Wichita (532796) 345kV ckt 1 near Thistle. a. Apply fault at the Thistle 345 kV bus. b. Clear fault after 5 cycles by tripping the faulted line. c. Wait 20 cycles, and then re-close the line in (b) back into the fault. d. Leave fault on for 5 cycles, then trip the line in (b) and remove fault.
65	FLT65-3PH	Prior Outage of the GEN-2012-016 (562286) to Woodward (515375) 345 kV line, then 3 phase fault on the Thistle (539801) – GEN-2012-016 (562286) 345 kV ckt 1 near Thistle. a. Apply fault at the Thistle 345 kV bus. b. Clear fault after 5 cycles by tripping the faulted line. c. Wait 20 cycles, and then re-close the line in (b) back into the fault. d. Leave fault on for 5 cycles, then trip the line in (b) and remove fault.



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Cont. No.	Cont. Name	Description
66	FLT66-3PH	<p>Prior Outage of the GEN-2011-051 (562075) – Tatonga (515407) 345 kV line, then 3 phase fault on the Thistle (539801) – Wichita (532796) 345kV ckt 1 near Thistle.</p> <p>a. Apply fault at the Thistle 345 kV bus. b. Clear fault after 5 cycles by tripping the faulted line. c. Wait 20 cycles, and then re-close the line in (b) back into the fault. d. Leave fault on for 5 cycles, then trip the line in (b) and remove fault.</p>
67	FLT67-3PH	<p>Prior Outage of the Tuco (525832) – G12-038-Tap (562309) 345 kV line, then 3 phase fault on the Tatonga (515407) – GEN-2011-051 (562075) 345kV ckt 1 near Tatonga.</p> <p>a. Apply fault at the Tatonga 345 kV bus. b. Clear fault after 5 cycles by tripping the faulted line. c. Wait 20 cycles, and then re-close the line in (b) back into the fault. d. Leave fault on for 5 cycles, then trip the line in (b) and remove fault.</p>

Note that single line-to-ground faults were simulated in a manner consistent with currently accepted practices, i.e. to assume that a single line-to-ground fault will cause a positive-sequence voltage drop at the fault location to 60% of nominal.

The prior-queued projects monitored are listed in Table 6.

Table 6: Prior-queued projects

Request	Size (MW)	Generator Model	Point of Interconnection
GEN-2001-014	94.5	Suzlon 2.1 MW	Fort Supply 138 kV (520920)
GEN-2001-037	102	GE 1.5 MW	Moorland – Woodward 138 kV (515785)
GEN-2005-008	120	GE 1.5 MW	Woodward 138 kV (514785)
GEN-2006-024S	18.9	Suzlon 2.1 MW	Buffalo Bear 69kV (521120)
GEN-2006-046	132	Mitsubishi 2.4 MW	Dewey 138 kV (514787)
GEN-2007-021	200	GE 1.6 MW	Tatonga 345 kV (515407)
GEN-2007-043	200	GE 1.6 MW	Minco 345 kV (514801)
GEN-2007-044	299.2	GE 1.6 MW	Tatonga 345 kV (515407)
GEN-2007-050	170.2	Siemens 2.3 MW	Woodward 138 kV (515376)
GEN-2007-062	765	GE 1.5 MW	Woodward 345 kV (515375)
GEN-2008-003	101.2	Siemens 2.3 MW	Woodward 138 kV (515376)
GEN-2008-019	300	Mitsubishi 2.4 MW	Tatonga 345 kV (515407)
GEN-2008-029	250.5	GE 1.5 MW	Woodward 138 kV (515376)
GEN-2008-044	197.8	Siemens SWT 2.3 MW	Tatonga 345 kV (515407)
GEN-2010-011	29.7	Siemens SWT 2.3 MW	Tatonga 345 kV (515407) (Addition to Gen-2008-044 34.5 kV bus (515450))
GEN-2010-040	298.5	RePower 2.05 MW	Cimarron 345 kV (514901)
GEN-2011-007	250.2	RePower 2.05MW	Mathewson 345kV (560368)



Request	Size (MW)	Generator Model	Point of Interconnection
GEN-2011-010	100.8	GE 1.6MW	Minco 345kV (514801)
GEN-2011-019	299	Siemens 2.3MW	Woodward 345kV (515375)
GEN-2011-020	299	Siemens 2.3MW	Woodward 345kV (515375)
GEN-2011-024	299	Siemens 2.3MW	Tatonga 345kV (515407)
GEN-2011-051	104.4	Vestas V90 1.8MW	Tap on the Woodward - Tatonga 345kV line (G11_051-TAP, 562075)
GEN-2011-054	299	Siemens 2.3MW	Cimarron 345kV (514901)
GEN-2012-016	280 Summer 312 Winter	GENROU	Tap Woodward-Thistle 345kV (562286)
GEN-2012-031	200.1	Siemens 2.3 (SWTVS4)	Cimarron 345kV (514901)

6.1. STABILITY CRITERIA

Disturbances, including three-phase and single-phase to ground faults, should not cause synchronous and asynchronous plants to become unstable or disconnect from the transmission grid.

The criterion for synchronous generator stability as defined by NERC is:

“Power system stability is defined as that condition in which the difference of the angular positions of synchronous machine rotor becomes constant following an aperiodic system disturbance.”

Voltage magnitudes and frequencies at terminals of asynchronous generators should not exceed magnitudes and durations that will cause protection elements to operate. Furthermore, the response after the disturbance needs to be studied at the terminals of the machine to insure that there are no sustained oscillations in power output, speed, frequency, etc.

Voltage magnitudes and angles after the disturbance should settle to a constant and acceptable operating level. Frequencies should settle to the value within an acceptable range of nominal 60 Hz power frequency.

SPP has two specific transient stability requirements as summarized below (details of these requirements can be found in Appendix A):

1. **Angular Oscillations:** for study projects that include synchronous machines, rotor angle oscillations should meet the damping requirements described in Appendix A. For other



projects that do not include synchronous machines, but based on engineering judgment have questionable rotor angle oscillation, damping should also meet the requirements described in Appendix A.

- 2. Transient Voltage Recovery:** for the transient voltage recovery requirement in Appendix A, the bus voltages to be included are those at the point of interconnection for each study generator. Other voltages in the area should be checked for this requirement if the terminal voltage of other machines in the monitored area appears to have voltage recovery issues.

6.2. TRANSIENT STABILITY RESULTS

Undisturbed runs of 20 seconds were performed with the summer and winter peak cases to verify proper initialization of dynamic models.

Transient stability analysis indicated that Group 1 is expected to successfully ride-through each fault contingency specified by SPP and the nearby areas will retain angular, frequency and voltage stability. Group 1 is expected to successfully interconnect into the transmission system at the desired location without reduction in output power. See Appendix B through Appendix D for detailed results of the transient stability studies.

Furthermore, Group 1 is expected to meet angular oscillation stability requirements. Note that there are several contingency cases, e.g. contingency 33 through 42, where SPP's angular oscillation requirements are not met (see Appendix E for detailed results). However, this is for small disturbances and does not imply any instability in the system. For instance, in contingencies 1, 3, 64 or 65, among others, since the disturbance occurs in the vicinity of study project, changes in the rotor angle of the generator are significant. Therefore, considering the relative ratio of the 1st positive swing peak to the subsequent ones (i.e. 2nd or 5th as instructed in Appendix A) can be appropriate to evaluate the damping ratio. However, this is not the case in contingencies 34, 38, 40 or 42, among others, where the disturbance occurs in locations electrically remote from the study project, and thus the changes in the rotor angle of the generators are small. In these cases all the rotor angle peaks are on the same order, i.e., the SPPR is about one.



Appendix F shows voltage at the POI of the study project for all contingency cases. As the results indicate the study project meets SPP’s transient voltage recovery requirement, i.e. voltage at the POI remains in the range of 0.7 – 1.2 p.u. in all post-contingency cases.

Summary results of transient stability analysis are listed in Table 7.

Table 7: Summary of Transient Stability Results

Cont. No.	Cont. Name	Summer 2014 Peak	Winter 2014 Peak	Summer 2023 Peak
1	FLT01-3PH	STABLE	STABLE	STABLE
2	FLT02-1PH	STABLE	STABLE	STABLE
3	FLT03-3PH	STABLE	STABLE	STABLE
4	FLT04-1PH	STABLE	STABLE	STABLE
5	FLT05-3PH	STABLE	STABLE	STABLE
6	FLT06-1PH	STABLE	STABLE	STABLE
7	FLT07-3PH	STABLE	STABLE	STABLE
8	FLT08-1PH	STABLE	STABLE	STABLE
9	FLT09-3PH	STABLE	STABLE	STABLE
10	FLT10-1PH	STABLE	STABLE	STABLE
11	FLT11-3PH	STABLE	STABLE	STABLE
12	FLT12-1PH	STABLE	STABLE	STABLE
13	FLT13-3PH	STABLE	STABLE	STABLE
14	FLT14-1PH	STABLE	STABLE	STABLE
15	FLT15-3PH	STABLE	STABLE	STABLE
16	FLT16-1PH	STABLE	STABLE	STABLE
17	FLT17-3PH	STABLE	STABLE	STABLE
18	FLT18-1PH	STABLE	STABLE	STABLE
19	FLT19-3PH	STABLE	STABLE	STABLE
20	FLT20-1PH	STABLE	STABLE	STABLE
21	FLT21-3PH	STABLE	STABLE	STABLE
22	FLT22-1PH	STABLE	STABLE	STABLE
23	FLT23-3PH	STABLE	STABLE	STABLE
24	FLT24-1PH	STABLE	STABLE	STABLE
25	FLT25-3PH	STABLE	STABLE	STABLE
26	FLT26-1PH	STABLE	STABLE	STABLE
27	FLT27-3PH	STABLE	STABLE	STABLE
28	FLT28-1PH	STABLE	STABLE	STABLE
29	FLT29-3PH	STABLE	STABLE	STABLE
30	FLT30-1PH	STABLE	STABLE	STABLE
31	FLT31-3PH	STABLE	STABLE	STABLE
32	FLT32-1PH	STABLE	STABLE	STABLE
33	FLT33-3PH	STABLE	STABLE	STABLE
34	FLT34-1PH	STABLE	STABLE	STABLE
35	FLT35-3PH	STABLE	STABLE	STABLE
36	FLT36-1PH	STABLE	STABLE	STABLE



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Cont. No.	Cont. Name	Summer 2014 Peak	Winter 2014 Peak	Summer 2023 Peak
37	FLT37-3PH	STABLE	STABLE	STABLE
38	FLT38-1PH	STABLE	STABLE	STABLE
39	FLT39-3PH	STABLE	STABLE	STABLE
40	FLT40-1PH	STABLE	STABLE	STABLE
41	FLT41-3PH	STABLE	STABLE	STABLE
42	FLT42-1PH	STABLE	STABLE	STABLE
43	FLT43-3PH	STABLE	STABLE	STABLE
44	FLT44-1PH	STABLE	STABLE	STABLE
45	FLT45-3PH	STABLE	STABLE	STABLE
46	FLT46-1PH	STABLE	STABLE	STABLE
47	FLT47-3PH	STABLE	STABLE	STABLE
48	FLT48-1PH	STABLE	STABLE	STABLE
49	FLT49-3PH	STABLE	STABLE	STABLE
50	FLT50-1PH	STABLE	STABLE	STABLE
51	FLT51-3PH	STABLE	STABLE	STABLE
52	FLT52-1PH	STABLE	STABLE	STABLE
53	FLT53-3PH	STABLE	STABLE	STABLE
54	FLT54-1PH	STABLE	STABLE	STABLE
55	FLT55-3PH	STABLE	STABLE	STABLE
56	FLT56-1PH	STABLE	STABLE	STABLE
57	FLT57-3PH	STABLE	STABLE	STABLE
58	FLT58-3PH	STABLE	STABLE	STABLE
59	FLT59-3PH	STABLE	STABLE	STABLE
60	FLT60-3PH	STABLE	STABLE	STABLE
61	FLT61-3PH	STABLE	STABLE	STABLE
62	FLT62-3PH	STABLE	STABLE	STABLE
63	FLT63-3PH	STABLE	STABLE	STABLE
64	FLT64-3PH	STABLE	STABLE	STABLE
65	FLT65-3PH	STABLE	STABLE	STABLE
66	FLT66-3PH	STABLE	STABLE	STABLE
67	FLT67-3PH	STABLE	STABLE	STABLE



7. CONCLUSIONS AND RECOMMENDATIONS

Group 1 and prior-queued projects were studied at 100% output power using 2014 Summer and Winter peak cases, as well as Summer 2023 peak case provided by SPP.

Transient analysis results indicate that DISIS-2013-001 (Group 1) project is expected to successfully interconnect into the transmission system at 100% output power and at the desired locations. Transient stability analysis also indicate that Group 1 is expected to ride-through each N-1 and N-2 fault contingency specified by SPP and the nearby areas will retain angular, frequency and voltage stability. Thus, Group 1 is expected to meet SPP's angular oscillation stability and transient voltage recovery requirement.

K: Group 3 Dynamic Stability Analysis Report

See POWER-tek report on next page.

Southwestern Power Pool Inc. (SPP)



Definitive Impact Study DISIS-2013-001 (Group 03)



Report Submitted to
Southwest Power Pool Inc.
July 19, 2013

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TABLE OF CONTENTS

1.	Executive Summary	1
2.	Introduction	2
2.1.	Project Overview and Assumptions	2
2.2.	Objectives	3
2.3.	Models and Simulations Tools Used.....	3
3.	Power Factor Analysis	5
3.1.	Methodology	5
3.2.	Analysis	5
3.3.	Conclusions	12
4.	Stability Analysis	12
4.1.	Faults Simulated	12
4.2.	Simulation Results	22
5.	Conclusions.....	23
6.	Appendix A: 2014 Summer Peak Case Stability Run Plots	24
7.	Appendix B: 2014 Winter Peak Case Stability Run Plots	24
8.	Appendix C: 2023 Summer Peak Case Stability Run Plots	24
9.	Appendix D: Project Model Data.....	24

1. Executive Summary

This report presents the results of impact study comprising of power factor and stability analyses of the proposed interconnection projects under DISIS-2013-001 Group 03 (the Project) as described in the following table.

Table 1.1: Interconnection Request

Request	Size (MW)	Generator Model	Point of Interconnection
GEN-2013-010	99.0	Siemens 3.0MW (583603)	GEN-2012-011 Tap 345kV (562334) (Tap on Spearville to Post Rock 345kV line)

Power factor analysis and transient stability simulations were performed for the Project in service at its full output. SPP provided three base cases for summer and winter conditions for year 2014, and summer conditions for year 2023, respectively, each comprising of a power flow and corresponding dynamics database. The previous queued request projects are already modeled in the base cases.

The power factor analysis indicates that interconnection request of GEN-2013-001 is required carryout power factor analysis by running all N-1, three phase contingencies shown in the Fault Definitions table (Table 3) in power flow to advise the necessary power factor at the POI for each contingency. It has been observed that during most of the contingencies the power factor control at the subject requested interconnection is beyond the capability of the machine.

There are no impacts on the stability performance of the SPP system for the contingencies simulated on the supplied base cases. The study Project stayed on-line and stable for all simulated faults. The Project stability simulations with Sixty Six (66) specified test disturbances did not show instability problems in the SPP system and oscillations were damped out.

2. Introduction

2.1. Project Overview and Assumptions

The DISIS-2013-001 Group 03 Impact Study is a generation interconnection study performed by POWER-tek Global Inc. for Southwest Power Pool (SPP). This report presents the results of impact study comprising of power factor and stability analyses of the proposed interconnection project under DISIS-2013-001 Group 03 (“The Project”) as described in Table 1.1 below:

Table 1.1: Interconnection Requests

Request	Size (MW)	Wind Turbine Model	Point of Interconnection
GEN-2013-001	99.0	Siemens 3.0MW (583603)	GEN-2012-011 Tap 345kV (562334) (Tap on Spearville to Post Rock 345kV line)

Figure 1.1 shows the single line diagram for the interconnection of the Project to present and planned system of SPP. This arrangement was modeled and studied in power flow cases for this Project.

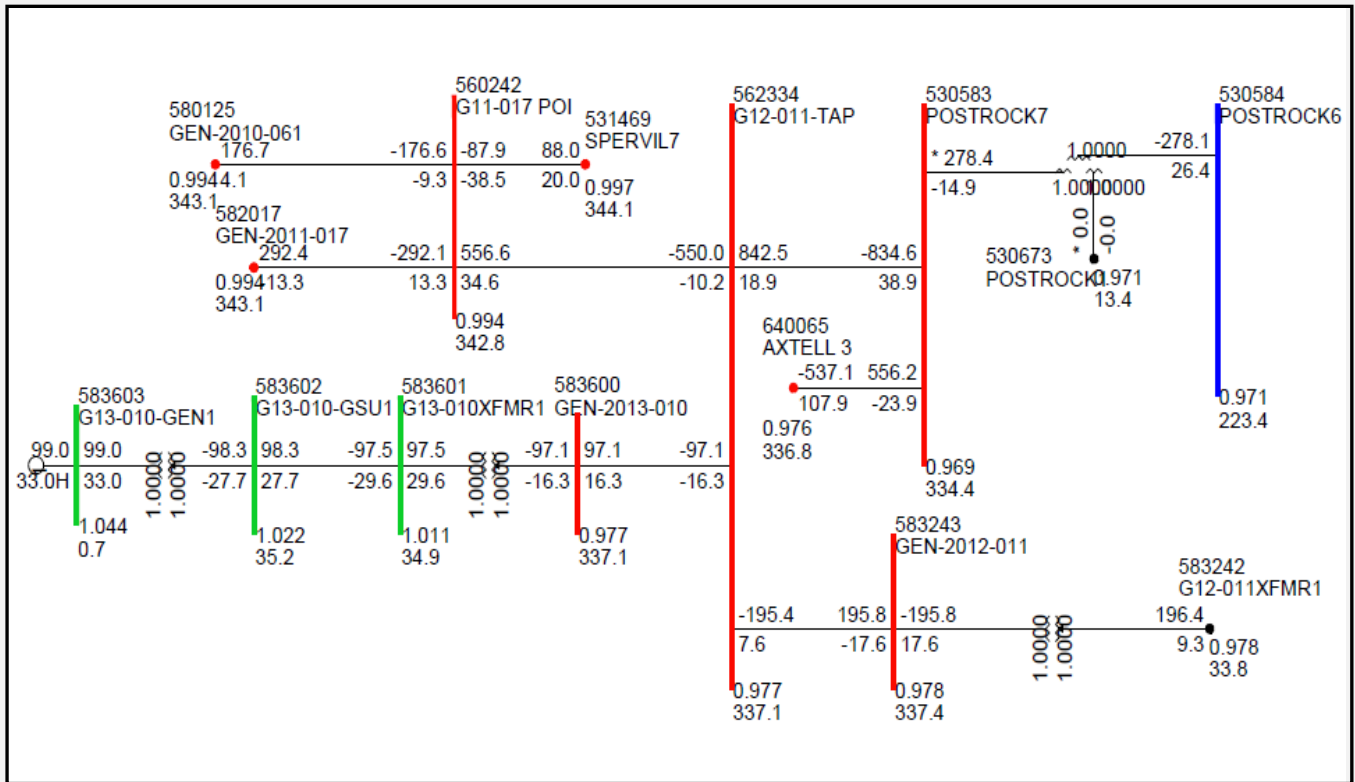


Figure 1.1: Power Flow Single Line Diagram for GEN-2013-001 and surrounding system components [Appendix-D contains the machines, interconnection, and machine user model parameters]

Table 1.2 below shows the list of prior queued projects modeled in the base case.

Table 1.2: List of previous queued request projects

Request	Size (MW)	Wind Turbine Model	Point of Interconnection
GEN-2001-039A	104	GE 1.6MW	Shooting Star 115kV (539763)
GEN-2002-025A	150	GE 1.5 MW	Spearville 230kV (539695)
GEN-2004-014	154.5	GE 1.5 MW	Spearville 230kV (539695)
GEN-2005-012	250.7	Siemens 2.3MW	Spearville 345kV (531469)
GEN-2006-006	205.5	GE 1.5 MW	Spearville 345kV (531469)
GEN-2006-021	100	Clipper 2.5MW	Flat Ridge 138kV (539638)
GEN-2006-022	150	Clipper 2.5MW	Pratt 115kV (539687)
GEN-2007-038	200	Clipper 2.5MW	Spearville 345kV (531469)
GEN-2007-040	200.1	Siemens 2.3MW	Buckner 345kV (531501)
GEN-2008-018	405	GE 1.85 MW	Finney 345kV (523853)
GEN-2008-079	98.9	Siemens 2.3MW	Tap on Cudahy – Fort Dodge 115kV line (560229)
GEN-2008-124	200.1	Siemens 2.3MW	Spearville 345kV (531469)
GEN-2010-009	165.6	Siemens 2.3MW	Buckner 345kV (531501)
GEN-2010-015	200.1	Siemens 2.3MW	Spearville 345kV (531469)
GEN-2010-029	450	Vestas V90 1.8MW	Spearville 345kV (531469)
GEN-2010-045	197.8	Siemens 2.3MW	Buckner 345kV (531501)
GEN-2010-061	179.4	Siemens 2.3MW	Tap on Spearville – Post Rock 345kV line (G11-017 POI, 560242)
GEN-2011-008	600	GE 1.6MW	Clark County 345kV (539800)

Note: Gen-2010-029 has been removed from the cases as requested by SPP through their revised cases. ATC (Available Transfer Capability) studies were not performed as part of this study. These studies will be required at the time transmission service is actually requested. Additional transmission upgrades may be required based on that analysis.

Study assumptions in general have been based on the specific information and data provided by SPP. The accuracy of the conclusions contained within this study is dependent on the assumptions made with respect to other generation additions and transmission improvements planned by other entities. Changes in the assumptions of the timing of other generation additions or transmission improvements may affect this study’s conclusions.

2.2. Objectives

The objectives of the study are to conduct power factor analysis and to determine the impact on system stability of interconnecting the proposed wind farm to SPP’s transmission system.

2.3. Models and Simulations Tools Used

Version 32 of the Siemens, PSS/E™ power system simulation program was used in this study.

SPP provided its latest stability database cases for both summer and winter peak seasons for year 2014 and summer peak case for year 2023. The Project’s PSS/E model had been developed prior to this study and was included in the power flow case and the dynamics database. Machine, interconnection and dynamic model data for the Project plant is provided in Appendix D.

Power flow single line diagram of the projects in summer peak condition has been shown in Figure 1.1. This Figure shows that wind farm model includes representation of the radial transmission line, the substation transformer from transmission voltage to 34.5V and 345 kV respectively. The remainder of each wind farm is represented by lumped equivalents including a generator, a step-up transformer, and collector system impedance.

No special modeling is required of line relays in these cases, except for the special modeling related to the wind-turbine tripping.

All generators in Areas 520, 524, 525, 526, 531, 534, 536, 640, 645, 650, and 652 were monitored.

3. Power Factor Analysis

3.1. Methodology

Power factor analysis was conducted for the Project using the following methodology:

1. Replace the wind farm by a generator at the high side bus 345 kV, 138 kV, or 69 kV bus, as applicable, with the MW of the wind farms at that point of interconnection and with no var capability.
2. Turn off the wind farm as modeled (as well as previous queued projects at the same point of interconnection).
3. Model A var generator at the Project’s high voltage side, 345 kV, 138 kV, or 69kV bus, as applicable. The var generator is set to hold a voltage schedule at the POI consistent with the voltage schedule in the provided power flow cases for summer and winter or 1.0 pu voltage, whichever is higher.
4. Perform the steady state contingency analysis to determine the power factor necessary at the POI for each contingency.
5. If the required power factor at the POI is beyond the capability of the studied wind turbines to meet (at the POI) capacitor banks may be considered for the stability analysis. The preference is to locate the capacitance banks on the 34.5 kV customer side. Factors to sizing capacitor banks include:
 - 5.1. The ability of the wind farm to meet FERC Order 661A (low voltage ride through) with and without capacitor banks.
 - 5.2. The ability of the wind farm to meet FERC Order 661A (wind farm recovery to pre-fault voltage).
 - 5.3. If wind farms trips on high voltage, power factor lower than unity may be required.

3.2. Analysis

Analysis was performed for proposed Project with all prior queued projects in service. A var generator was modeled at the point of interconnection and was set to hold a voltage schedule at the POI consistent with the voltage schedule in the provided power flow cases. These voltages for this Project are summarized in Table 2.2. All upgrades and instructions were made in the base cases. No other changes were made in the base cases provided, other than the addition of the var generators. Contingency analysis was run for provided list of contingencies.

Table 2.2: POI voltages for the summer and winter peak cases

Request	Point of Interconnection	Size (MW)	Base Case Voltage (p.u.)		
			Summer 2014 Peak	Winter 2014 Peak	Summer 2023 Peak
GEN-2013-010	Bus # 562334 (Tap on Spearville to Post Rock 345kV line)	99.0	0.977	0.975	0.996

POI: (562334) – GEN-2013-011 Tap 345kV line

It has been observed that during most of the contingencies the var generator supplies excessive reactive power which means the power factor control at the subject requested interconnection is beyond the capability of the machine. The details of the var requirement during contingencies are highlighted in Table 2.3. The highest and the lowest values obtained are highlighted and as follows:

1. For 2014 summer case, the maximum var generator supply is 437.2 MVARs for the outage both circuits from BUS 539801 [THISTLE7 345.0] to BUS 539800 [CLARKCOUNTY7 345.0] 345 kV line (double outage). The minimum

var requirement is for outage of for 560242 [G11-017 POI 345.0] to 562334 [G12-011-TAP 345.0] CKT 1 requiring 13.5 MVAR at 0.99 power factor lagging.

Table 2.3: Var Generator Output in 2014 Summer Peak Case for GEN-2013-010
2014 Summer Peak Case Power Factor Study:

Rated MW of Wind Farm OR at POI = 99.0MW Rated MVAR (lagging) of Wind Farm = 33.0 MVAR								
Cont. Name	From Bus (# & Name)		To Bus (# & Name)		ID	MVAR at POI	% of Max MVAR	P.F at POI
Base Case MVAR Flow					N/A	145.6	441.21	0.56
FLT01-3PH	560242	G11-017 POI 345.00	562334	G12-011-TAP 345.00	CKT A1	13.5	40.91	0.99
FLT03-3PH	560242	G11-017 POI 345.00	531469	SPERVIL7 345.00	CKT A1	65.3	197.88	0.83
FLT05-3PH	531469	SPERVIL7 345.00	531501	BUCKNER7 345.00	CKT 1	148.9	451.21	0.55
FLT07-3PH	531449	HOLCOMB7 345.00	523853	FINNEY 7345.00	CKT 1	148.9	451.21	0.55
FLT09-3PH	531469	SPERVIL7 345.00	539800	CLARKCOUNTY7 345.00	CKT 2	145.6	441.21	0.56
FLT11-3PH	531501	BUCKNER7 345.00	531449	HOLCOMB7 345.00	CKT 1	152	460.61	0.55
FLT13-3PH	531501	BUCKNER7 345.00	580500	BEAVER CO 345.00	CKT 1	150.7	456.67	0.55
FLT15-3PH	539801	THISTLE7 345.00	515375	WWRDEHV7 345.00	CKT 2	186.7	565.76	0.47
FLT17-3PH	539801	THISTLE7 345.00	532796	WICHITA7 345.00	CKT 1	153.1	463.94	0.54
FLT19-3PH	539801	THISTLE7 345.00	539800	CLARKCOUNTY7 345.00	CKT 1	190	575.76	0.46
FLT21-3PH	539801	THISTLE7 345.00	562286	G12-016-TAP 345.00	CKT 1	206.8	626.67	0.43
FLT23-3PH	580500	BEAVER CO 345.00	523097	HITCHLAND7 345.00	CKT 1	153.2	464.24	0.54
FLT25-3PH	539801	THISTLE7 345.00	532796	WICHITA7 345.00	CKT 1	345.6	1047.27	0.28
	539801	THISTLE7 345.00	532796	WICHITA7 345.00	CKT 2			
FLT26-3PH	539801	THISTLE7 345.00	539800	CLARKCOUNTY7 345.00	CKT 1	437.2	1324.85	0.22
	539801	THISTLE7 345.00	539800	CLARKCOUNTY7 345.00	CKT 2			
FLT27-3PH	580500	BEAVER CO 345.00	523097	HITCHLAND7 345.00	CKT 1	144.8	438.79	0.56
		BEAVER CO 345.00	523097	HITCHLAND7 345.00	CKT 2			
FLT28-3PH	531469	SPERVIL7 345.00	539803	IRONWOOD7 345.00	CKT 1	135.3	410.00	0.59
FLT29-3PH	539801	THISTLE7 345.00	539804	THISTLE4 138.00	T/F	146.7	444.55	0.56
FLT30-3PH	530583	POSTROCK7 345.00	530584	POSTROCK6 230.00	T/F	106	321.21	0.68
FLT31-3PH	531469	SPERVIL7 345.00	539695	SPEARVL6 230.00	T/F	144.8	438.79	0.56

Rated MW of Wind Farm OR at POI = 99.0MW Rated MVAR (lagging) of Wind Farm = 33.0 MVAR								
Cont. Name	From Bus (# & Name)		To Bus (# & Name)		ID	MVAR at POI	% of Max MVAR	P.F at POI
FLT32-3PH	515375	WWRDEHV7 345.00	515458	BORDER 7345.00	CKT 1	145.4	440.61	0.56
FLT34-3PH	580500	BEAVER CO 345.00	523097	HITCHLAND 7345.00	CKT 1	144.9	439.09	0.56
FLT36-3PH	515375	WWRDEHV7 345.00	562075	G11-051-TAP 345.00	CKT 1	218.5	662.12	0.41
FLT38-3PH	531449	HOLCOMB7 345.00	531448	HOLCOMB3 115.00	T/F	143.8	435.76	0.57
FLT39-3PH	515375	WWRDEHV7 345.00	562286	G12-016-TAP 345.00	CKT 1	145.8	441.82	0.56
FLT41-3PH	515375	WWRDEHV7 345.00	580500	BEAVER CO 345.00	CKT 1	158.3	479.70	0.53
FLT43-3PH	531449	HOLCOMB7 345.00	531465	SETAB 7 345.00	CKT 1	188	569.70	0.47
FLT45-3PH	530583	POSTROCK7 345.00	562334	G12-011-TAP 345.00	CKT A1	40.2	121.82	0.93
FLT47-3PH	640065	AXTELL 3 345.00	640312	PAULINE3 345.00	CKT 1	131.8	399.39	0.60
FLT49-3PH	539803	IRONWOOD7 345.00	539800	CLARKCOUNTY7345.00	CKT 1	152.5	462.12	0.54
FLT51-3PH	560013	MULGREN7 345.00	532771	RENO 7 345.00	CKT 1	188.9	572.42	0.46
FLT53-3PH	530584	POSTROCK6 230.00	530558	KNOLL 6 230.00	CKT 1	127.8	387.27	0.61
FLT55-3PH	530584	POSTROCK6 230.00	530582	S HAYS6 230.00	CKT 1	143.3	434.24	0.57
FLT57-3PH	531469	SPERVIL7 345.00	560013	MULGREN7 345.00	CKT 1	189.9	575.45	0.46
FLT59-3PH	515375	WWRDEHV7 345.00	562075	G11-051-TAP 345.00	CKT 1	218.6	662.42	0.41
FLT61-3PH	531451	MINGO7 345.00	640325	REDWILLOW3 345.00	CKT 1	233.4	707.27	0.39
FLT62-3PH	530592	SMOKYHL6 230.00	532873	SUMMIT 6 230.00	CKT 1	134.5	407.58	0.59
	539679	GRTBEND6 230.00	532871	CIRCLE 6 230.00	CKT 1			
FLT63-3PH	530558	KNOLL 6 230.00	530592	SMOKYHL6 230.00	CKT 1	143.3	434.24	0.57
FLT64-3PH	530592	SMOKYHL6 230.00	532873	SUMMIT 6 230.00	CKT 1	127.3	385.76	0.61
FLT66-3PH	531449	HOLCOMB7 345.00	523853	FINNEY 7345.00	CKT 1	107.6	326.06	0.68
	530583	POSTROCK7 345.00	640065	AXTELL 345.00	CKT A1			

2. For 2014 winter case, the maximum var generator supply is 450.2 MVARs for the outage both circuits from BUS 539801 [THISTLE7 345.0] to BUS 539800 [CLARKCOUNTY7 345.0] 345 kV line (double outage). The minimum var requirement is for outage of for 560242 [G11-017 POI 345.0] to 562334 [G12-011-TAP 345.0] CKT 1 requiring 17.6 MVAR at 0.98 power factor lagging.

Table: 2.4 Var Generator Output in 2014 Winter Peak Case for GEN-2013-010
2014 Winter Peak Case Power Factor Study

Rated MW of Wind Farm OR at POI = 99.0MW Rated MVAR (lagging) of Wind Farm = 34.0 MVAR								
Cont. Name	From Bus (# & Name)		To Bus (# & Name)		ID	MVAR at POI	% of Max MVAR	P.F at POI
Base Case MVAR Flow					N/A	148.6	437.06	0.55
FLT01-3PH	560242	G11-017 POI 345.00	562334	G12-011-TAP 345.00	CKT A1	17.6	51.76	0.98
FLT03-3PH	560242	G11-017 POI 345.00	531469	SPERVIL7 345.00	CKT A1	91.8	270.00	0.73
FLT05-3PH	531469	SPERVIL7 345.00	531501	BUCKNER7 345.00	CKT 1	169.1	497.35	0.51
FLT07-3PH	531449	HOLCOMB7 345.00	523853	FINNEY 7345.00	CKT 1	169.1	497.35	0.51
FLT09-3PH	531469	SPERVIL7 345.00	539800	CLARKCOUNTY7 345.00	CKT 2	148.7	437.35	0.55
FLT11-3PH	531501	BUCKNER7 345.00	531449	HOLCOMB7 345.00	CKT 1	154.4	454.12	0.54
FLT13-3PH	531501	BUCKNER7 345.00	580500	BEAVER CO 345.00	CKT 1	161.7	475.59	0.52
FLT15-3PH	539801	THISTLE7 345.00	515375	WWRDEHV7 345.00	CKT 2	197.2	580.00	0.45
FLT17-3PH	539801	THISTLE7 345.00	532796	WICHITA7 345.00	CKT 1	160.7	472.65	0.52
FLT19-3PH	539801	THISTLE7 345.00	539800	CLARKCOUNTY7 345.00	CKT 1	202.9	596.76	0.44
FLT21-3PH	539801	THISTLE7 345.00	562286	G12-016-TAP 345.00	CKT 1	215.8	634.71	0.42
FLT23-3PH	580500	BEAVER CO 345.00	523097	HITCHLAND7 345.00	CKT 1	160.9	473.24	0.52
FLT25-3PH	539801	THISTLE7 345.00	532796	WICHITA7 345.00	CKT 1	373	1097.06	0.26
	539801	THISTLE7 345.00	532796	WICHITA7 345.00	CKT 2			
FLT26-3PH	539801	THISTLE7 345.00	539800	CLARKCOUNTY7 345.00	CKT 1	450.2	1324.12	0.21
	539801	THISTLE7 345.00	539800	CLARKCOUNTY7 345.00	CKT 2			
FLT27-3PH	580500	BEAVER CO 345.00	523097	HITCHLAND7 345.00	CKT 1	147.7	434.41	0.56
		BEAVER CO 345.00	523097	HITCHLAND7 345.00	CKT 2			
FLT28-3PH	531469	SPERVIL7 345.00	539803	IRONWOOD7 345.00	CKT 1	139	408.82	0.58
FLT29-3PH	539801	THISTLE7 345.00	539804	THISTLE4 138.00	T/F	148.7	437.35	0.55
FLT30-3PH	530583	POSTROCK7 345.00	530584	POSTROCK6 230.00	T/F	134	394.12	0.59

Rated MW of Wind Farm OR at POI = 99.0MW Rated MVAR (lagging) of Wind Farm = 34.0 MVAR								
Cont. Name	From Bus (# & Name)		To Bus (# & Name)		ID	MVAR at POI	% of Max MVAR	P.F at POI
FLT31-3PH	531469	SPERVIL7 345.00	539695	SPEARVL6 230.00	T/F	148.2	435.88	0.56
FLT32-3PH	515375	WWRDEHV7 345.00	515458	BORDER 7345.00	CKT 1	150.2	441.76	0.55
FLT34-3PH	580500	BEAVER CO 345.00	523097	HITCHLAND 7345.00	CKT 1	147.9	435.00	0.56
FLT36-3PH	515375	WWRDEHV7 345.00	562075	G11-051-TAP 345.00	CKT 1	244.1	717.94	0.38
FLT38-3PH	531449	HOLCOMB7 345.00	531448	HOLCOMB3 115.00	T/F	147.4	433.53	0.56
FLT39-3PH	515375	WWRDEHV7 345.00	562286	G12-016-TAP 345.00	CKT 1	149.4	439.41	0.55
FLT41-3PH	515375	WWRDEHV7 345.00	580500	BEAVER CO 345.00	CKT 1	162.7	478.53	0.52
FLT43-3PH	531449	HOLCOMB7 345.00	531465	SETAB 7 345.00	CKT 1	179.2	527.06	0.48
FLT45-3PH	530583	POSTROCK7 345.00	562334	G12-011-TAP 345.00	CKT A1	61.1	179.71	0.85
FLT47-3PH	640065	AXTELL 3 345.00	640312	PAULINE3 345.00	CKT 1	131	385.29	0.60
FLT49-3PH	539803	IRONWOOD7 345.00	539800	CLARKCOUNTY7345.00	CKT 1	154.9	455.59	0.54
FLT51-3PH	560013	MULGREN7 345.00	532771	RENO 7 345.00	CKT 1	198.1	582.65	0.45
FLT53-3PH	530584	POSTROCK6 230.00	530558	KNOLL 6 230.00	CKT 1	138.8	408.24	0.58
FLT55-3PH	530584	POSTROCK6 230.00	530582	S HAYS6 230.00	CKT 1	151.3	445.00	0.55
FLT57-3PH	531469	SPERVIL7 345.00	560013	MULGREN7 345.00	CKT 1	196.2	577.06	0.45
FLT59-3PH	515375	WWRDEHV7 345.00	562075	G11-051-TAP 345.00	CKT 1	244.2	718.24	0.38
FLT61-3PH	531451	MINGO7 345.00	640325	REDWILLOW3 345.00	CKT 1	236.7	696.18	0.39
FLT62-3PH	530592	SMOKYHL6 230.00	532873	SUMMIT 6 230.00	CKT 1	148	435.29	0.56
	539679	GRTBEND6 230.00	532871	CIRCLE 6 230.00	CKT 1			
FLT63-3PH	530558	KNOLL 6 230.00	530592	SMOKYHL6 230.00	CKT 1	153	450.00	0.54
FLT64-3PH	530592	SMOKYHL6 230.00	532873	SUMMIT 6 230.00	CKT 1	138.6	407.65	0.58
FLT66-3PH	531449	HOLCOMB7 345.00	523853	FINNEY 7345.00	CKT 1	111.9	329.12	0.66
	530583	POSTROCK7 345.00	640065	AXTELL 345.00	CKT A1			

3. For 2023 summer case, the maximum var generator supply is 287.2 MVARs for the outage both circuits from BUS 539801 [THISTLE7 345.0] to BUS 539800 [CLARKCOUNTY7 345.0] 345 kV line (double outage). The minimum var supply is for outage of for 640065 [AXTELL3 345.0] to 640312 [PAULINE 345.0] CKT 1 requiring 8.4 MVARs at unity power factor lagging.

Table: 2.5 Var Generator Output in 2023 Summer Peak Case for GEN-2013-010
2023 Summer Peak Case Power Factor Study

Rated MW of Wind Farm OR at POI = 99.0MW Rated MVAR (lagging) of Wind Farm = 47.948 MVAR								
Cont. Name	From Bus (# & Name)		To Bus (# & Name)		ID	MVAR at POI	% of Max MVAR	P.F at POI
Base Case MVAR Flow					N/A	26.4	55.06	0.97
FLT01-3PH	560242	G11-017 POI 345.00	562334	G12-011-TAP 345.00	CKT A1	67.3	140.36	0.83
FLT03-3PH	560242	G11-017 POI 345.00	531469	SPERVIL7 345.00	CKT A1	31.8	66.32	0.95
FLT05-3PH	531469	SPERVIL7 345.00	531501	BUCKNER7 345.00	CKT 1	8.5	17.73	1.00
FLT07-3PH	531449	HOLCOMB7 345.00	523853	FINNEY 7345.00	CKT 1	49	102.19	0.90
FLT09-3PH	531469	SPERVIL7 345.00	539800	CLARKCOUNTY7 345.00	CKT 2	26.4	55.06	0.97
FLT11-3PH	531501	BUCKNER7 345.00	531449	HOLCOMB7 345.00	CKT 1	32.4	67.57	0.95
FLT13-3PH	531501	BUCKNER7 345.00	580500	BEAVER CO 345.00	CKT 1	37.2	77.58	0.94
FLT15-3PH	539801	THISTLE7 345.00	515375	WWRDEHV7 345.00	CKT 2	72	150.16	0.81
FLT17-3PH	539801	THISTLE7 345.00	532796	WICHITA7 345.00	CKT 1	35.8	74.66	0.94
FLT19-3PH	539801	THISTLE7 345.00	539800	CLARKCOUNTY7 345.00	CKT 1	60.3	125.76	0.85
FLT21-3PH	539801	THISTLE7 345.00	562286	G12-016-TAP 345.00	CKT 1	84.2	175.61	0.76
FLT23-3PH	580500	BEAVER CO 345.00	523097	HITCHLAND7 345.00	CKT 1	35.9	74.87	0.94
FLT25-3PH	539801	THISTLE7 345.00	532796	WICHITA7 345.00	CKT 1	163.5	340.99	0.52
	539801	THISTLE7 345.00	532796	WICHITA7 345.00	CKT 2			
FLT26-3PH	539801	THISTLE7 345.00	539800	CLARKCOUNTY7 345.00	CKT 1	287.2	598.98	0.33
	539801	THISTLE7 345.00	539800	CLARKCOUNTY7 345.00	CKT 2			
FLT27-3PH	580500	BEAVER CO 345.00	523097	HITCHLAND7 345.00	CKT 1	24.6	51.31	0.97
		BEAVER CO 345.00	523097	HITCHLAND7 345.00	CKT 2			
FLT28-3PH	531469	SPERVIL7 345.00	539803	IRONWOOD7 345.00	CKT 1	15.4	32.12	0.99
FLT29-3PH	539801	THISTLE7 345.00	539804	THISTLE4 138.00	T/F	26.2	54.64	0.97

Rated MW of Wind Farm OR at POI = 99.0MW Rated MVAR (lagging) of Wind Farm = 47.948 MVAR								
Cont. Name	From Bus (# & Name)		To Bus (# & Name)		ID	MVAR at POI	% of Max MVAR	P.F at POI
FLT30-3PH	530583	POSTROCK7 345.00	530584	POSTROCK6 230.00	T/F	14.3	29.82	0.99
FLT31-3PH	531469	SPERVIL7 345.00	539695	SPEARVL6 230.00	T/F	24.7	51.51	0.97
FLT32-3PH	515375	WWRDEHV7 345.00	515458	BORDER 7345.00	CKT 1	26.9	56.10	0.97
FLT34-3PH	580500	BEAVER CO 345.00	523097	HITCHLAND 7345.00	CKT 1	25.7	53.60	0.97
FLT36-3PH	515375	WWRDEHV7 345.00	562075	G11-051-TAP 345.00	CKT 1	36.9	76.96	0.94
FLT38-3PH	531449	HOLCOMB7 345.00	531448	HOLCOMB3 115.00	T/F	24.8	51.72	0.97
FLT39-3PH	515375	WWRDEHV7 345.00	562286	G12-016-TAP 345.00	CKT 1	27.3	56.94	0.96
FLT41-3PH	515375	WWRDEHV7 345.00	580500	BEAVER CO 345.00	CKT 1	37.2	77.58	0.94
FLT43-3PH	531449	HOLCOMB7 345.00	531465	SETAB 7 345.00	CKT 1	67.9	141.61	0.82
FLT45-3PH	530583	POSTROCK7 345.00	562334	G12-011-TAP 345.00	CKT A1	40.7	84.88	0.92
FLT47-3PH	640065	AXTELL 3 345.00	640312	PAULINE3 345.00	CKT 1	8.4	17.52	1.00
FLT49-3PH	539803	IRONWOOD7 345.00	539800	CLARKCOUNTY7345.00	CKT 1	33	68.82	0.95
FLT51-3PH	560013	MULGREN7 345.00	532771	RENO 7 345.00	CKT 1	64.1	133.69	0.84
FLT53-3PH	530584	POSTROCK6 230.00	530558	KNOLL 6 230.00	CKT 1	24.9	51.93	0.97
FLT55-3PH	530584	POSTROCK6 230.00	530582	S HAYS6 230.00	CKT 1	26.6	55.48	0.97
FLT57-3PH	531469	SPERVIL7 345.00	560013	MULGREN7 345.00	CKT 1	67.1	139.94	0.83
FLT59-3PH	515375	WWRDEHV7 345.00	562075	G11-051-TAP 345.00	CKT 1	36.9	76.96	0.94
FLT61-3PH	531451	MINGO7 345.00	640325	REDWILLOW3 345.00	CKT 1	105.7	220.45	0.68
FLT62-3PH	530592	SMOKYHL6 230.00	532873	SUMMIT 6 230.00	CKT 1	21.8	45.47	0.98
	539679	GRTBEND6 230.00	532871	CIRCLE 6 230.00	CKT 1			
FLT63-3PH	530558	KNOLL 6 230.00	530592	SMOKYHL6 230.00	CKT 1	31.5	65.70	0.95
FLT64-3PH	530592	SMOKYHL6 230.00	532873	SUMMIT 6 230.00	CKT 1	11.8	24.61	0.99
FLT66-3PH	531449	HOLCOMB7 345.00	523853	FINNEY 7345.00	CKT 1	-8.6	-17.94	1.00
	530583	POSTROCK7 345.00	640065	AXTELL 345.00	CKT A1			

3.3. Conclusions

The power factor analysis indicates the GEN-2013-010 interconnection request cannot maintain power factor within the machine capability. The reason is, the voltage at the POI is significantly below 1 p.u. Therefore, some additional reactive power support is required to maintain the power factor for all listed contingencies.

4. Stability Analysis

4.1. Faults Simulated

Sixty Six (66) faults were considered for the transient stability simulations which included three phase faults, as well as single phase line faults, at the locations defined by SPP. Single-phase line faults were simulated by applying a fault impedance to the positive sequence network at the fault location. As per the SPP current practice to compute the fault levels, the fault impedance was computed to give a positive sequence voltage at the specified fault location of approximately 60% of pre-fault voltage. Prior queued projects shown in item #10 in the study request i.e., (GEN-2001-039A, GEN-2002-025A, GEN-2004-014, GEN-2005-012, GEN-2006-006, GEN-2006-021, GEN-2006-022, GEN-2007-038, GEN-2007-040, GEN-2008-018, GEN-2008-079, GEN-2008-124, GEN-2010-009, GEN-2010-015, GEN-2010-045, GEN-2010-061, GEN-2011-008, GEN-2011-016, GEN-2011-017, GEN-2011-023, GEN-2011-043, GEN-2011-044, GEN-2012-007, GEN-2012-011, ASGI-2012-006, GEN-2012-024), other neighboring machines, as well as areas number 520, 524, 525, 526, 531, 534, 536, 640, 645, 650, and 652 were monitored during all the simulations. Table 4.1 shows the list of simulated contingencies. This Table also shows the fault clearing time and the time delay before re-closing for all the study contingencies.

Simulations were performed with a 0.1-second steady-state run followed by the appropriate disturbance as described in Table 4.1. Simulations were run for minimum 15-second duration to confirm proper machine damping.

Table 4.1 summarizes the overall results for all faults simulations. Complete sets of plots for both summer and winter peak seasons for year 2014 and summer peak year 2023 for each fault are included in Appendices A, B and C respectively.

For each power flow case, the following faults were run (3-phase and single phase as noted).

Table 4.1: List of simulated faults for stability analysis

Cont. #	Contingency Name	Description	2014 Summer Results	2014 Winter Results	2023 Summer Results
1	FLT01-3PH	3 phase fault on the GEN-2011-017 Tap (560242) to GEN-2012-011Tap (562334) 345kV line, near GEN-2011-017 Tap. a. Apply fault at the GEN-2011-017 Tap 345kV bus. b. Clear fault after 5 cycles by tripping the faulted line. c. Wait 20 cycles, and then re-close the line in (b) back into the fault. d. Leave fault on for 5 cycles, then trip the line in (b) and remove fault.	Stable	Stable	Stable
2	FLT02-1PH	Single phase fault and sequence like previous	Stable	Stable	Stable
3	FLT03-3PH	3 phase fault on the GEN-2011-017 Tap (560242) to Spearville (531469) 345kV line, near GEN-2011-017 Tap. a. Apply fault at the GEN-2011-017 Tap 345kV bus. b. Clear fault after 5 cycles by tripping the faulted line. c. Wait 20 cycles, and then re-close the line in (b) back into the fault. d. Leave fault on for 5 cycles, then trip the line in (b) and remove fault.	Stable	Stable	Stable
4	FLT04-1PH	Single phase fault and sequence like previous	Stable	Stable	Stable
5	FLT05-3PH	3 phase fault on Post Rock (530583) to Axtell (640065) 345kV line, near Post Rock. a. Apply fault at the Post Rock 345kV bus. b. Clear fault after 5 cycles by tripping the faulted line. c. Wait 20 cycles, and then re-close the line in (b) back into the fault. d. Leave fault on for 5 cycles, then trip the line in (b) and remove fault.	Stable	Stable	Stable
6	FLT06-1PH	Single phase fault and sequence like previous	Stable	Stable	Stable
7	FLT07-3PH	3 phase fault on Spearville (531469) to Buckner (531501) 345kV line, near Spearville. a. Apply fault at the Spearville 345kV bus. b. Clear fault after 5 cycles by tripping the faulted line. c. Wait 20 cycles, and then re-close the line in (b) back into the fault. d. Leave fault on for 5 cycles, then trip the line in (b) and remove fault.	Stable	Stable	Stable
8	FLT08-1PH	Single phase fault and sequence like previous	Stable	Stable	Stable

Cont. #	Contingency Name	Description	2014 Summer Results	2014 Winter Results	2023 Summer Results
9	FLT09-3PH	3 phase fault on Holcomb (531449) to Finney (523853) 345kV line, ckt1, near Holcomb. a. Apply fault at the Holcomb 345kV bus. b. Clear fault after 5 cycles by tripping the faulted line. c. Wait 20 cycles, and then re-close the line in (b) back into the fault. d. Leave fault on for 5 cycles, then trip the line in (b) and remove fault.	Stable	Stable	Stable
10	FLT10-1PH	Single phase fault and sequence like previous	Stable	Stable	Stable
11	FLT11-3PH	3 phase fault on Spearville (531469) to Clark County (539800) 345kV line, ckt2, near Spearville. a. Apply fault at the Spearville 345kV bus. b. Clear fault after 5 cycles by tripping the faulted line. c. Wait 20 cycles, and then re-close the line in (b) back into the fault. d. Leave fault on for 5 cycles, then trip the line in (b) and remove fault.	Stable	Stable	Stable
12	FLT12-1PH	Single phase fault and sequence like previous	Stable	Stable	Stable
13	FLT13-3PH	3 phase fault on Buckner (531501) to Holcomb (531449) 345kV line, near Buckner. a. Apply fault at the Buckner 345kV bus. b. Clear fault after 5 cycles by tripping the faulted line. c. Wait 20 cycles, and then re-close the line in (b) back into the fault. d. Leave fault on for 5 cycles, then trip the line in (b) and remove fault.	Stable	Stable	Stable
14	FLT14-1PH	Single phase fault and sequence like previous	Stable	Stable	Stable
15	FLT15-3PH	3 phase fault on Buckner (531501) to Beaver County (580500) 345kV line, near Buckner. a. Apply fault at the Buckner 345kV bus. b. Clear fault after 5 cycles by tripping the faulted line. c. Wait 20 cycles, and then re-close the line in (b) back into the fault. d. Leave fault on for 5 cycles, then trip the line in (b) and remove fault.	Stable	Stable	Stable
16	FLT16-1PH	Single phase fault and sequence like previous	Stable	Stable	Stable

Cont. #	Contingency Name	Description	2014 Summer Results	2014 Winter Results	2023 Summer Results
17	FLT17-3PH	3 phase fault on Thistle (539801) to Woodward (515375) 345kV line, ckt2, near Thistle. a. Apply fault at the Thistle 345kV bus. b. Clear fault after 5 cycles by tripping the faulted line. c. Wait 20 cycles, and then re-close the line in (b) back into the fault. d. Leave fault on for 5 cycles, then trip the line in (b) and remove fault.	Stable	Stable	Stable
18	FLT18-1PH	Single phase fault and sequence like previous	Stable	Stable	Stable
19	FLT19-3PH	3 phase fault on Thistle (539801) to Wichita (532796) 345kV line, ckt1, near Thistle. a. Apply fault at the Thistle 345kV bus. b. Clear fault after 5 cycles by tripping the faulted line. c. Wait 20 cycles, and then re-close the line in (b) back into the fault. d. Leave fault on for 5 cycles, then trip the line in (b) and remove fault.	Stable	Stable	Stable
20	FLT20-1PH	Single phase fault and sequence like previous	Stable	Stable	Stable
21	FLT21-3PH	3 phase fault on Thistle (539801) to Clark County (539800) 345kV line, ckt1, near Thistle. a. Apply fault at the Thistle 345kV bus. b. Clear fault after 5 cycles by tripping the faulted line. c. Wait 20 cycles, and then re-close the line in (b) back into the fault. d. Leave fault on for 5 cycles, then trip the line in (b) and remove fault.	Stable	Stable	Stable
22	FLT22-1PH	Single phase fault and sequence like previous	Stable	Stable	Stable
23	FLT23-3PH	3 phase fault on Thistle (539801) to G12-016-TAP (562286) 345kV line, ckt1, near Thistle. a. Apply fault at the Thistle 345kV bus. b. Clear fault after 5 cycles by tripping the faulted line. c. Wait 20 cycles, and then re-close the line in (b) back into the fault. d. Leave fault on for 5 cycles, then trip the line in (b) and remove fault.	Stable	Stable	Stable
24	FLT24-1PH	Single phase fault and sequence like previous	Stable	Stable	Stable

Cont. #	Contingency Name	Description	2014 Summer Results	2014 Winter Results	2023 Summer Results
25	FLT25-3PH	3 phase double circuit fault on Thistle (539801) to Wichita (532796) 345kV line, ckt1&2, near Thistle. a. Apply fault at the Thistle 345kV bus. b. Clear fault after 5 cycles by tripping the faulted lines. c. Wait 20 cycles, and then re-close the line in (b) back into the fault. d. Leave fault on for 5 cycles, then trip the line in (b) and remove fault.	Stable	Stable	Stable
26	FLT26-3PH	3 phase double circuit fault on Thistle (539801) to Clark County (539800) 345kV line, ckt1&2, near Thistle. a. Apply fault at the Thistle 345kV bus. b. Clear fault after 5 cycles by tripping the faulted lines. c. Wait 20 cycles, and then re-close the line in (b) back into the fault. d. Leave fault on for 5 cycles, then trip the line in (b) and remove fault.	Stable	Stable	Stable
27	FLT27-3PH	3 phase double circuit fault on Beaver County (580500) to Hitchland (523097) 345kV line, ckt1&2, near Beaver County. a. Apply fault at the Beaver County 345kV bus. b. Clear fault after 5 cycles by tripping the faulted lines. c. Wait 20 cycles, and then re-close the line in (b) back into the fault. d. Leave fault on for 5 cycles, then trip the line in (b) and remove fault.	Stable	Stable	Stable
28	FLT28-3PH	3 phase fault on Spearville (531469) to Ironwood (539803) 345kV line, ckt1, near Spearville. a. Apply fault at the Spearville 345kV bus. b. Clear fault after 5 cycles by tripping the faulted line. c. Wait 20 cycles, and then re-close the line in (b) back into the fault. d. Leave fault on for 5 cycles, then trip the line in (b) and remove fault.	Stable	Stable	Stable
29	FLT29-3PH	3 phase fault on the Thistle (539801) 345kV to Thistle (539804) 138kV/(539802) 13.8kV transformer near the 138kV bus. a. Apply fault at the Thistle 138kVbus. b. Clear fault after 5 cycles and trip the faulted transformer.	Stable	Stable	Stable

Cont. #	Contingency Name	Description	2014 Summer Results	2014 Winter Results	2023 Summer Results
30	FLT30-3PH	3 phase fault on the Post Rock (530583) 345kV to Post Rock (530584) 138kV/(530673) 13.8kV transformer near the 138kV bus. a. Apply fault at the Post Rock 138kV bus. b. Clear fault after 5 cycles and trip the faulted transformer.	Stable	Stable	Stable
31	FLT31-3PH	3 phase fault on the Spearville (531469) 345kV to Spearville (539695) 230kV/(531468) 13.8 transformer near the 230kV bus. a. Apply fault at the Spearville 230kV bus. b. Clear fault after 5 cycles and trip the faulted transformer.	Stable	Stable	Stable
32	FLT32-3PH	3 phase fault on the Woodward (515375) to Border (515458) 345kV line, ckt1, near Woodward. a. Apply fault at the Woodward 115kV bus. b. Clear fault after 5 cycles by tripping the faulted line. c. Wait 20 cycles, and then re-close the line in (b) back into the fault. d. Leave fault on for 5 cycles, then trip the line in (b) and remove fault.	Stable	Stable	Stable
33	FLT33-1PH	Single phase fault and sequence like previous	Stable	Stable	Stable
34	FLT34-3PH	3 phase fault on Beaver County (580500) to Hitchland (523097) 345kV line, ckt1, near Beaver County. a. Apply fault at the Beaver County 345kV bus. b. Clear fault after 5 cycles by tripping the faulted line. c. Wait 20 cycles, and then re-close the line in (b) back into the fault. d. Leave fault on for 5 cycles, then trip the line in (b) and remove fault.	Stable	Stable	Stable
35	FLT35-1PH	Single phase fault and sequence like previous	Stable	Stable	Stable
36	FLT36-3PH	3 phase fault on the Woodward (515375) to G11-051-TAP (562075) 345kV line, ckt1, near Woodward. a. Apply fault at the Woodward 115kV bus. b. Clear fault after 5 cycles by tripping the faulted line. c. Wait 20 cycles, and then re-close the line in (b) back into the fault. d. Leave fault on for 5 cycles, then trip the line in (b) and remove fault.	Stable	Stable	Stable
37	FLT37-1PH	Single phase fault and sequence like previous	Stable	Stable	Stable

Cont. #	Contingency Name	Description	2014 Summer Results	2014 Winter Results	2023 Summer Results
38	FLT38-3PH	3 phase fault on the Holcomb (531449) 345kV to Holcomb (531448) 115kV/(531450) 13.8kV transformer near the 345kV bus. a. Apply fault at the Holcomb 345kV bus. b. Clear fault after 5 cycles and trip the faulted transformer.	Stable	Stable	Stable
39	FLT39-3PH	3 phase fault on the Woodward (515375) to G12-016-TAP (562286) 345kV line, ckt1, near Woodward. a. Apply fault at the Woodward 115kV bus. b. Clear fault after 5 cycles by tripping the faulted line. c. Wait 20 cycles, and then re-close the line in (b) back into the fault. d. Leave fault on for 5 cycles, then trip the line in (b) and remove fault.	Stable	Stable	Stable
40	FLT40-1PH	Single phase fault and sequence like previous	Stable	Stable	Stable
41	FLT41-3PH	3 phase fault on the Woodward (515375) to Beaver County (580500) 345kV line, ckt1, near Woodward. a. Apply fault at the Woodward 115kV bus. b. Clear fault after 5 cycles by tripping the faulted line. c. Wait 20 cycles, and then re-close the line in (b) back into the fault. d. Leave fault on for 5 cycles, then trip the line in (b) and remove fault.	Stable	Stable	Stable
42	FLT42-1PH	Single phase fault and sequence like previous	Stable	Stable	Stable
43	FLT43-3PH	3 phase fault on Holcomb (531449) to Setab (531465) 345kV line, near Holcomb. a. Apply fault at the Holcomb 345kV bus. b. Clear fault after 5 cycles by tripping the faulted line. c. Wait 20 cycles, and then re-close the line in (b) back into the fault. d. Leave fault on for 5 cycles, then trip the line in (b) and remove fault.	Stable	Stable	Stable
44	FLT44-1PH	Single phase fault and sequence like previous	Stable	Stable	Stable
45	FLT45-3PH	3 phase fault on Post Rock (530583) to G12-011 POI (562334) 345kV line ckt1, near Post Rock. a. Apply fault at the Post Rock 345kV bus. b. Clear fault after 5 cycles by tripping the faulted line. c. Wait 20 cycles, and then re-close the line in (b) back into the fault. d. Leave fault on for 5 cycles, then trip the line in (b) and remove fault.	Stable	Stable	Stable
46	FLT46-1PH	Single phase fault and sequence like previous	Stable	Stable	Stable

Cont. #	Contingency Name	Description	2014 Summer Results	2014 Winter Results	2023 Summer Results
47	FLT47-3PH	3 phase fault on Axtell (640065) to Pauline (640312) 345kV line, near Axtell. a. Apply fault at the Axtell 345kV bus. b. Clear fault after 5 cycles by tripping the faulted line. c. Wait 20 cycles, and then re-close the line in (b) back into the fault. d. Leave fault on for 5 cycles, then trip the line in (b) and remove fault.	Stable	Stable	Stable
48	FLT48-1PH	Single phase fault and sequence like previous	Stable	Stable	Stable
49	FLT49-3PH	3 phase fault on Ironwood (539803) to Clark Co (539800) 345kV line, near Ironwood. a. Apply fault at the Ironwood 345kV bus. b. Clear fault after 5 cycles by tripping the faulted line. c. Wait 20 cycles, and then re-close the line in (b) back into the fault. d. Leave fault on for 5 cycles, then trip the line in (b) and remove fault.	Stable	Stable	Stable
50	FLT50-1PH	Single phase fault and sequence like previous	Stable	Stable	Stable
51	FLT51-3PH	3 phase fault on Mullergren (560013) to Reno (532771) 345kV line, near Mullergren. a. Apply fault at the Mullergren 345kV bus. b. Clear fault after 5 cycles by tripping the faulted line. c. Wait 20 cycles, and then re-close the line in (b) back into the fault. d. Leave fault on for 5 cycles, then trip the line in (b) and remove fault.	Stable	Stable	Stable
52	FLT52-1PH	Single phase fault and sequence like previous	Stable	Stable	Stable
53	FLT53-3PH	3 phase fault on Post Rock (530584) to Knoll (530558) 230kV line, near Post Rock. a. Apply fault at the Post Rock 230 kV bus. b. Clear fault after 5 cycles by tripping the faulted line. c. Wait 20 cycles, and then re-close the line in (b) back into the fault. d. Leave fault on for 5 cycles, then trip the line in (b) and remove fault.	Stable	Stable	Stable
54	FLT54-1PH	Single phase fault and sequence like previous	Stable	Stable	Stable

Cont. #	Contingency Name	Description	2014 Summer Results	2014 Winter Results	2023 Summer Results
55	FLT55-3PH	3 phase fault on Post Rock (530584) to South Hays (530582) 230kV line, near Post Rock. a. Apply fault at the Post Rock 230 kV bus. b. Clear fault after 5 cycles by tripping the faulted line. c. Wait 20 cycles, and then re-close the line in (b) back into the fault. d. Leave fault on for 5 cycles, then trip the line in (b) and remove fault.	Stable	Stable	Stable
56	FLT56-1PH	Single phase fault and sequence like previous	Stable	Stable	Stable
57	FLT57-3PH	3 phase fault on Spearville (531469) to Mullergren (560013) 345kV line, near Spearville. a. Apply fault at the Spearville 345 kV bus. b. Clear fault after 5 cycles by tripping the faulted line. c. Wait 20 cycles, and then re-close the line in (b) back into the fault. d. Leave fault on for 5 cycles, then trip the line in (b) and remove fault.	Stable	Stable	Stable
58	FLT58-1PH	Single phase fault and sequence like previous	Stable	Stable	Stable
59	FLT59-3PH	3 phase fault on Woodward (515375) to GEN-2011-051 (562075) 345kV line, near Woodward. a. Apply fault at the Woodward 345 kV bus. b. Clear fault after 5 cycles by tripping the faulted line. c. Wait 20 cycles, and then re-close the line in (b) back into the fault. d. Leave fault on for 5 cycles, then trip the line in (b) and remove fault.	Stable	Stable	Stable
50	FLT60-1PH	Single phase fault and sequence like previous	Stable	Stable	Stable
61	FLT61-3PH	Prior outage of Holcomb Generating Unit (531447), with 3 phase fault on Mingo (531451) to Red Willow (640325) 345kV line, near Mingo 345kV. a. Prior Outage Holcomb Unit 1, redispatch by scaling the remaining SPP generators per instructions. b. Apply fault at the Mingo 345kV bus. c. Clear fault after 5 cycles by tripping the faulted line. d. Wait 20 cycles, and then re-close the line in (c) back into the fault. e. Leave fault on for 5 cycles, then trip the line in (c) and remove fault. NOTE: CAT C from 2012 SPP Stability Study	Stable *	Stable *	Stable

Cont. #	Contingency Name	Description	2014 Summer Results	2014 Winter Results	2023 Summer Results
62	FLT62-3PH	<p>3 phase fault on Smoky Hills (530592) to Summit (532873) 230kV line, near Smoky Hills 230kV and outage, followed by 3 phase fault on Mullergren (539679) to Circle (532871) 230kV line.</p> <p>a. Apply fault at the Smoky Hills 230kV bus.</p> <p>b. Clear fault after 5 cycles by tripping Smoky Hills – Summit 230kV and remove fault.</p> <p>c. Wait 20 cycles, and Apply fault at the Mullergren 230kV bus.</p> <p>d. Clear fault after 5 cycles by tripping Mullergren – Circle 230kV and remove fault.</p> <p>NOTE: CAT C6 from 2012 SPP Stability Study</p>	Stable	Stable	Stable
63	FLT63-3PH	<p>3 phase fault on Knoll (530558) to Smoky Hills (530592) 230kV line, near Knoll.</p> <p>a. Apply fault at the Knoll 230 kV bus.</p> <p>b. Clear fault after 5 cycles by tripping the faulted line.</p> <p>c. Wait 90 cycles, and then re-close the line in (b) back into the fault.</p> <p>d. Leave fault on for 5 cycles, then trip the line in (b) and remove fault.</p> <p>NOTE: CAT B26 from 2012 SPP Stability Study</p>	Stable	Stable	Stable
64	FLT64-3PH	<p>3 phase fault on Smoky Hills (530592) to Summit (532873) 230kV line, near Smoky Hills.</p> <p>a. Apply fault at the Smoky Hills 230 kV bus.</p> <p>b. Clear fault after 5 cycles by tripping the faulted line.</p> <p>c. Wait 90 cycles, and then re-close the line in (b) back into the fault.</p> <p>d. Leave fault on for 5 cycles, then trip the line in (b) and remove fault.</p> <p>NOTE: CAT B27 from 2012 SPP Stability Study</p>	Stable	Stable	Stable
65	FLT65-1PH	<p>Single phase (SLG) fault on Holcomb (531448) 115kV that trips the Holcomb (531449) 345kV to Holcomb (531448)/(531450) 13.8kV transformer near the 115 kV bus.</p> <p>a. Apply fault at the Holcomb 115kVbus.</p> <p>b. Clear fault after 5 cycles and trip the faulted transformer.</p> <p>NOTE: CAT C17 from 2012 SPP Stability Study</p>	Stable	Stable	Stable

Cont. #	Contingency Name	Description	2014 Summer Results	2014 Winter Results	2023 Summer Results
66	FLT66-3PH	<p>Prior outage of Holcomb (531449) to Finney (523853) 345kV line, with 3 phase fault on Post Rock (530583) to Axtell (640065) 345kV line, near Post Rock 345kV.</p> <p>a. Prior Outage Holcomb – Finney 345. b. Apply fault at the Post Rock 345kV bus. c. Clear fault after 5 cycles by tripping the faulted line. d. Wait 20 cycles, and then re-close the line in (c) back into the fault. e. Leave fault on for 5 cycles, then trip the line in (c) and remove fault.</p>	Stable	Stable	Stable

* During this contingency, a prior queued project machine of 150 MW (GEN-2002-025A) at POI 539695 tripped with VTGTPA relay.

4.2. Simulation Results

There are no impacts on the stability performance of the SPP system for the contingencies tested on the SPP provided base cases.

5. Conclusions

The findings of the impact study for the proposed interconnection projects under DISIS -2013-001 (Group-03), GEN-2013-010, considered at 100% of their proposed installed capacity is as follows:

1. The power factor analysis indicates that interconnection request GEN-2013-010 would not be able to maintain power factor at the point of interconnection (GEN-2012-011 Tap 345kV Bus # 562334) Tap on Spearville to Post Rock 345kV line. It has been observed that during most of the contingencies the power factor control at the subject requested interconnection is beyond the capability of the machine. However, this appears to be partly inherent problem at the point of interconnection as the voltage during normal conditions is significantly below to 1 p.u.. Therefore, additional reactive power support is required to maintain required power factor.
2. There are no impacts on the stability performance of the SPP system for the contingencies tested on the provided base cases. The study machines stayed on-line and stable for all simulated faults. The Project stability simulations with sixty six (66) specified test disturbances did not show instability problems in the SPP system. Any oscillations were damped out.

6. Appendix A: 2014 Summer Peak Case Stability Run Plots

7. Appendix B: 2014 Winter Peak Case Stability Run Plots

8. Appendix C: 2023 Summer Peak Case Stability Run Plots

9. Appendix D: Project Model Data

L: Group 5 Dynamic Stability Analysis Report

See SPP report on next page.



Group 5 Impact Study

DISIS-2013-001

July 2013
Generator Interconnection



Executive Summary

DISIS-2013-001 Interconnection Customers have requested a Definitive Interconnection System Impact Study detailing the impacts of interconnecting the generation projects shown below.

- ASGI-2013-001 – 11.5MW wind farm using Siemens 2.3MW generators connected to the distribution bus of an industrial facility on the PanTex South 115kV bus on the Southwestern Public Service (SPS) Transmission System.

There are six (6) previously queued generation projects in the Group 5 area.

A stability analysis and power factor analysis were performed for the addition of the generation project in Group 5. The analyses were performed on three seasonal models, the modified versions of the 2014 summer peak, the 2014 winter peak, and the 2023 summer peak cases. A total of thirty-six (36) contingencies were evaluated for each season.

ASGI-2013-001 was found to be stable for all conditions studied. The wind turbine generators in ASGI-2013-001 have the capability of pre-contingency voltage recovery, and the post fault voltage recovery was found to be within the criterion of 0.7 pu to 1.2 pu.

The power factor analysis showed that ASGI-2013-001 required a power factor range of 0.79 leading (absorbing) to 0.63 lagging (supplying) for the three study cases, 2014 summer, 2014 winter, and 2023 summer peak conditions. ASGI-2013-001 will be required to provide the pro-forma standard 0.95 leading (absorbing) to 0.95 lagging (supplying) at the Point of Interconnection.

Low Voltage Ride Through (LVRT) analysis showed no generators tripping offline due to low voltage.

All generators in the monitored areas remained stable for all of the modeled disturbances.

Nothing in this study should be construed as a guarantee of delivery or transmission service. If the customer wishes to sell power from the facility, a separate request for transmission service must be requested on Southwest Power Pool's OASIS by the Customer.

Table of Contents

Executive Summary.....	i
Table of Contents.....	ii
Introduction.....	1
Facilities.....	2
Generating Facility	2
Interconnection Facilities	2
Stability Analysis.....	3
Model Preparation	3
Disturbances.....	3
Power Factor Analysis	7
Results	9
FERC LVRT Compliance.....	10
Conclusion	11

Introduction

DISIS-2013-001 Interconnection Customers have requested a Definitive Interconnection System Impact Study detailing the impacts of interconnecting the generation projects shown below.

- ASGI-2013-001 – 11.5MW wind farm using Siemens 2.3MW generators connected to the distribution bus of an industrial facility on the PanTex South 115kV bus on the Southwestern Public Service (SPS) Transmission System.

There are six (6) previously queued generation projects in the Group 5 area. These Interconnection Requests are listed below.

- GEN-2002-022 – 240MW of Siemens 2.3MW wind generators interconnected at the Bushland 230kV substation
- GEN-2006-047 – 240MW of Suzlon 2.1MW wind generator interconnected to the Bushland-Deaf Smith 230kV line
- GEN-2007-048 – 400MW of F 2.5MW wind generators interconnected to the Amarillo South – Swisher 230kV line.
- GEN-2008-051 – 322MW of Siemens 2.3MW wind generators interconnected at the Potter 345kV substation
- GEN-2008-088 – 50.6MW of Siemens 2.3MW wind generators interconnected at the Vega 69kV substation
- Llano Estacado – 80MW of wind generators interconnected at the Llano Wind 115kV

A stability analysis and a power factor analysis were performed for the addition of the generation project in Group 5. The analyses were performed on three seasonal models, the modified versions of the 2014 summer peak, the 2014 winter peak, and the 2023 summer peak cases.

The stability analysis determines the impacts of the new interconnecting project on the stability and voltage recovery of the nearby systems and the ability of the interconnecting project to meet FERC Order 661A. If problems with stability or voltage recovery are identified, the need for reactive compensation or system upgrades is investigated. The three-phase faults and the single line-to-ground faults listed in Table 1 were used in the stability analysis.

The power factor analysis determines the power factor at the point of interconnection for the wind interconnection project for pre-contingency and post-contingency conditions. The contingencies used in the power factor analysis (Table 3) are a subset of the stability analysis contingencies shown in Table 1.

Nothing in this System Impact Study constitutes a request for transmission service or grants the Interconnection Customer any rights to transmission service.

Facilities

Generating Facility

ASGI-2013-001 Interconnection Customer’s request to interconnect a total of 11.5MW is comprised of five (5) Siemens 2.3MW wind turbine generators and associated interconnection facilities.

Interconnection Facilities

The POI for ASGI-2013-001 Interconnection Customer is the Pantex 115kV substation in Carson County, Texas. Figure 1 depicts the one-line diagram of the local transmission system including the POI as well as the power flow model representing the request.

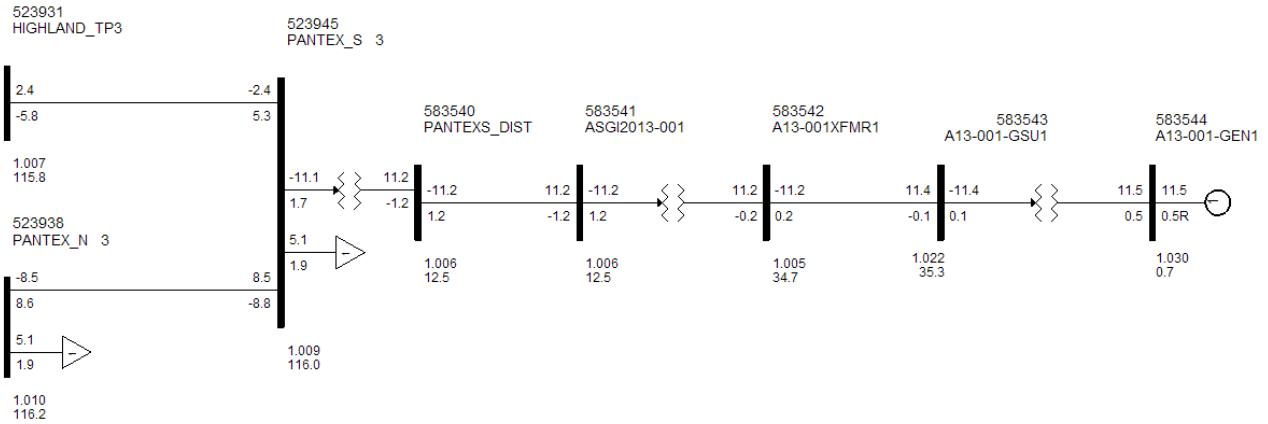


Figure 1: Proposed POI Configuration and Request Power Flow Model

Stability Analysis

Transient stability analysis is used to determine if the transmission system can maintain angular stability and ensure bus voltages stay within planning criteria bandwidth during and after a disturbance while considering the addition of a generator interconnection request.

Model Preparation

Transient stability analysis was performed using modified versions of the 2012 series of Model Development Working Group (MDWG) dynamic study models including the 2014 summer peak, 2014 winter peak, and the 2023 summer peak seasonal models. The cases are then loaded with prior queued interconnection requests and network upgrades assigned to those interconnection requests. Finally the prior queued and study generation are dispatched into the SPP footprint. Initial simulations are then carried out for a no-disturbance run of twenty (20) seconds to verify the numerical stability of the model.

Disturbances

Thirty-six (36) contingencies were identified for use in this study and are listed in Table 1. These contingencies included three-phase faults and single-phase line faults at locations defined by SPP. Single-phase line faults were simulated by applying fault impedance to the positive sequence network at the fault location to represent the effect of the negative and zero sequence networks on the positive sequence network. The fault impedance was computed to give a positive sequence voltage at the specified fault location of approximately 60% of pre-fault voltage. This method is in agreement with SPP current practice.

Except for transformer faults, the typical sequence of events for a three-phase and a single-phase fault is as follows:

1. apply fault at particular location
2. continue fault for five (5) cycles, clear the fault by tripping the faulted facility
3. after an additional twenty (20) cycles, re-close the previous facility back into the fault
4. continue fault for five (5) additional cycles
5. trip the faulted facility and remove the fault

Transformer faults are typically modeled as three-phase faults, unless otherwise noted. The sequence of events for a transformer fault is as follows:

1. apply fault for five (5) cycles
2. clear the fault by tripping the affected transformer facility (unless otherwise noted there will be no re-closing into a transformer fault)

Table 1 – Contingencies Evaluated

Cont. No.	Contingency Name	Description
1	FLT_01_POTTERCO7_HIT CHLAND7_345kV_3PH	3 phase fault on the Potter Co. (523961) to Hitchland (523097) 345kV line, near Potter Co. a. Apply fault at the Potter Co. 345kV bus. b. Clear fault after 5 cycles by tripping the faulted line. c. Wait 20 cycles, and then re-close the line in (b) back into the fault. d. Leave fault on for 5 cycles, then trip the line in (b) and remove fault.
2	FLT_02_POTTERCO7_HIT CHLAND7_345kV_1PH	<i>Single phase fault and sequence like previous</i>
3	FLT_03_TUCOINT7_BORDER7_345kV_3PH	3 phase fault on the Tuco (525832) to Border (562309) 345kV line, near Tuco. a. Apply fault at the Tuco 345kV bus. b. Clear fault after 5 cycles by tripping the faulted line. c. Wait 20 cycles, and then re-close the line in (b) back into the fault. d. Leave fault on for 5 cycles, then trip the line in (b) and remove fault.
4	FLT_04_TUCOINT7_BORDER7_345kV_1PH	<i>Single phase fault and sequence like previous</i>
5	FLT_05_G13017TAP_OKU7_345kV_3PH	3 phase fault on the GEN-2013-017-Tap (560700) to Oklaunion (511456) 345kV line, near GEN-2013-017-Tap. a. Apply fault at the GEN-2013-017-Tap 345kV bus. b. Clear fault after 5 cycles by tripping the faulted line. c. Wait 20 cycles, and then re-close the line in (b) back into the fault. d. Leave fault on for 5 cycles, then trip the line in (b) and remove fault.
6	FLT_06_G13017TAP_OKU7_345kV_1PH	<i>Single phase fault and sequence like previous</i>
7	FLT_07_POTTERCO6_MOORECNTY6_230kV_3PH	3 phase fault on the Potter Co. (523959) to Moore Co. (523309) 230kV line, near Potter Co. a. Apply fault at the Potter Co. 230kV bus. b. Clear fault after 5 cycles by tripping the faulted line. c. Wait 20 cycles, and then re-close the line in (b) back into the fault. d. Leave fault on for 5 cycles, then trip the line in (b) and remove fault.
8	FLT_08_POTTERCO6_MOORECNTY6_230kV_1PH	<i>Single phase fault and sequence like previous</i>
9	FLT_09_POTTERCO6_PLANTX6_230kV_3PH	3 phase fault on the Potter Co. (523959) to Plant X (525481) 230kV line, near Potter Co. a. Apply fault at the Potter Co. 230kV bus. b. Clear fault after 5 cycles by tripping the faulted line. c. Wait 20 cycles, and then re-close the line in (b) back into the fault. d. Leave fault on for 5 cycles, then trip the line in (b) and remove fault.
10	FLT_10_POTTERCO6_PLANTX6_230kV_1PH	<i>Single phase fault and sequence like previous</i>
11	FLT_11_HARRNGEST6_PRINGLE6_230kV_3PH	3 phase fault on the Harrington (523979) to Pringle (523267) 230kV line, near Harrington. a. Apply fault at the Harrington 230kV bus. b. Clear fault after 5 cycles by tripping the faulted line. c. Wait 20 cycles, and then re-close the line in (b) back into the fault. d. Leave fault on for 5 cycles, then trip the line in (b) and remove fault.
12	FLT_12_HARRNGEST6_PRINGLE6_230kV_1PH	<i>Single phase fault and sequence like previous</i>

Table 1 – Contingencies Evaluated

Cont. No.	Contingency Name	Description
13	FLT_13_NICHOLS6_HUTC HISON6_230kV_3PH	3 phase fault on the Nichols (524044) to Hutchinson Co. Intg. (523551) 230kV line, near Nichols. a. Apply fault at the Nichols 230kV bus. b. Clear fault after 5 cycles by tripping the faulted line. c. Wait 20 cycles, and then re-close the line in (b) back into the fault. d. Leave fault on for 5 cycles, then trip the line in (b) and remove fault.
14	FLT_14_NICHOLS6_HUTC HISON6_230kV_1PH	<i>Single phase fault and sequence like previous</i>
15	FLT_15_NICHOLS6_GRAP EVINE6_230kV_3PH	3 phase fault on the Nichols (524044) to Grapevine (523771) 230kV line, near Nichols. a. Apply fault at the Nichols 230kV bus. b. Clear fault after 5 cycles by tripping the faulted line. c. Wait 20 cycles, and then re-close the line in (b) back into the fault. d. Leave fault on for 5 cycles, then trip the line in (b) and remove fault.
16	FLT_16_NICHOLS6_GRAP EVINE6_230kV_1PH	<i>Single phase fault and sequence like previous</i>
17	FLT_17_BUFFALO_DEAFS MITH6_230kV_3PH	3 phase fault on the Buffalo (560009) to Deaf Smith (524623) 230kV line, near Buffalo. a. Apply fault at the Buffalo 230kV bus. b. Clear fault after 5 cycles by tripping the faulted line. c. Wait 20 cycles, and then re-close the line in (b) back into the fault. d. Leave fault on for 5 cycles, then trip the line in (b) and remove fault.
18	FLT_18_BUFFALO_DEAFS MITH6_230kV_1PH	<i>Single phase fault and sequence like previous</i>
19	FLT_19_G07048TAP_SWI SHER6_230kV_3PH	3 phase fault on the GEN-2007-048-Tap (560164) to Swisher Co. (525213) 230kV line, near GEN-2007-048-Tap. a. Apply fault at the GEN-2007-048-Tap 230kV bus. b. Clear fault after 5 cycles by tripping the faulted line. c. Wait 20 cycles, and then re-close the line in (b) back into the fault. d. Leave fault on for 5 cycles, then trip the line in (b) and remove fault.
20	FLT_20_G07048TAP_SWI SHER6_230kV_1PH	<i>Single phase fault and sequence like previous</i>
21	FLT_21_PANTEXS3_HIGHL ANDTP3_115kV_3PH	3 phase fault on the Pantex South (523945) to Highland Park Tap (523931) 115kV line, near Pantex South. a. Apply fault at the Pantex South 115kV bus. b. Clear fault after 5 cycles by tripping the faulted line. c. Wait 20 cycles, and then re-close the line in (b) back into the fault. d. Leave fault on for 5 cycles, then trip the line in (b) and remove fault.
22	FLT_22_PANTEXS3_HIGHL ANDTP3_115kV_1PH	<i>Single phase fault and sequence like previous</i>
23	FLT_23_PANTEXS3_PANT EXN3_115kV_3PH	3 phase fault on the Pantex South (523945) to Pantex North (523938) 115kV line, near Pantex South. a. Apply fault at the Pantex South 115kV bus. b. Clear fault after 5 cycles by tripping the faulted line. c. Wait 20 cycles, and then re-close the line in (b) back into the fault. d. Leave fault on for 5 cycles, then trip the line in (b) and remove fault.
24	FLT_24_PANTEXS3_PANT EXN3_115kV_1PH	<i>Single phase fault and sequence like previous</i>

Table 1 – Contingencies Evaluated

Cont. No.	Contingency Name	Description
25	FLT_25_MARTIN3_HUTC HS3_115kV_3PH	3 phase fault on the Martin (523928) to Hutchinson Co. Intg. (523546) 115kV line, near Martin. a. Apply fault at the Martin 115kV bus. b. Clear fault after 5 cycles by tripping the faulted line. c. Wait 20 cycles, and then re-close the line in (b) back into the fault. d. Leave fault on for 5 cycles, then trip the line in (b) and remove fault.
26	FLT_26_MARTIN3_HUTC HS3_115kV_1PH	<i>Single phase fault and sequence like previous</i>
27	FLT_27_CONWAY3_KIRBY 3_115kV_3PH	3 phase fault on the Conway (524079) to Kirby Sw. Sta. (524088) 115kV line, near Conway. a. Apply fault at the Conway 115kV bus. b. Clear fault after 5 cycles by tripping the faulted line. c. Wait 20 cycles, and then re-close the line in (b) back into the fault. d. Leave fault on for 5 cycles, then trip the line in (b) and remove fault.
28	FLT_28_CONWAY3_KIRBY 3_115kV_1PH	<i>Single phase fault and sequence like previous</i>
29	FLT_29_POTTERCO6_POT TERCO7_230_345kV_3PH	3 phase fault on the Potter Co. 345kV (523961) / 230kV (523959) / 13.2kV (523957) transformer, near Potter Co. 230kV. a. Apply fault at the Potter Co. 230kV bus. b. Clear fault after 5 cycles by tripping the faulted transformer.
30	FLT_30_HUTCHS3_HUTC HISON6_115_230kV_3PH	3 phase fault on the Hutchinson Co. Intg. 230kV (523551) / 115kV (523546) / 12.8kV (523541) transformer, near Hutchinson Co. Intg. 115kV. a. Apply fault at the Hutchinson Co. Intg. 115kV bus. b. Clear fault after 5 cycles by tripping the faulted transformer.
31	FLT_31_NICHOLS3_NICH OLS6_115_230kV_3PH	3 phase fault on the Nichols 230kV (524044) / 115kV (524043) / 13.2kV (524041) transformer, near Nichols 115kV. a. Apply fault at the Nichols 115kV bus. b. Clear fault after 5 cycles by tripping the faulted transformer.
32	FLT_32_HUTCHS3_HUTC HISON2_115_69kV_3PH	3 phase fault on the Hutchinson Co. Intg. 115kV (523546) / 69kV (523543) / 13.2kV (523542) transformer, near Hutchinson Co. Intg. 115kV ckt 1. a. Apply fault at the Hutchinson Co. Intg. 115kV bus. b. Clear fault after 5 cycles by tripping the faulted transformer.
33	FLT_33_PO_HUTCHISON6 _HUTCHS3_PANTEXS3_HI GHLANDTP3_115kV_3PH	Prior outage on the Hutchinson Co. Intg. (523551) 230kV / 115kV (523546) / 12.8kV (523541) transformer ckt 1: 3 phase fault on the Pantex South (523945) to Highland Park Tap (523931) 115kV line, near Pantex South 115kV. a. Prior outage of Hutchinson Co. Intg. 230/115/12.8 kV transformer. b. Apply fault at the Pantex South 115kV bus. c. Clear fault after 5 cycles by tripping the faulted line. d. Wait 20 cycles, and then re-close the line in (c) back into the fault. e. Leave fault on for 5 cycles, then trip the line in (c) and remove fault.
34	FLT_34_PO_HUTCHISON6 _HUTCHS3_PANTEXS3_HI GHLANDTP3_115kV_1PH	<i>Single phase fault and sequence like previous</i>

Table 1 – Contingencies Evaluated

Cont. No.	Contingency Name	Description
35	FLT_35_PO_NICHOLS6_NICHOLS3_MARTIN3_HUTC HS3_115kV_3PH	<p>Prior outage on the Nichols 230kV (524044) / 115kV (524043) / 13.2kV (524041) transformer ckt 1: 3 phase fault on the Martin (523928) to Hutchinson Co. Intg. (523546) 115kV line, near Martin 115kV.</p> <p>a. Prior outage of Nichols 230/115kV transformer ckt 1. b. Apply fault at the Martin 115kV bus. c. Clear fault after 5 cycles by tripping the faulted line. d. Wait 20 cycles, and then re-close the line in (c) back into the fault. e. Leave fault on for 5 cycles, then trip the line in (c) and remove fault.</p>
36	FLT_36_PO_NICHOLS6_NICHOLS3_MARTIN3_HUTC HS3_115kV_1PH	<i>Single phase fault and sequence like previous</i>

NOTE: For prior outage contingencies assume that the network is at steady state after the prior outage.

Power Factor Analysis

The power factor analysis was performed for this study and is designed to demonstrate the reactive power requirements at the point of interconnection. In order to perform the analysis the request and equivalent transmission lines and collectors systems were modeled using specifications provided by the Customer. Table 2 shows a summary of the power factor analysis at the POI, and Table 3 shows the contingencies and the resultant power factors at the POI.

Table 2 – Summary of Power Factor Analysis at the POI

Request	Capacity	POI	Fuel	Generator	Power Factor at POI Leading (absorbing vars)	Power Factor at POI Lagging (providing vars)
ASGI-2013-001	11.5MW	PanTex South 115kV	Wind	Siemens 2.3MW	0.798	0.638

NOTE: As reactive power is required for all projects, the final requirement in the GIA will be the pro-forma 95% lagging to 95% leading at the point of interconnection.

Table 3 – Power Factor Analysis at the POI

DISIS-2013-001 Group 5 POI – Pantex South 115kV (523945)		2014 Summer Voltage = 1.008 pu				2014 Winter Voltage = 1.008 pu				2023 Summer Voltage = 1.007 pu			
Cont. No.	Contingency Name	Power @ POI	VARs @ POI	Power Factor		Power @ POI	VARs @ POI	Power Factor		Power @ POI	VARs @ POI	Power Factor	
0	No Fault	11.5	-3.1	0.9655	LEAD	11.5	-3.1	0.9655	LEAD	11.5	-2.9	0.9696	LEAD
1	FLT_01_POTTERCO7_HITCHLAND7_345kV	11.5	-1.6	0.9905	LEAD	11.5	-2.3	0.9806	LEAD	11.5	0.1	1.0000	LAG
3	FLT_03_TUCOINT7_BORDER7_345kV	11.5	-2.5	0.9772	LEAD	11.5	-2.8	0.9716	LEAD	11.5	-1.6	0.9905	LEAD
5	FLT_05_G13017TAP_OKU7_345kV	11.5	-1.1	0.9955	LEAD	11.5	-2.2	0.9822	LEAD	11.5	-0.3	0.9997	LEAD
7	FLT_07_POTTERCO6_MOORECNTY6_230kV	11.5	-1.7	0.9892	LEAD	11.5	-2.2	0.9822	LEAD	11.5	-1.6	0.9905	LEAD
9	FLT_09_POTTERCO6_PLANTX6_230kV	11.5	-3.1	0.9655	LEAD	11.5	-3.1	0.9655	LEAD	11.5	-2.8	0.9716	LEAD
11	FLT_11_HARRNGEST6_PRINGLE6_230kV	11.5	-1.6	0.9905	LEAD	11.5	-2.2	0.9822	LEAD	11.5	-1	0.9962	LEAD
13	FLT_13_NICHOLS6_HUTCHISON6_230kV	11.5	9.4	0.7743	LAG	11.5	6.9	0.8575	LAG	11.5	13.9	0.6375	LAG
15	FLT_15_NICHOLS6_GRAPEVINE6_230kV	11.5	2.3	0.9806	LAG	11.5	-2.6	0.9754	LEAD	11.5	4.3	0.9367	LAG
17	FLT_17_BUFFALO_DEAFSMITH6_230kV	11.5	-3	0.9676	LEAD	11.5	-3	0.9676	LEAD	11.5	-3	0.9676	LEAD
19	FLT_19_G07048TAP_SWISHER6_230kV	11.5	-2.8	0.9716	LEAD	11.5	-2.7	0.9735	LEAD	11.5	-2.2	0.9822	LEAD
21	FLT_21_PANTEXS3_HIGHLANDTP3_115kV	11.5	-7.1	0.8509	LEAD	11.5	-8.7	0.7975	LEAD	11.5	-7.6	0.8343	LEAD
23	FLT_23_PANTEXS3_PANTEXN3_115kV	11.5	3.6	0.9543	LAG	11.5	5.2	0.9112	LAG	11.5	4.2	0.9393	LAG
25	FLT_25_MARTIN3_HUTCHS3_115kV	11.5	1.4	0.9927	LAG	11.5	1	0.9962	LAG	11.5	2.1	0.9837	LAG
27	FLT_27_CONWAY3_KIRBY3_115kV	11.5	-2.2	0.9822	LEAD	11.5	-2.5	0.9772	LEAD	11.5	-2.5	0.9772	LEAD
29	FLT_29_POTTERCO6_POTTERCO7_230_345kV	11.5	-2.6	0.9754	LEAD	11.5	-2.8	0.9716	LEAD	11.5	-2.4	0.9789	LEAD
30	FLT_30_HUTCHS3_HUTCHISON6_115_230kV	11.5	-0.8	0.9976	LEAD	11.5	-1.6	0.9905	LEAD	11.5	0.6	0.9986	LAG
31	FLT_31_NICHOLS3_NICHOLS6_115_230kV	11.5	-3.6	0.9543	LEAD	11.5	-3.5	0.9567	LEAD	11.5	-7.4	0.8409	LEAD
32	FLT_32_HUTCHS3_HUTCHISON2_115_69kV	11.5	-4.6	0.9285	LEAD	11.5	-4.3	0.9367	LEAD	11.5	-4.7	0.9257	LEAD
33	FLT_33_PO_HUTCHISON6_HUTCHS3_PANTEXS3_HIGHLANDTP3_115kV	11.5	-6.3	0.8770	LEAD	11.5	-8.3	0.8109	LEAD	11.5	-6.4	0.8738	LEAD
35	FLT_35_PO_NICHOLS6_NICHOLS3_MARTIN3_HUTCHS3_115kV	11.5	1.8	0.9880	LAG	11.5	1.3	0.9937	LAG	11.5	2.1	0.9837	LAG

Results

The stability analysis was performed and the results are summarized in **Error! Reference source not found.4**. The results indicate that the transmission system remained stable for all contingencies studied. The plots will be available upon request.

Table 4 – Stability Analysis Results

Contingency Number and Name		2014SP	2014WP	2023SP
1	FLT_01_POTTERCO7_HITCHLAND7_345kV_3PH	Stable	Stable	Stable
2	FLT_02_POTTERCO7_HITCHLAND7_345kV_1PH	Stable	Stable	Stable
3	FLT_03_TUCOINT7_BORDER7_345kV_3PH	Stable	Stable	Stable
4	FLT_04_TUCOINT7_BORDER7_345kV_1PH	Stable	Stable	Stable
5	FLT_05_G13017TAP_OKU7_345kV_3PH	Stable	Stable	Stable
6	FLT_06_G13017TAP_OKU7_345kV_1PH	Stable	Stable	Stable
7	FLT_07_POTTERCO6_MOORECNTY6_230kV_3PH	Stable	Stable	Stable
8	FLT_08_POTTERCO6_MOORECNTY6_230kV_1PH	Stable	Stable	Stable
9	FLT_09_POTTERCO6_PLANTX6_230kV_3PH	Stable	Stable	Stable
10	FLT_10_POTTERCO6_PLANTX6_230kV_1PH	Stable	Stable	Stable
11	FLT_11_HARRNGEST6_PRINGLE6_230kV_3PH	Stable	Stable	Stable
12	FLT_12_HARRNGEST6_PRINGLE6_230kV_1PH	Stable	Stable	Stable
13	FLT_13_NICHOLS6_HUTCHISON6_230kV_3PH	Stable	Stable	Stable
14	FLT_14_NICHOLS6_HUTCHISON6_230kV_1PH	Stable	Stable	Stable
15	FLT_15_NICHOLS6_GRAPEVINE6_230kV_3PH	Stable	Stable	Stable
16	FLT_16_NICHOLS6_GRAPEVINE6_230kV_1PH	Stable	Stable	Stable
17	FLT_17_BUFFALO_DEAFSMITH6_230kV_3PH	Stable	Stable	Stable
18	FLT_18_BUFFALO_DEAFSMITH6_230kV_1PH	Stable	Stable	Stable
19	FLT_19_G07048TAP_SWISHER6_230kV_3PH	Stable	Stable	Stable
20	FLT_20_G07048TAP_SWISHER6_230kV_1PH	Stable	Stable	Stable
21	FLT_21_PANTEXS3_HIGHLANDTP3_115kV_3PH	Stable	Stable	Stable
22	FLT_22_PANTEXS3_HIGHLANDTP3_115kV_1PH	Stable	Stable	Stable
23	FLT_23_PANTEXS3_PANTEXN3_115kV_3PH	Stable	Stable	Stable
24	FLT_24_PANTEXS3_PANTEXN3_115kV_1PH	Stable	Stable	Stable
25	FLT_25_MARTIN3_HUTCHS3_115kV_3PH	Stable	Stable	Stable
26	FLT_26_MARTIN3_HUTCHS3_115kV_1PH	Stable	Stable	Stable
27	FLT_27_CONWAY3_KIRBY3_115kV_3PH	Stable	Stable	Stable
28	FLT_28_CONWAY3_KIRBY3_115kV_1PH	Stable	Stable	Stable
29	FLT_29_POTTERCO6_POTTERCO7_230_345kV_3PH	Stable	Stable	Stable
30	FLT_30_HUTCHS3_HUTCHISON6_115_230kV_3PH	Stable	Stable	Stable
31	FLT_31_NICHOLS3_NICHOLS6_115_230kV_3PH	Stable	Stable	Stable
32	FLT_32_HUTCHS3_HUTCHISON2_115_69kV_3PH	Stable	Stable	Stable
33	FLT_33_PO_HUTCHISON6_HUTCHS3_PANTEXS3_HIGHLANDTP3_115kV_3PH	Stable	Stable	Stable
34	FLT_34_PO_HUTCHISON6_HUTCHS3_PANTEXS3_HIGHLANDTP3_115kV_1PH	Stable	Stable	Stable
35	FLT_35_PO_NICHOLS6_NICHOLS3_MARTIN3_HUTCHS3_115kV_3PH	Stable	Stable	Stable
36	FLT_36_PO_NICHOLS6_NICHOLS3_MARTIN3_HUTCHS3_115kV_1PH	Stable	Stable	Stable

FERC LVRT Compliance

FERC Order #661A places specific requirements on wind farms through its Low Voltage Ride Through (LVRT) provisions. For Interconnection Agreements signed after December 31, 2006, wind farms shall stay on line for faults at the POI that draw the voltage down at the POI to 0.0 pu.

Fault contingencies were developed to verify that wind farms remain on line when the POI voltage is drawn down to 0.0 pu. These contingencies are shown in Table 5.

Table 5 – LVRT Contingencies

Contingency Number and Name		Description
1	FLT_21_PANTEXS3_HIGHLANDTP3_115kV_3PH	3 phase fault on the Pantex South (523945) to Highland Park Tap (523931) 115kV line, near Pantex South.
2	FLT_23_PANTEXS3_PANTEXN3_115kV_3PH	3 phase fault on the Pantex South (523945) to Pantex North (523938) 115kV line, near Pantex South.

The required prior queued project wind farms remained online for the fault contingencies described in this section as well as the fault contingencies described in the Disturbances section of this report. ASGI-2013-001 was found to be in compliance with FERC Order #661A.

Conclusion

DISIS-2013-001 Interconnection Customers have requested an Impact Study to determine the impacts of interconnecting generation to the SPP Transmission System.

ASGI-2013-001 was found to be stable for all conditions studied. The wind turbine generators in ASGI-2013-001 have the capability of pre-contingency voltage recovery, and the post fault voltage recovery was found to be within the criterion of 0.7 pu to 1.2 pu.

The power factor analysis showed that ASGI-2013-001 required a power factor range of 0.79 leading (absorbing) to 0.63 lagging (supplying) for the three study cases, 2014 summer, 2014 winter, and 2023 summer peak conditions. ASGI-2013-001 will be required to provide the pro-forma standard 0.95 leading (absorbing) to 0.95 lagging (supplying) at the Point of Interconnection.

Low Voltage Ride Through (LVRT) analysis showed no generators tripping offline due to low voltage.

All generators in the monitored areas remained stable for all of the modeled disturbances.

Any changes to the assumptions made in this study, for example, one or more of the previously queued requests withdraw, may require a re-study at the expense of the Customer.

Nothing in this System Impact Study constitutes a request for transmission service or confers upon the Interconnection Customer any right to receive transmission service.

M: Group 6 Dynamic Stability Analysis Report

See report on next page



Group 6 Impact Study

DISIS-2013-001

August 2013
Generator Interconnection



Executive Summary

DISIS-2013-001-1 Interconnection Customers have requested a Definitive Interconnection System Impact Study detailing the impacts of interconnecting the generation projects shown below.

- GEN-2013-013 – 248.4MW wind farm using Siemens 2.3MW generators connected to a 345kV substation along the Eddy County – Tolk 345kV transmission line on the Southwestern Public Service (SPS) Transmission System.
- GEN-2013-016 – 191MW/203MW (summer/winter) combustion turbine generation facility connected at Tuco 345kV Interchange on the Southwestern Public Service (SPS) Transmission System.
- GEN-2013-017 – 199.5MW wind farm using G.E. 1.7MW generators connected to a 345kV substation along the Tuco-Oklaunion 345kV transmission line on the Southwestern Public Service (SPS) Transmission System.
- ASGI-2013-002 – 18.4MW wind farm using Siemens 2.3MW generators connected to a 69kV substation on the Farmers Electric Cooperative transmission system. This request was studied as an Affected System request.
- ASGI-2013-003 – 18.4MW wind farm using Siemens 2.3MW generators connected to a 69kV substation on the Farmers Electric Cooperative transmission system. This request was studied as an Affected System request.

There are thirty (30) previously queued generation projects in the Group 6 area.

A stability analysis and power factor analysis were performed for the addition of the generation projects in Group 6. The analyses were performed on three seasonal models, the modified versions of the 2014 summer peak, the 2014 winter peak, and the 2023 summer peak cases. A total of seventy-seven (77) contingencies were evaluated for each season.

Transmission System Stability issues were observed with several studied contingencies as noted in Table III-2. Most notable of stability issues was voltage instability that was associated with transmission line faults causing the outage of the Tuco-Border-Woodward 345kV transmission line. The outage of these line segments caused voltage collapse along the existing Tuco – Oklaunion 345kV line with most notable voltage depressions at the Oklaunion 345kV bus. 345kV transmission reinforcements are required to alleviate this potential voltage instability. The transmission reinforcements required are the following –

- Sweetwater 345kV substation - new substation tapping into the Tuco – Border 345kV line
- Tuco – Sweetwater 345kV transmission line – new 345kV line
- Sweetwater – Gracemont 345kV line – new 345kV line. Portions of this line are currently under an NTC-C (Notification to Construct with Conditions) but a final NTC has not been issued at the time of this report.

With all Base Case Network Upgrades in service, previously assigned Network Upgrades in service,

and the above listed newly assigned Network Upgrades in service, the Group 6 projects were found to remain on line, and the transmission system was found to remain stable for all conditions studied.

The power factor analysis of the three study cases showed that the Group 6 projects are all required to maintain a power factor requirement of the pro-forma standard 0.95 leading (absorbing) to 0.95 lagging (supplying) at the Point of Interconnection. Interconnection Requests GEN-2013-013 and GEN-2013-017 were also found to need additional reactors to compensate for potential high voltage during low wind conditions.

Low Voltage Ride Through (LVRT) analysis showed none of the study generators tripping offline due to low voltage when all Network Upgrades are in service.

All generators in the monitored areas remained stable for all of the modeled disturbances.

Nothing in this study should be construed as a guarantee of delivery or transmission service. If the customer wishes to sell power from the facility, a separate request for transmission service must be requested on Southwest Power Pool's OASIS by the Customer.

Table of Contents

Executive Summary	i
Table of Contents	iii
I. Introduction	1
II. Facilities	3
III. Stability Analysis	7
Model Preparation	7
Disturbances.....	7
Results	15
FERC LVRT Compliance.....	20
IV. Power Factor Analysis	22
Power Factor Analysis	22
Low Wind Reactor Sizing Analysis	24
V. Conclusion	26
Appendix A: 2014 Summer Stability Plots	27
Appendix B: 2014 Winter Peak Stability Plots	28
Appendix C: 2023 Summer Peak Stability Plots	29
Appendix D: Power Factor Analysis Tables	30

I. Introduction

DISIS-2013-001 Interconnection Customers have requested a Definitive Interconnection System Impact Study detailing the impacts of interconnecting the generation projects shown Table I-1 below.

Table I-1: Group 6 Interconnection Requests

Request	Capacity (MW)	Generator Model	Point of Interconnection
GEN-2013-013	248.4	Siemens 2.3MW	Tap Eddy County – Tolk 345kV (GEN-2013-013 POI, 560726)
GEN-2013-016	191 Summer 203 Winter	GENROU	TUCO 345kV (525832)
GEN-2013-017	199.5	G.E. 1.7MW	Tap TUCO – O.K.U 345kV (GEN-2013-017 POI, 560700)
ASGI-2013-002	18.4	Siemens 2.3MW VS	Tucumcari 115kV (524509)
ASGI-2013-003	18.4	Siemens 2.3MW VS	Clovis 115kV (524808)

The previously queued generation projects in the Group 6 area are listed in Table I-2 below.

Table I-2: Group 6 Prior Queued Interconnection Requests

Request	Capacity (MW)	Generator Model	Point of Interconnection
GEN-2001-033	180	Mitsubishi 1000	San Juan Mesa 230kV (524885)
GEN-2001-036	80	CIMTR	Norton 115kV (524502)
GEN-2006-018	170	GENSAL	TUCO 230kV (525830)
GEN-2008-008	60	G.E. 1.5MW	Graham 69kV (526693)
GEN-2008-009	60	G.E. 1.5MW	San Juan Mesa 230kV (524885)
GEN-2008-022	300	G.E. 2.5MW	Tap on Eddy County – Tolk 345kV line (GEN-2008-022-POI, 560007)
GEN-2010-006	180 Summer 205 Winter	GENROU	Jones 230kV(526337)
ASGI-2010-010	42	GENSAL	Lovington 115kV (528334)
ASGI-2010-020	30	Nordex 2.5MW	Tap LE-Tatum – LE-Crossroads 69kV (ASGI-2010-020-POI, 560360)
GEN-2010-020	20	Emerson 0.5MW	Roswell 69kV (527563)
ASGI-2010-021	15	Mitsubishi MPS-1000A 1.0MW	Tap LE-Saunders Tap – LE-Anderson 69kV (ASGI-2010-021 POI, 560364)
GEN-2010-046	56	GENSAL	TUCO 230kV (525830)
GEN-2010-058	20	Emerson 0.5MW	Chaves County 115kV (527482)
ASGI-2011-003	10	Sany 2.0MW	Hendricks 69kV (525943)
ASGI-2011-001	27.3	Suzlon 2.1MW	Lovington 115kV (528334)
GEN-2011-025	80	G.E. 1.6MW	Tap on Floyd County – Crosby County 115kV line (GEN-2011-025 POI, 562004)
GEN-2011-045	180 Summer 205 Winter	GENROU	Jones 230kV (526337)
GEN-2011-046	23 Summer 27 Winter	GENROU	Quay County 115kV (524472)
GEN-2011-048	165 Summer 175 Winter	GENROU	Mustang 230kV (527151)

Table I-2: Group 6 Prior Queued Interconnection Requests

Request	Capacity (MW)	Generator Model	Point of Interconnection
ASGI-2011-004	19.2	G.E. 1.6MW	Crosby 69kV (525915)
GEN-2012-001	61.2	CCWE 3.6MW (WT4)	Tap Grassland – Borden 230kV (GEN-2012-001 POI, 562089)
GEN-2012-008	40 MW increase	GENROU	Mustang 115kV (527146)
GEN-2012-009	15 MW increase	GENROU	Mustang 230kV (527151)
GEN-2012-010	15 MW increase	GENROU	Mustang 230kV (527151)
GEN-2012-020	478	G.E. 1.68MW	TUCO 230kV (525830)
GEN-2012-034	7 MW increase	GENROU	Mustang 230kV (527151)
GEN-2012-035	7 MW increase	GENROU	Mustang 230kV (527151)
GEN-2012-036	7 MW increase	GENROU	Mustang 230kV (527151)
GEN-2012-037	196 Summer 203 Winter	GENROU	TUCO 345kV (525832)
ASGI-2012-002	18	Vestas 1.65MW V82	Clovis 115kV (524808)

A stability analysis and a power factor analysis were performed for the addition of the generation projects in Group 6. The analyses were performed on three seasonal models, the modified versions of the 2014 summer peak, the 2014 winter peak, and the 2023 summer peak cases.

The stability analysis determines the impacts of the new interconnecting project on the stability and voltage recovery of the nearby systems and the ability of the interconnecting project to meet FERC Order 661A. If problems with stability or voltage recovery are identified, the need for reactive compensation or system upgrades is investigated. The three-phase faults and the single line-to-ground faults listed in Table III-1 were used in the stability analysis.

The power factor analysis determines the power factor at the point of interconnection for the wind interconnection project for pre-contingency and post-contingency conditions. The contingencies used in the power factor analysis (Table IV-2) are a subset of the stability analysis contingencies shown in Table III-1.

Nothing in this System Impact Study constitutes a request for transmission service or grants the Interconnection Customer any rights to transmission service.

II. Facilities

A one-line drawing for each of the generation interconnection requests in this study is shown in Figure II-1 through Figure II-5.

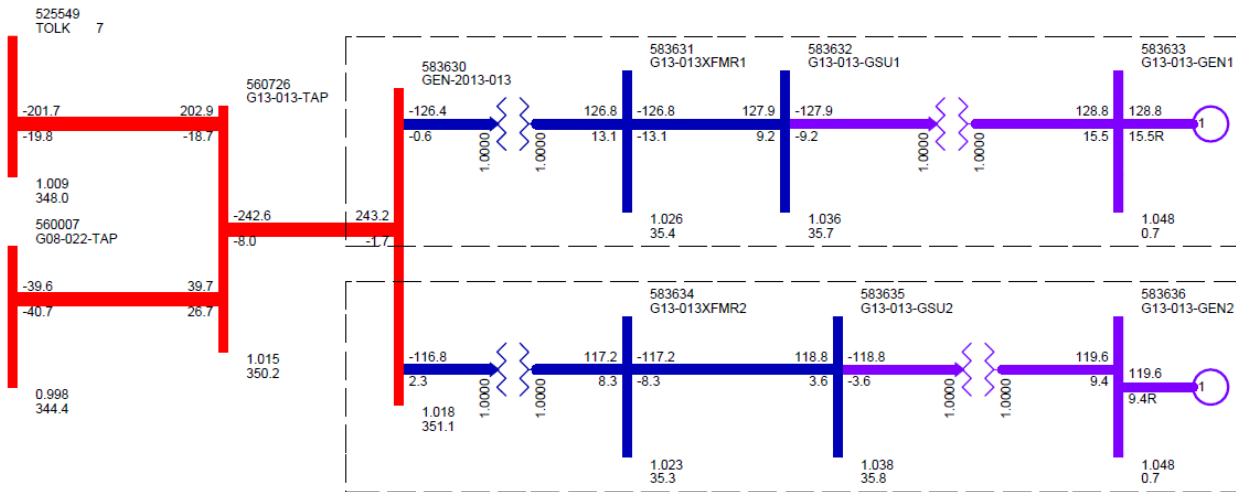


Figure II-1¹: GEN-2013-013 One-line Diagram

¹ Taken from Burns & McDonnell work product from B&M Project #74393 performed under contract to SPP.

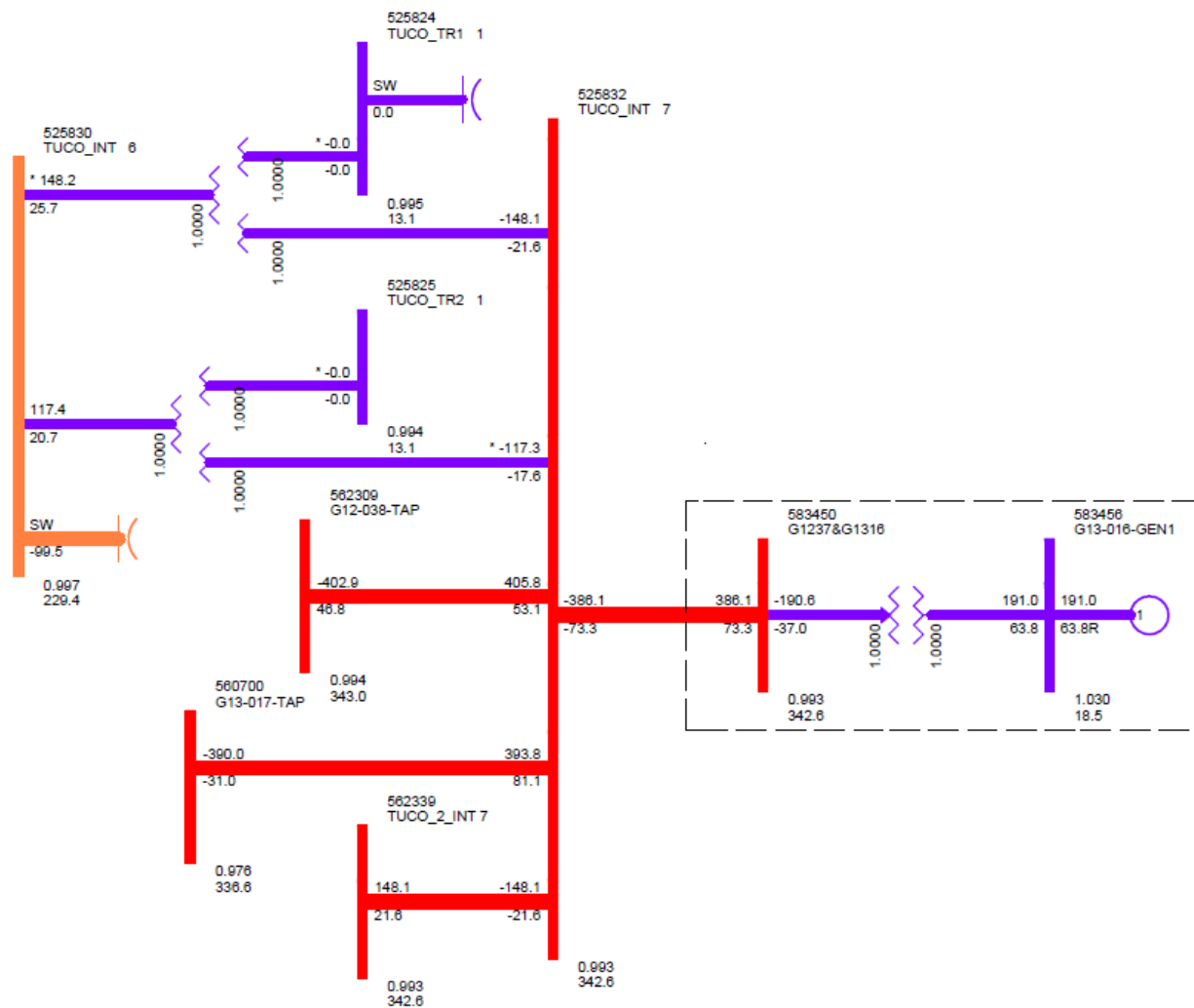


Figure II-2²: GEN-2013-016 One-line Diagram

² Taken from Burns & McDonnell work product from B&M Project #74393 performed under contract to SPP.

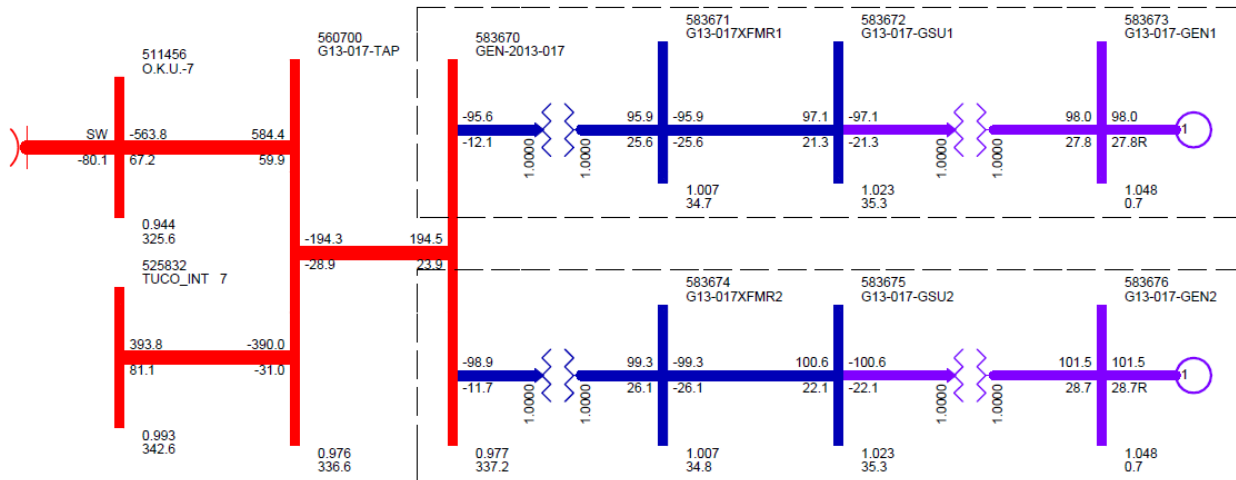


Figure II-3³: GEN-2013-017 One-line Diagram

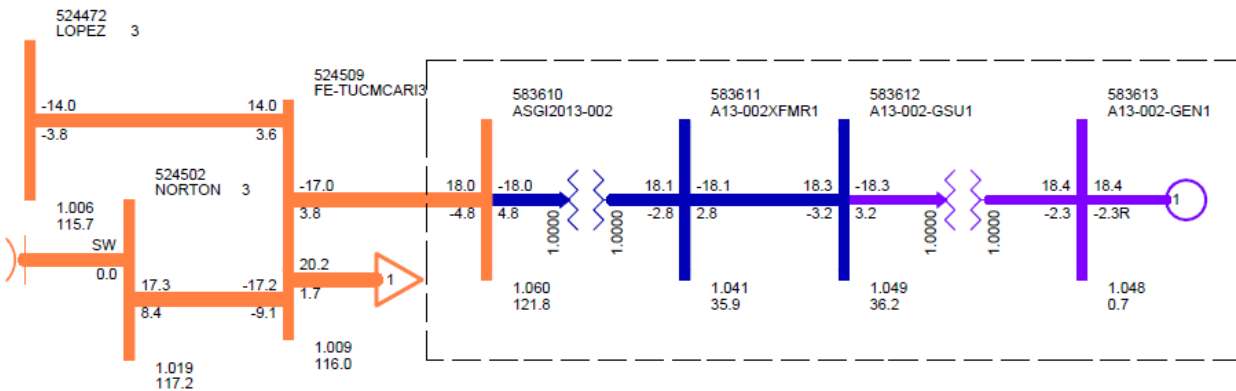


Figure II-4⁴: ASGI-2013-002 One-line Diagram

³ Taken from Burns & McDonnell work product from B&M Project #74393 performed under contract to SPP.

⁴ Taken from Burns & McDonnell work product from B&M Project #74393 performed under contract to SPP.

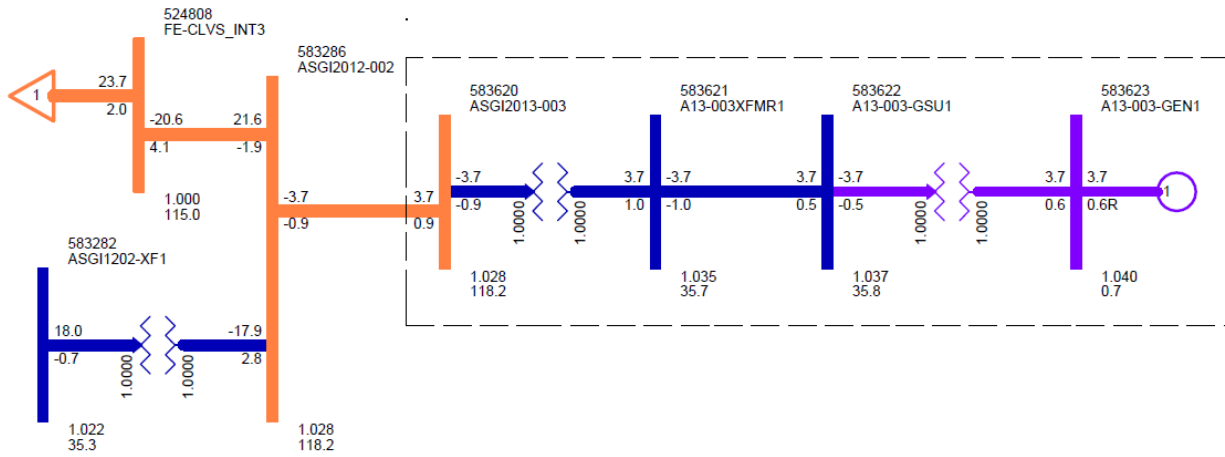


Figure II-5⁵: ASGI-2013-003 One-line Diagram

⁵ Taken from Burns & McDonnell work product from B&M Project #74393 performed under contract to SPP.

III. Stability Analysis

Transient stability analysis is used to determine if the transmission system can maintain angular stability and ensure bus voltages stay within planning criteria bandwidth during and after a disturbance while considering the addition of a generator interconnection request.

Model Preparation

Transient stability analysis was performed using modified versions of the 2012 series of Model Development Working Group (MDWG) dynamic study models including the 2014 summer peak, 2014 winter peak, and the 2023 summer peak seasonal models. The cases are then loaded with prior queued interconnection requests and network upgrades assigned to those interconnection requests. Finally the prior queued and study generation are dispatched into the SPP footprint. Initial simulations are then carried out for a no-disturbance run of twenty (20) seconds to verify the numerical stability of the model.

Disturbances

Seventy-seven (77) contingencies were identified for use in this study and are listed in Table III-1. These contingencies included three-phase faults and single-phase line faults at locations defined by SPP. Single-phase line faults were simulated by applying fault impedance to the positive sequence network at the fault location to represent the effect of the negative and zero sequence networks on the positive sequence network. The fault impedance was computed to give a positive sequence voltage at the specified fault location of approximately 60% of pre-fault voltage. This method is in agreement with SPP current practice.

Except for transformer faults, the typical sequence of events for a three-phase and a single-phase fault is as follows:

1. apply fault at particular location
2. continue fault for five (5) cycles, clear the fault by tripping the faulted facility
3. after an additional twenty (20) cycles, re-close the previous facility back into the fault
4. continue fault for five (5) additional cycles
5. trip the faulted facility and remove the fault

Transformer faults are typically modeled as three-phase faults, unless otherwise noted. The sequence of events for a transformer fault is as follows:

1. apply fault for five (5) cycles
2. clear the fault by tripping the affected transformer facility (unless otherwise noted there will be no re-closing into a transformer fault)

The control areas monitored are 520, 524, 525, 526, 531, 534, and 536.

Table III-1: Contingencies Evaluated

Cont. No.	Contingency Name	Description
1	FLT_01_PANTEXS3_PANTEXN3_115kV_3PH	3 phase fault on the Pantex South (523945) to Pantex North (523938) 115kV line, near Pantex South. a. Apply fault at the Pantex South 115kV bus. b. Clear fault after 5 cycles by tripping the faulted line. c. Wait 20 cycles, and then re-close the line in (b) back into the fault. d. Leave fault on for 5 cycles, then trip the line in (b) and remove fault.
2	FLT_02_PANTEXS3_PANTEXN3_115kV_1PH	<i>Single phase fault and sequence like previous</i>
3	FLT_03_PANTEXS3_HIGHLANDTP3_115kV_3PH	3 phase fault on the Pantex South (523945) to Highland Park Tap (523931) 115kV line, near Pantex South. a. Apply fault at the Pantex South 115kV bus. b. Clear fault after 5 cycles by tripping the faulted line. c. Wait 20 cycles, and then re-close the line in (b) back into the fault. d. Leave fault on for 5 cycles, then trip the line in (b) and remove fault.
4	FLT_04_PANTEXS3_HIGHLANDTP3_115kV_1PH	<i>Single phase fault and sequence like previous</i>
5	FLT_05_MARTIN3_HUTCHS3_115kV_3PH	3 phase fault on the Martin (523928) to Hutchinson Co. Intg. (523546) 115kV line, near Martin. a. Apply fault at the Martin 115kV bus. b. Clear fault after 5 cycles by tripping the faulted line. c. Wait 20 cycles, and then re-close the line in (b) back into the fault. d. Leave fault on for 5 cycles, then trip the line in (b) and remove fault.
6	FLT_06_MARTIN3_HUTCHS3_115kV_1PH	<i>Single phase fault and sequence like previous</i>
7	FLT_07_HUTCHS3_HUTCHISON6_115_230kV_3PH	3 phase fault on the Hutchinson Co. Intg. 230kV (523551) / 115kV (523546) / 12.8kV (523541) transformer, near Hutchinson Co. Intg. 115kV. a. Apply fault at the Hutchinson Co. Intg. 115kV bus. b. Clear fault after 5 cycles by tripping the faulted transformer.
8	FLT_08_HUTCHS3_HUTCHISON2_115_69kV_3PH	3 phase fault on the Hutchinson Co. Intg. 115kV (523546) / 69kV (523543) / 13.2kV (523542) transformer, near Hutchinson Co. Intg. 115kV ckt 1. a. Apply fault at the Hutchinson Co. Intg. 115kV bus. b. Clear fault after 5 cycles by tripping the faulted transformer.
9	FLT_09_PANTEXS3_HIGHLANDTP3_115kV_3PH_PO_HUTCHISON6_HUTCHS3	Prior outage on the Hutchinson Co. Intg. (523551) 230kV / 115kV (523546) / 12.8kV (523541) transformer ckt 1: 3 phase fault on the Pantex South (523945) to Highland Park Tap (523931) 115kV line, near Pantex South 115kV. a. Prior outage of Hutchinson Co. Intg. 230/115/12.8 kV transformer. b. Apply fault at the Pantex South 115kV bus. c. Clear fault after 5 cycles by tripping the faulted line. d. Wait 20 cycles, and then re-close the line in (c) back into the fault. e. Leave fault on for 5 cycles, then trip the line in (c) and remove fault.
10	FLT_10_MARTIN3_HUTCHS3_115kV_3PH_PO_NICHOLS6_NICHOLS3	Prior outage on the Nichols 230kV (524044) / 115kV (524043) / 13.2kV (524041) transformer ckt 1: 3 phase fault on the Martin (523928) to Hutchinson Co. Intg. (523546) 115kV line, near Martin 115kV. a. Prior outage of Nichols 230/115kV transformer ckt 1. b. Apply fault at the Martin 115kV bus. c. Clear fault after 5 cycles by tripping the faulted line. d. Wait 20 cycles, and then re-close the line in (c) back into the fault. e. Leave fault on for 5 cycles, then trip the line in (c) and remove fault.

Table III-1: Contingencies Evaluated

Cont. No.	Contingency Name	Description
11	FLT_11_FETUCMCARI3_FETUCMCARI3_115kV_3PH	3 phase fault on the Farmers Electric Tucumcari (524509) 115kV bus. a. Apply fault at the Farmers Electric Tucumcari 115kV bus. b. Clear fault after 5 cycles. c. Wait 20 cycles, and then re-establish the fault. d. Leave fault on for 5 cycles, then remove fault.
12	FLT_12_FETUCMCARI3_FETUCMCARI3_115kV_1PH	<i>Single phase fault and sequence like previous</i>
13	FLT_13_FECLVSINT3_NCLOVISTP3_115kV_3PH	3 phase fault on the Farmers Electric Clovis Interchange (524808) to North Clovis Tap (524777) 115kV line, near Farmers Electric Clovis Interchange. a. Apply fault at the Farmers Electric Clovis Interchange 115kV bus. b. Clear fault after 5 cycles by tripping the faulted line. c. Wait 20 cycles, and then re-close the line in (b) back into the fault. d. Leave fault on for 5 cycles, then trip the line in (b) and remove fault.
14	FLT_14_FECLVSINT3_NCLOVISTP3_115kV_1PH	<i>Single phase fault and sequence like previous</i>
15	FLT_15_FECLVSINT3_WCLOVIS3_115kV_3PH	3 phase fault on the Farmers Electric Clovis Interchange (524808) to West Clovis Tap (524784) 115kV line, near Farmers Electric Clovis Interchange. a. Apply fault at the Farmers Electric Clovis Interchange 115kV bus. b. Clear fault after 5 cycles by tripping the faulted line. c. Wait 20 cycles, and then re-close the line in (b) back into the fault. d. Leave fault on for 5 cycles, then trip the line in (b) and remove fault.
16	FLT_16_FECLVSINT3_WCLOVIS3_115kV_1PH	<i>Single phase fault and sequence like previous</i>
17	FLT_17_CURRY3_ROOSEVELT3_115kV_3PH	3 phase fault on the Curry (524822) to Roosevelt (524908) 115kV line, near Curry. a. Apply fault at the Curry 115kV bus. b. Clear fault after 5 cycles by tripping the faulted line. c. Wait 20 cycles, and then re-close the line in (b) back into the fault. d. Leave fault on for 5 cycles, then trip the line in (b) and remove fault.
18	FLT_18_CURRY3_ROOSEVELT3_115kV_1PH	<i>Single phase fault and sequence like previous</i>
19	FLT_19_CURRY3_ROOSEVELT3_115kV_3PH_PO_CURRY3_FECLOVIS23	Prior outage on the Curry (524822) to Farmers Electric Clovis Interchange (524838) 115kV Ckt 1: 3 phase fault on the Curry (524822) to Roosevelt (524908) 115kV line, near Curry. a. Prior outage of Curry to Farmers Electric Clovis Interchange 115kV Ckt 1. b. Apply fault at the Curry 115kV bus. c. Clear fault after 5 cycles by tripping the faulted line. d. Wait 20 cycles, and then re-close the line in (c) back into the fault. e. Leave fault on for 5 cycles, then trip the line in (c) and remove fault.
20	FLT_20_CURRY3_ROOSEVELT3_115kV_1PH_PO_CURRY3_FECLOVIS23	<i>Single phase fault and sequence like previous</i>

Table III-1: Contingencies Evaluated

Cont. No.	Contingency Name	Description
21	FLT_21_CURRY3_ROOSEVELT3_1 15kV_3PH_PO_CURRY3_NORRIST P3	Prior outage on the Curry (524822) to Norris Tap (524764) 115kV Ckt 1: 3 phase fault on the Curry (524822) to Roosevelt (524908) 115kV line, near Curry. a. Prior outage of Curry to Norris Tap 115kV Ckt 1. b. Apply fault at the Curry 115kV bus. c. Clear fault after 5 cycles by tripping the faulted line. d. Wait 20 cycles, and then re-close the line in (c) back into the fault. e. Leave fault on for 5 cycles, then trip the line in (c) and remove fault.
22	FLT_22_CURRY3_ROOSEVELT3_1 15kV_1PH_PO_CURRY3_NORRIST P3	<i>Single phase fault and sequence like previous</i>
23	FLT_23_ROOSEVELT3_ROSEVELT N6_115_230kV_3PH	3 phase fault on the Roosevelt 230kV (524909) / 115kV (524908) / 13.2kV (524907) transformer, near Roosevelt 115kV. a. Apply fault at the Roosevelt 115kV bus. b. Clear fault after 5 cycles by tripping the faulted transformer.
24	FLT_24_OASIS3_OASIS6_115_230 kV_3PH	3 phase fault on the Oasis 230kV (524875) / 115kV (524874) / 13.2kV (524872) transformer, near Oasis 115kV. a. Apply fault at the Oasis 115kV bus. b. Clear fault after 5 cycles by tripping the faulted transformer.
25	FLT_25_G13013TAP_TOLK7_345k V_3PHa	3 phase fault on the GEN 2013-013 tap (560726) to Tolk (525549) 345kV line, near GEN 2013-013 tap. a. Apply fault at the GEN 2013-013 tap 345kV bus. b. Clear fault after 5 cycles by tripping the faulted line and Tolk 345/230kV transformer. c. Wait 20 cycles, and then re-close the equipment in (b) back into the fault. d. Leave fault on for 5 cycles, then trip the equipment in (b) and remove fault.
26	FLT_26_G13013TAP_TOLK7_345k V_1PHa	<i>Single phase fault and sequence like previous</i>
27	FLT_27_G13013TAP_G08022TAP _345kV_3PH	3 phase fault on the GEN 2013-013 tap (560726) to Chaves (560007) 345kV line, near GEN 2013-013 tap. a. Apply fault at the GEN 2013-013 tap 345kV bus. b. Clear fault after 5 cycles by tripping the faulted line. c. Wait 20 cycles, and then re-close the line in (b) back into the fault. d. Leave fault on for 5 cycles, then trip the line in (b) and remove fault.
28	FLT_28_G13013TAP_G08022TAP _345kV_1PH	<i>Single phase fault and sequence like previous</i>
29	FLT_29_TOLK7_TOLKTAP6_345_2 30kV_3PHa	3 phase fault on the Tolk (525549) to Tolk tap (525543) 345/230/13.2kV autotransformer, near Tolk 345kV. a. Apply fault at the Tolk 345kV bus. b. Clear fault after 5 cycles by tripping GEN-2013-013 Tap – Tolk 345kV Ckt 1 and the faulted transformer.
30	FLT_30_EDDYCNTY7_EDDYNORT H6_345_230kV_3PH	3 phase fault on the Eddy County (527802) to Eddy North (527799) 345/230/13.2kV autotransformer, near Eddy County 345kV. a. Apply fault at the Eddy County 345kV bus. b. Clear fault after 5 cycles by tripping the faulted transformer.

Table III-1: Contingencies Evaluated

Cont. No.	Contingency Name	Description
31	FLT_31_EDDYCNTY7_G08022TAP_345kV_3PH	3 phase fault on the Chaves (560007) to Eddy County (527802) 345kV line, near Eddy County 345kV bus. a. Apply fault at the Eddy County 345kV bus. b. Clear fault after 5 cycles by tripping the faulted line. c. Wait 20 cycles, and then re-close the line in (b) back into the fault. d. Leave fault on for 5 cycles, then trip the line in (b) and remove fault.
32	FLT_32_EDDYCNTY7_G08022TAP_345kV_1PH	<i>Single phase fault and sequence like previous</i>
33	FLT_33_EDDYNORTH6_CHAVESCNTY6_230kV_3PH	3 phase fault on the Eddy North (527799) to Chaves (527483) 230kV line, near Eddy North 230kV bus. a. Apply fault at the Eddy North 230kV bus. b. Clear fault after 5 cycles by tripping the faulted line. c. Wait 20 cycles, and then re-close the line in (b) back into the fault. d. Leave fault on for 5 cycles, then trip the line in (b) and remove fault.
34	FLT_34_EDDYNORTH6_CHAVESCNTY6_230kV_1PH	<i>Single phase fault and sequence like previous</i>
35	FLT_35_EDDYNORTH6_EDDYSOUTH6_230kV_3PH	3 phase fault on the Eddy North (527799) to Eddy South (527800) 230kV line, near Eddy North 230kV bus. a. Apply fault at the Eddy North 230kV bus. b. Clear fault after 5 cycles by tripping the faulted line. c. Wait 20 cycles, and then re-close the line in (b) back into the fault. d. Leave fault on for 5 cycles, then trip the line in (b) and remove fault.
36	FLT_36_EDDYNORTH6_EDDYSOUTH6_230kV_1PH	<i>Single phase fault and sequence like previous</i>
37	FLT_37_EDDYNORTH6_EDDYSOUTH6_230kV_3PH_PO_CHAVESCNTY6_CHAVESCNTY3	Prior outage on the Chaves 230kV (527483) / 115kV (527482) / 13.2kV (527478) transformer ckt 1: 3 phase fault on the Eddy North (527799) to Eddy South (527800) 230kV line, near Eddy North 230kV bus. a. Prior outage of Chaves 230/115kV transformer ckt 1. b. Apply fault at the Eddy North 230kV bus. c. Clear fault after 5 cycles by tripping the faulted line. d. Wait 20 cycles, and then re-close the line in (c) back into the fault. e. Leave fault on for 5 cycles, then trip the line in (c) and remove fault.
38	FLT_38_EDDYNORTH6_CHAVESCNTY6_230kV_3PH_PO_EDDYSOUTH6_EDDYCNTY3	Prior outage on the Eddy South 230kV (527800) / 115kV (527798) / 13.2kV (527797) transformer ckt 1: 3 phase fault on the Eddy North (527799) to Chaves (527483) 230kV line, near Eddy North 230kV bus. a. Prior outage of Chaves 230/115kV transformer ckt 1. b. Apply fault at the Eddy North 230kV bus. c. Clear fault after 5 cycles by tripping the faulted line. d. Wait 20 cycles, and then re-close the line in (c) back into the fault. e. Leave fault on for 5 cycles, then trip the line in (c) and remove fault.
39	FLT_39_TOLKTAP6_TOLKEAST6_230kV_3PH	3 phase fault on the Tolk Tap (525543) to Tolk East (525524) 230kV line, near Tolk Tap 230kV bus. a. Apply fault at the Tolk Tap 230kV bus. b. Clear fault after 5 cycles by tripping the faulted line. c. Wait 20 cycles, and then re-close the line in (b) back into the fault. d. Leave fault on for 5 cycles, then trip the line in (b) and remove fault.
40	FLT_40_TOLKTAP6_TOLKEAST6_230kV_1PH	<i>Single phase fault and sequence like previous</i>

Table III-1: Contingencies Evaluated

Cont. No.	Contingency Name	Description
41	FLT_41_TOLKTAP6_TOLKWEST6_230kV_3PH	3 phase fault on the Tolk Tap (525543) to Tolk West (525531) 230kV line, near Tolk Tap 230kV bus. a. Apply fault at the Tolk Tap 230kV bus. b. Clear fault after 5 cycles by tripping the faulted line. c. Wait 20 cycles, and then re-close the line in (b) back into the fault. d. Leave fault on for 5 cycles, then trip the line in (b) and remove fault.
42	FLT_42_TOLKTAP6_TOLKWEST6_230kV_1PH	<i>Single phase fault and sequence like previous</i>
43	FLT_43_TOLKEAST6_PLANTX6_230kV_3PH	3 phase fault on the Tolk East (525524) to Plant X (525481) 230kV line, near Tolk East 230kV bus. a. Apply fault at the Tolk East 230kV bus. b. Clear fault after 5 cycles by tripping the faulted line. c. Wait 20 cycles, and then re-close the line in (b) back into the fault. d. Leave fault on for 5 cycles, then trip the line in (b) and remove fault.
44	FLT_44_TOLKEAST6_PLANTX6_230kV_1PH	<i>Single phase fault and sequence like previous</i>
45	FLT_45_TOLKEAST6_TUCOINT6_230kV_3PH	3 phase fault on the Tolk East (525524) to Tuco (525830) 230kV line, near Tolk East 230kV bus. a. Apply fault at the Tolk East 230kV bus. b. Clear fault after 5 cycles by tripping the faulted line. c. Wait 20 cycles, and then re-close the line in (b) back into the fault. d. Leave fault on for 5 cycles, then trip the line in (b) and remove fault.
46	FLT_46_TOLKEAST6_TUCOINT6_230kV_1PH	<i>Single phase fault and sequence like previous</i>
47	FLT_47_TOLKEAST6_PLANTX6_230kV_3PH_PO_TOLKEAST6_TUCOINT6	Prior outage on the Tolk East (525524) to Tuco (525830) 230kV Ckt 1: 3 phase fault on the Tolk East (525524) to Plant X (525481) 230kV line, near Tolk East 230kV bus. a. Prior outage of Tolk to Tuco 230kV Ckt 1. b. Apply fault at the Tolk East 230kV bus. c. Clear fault after 5 cycles by tripping the faulted line. d. Wait 20 cycles, and then re-close the line in (c) back into the fault. e. Leave fault on for 5 cycles, then trip the line in (c) and remove fault.
48	FLT_48_TOLKWEST6_PLANTX6_230kV_3PH_PO_TOLKWEST6_ROSEVELT6	Prior outage on the Tolk West (525531) to Roosevelt (524909) 230kV Ckt: 3 phase fault on the Tolk West (525531) to Plant X (525481) 230kV line, near Tolk West 230kV bus. a. Prior outage of Tolk West to Roosevelt 230kV Ckt 1. b. Apply fault at the Tolk West 230kV bus. c. Clear fault after 5 cycles by tripping the faulted line. d. Wait 20 cycles, and then re-close the line in (c) back into the fault. e. Leave fault on for 5 cycles, then trip the line in (c) and remove fault.
49	FLT_49_TOLKWEST6_PLANTX6_230kV_3PH_PO_TOLKEAST6_PLANTX6	Prior outage on the Tolk East (525524) to Plant X (525481) 230kV Ckt: 3 phase fault on the Tolk West (525531) to Plant X (525481) 230kV line, near Tolk West 230kV bus. a. Prior outage of Tolk East to Plant X 230kV Ckt 1. b. Apply fault at the Tolk West 230kV bus. c. Clear fault after 5 cycles by tripping the faulted line. d. Wait 20 cycles, and then re-close the line in (c) back into the fault. e. Leave fault on for 5 cycles, then trip the line in (c) and remove fault.

Table III-1: Contingencies Evaluated

Cont. No.	Contingency Name	Description
50	FLT_50_SUNDOWN6_WOLFFORT H6_230kV_3PH_PO_TOLKEAST6_TUCOINT6	<p>Prior outage on the Tolk East (525524) to Tuco (525830) 230kV Ckt 1: 3 phase fault on the Sundown (526435) to Wolfforth (526525) 230kV line, near Sundown 230kV bus.</p> <p>a. Prior outage of Tolk East to Tuco 230kV Ckt 1. b. Apply fault at the Sundown 230kV bus. c. Clear fault after 5 cycles by tripping the faulted line. d. Wait 20 cycles, and then re-close the line in (c) back into the fault. e. Leave fault on for 5 cycles, then trip the line in (c) and remove fault.</p>
51	FLT_51_G13013TAP_TOLK7_345kV_3PH_PO_OASIS6_SANJANHVB1 a	<p>Prior outage on the Oasis (524875) to San Juan Tap (524885) 230kV Ckt 1: 3 phase fault on the GEN-2013-013 Tap (560726) to Tolk (525549) 345kV line, near GEN-2013-013 Tap 345kV bus.</p> <p>a. Prior outage of Oasis to San Juan Tap 230kV Ckt 1. b. Apply fault at the GEN-2013-013 Tap 345kV bus. c. Clear fault after 5 cycles by tripping the faulted line and Tolk 345/230kV transformer. d. Wait 20 cycles, and then re-close the equipment in (c) back into the fault. e. Leave fault on for 5 cycles, then trip the equipment in (c) and remove fault.</p>
52	FLT_52_G13017TAP_TUCOINT7_345kV_3PH	<p>3 phase fault on the GEN-2013-017-Tap (560700) to Tuco (525832) 345kV line, near GEN-2013-017-Tap.</p> <p>a. Apply fault at the GEN-2013-017-Tap 345kV bus. b. Clear fault after 5 cycles by tripping the faulted line. c. Wait 20 cycles, and then re-close the line in (b) back into the fault. d. Leave fault on for 5 cycles, then trip the line in (b) and remove fault.</p>
53	FLT_53_G13017TAP_TUCOINT7_345kV_1PH	<i>Single phase fault and sequence like previous</i>
54	FLT_54_TUCOINT7_G12038TAP_345kV_3PH	<p>3 phase fault on the Tuco (525832) to Sweetwater (562335) 345kV line, near Tuco.</p> <p>a. Apply fault at the Tuco 345kV bus. b. Clear fault after 5 cycles by tripping the faulted line. c. Wait 20 cycles, and then re-close the line in (b) back into the fault. d. Leave fault on for 5 cycles, then trip the line in (b) and remove fault.</p>
55	FLT_55_TUCOINT7_G12038TAP_345kV_1PH	<i>Single phase fault and sequence like previous</i>
56	FLT_56_G13017TAP_OKU7_345kV_3PH	<p>3 phase fault on the GEN-2013-017-Tap (560700) to Oklaunion (511456) 345kV line, near GEN-2013-017-Tap.</p> <p>a. Apply fault at the GEN-2013-017-Tap 345kV bus. b. Clear fault after 5 cycles by tripping the faulted line. c. Wait 20 cycles, and then re-close the line in (b) back into the fault. d. Leave fault on for 5 cycles, then trip the line in (b) and remove fault.</p>
57	FLT_57_G13017TAP_OKU7_345kV_1PH	<i>Single phase fault and sequence like previous</i>
58	FLT_58_OKU7_LES7_345kV_3PH	<p>3 phase fault on the Lawton East Side (511468) to Oklaunion (511456) 345kV line, near Oklaunion.</p> <p>a. Apply fault at the Oklaunion 345kV bus. b. Clear fault after 5 cycles by tripping the faulted line. c. Wait 20 cycles, and then re-close the line in (b) back into the fault. d. Leave fault on for 5 cycles, then trip the line in (b) and remove fault.</p>
59	FLT_59_OKU7_LES7_345kV_1PH	<i>Single phase fault and sequence like previous</i>

Table III-1: Contingencies Evaluated

Cont. No.	Contingency Name	Description
60	FLT_60_G12038TAP_SWEETWATER7_345kV_3PH	3 phase fault on the Tuco (525832) to Sweetwater (562335) 345kV line, near the line’s midpoint. a. Apply fault at the GEN-2012-038 Tap 345kV bus. b. Clear fault after 5 cycles by tripping the faulted line. c. Wait 20 cycles, and then re-close the line in (b) back into the fault. d. Leave fault on for 5 cycles, then trip the line in (b) and remove fault.
61	FLT_61_G12038TAP_SWEETWATER7_345kV_1PH	<i>Single phase fault and sequence like previous</i>
62	FLT_62_SWEETWATER7_GRACMNT7_345kV_3PH	3 phase fault on the Gracemont (515800) to Sweetwater (562335) 345kV line, near Sweetwater. a. Apply fault at the Sweetwater 345kV bus. b. Clear fault after 5 cycles by tripping the faulted line. c. Wait 20 cycles, and then re-close the line in (b) back into the fault. d. Leave fault on for 5 cycles, then trip the line in (b) and remove fault.
63	FLT_63_SWEETWATER7_GRACMNT7_345kV_1PH	<i>Single phase fault and sequence like previous</i>
64	FLT_64_SWEETWATER7_BORDER7_345kV_3PH	3 phase fault on the Border (515458) to Sweetwater (562335) 345kV line, near Sweetwater. a. Apply fault at the Sweetwater 345kV bus. b. Clear fault after 5 cycles by tripping the faulted line. c. Wait 20 cycles, and then re-close the line in (b) back into the fault. d. Leave fault on for 5 cycles, then trip the line in (b) and remove fault.
65	FLT_65_SWEETWATER7_BORDER7_345kV_1PH	<i>Single phase fault and sequence like previous</i>
66	FLT_66_BORDER7_WWRDEHV7_345kV_3PH	3 phase fault on the Border (515458) to Woodward (515375) 345kV line, near Border. a. Apply fault at the Border 345kV bus. b. Clear fault after 5 cycles by tripping the faulted line. c. Wait 20 cycles, and then re-close the line in (b) back into the fault. d. Leave fault on for 5 cycles, then trip the line in (b) and remove fault.
67	FLT_67_BORDER7_WWRDEHV7_345kV_1PH	<i>Single phase fault and sequence like previous</i>
68	FLT_68_WWRDEHV7_G11051TAP_345kV_3PH	3 phase fault on the GEN-2011-051 Tap (562075) to Woodward (515375) 345kV line, near Woodward. a. Apply fault at the Woodward 345kV bus. b. Clear fault after 5 cycles by tripping the faulted line. c. Wait 20 cycles, and then re-close the line in (b) back into the fault. d. Leave fault on for 5 cycles, then trip the line in (b) and remove fault.
69	FLT_69_WWRDEHV7_G11051TAP_345kV_1PH	<i>Single phase fault and sequence like previous</i>
70	FLT_70_TUCOINT7_TUCOINT6_345_230kV_3PH	3 phase fault on the Tuco (525832) 345kV / (525830) 230kV / (525842) 13.2kV autotransformer, near Tuco 345kV. a. Apply fault at the Tuco 345kV bus. b. Clear fault after 5 cycles by tripping the faulted transformer.
71	FLT_71_TUCOINT6_TUCOINT3_230_115kV_3PH	3 phase fault on the Tuco (525830) 230kV / (525828) 115kV / (525819) 13.2kV autotransformer, near Tuco 230kV. a. Apply fault at the Tuco 230kV bus. b. Clear fault after 5 cycles by tripping the faulted transformer.

Table III-1: Contingencies Evaluated

Cont. No.	Contingency Name	Description
72	FLT_72_TUCOINT6_SWISHER6_230KV_3PH	3 phase fault on the Swisher (525213) to Tuco (525830) 230kV line, near Tuco 230kV bus. a. Apply fault at the Tuco 230kV bus. b. Clear fault after 5 cycles by tripping the faulted line. c. Wait 20 cycles, and then re-close the line in (b) back into the fault. d. Leave fault on for 5 cycles, then trip the line in (b) and remove fault.
73	FLT_73_TUCOINT6_SWISHER6_230KV_1PH	<i>Single phase fault and sequence like previous</i>
74	FLT_74_TUCOINT6_JONES6_230kV_3PH	3 phase fault on the Jones (526337) to Tuco (525830) 230kV line, near Tuco 230kV bus. a. Apply fault at the Tuco 230kV bus. b. Clear fault after 5 cycles by tripping the faulted line. c. Wait 20 cycles, and then re-close the line in (b) back into the fault. d. Leave fault on for 5 cycles, then trip the line in (b) and remove fault.
75	FLT_75_TUCOINT6_JONES6_230kV_1PH	<i>Single phase fault and sequence like previous</i>
76	FLT_76_TUCOINT6_CARLISLE6_230kV_3PH	3 phase fault on the Carlisle (526161) to Tuco (525830) 230kV line, near Tuco 230kV bus. a. Apply fault at the Tuco 230kV bus. b. Clear fault after 5 cycles by tripping the faulted line. c. Wait 20 cycles, and then re-close the line in (b) back into the fault. d. Leave fault on for 5 cycles, then trip the line in (b) and remove fault.
77	FLT_77_TUCOINT7_G13017TAP_345kV_3PH_PO_TUCOINT7_G12038TAP	Prior outage on the Sweetwater (562335) to Tuco (525832) 345kV Ckt 1: 3 phase fault on the GEN-2013-017-Tap (560700) to Tuco (525832) 345kV line, near Tuco. a. Prior outage of Sweetwater to Tuco 345kV Ckt 1. b. Apply fault at the Tuco 345kV bus. c. Clear fault after 5 cycles by tripping the faulted line. d. Wait 20 cycles, and then re-close the line in (c) back into the fault. e. Leave fault on for 5 cycles, then trip the line in (c) and remove fault.

NOTE: For prior outage contingencies assume that the network is at steady state after the prior outage.

Results

The stability analysis was performed and the results are summarized in Table III-2. Several transmission system stability issues were observed. Most notable was the voltage instability that was associated with transmission line faults causing the outage of the Tuco-Border-Woodward 345kV transmission line. The outage of these line segments caused voltage collapse along the existing Tuco – Oklaunion 345kV line with most notable voltage depressions at the Oklaunion 345kV bus. 345kV transmission reinforcements are required to alleviate this potential voltage instability. The transmission reinforcements required are the following:

- Sweetwater 345kV substation - new substation tapping into the Tuco – Border 345kV line
- Tuco – Sweetwater 345kV transmission line – new 345kV line

- Sweetwater – Gracemont 345kV line – new 345kV line. Portions of this line are currently under an NTC-C (Notification to Construct with Conditions) but a final NTC has not been issued at the time of this report.

The transmission reinforcements listed above were added into the models and all simulations were performed again. These results are listed in Table III-3. The results indicate that the transmission system remained stable for all Category “B” fault contingencies studied.

Some prior outage conditions that were studied indicated potential instability in the power system. For these Category “C” contingencies studied, it will be required to back down (curtail) studied and prior queued generation for the prior outage.

The stability plots will be available upon request.

Table III-2: Stability Analysis Results

Contingency Number and Name		2014SP	2014WP	2023SP
1	FLT_01_PANTEXS3_PANTEXN3_115kV_3PH	Stable	Stable	Stable
2	FLT_02_PANTEXS3_PANTEXN3_115kV_1PH	Stable	Stable	Stable
3	FLT_03_PANTEXS3_HIGHLANDTP3_115kV_3PH	Stable	Stable	Stable
4	FLT_04_PANTEXS3_HIGHLANDTP3_115kV_1PH	Stable	Stable	Stable
5	FLT_05_MARTIN3_HUTCHS3_115kV_3PH	Stable	Stable	Stable
6	FLT_06_MARTIN3_HUTCHS3_115kV_1PH	Stable	Stable	Stable
7	FLT_07_HUTCHS3_HUTCHISON6_115_230kV_3PH	Stable	Stable	Stable
8	FLT_08_HUTCHS3_HUTCHISON2_115_69kV_3PH	Stable	Stable	Stable
9	FLT_09_PANTEXS3_HIGHLANDTP3_115kV_3PH_PO_HUTCHISON6_HUTCHS3	Stable	Stable	Stable
10	FLT_10_MARTIN3_HUTCHS3_115kV_3PH_PO_NICHOLS6_NICHOLS3	Stable	Stable	Stable
11	FLT_11_FETUCMCARI3_FETUCMCARI3_115kV_3PH	Stable	Stable	Stable
12	FLT_12_FETUCMCARI3_FETUCMCARI3_115kV_1PH	Stable	Stable	Stable
13	FLT_13_FECLVSINT3_NCLOVISTP3_115kV_3PH	Stable	Stable	Stable
14	FLT_14_FECLVSINT3_NCLOVISTP3_115kV_1PH	Stable	Stable	Stable
15	FLT_15_FECLVSINT3_WCLOVIS3_115kV_3PH	Stable	Stable	Stable
16	FLT_16_FECLVSINT3_WCLOVIS3_115kV_1PH	Stable	Stable	Stable
17	FLT_17_CURRY3_ROOSEVELT3_115kV_3PH	Stable	Stable	Stable
18	FLT_18_CURRY3_ROOSEVELT3_115kV_1PH	Stable	Stable	Stable
19	FLT_19_CURRY3_ROOSEVELT3_115kV_3PH_PO_CURRY3_FECLOVIS23	Stable	Stable	Stable
20	FLT_20_CURRY3_ROOSEVELT3_115kV_1PH_PO_CURRY3_FECLOVIS23	Stable	Stable	Stable
21	FLT_21_CURRY3_ROOSEVELT3_115kV_3PH_PO_CURRY3_NORRISTP3	Stable	Stable	Stable
22	FLT_22_CURRY3_ROOSEVELT3_115kV_1PH_PO_CURRY3_NORRISTP3	Stable	Stable	Stable
23	FLT_23_ROOSEVELT3_ROSEVELTN6_115_230kV_3PH	Stable	Stable	Stable
24	FLT_24_OASIS3_OASIS6_115_230kV_3PH	Stable	Stable	Stable
25	FLT_25_G13013TAP_TOLK7_345kV_3PHa	Stable	Stable	Unstable
26	FLT_26_G13013TAP_TOLK7_345kV_1PHa	Stable	Stable	Stable
27	FLT_27_G13013TAP_G08022TAP_345kV_3PH	Stable	Stable	Stable
28	FLT_28_G13013TAP_G08022TAP_345kV_1PH	Stable	Stable	Stable
29	FLT_29_TOLK7_TOLKTAP6_345_230kV_3PHa	Stable	Stable	Stable
30	FLT_30_EDDYCNTY7_EDDYNORTH6_345_230kV_3PH	Stable	Stable	Stable
31	FLT_31_EDDYCNTY7_G08022TAP_345kV_3PH	Stable	Stable	Stable
32	FLT_32_EDDYCNTY7_G08022TAP_345kV_1PH	Stable	Stable	Stable

Table III-2: Stability Analysis Results

Contingency Number and Name		2014SP	2014WP	2023SP
33	FLT_33_EDDYNORTH6_CHAVESCNTY6_230kV_3PH	Stable	Stable	Stable
34	FLT_34_EDDYNORTH6_CHAVESCNTY6_230kV_1PH	Stable	Stable	Stable
35	FLT_35_EDDYNORTH6_EDDYSOUTH6_230kV_3PH	Stable	Stable	Stable
36	FLT_36_EDDYNORTH6_EDDYSOUTH6_230kV_1PH	Stable	Stable	Stable
37	FLT_37_EDDYNORTH6_EDDYSOUTH6_230kV_3PH_PO_CHAVE SCNTY6_CHAVESCNTY3	Stable	Stable	Stable
38	FLT_38_EDDYNORTH6_CHAVESCNTY6_230kV_3PH_PO_EDDY SOUTH6_EDDYCNTY3	Stable	Stable	Stable
39	FLT_39_TOLKTAP6_TOLKEAST6_230kV_3PH	Stable	Stable	Stable
40	FLT_40_TOLKTAP6_TOLKEAST6_230kV_1PH	Stable	Stable	Stable
41	FLT_41_TOLKTAP6_TOLKWEST6_230kV_3PH	Stable	Stable	Stable
42	FLT_42_TOLKTAP6_TOLKWEST6_230kV_1PH	Stable	Stable	Stable
43	FLT_43_TOLKEAST6_PLANTX6_230kV_3PH	simulation did not complete due to voltage collapse	Stable	Stable
44	FLT_44_TOLKEAST6_PLANTX6_230kV_1PH	Stable	Stable	Stable
45	FLT_45_TOLKEAST6_TUCOINT6_230kV_3PH	Stable	Stable	Stable
46	FLT_46_TOLKEAST6_TUCOINT6_230kV_1PH	Stable	Stable	Stable
47	FLT_47_TOLKEAST6_PLANTX6_230kV_3PH_PO_TOLKEAST6_TUCOINT6	Stable	Stable	Stable
48	FLT_48_TOLKWEST6_PLANTX6_230kV_3PH_PO_TOLKWEST6_ROSEVELTN6	simulation did not complete due to voltage collapse	Stable	Stable
49	FLT_49_TOLKWEST6_PLANTX6_230kV_3PH_PO_TOLKEAST6_PLANTX6	Unstable	Stable	Unstable
50	FLT_50_SUNDOWN6_WOLFFORTH6_230kV_3PH_PO_TOLKEAST6_TUCOINT6	Stable	Stable	Stable
51	FLT_51_G13013TAP_TOLK7_345kV_3PH_PO_OASIS6_SANJAN HVB1a	Stable	Unstable	Unstable
52	FLT_52_G13017TAP_TUCOINT7_345kV_3PH	Stable	Stable	Stable
53	FLT_53_G13017TAP_TUCOINT7_345kV_1PH	Stable	Stable	Stable
54	FLT_54_TUCOINT7_G12038TAP_345kV_3PH	Unstable	simulation did not complete due to voltage collapse	simulation did not complete due to voltage collapse
55	FLT_55_TUCOINT7_G12038TAP_345kV_1PH	simulation did not complete due to voltage collapse	simulation did not complete due to voltage collapse	Stable
56	FLT_56_G13017TAP_OKU7_345kV_3PH	Unstable	Stable	Stable
57	FLT_57_G13017TAP_OKU7_345kV_1PH	Unstable	Stable	Stable
58	FLT_58_OKU7_LES7_345kV_3PH	Unstable	Unstable	Stable
59	FLT_59_OKU7_LES7_345kV_1PH	Unstable	Unstable	Stable
60	FLT_60_G12038TAP_SWEETWATER7_345kV_3PH	simulation did not complete due to voltage collapse	simulation did not complete due to voltage collapse	simulation did not complete due to voltage collapse
61	FLT_61_G12038TAP_SWEETWATER7_345kV_1PH	simulation did not complete due to voltage collapse	simulation did not complete due to voltage collapse	Stable
62	FLT_62_SWEETWATER7_GRACMNT7_345kV_3PH	Stable	Stable	Stable
63	FLT_63_SWEETWATER7_GRACMNT7_345kV_1PH	Stable	Stable	Stable
64	FLT_64_SWEETWATER7_BORDER7_345kV_3PH	simulation did not complete due to voltage collapse	simulation did not complete due to voltage collapse	simulation did not complete due to voltage collapse

Table III-2: Stability Analysis Results

Contingency Number and Name		2014SP	2014WP	2023SP
65	FLT_65_SWEETWATER7_BORDER7_345kV_1PH	simulation did not complete due to voltage collapse	simulation did not complete due to voltage collapse	Stable
66	FLT_66_BORDER7_WWRDEHV7_345kV_3PH	simulation did not complete due to voltage collapse	simulation did not complete due to voltage collapse	simulation did not complete due to voltage collapse
67	FLT_67_BORDER7_WWRDEHV7_345kV_1PH	simulation did not complete due to voltage collapse	simulation did not complete due to voltage collapse	Stable
68	FLT_68_WWRDEHV7_G11051TAP_345kV_3PH	simulation did not complete due to voltage collapse	Stable	Stable
69	FLT_69_WWRDEHV7_G11051TAP_345kV_1PH	Stable	Stable	Stable
70	FLT_70_TUPOINT7_TUPOINT6_345_230kV_3PH	Stable	Stable	Stable
71	FLT_71_TUPOINT6_TUPOINT3_230_115kV_3PH	Stable	Stable	Stable
72	FLT_72_TUPOINT6_SWISHER6_230kV_3PH	Stable	Stable	Stable
73	FLT_73_TUPOINT6_SWISHER6_230kV_1PH	Stable	Stable	Stable
74	FLT_74_TUPOINT6_JONES6_230kV_3PH	Stable	Stable	Stable
75	FLT_75_TUPOINT6_JONES6_230kV_1PH	Stable	Stable	Stable
76	FLT_76_TUPOINT6_CARLISLE6_230kV_3PH	Stable	Stable	Stable
77	FLT_77_TUPOINT7_G13017TAP_345kV_3PH_PO_TUPOINT7_G12038TAP	Stable	Stable	Unstable

Table III-3: Stability Analysis Results (with Tuco-Sweetwater-Gracemont upgrade)

Contingency Number and Name		2014SP	2014W P	2023SP
1	FLT_01_PANTEXS3_PANTEXN3_115kV_3PH	Stable	Stable	Stable
2	FLT_02_PANTEXS3_PANTEXN3_115kV_1PH	Stable	Stable	Stable
3	FLT_03_PANTEXS3_HIGHLANDTP3_115kV_3PH	Stable	Stable	Stable
4	FLT_04_PANTEXS3_HIGHLANDTP3_115kV_1PH	Stable	Stable	Stable
5	FLT_05_MARTIN3_HUTCHS3_115kV_3PH	Stable	Stable	Stable
6	FLT_06_MARTIN3_HUTCHS3_115kV_1PH	Stable	Stable	Stable
7	FLT_07_HUTCHS3_HUTCHISON6_115_230kV_3PH	Stable	Stable	Stable
8	FLT_08_HUTCHS3_HUTCHISON2_115_69kV_3PH	Stable	Stable	Stable
9	FLT_09_PANTEXS3_HIGHLANDTP3_115kV_3PH_PO_HUTCHISON6_HUTCHS3	Stable	Stable	Stable
10	FLT_10_MARTIN3_HUTCHS3_115kV_3PH_PO_NICHOLS6_NICHOLS3	Stable	Stable	Stable
11	FLT_11_FETUCMCARI3_FETUCMCARI3_115kV_3PH	Stable	Stable	Stable
12	FLT_12_FETUCMCARI3_FETUCMCARI3_115kV_1PH	Stable	Stable	Stable
13	FLT_13_FECLVSINT3_NCLOVISTP3_115kV_3PH	Stable	Stable	Stable
14	FLT_14_FECLVSINT3_NCLOVISTP3_115kV_1PH	Stable	Stable	Stable
15	FLT_15_FECLVSINT3_WCLOVIS3_115kV_3PH	Stable	Stable	Stable
16	FLT_16_FECLVSINT3_WCLOVIS3_115kV_1PH	Stable	Stable	Stable
17	FLT_17_CURRY3_ROOSEVELT3_115kV_3PH	Stable	Stable	Stable
18	FLT_18_CURRY3_ROOSEVELT3_115kV_1PH	Stable	Stable	Stable
19	FLT_19_CURRY3_ROOSEVELT3_115kV_3PH_PO_CURRY3_FECLOVIS23	Stable	Stable	Stable
20	FLT_20_CURRY3_ROOSEVELT3_115kV_1PH_PO_CURRY3_FECLOVIS23	Stable	Stable	Stable
21	FLT_21_CURRY3_ROOSEVELT3_115kV_3PH_PO_CURRY3_NORRISTP3	Stable	Stable	Stable
22	FLT_22_CURRY3_ROOSEVELT3_115kV_1PH_PO_CURRY3_NORRISTP3	Stable	Stable	Stable
23	FLT_23_ROOSEVELT3_ROSEVELTN6_115_230kV_3PH	Stable	Stable	Stable
24	FLT_24_OASIS3_OASIS6_115_230kV_3PH	Stable	Stable	Stable
25	FLT_25_G13013TAP_TOLK7_345kV_3PHa	Stable	Stable	Stable

Table III-3: Stability Analysis Results (with Tuco-Sweetwater-Gracemont upgrade)

Contingency Number and Name		2014SP	2014W P	2023SP
26	FLT_26_G13013TAP_TOLK7_345kV_1PHa	Stable	Stable	Stable
27	FLT_27_G13013TAP_G08022TAP_345kV_3PH	Stable	Stable	Stable
28	FLT_28_G13013TAP_G08022TAP_345kV_1PH	Stable	Stable	Stable
29	FLT_29_TOLK7_TOLKTAP6_345_230kV_3PHa	Stable	Stable	Stable
30	FLT_30_EDDYCNTY7_EDDYNORTH6_345_230kV_3PH	Stable	Stable	Stable
31	FLT_31_EDDYCNTY7_G08022TAP_345kV_3PH	Stable	Stable	Stable
32	FLT_32_EDDYCNTY7_G08022TAP_345kV_1PH	Stable	Stable	Stable
33	FLT_33_EDDYNORTH6_CHAVESCNTY6_230kV_3PH	Stable	Stable	Stable
34	FLT_34_EDDYNORTH6_CHAVESCNTY6_230kV_1PH	Stable	Stable	Stable
35	FLT_35_EDDYNORTH6_EDDYSOUTH6_230kV_3PH	Stable	Stable	Stable
36	FLT_36_EDDYNORTH6_EDDYSOUTH6_230kV_1PH	Stable	Stable	Stable
37	FLT_37_EDDYNORTH6_EDDYSOUTH6_230kV_3PH_PO_CHAVESCNTY6_CHAVESCNTY3	Stable	Stable	Stable
38	FLT_38_EDDYNORTH6_CHAVESCNTY6_230kV_3PH_PO_EDDYSOUTH6_EDDYCNTY3	Stable	Stable	Stable
39	FLT_39_TOLKTAP6_TOLKEAST6_230kV_3PH	Stable	Stable	Stable
40	FLT_40_TOLKTAP6_TOLKEAST6_230kV_1PH	Stable	Stable	Stable
41	FLT_41_TOLKTAP6_TOLKWEST6_230kV_3PH	Stable	Stable	Stable
42	FLT_42_TOLKTAP6_TOLKWEST6_230kV_1PH	Stable	Stable	Stable
43	FLT_43_TOLKEAST6_PLANTX6_230kV_3PH	Stable	Stable	Stable
44	FLT_44_TOLKEAST6_PLANTX6_230kV_1PH	Stable	Stable	Stable
45	FLT_45_TOLKEAST6_TUCOINT6_230kV_3PH	Stable	Stable	Stable
46	FLT_46_TOLKEAST6_TUCOINT6_230kV_1PH	Stable	Stable	Stable
47	FLT_47_TOLKEAST6_PLANTX6_230kV_3PH_PO_TOLKEAST6_TUCOINT6	Stable	Stable	Stable
48	FLT_48_TOLKWEST6_PLANTX6_230kV_3PH_PO_TOLKWEST6_ROSEVELTN6	Stable	Stable	Stable
49	FLT_49_TOLKWEST6_PLANTX6_230kV_3PH_PO_TOLKEAST6_PLANTX6	Stable	Stable	Unstable
50	FLT_50_SUNDOWN6_WOLFFORTH6_230kV_3PH_PO_TOLKEAST6_TUCOINT6	Stable	Stable	Stable
51	FLT_51_G13013TAP_TOLK7_345kV_3PH_PO_OASIS6_SANJANHVB1a	Unstable	Unstable	Unstable
52	FLT_52_G13017TAP_TUCOINT7_345kV_3PH	Stable	Stable	Stable
53	FLT_53_G13017TAP_TUCOINT7_345kV_1PH	Stable	Stable	Stable
54	FLT_54_TUCOINT7_G12038TAP_345kV_3PH	Stable	Stable	Stable
55	FLT_55_TUCOINT7_G12038TAP_345kV_1PH	Stable	Stable	Stable
56	FLT_56_G13017TAP_OKU7_345kV_3PH	Stable	Stable	Stable
57	FLT_57_G13017TAP_OKU7_345kV_1PH	Stable	Stable	Stable
58	FLT_58_OKU7_LES7_345kV_3PH	Stable	Stable	Stable
59	FLT_59_OKU7_LES7_345kV_1PH	Stable	Stable	Stable
60	FLT_60_G12038TAP_SWEETWATER7_345kV_3PH	Stable	Stable	Stable
61	FLT_61_G12038TAP_SWEETWATER7_345kV_1PH	Stable	Stable	Stable
62	FLT_62_SWEETWATER7_GRACMNT7_345kV_3PH	Stable	Stable	Stable
63	FLT_63_SWEETWATER7_GRACMNT7_345kV_1PH	Stable	Stable	Stable
64	FLT_64_SWEETWATER7_BORDER7_345kV_3PH	Stable	Stable	Stable
65	FLT_65_SWEETWATER7_BORDER7_345kV_1PH	Stable	Stable	Stable
66	FLT_66_BORDER7_WWRDEHV7_345kV_3PH	Stable	Stable	Stable
67	FLT_67_BORDER7_WWRDEHV7_345kV_1PH	Stable	Stable	Stable
68	FLT_68_WWRDEHV7_G11051TAP_345kV_3PH	Stable	Stable	Stable
69	FLT_69_WWRDEHV7_G11051TAP_345kV_1PH	Stable	Stable	Stable
70	FLT_70_TUCOINT7_TUCOINT6_345_230kV_3PH	Stable	Stable	Stable
71	FLT_71_TUCOINT6_TUCOINT3_230_115kV_3PH	Stable	Stable	Stable
72	FLT_72_TUCOINT6_SWISHER6_230kV_3PH	Stable	Stable	Stable
73	FLT_73_TUCOINT6_SWISHER6_230kV_1PH	Stable	Stable	Stable
74	FLT_74_TUCOINT6_JONES6_230kV_3PH	Stable	Stable	Stable
75	FLT_75_TUCOINT6_JONES6_230kV_1PH	Stable	Stable	Stable
76	FLT_76_TUCOINT6_CARLISLE6_230kV_3PH	Stable	Stable	Stable
77	FLT_77_TUCOINT7_G13017TAP_345kV_3PH_PO_TUCOINT7_G12038TAP	Stable	Stable	Stable

FERC LVRT Compliance

FERC Order #661A places specific requirements on wind farms through its Low Voltage Ride Through (LVRT) provisions. For Interconnection Agreements signed after December 31, 2006, wind farms shall stay on line for faults at the POI that draw the voltage down at the POI to 0.0 pu.

Fault contingencies were developed to verify that wind farms remain on line when the POI voltage is drawn down to 0.0 pu. These contingencies are shown in Table III-4.

Table III-4: LVRT Contingencies

Contingency Number and Name		Description
11	FLT_11_FETUCMCARI3_FETUCMCARI3_115kV_3PH	3 phase fault on the Farmers Electric Tucumcari (524509) 115kV bus. a. Apply fault at the Farmers Electric Tucumcari 115kV bus. b. Clear fault after 5 cycles. c. Wait 20 cycles, and then re-establish the fault. d. Leave fault on for 5 cycles, then remove fault.
13	FLT_13_FECLVSINT3_NCLOVISTP3_115kV_3PH	3 phase fault on the Farmers Electric Clovis Interchange (524808) to North Clovis Tap (524777) 115kV line, near Farmers Electric Clovis Interchange. a. Apply fault at the Farmers Electric Clovis Interchange 115kV bus. b. Clear fault after 5 cycles by tripping the faulted line. c. Wait 20 cycles, and then re-close the line in (b) back into the fault. d. Leave fault on for 5 cycles, then trip the line in (b) and remove fault.
15	FLT_15_FECLVSINT3_WCLOVIS3_115kV_3PH	3 phase fault on the Farmers Electric Clovis Interchange (524808) to West Clovis Tap (524784) 115kV line, near Farmers Electric Clovis Interchange. a. Apply fault at the Farmers Electric Clovis Interchange 115kV bus. b. Clear fault after 5 cycles by tripping the faulted line. c. Wait 20 cycles, and then re-close the line in (b) back into the fault. d. Leave fault on for 5 cycles, then trip the line in (b) and remove fault.
25	FLT_25_G13013TAP_TOLK7_345kV_3PHa	3 phase fault on the GEN 2013-013 tap (560726) to Tolk (525549) 345kV line, near GEN 2013-013 tap. a. Apply fault at the GEN 2013-013 tap 345kV bus. b. Clear fault after 5 cycles by tripping the faulted line and Tolk 345/230kV transformer. c. Wait 20 cycles, and then re-close the equipment in (b) back into the fault. d. Leave fault on for 5 cycles, then trip the equipment in (b) and remove fault.
27	FLT_27_G13013TAP_G08022TAP_345kV_3PH	3 phase fault on the GEN 2013-013 tap (560726) to Chaves (560007) 345kV line, near GEN 2013-013 tap. a. Apply fault at the GEN 2013-013 tap 345kV bus. b. Clear fault after 5 cycles by tripping the faulted line. c. Wait 20 cycles, and then re-close the line in (b) back into the fault. d. Leave fault on for 5 cycles, then trip the line in (b) and remove fault.

Contingency Number and Name		Description
52	FLT_52_G13017TAP_TUCOINT7_345kV_3PH	3 phase fault on the GEN-2013-017-Tap (560700) to Tuco (525832) 345kV line, near GEN-2013-017-Tap. a. Apply fault at the GEN-2013-017-Tap 345kV bus. b. Clear fault after 5 cycles by tripping the faulted line. c. Wait 20 cycles, and then re-close the line in (b) back into the fault. d. Leave fault on for 5 cycles, then trip the line in (b) and remove fault.
56	FLT_56_G13017TAP_OKU7_345kV_3PH	3 phase fault on the GEN-2013-017-Tap (560700) to Oklaunion (511456) 345kV line, near GEN-2013-017-Tap. a. Apply fault at the GEN-2013-017-Tap 345kV bus. b. Clear fault after 5 cycles by tripping the faulted line. c. Wait 20 cycles, and then re-close the line in (b) back into the fault. d. Leave fault on for 5 cycles, then trip the line in (b) and remove fault.

The required prior queued project wind farms remained online for the fault contingencies described in this section as well as the fault contingencies described in the Disturbances section of this report. The wind farms listed in Table I-1 were found to be in compliance with FERC Order #661A.

IV. Power Factor Analysis

Power Factor Analysis

The power factor analysis was performed for this study and is designed to demonstrate the reactive power requirements at the point of interconnection. In order to perform the analysis the request and equivalent transmission lines and collectors systems were modeled using specifications provided by the Customer. Table IV-1 shows a summary of the base case Group 6 POI voltages, and Table IV-2 shows the contingencies used in the analysis.

Table IV-1: Base Case Group 6 POI Voltages

Project	Point of Interconnection	Voltage (pu)		
		2014 Summer Peak	2014 Winter Peak	2023 Summer Peak
GEN-2013-013	Tap Eddy County (527802) – Tolk (525549) 345kV (560726)	1.015	1.016	1.016
GEN-2013-016	Tuco 345kV (525832)	1.000	1.004	1.004
GEN-2013-017	Tap Tuco (525832) – OKU (511456) 345kV (560700)	1.000	1.000	1.000
ASGI-2013-002	Tucumcari 115kV (524509)	1.056	1.060	1.060
ASGI-2013-003	Clovis 115kV (524808)	1.028	1.029	1.029

Table IIV-2: Power Factor Contingency Summary

Contingency ID	Outage Description
1	Pantex S (523945) to Pantex N (523938) 115kV line
3	Pantex S (523945) to Highland Tap (523931) 115kV line
5	Martin (523928) to Hutchinson S (523546) 115kV line
7	Hutchinson S (523551) 230kV to Hutchinson S (523546) 115kV/(523541) 12.8kV transformer
8	Hutchinson S (523546) 115kV to Hutchinson S (523543) 69kV/(523542) 13.2kV transformer
9	Hutchins S 230/115 kV transformer (523551) & Pantex S (523945) to Highland Tap (523931) 115kV line
10	Nichols 230/115kV (524044) transformer 1 & Martin (523928) to Hutchinson S (523546) 115kV line
11	FE-Tucumcari (524509) to Lopez (524472) 115kV line
13	FE-Clovis Int (524808) to North Clovis Tap (524777) 115kV line
15	FE-Clovis Int (524808) to Clovis West (524784) 115kV line
17	FE-Tucumcari (524509) to Lopez (524472) 115kV line & Curry (524822) to Roosevelt (524908) 115kV line 2

Table IIV-2: Power Factor Contingency Summary

Contingency ID	Outage Description
19	Curry (524822) to FE-Clovis (524838) 115kV line & Curry (524822) to Roosevelt (524908) 115kV line 2
21	Curry (524822) to Norris Tap (524764) 115kV line & Curry (524822) to Roosevelt (524908) 115kV line 2
23	Roosevelt (524909) 230kV to Roosevelt (524908) 115kV/(524907) 13.2kV transformer
24	Oasis (524875) 230kV to Oasis (524874) 115kV/(524872) 13.2kV transformer
25	GEN-2013-013 Tap (560726) to Tolk (525549) 345kV line
27	GEN-2013-013 Tap (560726) to GEN-2008-022 Tap (560007) 345kV line
29	Tolk (525549) 345kV to Tolk (525543) 230kV/(525537) 13.2kV transformer
30	Eddy Co (527802) 345kV to Eddy Co N (527799) 230kV/(527796) 13.2kV transformer
31	Eddy Co (527802) to GEN-2008-022 Tap (560007) 345kV line
33	Eddy Co N (527799) to Chaves Co (527483) 230kV line
35	Eddy Co N (527799) to Eddy Co S (527800) 230kV line
37	Chaves Co 230/115 kV (527483) transformer & Eddy Co N (527799) to Eddy Co S (527800) 230kV line
38	Eddy Co S 230/115 kV (527800) transformer & Eddy Co N (527799) to Chaves Co (527483) 230kV line
39	Tolk (525543) to Tolk E (525524) 230kV line
41	Tolk (525543) to Tolk W (525531) 230kV line
43	Tolk E (525524) to Plant X (525481) 230kV line 2
45	Tolk E (525524) to TUCO (525830) 230kV line
47	Tolk E (525524) to TUCO (525830) 230kV line 2 & Tolk E (525524) to Plant X (525481) 230kV line
48	Tolk W (525531) to Roosevelt N (524909) 230kV line & Tolk W (525531) to Plant X (525481) 230kV line
49	Tolk E (525524) to Plant X (525481) 230kV line & Tolk W (525531) to Plant X (525481) 230kV line
50	Tolk E (525524) to TUCO (525830) 230kV line & Sundown (526435) to Wolfforth (526525) 230kV line
51	Oasis (524875) to San Juan (524885) Tap 230kV line & GEN-2013-013 Tap (560726) to Tolk 345kV (525549) line
52	GEN-2013-017 Tap (560700) to TUCO (525832) 345kV line
54	TUCO (525832) to GEN-2012-038 Tap (562309) 345kV line
56	GEN-2013-017 Tap (560700) to OKU (511456) 345kV line
58	OKU (511456) to LES (511468) 345kV line
60	GEN-2012-038 Tap (562309) to Sweetwater (562335) 345kV line
62	Sweetwater (562335) to Gracemont (515800) 345kV line
64	Sweetwater (562335) to Border (515458) 345kV line
66	Border (515458) to Woodward (515375) 345kV line
68	Woodward (515375) to GEN-2011-051 Tap (562075) 345kV line
70	TUCO (525832) 345kV to TUCO (525830) 230kV/(525825) 13.2kV transformer # 2

Table IIV-2: Power Factor Contingency Summary

Contingency ID	Outage Description
71	TUCO (525830) 230kV to TUCO (525828) 115kV/(525819) 13.2kV transformer # 2
72	TUCO (525830) to Swisher (525213) 230kV line
74	TUCO (525830) to Jones (526337) 230kV line
76	TUCO (525830) to Carlisle (526161) 230kV line
77	TUCO (525832) to GEN-2012-038 Tap (562309) 345kV line & TUCO (525832) to GEN-2013-017 Tap (560700) 345kV line

Table IV-3 summarizes the results of the Power Factor Analysis. More detailed Power Factor Analysis tables are in Appendix D.

Table IV-3: Summary of Power Factor Analysis

Request	Capacity (MW)	POI	Fuel	Generator	Power Factor at POI Leading (absorbing vars)	Power Factor at POI Lagging (providing vars)
GEN-2013-013	248.4	Tap Eddy County (527802) – Tolk (525549) 345kV (560726)	Wind	Siemens 2.3 MW	0.704	0.937
GEN-2013-017	199.5	Tap Tuco (525832) – OKU (511456) 345kV (560700)	Wind	GE 1.7 MW	0.871	0.426
ASGI-2013-002	18.4	Tucumcari 115kV (524509)	Wind	Siemens 2.3 MW VS	0.952	1.0
ASGI-2013-003	18.4	Clovis 115kV (524808)	Wind	Siemens 2.3 MW VS	0.800	0.962

NOTE: As reactive power is required for all projects, the final requirement in the GIA will be the pro-forma 95% lagging to 95% leading at the point of interconnection.

Low Wind Reactor Sizing Analysis

The power factor analysis was also used for reactor sizing in low wind or no wind conditions. In order to perform this analysis the request and equivalent transmission lines and collectors systems were modeled using specifications provided by the Customer. The cases are modeled such that the generation and capacitor banks are switched out of service, but the wind farm’s transmission subsystem (345kV and 34.5kV) remains in-service. The charging from these open-ended transmission facilities is then monitored for reactive power injections into the POI.

Analysis for low wind conditions shows that that GEN-2013-013 and GEN-2013-017 will be required to install additional reactors (or alternate means of producing reactive power). It is recommended that GEN-2013-013 install approximately 25Mvars of reactor banks and GEN-2013-017 install approximately 17MVars of reactor banks to compensate for this injection into the transmission system (see Table IV-4, Figure IV-1, and Figure IV-2).

Table IV-4: Summary of Reactor Sizing Analysis

Request	POI	Reactor size (MVAR)
GEN-2013-013	Tap Eddy County (527802) – Tolk (525549) 345kV (560726)	25
GEN-2013-017	Tap Tuco (525832) – OKU (511456) 345kV (560700)	17

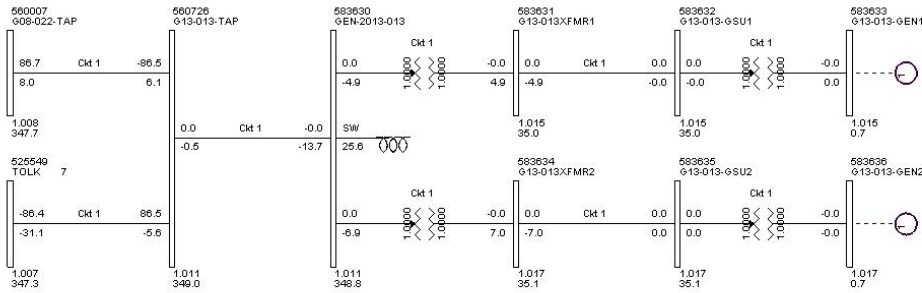


Figure IV-1: GEN-2013-013 Reactor Placement

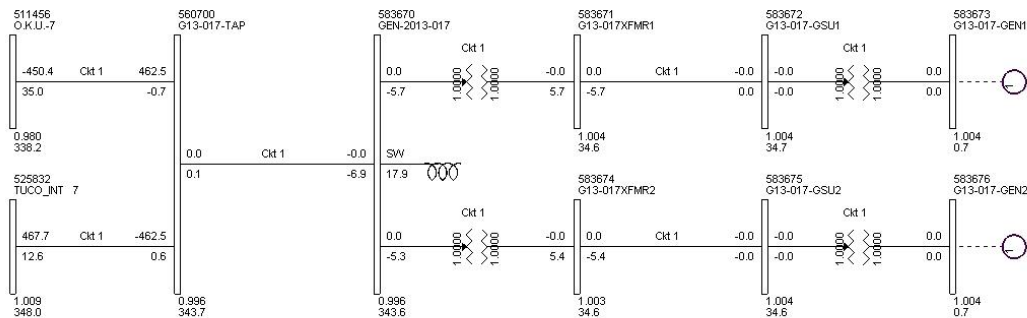


Figure IV-2: GEN-2013-017 Reactor Placement

V. Conclusion

DISIS-2013-001 Interconnection Customers have requested an Impact Study to determine the impacts of interconnecting generation to the SPP Transmission System.

Transmission System Stability issues were observed with several studied contingencies as noted in Table III-2. Most notable of stability issues was voltage instability that was associated with transmission line faults causing the outage of the Tuco-Border-Woodward 345kV transmission line. The outage of these line segments caused voltage collapse along the existing Tuco – Oklaunion 345kV line with most notable voltage depressions at the Oklaunion 345kV bus. 345kV transmission reinforcements are required to alleviate this potential voltage instability.

With all Base Case Network Upgrades in service, previously assigned Network Upgrades in service, and the newly assigned Network Upgrades in service, the Group 6 projects were found to remain on line, and the transmission system was found to remain stable for all conditions studied.

The power factor analysis of the study cases showed that the Group 6 projects are all required to maintain a power factor requirement of the pro-forma standard 0.95 leading (absorbing) to 0.95 lagging (supplying) at the Point of Interconnection. Interconnection Requests GEN-2013-013 and GEN-2013-017 were also found to need additional reactors to compensate for potential high voltage during low wind conditions.

Low Voltage Ride Through (LVRT) analysis showed none of the study generators tripping offline due to low voltage when all Network Upgrades are in service.

All generators in the monitored areas remained stable for all of the modeled disturbances.

Any changes to the assumptions made in this study, for example, one or more of the previously queued requests withdraw, may require a re-study at the expense of the Customer.

Nothing in this System Impact Study constitutes a request for transmission service or confers upon the Interconnection Customer any right to receive transmission service.

Appendix A: 2014 Summer Stability Plots

(Available on request)

Appendix B: 2014 Winter Peak Stability Plots

(Available on request)

Appendix C: 2023 Summer Peak Stability Plots

(Available on request)

Appendix D: Power Factor Analysis Tables⁶

⁶ Taken from Burns & McDonnell work product from B&M Project #74393 performed under contract to SPP

<i>GEN-2013-013 Power Factor Requirements</i>									
1	248.4	-9.7	99.92%	248.4	-10.4	99.91%	248.4	-17.5	99.75%
3	248.4	-9.7	99.92%	248.4	-10.4	99.91%	248.4	-17.5	99.75%
5	248.4	-9.7	99.92%	248.4	-10.4	99.91%	248.4	-17.5	99.75%
7	248.4	-9.7	99.92%	248.4	-10.4	99.91%	248.4	-17.5	99.75%
8	248.4	-9.7	99.92%	248.4	-10.4	99.91%	248.4	-17.5	99.75%
9	248.4	-9.7	99.92%	248.4	-10.4	99.91%	248.4	-17.5	99.75%
10	248.4	-9.7	99.92%	248.4	-10.4	99.91%	248.4	-17.5	99.75%
11	248.4	-9.7	99.92%	248.4	-10.4	99.91%	248.4	-17.5	99.75%
13	248.4	-9.6	99.93%	248.4	-10.4	99.91%	248.4	-17.5	99.75%
15	248.4	-9.6	99.93%	248.4	-10.4	99.91%	248.4	-17.5	99.75%
17	248.4	-9.7	99.92%	248.4	-10.4	99.91%	248.4	-17.5	99.75%
19	248.4	-9.6	99.93%	248.4	-10.4	99.91%	248.4	-17.5	99.75%
21	248.4	-9.5	99.93%	248.4	-10.3	99.91%	248.4	-17.7	99.75%
23	248.4	-9.7	99.92%	248.4	-10.4	99.91%	248.4	-16.7	99.77%
24	248.4	-9.2	99.93%	248.4	-10.2	99.92%	248.4	-17.3	99.76%
25	248.4	31.7	99.20%	248.4	23.2	99.57%	248.4	26.4	99.44%
27	248.4	-31.3	99.22%	248.4	-19	99.71%	248.4	-37.2	98.90%
29	248.4	-3.5	99.99%	248.4	-12.2	99.88%	248.4	-20	99.68%
30	248.4	12.8	99.87%	248.4	25.1	99.49%	248.4	25.4	99.48%
31	248.4	16.1	99.79%	248.4	28.4	99.35%	248.4	13.2	99.86%
33	248.4	-7.7	99.95%	248.4	-10.2	99.92%	248.4	-17.8	99.74%
35	248.4	-6.1	99.97%	248.4	1.6	100.00%	248.4	-13	99.86%
37	248.4	-2.9	99.99%	248.4	4.7	99.98%	248.4	-14.3	99.83%
38	248.4	-6.8	99.96%	248.4	-9.8	99.92%	248.4	-12.3	99.88%
39	248.4	-10.3	99.91%	248.4	-10.1	99.92%	248.4	-17.5	99.75%
41	248.4	-10.3	99.91%	248.4	-10.8	99.91%	248.4	-17.4	99.76%
43	248.4	-10.3	99.91%	248.4	-10.6	99.91%	248.4	-17.3	99.76%
45	248.4	-11.4	99.89%	248.4	-11	99.90%	248.4	-17.2	99.76%
47	248.4	-9.7	99.92%	248.4	-10.4	99.91%	248.4	-17.5	99.75%
48	248.4	-10.3	99.91%	248.4	-10.6	99.91%	248.4	-17.4	99.76%
49	248.4	-10.3	99.91%	248.4	-10.6	99.91%	248.4	-17.4	99.76%
50	248.4	-10.8	99.91%	248.4	-10.7	99.91%	248.4	-17.2	99.76%
51	248.4	92.8	93.68%	248.4	51.1	97.95%	248.4	73.5	95.89%
52	248.4	-9.1	99.93%	248.4	-10.1	99.92%	248.4	-17.3	99.76%
54	248.4	-8.9	99.94%	248.4	-10	99.92%	248.4	-17.3	99.76%
56	248.4	-8.8	99.94%	248.4	-9.9	99.92%	248.4	-17.2	99.76%
58	248.4	-250.4	70.43%	248.4	-9.8	99.92%	248.4	-16.9	99.77%

<i>GEN-2013-013 Power Factor Requirements</i>									
60	248.4	-8.9	99.94%	248.4	-10	99.92%	248.4	-17.3	99.76%
62	248.4	-9.7	99.92%	248.4	-10.4	99.91%	248.4	-17.5	99.75%
64	248.4	-9	99.93%	248.4	-10	99.92%	248.4	-17.3	99.76%
66	248.4	-8.9	99.94%	248.4	-10	99.92%	248.4	-17.3	99.76%
68	248.4	-9.7	99.92%	248.4	-10.4	99.91%	248.4	-17.5	99.75%
70	248.4	-9.6	99.93%	248.4	-10.4	99.91%	248.4	-17.5	99.75%
71	248.4	-9.7	99.92%	248.4	-10.4	99.91%	248.4	-17.5	99.75%
72	248.4	-9.3	99.93%	248.4	-10.2	99.92%	248.4	-17.4	99.76%
74	248.4	-9.1	99.93%	248.4	-10.3	99.91%	248.4	-17.5	99.75%
76	248.4	-10	99.92%	248.4	-10.6	99.91%	248.4	-17.5	99.75%
77	248.4	-7.9	99.95%	248.4	-9.5	99.93%	248.4	-8.8	99.94%

<i>GEN-2013-017 Power Factor Requirements</i>									
Contingency Number	2014 Summer Peak			2014 Winter Peak			2023 Summer Peak		
	P (MW)	Q (MVAR)	Power Factor	P (MW)	Q (MVAR)	Power Factor	P (MW)	Q (MVAR)	Power Factor
1	199.5	184.6	73.40%	199.5	146.3	80.64%	199.5	85.4	91.93%
3	199.5	184.5	73.42%	199.5	146.2	80.66%	199.5	85.3	91.95%
5	199.5	184.7	73.38%	199.5	146.4	80.62%	199.5	85.5	91.91%
7	199.5	185.3	73.27%	199.5	146.7	80.56%	199.5	86.1	91.81%
8	199.5	184.7	73.38%	199.5	146.4	80.62%	199.5	85.4	91.93%
9	199.5	185.5	73.23%	199.5	146.8	80.54%	199.5	86.2	91.80%
10	199.5	184.9	73.34%	199.5	146.5	80.60%	199.5	85.3	91.95%
11	199.5	184.5	73.42%	199.5	146.2	80.66%	199.5	85.3	91.95%
13	199.5	184.5	73.42%	199.5	146.3	80.64%	199.5	85.3	91.95%
15	199.5	184.6	73.40%	199.5	146.3	80.64%	199.5	85.2	91.96%
17	199.5	184.5	73.42%	199.5	146.2	80.66%	199.5	85.3	91.95%
19	199.5	187.2	72.92%	199.5	147.2	80.47%	199.5	86.2	91.80%
21	199.5	189.2	72.56%	199.5	148	80.31%	199.5	86.5	91.75%
23	199.5	187.1	72.94%	199.5	147.5	80.41%	199.5	86.4	91.76%
24	199.5	186.2	73.11%	199.5	147.5	80.41%	199.5	86	91.83%
25	199.5	177.1	74.78%	199.5	146.1	80.68%	199.5	84.1	92.15%
27	199.5	184.5	73.42%	199.5	146.5	80.60%	199.5	86.1	91.81%
29	199.5	177.1	74.78%	199.5	145.8	80.74%	199.5	83.7	92.21%
30	199.5	181	74.06%	199.5	140.8	81.70%	199.5	76.9	93.31%
31	199.5	181	74.06%	199.5	140.8	81.70%	199.5	76.9	93.31%
33	199.5	183.8	73.55%	199.5	146.7	80.56%	199.5	84.2	92.13%
35	199.5	181.6	73.95%	199.5	140.3	81.80%	199.5	78.7	93.02%
37	199.5	181.1	74.04%	199.5	140.2	81.82%	199.5	78.3	93.09%
38	199.5	183.7	73.56%	199.5	147.3	80.45%	199.5	84.6	92.06%
39	199.5	180.7	74.12%	199.5	144.9	80.91%	199.5	86	91.83%
41	199.5	185.1	73.31%	199.5	146.7	80.56%	199.5	87.6	91.56%
43	199.5	190	72.41%	199.5	148.4	80.24%	199.5	90.4	91.09%
45	199.5	144.4	81.01%	199.5	126.3	84.49%	199.5	57.4	96.10%
47	199.5	184.5	73.42%	199.5	146.2	80.66%	199.5	85.3	91.95%
48	199.5	189.9	72.43%	199.5	148.3	80.26%	199.5	89.7	91.20%
49	199.5	189.9	72.43%	199.5	148.3	80.26%	199.5	89.7	91.20%
50	199.5	111.8	87.24%	199.5	108.7	87.81%	199.5	44.5	97.60%
51	199.5	162.1	77.61%	199.5	141.2	81.62%	199.5	74	93.76%
52	199.5	-91.1	90.96%	199.5	-98.5	89.67%	199.5	-98.2	89.72%
54	199.5	391.2	45.43%	199.5	329.5	51.79%	199.5	214.4	68.12%
56	199.5	24.3	99.27%	199.5	-38.3	98.21%	199.5	6.3	99.95%
58	199.5	-112.8	87.05%	199.5	-42.2	97.84%	199.5	16.4	99.66%

GEN-2013-017 Power Factor Requirements									
Contingency Number	2014 Summer Peak			2014 Winter Peak			2023 Summer Peak		
	P (MW)	Q (MVAR)	Power Factor	P (MW)	Q (MVAR)	Power Factor	P (MW)	Q (MVAR)	Power Factor
60	199.5	414.2	43.39%	199.5	341.6	50.43%	199.5	235.5	64.64%
62	199.5	184.5	73.42%	199.5	146.2	80.66%	199.5	85.3	91.95%
64	199.5	383.6	46.14%	199.5	326.1	52.19%	199.5	206.9	69.41%
66	199.5	424.2	42.56%	199.5	357.4	48.74%	199.5	233.8	64.91%
68	199.5	283.6	57.54%	199.5	250	62.37%	199.5	96.1	90.09%
70	199.5	184.1	73.49%	199.5	148	80.31%	199.5	85.1	91.98%
71	199.5	186.2	73.11%	199.5	146.8	80.54%	199.5	89.5	91.24%
72	199.5	222.1	66.82%	199.5	170.9	75.94%	199.5	93.3	90.58%
74	199.5	172	75.74%	199.5	145.6	80.78%	199.5	78.9	92.99%
76	199.5	194.5	71.60%	199.5	147.9	80.33%	199.5	93.7	90.51%
77	199.5	-91.5	90.90%	199.5	-97.6	89.83%	199.5	-85.6	91.90%

<i>ASGI-2013-002 Power Factor Requirements</i>									
Contingency Number	2014 Summer Peak			2014 Winter Peak			2023 Summer Peak		
	P (MW)	Q (MVAR)	Power Factor	P (MW)	Q (MVAR)	Power Factor	P (MW)	Q (MVAR)	Power Factor
1	18.4	-5.2	96.23%	18.4	-5.9	95.22%	18.4	-5.6	95.67%
3	18.4	-5.2	96.23%	18.4	-5.9	95.22%	18.4	-5.6	95.67%
5	18.4	-5.2	96.23%	18.4	-5.9	95.22%	18.4	-5.6	95.67%
7	18.4	-5.2	96.23%	18.4	-5.9	95.22%	18.4	-5.6	95.67%
8	18.4	-5.2	96.23%	18.4	-5.9	95.22%	18.4	-5.6	95.67%
9	18.4	-5.2	96.23%	18.4	-5.9	95.22%	18.4	-5.6	95.67%
10	18.4	-5.2	96.23%	18.4	-5.9	95.22%	18.4	-5.6	95.67%
11	18.4	-5.2	96.23%	18.4	-5.9	95.22%	18.4	-5.6	95.67%
13	18.4	-5.2	96.23%	18.4	-5.8	95.37%	18.4	-5.6	95.67%
15	18.4	-5.1	96.37%	18.4	-5.8	95.37%	18.4	-5.5	95.81%
17	18.4	-5.2	96.23%	18.4	-5.9	95.22%	18.4	-5.6	95.67%
19	18.4	-4.1	97.61%	18.4	-5.1	96.37%	18.4	-5.1	96.37%
21	18.4	-2.9	98.78%	18.4	-3.6	98.14%	18.4	-4.8	96.76%
23	18.4	-4.3	97.38%	18.4	-4.8	96.76%	18.4	-5.1	96.37%
24	18.4	-4.9	96.63%	18.4	-5	96.50%	18.4	-5.2	96.23%
25	18.4	-5	96.50%	18.4	-5.5	95.81%	18.4	-5.6	95.67%
27	18.4	-5.1	96.37%	18.4	-5.9	95.22%	18.4	-5.5	95.81%
29	18.4	-5.1	96.37%	18.4	-5.6	95.67%	18.4	-5.7	95.52%
30	18.4	-5.2	96.23%	18.4	-5.8	95.37%	18.4	-5.7	95.52%
31	18.4	-5.2	96.23%	18.4	-5.8	95.37%	18.4	-5.7	95.52%
33	18.4	-5.3	96.09%	18.4	-5.8	95.37%	18.4	-5.7	95.52%
35	18.4	-5.2	96.23%	18.4	-5.7	95.52%	18.4	-5.6	95.67%
37	18.4	-5.1	96.37%	18.4	-5.7	95.52%	18.4	-5.7	95.52%
38	18.4	-5.3	96.09%	18.4	-5.7	95.52%	18.4	-5.7	95.52%
39	18.4	-5.2	96.23%	18.4	-5.9	95.22%	18.4	-5.6	95.67%
41	18.4	-5.2	96.23%	18.4	-5.9	95.22%	18.4	-5.6	95.67%
43	18.4	-5.2	96.23%	18.4	-5.9	95.22%	18.4	-5.5	95.81%
45	18.4	-5.1	96.37%	18.4	-5.9	95.22%	18.4	-5.5	95.81%
47	18.4	-5.2	96.23%	18.4	-5.9	95.22%	18.4	-5.6	95.67%
48	18.4	-5.2	96.23%	18.4	-5.9	95.22%	18.4	-5.5	95.81%
49	18.4	-5.2	96.23%	18.4	-5.9	95.22%	18.4	-5.5	95.81%
50	18.4	-5	96.50%	18.4	-5.9	95.22%	18.4	-5.4	95.95%
51	18.4	-5.5	95.81%	18.4	-5.9	95.22%	18.4	-5.9	95.22%
52	18.4	-5.1	96.37%	18.4	-5.8	95.37%	18.4	-5.5	95.81%
54	18.4	-5	96.50%	18.4	-5.9	95.22%	18.4	-5.5	95.81%
56	18.4	-5	96.50%	18.4	-5.9	95.22%	18.4	-5.4	95.95%
58	18.4	-4.9	96.63%	18.4	-5.9	95.22%	18.4	-5.4	95.95%

ASGI-2013-002 Power Factor Requirements									
Contingency Number	2014 Summer Peak			2014 Winter Peak			2023 Summer Peak		
	P (MW)	Q (MVAR)	Power Factor	P (MW)	Q (MVAR)	Power Factor	P (MW)	Q (MVAR)	Power Factor
60	18.4	-5	96.50%	18.4	-5.9	95.22%	18.4	-5.5	95.81%
62	18.4	-5.2	96.23%	18.4	-5.9	95.22%	18.4	-5.6	95.67%
64	18.4	-5.1	96.37%	18.4	-5.9	95.22%	18.4	-5.5	95.81%
66	18.4	-5	96.50%	18.4	-5.9	95.22%	18.4	-5.4	95.95%
68	18.4	-5.2	96.23%	18.4	-5.9	95.22%	18.4	-5.6	95.67%
70	18.4	-5.2	96.23%	18.4	-5.9	95.22%	18.4	-5.6	95.67%
71	18.4	-5.2	96.23%	18.4	-5.9	95.22%	18.4	-5.6	95.67%
72	18.4	-5.1	96.37%	18.4	-5.8	95.37%	18.4	-5.6	95.67%
74	18.4	-5.2	96.23%	18.4	-5.9	95.22%	18.4	-5.6	95.67%
76	18.4	-5.2	96.23%	18.4	-5.9	95.22%	18.4	-5.6	95.67%
77	18.4	-4.8	96.76%	18.4	-5.6	95.67%	18.4	-3	98.70%

<i>ASGI-2013-003 Power Factor Requirements</i>									
Contingency Number	2014 Summer Peak			2014 Winter Peak			2023 Summer Peak		
	P (MW)	Q (MVAR)	Power Factor	P (MW)	Q (MVAR)	Power Factor	P (MW)	Q (MVAR)	Power Factor
1	18.4	-1	99.85%	18.4	-1.2	99.79%	18.4	-0.9	99.88%
3	18.4	-1	99.85%	18.4	-1.2	99.79%	18.4	-0.9	99.88%
5	18.4	-1	99.85%	18.4	-1.2	99.79%	18.4	-0.9	99.88%
7	18.4	-1	99.85%	18.4	-1.2	99.79%	18.4	-0.9	99.88%
8	18.4	-1	99.85%	18.4	-1.2	99.79%	18.4	-0.9	99.88%
9	18.4	-1	99.85%	18.4	-1.2	99.79%	18.4	-0.9	99.88%
10	18.4	-1	99.85%	18.4	-1.2	99.79%	18.4	-0.9	99.88%
11	18.4	-1	99.85%	18.4	-1.2	99.79%	18.4	-0.9	99.88%
13	18.4	-1.1	99.82%	18.4	-1.1	99.82%	18.4	0.2	99.99%
15	18.4	0.2	99.99%	18.4	-0.4	99.98%	18.4	-0.5	99.96%
17	18.4	-1	99.85%	18.4	-1.2	99.79%	18.4	-0.9	99.88%
19	18.4	3	98.70%	18.4	2.5	99.09%	18.4	-0.5	99.96%
21	18.4	3.9	97.83%	18.4	2.3	99.23%	18.4	0.1	100.00%
23	18.4	0.9	99.88%	18.4	0.7	99.93%	18.4	-0.2	99.99%
24	18.4	0.5	99.96%	18.4	1.8	99.52%	18.4	-0.1	100.00%
25	18.4	-0.6	99.95%	18.4	-0.3	99.99%	18.4	-1.1	99.82%
27	18.4	-0.9	99.88%	18.4	-1.2	99.79%	18.4	-0.8	99.91%
29	18.4	-0.7	99.93%	18.4	-0.4	99.98%	18.4	-1.2	99.79%
30	18.4	-1.1	99.82%	18.4	-1	99.85%	18.4	-1.2	99.79%
31	18.4	-1.1	99.82%	18.4	-1	99.85%	18.4	-1.2	99.79%
33	18.4	-1.2	99.79%	18.4	-0.9	99.88%	18.4	-1.5	99.67%
35	18.4	-0.9	99.88%	18.4	-0.9	99.88%	18.4	-1.2	99.79%
37	18.4	-0.8	99.91%	18.4	-0.7	99.93%	18.4	-1.5	99.67%
38	18.4	-1.2	99.79%	18.4	-0.9	99.88%	18.4	-1.4	99.71%
39	18.4	-1	99.85%	18.4	-1.2	99.79%	18.4	-0.9	99.88%
41	18.4	-1	99.85%	18.4	-1.2	99.79%	18.4	-0.9	99.88%
43	18.4	-0.9	99.88%	18.4	-1.2	99.79%	18.4	-0.8	99.91%
45	18.4	-0.8	99.91%	18.4	-1.2	99.79%	18.4	-0.7	99.93%
47	18.4	-1	99.85%	18.4	-1.2	99.79%	18.4	-0.9	99.88%
48	18.4	-0.9	99.88%	18.4	-1.2	99.79%	18.4	-0.8	99.91%
49	18.4	-0.9	99.88%	18.4	-1.2	99.79%	18.4	-0.8	99.91%
50	18.4	-0.5	99.96%	18.4	-1.2	99.79%	18.4	-1	99.85%
51	18.4	-1.9	99.47%	18.4	-1.3	99.75%	18.4	-1.7	99.58%
52	18.4	-0.7	99.93%	18.4	-1.1	99.82%	18.4	-0.7	99.93%
54	18.4	-0.6	99.95%	18.4	-1.2	99.79%	18.4	-0.7	99.93%
56	18.4	-0.5	99.96%	18.4	-1.2	99.79%	18.4	-1	99.85%
58	18.4	-13.8	80.00%	18.4	-1.2	99.79%	18.4	-0.8	99.91%

ASGI-2013-003 Power Factor Requirements									
Contingency Number	2014 Summer Peak			2014 Winter Peak			2023 Summer Peak		
	P (MW)	Q (MVAR)	Power Factor	P (MW)	Q (MVAR)	Power Factor	P (MW)	Q (MVAR)	Power Factor
60	18.4	-0.6	99.95%	18.4	-1.2	99.79%	18.4	-0.7	99.93%
62	18.4	-1	99.85%	18.4	-1.2	99.79%	18.4	-0.9	99.88%
64	18.4	-0.6	99.95%	18.4	-1.2	99.79%	18.4	-0.7	99.93%
66	18.4	-0.5	99.96%	18.4	-1.2	99.79%	18.4	-0.6	99.95%
68	18.4	-1	99.85%	18.4	-1.2	99.79%	18.4	-0.9	99.88%
70	18.4	-1	99.85%	18.4	-1.2	99.79%	18.4	-0.9	99.88%
71	18.4	-1	99.85%	18.4	-1.2	99.79%	18.4	-0.9	99.88%
72	18.4	-0.9	99.88%	18.4	-1.2	99.79%	18.4	-0.9	99.88%
74	18.4	-1	99.85%	18.4	-1.2	99.79%	18.4	-0.9	99.88%
76	18.4	-1.1	99.82%	18.4	-1.2	99.79%	18.4	-0.9	99.88%
77	18.4	0.2	99.99%	18.4	-0.6	99.95%	18.4	5.2	96.23%

N: Group 8 Dynamic Stability Analysis Report

See Quanta Technology report on next page.



DISIS 2013-003

Group 8

Definitive Interconnection System Impact Study

August 30, 2013

Submitted To:
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EXECUTIVE SUMMARY

The Southwest Power Pool (SPP), on behalf of generation interconnection customers, desires a definitive interconnection system impact study for a group of generators in north central Oklahoma between Oklahoma City and the Kansas border collectively referred to as Group 8. Group 8 is made of two generators:

- GEN-2013-009. 100.3 MW windfarm using GE 1.7 MVA units connected to a tap of the Vinita Junction to Alluwe Tap 138kVline.
- GEN-2013-012. 68 MW increase summer ($P_{gen}=672$ MW summer), 147 MW increase winter ($P_{gen}=860$ MW winter), to the four (4) existing combustion turbines (CT) currently interconnected to the Redbud 345kV Substation northeast of Oklahoma City, OK.

There are 19 previously queued generators in Group 8.

SPP requested a stability analysis for the queued generator projects in Group 8. A power factor analysis was completed for the wind farm in GEN-2013-009. No power factor study was performed for GEN-2013-012. SPP did not request an Available Transfer Capability (ATC) study as part of this study.

GEN-2013-009 was found to be stable for all conditions studied. The wind turbine generators in GEN-2013-009 have the capability of pre-contingency voltage recovery and the post fault voltage recovery was found to be within the criterion of 0.7 PU to 1.2 PU.

Transient stability analysis showed that requested uprated GEN-2013-012 generators and existing units at Redbud are unstable for 2014 summer and 2014 winter peak conditions for a prior outage of Redbud to Arcadia 345kV CKT 2 followed by a three phase fault at Redbud on the Redbud to Arcadia 345kV CKT 1. For the prior outage of the Redbud to Arcadia 345kV ckt 2, the generation of all units at Redbud (including GEN-2013-012 rate increases) should be reduced to 1120MW for the subsequent outage to not cause instability for the 2014 summer and winter peak conditions. Presently, before the addition of GEN-2013-012 there is 1164MW (Summer Peak)/1273MW (Winter Peak) interconnected at the Redbud 345kV bus. . GEN-2013-012 was found to be stable for all contingencies for 2023 Summer Peak condition at full plant output.

The post fault voltage recovery for GEN-2013-012 was found to be within the 0.7 PU to 1.2 PU criterion except at Redbud 345 kV bus for the prior outage of Redbud-Arcadia CKT 2 followed by an outage of Redbud-Arcadia CKT 1 345 kV in the 2014 summer peak model. The post fault voltage recovery criterion is met if all generating units at Redbud are limited to 994 MW, the N-1 thermal limit for the prior outage condition.

All generators are found to be compliant with rotor angle damping requirement.

Low Voltage Ride Through (LVRT) analysis shows no generators tripping offline due to low voltage.

All generators in the monitored areas remain stable for all of the modeled disturbances.

Power factor analysis indicates that GEN-2013-009 will need to provide leading reactive compensation at the POI under base case and a majority of contingency conditions to maintain voltage at the POI at a 1.00 PU voltage schedule. The power factor at the POI was slightly lagging for some contingencies in the 2023 summer peak analysis. For the network conditions studied, no contingencies that were tested will require the contribution of reactive power from GEN-2013-009 to exceed a net power factor of 95% lagging (supplying VARs to the network) to 95% leading (absorbing VARs from the network) at the POI.

TABLE OF CONTENTS

	PAGE
1. INTRODUCTION.....	1
2. STUDY METHODOLOGY	2
2.1 POWER FACTOR ANALYSIS	2
2.2 DYNAMIC ANALYSIS	3
3. PROJECT DESCRIPTION	6
4. POWER FACTOR RESULTS.....	11
5. TRANSIENT STABILITY RESULTS.....	15
6. ROTOR ANGLE DAMPING AND VOLTAGE RECOVERY REQUIREMENT	19
7. CONCLUSIONS.....	20

1. INTRODUCTION

The Southwest Power Pool (hereafter referred to as SPP) commissioned Quanta Technology to study the impact of a group of generators in the SPP interconnection queue referred to as Group 8. The sites studied are in Oklahoma northeast of Tulsa (GEN-2013-009) and northeast of Oklahoma City (GEN-2013-012).

The sites studied were:

- GEN-2013-009. 100.3 MW windfarm using GE 1.7 MVA units connected to a tap of the Vinita Junction to Alluwe Tap 138kVline.
- GEN-2013-012. 68 MW increase summer ($P_{gen}=672$ MW summer), 147 MW increase winter ($P_{gen}=860$ MW winter), to the four (4) existing combustion turbines (CT) currently interconnected to the Redbud 345kV Substation northeast of Oklahoma City, OK.

SPP did not request an Available Transfer Capability (ATC) study.

SPP requested a stability analysis for all of the generation in Group 8 and a power factor analysis for the windfarm in GEN-2013-009. Quanta Technology performed a dynamics study and a power factor study utilizing SPP's list of faults as follows:

1. Determine the amount of reactive compensation to be supplied by the wind farm facility as determined by a proxy VAR generator modeled at the Point of Interconnection (POI) to maintain a scheduled bus voltage of 1.0 PU for the transmission line and transformer outages specified in the Group 8 study. Determine the ability of the wind farm to meet FERC Order 661A (low voltage ride through and wind farm recovery to pre-fault voltage) with and without additional reactive power support.
2. Determine the ability of the generators to remain in synchronism following three phase and single line to ground faults.

The results of the study are given in the following sections.

2. STUDY METHODOLOGY

SPP provided 2014 summer peak and 2014 winter peak and 2023 summer peak load flow cases in PSS/E format. Table 2-1 below shows the total demand and generation in the monitored areas.

Table 2-1 Description of Study Areas

Area #	Area Name	2014 Summer Peak		2014 Winter Peak		2023 Summer Peak	
		Load (MW)	Generation (MW)	Load (MW)	Generation (MW)	Load (MW)	Generation (MW)
520	AEPW	10,477.0	9,071.2	7,998.0	6,777.7	10,987.2	9,528.7
523	GRDA	1,051.3	900.6	741.4	703.4	1,256.6	1,107.1
524	OKGE	6,554.7	8,013.9	4,599.2	6,171.5	7,081.5	8,350.4
525	WFEC	1,452.8	1,590.0	1,332.4	1,384.1	1,660.7	1,713.8
536	WERE	5,918.0	6,695.3	3,932.4	5,072.4	6,407.6	7,178.8
540	GMO	2,023.7	980.7	1,587.4	583.9	2,246.7	1,090.1
541	KCPL	3,674.2	3,642.8	2,702.4	2,575.7	3,944.4	4,157.0
544	EMDE	1,170.5	854.6	1,024.8	485.6	1,326.3	1,032.1

2.1 POWER FACTOR ANALYSIS

A VAR generator with large capacity was placed at the GEN-2013-009 wind farm POI. The VAR generator was set to hold a voltage schedule at the POI of 1.0 PU. The list of contingencies shown in Table 2-2 was simulated. The reactive compensation from GEN-2013-009 to maintain 1.0PU at the POI was determined.

Table 2-2 Steady State Contingency Descriptions

Cont No.	Description
FLT01	Outage the Arcadia (514908) to Northwest (514880) 345kV line
FLT03	Outage the Arcadia (514908) to Seminole (515045) 345kV line
FLT05	Outage the GEN-2013-009 Tap (560742) to Vinita Junction (510417) 138kV line
FLT07	Outage the GEN-2013-009 Tap (560742) to Alluwe Shell Tap (510429) 138kV line
FLT09	Outage the Hockerville (547486) to Miami (512631) 161kV line
FLT11	Outage the Hockerville (547486) to Riverton S (547469) 161kV line
FLT13	Outage the NES (510396) to Hawthorne (510413) 138kV line
FLT15	Outage the NES (510396) to TNO (509817) 138kV line
FLT17	Outage the Redbud (514909) to RSS (509782) 345kV line
FLT19	Outage the Redbud (514909) to Arcadia (514908) 345kV line
FLT21	Outage the RSS (509782) to Oneta (509807) 345kV line
FLT23	Outage the RSS (509782) to Salpulpa Rd (509870) 345kV line
FLT25	Outage the RSS (509782) to Pecan Creek (515235) 345kV line
FLT27	Outage the Vinita Junction (510417) to Hockerville (547486) 138kV line
FLT29	Outage the NES (510396) to Oologah (300795) 138kV line
FLT31	Outage the NES (510396) to Rice Creek (510385) 138kV line
FLT33	Outage the Northwest (514880) to Cimarron (514901) 345kV line
FLT35	Outage the Northwest (514880) to Spring Creek (514881) 345kV line
FLT37	Outage the Northwest (514880) to Mathewson (560368) 345kV line
FLT39	Outage the Seminole (515045) to Pittsburg (510907) 345kV line
FLT41	Outage the Seminole (515045) to Draper (514934) 345kV line
FLT43	Outage the Seminole (515045) to Muskogee (515224) 345kV line
FLT45	Outage the Hockerville 138kV (547486) to Hockerville (547487) 161kV/(547715) 12.5kV transformer
FLT46	Outage the TNO 138kV (509817) to TNO (509852) 345kV/(509883) 13.8kV transformer
FLT47	Outage the Vinita Junction 138kV (510417) to Vinita Junction (510418) 69kV/(510367) 13.8kV transformer
FLT48	Outage the Arcadia 345kV (514908) to Arcadia (514907) 138kV/(515703) 12.5kV transformer
FLT49	Outage the Seminole 345kV (515045) to Seminole (515044) 138kV/(515756) 14.4kV transformer
FLT50	Prior Outage of the Pensacola (512654) to Kerr (512635) 161kV line, then -- Outage the Pensacola (512654) – Kerr (512635) 161kV line
FLT51	Prior Outage of the Pensacola (512654) to Kerr (512635) 161kV line, then -- Outage the Hockerville (547487) – Riverton (547469) 161kV line
FLT52	Prior outage of Redbud (514909) to Arcadia (514908) 345kV ckt.2, then -- Outage the Redbud (514909) to Arcadia (514908) 345kV CKT 1
FLT53	Prior outage of Redbud (514909) to RSS (509782) 345kV CKT 1, then -- Outage the Redbud (514909) to Arcadia (514908) 345kV CKT 1

2.2 DYNAMIC ANALYSIS

The study areas shown in Table 2-1 were monitored in the dynamic analysis.

The transmission line and transformer faults were simulated and synchronous machine rotor angles and wind turbine generator speeds were monitored to check whether synchronism is maintained following fault removal.

All line faults were simulated in the following fashion:

1. Apply fault to a line near one of its buses.
2. Clear fault after five (5) cycles by tripping the faulted line.
3. Wait 20 cycles and reclose the tripped line into the fault.
4. Leave fault on for five (5) cycles, then trip the line and remove the fault.

Note that the above line faults were simulated in three phase (3PH) and single line to ground (1PH) versions as specified in the contingency list provided.

All transformer and double-circuit faults were simulated in the following fashion:

1. Apply fault at the identified bus terminals of the transformer or double circuit lines.
2. Clear fault after five (5) cycles by tripping the faulted transformer or double circuit.

Note that no reclosing was considered for the above transformer and double-circuit faults.

Table 2-3 Fault Descriptions

Fault No.	Description
1,2	Fault the Arcadia (514908) to Northwest (514880) 345kV line
3,4	Fault the Arcadia (514908) to Seminole (515045) 345kV line
5,6	Fault the GEN-2013-009 Tap (560742) to Vinita Junction (510417) 138kV line
7,8	Fault the GEN-2013-009 Tap (560742) to Alluwe Shell Tap (510429) 138kV line
9,10	Fault the Hockerville (547486) to Miami (512631) 161kV line
11,12	Fault the Hockerville (547486) to Riverton S (547469) 161kV line
13,14	Fault the NES (510396) to Hawthorne (510413) 138kV line
15,16	Fault the NES (510396) to TNO (509817) 138kV line
17,18	Fault the Redbud (514909) to RSS (509782) 345kV line
19,20	Fault the Redbud (514909) to Arcadia (514908) 345kV line
21,22	Fault the RSS (509782) to Oneta (509807) 345kV line
23,24	Fault the RSS (509782) to Salpulpa Rd (509870) 345kV line
25,26	Fault the RSS (509782) to Pecan Creek (515235) 345kV line
27,28	Fault the Vinita Junction (510417) to Hockerville (547486) 138kV line
29,30	Fault the NES (510396) to Oologah (300795) 138kV line
31,32	Fault the NES (510396) to Rice Creek (510385) 138kV line
33,34	Fault the Northwest (514880) to Cimarron (514901) 345kV line
35,36	Fault the Northwest (514880) to Spring Creek (514881) 345kV line
37,38	Fault the Northwest (514880) to Mathewson (560368) 345kV line
39,40	Fault the Seminole (515045) to Pittsburg (510907) 345kV line
41,42	Fault the Seminole (515045) to Draper (514934) 345kV line
43,44	Fault the Seminole (515045) to Muskogee (515224) 345kV line
45	Fault the Hockerville 138kV (547486) to Hockerville (547487) 161kV/(547715) 12.5kV transformer
46	Fault the TNO 138kV (509817) to TNO (509852) 345kV/(509883) 13.8kV transformer
47	Fault the Vinita Junction 138kV (510417) to Vinita Junction (510418) 69kV/(510367) 13.8kV transformer
48	Fault the Arcadia 345kV (514908) to Arcadia (514907) 138kV/(515703) 12.5kV transformer
49	Fault the Seminole 345kV (515045) to Seminole (515044) 138kV/(515756) 14.4kV transformer
50	Prior Outage of the Hockerville (547487) to Riverton (547469) 161kV line, then -- Fault the Pensacola (512654) – Kerr (512635) 161kV line
51	Prior Outage of the Pensacola (512654) to Kerr (512635) 161kV line, then -- Fault the Hockerville (547487) – Riverton (547469) 161kV line
52	Prior outage of Redbud (514909) to Arcadia (514908) 345kV ckt.2, then -- Fault the Redbud (514909) to Arcadia (514908) 345kV CKT 1
53	Prior outage of Redbud (514909) to RSS (509782) 345kV CKT 1, then -- Fault the Redbud (514909) to Arcadia (514908) 345kV CKT 1

In order to simulate 1PH faults, equivalent reactance¹ were determined to be applied at the faulted buses. Table 2-4 presents equivalent reactors used in the transient stability study.

Table 2-4 Equivalent Reactors (MVAR) for Single Line to Ground Faults

Fault No.	Faulted Bus #	2014 Summer Peak	2014 Winter Peak	2023 Summer Peak
2,4	514908	-9891	-9081	-10047
6,8	560742	-954	-954	-965
10,12	547486	-1022	-995	-1040
14,16,30,3 2	510396	-5581	-5556	-5510
18,20	514909	-9659	-8907	-9844
22,24,26	509782	-11916	-11274	-11564
28	510417	-861	-860	-871
34,36,38	514880	-11421	-10019	-12022
40,42,44	515045	-10232	-8941	-10919

Another important aspect of the dynamic analysis was to check FERC Order 661A compliance. The turbine generators were monitored to determine whether they stayed connected to the grid (Low Voltage Ride Through - LVRT) following the faults defined in Table 3-1. The wind farm capability of post-fault voltage recovery at the POI was also checked.

3. PROJECT DESCRIPTION

Following is a table of the proposed generators in Group 8.

Table 3-1: Points of Interconnection for Group 8

Request	Size (MW)	Turbine Model	Point Of Interconnection		
			Common Name	Bus #	Name in Model
GEN-2013-009	100.3	GE 1.7 MW	Tap Alluwe Tap-Vinita Junction 138kV	560742	G13-009-TAP
GEN-2013-012	68 MW increase summer (Pgen=672 MW summer) 147 MW increase winter (Pgen=860 MW winter)	GENROU	Redbud 345kV	514909	REDBUD 7

¹ The equivalent reactance were calculated when the voltage at the faulted bus dropped to 0.60 pu.

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 Group 8
 Definitive Interconnection System Impact Study 2013-001
 August 30, 2013

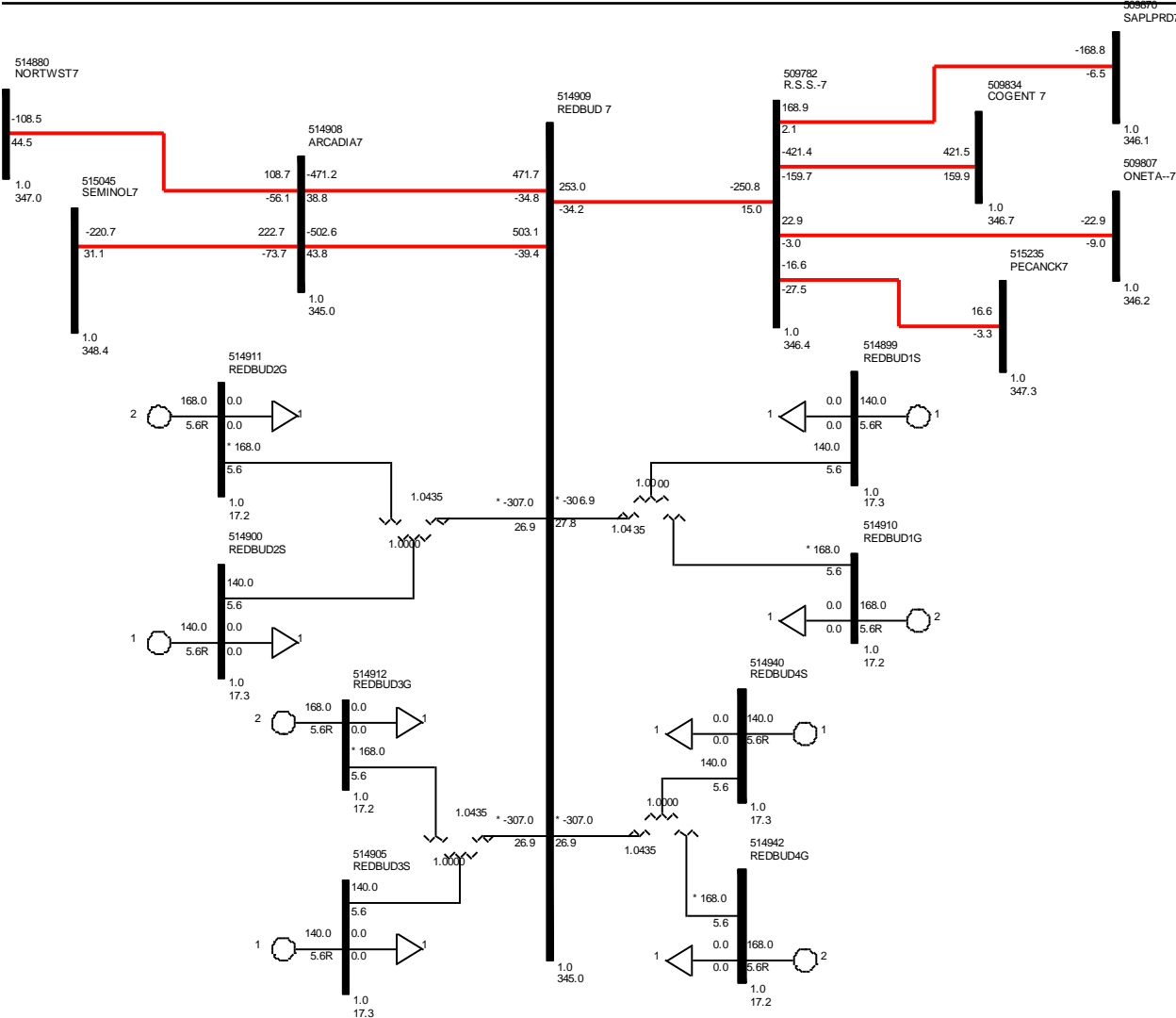


Figure 3-2 GEN-2013-012 One-Line Diagram

As illustrated below, the sites of the interconnections in Group 8 is in north-central Oklahoma northeast of Tulsa (GEN-2013-009) and northeast of Oklahoma City (GEN-2013-012).

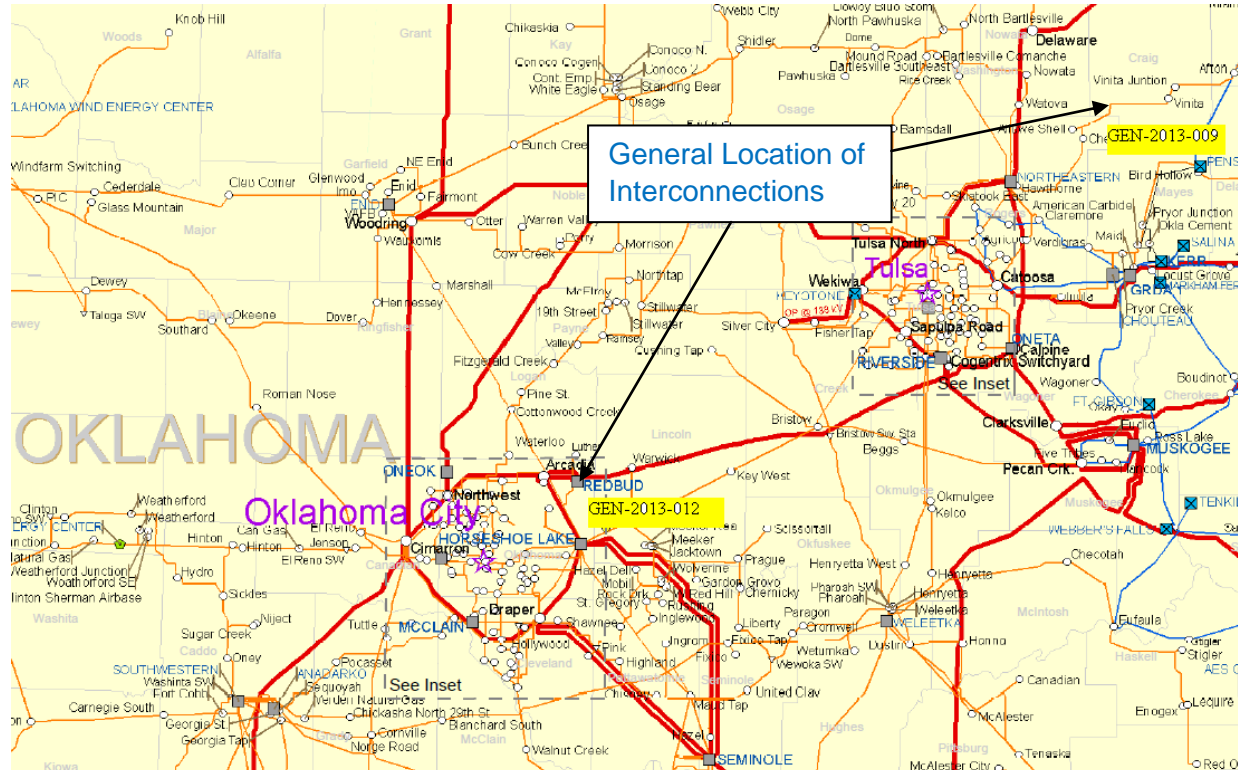


Figure 3-3 Geographical Location of Group 8 Project

The following is the detailed description of the wind projects in Group 8.

GEN-2013-009

- Wind farm rating
 - Active power capability: 100.3 MW
 - Reactive power capability: 48.38 MVAR
 - Power factor: 90% lagging/leading
- Interconnection:
 - Voltage: 138 kV
 - Location: Radial 138kV lead line from a tap of the 138kV line between Alluwe Tap and Vinita Junction
 - Transformer: One step-up transformer connecting to the 138 kV
 - MVA: Rate A - 115, Rate B - 115

- Voltage: 138/34.5 kV
- X: 9.07% on 100 MVA

- Wind turbine:
 - Number: 59
 - Manufacturer: GE
 - Type:
 - Machine terminal voltage: 700V
 - Rated power: 100.3 MW
 - Frequency: 60Hz
 - Generator step-up transformer
 - MVA: 100
 - Voltage: 34.5/0.7kV
 - X: 7.58% on 100 MVA

GEN-2013-012

- Combustion Turbine
 - Active power capability: 672 MW Summer; 860 MW Winter
 - Reactive power capability: 80 MVAR Summer; 104 MVAR Winter
 - Power factor: 90% lagging, 95% leading

- Interconnection
 - Voltage: 345kV
 - Location: Redbud 345 kV bus
 - Transformers: Four step-up transformers connecting to the 345 kV
 - Transformer 1
 - MVA: Rate A - 180, Rate B -180
 - Voltage: 345/18 kV
 - X: 6.7% on 100 MVA
 - Transformer 2
 - MVA: Rate A – 180, Rate B - 180
 - Voltage: 345/18 kV
 - X: 6.7% on 100 MVA
 - Transformer 3
 - MVA: Rate A – 180, Rate B - 180
 - Voltage: 345/18 kV
 - X: 6.7% on 100 MVA
 - Transformer 4
 - MVA: Rate A – 180, Rate B - 180

- Voltage: 345/18 kV
- X: 6.7% on 100 MVA

4. POWER FACTOR RESULTS

The proposed GEN-2013-009 wind farm (100 MW) will be comprised of 59 GE 1.7 MW wind turbine generators. The wind turbine generators were modeled off-line and replaced by a 100 MW proxy generator at the 138kV POI. A high capacity continuously variable VAR generator with a voltage schedule of 1.0 PU was modeled at the POI.

Table 4-1, Table 4-2, and Table 4-3 indicate the reactive capability attributed to GEN-2013-009 at the POI to maintain a scheduled voltage of 1.0 PU for base case and contingency conditions for the 2014 and 2023 summer and 2014 winter peak cases provided. For the network conditions studied, no contingencies that were tested will require the contribution of reactive power from GEN-2013-009 to exceed a net power factor of 95% lagging (supplying VARs to the network) to 95% leading (absorbing VARs from the network) at the POI.

Table 4-1: P.F. at POI with VAR Generator, 2014 Summer Peak

Cont. No.	Voltage @ POI (PU)	Power Factor GEN-2013-009 @ POI				
		P	Q	MVA	PF	Lead/Lag
Base Case	1.00	100	-8.5	100.4	99.64	Lead
FLT01	1.00	100	-8.4	100.4	99.65	Lead
FLT03	1.00	100	-8.3	100.3	99.66	Lead
FLT05	1.00	100	-18.5	101.7	98.33	Lead
FLT07	1.00	100	-3.8	100.1	99.93	Lead
FLT09	1.00	100	-9.3	100.4	99.57	Lead
FLT11	1.00	100	-4.4	100.1	99.91	Lead
FLT13	1.00	100	-4.7	100.1	99.89	Lead
FLT15	1.00	100	-7.8	100.3	99.69	Lead
FLT17	1.00	100	-8.6	100.4	99.63	Lead
FLT19	1.00	100	-8.4	100.4	99.65	Lead
FLT21	1.00	100	-8.4	100.4	99.65	Lead
FLT23	1.00	100	-8.5	100.4	99.64	Lead
FLT25	1.00	100	-8.4	100.4	99.65	Lead
FLT27	1.00	100	-11.1	100.6	99.39	Lead
FLT29	1.00	100	-6.5	100.2	99.79	Lead
FLT31	1.00	100	-7.5	100.3	99.72	Lead
FLT33	1.00	100	-8.4	100.4	99.65	Lead
FLT35	1.00	100	-8.2	100.3	99.66	Lead
FLT37	1.00	100	-8.4	100.4	99.65	Lead
FLT39	1.00	100	-8.2	100.3	99.67	Lead
FLT41	1.00	100	-8.4	100.4	99.65	Lead
FLT43	1.00	100	-8.4	100.4	99.65	Lead
FLT45	1.00	100	-14.7	101.1	98.94	Lead
FLT46	1.00	100	-10.1	100.5	99.50	Lead
FLT47	1.00	100	-14.3	101.0	99.00	Lead
FLT48	1.00	100	-8.4	100.4	99.65	Lead
FLT49	1.00	100	-8.4	100.4	99.65	Lead
FLT50	1.00	100	-0.8	100.0	100.00	Lead
FLT51	1.00	100	-0.8	100.0	100.00	Lead
FLT52	1.00	100	-7.5	100.3	99.72	Lead
FLT53	1.00	100	-8.6	100.4	99.63	Lead

Table 4-2: P.F. at POI with VAR Generator, 2014 Winter Peak

Cont. No.	Voltage @ POI (PU)	Power Factor of Wind Generator GEN-2013-009 @ POI				
		P	Q	MVA	PF	Lead/Lag
Base Case	1.00	100	-10	100.5	99.50	Lead
FLT01	1.00	100	-10.6	100.6	99.45	Lead
FLT03	1.00	100	-10.5	100.5	99.45	Lead
FLT05	1.00	100	-19.3	101.8	98.19	Lead
FLT07	1.00	100	-6.6	100.2	99.78	Lead
FLT09	1.00	100	-11.3	100.6	99.37	Lead
FLT11	1.00	100	-9.3	100.4	99.57	Lead
FLT13	1.00	100	-8.6	100.4	99.63	Lead
FLT15	1.00	100	-10.1	100.5	99.49	Lead
FLT17	1.00	100	-10.9	100.6	99.41	Lead
FLT19	1.00	100	-10.6	100.6	99.44	Lead
FLT21	1.00	100	-10.6	100.6	99.44	Lead
FLT23	1.00	100	-10.7	100.6	99.43	Lead
FLT25	1.00	100	-10.5	100.5	99.45	Lead
FLT27	1.00	100	-16.3	101.3	98.69	Lead
FLT29	1.00	100	-8.9	100.4	99.61	Lead
FLT31	1.00	100	-10	100.5	99.51	Lead
FLT33	1.00	100	-10.6	100.6	99.44	Lead
FLT35	1.00	100	-10.5	100.5	99.45	Lead
FLT37	1.00	100	-10.7	100.6	99.43	Lead
FLT39	1.00	100	-10.4	100.5	99.47	Lead
FLT41	1.00	100	-10.6	100.6	99.44	Lead
FLT43	1.00	100	-10.6	100.6	99.44	Lead
FLT45	1.00	100	-19.9	102.0	98.07	Lead
FLT46	1.00	100	-11.9	100.7	99.3	Lead
FLT47	1.00	100	-12.4	100.8	99.23	Lead
FLT48	1.00	100	-10.6	100.6	99.44	Lead
FLT49	1.00	100	-10.6	100.6	99.44	Lead
FLT50	1.00	100	-7.6	100.3	99.71	Lead
FLT51	1.00	100	-7.6	100.3	99.71	Lead
FLT52	1.00	100	-10.2	100.5	99.48	Lead
FLT53	1.00	100	-10.9	100.6	99.41	Lead

Table 4-3: P.F. at POI with VAR Generator, 2023Summer Peak

Cont. No.	Voltage @ POI (PU)	Power Factor of Wind Generator GEN-2013-009 @ POI				
		P	Q	MVA	PF	Lead/Lag
Base Case	1.00	100	-6.0	100.2	99.82	Lead
FLT01	1.00	100	-5.9	100.2	99.83	Lead
FLT03	1.00	100	-5.9	100.2	99.83	Lead
FLT05	1.00	100	-14.7	101.1	98.93	Lead
FLT07	1.00	100	-5.0	100.1	99.88	Lead
FLT09	1.00	100	-6.7	100.2	99.78	Lead
FLT11	1.00	100	0.2	100.0	100.00	Lag
FLT13	1.00	100	-6.1	100.2	99.81	Lead
FLT15	1.00	100	-5.4	100.1	99.85	Lead
FLT17	1.00	100	-6.2	100.2	99.81	Lead
FLT19	1.00	100	-5.9	100.2	99.82	Lead
FLT21	1.00	100	-5.9	100.2	99.82	Lead
FLT23	1.00	100	-6.1	100.2	99.82	Lead
FLT25	1.00	100	-6.0	100.2	99.82	Lead
FLT27	1.00	100	-6.3	100.2	99.8	Lead
FLT29	1.00	100	-3.8	100.1	99.93	Lead
FLT31	1.00	100	-5.1	100.1	99.87	Lead
FLT33	1.00	100	-5.9	100.2	99.82	Lead
FLT35	1.00	100	-5.8	100.2	99.83	Lead
FLT37	1.00	100	-5.9	100.2	99.82	Lead
FLT39	1.00	100	-6.0	100.2	99.82	Lead
FLT41	1.00	100	-5.8	100.2	99.83	Lead
FLT43	1.00	100	-5.9	100.2	99.82	Lead
FLT45	1.00	100	-6.0	100.2	99.82	Lead
FLT46	1.00	100	-9.9	100.5	99.51	Lead
FLT47	1.00	100	-7.7	100.3	99.71	Lead
FLT48	1.00	100	-12.9	100.8	99.18	Lead
FLT49	1.00	100	-5.9	100.2	99.82	Lead
FLT50	1.00	100	-5.9	100.2	99.82	Lead
FLT51	1.00	100	3.0	100.0	99.96	Lag
FLT52	1.00	100	3.0	100.0	99.96	Lag
FLT53	1.00	100	-5.9	100.2	99.83	Lead

5. TRANSIENT STABILITY RESULTS

Dynamic simulations were performed using each fault noted in Section 2. All faults were cleared after five (5) cycles. Faulted transmission lines were reclosed into the fault 20 cycles after the initial clearing, then cleared and locked out after five (5) more cycles. Faulted transformers were not reclosed.

Based on the dynamics results, the requested uprate GEN-2013-012 and the existing units at Redbud were found to be unstable in 2014 Summer Peak and 2014 Winter peak conditions for one fault scenario studied (FLT52-3PH) shown in Table 5-1. For the prior outage of the Redbud to Arcadia 345kV ckt 2, the generation of all units at Redbud (including GEN-2013-012 rate increases) should be reduced to 1120MW for the subsequent outage to not cause instability for the 2014 summer and winter peak conditions as shown in Table 5-2. Presently, before the addition of GEN-2013-012 there is 1164MW (Summer Peak)/1273MW (Winter Peak) interconnected at the Redbud 345kV bus. The 2023 Summer Peak model had a new line from Redbud-Arcadia 345 kV CKT 3.

GEN-2013-009 was found to be stable for all conditions studied. For the faults studied, the three phase faults are relatively more severe than the corresponding single line to ground faults. No other generators pulled out of synchronism with the grid and no generators tripped.

Below are the worst-case faults for the generator to be studied in Group 8, as determined by visual inspection of the rotor angle graphs from PSS/E dynamic analysis.

Table 5-1: Worst Faults for Dynamic Behavior within Group 8 (Summer Peak)

Generator	Worst Fault	Worst Fault Description
GEN-2013-012	FLT52-3PH	3 phase fault on the Redbud (514909) to Arcadia (514908) 345kV CKT 1, near Redbud with Redbud (514909) to Arcadia (514908) 345kV CKT 2 modeled out of service.

Table 5-2: Stability Limits for GEN-2013-012 for FLT52-3PH

System Conditions	Total Redbud Generation Stability Limit (No outage) (MW)	Total Redbud Generation Stability Limit (Prior outage) (MW)
2014 Summer Peak	1232	1120
2014 Winter Peak	1420	1120
2023 Summer Peak	1232	1232

Figure 5-1 exhibits the unstable rotor angle of GEN-2013-012 for FLT52-3PH in the 2014 summer peak case. Figure 5-1 exhibits the stable rotor angle of GEN-2013-012 for FLT52-3PH to the 2014 summer peak case at a reduced output of 1120 MW (total Redbud generation plant)

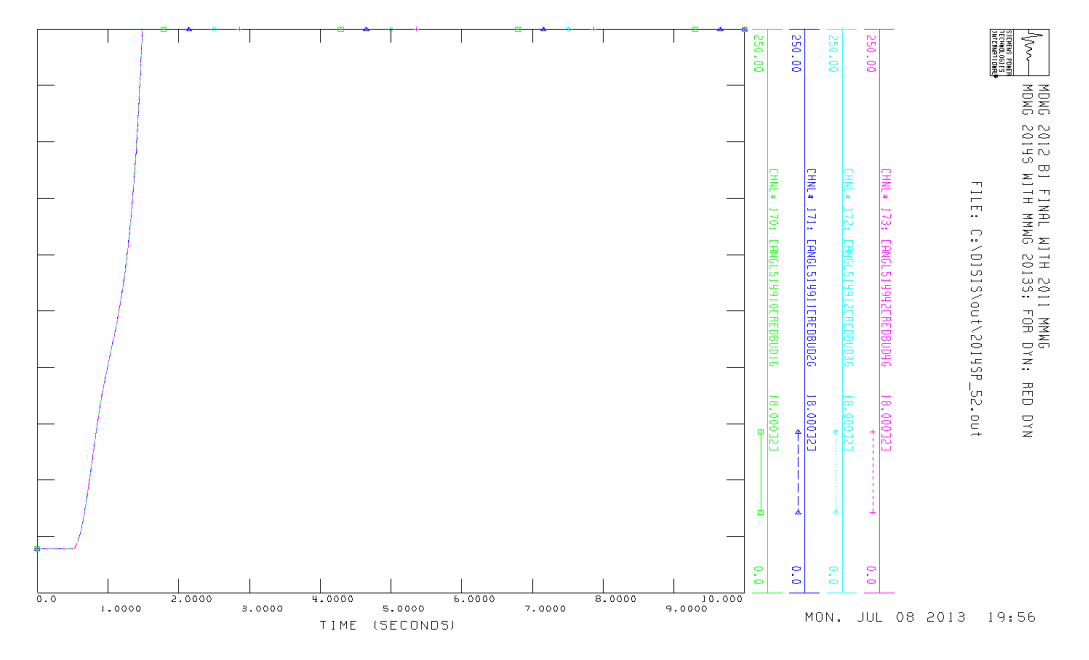
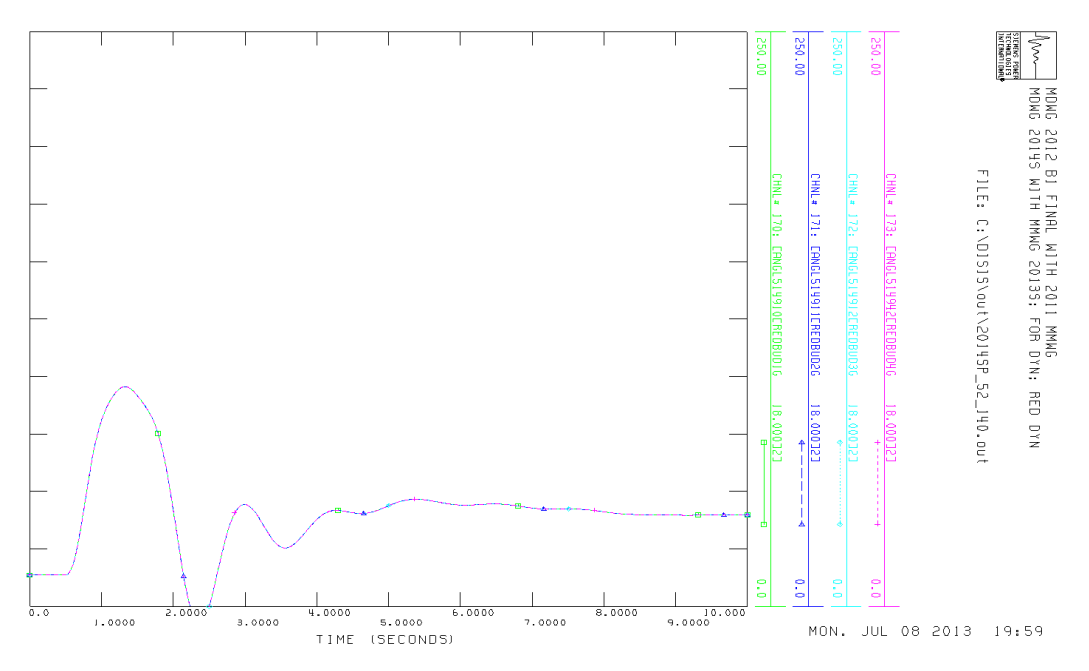


Figure 5-1: GEN-2013-012 Response to FLT52, 2014 Summer Peak



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 August 30, 2013

Figure 5-2: GEN-2013-012 (1120 MW total Redbud generation plant) Response to FLT52, 2014 Summer Peak

Figure 5-1 exhibits the unstable rotor angle of GEN-2013-012 for FLT52-3PH in the 2014 winter peak case. Figure 5-1 exhibits the stable rotor angle of GEN-2013-012 for FLT52-3PH in the 2014 winter peak case at a reduced output of 1120 MW (total Redbud generation plant)

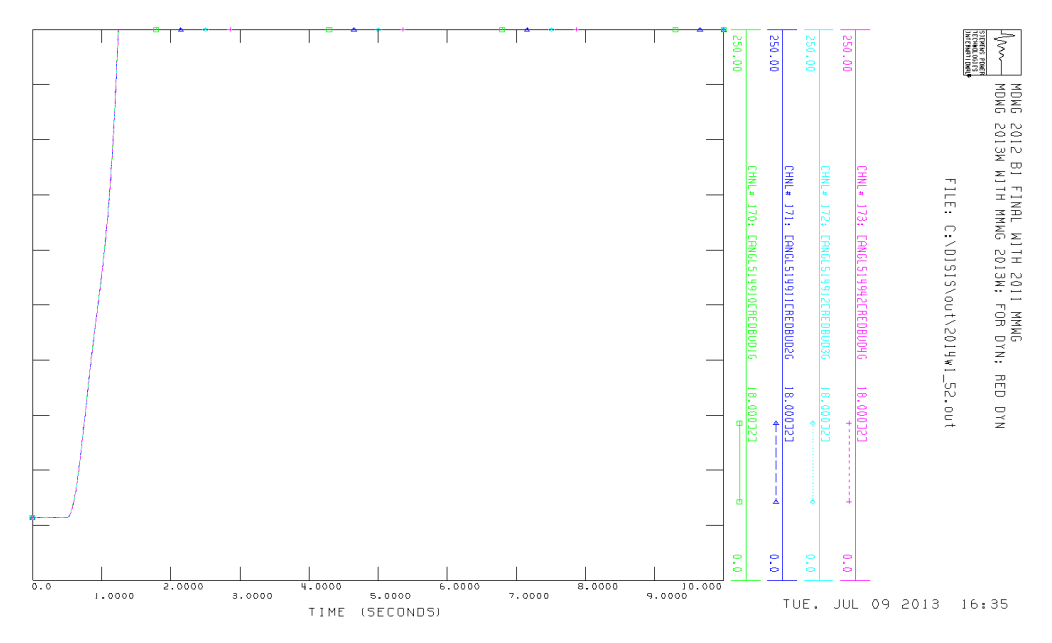


Figure 5-3: GEN-2013-012 Response to FLT52, 2014 Winter Peak

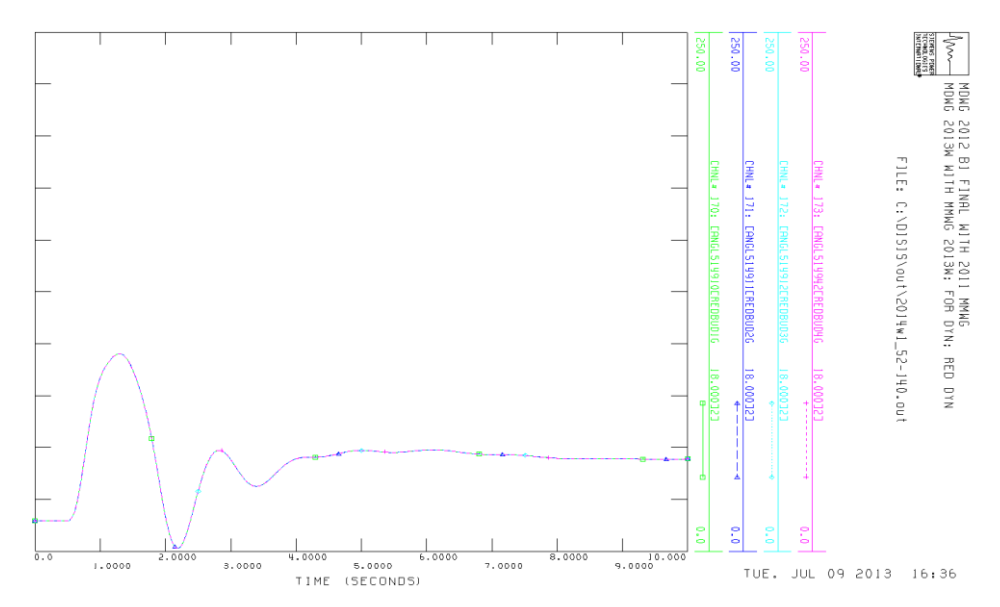


Figure 5-4: GEN-2013-012 (1120MW total Redbud generation plant) Response to FLT52, 2014 Winter Peak

6. ROTOR ANGLE DAMPING AND VOLTAGE RECOVERY REQUIREMENT

Rotor angle damping and voltage recovery as determined via dynamic simulation were checked against all contingencies. If the voltage recovers post-fault to a steady-state level consistent with the steady-state simulation, the generator interconnection is considered stable from a voltage standpoint. Rotor angle plots for GEN-2013-012 are provided in Appendix A and POI voltage recovery plots for GEN-2013-009 and GEN-2013-012 are provided in Appendix B.

In these dynamic simulations, real loads are modeled as constant current and reactive loads are modeled as constant admittance; i.e. MW loads are proportional to voltage and MVAR loads are proportional to voltage squared. In contrast, loads are modeled as constant MW and constant MVAR in steady-state simulations. Therefore, due to differences in load modeling, minor differences in voltages are to be expected between dynamic and steady-state simulations.

Visual inspection of SPPR and SPPR5 showed compliance with Rotor angle damping requirement. The post fault voltage recovery was found to be within the criterion of 0.7 PU to 1.2 PU except for GEN-2013-012 during 2014 Summer Peak conditions for the fault below. The post fault voltage at GEN-2013-012 was found to be <0.7 PU even after applying the stability limit of 1120 MW (total Redbud plant output). Further investigation revealed that the post fault voltage recovery criterion is met if the total Redbud plant output is limited to 994 MW, the N-1 thermal limit for the prior outage condition.

Generator	Worst Fault	Worst Fault Description
GEN-2013-012	FLT52-3PH	3 phase fault on the Redbud (514909) to Arcadia (514908) 345kV CKT 1, near Redbud.

The wind farm GEN-2013-009 was found to meet FERC Order 661A (low voltage ride through and wind farm recovery to pre-fault voltage). It did not trip during any of the contingencies tested.

7. CONCLUSIONS

Based on the results of Group 8 studies, the following findings had been observed:

- For the network conditions studied, no contingencies that were tested will require the contribution of reactive power from GEN-2013-009 to exceed a net power factor of 95% lagging (supplying VARs to the network) to 95% leading (absorbing VARs from the network) at the POI.
- GEN-2013-009 is capable of meeting LVRT requirements. GEN-2013-009 did not trip off line under any fault conditions.
- GEN-2013-009 has the capability of recovering to the pre-contingency voltage following all studied fault disturbances.
- All generators are found to meet the rotor angle damping requirement.
- GEN-2013-009 was found to be stable for all conditions studied.
- Transient stability analysis showed that the requested updated GEN-2013-012 generators and the existing units at Redbud are unstable for 2014 summer and 2014 winter peak conditions for the prior outage of Redbud to Arcadia 345kV CKT 2 and a three phase fault at Redbud on the Redbud to Arcadia 345kV CKT 1. For the prior outage of the Redbud to Arcadia 345kV ckt 2, the generation of all units at Redbud (including GEN-2013-012 rate increases) should be reduced to 1120MW for the subsequent outage to not cause instability for the 2014 summer and winter peak conditions. GEN-2013-012 was found to be stable for 2023 summer peak condition at full plant output.
- The post fault voltage recovery was found to be within the criterion of 0.7 PU to 1.2 PU except at Redbud 345 kV bus for the prior outage of Redbud-Arcadia CKT 2 and the contingency outage of Redbud-Arcadia CKT 1 345 kV in the 2014 summer peak model with GEN-2013-012 at full rated output. The post fault voltage recovery criterion is met if all generating units at Redbud are limited to 994 MW, the N-1 thermal limit for the prior outage condition.

O: Group 9 Dynamic Stability Analysis Report

See Mitsubishi Electric Power Products, Inc report on next page.

Southwest Power Pool, Inc. (SPP)

Definitive Impact Study DISIS-2013-001 (Group 09)

Final Report

**PXE-0706
Revision #01**

July 2013

**Submitted By:
Mitsubishi Electric Power Products, Inc. (MEPPI)
Power Systems Engineering Services Department
Warrendale, PA**

Title: Definitive Impact Study DISIS-2013-001 (Group 9): Final Report PXE-0706
Date: July 2013
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Approved: Robert T. Hellested; Deputy Manager, Power Systems Engineering Dept. Robert T. Hellested

EXECUTIVE SUMMARY

SPP requested a Definitive Interconnection System Impact Study (DISIS). The DISIS required a Power Factor Analysis and a Stability Analysis detailing the impacts of the interconnecting projects as shown in Table ES-1.

**Table ES-1
Interconnection Projects Evaluated**

Request	Size (MW)	Generator Model	Point of Interconnection (POI)
GEN-2012-005	81.0	GE 1.62MW (583503)	Tap Fort Randall (652509) – Columbus (640133) 230kV (560718)
GEN-2013-002	50.6	Siemens 2.3MW (583523)	Tap Sheldon (640278) – Folsom (650242) 115kV (560746)
GEN-2013-004	206.5	GE 1.75MW (579469, 579569)	Tap Fort Randall (652509) – Columbus (640133) 230kV (560006)
GEN-2013-005	73.5	GE 1.75MW (583553)	Tap Fort Randall (652509) – Columbus (640133) 230kV (560006)
GEN-2013-006	50.6	Siemens 2.3 MW (583563)	Tap Fort Randall (652509) – Columbus (640133) 230kV (560006)
GEN-2013-008	74.8	GE 1.7MW (582318)	Steele City (640426) 115kV
GEN-2013-014	25.5	GE 1.7MW (583643)	Tap Pauline (640313) – Guide Rock (640206) 115kV (560137)
GEN-2013-015	125.8	GE 1.7MW (583653)	Tap Pauline (640313) – Hildreth (640222) 115kV (560733)
GEN-2013-018	50.2	GE 1.62MW (583683)	Tap S974 (647974) – Hydrocarbon Tap (647102) 69kV (560753)

SUMMARY OF STABILITY ANALYSIS

For the 2014 summer, 2014 winter, and 2023 summer peak power flows, the Stability Analysis determined that there was no voltage violations or wind turbine tripping that occurred from interconnecting GEN-2012-005, GEN-2013-002, GEN-2013-004, GEN-2013-005, GEN-2013-006, GEN-2013-008, GEN-2013-014, GEN-2013-015, or GEN-2013-018 at 100% output.

SUMMARY OF POWER FACTOR ANALYSIS

Refer to Table ES-2 for a table summary of the power factor analysis. The Power Factor Analysis shows that GEN-2012-005 has a power factor range of 0.9558 leading (absorbing) to 0.6473 lagging (supplying) for the three study cases, 2014 summer, 2014 winter, and 2023 summer peak conditions. The Power Factor Analysis shows that GEN-2013-002 has a power factor range of 0.8678 leading (absorbing) to 0.7935 lagging (supplying) for the three study cases. The Power Factor Analysis shows that GEN-2013-004 and GEN-2013-005 have a power factor range of 0.9990 leading (absorbing) to 0.9931 lagging (supplying) for the three study

cases. The Power Factor Analysis shows that GEN-2013-006 has a power factor range of 0.9786 leading (absorbing) to 0.9515 lagging (supplying) for the three study cases. The Power Factor Analysis shows that GEN-2013-008 has a power factor range of 0.9679 leading (absorbing) to 0.9955 lagging (supplying) for the three study cases. The Power Factor Analysis shows that GEN-2013-014 has a power factor range of 0.9399 leading (absorbing) to 0.8688 lagging (supplying) for the three study cases. The Power Factor Analysis shows that GEN-2013-015 has a power factor range of 0.9895 leading (absorbing) to 0.9931 lagging (supplying) for the three study cases. The Power Factor Analysis shows that GEN-2013-018 has a power factor range of 0.9270 leading (absorbing) to 0.9352 lagging (supplying) for the three study cases.

**Table ES-2
Power Factor Analysis Summary**

Generator	Size (MW)	Power Factor Range			
GEN-2012-005	81.0	0.9558	Leading	0.6473	Lagging
GEN-2013-002	50.6	0.8678	Leading	0.7935	Lagging
GEN-2013-004	206.5	0.9990	Leading	0.9931	Lagging
GEN-2013-005	73.5	0.9990	Leading	0.9931	Lagging
GEN-2013-006	50.6	0.9786	Leading	0.9515	Lagging
GEN-2013-008	74.8	0.9679	Leading	0.9955	Lagging
GEN-2013-014	25.5	0.9399	Leading	0.8688	Lagging
GEN-2013-015	125.8	0.9895	Leading	0.9931	Lagging
GEN-2013-018	50.2	0.9270	Leading	0.9352	Lagging

Table of Contents

Section 1:	Objectives	6
Section 2:	Background	6
Section 3:	Stability Analysis	21
Section 4:	Power Factor Analysis	33
	4.1: Study Project – GEN-2012-005	33
	4.2: Study Project – GEN-2013-002	36
	4.3: Study Project – GEN-2013-004	40
	4.4: Study Project – GEN-2013-005	44
	4.5: Study Project – GEN-2013-006	48
	4.6: Study Project – GEN-2013-008	52
	4.7: Study Project – GEN-2013-014	56
	4.8: Study Project – GEN-2013-015	60
	4.9: Study Project – GEN-2013-018	64
Section 5:	Conclusions	68

List of Tables

Table 2-1:	Interconnection Project Evaluated.....	6
Table 2-2:	Previously Queued Nearby Interconnection Projects Included.....	7
Table 2-3:	Case List with Contingency Description.....	15
Table 3-1:	Calculated Single-Phase Fault Impedances.....	21
Table 3-2:	Stability Analysis Summary of Results.....	23
Table 4-1:	Power Factor Analysis: GEN-2012-005 (81.0 MW).....	34
Table 4-2:	Power Factor Analysis: GEN-2013-002 (50.6 MW).....	38
Table 4-3:	Power Factor Analysis: GEN-2013-004 (206.5 MW).....	42
Table 4-4:	Power Factor Analysis: GEN-2013-005 (73.5 MW).....	46
Table 4-5:	Power Factor Analysis: GEN-2013-006 (50.6 MW).....	50
Table 4-6:	Power Factor Analysis: GEN-2013-008 (74.8 MW).....	54
Table 4-7:	Power Factor Analysis: GEN-2013-014 (25.5 MW).....	58
Table 4-8:	Power Factor Analysis: GEN-2013-015 (125.8 MW).....	62
Table 4-9:	Power Factor Analysis: GEN-2013-018 (50.2 MW).....	66
Table 5-1:	Power Factor Analysis Summary	69

List of Figures

Figure 2-1.	Power flow one-line diagram for interconnection project GEN-2012-005	8
Figure 2-2.	Power flow one-line diagram for interconnection project GEN-2013-002	9
Figure 2-3.	Power flow one-line diagram for interconnection projects at POI 560006	10
Figure 2-4.	Power flow one-line diagram for interconnection project GEN-2013-008	11

Figure 2-5.	Power flow one-line diagram for interconnection project GEN-2013-014	12
Figure 2-6.	Power flow one-line diagram for interconnection project GEN-2013-015	13
Figure 2-7.	Power flow one-line diagram for interconnection project GEN-2013-018	14
Figure 3-1.	Response of select bus voltages during Contingency #45 (FLT45-3PH) for 2014 summer peak conditions	27
Figure 3-2.	Response of select bus voltages during Contingency #68 (FLT68-3PH) for 2014 summer peak conditions	28
Figure 3-3.	Response of select bus voltages during Contingency #45(FLT45-3PH) for 2014 winter peak conditions.....	29
Figure 3-4.	Response of select bus voltages during Contingency #68 (FLT68-3PH) for 2014 winter peak conditions.....	30
Figure 3-5.	Response of select bus voltages during Contingency #45 (FLT45-3PH) for 2023 summer peak conditions	31
Figure 3-6.	Response of select bus voltages during Contingency #68 (FLT68-3PH) for 2023 summer peak conditions	32

SECTION 1: OBJECTIVES

The objective of this report is to provide Southwest Power Pool, Inc. (SPP) with the deliverables for the “GEN-2013-001 (Group 9) Definitive Impact Study.” SPP requested an Interconnection System Impact Study for nine generation interconnections, which require Power Factor Analysis, Stability Analysis, and an Impact Study Report.

SECTION 2: BACKGROUND

The Siemens Power Technologies, Inc. PSS/E power system simulation program Version 32.2.0 was used for this study. SPP provided the stability database cases for 2014 summer peak, 2014 winter peak, and 2023 summer peak seasons and a list of contingencies to be examined. The model includes the study project and the previously queued projects as listed in Table 2-1 and Table 2-2, respectively. Refer to Appendix A for the steady-state and dynamic model data for the study projects. A power flow one-line diagram for each generation interconnection project is shown in Figures 2-1 through 2-7.

The Power Factor analysis will determine the power factor at the point of interconnection for the wind interconnection project for pre-contingency and post-contingency conditions. Table 2-3 lists the contingencies developed from the three-phase fault definitions provided in the Group’s interconnection impact study request.

The Stability Analysis will determine the impacts of the new interconnecting projects on the stability and voltage recovery of the nearby systems and the ability of the interconnecting project to meet FERC Order 661A. If problems with stability or voltage recovery are identified, the need for reactive compensation or system upgrades will be investigated. Three-phase faults and single line-to-ground faults will be examined as listed in Table 2-3.

**Table 2-1
Interconnection Project Evaluated**

Request	Size (MW)	Generator Model	Point of Interconnection (POI)
GEN-2012-005	81.0	GE 1.62MW (583503)	Tap Fort Randall (652509) – Columbus (640133) 230kV (560718)
GEN-2013-002	50.6	Siemens 2.3MW (583523)	Tap Sheldon (640278) – Folsom (650242) 115kV (560746)
GEN-2013-004	206.5	GE 1.75MW (579469, 579569)	Tap Fort Randall (652509) – Columbus (640133) 230kV (560006)
GEN-2013-005	73.5	GE 1.75MW (583553)	Tap Fort Randall (652509) – Columbus (640133) 230kV (560006)
GEN-2013-006	50.6	Siemens 2.3 MW (583563)	Tap Fort Randall (652509) – Columbus (640133) 230kV (560006)
GEN-2013-008	74.8	GE 1.7MW (582318)	Steele City (640426) 115kV
GEN-2013-014	25.5	GE 1.7MW (583643)	Tap Pauline (640313) – Guide Rock (640206) 115kV (560137)
GEN-2013-015	125.8	GE 1.7MW (583653)	Tap Pauline (640313) – Hildreth (640222) 115kV (560733)
GEN-2013-018	50.2	GE 1.62MW (583683)	Tap S974 (647974) – Hydrocarbon Tap (647102) 69kV (560753)

Table 2-2
Previously Queued Nearby Interconnection Projects Included

Request	Size (MW)	Generator Model	Point of Interconnection
GEN-2003-021N	75.0	GE 1.5MW	Tap on the Ainsworth – Calamus 115kV line (640050)
GEN-2004-005N	30.0	GE 1.5MW	St Francis 115kV (640351)
GEN-2004-023N	75.0	GENROU	Columbus 115kV (640119)
GEN-2006-020N	42.0	Vestas 3.0MW	Bloomfield 115kV (640084)
GEN-2006-037N1	75.0	GE 1.5MW	Broken Bow 115kV (640089)
GEN-2006-038N005	79.5	GE 1.5MW	Broken Bow 115kV (640089)
GEN-2006-038N019	79.5	Generic wind turbine 1.5MW	Petersburg 115kV (640444)
GEN-2006-044N	40.5	GE 1.5MW	Petersburg 115kV (640444)
GEN-2007-011N08	81.0	Vestas 3.0MW	Bloomfield 115kV (640084)
GEN-2007-015	135.0	GE 1.5MW	Tap Kelly – S1399 161kV (560610)
GEN-2008-086N02 (replaced by GEN-2013-004 in Table 1)	199.5	GE 1.5MW	Tap on the Columbus – Ft Randall 230kV line (560006)
GEN-2008-119O	60.0	GE 1.5MW	S1399 161kV (646399)
GEN-2008-123N	89.7	SMK203	Tap on the Pauline – Guide Rock 115kV (560137)
GEN-2009-040	73.8	Vestas V90 1.8MW	Marshall 115kV (533349)
GEN-2010-041	10.5	GE 1.5MW	S1399 161kV (646399)
GEN-2010-044	99.0	Siemens 3.0MW	Harbine 115kV (640208)
GEN-2010-051	200.0	GE 1.6MW	Tap on the Twin Church – Hoskins 230kV line (560347)
GEN-2011-018 (replaced by GEN-2013-008 in Table 1)	73.6	Siemens 2.3MW	Steele County 115kV (640426)
GEN-2011-027	120.0	Nordex N100 2.5MW	Hoskins 230kV (640227)
GEN-2011-055	52.8	GE 1.6MW	South Sterling 69kV (S969, 647969)
GEN-2011-056	3.6 increase	GENSAL	Jeffrey 115kV (640238)
GEN-2011-056A	3.6 increase	GENSAL	Johnson 1 115kV (640240)
GEN-2011-056B	4.5 increase	GENSAL	Johnson 2 115kV (640242)
GEN-2012-017	115 increase	GENROU	Cooper 345kV (640139)
GEN-2012-018	200.0	GE 1.6MW	GEN-2010-051 230kV Tap (560347)
GEN-2012-021	4.8	GENROU	84th & Bluff 115kV (650275)

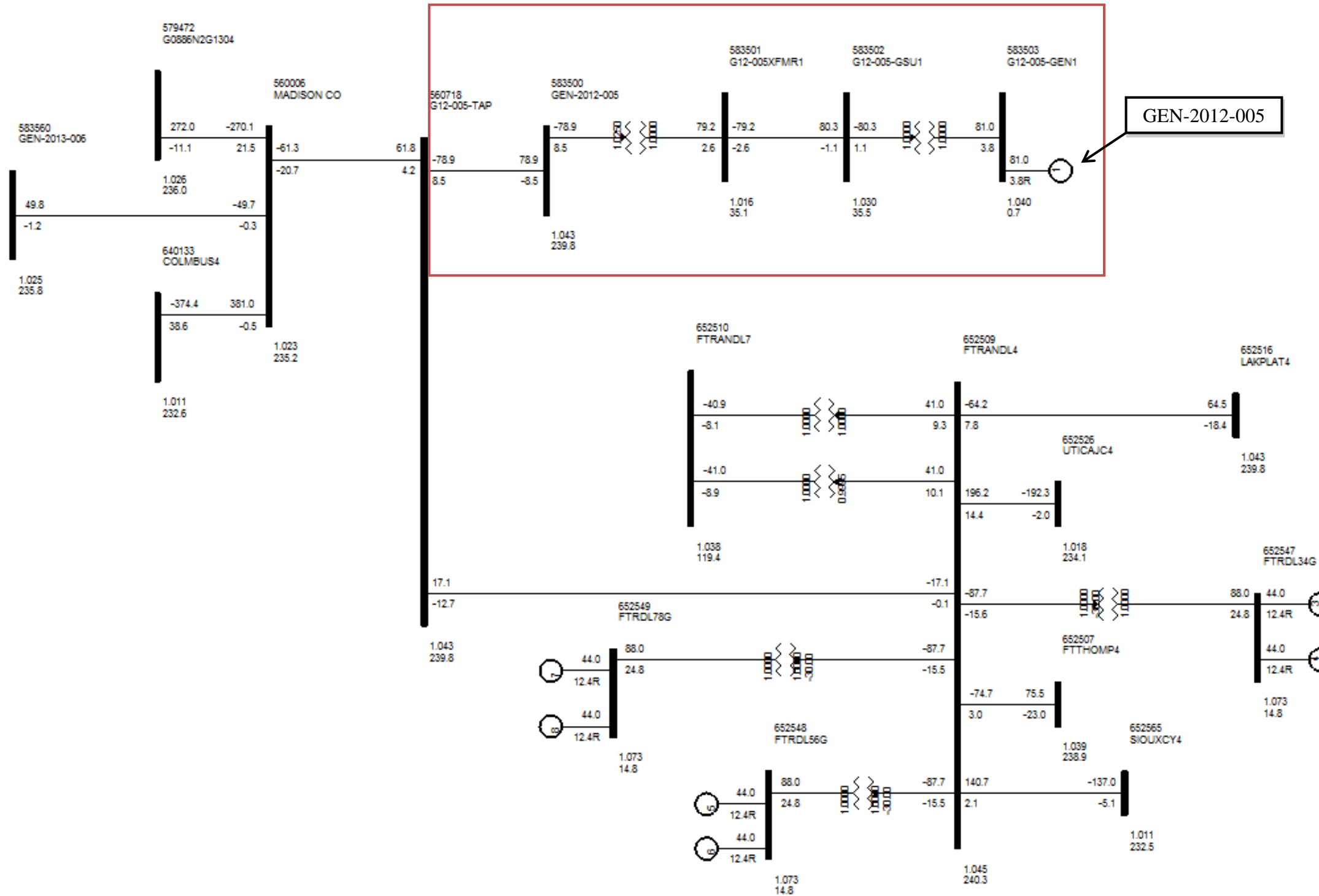


Figure 2-1. Power flow one-line diagram for interconnection project GEN-2012-005 (81.0 MW).

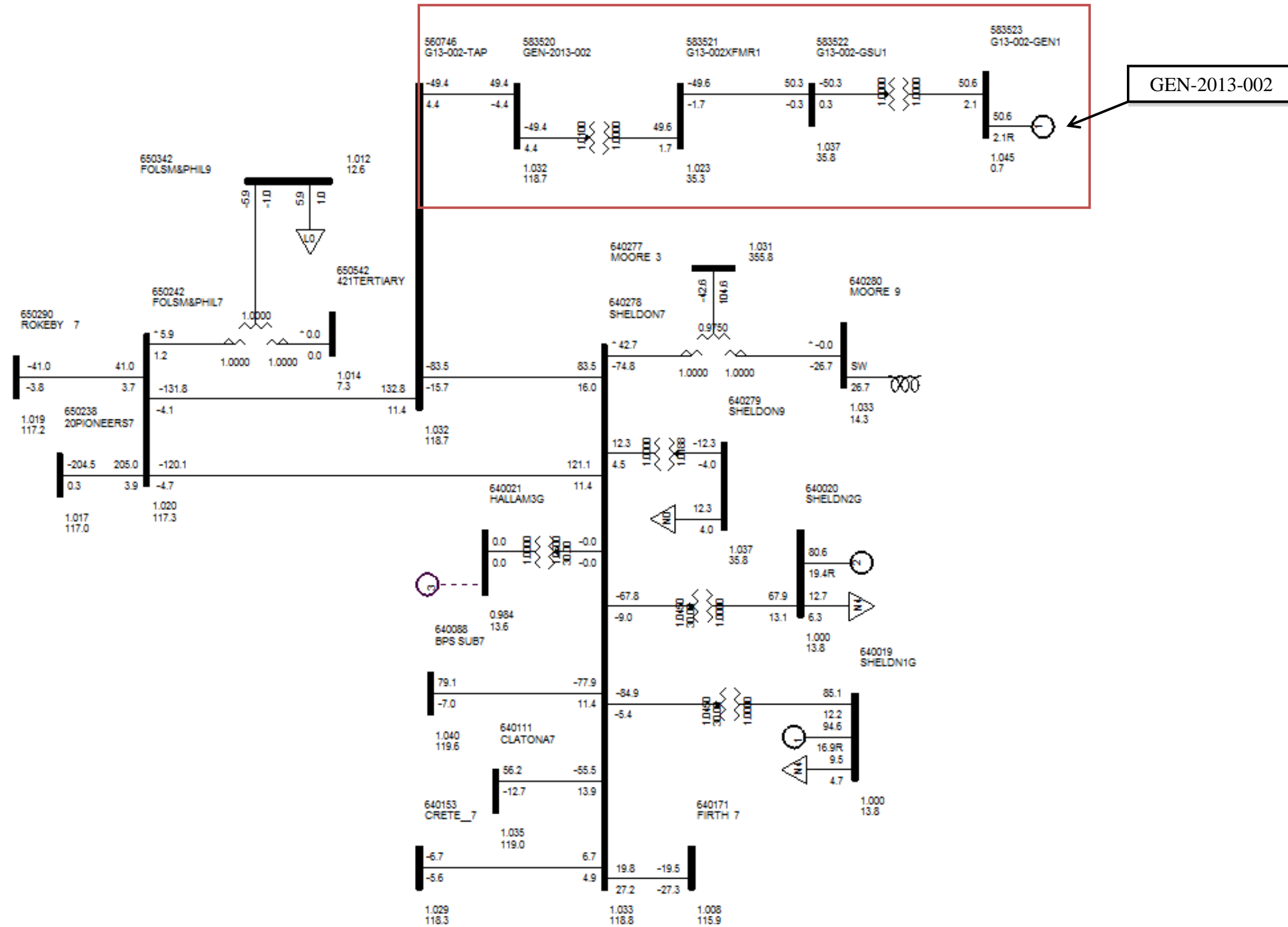


Figure 2-2. Power flow one-line diagram for interconnection project GEN-2013-002 (50.6 MW).

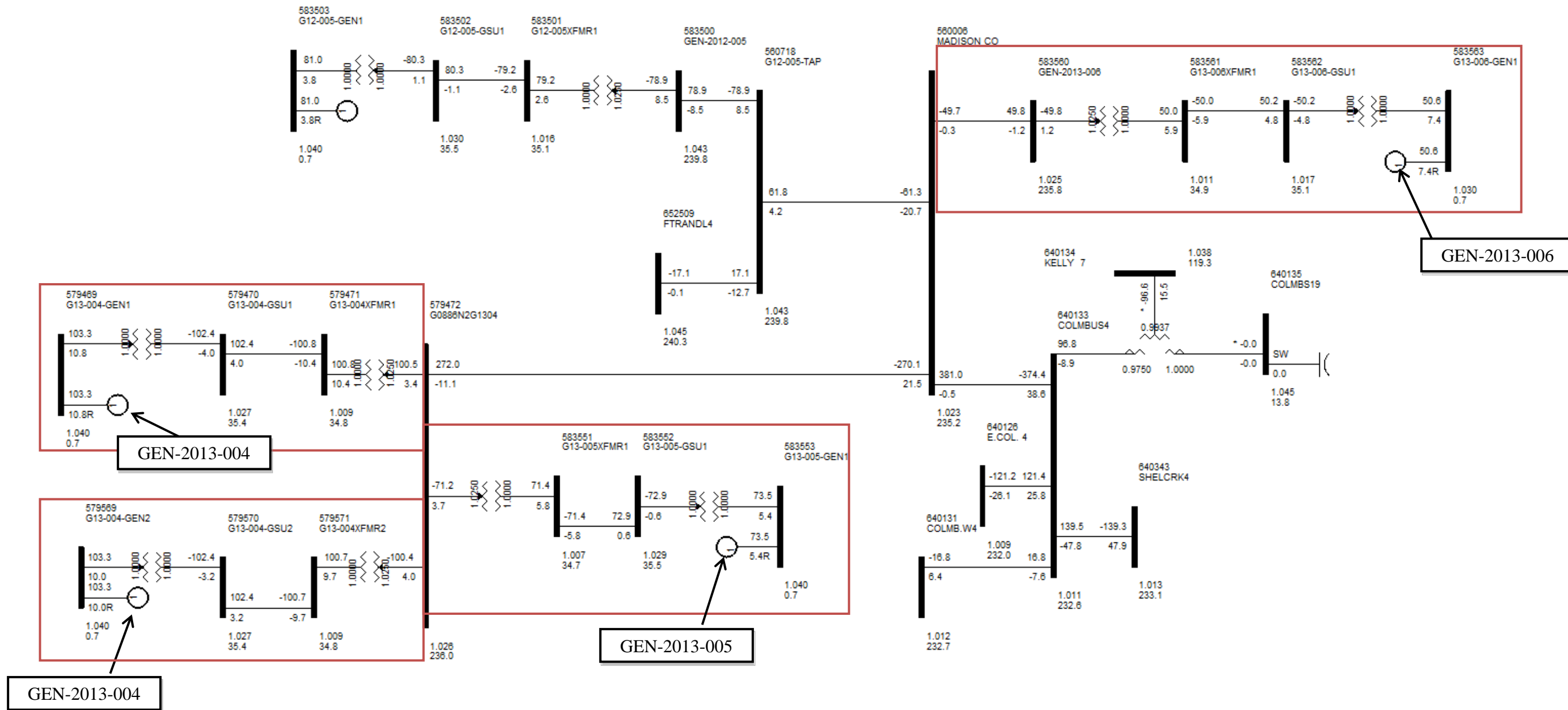


Figure 2-3. Power flow one-line diagram for interconnection project GEN-2013-004 (206.5 MW), GEN-2013-005 (73.5 MW), GEN-2013-006 (50.6 MW).

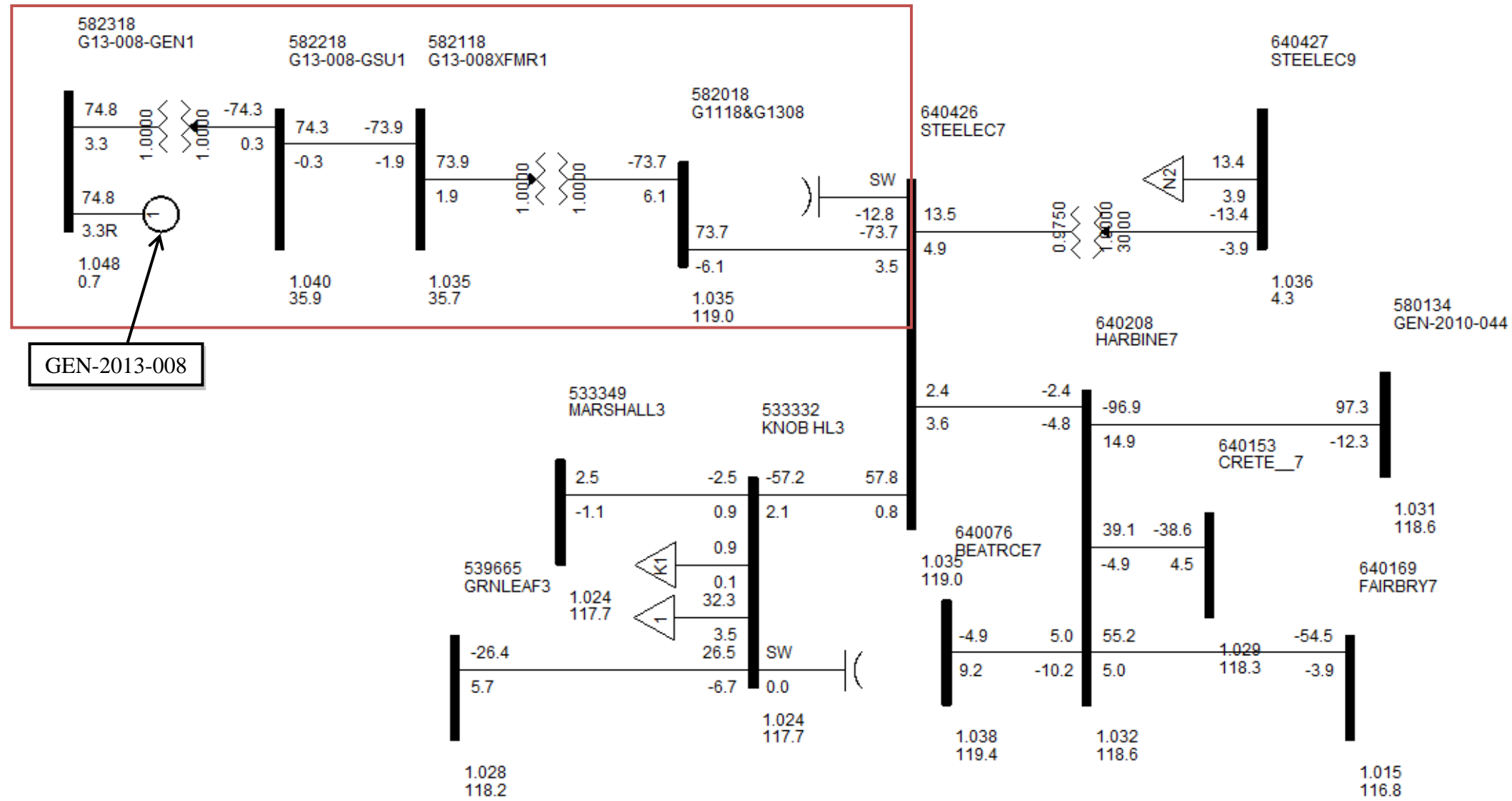


Figure 2-4. Power flow one-line diagram for interconnection project GEN-2013-008 (74.8 MW).

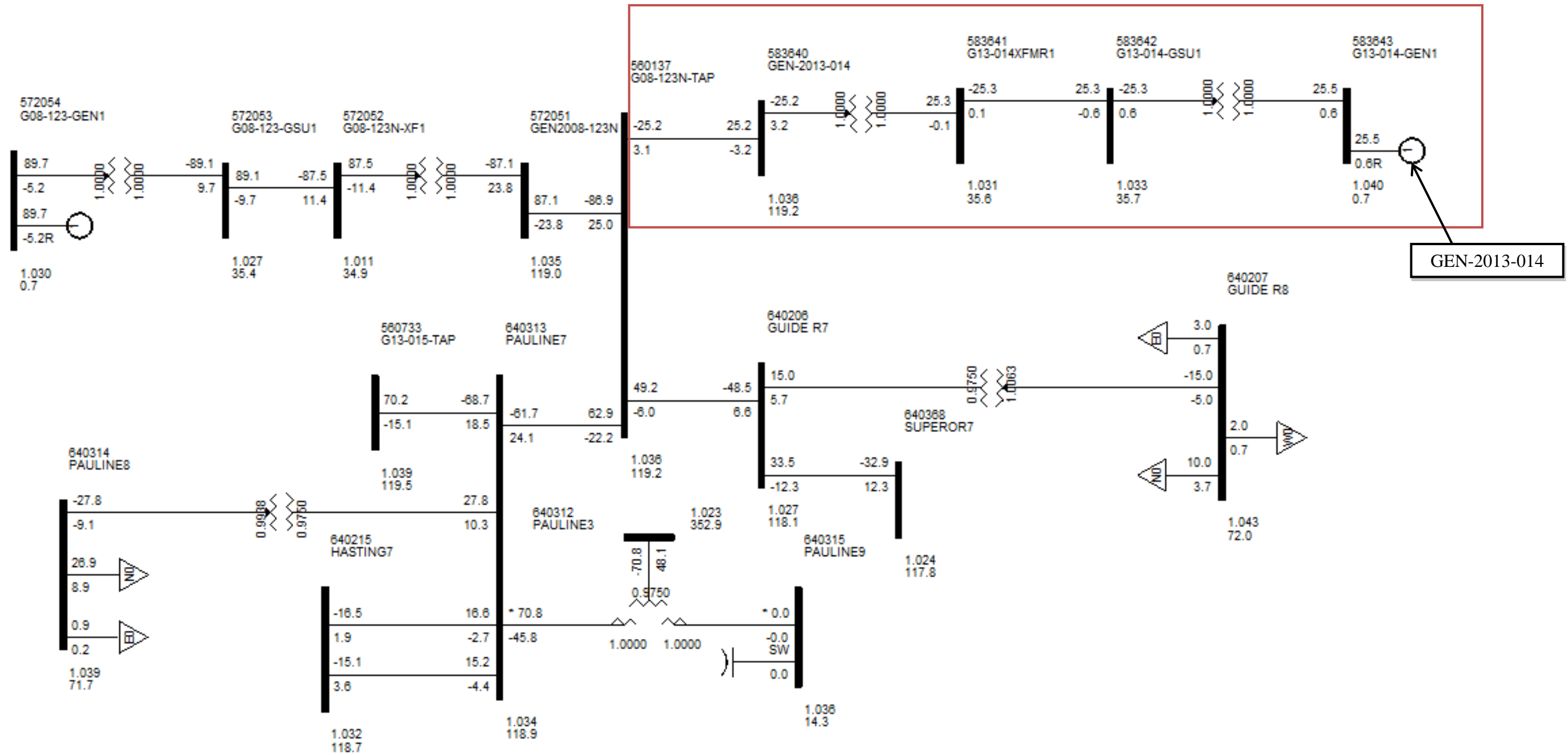


Figure 2-5. Power flow one-line diagram for interconnection project GEN-2013-014 (25.5 MW).

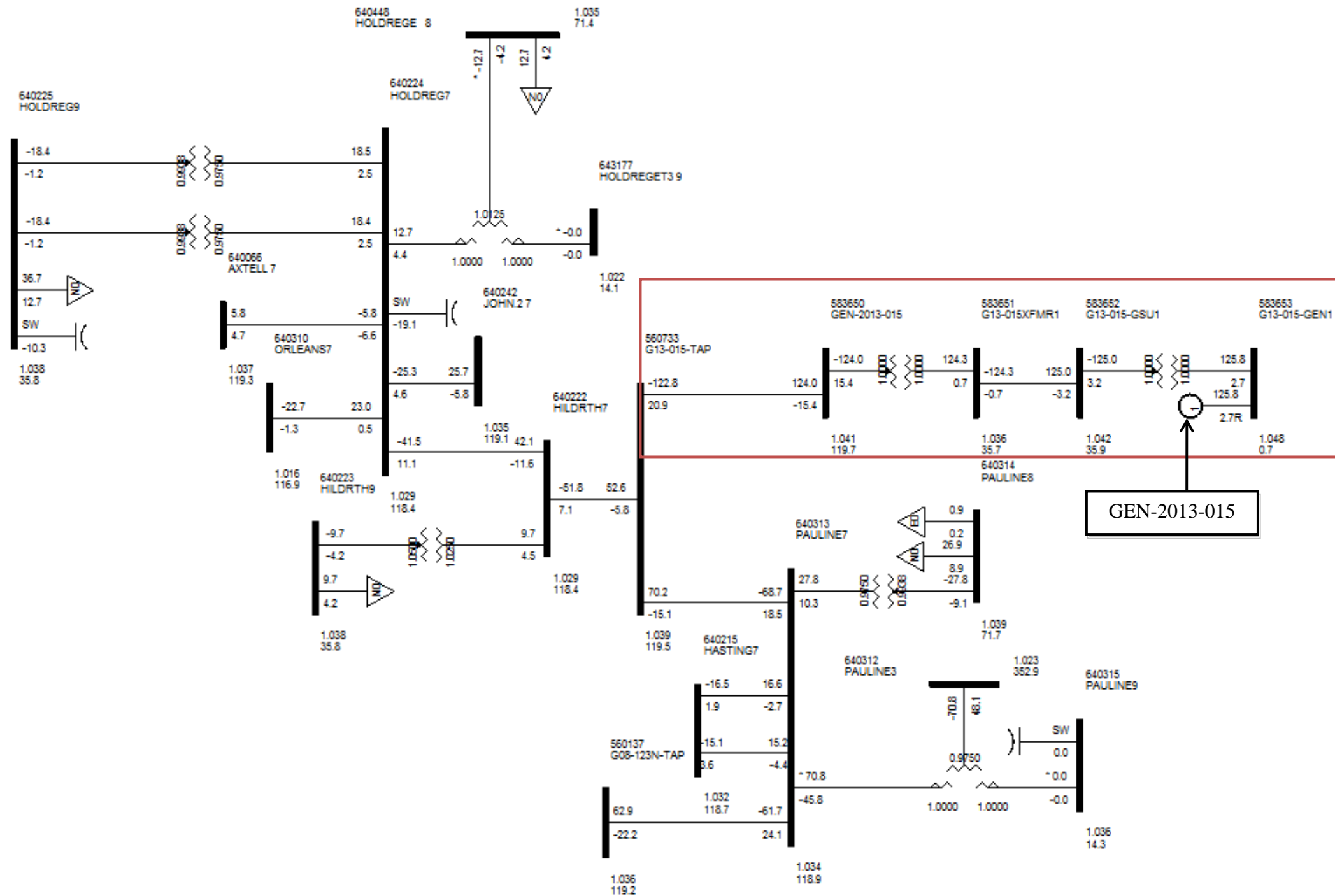


Figure 2-6. Power flow one-line diagram for interconnection project GEN-2013-015 (125.8 MW).

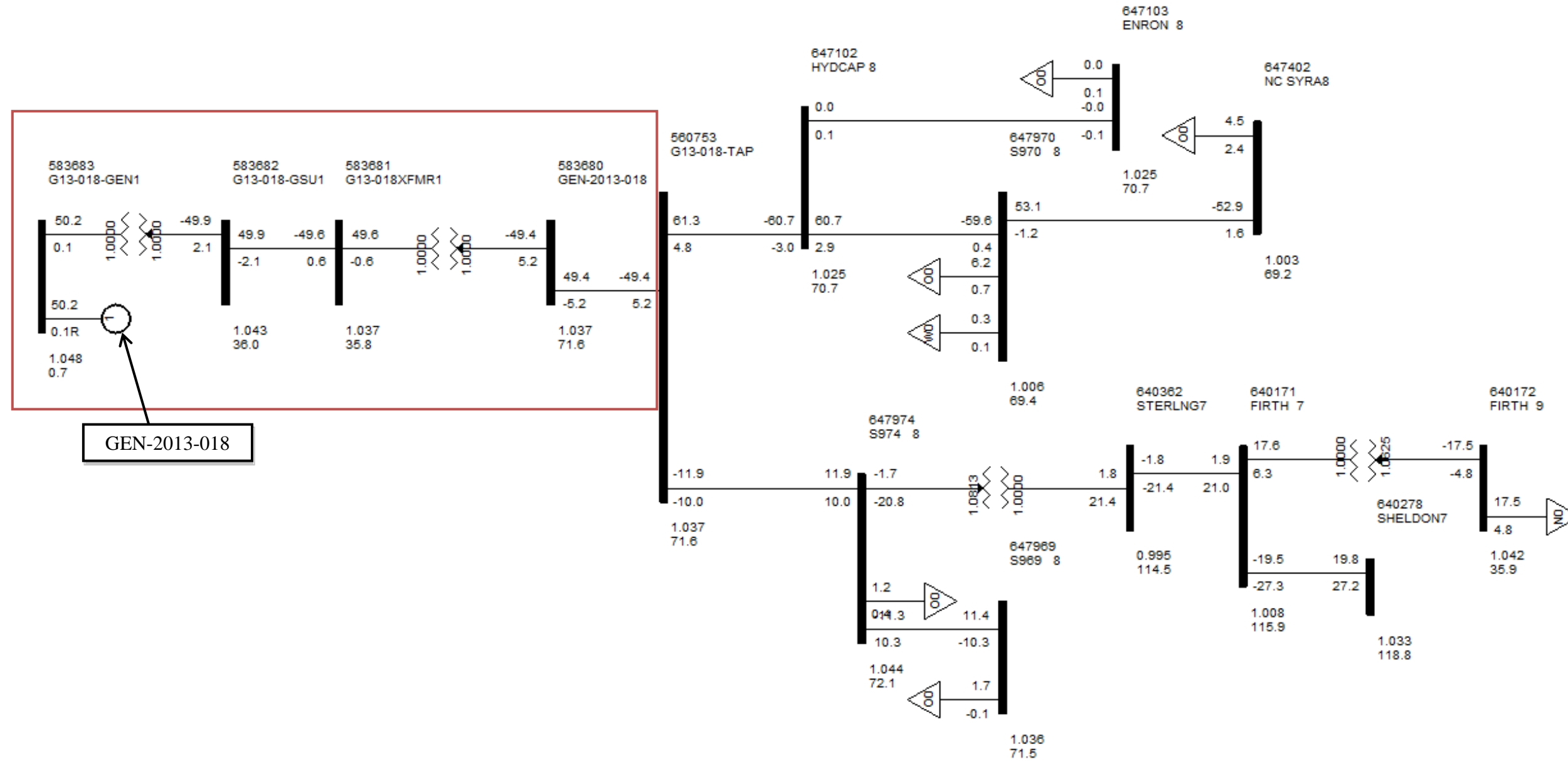


Figure 2-7. Power flow one-line diagram for interconnection project GEN-2013-018 (50.2 MW).

**Table 2-3
Case List with Contingency Description**

Contingency Number	Contingency Name	Description
1	FLT01-3PH	3 phase fault on the G13-002-Tap (560746) to Sheldon (640278) 115kV near G13-002-Tap. a. Apply fault at G13-002-Tap 115kV bus. b. Clear fault after 6.5 cycles by tripping faulted line.
2	FLT02-3PH	3 phase fault on the G13-002-Tap (560746) to Folsom (650242) 115kV near G13-002-Tap. a. Apply fault at G13-002-Tap 115kV bus. b. Clear fault after 6.5 cycles by tripping faulted line.
3	FLT03-3PH	3 phase fault on the Sheldon (640278) to BPS Sub (640088) 115kV near Sheldon. a. Apply fault at Sheldon 115kV bus. b. Clear fault after 6.5 cycles by tripping faulted line.
4	FLT04-3PH	3 phase fault on the Sheldon (640278) to Clatonia (640111) 115kV near Sheldon. a. Apply fault at Sheldon 115kV bus. b. Clear fault after 6.5 cycles by tripping faulted line.
5	FLT05-3PH	3 phase fault on the Sheldon (640278) to Crete (640153) 115kV near Sheldon. a. Apply fault at Sheldon 115kV bus. b. Clear fault after 6.5 cycles by tripping faulted line.
6	FLT06-3PH	3 phase fault on the Sheldon (640278) to Firth (640171) 115kV near Sheldon. a. Apply fault at Sheldon 115kV bus. b. Clear fault after 6.5 cycles by tripping faulted line.
7	FLT07-3PH	3 phase fault on the Folsom (650242) to Pioneers (650238) 115kV near Folsom. a. Apply fault at Folsom 115kV bus. b. Clear fault after 6.5 cycles by tripping faulted line.
8	FLT08-3PH	3 phase fault on the Folsom (650242) to Rokeby (650290) 115kV near Folsom. a. Apply fault at Folsom 115kV bus. b. Clear fault after 6.5 cycles by tripping faulted line.
9	FLT09-3PH	3 phase fault on the Beatrice (640076) to BPS Sub (640088) 115kV near Beatrice. a. Apply fault at Beatrice 115kV bus. b. Clear fault after 6.5 cycles by tripping faulted line.
10	FLT10-3PH	3 phase fault on the Beatrice (640076) to Harbine (640208) 115kV near Beatrice. a. Apply fault at Beatrice 115kV bus. b. Clear fault after 6.5 cycles by tripping faulted line.
11	FLT11-3PH	3 phase fault on the Beatrice (640076) to Steiner (640361) 115kV near Beatrice. a. Apply fault at Beatrice 115kV bus. b. Clear fault after 6.5 cycles by tripping faulted line.
12	FLT12-3PH	3 phase fault on the Humboldt (640235) to Steiner (640361) 115kV near Humboldt. a. Apply fault at Humboldt 115kV bus. b. Clear fault after 6.5 cycles by tripping faulted line.
13	FLT13-3PH	3 phase fault on the Harbine (640208) to Fairbury (640169) 115kV near Harbine. a. Apply fault at Harbine 115kV bus. b. Clear fault after 6.5 cycles by tripping faulted line.
14	FLT14-3PH	3 phase fault on the Steele City (640426) to Harbine (640208) 115kV near Harbine. a. Apply fault at Harbine 115kV bus. b. Clear fault after 6.5 cycles by tripping faulted line.
15	FLT15-3PH	3 phase fault on the Steele City (640426) to Knob Hill (533332) 115kV near Knob Hill. a. Apply fault at Harbine 115kV bus. b. Clear fault after 6.5 cycles by tripping faulted line.
16	FLT16-3PH	3 phase fault on the Knob Hill (533332) to Green Leaf (539665) 115kV near Knob Hill. a. Apply fault at Knob Hill 115kV bus. b. Clear fault after 6.5 cycles by tripping faulted line.
17	FLT17-3PH	3 phase fault on the Knob Hill (533332) to Marshall (533349) 115kV near Knob Hill. a. Apply fault at Knob Hill 115kV bus. b. Clear fault after 6.5 cycles by tripping faulted line.
18	FLT18-3PH	3 phase fault on the Kelly (533217) to King Hill (533331) 115kV near Kelly. a. Apply fault at Kelly 115kV bus. b. Clear fault after 6.5 cycles by tripping faulted line.

Table 2-3 (Continued)
Case List with Contingency Description

Contingency Number	Contingency Name	Description
19	FLT19-3PH	3 phase fault on the Clifton (539656) to Concordia (539657) 115kV near Clifton.
		a. Apply fault at Clifton 115kV bus. b. Clear fault after 6.5 cycles by tripping faulted line.
20	FLT20-3PH	3 phase fault on the Concordia (539657) to Beloit (539650) 115kV near Concordia.
		a. Apply fault at Concordia 115kV bus. b. Clear fault after 6.5 cycles by tripping faulted line.
21	FLT21-3PH	3 phase fault on the Concordia (539657) to Jewell (539669) 115kV near Concordia.
		a. Apply fault at Concordia 115kV bus. b. Clear fault after 6.5 cycles by tripping faulted line.
22	FLT22-3PH	3 phase fault on the Pioneers (650238) to Vandorn (650218) 115kV near Pioneers.
		a. Apply fault at Pioneers 115kV bus. b. Clear fault after 6.5 cycles by tripping faulted line.
23	FLT23-3PH	3 phase fault on the Pioneers (650238) to 2&N (650230) 115kV near Pioneers.
		a. Apply fault at Pioneers 115kV bus. b. Clear fault after 6.5 cycles by tripping faulted line.
24	FLT24-3PH	3 phase fault on the Pioneers (650238) to 40&Gertie (650258) 115kV near Pioneers.
		a. Apply fault at Pioneers 115kV bus. b. Clear fault after 6.5 cycles by tripping faulted line.
25	FLT25-3PH	3 phase fault on the Pioneers (650238) to 70&Calvert (650270) 115kV near Pioneers.
		a. Apply fault at Pioneers 115kV bus. b. Clear fault after 6.5 cycles by tripping faulted line.
26	FLT26-3PH	3 phase fault on the Rokeby (650290) to NW68Holdrg (650214) 115kV near Rokeby.
		a. Apply fault at Rokeby 115kV bus. b. Clear fault after 6.5 cycles by tripping faulted line.
27	FLT27-3PH	3 phase fault on the Rokeby (650290) to 27&Plr (650229) 115kV near Rokeby.
		a. Apply fault at Rokeby 115kV bus. b. Clear fault after 6.5 cycles by tripping faulted line.
28	FLT28-3PH	3 phase fault on the Moore (640277) to Cooper (640139) 345kV line, near Moore.
		a. Apply fault at the Moore 345kV bus. b. Clear fault after 6.5 cycles by tripping the faulted line.
29	FLT29-3PH	3 phase fault on the Moore (640277) to McCool (640271) 345kV line, near Moore.
		a. Apply fault at the Moore 345kV bus. b. Clear fault after 6.5 cycles by tripping the faulted line.
30	FLT30-3PH	3 phase fault on the Moore (640277) to Pauline (640312) 345kV line, near Moore.
		a. Apply fault at the Moore 345kV bus. b. Clear fault after 6.5 cycles by tripping the faulted line.
31	FLT31-3PH	3 phase fault on the Moore (640277) to NW68Holdrg (650114) 345kV line, near Moore.
		a. Apply fault at the Moore 345kV bus. b. Clear fault after 6.5 cycles by tripping the faulted line.
32	FLT32-3PH	3 phase fault on the Moore (640277) to 103&Rokeby (650189) 345kV line, near Moore.
		a. Apply fault at the Moore 345kV bus. b. Clear fault after 6.5 cycles by tripping the faulted line.
33	FLT33-3PH	3 phase fault on the NW68Holdrg (650114) to Wagener (650185) 345kV line, near NW68Holdrg.
		a. Apply fault at the NW68Holdrg 345kV bus. b. Clear fault after 6.5 cycles by tripping the faulted line.
34	FLT34-3PH	3 phase fault on the NW68Holdrg (650114) to Columbus East (640125) 345kV line, near NW68Holdrg.
		a. Apply fault at the NW68Holdrg 345kV bus. b. Clear fault after 6.5 cycles by tripping the faulted line.
35	FLT35-3PH	3 phase fault on the 103&Rokeby (650189) to S3458 (645458) 345kV line, near 103&Rokeby.
		a. Apply fault at the 103&Rokeby 345kV bus. b. Clear fault after 6.5 cycles by tripping the faulted line.
36	FLT36-3PH	3 phase fault on the 103&Rokeby (650189) to Wagener (650185) 345kV line, near 103&Rokeby.
		a. Apply fault at the 103&Rokeby 345kV bus. b. Clear fault after 6.5 cycles by tripping the faulted line.

Table 2-3 (Continued)
Case List with Contingency Description

Contingency Number	Contingency Name	Description
37	FLT37-3PH	3 phase fault on the Wagener (650185) to S3454 (645454) 345kV line, near Wagener.
		a. Apply fault at the Wagener 345kV bus. b. Clear fault after 6.5 cycles by tripping the faulted line.
38	FLT38-3PH	3 phase fault on the Pauline (640312) to Axtell (640065) 345kV line, near Pauline.
		a. Apply fault at the Pauline 345kV bus. b. Clear fault after 6.5 cycles by tripping the faulted line.
39	FLT39-3PH	3 phase fault on the Axtell (640065) to Post Rock (530583) 345kV line, near Axtell.
		a. Apply fault at the Axtell 345kV bus. b. Clear fault after 6.5 cycles by tripping the faulted line.
40	FLT40-3PH	3 phase fault on the Axtell (640065) to Sweetwater (640374) 345kV line, near Axtell.
		a. Apply fault at the Axtell 345kV bus. b. Clear fault after 6.5 cycles by tripping the faulted line.
41	FLT41-3PH	3 phase fault on the Sweetwater (640374) to Grand Island (652571) 345kV line, near Sweetwater.
		a. Apply fault at the Sweetwater 345kV bus. b. Clear fault after 6.5 cycles by tripping the faulted line.
42	FLT42-3PH	3 phase fault on the Grand Island (652571) to McCool (640271) 345kV line, near Grand Island.
		a. Apply fault at the Grand Island 345kV bus. b. Clear fault after 6.5 cycles by tripping the faulted line.
43	FLT43-3PH	3 phase fault on the Grand Island (652571) to Ft. Thompson (652506) 345kV line, near Grand Island.
		a. Apply fault at the Grand Island 345kV bus. b. Clear fault after 6.5 cycles by tripping the faulted line.
44	FLT44-3PH	3 phase fault on the G08-123N-Tap (560137) to Guide Rock (640206) 115kV near G08-123N-Tap.
		a. Apply fault at G08-123N-Tap 115kV bus. b. Clear fault after 6.5 cycles by tripping faulted line.
45	FLT45-3PH	3 phase fault on the G08-123N-Tap (560137) to Pauline (640313) 115kV near G08-123N-Tap.
		a. Apply fault at G08-123N-Tap 115kV bus. b. Clear fault after 6.5 cycles by tripping faulted line.
46	FLT46-3PH	3 phase fault on the Hebron North (640218) to Fairbury (640169) 115kV near Hebron North.
		a. Apply fault at Hebron North 115kV bus. b. Clear fault after 6.5 cycles by tripping faulted line.
47	FLT47-3PH	3 phase fault on the Hebron North (640218) to Carlton Jct (640105) 115kV near Hebron North.
		a. Apply fault at Hebron North 115kV bus. b. Clear fault after 6.5 cycles by tripping faulted line.
48	FLT48-3PH	3 phase fault on the G13-015-Tap (560733) to Pauline (640313) 115kV near G13-015-Tap.
		a. Apply fault at G13-015-Tap 115kV bus. b. Clear fault after 6.5 cycles by tripping faulted line.
49	FLT49-3PH	3 phase fault on the Pauline (640313) to Hastings (640215) 115kV CKT 1 near Pauline.
		a. Apply fault at Pauline 115kV bus. b. Clear fault after 6.5 cycles by tripping faulted line.
50	FLT50-3PH	3 phase fault on the G13-015-Tap (560733) to Hildreth (640222) 115kV near G13-015-Tap.
		a. Apply fault at G13-015-Tap 115kV bus. b. Clear fault after 6.5 cycles by tripping faulted line.
51	FLT51-3PH	3 phase fault on the Holdredge (640224) to Axtell (640066) 115kV near Holdredge.
		a. Apply fault at Holdredge 115kV bus. b. Clear fault after 6.5 cycles by tripping faulted line.
52	FLT52-3PH	3 phase fault on the Holdredge (640224) to Hildreth (640222) 115kV near Holdredge.
		a. Apply fault at Holdredge 115kV bus. b. Clear fault after 6.5 cycles by tripping faulted line.
53	FLT53-3PH	3 phase fault on the Holdredge (640224) to Johnson.2 (640242) 115kV near Holdredge.
		a. Apply fault at Holdredge 115kV bus. b. Clear fault after 6.5 cycles by tripping faulted line.
54	FLT54-3PH	3 phase fault on the Johnson.2 (640242) to Canaday (640103) 115kV CKT 1 near Johnson.2.
		a. Apply fault at Johnson.2 115kV bus. b. Clear fault after 6.5 cycles by tripping faulted line.

Table 2-3 (Continued)
Case List with Contingency Description

Contingency Number	Contingency Name	Description
55	FLT55-3PH	3 phase fault on the Johnson.2 (640242) to Gosper (640194) 115kV near Johnson.2. a. Apply fault at Johnson.2 115kV bus. b. Clear fault after 6.5 cycles by tripping faulted line.
56	FLT56-3PH	3 phase fault on the Johnson.2 (640242) to Johnson Lake (640244) 115kV near Johnson.2. a. Apply fault at Johnson.2 115kV bus. b. Clear fault after 6.5 cycles by tripping faulted line.
57	FLT57-3PH	3 phase fault on the Johnson.2 (640242) to Westminster (640407) 115kV near Johnson.2. a. Apply fault at Johnson.2 115kV bus. b. Clear fault after 6.5 cycles by tripping faulted line.
58	FLT58-3PH	3 phase fault on the Axtell (640066) to Kearney (640250) 115kV near Axtell. a. Apply fault at Axtell 115kV bus. b. Clear fault after 6.5 cycles by tripping faulted line.
59	FLT59-3PH	3 phase fault on the Axtell (640066) to Minden (640275) 115kV near Axtell. a. Apply fault at Axtell 115kV bus. b. Clear fault after 6.5 cycles by tripping faulted line.
60	FLT60-3PH	3 phase fault on the Energy Center (641087) to Sutton (640372) 115kV near Energy Center. a. Apply fault at Energy Center 115kV bus. b. Clear fault after 6.5 cycles by tripping faulted line.
61	FLT61-3PH	3 phase fault on the Bypass (641082) to N. Hasting (640282) 115kV near Bypass. a. Apply fault at Bypass 115kV bus. b. Clear fault after 6.5 cycles by tripping faulted line.
62	FLT62-3PH	3 phase fault on the G12-005-Tap (560718) to Ft. Randall (652509) 230kV near G12-005-Tap. a. Apply fault at G12-005-Tap 230kV bus. b. Clear fault after 6.5 cycles by tripping faulted line.
63	FLT63-3PH	3 phase fault on the G12-005-Tap (560718) to Madison County (560006) 230kV near G12-005-Tap. a. Apply fault at G12-005-Tap 230kV bus. b. Clear fault after 6.5 cycles by tripping faulted line.
64	FLT64-3PH	3 phase fault on the Ft. Randall (652509) to Ft. Thompson (652507) 230kV near Ft. Randall. a. Apply fault at Ft. Randall 230kV bus. b. Clear fault after 6.5 cycles by tripping faulted line.
65	FLT65-3PH	3 phase fault on the Ft. Randall (652509) to Lake Platte (652516) 230kV near Ft. Randall. a. Apply fault at Ft. Randall 230kV bus. b. Clear fault after 6.5 cycles by tripping faulted line.
66	FLT66-3PH	3 phase fault on the Ft. Randall (652509) to Utica Jct (652526) 230kV near Ft. Randall. a. Apply fault at Ft. Randall 230kV bus. b. Clear fault after 6.5 cycles by tripping faulted line.
67	FLT67-3PH	3 phase fault on the Ft. Randall (652509) to Sioux City (652565) 230kV near Ft. Randall. a. Apply fault at Ft. Randall 230kV bus. b. Clear fault after 6.5 cycles by tripping faulted line.
68	FLT68-3PH	3 phase fault on the Madison County (560006) to Columbus (640133) 230kV near Madison County. a. Apply fault at Madison County 230kV bus. b. Clear fault after 6.5 cycles by tripping faulted line.
69	FLT69-3PH	3 phase fault on the Columbus (640133) to E. Columbus (640126) 230kV near Columbus. a. Apply fault at Columbus 230kV bus. b. Clear fault after 6.5 cycles by tripping faulted line.
70	FLT70-3PH	3 phase fault on the Columbus (640133) to Columbus West (640131) 230kV near Columbus. a. Apply fault at Columbus 230kV bus. b. Clear fault after 6.5 cycles by tripping faulted line.
71	FLT71-3PH	3 phase fault on the Columbus (640133) to Shell Creek (640343) 230kV near Columbus. a. Apply fault at Columbus 230kV bus. b. Clear fault after 6.5 cycles by tripping faulted line.
72	FLT72-3PH	3 phase fault on the Columbus West (640131) to Grand Island (640200) 230kV near Columbus West. a. Apply fault at Columbus West 230kV bus. b. Clear fault after 6.5 cycles by tripping faulted line.

Table 2-3 (Continued)
Case List with Contingency Description

Contingency Number	Contingency Name	Description
73	FLT73-3PH	3 phase fault on the G13-018-Tap (560753) to Hydrocarbon Tap (647102) 69kV near G13-018-Tap. a. Apply fault at G13-018-Tap 69kV bus. b. Clear fault after 6.5 cycles by tripping faulted line.
74	FLT74-3PH	3 phase fault on the G13-018-Tap (560753) to S974 (647974) 69kV near G13-018-Tap. a. Apply fault at G13-018-Tap 69kV bus. b. Clear fault after 6.5 cycles by tripping faulted line.
75	FLT75-3PH	3 phase fault on the S974 (647974) to S969 (647969) 69kV near S974. a. Apply fault at S974 69kV bus. b. Clear fault after 6.5 cycles by tripping faulted line.
76	FLT76-3PH	3 phase fault on the W. Brock (647111) to S963 (647963) 69kV near W. Brock. a. Apply fault at W. Brock 69kV bus. b. Clear fault after 6.5 cycles by tripping faulted line.
77	FLT77-3PH	3 phase fault on the S971 (647971) to 990TP (647090) 69kV near S971. a. Apply fault at S971 69kV bus. b. Clear fault after 6.5 cycles by tripping faulted line.
78	FLT78-3PH	3 phase fault on the S971 (647971) to Kinder Morgan (647114) 69kV near S971. a. Apply fault at S971 69kV bus. b. Clear fault after 6.5 cycles by tripping faulted line.
79	FLT79-3PH	3 phase fault on the S971 (647971) to NC Syra (647402) 69kV near S971. a. Apply fault at S971 69kV bus. b. Clear fault after 6.5 cycles by tripping faulted line.
80	FLT80-3PH	3 phase fault on the Moore (640277) 345kV to Sheldon (640278) 115kV/(640280) 13.8kV transformer at the 345kV bus. a. Apply fault at the Moore 345kV bus. b. Clear fault after 5.5 cycles by tripping the transformer
81	FLT81-3PH	3 phase fault on the Humboldt (640235) 115kV to Humboldt (640234) 161kV/(643087) 13.8kV transformer at the 115kV bus. a. Apply fault at the Humboldt 115kV bus. b. Clear fault after 5.5 cycles by tripping the transformer
82	FLT82-3PH	3 phase fault on the Kelly (533217) 115kV to Kelly (532913) 161kV/(532942) 13.8kV transformer at the 115kV bus. a. Apply fault at the Kelly 115kV bus. b. Clear fault after 5.5 cycles by tripping the transformer
83	FLT83-3PH	3 phase fault on the Concordia (539657) 115kV to Concordia (539658) 230kV/(539904) 13.8kV transformer at the 115kV bus. a. Apply fault at the Concordia 115kV bus. b. Clear fault after 5.5 cycles by tripping the transformer
84	FLT84-3PH	3 phase fault on the NW68Holdrg (650114) 345kV to NW68Holdrg (650214) 115kV/(650314) 13.8kV transformer at the 345kV bus. a. Apply fault at the NW68Holdrg 345kV bus. b. Clear fault after 5.5 cycles by tripping the transformer
85	FLT85-3PH	3 phase fault on the Pauline (640312) 345kV to Pauline (640313) 115kV/(640315) 13.8kV transformer at the 345kV bus. a. Apply fault at the Pauline 345kV bus. b. Clear fault after 5.5 cycles by tripping the transformer
86	FLT86-3PH	3 phase fault on the Grand Island (652571) 345kV to Grand Island (640200) 230kV/(643071) 13.8kV transformer at the 230kV bus. a. Apply fault at the Grand Island 345kV bus. b. Clear fault after 5.5 cycles by tripping the transformer
87	FLT87-3PH	3 phase fault on the Grand Island (640201) 115kV to Grand Island (640200) 230kV/(640203) 13.8kV transformer at the 230kV bus. a. Apply fault at the Grand Island 115kV bus. b. Clear fault after 5.5 cycles by tripping the transformer
88	FLT88-3PH	3 phase fault on the Hasting City (641088) 115kV to Hasting City (640214) 230kV/(643075) 13.8kV transformer at the 115kV bus. a. Apply fault at the Hastings City 115kV bus. b. Clear fault after 5.5 cycles by tripping the transformer

Table 2-3 (Continued)
Case List with Contingency Description

Contingency Number	Contingency Name	Description
89	FLT89-3PH	3 phase fault on the Ft. Randall (652509) 230kV to Ft. Randall (652510) 115V transformer at the 230kV bus. a. Apply fault at the Ft. Randall 230kV bus. b. Clear fault after 5.5 cycles by tripping the transformer
90	FLT90-3PH	3 phase fault on the Columbus (640133) 230kV to Kelly (640134) 115kV/(640135) 13.8kV transformer at the 230kV bus. a. Apply fault at the Columbus 230kV bus. b. Clear fault after 5.5 cycles by tripping the transformer
91	FLT91-3PH	3 phase fault on the E. Columbus (640126) 230kV to E. Columbus (640127) 115kV/(640306) 13.8kV transformer at the 230kV bus. a. Apply fault at the E. Columbus 230kV bus. b. Clear fault after 5.5 cycles by tripping the transformer
92	FLT92-3PH	3 phase fault on the Shell Creek (640343) 230kV to Shell Creek (640342) 115kV/(643136) 13.8kV transformer at the 230kV bus. a. Apply fault at the Shell Creek 230kV bus. b. Clear fault after 5.5 cycles by tripping the transformer
93	FLT93-3PH	3 phase fault on the S974 (647974) 69kV to Sterling (640362) 115V transformer at the 69kV bus. a. Apply fault at the S974 69kV bus. b. Clear fault after 5.5 cycles by tripping the transformer
94	FLT94-3PH	3 phase fault on the W Brock (647111) 69kV to S1263 (646263) 161kV/(648263) 13.8kV transformer at the 69kV bus. a. Apply fault at the W Brock 69kV bus. b. Clear fault after 5.5 cycles by tripping the transformer
95	FLT95-3PH	Prior outage of Fairport (300039) - St Joe (541199) 345 kV with a 3-phase fault near Cooper (640139) on Cooper (640139) - St Joe (541199) 345 kV. Prior outage of Fairport (300039) to St.Joe (541199) 345kV line (network back at steady state) a. Apply 3-phase fault at Cooper (640139) 345kV b. Run for 5 cycles c. Clear fault d. Trip line from Cooper (640139) to G10-056-Tap (560663) 345kV
96	FLT96-1PH	SLG fault at the S3451 (645451) end of the S3451 (645451) -S3459 (645459) and S3451 (645451) -S3454 (645454) 345kV lines. Normal clearing (4.5 cycles) a. Apply SLG fault at S3451 (645451) 345kV b. Run for 4.5 cycles c. Clear fault d. Trip line from S3451 (645451) to S3459 (645459) 345kV e. Trip line from S3451 (645451) to S3454 (645454) 345kV
97	FLT97-1PH	SLG fault at the S3451 (645451) end of the S3451 (645451)-Raun (635200) 345kV line, followed by a stuck breaker and the opening (4.5cycles) of transformer T4 (64545/345kv – 646251/161kV – 648351/13.8kV) at S3451. a. Apply SLG fault at S3451 (645451) 345kV b. Run for 4.5 cycles c. Trip line from S3451 (645451) to Raun (635200) 345kV d. Clear fault e. Apply SLG fault at S3451 (645451) 345kV f. Run for 10 cycles g. Disconnect three winding transformer (S3451 T4) at bus 645451/646251/648351 h. Clear fault
98	FLT98-1PH	SLG fault at S1206 (646206) on the S1206 (646206) - S1232 (66232) 161kV line, followed by a stuck breaker and the opening of the S1206 (646206) - S1201 (646201) 161kV line. a. Apply SLG fault at S1206 (646206) 161kV b. Run for 8.5 cycles c. Trip line from S1206 (646206) to S1232 (646232) 161kV d. Clear fault e. Apply SLG fault at S1206 (646206) 161kV f. Run for 10.5 cycles g. Trip line from S1206 (646206) to S1201 (646201) 161kV h. Clear fault

SECTION 3: STABILITY ANALYSIS

The objective of the stability analysis was to determine the impacts of the new wind farms on the stability and voltage recovery on the SPP transmission system. If problems with stability or voltage recovery were identified the need for reactive compensation or system upgrades were investigated.

Approach

The 2014 winter peak, 2014 summer peak, and 2023 summer peak power flows provided by SPP were examined prior to the Stability Analysis to ensure they contained the nine proposed study projects (GEN-2012-005, GEN-2013-002, GEN-2013-004, GEN-2013-005, GEN-2013-006, GEN-2013-008, GEN-2013-014, GEN-2013-015, and GEN-2013-018) modeled at 100% of the nameplate rating and any previously queued projects listed in Table 2-2. There was no suspect power flow data in the study area. The dynamic datasets were also verified and stable initial system conditions (i.e., “flat lines”) were achieved. Three-phase and single line-to-ground faults listed in Table 2-3 were examined. Single-phase fault impedances were calculated to result in a voltage of approximately 60% of the pre-fault voltage. Refer to Table 3-1 for a list of the calculated single-phase fault impedances used for this analysis.

**Table 3-1
Calculated Single-Phase Fault Impedances**

Contingency Number	Contingency Name	Single-Phase Fault Impedance (MVA)		
		2014 Summer Peak	2014 Winter Peak	2023 Summer Peak
96	FLT96-1PH	-8906.3	-8500.0	-9312.5
97	FLT97-1PH	-8906.3	-8500.0	-9312.5
98	FLT98-1PH	-7687.5	-6468.8	-7687.5

Bus voltages and previously queued generation in the study area were monitored in addition to the bus voltages in the following areas:

- 531 MIDW
- 534 SUNC
- 536 WERE
- 540 GMO
- 541 KCPL
- 640 NPPD
- 645 OPPD
- 650 LES
- 652 WAPA

The results of the analysis determined if reactive compensation or system upgrades were required to obtain acceptable system performance. If additional reactive compensation was required, the size, type, and location were determined. The proposed reactive reinforcements would ensure the wind farm meets FERC Order 661A low voltage requirements and return the wind farm to its pre-disturbance operating voltage. If the results indicated the need for fast responding reactive support, dynamic support such as an SVC or STATCOM was investigated. If tripping of the prior queued projects was observed during the stability analysis (for under/over voltage or under/over frequency) the simulations were re-ran with the prior queued project's voltage and frequency tripping disabled.

Results

Refer to Table 3-2 for a summary of the Stability Analysis results for the cases listed in Table 2-3.

**Table 3-2
Stability Analysis Summary of Results**

Contingency Number	Contingency Name	2014 Summer Peak		2014 Winter Peak		2023 Summer Peak	
		Stable?	Acceptable?	Stable?	Acceptable?	Stable?	Acceptable?
1	FLT01-3PH	Yes	Yes	Yes	Yes	Yes	Yes
2	FLT02-3PH	Yes	Yes	Yes	Yes	Yes	Yes
3	FLT03-3PH	Yes	Yes	Yes	Yes	Yes	Yes
4	FLT04-3PH	Yes	Yes	Yes	Yes	Yes	Yes
5	FLT05-3PH	Yes	Yes	Yes	Yes	Yes	Yes
6	FLT06-3PH	Yes	Yes	Yes	Yes	Yes	Yes
7	FLT07-3PH	Yes	Yes	Yes	Yes	Yes	Yes
8	FLT08-3PH	Yes	Yes	Yes	Yes	Yes	Yes
9	FLT09-3PH	Yes	Yes	Yes	Yes	Yes	Yes
10	FLT10-3PH	Yes	Yes	Yes	Yes	Yes	Yes
11	FLT11-3PH	Yes	Yes	Yes	Yes	Yes	Yes
12	FLT12-3PH	Yes	Yes	Yes	Yes	Yes	Yes
13	FLT13-3PH	Yes	Yes	Yes	Yes	Yes	Yes
14	FLT14-3PH	Yes	Yes	Yes	Yes	Yes	Yes
15	FLT15-3PH	Yes	Yes	Yes	Yes	Yes	Yes
16	FLT16-3PH	Yes	Yes	Yes	Yes	Yes	Yes
17	FLT17-3PH	Yes	Yes	Yes	Yes	Yes	Yes
18	FLT18-3PH	Yes	Yes	Yes	Yes	Yes	Yes
19	FLT19-3PH	Yes	Yes	Yes	Yes	Yes	Yes
20	FLT20-3PH	Yes	Yes	Yes	Yes	Yes	Yes
21	FLT21-3PH	Yes	Yes	Yes	Yes	Yes	Yes
22	FLT22-3PH	Yes	Yes	Yes	Yes	Yes	Yes
23	FLT23-3PH	Yes	Yes	Yes	Yes	Yes	Yes
24	FLT24-3PH	Yes	Yes	Yes	Yes	Yes	Yes
25	FLT25-3PH	Yes	Yes	Yes	Yes	Yes	Yes
26	FLT26-3PH	Yes	Yes	Yes	Yes	Yes	Yes
27	FLT27-3PH	Yes	Yes	Yes	Yes	Yes	Yes
28	FLT28-3PH	Yes	Yes	Yes	Yes	Yes	Yes
29	FLT29-3PH	Yes	Yes	Yes	Yes	Yes	Yes
30	FLT30-3PH	Yes	Yes	Yes	Yes	Yes	Yes
31	FLT31-3PH	Yes	Yes	Yes	Yes	Yes	Yes
32	FLT32-3PH	Yes	Yes	Yes	Yes	Yes	Yes
33	FLT33-3PH	Yes	Yes	Yes	Yes	Yes	Yes
34	FLT34-3PH	Yes	Yes	Yes	Yes	Yes	Yes
35	FLT35-3PH	Yes	Yes	Yes	Yes	Yes	Yes
36	FLT36-3PH	Yes	Yes	Yes	Yes	Yes	Yes

Table 3-2 (Continued)
Stability Analysis Summary of Results

Contingency Number	Contingency Name	2014 Summer Peak		2014 Winter Peak		2023 Summer Peak	
		Stable?	Acceptable?	Stable?	Acceptable?	Stable?	Acceptable?
37	FLT37-3PH	Yes	Yes	Yes	Yes	Yes	Yes
38	FLT38-3PH	Yes	Yes	Yes	Yes	Yes	Yes
39	FLT39-3PH	Yes	Yes	Yes	Yes	Yes	Yes
40	FLT40-3PH	Yes	Yes	Yes	Yes	Yes	Yes
41	FLT41-3PH	Yes	Yes	Yes	Yes	Yes	Yes
42	FLT42-3PH	Yes	Yes	Yes	Yes	Yes	Yes
43	FLT43-3PH	Yes	Yes	Yes	Yes	Yes	Yes
44	FLT44-3PH	Yes	Yes	Yes	Yes	Yes	Yes
45	FLT45-3PH	Yes	Yes	Yes	Yes	Yes	Yes
46	FLT46-3PH	Yes	Yes	Yes	Yes	Yes	Yes
47	FLT47-3PH	Yes	Yes	Yes	Yes	Yes	Yes
48	FLT48-3PH	Yes	Yes	Yes	Yes	Yes	Yes
49	FLT49-3PH	Yes	Yes	Yes	Yes	Yes	Yes
50	FLT50-3PH	Yes	Yes	Yes	Yes	Yes	Yes
51	FLT51-3PH	Yes	Yes	Yes	Yes	Yes	Yes
52	FLT52-3PH	Yes	Yes	Yes	Yes	Yes	Yes
53	FLT53-3PH	Yes	Yes	Yes	Yes	Yes	Yes
54	FLT54-3PH	Yes	Yes	Yes	Yes	Yes	Yes
55	FLT55-3PH	Yes	Yes	Yes	Yes	Yes	Yes
56	FLT56-3PH	Yes	Yes	Yes	Yes	Yes	Yes
57	FLT57-3PH	Yes	Yes	Yes	Yes	Yes	Yes
58	FLT58-3PH	Yes	Yes	Yes	Yes	Yes	Yes
59	FLT59-3PH	Yes	Yes	Yes	Yes	Yes	Yes
60	FLT60-3PH	Yes	Yes	Yes	Yes	Yes	Yes
61	FLT61-3PH	Yes	Yes	Yes	Yes	Yes	Yes
62	FLT62-3PH	Yes	Yes	Yes	Yes	Yes	Yes
63	FLT63-3PH	Yes	Yes	Yes	Yes	Yes	Yes
64	FLT64-3PH	Yes	Yes	Yes	Yes	Yes	Yes
65	FLT65-3PH	Yes	Yes	Yes	Yes	Yes	Yes
66	FLT66-3PH	Yes	Yes	Yes	Yes	Yes	Yes
67	FLT67-3PH	Yes	Yes	Yes	Yes	Yes	Yes
68	FLT68-3PH	Yes	Yes	Yes	Yes	Yes	Yes
69	FLT69-3PH	Yes	Yes	Yes	Yes	Yes	Yes
70	FLT70-3PH	Yes	Yes	Yes	Yes	Yes	Yes
71	FLT71-3PH	Yes	Yes	Yes	Yes	Yes	Yes
72	FLT72-3PH	Yes	Yes	Yes	Yes	Yes	Yes

Table 3-2 (Continued)
Stability Analysis Summary of Results

Contingency Number	Contingency Name	2014 Summer Peak		2014 Winter Peak		2023 Summer Peak	
		Stable?	Acceptable?	Stable?	Acceptable?	Stable?	Acceptable?
73	FLT73-3PH	Yes	Yes	Yes	Yes	Yes	Yes
74	FLT74-3PH	Yes	Yes	Yes	Yes	Yes	Yes
75	FLT75-3PH	Yes	Yes	Yes	Yes	Yes	Yes
76	FLT76-3PH	Yes	Yes	Yes	Yes	Yes	Yes
77	FLT77-3PH	Yes	Yes	Yes	Yes	Yes	Yes
78	FLT78-3PH	Yes	Yes	Yes	Yes	Yes	Yes
79	FLT79-3PH	Yes	Yes	Yes	Yes	Yes	Yes
80	FLT80-3PH	Yes	Yes	Yes	Yes	Yes	Yes
81	FLT81-3PH	Yes	Yes	Yes	Yes	Yes	Yes
82	FLT82-3PH	Yes	Yes	Yes	Yes	Yes	Yes
83	FLT83-3PH	Yes	Yes	Yes	Yes	Yes	Yes
84	FLT84-3PH	Yes	Yes	Yes	Yes	Yes	Yes
85	FLT85-3PH	Yes	Yes	Yes	Yes	Yes	Yes
86	FLT86-3PH	Yes	Yes	Yes	Yes	Yes	Yes
87	FLT87-3PH	Yes	Yes	Yes	Yes	Yes	Yes
88	FLT88-3PH	Yes	Yes	Yes	Yes	Yes	Yes
89	FLT89-3PH	Yes	Yes	Yes	Yes	Yes	Yes
90	FLT90-3PH	Yes	Yes	Yes	Yes	Yes	Yes
91	FLT91-3PH	Yes	Yes	Yes	Yes	Yes	Yes
92	FLT92-3PH	Yes	Yes	Yes	Yes	Yes	Yes
93	FLT93-3PH	Yes	Yes	Yes	Yes	Yes	Yes
94	FLT94-3PH	Yes	Yes	Yes	Yes	Yes	Yes
95	FLT95-3PH	Yes	Yes	Yes	Yes	Yes	Yes
96	FLT96-1PH	Yes	Yes	Yes	Yes	Yes	Yes
97	FLT97-1PH	Yes	Yes	Yes	Yes	Yes	Yes
98	FLT98-1PH	Yes	Yes	Yes	Yes	Yes	Yes

The Stability Analysis determined that there was no wind turbine tripping that occurred from interconnecting GEN-2012-005, GEN-2013-002, GEN-2013-004, GEN-2013-005, GEN-2013-006, GEN-2013-008, GEN-2013-014, GEN-2013-015, or GEN-2013-018 at 100% output.

2014 Summer Peak Summary

For the 2014 Summer Peak case, the Stability Analysis determined that there was no wind turbine tripping that occurred from interconnecting GEN-2012-005, GEN-2013-002, GEN-2013-004, GEN-2013-005, GEN-2013-006, GEN-2013-008, GEN-2013-014, GEN-2013-015, or GEN-2013-018 at 100% output. No voltages were observed to exceed 1.20 p.u. or fall below 0.7

p.u. at any time after the fault was cleared. Refer to Figure 3-1 for a response plot of select bus voltages during Contingency #45 (FLT45-3PH), a 3 phase fault on the G08-123N-Tap to Pauline 115 kV line. It was observed that local generation helped the voltage recovery of the G08-123N-Tap 115 kV bus. There was no load or generator tripping observed for this contingency.

FLT68-3PH, a 3 phase fault on the Madison County to Columbus 230 kV line, is the representative limiting contingency; the post-fault bus voltage did not recover to 94% of the pre-fault voltage. Refer to Figure 3-2 for a response plot of select bus voltages during FLT68-3PH.

2014 Winter Peak Summary

For the 2014 Winter Peak case, the Stability Analysis determined that there was no wind turbine tripping that occurred from interconnecting GEN-2012-005, GEN-2013-002, GEN-2013-004, GEN-2013-005, GEN-2013-006, GEN-2013-008, GEN-2013-014, GEN-2013-015, or GEN-2013-018 at 100% output. No voltages were observed to exceed 1.20 p.u. or fall below 0.7 p.u. at any time after the fault was cleared. Refer to Figure 3-3 for a response plot of select bus voltages during Contingency #45 (FLT45-3PH), a 3 phase fault on the G08-123N-Tap to Pauline 115 kV line. It was observed that local generation helped the voltage recovery of the G08-123N-Tap 115 kV bus. There was no load or generator tripping observed for this contingency.

FLT68-3PH, a 3 phase fault on the Madison County to Columbus 230 kV line, is the representative limiting contingency; the post-fault bus voltage did not recover to 94% of the pre-fault voltage. Refer to Figure 3-4 for a response plot of select bus voltages during FLT68-3PH.

2023 Summer Peak Summary

For the 2023 Summer Peak case, the Stability Analysis determined that there was no wind turbine tripping that occurred from interconnecting GEN-2012-005, GEN-2013-002, GEN-2013-004, GEN-2013-005, GEN-2013-006, GEN-2013-008, GEN-2013-014, GEN-2013-015, or GEN-2013-018 at 100% output. No voltages were observed to exceed 1.20 p.u. or fall below 0.7 p.u. at any time after the fault was cleared. Refer to Figure 3-5 for a response plot of select bus voltages during Contingency #45 (FLT45-3PH), a 3 phase fault on the G08-123N-Tap to Pauline 115 kV line.

FLT68-3PH, a 3 phase fault on the Madison County to Columbus 230 kV line, is the representative limiting contingency; the post-fault bus voltage did not recover to 94% of the pre-fault voltage. Refer to Figure 3-6 for a response plot of select bus voltages during FLT68-3PH.

Refer to Appendix B, Appendix C, and Appendix D for a complete set of plots for all contingencies for 2014 summer, 2014 winter, and 2023 summer peak conditions, respectively.

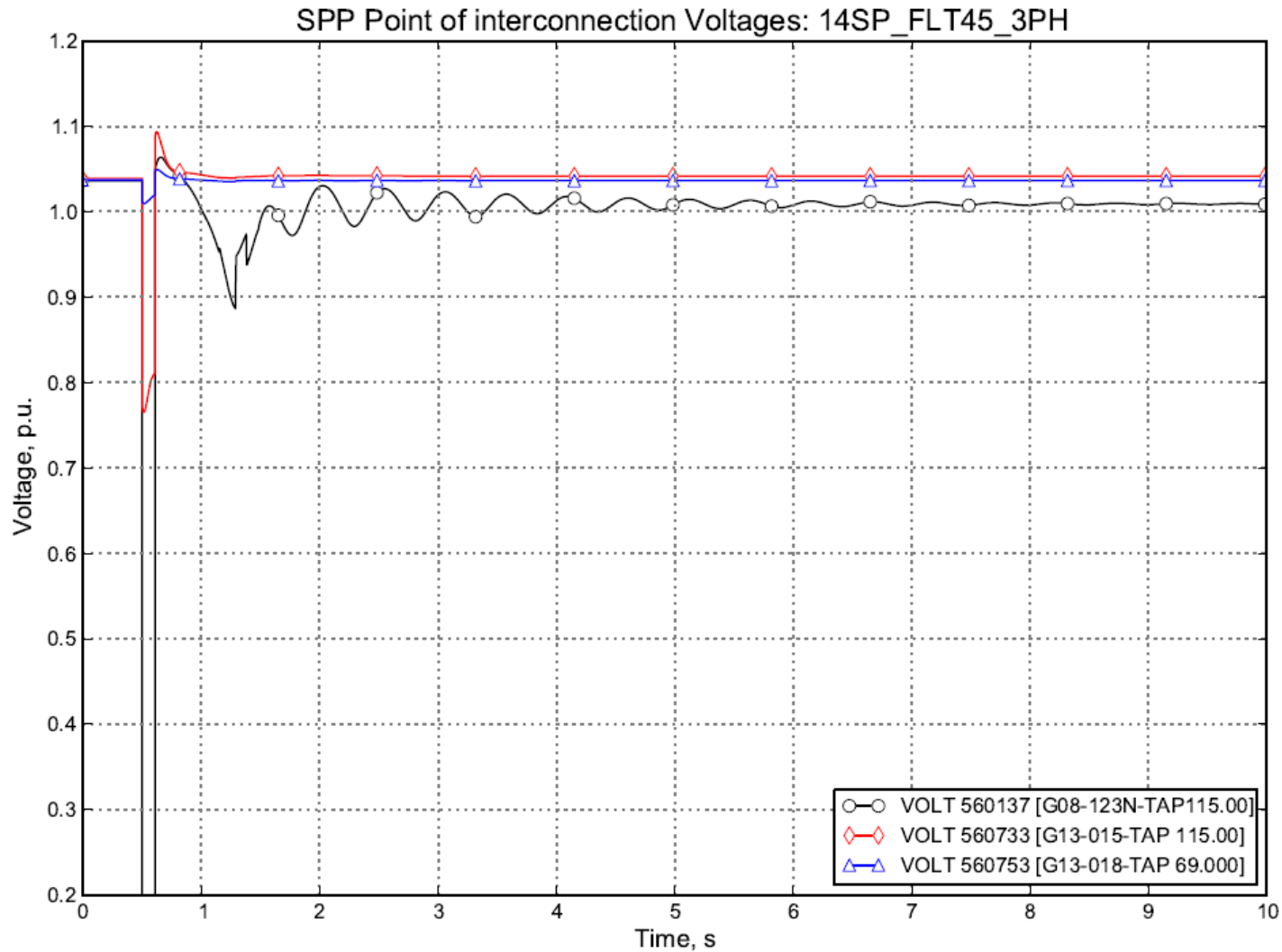


Figure 3-1. Response of select bus voltages during Contingency #45 (FLT45-3PH) for 2014 summer peak conditions.

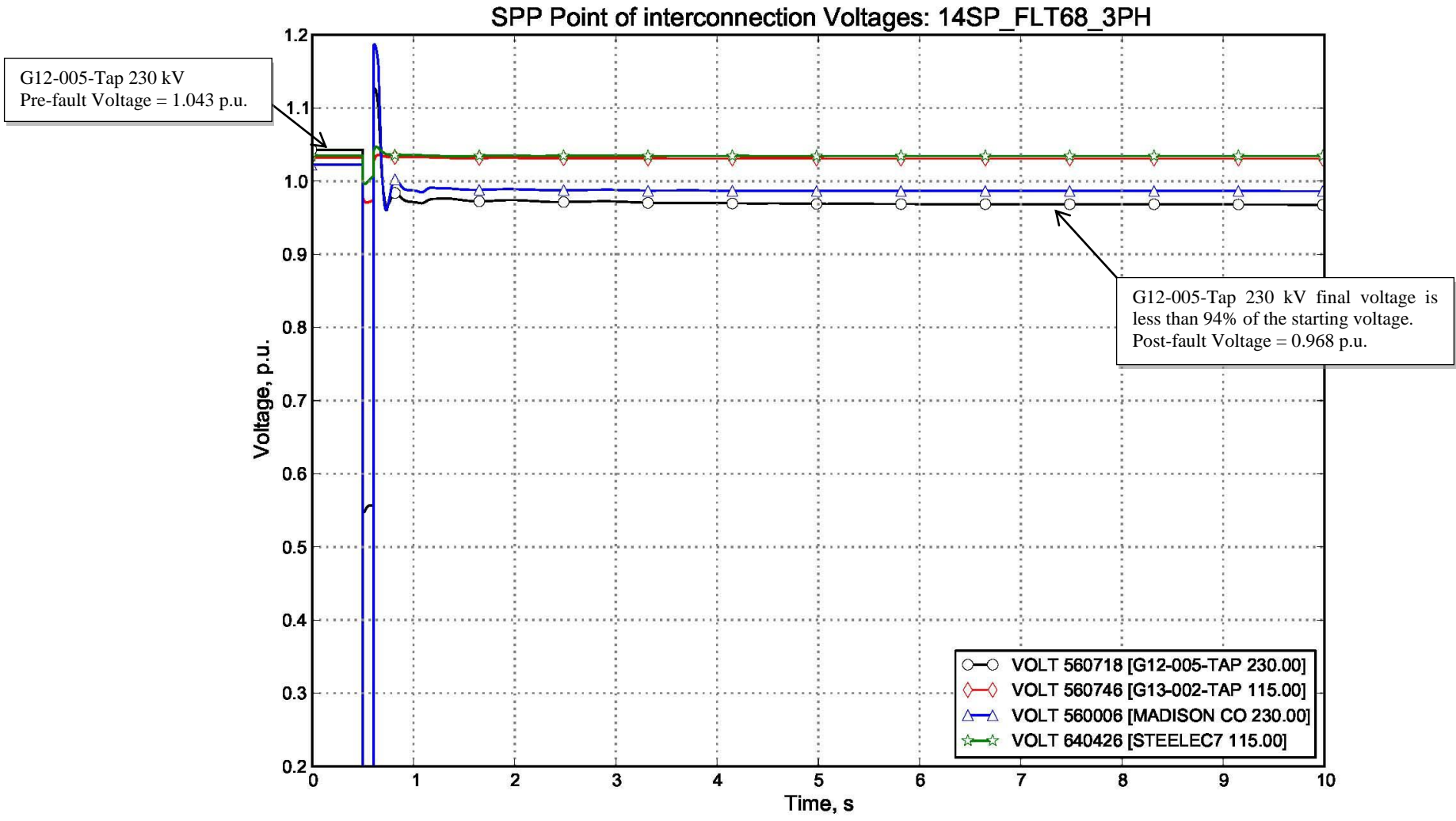


Figure 3-2. Response of select bus voltages during Contingency #68 (FLT68-3PH) for 2014 summer peak conditions.

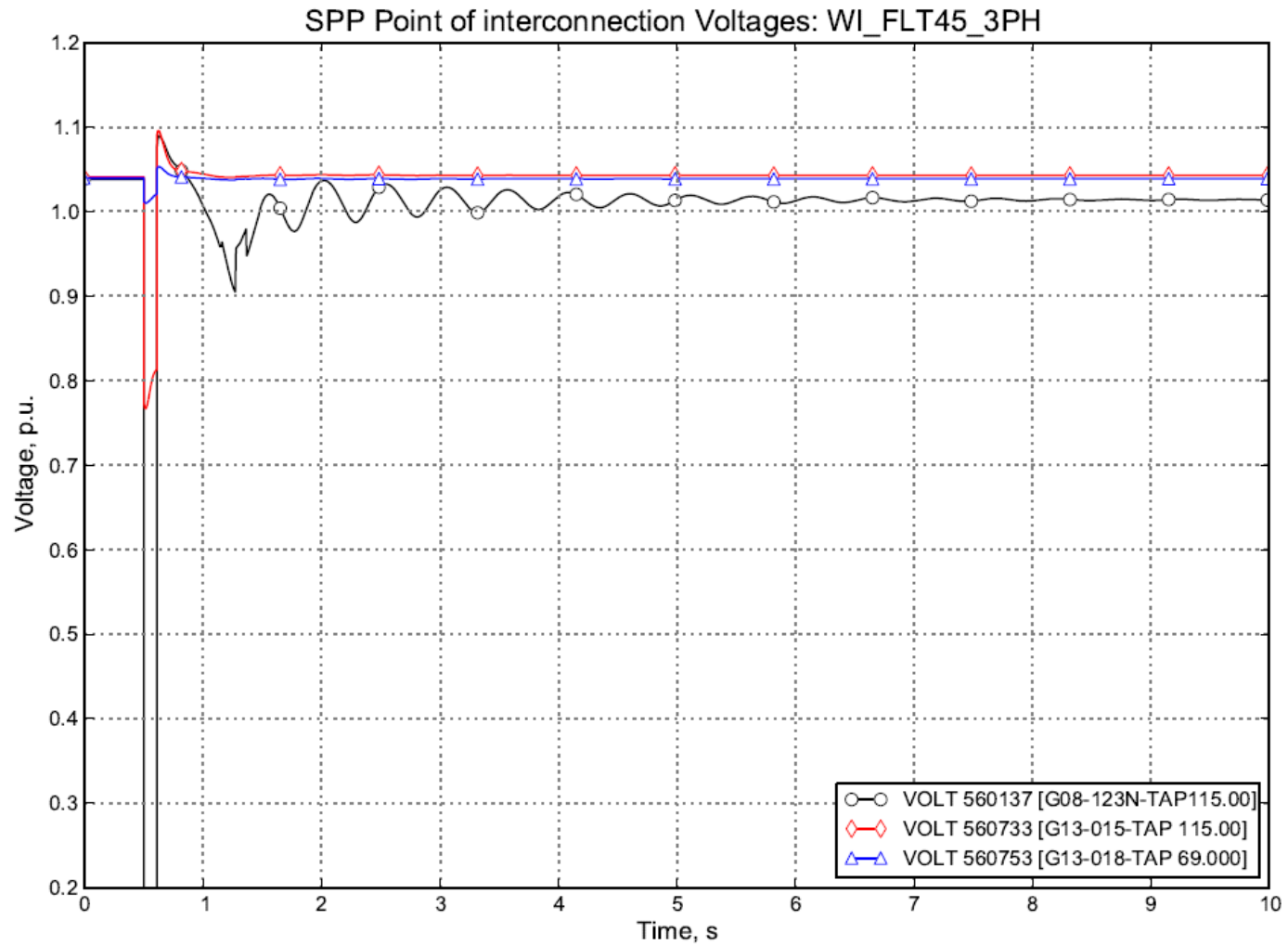


Figure 3-3. Response of select bus voltages during Contingency #45 (FLT45-3PH) for 2014 winter peak conditions.

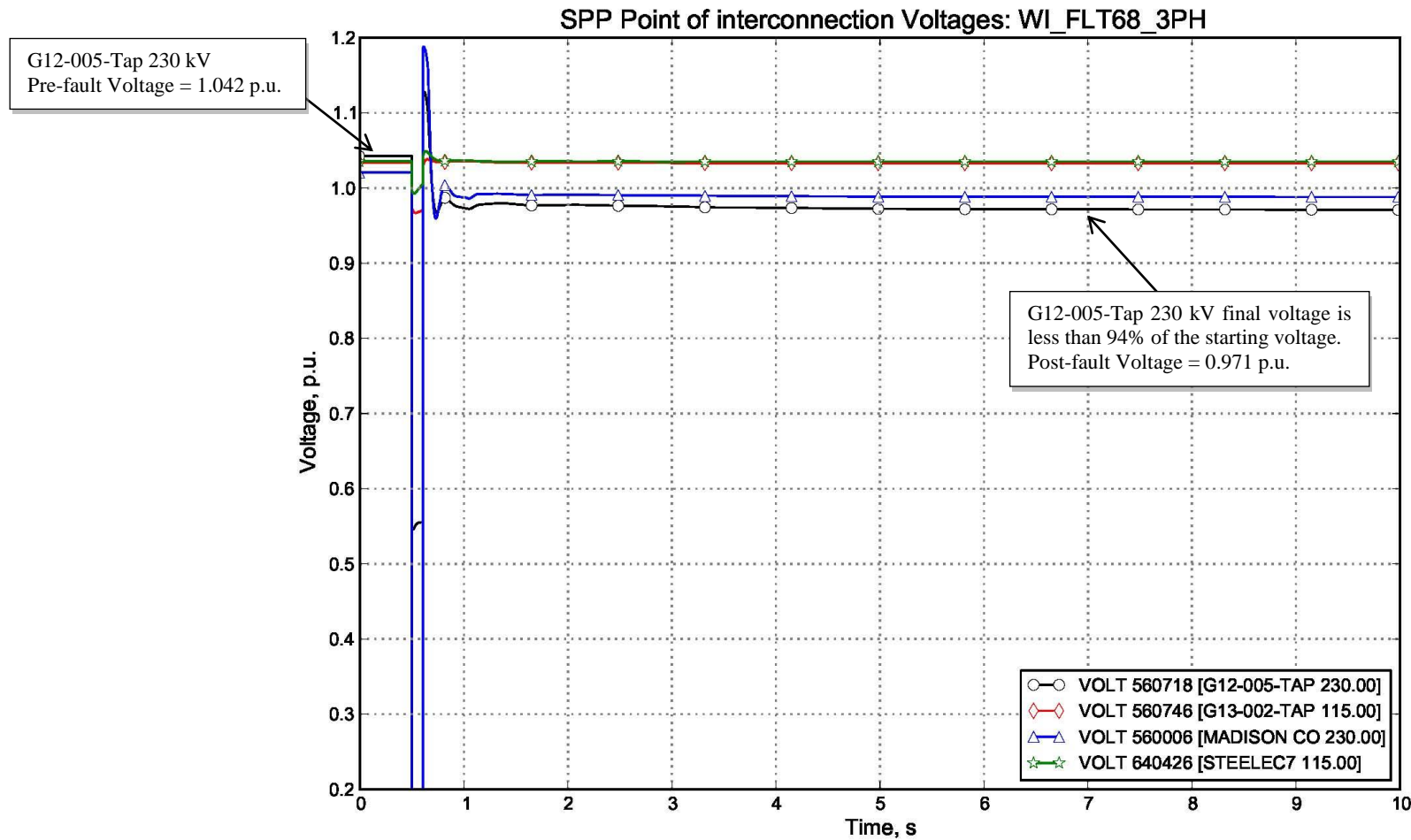


Figure 3-4. Response of select bus voltages during Contingency #68 (FLT68-3PH) for 2014 winter peak conditions.

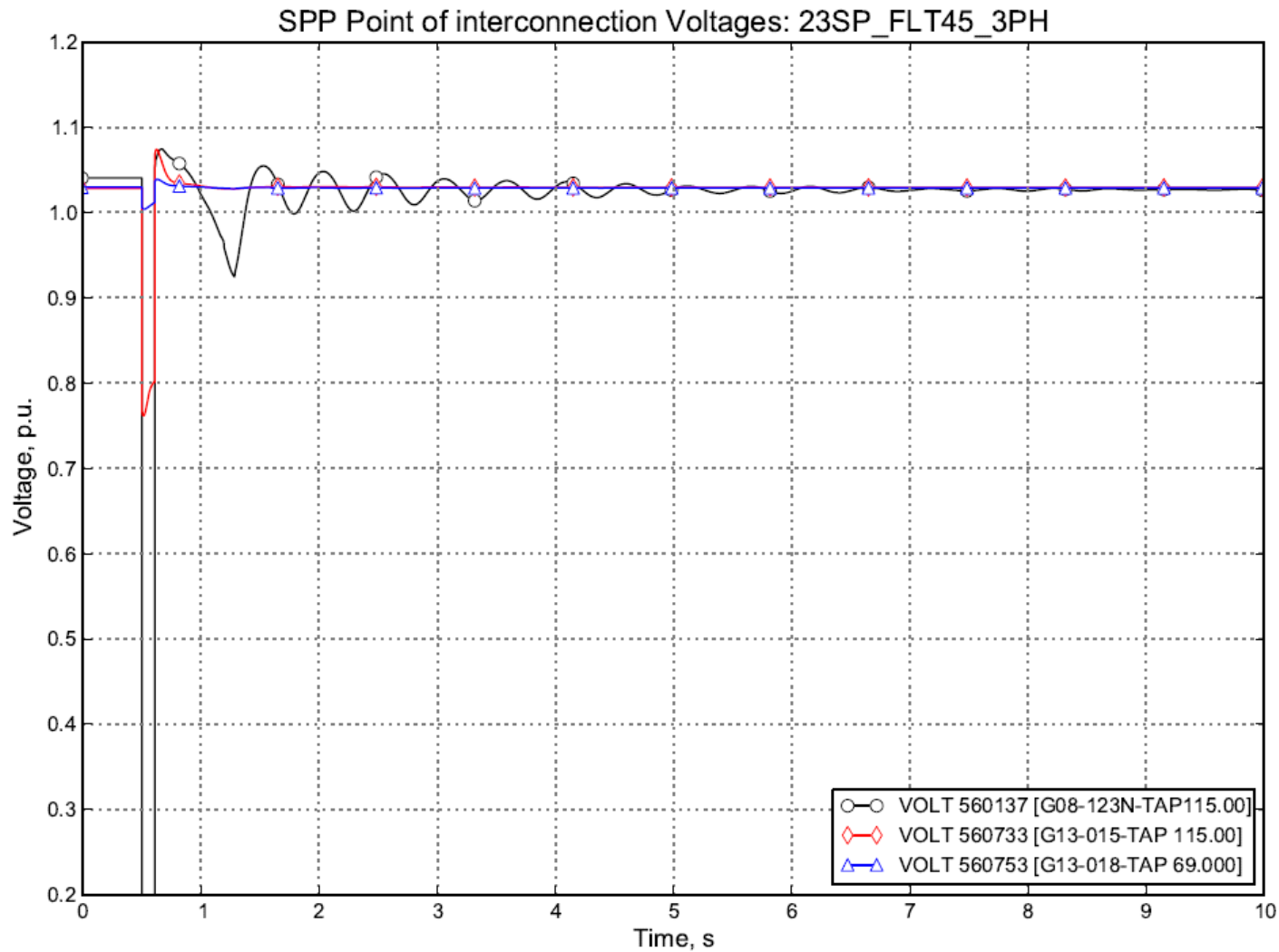


Figure 3-5. Response of select bus voltages during Contingency #45 (FLT45-3PH) for 2023 summer peak conditions.

SPP Point of interconnection Voltages: 23SP_FLT68_3PH

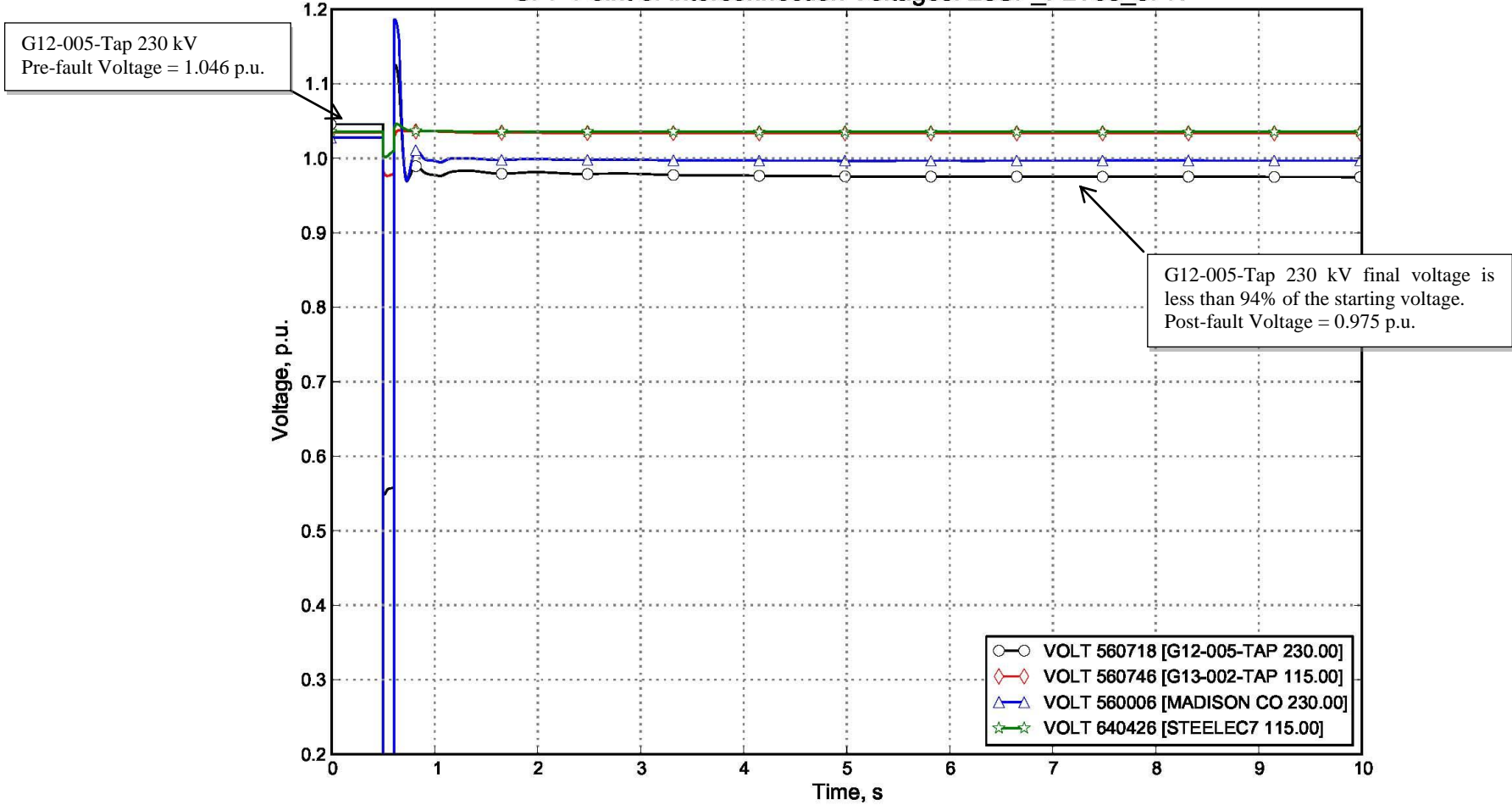


Figure 3-6. Response of select bus voltages during Contingency #68 (FLT68-3PH) for 2023 summer peak conditions.

SECTION 4: POWER FACTOR ANALYSIS

The objective of this task is to quantify the power factor at the point of interconnection for the wind farms during base case and system contingencies. SPP transmission planning practice requires interconnecting generation projects to maintain the power factor (pf) at the Point of Interconnection (POI) near unity for system intact conditions and within +/- 0.95 pf for post-contingency conditions. This is analyzed by having the wind farm maintain a prescribed voltage schedule at the point of interconnection of 1.0 p.u. voltage, or if the pre-project voltage is higher than 1.0 p.u., to maintain the pre-project voltage schedule.

The 2014 winter, 2014 summer, and 2023 summer peak power flows provided by SPP were examined prior to the Power Factor Analysis to ensure they contained the proposed study project modeled at 100% of the nameplate rating and any previously queued projects listed in Table 2-2. There was no suspect power flow data in the study area. The proposed study project and any previously queued projects at the same point of interconnection were turned off during the power factor analysis. The wind farm(s) were then replaced by a generator modeled at the high side bus with the same real power (MW) capability as the wind farm(s) and open limits for the reactive power set points (Mvar). The generator was set to hold the POI scheduled bus voltage. Contingencies from the three-phase fault definitions provided in Table 2-3 were then applied and the reactive power required to maintain the bus voltage was recorded.

4.1 Study Project – GEN-2012-005

Approach

GEN-2012-005 was disabled and a generator was placed at the study project's point of interconnect bus. The generator was modeled with $P_{GEN} = 81$ MW, $Q_{Min} = -9999$ Mvar, and $Q_{Max} = 9999$ Mvar. All buses and transformers connected from the study project's POI bus to the GEN-2012-005 generator were disabled. The pre-project voltage at the POI (Tap Fort Randall to Columbus 230 kV- Bus 560718) for the 2014 summer peak conditions is 1.040 p.u., for the 2014 winter peak conditions is 1.042 p.u., and for the 2023 summer peak conditions is 1.045 p.u. Therefore, the scheduled voltage for the POI was set accordingly for each of the three cases.

Results

The power factor was calculated for 2014 summer, 2014 winter, and 2023 summer peak conditions. Table 4-1 shows the power factor results for GEN-2012-005. Note that a positive Q (Mvar) output illustrates that the generator is absorbing reactive power from the system, implying a leading power factor; a negative Q (Mvar) illustrates that the generator is supplying reactive power to the system, implying a lagging power factor.

Table 4-1
Power Factor Analysis: GEN-2012-005 ($P_{GEN}=81$ MW)*

Power Factor Analysis									
Power Factor Analysis: GEN-2012-005 ($P_{gen}=81.0$)									
Case	2014 Summer Peak			2014 Winter Peak			2023 Summer Peak		
	Power Factor		Q**(MVAR)	Power Factor		Q**(MVAR)	Power Factor		Q**(MVAR)
Base	0.9821	Leading	15.52	0.9933	Leading	9.41	0.9946	Leading	8.43
FLT01-3PH	0.9826	Leading	15.33	0.9935	Leading	9.26	0.9948	Leading	8.32
FLT02-3PH	0.9829	Leading	15.15	0.9937	Leading	9.10	0.9949	Leading	8.20
FLT03-3PH	0.9825	Leading	15.35	0.9936	Leading	9.24	0.9948	Leading	8.28
FLT04-3PH	0.9822	Leading	15.47	0.9934	Leading	9.37	0.9947	Leading	8.40
FLT05-3PH	0.9821	Leading	15.53	0.9933	Leading	9.42	0.9946	Leading	8.47
FLT06-3PH	0.9817	Leading	15.71	0.9931	Leading	9.55	0.9944	Leading	8.59
FLT07-3PH	0.9828	Leading	15.21	0.9936	Leading	9.19	0.9950	Leading	8.10
FLT08-3PH	0.9823	Leading	15.46	0.9934	Leading	9.33	0.9946	Leading	8.46
FLT09-3PH	0.9821	Leading	15.52	0.9933	Leading	9.41	0.9946	Leading	8.43
FLT10-3PH	0.9822	Leading	15.48	0.9934	Leading	9.33	0.9947	Leading	8.41
FLT11-3PH	0.9822	Leading	15.50	0.9934	Leading	9.35	0.9947	Leading	8.40
FLT12-3PH	0.9822	Leading	15.50	0.9934	Leading	9.35	0.9947	Leading	8.40
FLT13-3PH	0.9825	Leading	15.35	0.9933	Leading	9.43	0.9947	Leading	8.36
FLT14-3PH	0.9822	Leading	15.50	0.9933	Leading	9.41	0.9946	Leading	8.42
FLT15-3PH	0.9821	Leading	15.52	0.9934	Leading	9.36	0.9946	Leading	8.42
FLT16-3PH	0.9821	Leading	15.53	0.9933	Leading	9.42	0.9946	Leading	8.43
FLT17-3PH	0.9821	Leading	15.52	0.9933	Leading	9.42	0.9946	Leading	8.43
FLT18-3PH	0.9821	Leading	15.54	0.9933	Leading	9.41	0.9946	Leading	8.43
FLT19-3PH	0.9821	Leading	15.55	0.9933	Leading	9.42	0.9946	Leading	8.45
FLT20-3PH	0.9821	Leading	15.52	0.9933	Leading	9.41	0.9946	Leading	8.43
FLT21-3PH	0.9821	Leading	15.52	0.9933	Leading	9.40	0.9946	Leading	8.43
FLT22-3PH	0.9822	Leading	15.48	0.9934	Leading	9.38	0.9947	Leading	8.39
FLT23-3PH	0.9822	Leading	15.49	0.9934	Leading	9.39	0.9947	Leading	8.39
FLT24-3PH	0.9822	Leading	15.51	0.9933	Leading	9.40	0.9946	Leading	8.42
FLT25-3PH	0.9821	Leading	15.52	0.9933	Leading	9.41	0.9946	Leading	8.42
FLT26-3PH	0.9822	Leading	15.49	0.9933	Leading	9.39	0.9946	Leading	8.42
FLT27-3PH	0.9823	Leading	15.46	0.9934	Leading	9.37	0.9946	Leading	8.42
FLT28-3PH	0.9830	Leading	15.11	0.9941	Leading	8.86	0.9953	Leading	7.87
FLT29-3PH	0.9848	Leading	14.29	0.9956	Leading	7.60	0.9961	Leading	7.20
FLT30-3PH	0.9850	Leading	14.21	0.9958	Leading	7.49	0.9961	Leading	7.21
FLT31-3PH	0.9838	Leading	14.77	0.9943	Leading	8.67	0.9959	Leading	7.40
FLT32-3PH	0.9828	Leading	15.23	0.9940	Leading	8.92	0.9949	Leading	8.23
FLT33-3PH	0.9825	Leading	15.34	0.9937	Leading	9.14	0.9949	Leading	8.23
FLT34-3PH	0.9873	Leading	13.02	0.9977	Leading	5.46	0.9961	Leading	7.17
FLT35-3PH	0.9847	Leading	14.33	0.9946	Leading	8.48	0.9959	Leading	7.38

*The scheduled voltage for the POI (Tap Fort Randall to Columbus 230 kV) was 1.040 p.u. for 2014 summer peak conditions, 1.042 p.u. for 2014 winter peak conditions, and 1.045 p.u. for 2023 summer peak conditions.

**A positive Q (Mvar) output illustrates the generator is absorbing Mvars from the system, which implies a leading power factor; negative Q (Mvar) output shows the generator is supplying Mvars to the system implying a lagging power factor.

Table 4-1 (Continued)
Power Factor Analysis: GEN-2012-005 ($P_{GEN}=81$ MW)

Power Factor Analysis									
Power Factor Analysis: GEN-2012-005 ($P_{gen}=81.0$)									
Case	2014 Summer Peak			2014 Winter Peak			2023 Summer Peak		
	Power Factor		Q**(MVAR)	Power Factor		Q**(MVAR)	Power Factor		Q**(MVAR)
FLT36-3PH	0.9833	Leading	14.99	0.9941	Leading	8.85	0.9953	Leading	7.90
FLT37-3PH	0.9808	Leading	16.09	0.9928	Leading	9.80	0.9940	Leading	8.89
FLT38-3PH	0.9836	Leading	14.86	0.9944	Leading	8.62	0.9954	Leading	7.81
FLT39-3PH	0.9822	Leading	15.48	0.9938	Leading	9.03	0.9949	Leading	8.24
FLT40-3PH	0.9853	Leading	14.04	0.9954	Leading	7.82	0.9960	Leading	7.23
FLT41-3PH	0.9845	Leading	14.42	0.9940	Leading	8.91	0.9962	Leading	7.11
FLT42-3PH	0.9861	Leading	13.66	0.9963	Leading	6.99	0.9968	Leading	6.52
FLT43-3PH	0.9905	Leading	11.27	0.9955	Leading	7.68	0.9963	Leading	7.00
FLT44-3PH	0.9827	Leading	15.28	0.9936	Leading	9.20	0.9949	Leading	8.20
FLT45-3PH	0.9821	Leading	15.54	0.9933	Leading	9.46	0.9946	Leading	8.42
FLT46-3PH	0.9821	Leading	15.54	0.9933	Leading	9.44	0.9946	Leading	8.48
FLT47-3PH	0.9821	Leading	15.52	0.9933	Leading	9.41	0.9946	Leading	8.43
FLT48-3PH	0.9826	Leading	15.33	0.9937	Leading	9.17	0.9947	Leading	8.37
FLT49-3PH	0.9822	Leading	15.51	0.9933	Leading	9.42	0.9946	Leading	8.42
FLT50-3PH	0.9824	Leading	15.42	0.9934	Leading	9.36	0.9948	Leading	8.28
FLT51-3PH	0.9821	Leading	15.52	0.9933	Leading	9.41	0.9946	Leading	8.49
FLT52-3PH	0.9823	Leading	15.46	0.9934	Leading	9.35	0.9946	Leading	8.42
FLT53-3PH	0.9823	Leading	15.45	0.9934	Leading	9.33	0.9948	Leading	8.31
FLT54-3PH	0.9821	Leading	15.53	0.9933	Leading	9.41	0.9946	Leading	8.43
FLT55-3PH	0.9821	Leading	15.52	0.9933	Leading	9.43	0.9946	Leading	8.42
FLT56-3PH	0.9822	Leading	15.50	0.9934	Leading	9.38	0.9946	Leading	8.42
FLT57-3PH	0.9819	Leading	15.60	0.9933	Leading	9.44	0.9946	Leading	8.45
FLT58-3PH	0.9823	Leading	15.43	0.9933	Leading	9.41	0.9947	Leading	8.37
FLT59-3PH	0.9823	Leading	15.45	0.9933	Leading	9.39	0.9947	Leading	8.39
FLT60-3PH	0.9827	Leading	15.27	0.9936	Leading	9.22	0.9949	Leading	8.18
FLT61-3PH	0.9823	Leading	15.43	0.9932	Leading	9.47	0.9947	Leading	8.38
FLT62-3PH	0.9997	Lagging	-2.03	0.9955	Lagging	-7.69	0.9998	Lagging	-1.74
FLT63-3PH	0.9558	Leading	24.91	0.9663	Leading	21.56	0.9798	Leading	16.53
FLT64-3PH	0.9799	Leading	16.50	0.9928	Leading	9.76	0.9939	Leading	8.97
FLT65-3PH	0.9802	Leading	16.36	0.9929	Leading	9.72	0.9941	Leading	8.85
FLT66-3PH	0.9923	Leading	10.10	0.9971	Leading	6.14	0.9987	Leading	4.17
FLT67-3PH	0.9898	Leading	11.64	0.9961	Leading	7.16	0.9976	Leading	5.60
FLT68-3PH	0.6473	Lagging	-95.38	0.6630	Lagging	-91.46	0.6573	Lagging	-92.86
FLT69-3PH	0.9760	Leading	18.09	0.9890	Leading	12.09	0.9915	Leading	10.62
FLT70-3PH	0.9840	Leading	14.68	0.9953	Leading	7.86	0.9945	Leading	8.57
FLT71-3PH	0.9915	Leading	10.60	0.9996	Leading	2.35	0.9997	Leading	1.92
FLT72-3PH	0.9874	Leading	13.01	0.9971	Leading	6.17	0.9965	Leading	6.76
FLT73-3PH	0.9823	Leading	15.46	0.9935	Leading	9.30	0.9947	Leading	8.38
FLT74-3PH	0.9820	Leading	15.56	0.9933	Leading	9.43	0.9946	Leading	8.47
FLT75-3PH	0.9821	Leading	15.53	0.9933	Leading	9.42	0.9946	Leading	8.43

Table 4-1 (Continued)
Power Factor Analysis: GEN-2012-005 ($P_{GEN}=81$ MW)

Power Factor Analysis									
Power Factor Analysis: GEN-2012-005 ($P_{gen}=81.0$)									
Case	2014 Summer Peak			2014 Winter Peak			2023 Summer Peak		
	Power Factor		Q**(MVAR)	Power Factor		Q**(MVAR)	Power Factor		Q**(MVAR)
FLT76-3PH	0.9822	Leading	15.51	0.9933	Leading	9.39	0.9947	Leading	8.41
FLT77-3PH	0.9822	Leading	15.50	0.9934	Leading	9.38	0.9947	Leading	8.40
FLT78-3PH	0.9821	Leading	15.53	0.9933	Leading	9.41	0.9946	Leading	8.44
FLT79-3PH	0.9822	Leading	15.48	0.9934	Leading	9.33	0.9947	Leading	8.40
FLT80-3PH	0.9802	Leading	16.34	0.9920	Leading	10.28	0.9940	Leading	8.90
FLT81-3PH	0.9822	Leading	15.51	0.9934	Leading	9.38	0.9946	Leading	8.42
FLT82-3PH	0.9821	Leading	15.55	0.9933	Leading	9.44	0.9946	Leading	8.45
FLT83-3PH	0.9822	Leading	15.51	0.9933	Leading	9.39	0.9946	Leading	8.42
FLT84-3PH	0.9819	Leading	15.64	0.9932	Leading	9.49	0.9945	Leading	8.50
FLT85-3PH	0.9822	Leading	15.50	0.9936	Leading	9.23	0.9946	Leading	8.42
FLT86-3PH	0.9928	Leading	9.76	0.9936	Leading	9.20	0.9993	Leading	3.08
FLT87-3PH	0.9824	Leading	15.39	0.9934	Leading	9.34	0.9948	Leading	8.31
FLT88-3PH	0.9811	Leading	15.99	0.9930	Leading	9.62	0.9941	Leading	8.86
FLT89-3PH	0.9826	Leading	15.30	0.9934	Leading	9.34	0.9949	Leading	8.24
FLT90-3PH	0.9832	Leading	15.02	0.9917	Leading	10.47	0.9938	Leading	9.04
FLT91-3PH	0.9755	Leading	18.27	0.9887	Leading	12.27	0.9912	Leading	10.80
FLT92-3PH	0.9912	Leading	10.84	0.9995	Leading	2.59	0.9996	Leading	2.16
FLT93-3PH	0.9818	Leading	15.65	0.9932	Leading	9.51	0.9945	Leading	8.53
FLT94-3PH	0.9822	Leading	15.51	0.9933	Leading	9.40	0.9947	Leading	8.41

Summary

The Power Factor Analysis shows that GEN-2012-005 has a power factor range of 0.9558 leading (absorbing) to 0.6473 lagging (supplying) for 2014 summer peak conditions, a power factor range of 0.9663 leading (absorbing) to 0.6630 lagging (supplying) for 2014 winter peak conditions, and a power factor range of 0.9798 leading (absorbing) to 0.6573 lagging (supplying) for 2023 summer peak conditions.

4.2 Study Project – GEN-2013-002

Approach

GEN-2013-002 was disabled and a generator was placed at the study project's point of interconnect bus. The generator was modeled with $P_{GEN} = 50.6$ MW, $Q_{Min} = -9999$ Mvar, and $Q_{Max} = 9999$ Mvar. All buses and transformers connected from the study project's POI bus to the GEN-2013-002 generator were disabled. The pre-project voltage at the POI (Tap Sheldon to Folsom 115 kV - Bus 560746) for the 2014 summer peak conditions is 1.031 p.u., for the 2014 winter peak conditions is 1.034 p.u., and for the 2023 summer peak conditions is 1.034 p.u. Therefore, the scheduled voltage for the POI was set accordingly for each of the three cases.

Results

The power factor was calculated for 2014 summer, 2014 winter, and 2023 summer peak conditions. Table 4-2 shows the power factor results for GEN-2013-002. Note that a positive Q (Mvar) output illustrates that the generator is absorbing reactive power from the system, implying a leading power factor; a negative Q (Mvar) illustrates that the generator is supplying reactive power to the system, implying a lagging power factor.

Table 4-2
Power Factor Analysis: GEN-2013-002 ($P_{GEN}=50.6$ MW)*

Power Factor Analysis									
Power Factor Analysis: GEN-2013-002 ($P_{gen}=50.6$)									
Case	2014 Summer Peak			2014 Winter Peak			2023 Summer Peak		
	Power Factor		Q**(MVAR)	Power Factor		Q**(MVAR)	Power Factor		Q**(MVAR)
Base	0.9827	Leading	9.52	0.9924	Leading	6.28	0.9897	Leading	7.31
FLT01-3PH	0.9610	Lagging	-14.56	0.9851	Lagging	-8.84	0.9933	Lagging	-5.89
FLT02-3PH	0.9212	Leading	21.37	0.9623	Leading	14.29	0.9669	Leading	13.35
FLT03-3PH	0.9998	Leading	0.91	0.9998	Lagging	-1.08	0.9999	Leading	0.59
FLT04-3PH	0.9830	Leading	9.46	0.9897	Leading	7.32	0.9853	Leading	8.77
FLT05-3PH	0.9688	Leading	12.95	0.9551	Leading	15.69	0.9679	Leading	13.13
FLT06-3PH	0.8678	Leading	28.98	0.9162	Leading	22.14	0.8986	Leading	24.71
FLT07-3PH	0.9612	Leading	14.52	0.9814	Leading	9.90	0.9668	Leading	13.37
FLT08-3PH	0.9747	Leading	11.61	0.9874	Leading	8.11	0.9974	Leading	3.64
FLT09-3PH	0.9861	Leading	8.53	0.9941	Leading	5.52	0.9920	Leading	6.44
FLT10-3PH	0.9874	Leading	8.11	0.9920	Leading	6.45	0.9904	Leading	7.06
FLT11-3PH	0.9993	Leading	1.92	0.9999	Leading	0.10	0.9999	Leading	0.78
FLT12-3PH	0.9990	Leading	2.22	0.9999	Leading	0.53	0.9998	Leading	1.07
FLT13-3PH	0.9988	Leading	2.46	0.9984	Leading	2.84	0.9997	Leading	1.28
FLT14-3PH	0.9843	Leading	9.06	0.9906	Leading	6.99	0.9893	Leading	7.47
FLT15-3PH	0.9984	Leading	2.91	1.0000	Leading	0.20	0.9991	Leading	2.10
FLT16-3PH	0.9887	Leading	7.67	0.9971	Leading	3.86	0.9936	Leading	5.73
FLT17-3PH	0.9823	Leading	9.66	0.9913	Leading	6.73	0.9883	Leading	7.82
FLT18-3PH	0.9862	Leading	8.51	0.9948	Leading	5.17	0.9913	Leading	6.70
FLT19-3PH	0.9955	Leading	4.81	0.9961	Leading	4.49	0.9983	Leading	2.93
FLT20-3PH	0.9832	Leading	9.40	0.9925	Leading	6.24	0.9900	Leading	7.21
FLT21-3PH	0.9830	Leading	9.46	0.9924	Leading	6.27	0.9899	Leading	7.25
FLT22-3PH	0.9815	Leading	9.87	0.9911	Leading	6.78	0.9880	Leading	7.92
FLT23-3PH	0.9823	Leading	9.64	0.9915	Leading	6.64	0.9887	Leading	7.67
FLT24-3PH	0.9801	Leading	10.24	0.9918	Leading	6.52	0.9877	Leading	8.01
FLT25-3PH	0.9840	Leading	9.17	0.9936	Leading	5.77	0.9907	Leading	6.95
FLT26-3PH	0.9856	Leading	8.68	0.9941	Leading	5.53	0.9944	Leading	5.39
FLT27-3PH	0.9754	Leading	11.44	0.9898	Leading	7.29	0.9913	Leading	6.72
FLT28-3PH	0.9999	Leading	0.71	0.9990	Lagging	-2.29	0.9980	Lagging	-3.18
FLT29-3PH	0.9992	Leading	1.90	0.9914	Lagging	-6.70	0.9986	Leading	2.60
FLT30-3PH	0.9996	Lagging	-1.51	0.9929	Lagging	-6.05	0.9965	Lagging	-4.26
FLT31-3PH	0.9947	Leading	5.22	0.9995	Leading	1.52	0.9988	Leading	2.52
FLT32-3PH	0.9967	Leading	4.10	1.0000	Lagging	-0.13	0.9973	Leading	3.70
FLT33-3PH	0.9950	Leading	5.07	0.9995	Leading	1.60	0.9982	Leading	3.03
FLT34-3PH	0.9985	Leading	2.82	0.9990	Leading	2.24	0.9985	Lagging	-2.77
FLT35-3PH	0.9909	Lagging	-6.88	0.9889	Lagging	-7.59	0.9867	Lagging	-8.33

*The scheduled voltage for the POI (Tap Sheldon to Folsom 115 kV) was 1.031 p.u. for 2014 summer peak conditions, 1.034 p.u. for 2014 winter peak conditions, and 1.034 p.u. for 2023 summer peak conditions.

**A positive Q (Mvar) output illustrates the generator is absorbing Mvars from the system, which implies a leading power factor; negative Q (Mvar) output shows the generator is supplying Mvars to the system implying a lagging power factor.

Table 4-2 (Continued)
Power Factor Analysis: GEN-2013-002 (P_{GEN}=50.6 MW)

Power Factor Analysis									
Power Factor Analysis: GEN-2013-002 (P _{GEN} =50.6)									
Case	2014 Summer Peak			2014 Winter Peak			2023 Summer Peak		
	Power Factor		Q**(MVAR)	Power Factor		Q**(MVAR)	Power Factor		Q**(MVAR)
FLT36-3PH	0.9967	Leading	4.11	0.9998	Leading	0.88	0.9993	Leading	1.85
FLT37-3PH	0.9633	Leading	14.10	0.9732	Leading	11.96	0.9757	Leading	11.35
FLT38-3PH	0.9939	Leading	5.60	0.9992	Leading	2.06	0.9977	Leading	3.41
FLT39-3PH	0.9867	Leading	8.34	0.9975	Leading	3.57	0.9941	Leading	5.53
FLT40-3PH	0.9977	Leading	3.42	1.0000	Leading	0.41	0.9986	Leading	2.68
FLT41-3PH	0.9969	Leading	3.99	0.9995	Leading	1.68	0.9995	Leading	1.65
FLT42-3PH	0.9923	Leading	6.33	0.9993	Leading	1.89	0.9917	Leading	6.57
FLT43-3PH	0.9925	Leading	6.24	0.9993	Leading	1.95	0.9858	Leading	8.62
FLT44-3PH	0.9792	Leading	10.48	0.9878	Leading	7.98	0.9855	Leading	8.70
FLT45-3PH	0.9980	Leading	3.20	1.0000	Lagging	-0.25	0.9995	Leading	1.68
FLT46-3PH	0.9875	Leading	8.07	0.9942	Leading	5.48	0.9939	Leading	5.61
FLT47-3PH	0.9827	Leading	9.52	0.9924	Leading	6.28	0.9897	Leading	7.31
FLT48-3PH	0.9834	Leading	9.35	0.9933	Leading	5.91	0.9881	Leading	7.87
FLT49-3PH	0.9828	Leading	9.50	0.9928	Leading	6.10	0.9897	Leading	7.31
FLT50-3PH	0.9871	Leading	8.20	0.9945	Leading	5.34	0.9937	Leading	5.71
FLT51-3PH	0.9826	Leading	9.57	0.9924	Leading	6.29	0.9886	Leading	7.72
FLT52-3PH	0.9863	Leading	8.46	0.9944	Leading	5.39	0.9913	Leading	6.73
FLT53-3PH	0.9834	Leading	9.34	0.9927	Leading	6.13	0.9909	Leading	6.89
FLT54-3PH	0.9826	Leading	9.55	0.9924	Leading	6.29	0.9897	Leading	7.32
FLT55-3PH	0.9826	Leading	9.58	0.9921	Leading	6.39	0.9898	Leading	7.30
FLT56-3PH	0.9828	Leading	9.50	0.9926	Leading	6.18	0.9897	Leading	7.32
FLT57-3PH	0.9816	Leading	9.83	0.9921	Leading	6.41	0.9897	Leading	7.33
FLT58-3PH	0.9831	Leading	9.42	0.9926	Leading	6.18	0.9895	Leading	7.40
FLT59-3PH	0.9831	Leading	9.42	0.9925	Leading	6.21	0.9898	Leading	7.29
FLT60-3PH	0.9863	Leading	8.47	0.9879	Leading	7.94	0.9905	Leading	7.03
FLT61-3PH	0.9867	Leading	8.35	0.9938	Leading	5.65	0.9921	Leading	6.39
FLT62-3PH	0.9859	Leading	8.59	0.9962	Leading	4.45	0.9921	Leading	6.39
FLT63-3PH	0.9851	Leading	8.83	0.9954	Leading	4.88	0.9916	Leading	6.59
FLT64-3PH	0.9834	Leading	9.33	0.9928	Leading	6.11	0.9900	Leading	7.20
FLT65-3PH	0.9833	Leading	9.36	0.9927	Leading	6.15	0.9899	Leading	7.23
FLT66-3PH	0.9895	Leading	7.37	0.9966	Leading	4.18	0.9940	Leading	5.59
FLT67-3PH	0.9892	Leading	7.50	0.9962	Leading	4.39	0.9934	Leading	5.82
FLT68-3PH	0.9923	Leading	6.31	0.9981	Leading	3.12	0.9973	Leading	3.72
FLT69-3PH	0.9872	Leading	8.17	0.9955	Leading	4.84	0.9931	Leading	5.99
FLT70-3PH	0.9824	Leading	9.61	0.9930	Leading	6.01	0.9897	Leading	7.31
FLT71-3PH	0.9832	Leading	9.40	0.9933	Leading	5.90	0.9882	Leading	7.83
FLT72-3PH	0.9878	Leading	7.96	0.9974	Leading	3.69	0.9938	Leading	5.65
FLT73-3PH	0.9944	Leading	5.37	0.9995	Leading	1.60	0.9965	Leading	4.25
FLT74-3PH	0.9657	Leading	13.60	0.9845	Leading	9.02	0.9744	Leading	11.67
FLT75-3PH	0.9704	Leading	12.60	0.9849	Leading	8.89	0.9837	Leading	9.26

Table 4-2 (Continued)
Power Factor Analysis: GEN-2013-002 ($P_{GEN}=50.6$ MW)

Power Factor Analysis									
Power Factor Analysis: GEN-2013-002 ($P_{GEN}=50.6$)									
Case	2014 Summer Peak			2014 Winter Peak			2023 Summer Peak		
	Power Factor		Q**(MVAR)	Power Factor		Q**(MVAR)	Power Factor		Q**(MVAR)
FLT76-3PH	0.9852	Leading	8.79	0.9938	Leading	5.66	0.9921	Leading	6.39
FLT77-3PH	0.9868	Leading	8.31	0.9952	Leading	4.99	0.9927	Leading	6.14
FLT78-3PH	0.9820	Leading	9.74	0.9923	Leading	6.32	0.9882	Leading	7.85
FLT79-3PH	0.9926	Leading	6.21	0.9987	Leading	2.56	0.9954	Leading	4.87
FLT80-3PH	0.8011	Lagging	-37.80	0.7935	Lagging	-38.80	0.8268	Lagging	-34.43
FLT81-3PH	0.9970	Leading	3.96	0.9989	Leading	2.30	0.9983	Leading	2.93
FLT82-3PH	0.9821	Leading	9.69	0.9915	Leading	6.64	0.9891	Leading	7.54
FLT83-3PH	0.9841	Leading	9.14	0.9935	Leading	5.80	0.9900	Leading	7.23
FLT84-3PH	0.9944	Lagging	-5.36	0.9968	Lagging	-4.04	0.9999	Leading	0.80
FLT85-3PH	0.9767	Leading	11.13	0.9891	Leading	7.53	0.9845	Leading	9.01
FLT86-3PH	0.9816	Leading	9.83	0.9916	Leading	6.60	0.9891	Leading	7.50
FLT87-3PH	0.9835	Leading	9.31	0.9925	Leading	6.23	0.9901	Leading	7.16
FLT88-3PH	0.9807	Leading	10.09	0.9928	Leading	6.10	0.9882	Leading	7.83
FLT89-3PH	0.9828	Leading	9.50	0.9924	Leading	6.29	0.9898	Leading	7.27
FLT90-3PH	0.9846	Leading	8.99	0.9938	Leading	5.68	0.9914	Leading	6.69
FLT91-3PH	0.9869	Leading	8.27	0.9953	Leading	4.93	0.9928	Leading	6.09
FLT92-3PH	0.9828	Leading	9.50	0.9931	Leading	5.99	0.9880	Leading	7.92
FLT93-3PH	0.8978	Leading	24.83	0.9426	Leading	17.92	0.9290	Leading	20.16
FLT94-3PH	0.9889	Leading	7.60	0.9957	Leading	4.73	0.9954	Leading	4.86

Summary

The Power Factor Analysis shows that GEN-2013-002 has a power factor range of 0.8678 leading (absorbing) to 0.8011 lagging (supplying) for 2014 summer peak conditions, a power factor range of 0.9162 leading (absorbing) to 0.7935 lagging (supplying) for 2014 winter peak conditions, and a power factor range of 0.8986 leading (absorbing) to 0.8268 lagging (supplying) for 2023 summer peak conditions.

4.3 Study Project – GEN-2013-004

Approach

GEN-2013-004 was disabled and a generator was placed at the study project's point of interconnect bus. The generator was modeled with $P_{GEN} = 206.5$ MW, $Q_{Min} = -9999$ Mvar, and $Q_{Max} = 9999$ Mvar. All buses and transformers connected from the study project's POI bus to the GEN-2013-004 generator were disabled. The pre-project voltage at the POI (Tap Fort Randall to Columbus 230 kV - Bus 560006) for the 2014 summer peak conditions is 1.022 p.u., for the 2014 winter peak conditions is 1.020 p.u., and for the 2023 summer peak conditions is

1.032 p.u. Therefore, the scheduled voltage for the POI was set accordingly for each of the three cases.

Results

The power factor was calculated for 2014 summer, 2014 winter, and 2023 summer peak conditions. Table 4-3 shows the power factor results for GEN-2013-004. Note that a positive Q (Mvar) output illustrates that the generator is absorbing reactive power from the system, implying a leading power factor; a negative Q (Mvar) illustrates that the generator is supplying reactive power to the system, implying a lagging power factor.

Table 4-3
Power Factor Analysis: GEN-2013-004 ($P_{GEN}=206.5$ MW)*

Power Factor Analysis									
Power Factor Analysis: GEN-2013-004 (Pgen=206.5)									
Case	2014 Summer Peak			2014 Winter Peak			2023 Summer Peak		
	Power Factor		Q**(MVAR)	Power Factor		Q**(MVAR)	Power Factor		Q**(MVAR)
Base	0.9998	Leading	3.89	0.9999	Leading	2.92	0.9994	Lagging	-7.10
FLT01-3PH	0.9999	Leading	3.48	0.9999	Leading	2.59	0.9994	Lagging	-7.33
FLT02-3PH	0.9999	Leading	3.11	0.9999	Leading	2.26	0.9993	Lagging	-7.60
FLT03-3PH	0.9999	Leading	3.54	0.9999	Leading	2.56	0.9994	Lagging	-7.40
FLT04-3PH	0.9998	Leading	3.80	0.9999	Leading	2.83	0.9994	Lagging	-7.16
FLT05-3PH	0.9998	Leading	3.91	0.9999	Leading	2.95	0.9994	Lagging	-7.01
FLT06-3PH	0.9998	Leading	4.30	0.9999	Leading	3.23	0.9995	Lagging	-6.74
FLT07-3PH	0.9999	Leading	3.21	0.9999	Leading	2.45	0.9993	Lagging	-7.83
FLT08-3PH	0.9998	Leading	3.77	0.9999	Leading	2.74	0.9994	Lagging	-7.02
FLT09-3PH	0.9998	Leading	3.89	0.9999	Leading	2.93	0.9994	Lagging	-7.10
FLT10-3PH	0.9998	Leading	3.80	0.9999	Leading	2.76	0.9994	Lagging	-7.14
FLT11-3PH	0.9998	Leading	3.81	0.9999	Leading	2.80	0.9994	Lagging	-7.17
FLT12-3PH	0.9998	Leading	3.81	0.9999	Leading	2.81	0.9994	Lagging	-7.17
FLT13-3PH	0.9999	Leading	3.53	0.9999	Leading	2.97	0.9994	Lagging	-7.23
FLT14-3PH	0.9998	Leading	3.86	0.9999	Leading	2.93	0.9994	Lagging	-7.10
FLT15-3PH	0.9998	Leading	3.84	0.9999	Leading	2.82	0.9994	Lagging	-7.13
FLT16-3PH	0.9998	Leading	3.91	0.9999	Leading	2.95	0.9994	Lagging	-7.09
FLT17-3PH	0.9998	Leading	3.90	0.9999	Leading	2.94	0.9994	Lagging	-7.09
FLT18-3PH	0.9998	Leading	3.92	0.9999	Leading	2.93	0.9994	Lagging	-7.09
FLT19-3PH	0.9998	Leading	3.93	0.9999	Leading	2.95	0.9994	Lagging	-7.06
FLT20-3PH	0.9998	Leading	3.90	0.9999	Leading	2.92	0.9994	Lagging	-7.09
FLT21-3PH	0.9998	Leading	3.90	0.9999	Leading	2.91	0.9994	Lagging	-7.10
FLT22-3PH	0.9998	Leading	3.82	0.9999	Leading	2.86	0.9994	Lagging	-7.19
FLT23-3PH	0.9998	Leading	3.84	0.9999	Leading	2.87	0.9994	Lagging	-7.17
FLT24-3PH	0.9998	Leading	3.87	0.9999	Leading	2.90	0.9994	Lagging	-7.12
FLT25-3PH	0.9998	Leading	3.89	0.9999	Leading	2.92	0.9994	Lagging	-7.11
FLT26-3PH	0.9998	Leading	3.84	0.9999	Leading	2.88	0.9994	Lagging	-7.11
FLT27-3PH	0.9998	Leading	3.77	0.9999	Leading	2.84	0.9994	Lagging	-7.11
FLT28-3PH	0.9999	Leading	2.86	1.0000	Leading	1.74	0.9992	Lagging	-8.37
FLT29-3PH	1.0000	Leading	1.16	1.0000	Lagging	-1.02	0.9989	Lagging	-9.88
FLT30-3PH	1.0000	Leading	1.05	1.0000	Lagging	-1.28	0.9989	Lagging	-9.80
FLT31-3PH	0.9999	Leading	2.37	1.0000	Leading	1.29	0.9990	Lagging	-9.25
FLT32-3PH	0.9999	Leading	3.21	1.0000	Leading	1.88	0.9993	Lagging	-7.57
FLT33-3PH	0.9999	Leading	3.42	0.9999	Leading	2.34	0.9993	Lagging	-7.55
FLT34-3PH	1.0000	Lagging	-1.84	0.9996	Lagging	-5.49	0.9989	Lagging	-9.79
FLT35-3PH	1.0000	Leading	1.38	1.0000	Leading	0.90	0.9990	Lagging	-9.36

*The scheduled voltage for the POI (Tap Fort Randall to Columbus 230 kV) was 1.022 p.u. for 2014 summer peak conditions, 1.020 p.u. for 2014 winter peak conditions, and 1.032 p.u. for 2023 summer peak conditions.

**A positive Q (Mvar) output illustrates the generator is absorbing Mvars from the system, which implies a leading power factor; negative Q (Mvar) output shows the generator is supplying Mvars to the system implying a lagging power factor.

Table 4-3 (Continued)
Power Factor Analysis: GEN-2013-004 ($P_{GEN}=206.5$ MW)

Power Factor Analysis									
Power Factor Analysis: GEN-2013-004 (Pgen=206.5)									
Case	2014 Summer Peak			2014 Winter Peak			2023 Summer Peak		
	Power Factor		Q**(MVAR)	Power Factor		Q**(MVAR)	Power Factor		Q**(MVAR)
FLT36-3PH	0.9999	Leading	2.76	1.0000	Leading	1.70	0.9992	Lagging	-8.26
FLT37-3PH	0.9997	Leading	4.94	0.9998	Leading	3.83	0.9996	Lagging	-6.19
FLT38-3PH	0.9999	Leading	2.50	1.0000	Leading	1.18	0.9992	Lagging	-8.42
FLT39-3PH	0.9998	Leading	3.71	0.9999	Leading	2.11	0.9993	Lagging	-7.55
FLT40-3PH	1.0000	Leading	0.69	1.0000	Lagging	-0.55	0.9989	Lagging	-9.73
FLT41-3PH	1.0000	Leading	1.76	1.0000	Leading	1.81	0.9989	Lagging	-9.81
FLT42-3PH	1.0000	Lagging	-0.18	0.9999	Lagging	-2.37	0.9985	Lagging	-11.37
FLT43-3PH	0.9999	Lagging	-2.07	1.0000	Lagging	-0.79	0.9990	Lagging	-9.05
FLT44-3PH	0.9999	Leading	3.37	0.9999	Leading	2.46	0.9993	Lagging	-7.61
FLT45-3PH	0.9998	Leading	3.96	0.9999	Leading	3.02	0.9994	Lagging	-7.11
FLT46-3PH	0.9998	Leading	3.94	0.9999	Leading	2.99	0.9994	Lagging	-6.97
FLT47-3PH	0.9998	Leading	3.89	0.9999	Leading	2.92	0.9994	Lagging	-7.10
FLT48-3PH	0.9999	Leading	3.50	0.9999	Leading	2.39	0.9994	Lagging	-7.21
FLT49-3PH	0.9998	Leading	3.88	0.9999	Leading	2.94	0.9994	Lagging	-7.12
FLT50-3PH	0.9998	Leading	3.67	0.9999	Leading	2.81	0.9993	Lagging	-7.45
FLT51-3PH	0.9998	Leading	3.90	0.9999	Leading	2.92	0.9994	Lagging	-6.96
FLT52-3PH	0.9998	Leading	3.74	0.9999	Leading	2.80	0.9994	Lagging	-7.13
FLT53-3PH	0.9998	Leading	3.75	0.9999	Leading	2.75	0.9994	Lagging	-7.36
FLT54-3PH	0.9998	Leading	3.91	0.9999	Leading	2.93	0.9994	Lagging	-7.09
FLT55-3PH	0.9998	Leading	3.91	0.9999	Leading	2.98	0.9994	Lagging	-7.11
FLT56-3PH	0.9998	Leading	3.86	0.9999	Leading	2.86	0.9994	Lagging	-7.11
FLT57-3PH	0.9998	Leading	4.06	0.9999	Leading	3.00	0.9994	Lagging	-7.05
FLT58-3PH	0.9998	Leading	3.70	0.9999	Leading	2.92	0.9994	Lagging	-7.22
FLT59-3PH	0.9998	Leading	3.76	0.9999	Leading	2.89	0.9994	Lagging	-7.17
FLT60-3PH	0.9999	Leading	3.33	0.9999	Leading	2.51	0.9993	Lagging	-7.65
FLT61-3PH	0.9998	Leading	3.70	0.9999	Leading	3.05	0.9994	Lagging	-7.20
FLT62-3PH	0.9997	Lagging	-5.03	0.9984	Lagging	-11.76	0.9977	Lagging	-14.05
FLT63-3PH	0.9994	Lagging	-7.41	0.9976	Lagging	-14.24	0.9967	Lagging	-16.72
FLT64-3PH	0.9997	Leading	5.37	0.9998	Leading	3.85	0.9996	Lagging	-6.20
FLT65-3PH	0.9997	Leading	5.15	0.9998	Leading	3.73	0.9995	Lagging	-6.39
FLT66-3PH	0.9999	Lagging	-3.45	0.9999	Lagging	-3.02	0.9979	Lagging	-13.38
FLT67-3PH	1.0000	Lagging	-1.64	1.0000	Lagging	-1.43	0.9985	Lagging	-11.51
FLT68-3PH	0.9936	Lagging	-23.51	0.9946	Lagging	-21.46	0.9931	Lagging	-24.30
FLT69-3PH	0.9991	Leading	8.71	0.9991	Leading	8.62	0.9999	Lagging	-2.47
FLT70-3PH	1.0000	Leading	1.88	1.0000	Lagging	-0.48	0.9995	Lagging	-6.48
FLT71-3PH	0.9994	Lagging	-7.05	0.9987	Lagging	-10.53	0.9953	Lagging	-20.06
FLT72-3PH	1.0000	Lagging	-1.22	0.9998	Lagging	-3.97	0.9988	Lagging	-10.01
FLT73-3PH	0.9998	Leading	3.74	0.9999	Leading	2.69	0.9994	Lagging	-7.23
FLT74-3PH	0.9998	Leading	3.98	0.9999	Leading	2.97	0.9994	Lagging	-7.02
FLT75-3PH	0.9998	Leading	3.92	0.9999	Leading	2.95	0.9994	Lagging	-7.09

Table 4-3 (Continued)
Power Factor Analysis: GEN-2013-004 ($P_{GEN}=206.5$ MW)

Power Factor Analysis									
Power Factor Analysis: GEN-2013-004 (Pgen=206.5)									
Case	2014 Summer Peak			2014 Winter Peak			2023 Summer Peak		
	Power Factor		Q**(MVAR)	Power Factor		Q**(MVAR)	Power Factor		Q**(MVAR)
FLT76-3PH	0.9998	Leading	3.86	0.9999	Leading	2.88	0.9994	Lagging	-7.13
FLT77-3PH	0.9998	Leading	3.84	0.9999	Leading	2.85	0.9994	Lagging	-7.15
FLT78-3PH	0.9998	Leading	3.91	0.9999	Leading	2.92	0.9994	Lagging	-7.08
FLT79-3PH	0.9998	Leading	3.79	0.9999	Leading	2.75	0.9994	Lagging	-7.19
FLT80-3PH	0.9996	Leading	5.71	0.9997	Leading	4.81	0.9996	Lagging	-6.04
FLT81-3PH	0.9998	Leading	3.85	0.9999	Leading	2.86	0.9994	Lagging	-7.14
FLT82-3PH	0.9998	Leading	3.95	0.9999	Leading	2.98	0.9994	Lagging	-7.06
FLT83-3PH	0.9998	Leading	3.87	0.9999	Leading	2.89	0.9994	Lagging	-7.12
FLT84-3PH	0.9998	Leading	4.13	0.9999	Leading	3.11	0.9994	Lagging	-6.94
FLT85-3PH	0.9998	Leading	3.83	0.9999	Leading	2.53	0.9994	Lagging	-7.15
FLT86-3PH	0.9998	Leading	3.40	0.9999	Leading	2.50	0.9993	Lagging	-7.44
FLT87-3PH	0.9998	Leading	3.61	0.9999	Leading	2.77	0.9994	Lagging	-7.36
FLT88-3PH	0.9997	Leading	4.93	0.9999	Leading	3.39	0.9996	Lagging	-6.12
FLT89-3PH	0.9999	Leading	3.57	0.9999	Leading	2.77	0.9994	Lagging	-7.41
FLT90-3PH	0.9999	Leading	2.33	0.9997	Leading	5.22	0.9996	Lagging	-5.87
FLT91-3PH	0.9990	Leading	9.11	0.9990	Leading	9.01	0.9999	Lagging	-2.07
FLT92-3PH	0.9995	Lagging	-6.58	0.9988	Lagging	-10.06	0.9955	Lagging	-19.58
FLT93-3PH	0.9998	Leading	4.19	0.9999	Leading	3.14	0.9994	Lagging	-6.86
FLT94-3PH	0.9998	Leading	3.87	0.9999	Leading	2.90	0.9994	Lagging	-7.14

Summary

The Power Factor Analysis shows that GEN-2013-004 has a power factor range of 0.9990 leading (absorbing) to 0.9936 lagging (supplying) for 2014 summer peak conditions, a power factor range of 0.9990 leading (absorbing) to 0.9976 lagging (supplying) for 2014 winter peak conditions, and a power factor range of 0.9931 lagging (supplying) to 0.9999 lagging (supplying) for 2023 summer peak conditions.

4.4 Study Project – GEN-2013-005

Approach

GEN-2013-005 was disabled and a generator was placed at the study project's point of interconnect bus. The generator was modeled with $P_{GEN} = 73.5$ MW, $Q_{Min} = -9999$ Mvar, and $Q_{Max} = 9999$ Mvar. All buses and transformers connected from the study project's POI bus to the GEN-2013-005 generator were disabled. The pre-project voltage at the POI (Tap Fort Randall to Columbus 230 kV - Bus 560006) for the 2014 summer peak conditions is 1.022 p.u., for the 2014 winter peak conditions is 1.020 p.u., and for the 2023 summer peak conditions is 1.032 p.u. Therefore, the scheduled voltage for the POI was set accordingly for each of the three cases.

Results

The power factor was calculated for 2014 summer, 2014 winter, and 2023 summer peak conditions. Table 4-4 shows the power factor results for GEN-2013-005. Note that a positive Q (Mvar) output illustrates that the generator is absorbing reactive power from the system, implying a leading power factor; a negative Q (Mvar) illustrates that the generator is supplying reactive power to the system, implying a lagging power factor.

Table 4-4
Power Factor Analysis: GEN-2013-005 ($P_{GEN}=73.5$ MW)*

Power Factor Analysis									
Power Factor Analysis: GEN-2013-005 (Pgen=73.5)									
Case	2014 Summer Peak			2014 Winter Peak			2023 Summer Peak		
	Power Factor		Q**(MVAR)	Power Factor		Q**(MVAR)	Power Factor		Q**(MVAR)
Base	0.9998	Leading	1.39	0.9999	Leading	1.04	0.9994	Lagging	-2.53
FLT01-3PH	0.9999	Leading	1.24	0.9999	Leading	0.92	0.9994	Lagging	-2.61
FLT02-3PH	0.9999	Leading	1.11	0.9999	Leading	0.80	0.9993	Lagging	-2.71
FLT03-3PH	0.9999	Leading	1.26	0.9999	Leading	0.91	0.9994	Lagging	-2.64
FLT04-3PH	0.9998	Leading	1.35	0.9999	Leading	1.01	0.9994	Lagging	-2.55
FLT05-3PH	0.9998	Leading	1.39	0.9999	Leading	1.05	0.9994	Lagging	-2.49
FLT06-3PH	0.9998	Leading	1.53	0.9999	Leading	1.15	0.9995	Lagging	-2.40
FLT07-3PH	0.9999	Leading	1.14	0.9999	Leading	0.87	0.9993	Lagging	-2.79
FLT08-3PH	0.9998	Leading	1.34	0.9999	Leading	0.98	0.9994	Lagging	-2.50
FLT09-3PH	0.9998	Leading	1.39	0.9999	Leading	1.04	0.9994	Lagging	-2.53
FLT10-3PH	0.9998	Leading	1.35	0.9999	Leading	0.98	0.9994	Lagging	-2.54
FLT11-3PH	0.9998	Leading	1.36	0.9999	Leading	1.00	0.9994	Lagging	-2.55
FLT12-3PH	0.9998	Leading	1.36	0.9999	Leading	1.00	0.9994	Lagging	-2.55
FLT13-3PH	0.9999	Leading	1.26	0.9999	Leading	1.06	0.9994	Lagging	-2.57
FLT14-3PH	0.9998	Leading	1.38	0.9999	Leading	1.04	0.9994	Lagging	-2.53
FLT15-3PH	0.9998	Leading	1.37	0.9999	Leading	1.00	0.9994	Lagging	-2.54
FLT16-3PH	0.9998	Leading	1.39	0.9999	Leading	1.05	0.9994	Lagging	-2.52
FLT17-3PH	0.9998	Leading	1.39	0.9999	Leading	1.05	0.9994	Lagging	-2.52
FLT18-3PH	0.9998	Leading	1.39	0.9999	Leading	1.04	0.9994	Lagging	-2.52
FLT19-3PH	0.9998	Leading	1.40	0.9999	Leading	1.05	0.9994	Lagging	-2.51
FLT20-3PH	0.9998	Leading	1.39	0.9999	Leading	1.04	0.9994	Lagging	-2.52
FLT21-3PH	0.9998	Leading	1.39	0.9999	Leading	1.04	0.9994	Lagging	-2.53
FLT22-3PH	0.9998	Leading	1.36	0.9999	Leading	1.02	0.9994	Lagging	-2.56
FLT23-3PH	0.9998	Leading	1.37	0.9999	Leading	1.02	0.9994	Lagging	-2.55
FLT24-3PH	0.9998	Leading	1.38	0.9999	Leading	1.03	0.9994	Lagging	-2.54
FLT25-3PH	0.9998	Leading	1.38	0.9999	Leading	1.04	0.9994	Lagging	-2.53
FLT26-3PH	0.9998	Leading	1.37	0.9999	Leading	1.03	0.9994	Lagging	-2.53
FLT27-3PH	0.9998	Leading	1.34	0.9999	Leading	1.01	0.9994	Lagging	-2.53
FLT28-3PH	0.9999	Leading	1.02	1.0000	Leading	0.62	0.9992	Lagging	-2.98
FLT29-3PH	1.0000	Leading	0.41	1.0000	Lagging	-0.36	0.9989	Lagging	-3.52
FLT30-3PH	1.0000	Leading	0.37	1.0000	Lagging	-0.46	0.9989	Lagging	-3.49
FLT31-3PH	0.9999	Leading	0.85	1.0000	Leading	0.46	0.9990	Lagging	-3.29
FLT32-3PH	0.9999	Leading	1.14	1.0000	Leading	0.67	0.9993	Lagging	-2.70
FLT33-3PH	0.9999	Leading	1.22	0.9999	Leading	0.83	0.9993	Lagging	-2.69
FLT34-3PH	1.0000	Lagging	-0.66	0.9996	Lagging	-1.95	0.9989	Lagging	-3.48
FLT35-3PH	1.0000	Leading	0.49	1.0000	Leading	0.32	0.9990	Lagging	-3.33

*The scheduled voltage for the POI (Tap Fort Randall to Columbus 230 kV) was 1.022 p.u. for 2014 summer peak conditions, 1.020 p.u. for 2014 winter peak conditions, and 1.032 p.u. for 2023 summer peak conditions.

**A positive Q (Mvar) output illustrates the generator is absorbing Mvars from the system, which implies a leading power factor; negative Q (Mvar) output shows the generator is supplying Mvars to the system implying a lagging power factor.

Table 4-4 (Continued)
Power Factor Analysis: GEN-2013-005 ($P_{GEN}=73.5$ MW)

Power Factor Analysis									
Power Factor Analysis: GEN-2013-005 ($P_{gen}=73.5$)									
Case	2014 Summer Peak			2014 Winter Peak			2023 Summer Peak		
	Power Factor		Q**(MVAR)	Power Factor		Q**(MVAR)	Power Factor		Q**(MVAR)
FLT36-3PH	0.9999	Leading	0.98	1.0000	Leading	0.61	0.9992	Lagging	-2.94
FLT37-3PH	0.9997	Leading	1.76	0.9998	Leading	1.36	0.9996	Lagging	-2.20
FLT38-3PH	0.9999	Leading	0.89	1.0000	Leading	0.42	0.9992	Lagging	-3.00
FLT39-3PH	0.9998	Leading	1.32	0.9999	Leading	0.75	0.9993	Lagging	-2.69
FLT40-3PH	1.0000	Leading	0.25	1.0000	Lagging	-0.20	0.9989	Lagging	-3.46
FLT41-3PH	1.0000	Leading	0.63	1.0000	Leading	0.64	0.9989	Lagging	-3.49
FLT42-3PH	1.0000	Lagging	-0.06	0.9999	Lagging	-0.84	0.9985	Lagging	-4.05
FLT43-3PH	0.9999	Lagging	-0.74	1.0000	Lagging	-0.28	0.9990	Lagging	-3.22
FLT44-3PH	0.9999	Leading	1.20	0.9999	Leading	0.88	0.9993	Lagging	-2.71
FLT45-3PH	0.9998	Leading	1.41	0.9999	Leading	1.08	0.9994	Lagging	-2.53
FLT46-3PH	0.9998	Leading	1.40	0.9999	Leading	1.06	0.9994	Lagging	-2.48
FLT47-3PH	0.9998	Leading	1.39	0.9999	Leading	1.04	0.9994	Lagging	-2.53
FLT48-3PH	0.9999	Leading	1.25	0.9999	Leading	0.85	0.9994	Lagging	-2.57
FLT49-3PH	0.9998	Leading	1.38	0.9999	Leading	1.05	0.9994	Lagging	-2.53
FLT50-3PH	0.9998	Leading	1.31	0.9999	Leading	1.00	0.9993	Lagging	-2.65
FLT51-3PH	0.9998	Leading	1.39	0.9999	Leading	1.04	0.9994	Lagging	-2.48
FLT52-3PH	0.9998	Leading	1.33	0.9999	Leading	1.00	0.9994	Lagging	-2.54
FLT53-3PH	0.9998	Leading	1.34	0.9999	Leading	0.98	0.9994	Lagging	-2.62
FLT54-3PH	0.9998	Leading	1.39	0.9999	Leading	1.04	0.9994	Lagging	-2.52
FLT55-3PH	0.9998	Leading	1.39	0.9999	Leading	1.06	0.9994	Lagging	-2.53
FLT56-3PH	0.9998	Leading	1.38	0.9999	Leading	1.02	0.9994	Lagging	-2.53
FLT57-3PH	0.9998	Leading	1.45	0.9999	Leading	1.07	0.9994	Lagging	-2.51
FLT58-3PH	0.9998	Leading	1.32	0.9999	Leading	1.04	0.9994	Lagging	-2.57
FLT59-3PH	0.9998	Leading	1.34	0.9999	Leading	1.03	0.9994	Lagging	-2.55
FLT60-3PH	0.9999	Leading	1.19	0.9999	Leading	0.89	0.9993	Lagging	-2.72
FLT61-3PH	0.9998	Leading	1.32	0.9999	Leading	1.09	0.9994	Lagging	-2.56
FLT62-3PH	0.9997	Lagging	-1.79	0.9984	Lagging	-4.19	0.9977	Lagging	-5.00
FLT63-3PH	0.9994	Lagging	-2.64	0.9976	Lagging	-5.07	0.9967	Lagging	-5.95
FLT64-3PH	0.9997	Leading	1.91	0.9998	Leading	1.37	0.9996	Lagging	-2.21
FLT65-3PH	0.9997	Leading	1.83	0.9998	Leading	1.33	0.9995	Lagging	-2.28
FLT66-3PH	0.9999	Lagging	-1.23	0.9999	Lagging	-1.08	0.9979	Lagging	-4.76
FLT67-3PH	1.0000	Lagging	-0.58	1.0000	Lagging	-0.51	0.9985	Lagging	-4.10
FLT68-3PH	0.9936	Lagging	-8.37	0.9946	Lagging	-7.64	0.9931	Lagging	-8.65
FLT69-3PH	0.9991	Leading	3.10	0.9991	Leading	3.07	0.9999	Lagging	-0.88
FLT70-3PH	1.0000	Leading	0.67	1.0000	Lagging	-0.17	0.9995	Lagging	-2.31
FLT71-3PH	0.9994	Lagging	-2.51	0.9987	Lagging	-3.75	0.9953	Lagging	-7.14
FLT72-3PH	1.0000	Lagging	-0.43	0.9998	Lagging	-1.41	0.9988	Lagging	-3.56
FLT73-3PH	0.9998	Leading	1.33	0.9999	Leading	0.96	0.9994	Lagging	-2.57
FLT74-3PH	0.9998	Leading	1.42	0.9999	Leading	1.06	0.9994	Lagging	-2.50
FLT75-3PH	0.9998	Leading	1.40	0.9999	Leading	1.05	0.9994	Lagging	-2.53

Table 4-4 (Continued)
Power Factor Analysis: GEN-2013-005 ($P_{GEN}=73.5$ MW)

Power Factor Analysis									
Power Factor Analysis: GEN-2013-005 ($P_{gen}=73.5$)									
Case	2014 Summer Peak			2014 Winter Peak			2023 Summer Peak		
	Power Factor		Q**(MVAR)	Power Factor		Q**(MVAR)	Power Factor		Q**(MVAR)
FLT76-3PH	0.9998	Leading	1.37	0.9999	Leading	1.03	0.9994	Lagging	-2.54
FLT77-3PH	0.9998	Leading	1.37	0.9999	Leading	1.01	0.9994	Lagging	-2.55
FLT78-3PH	0.9998	Leading	1.39	0.9999	Leading	1.04	0.9994	Lagging	-2.52
FLT79-3PH	0.9998	Leading	1.35	0.9999	Leading	0.98	0.9994	Lagging	-2.56
FLT80-3PH	0.9996	Leading	2.03	0.9997	Leading	1.71	0.9996	Lagging	-2.15
FLT81-3PH	0.9998	Leading	1.37	0.9999	Leading	1.02	0.9994	Lagging	-2.54
FLT82-3PH	0.9998	Leading	1.41	0.9999	Leading	1.06	0.9994	Lagging	-2.51
FLT83-3PH	0.9998	Leading	1.38	0.9999	Leading	1.03	0.9994	Lagging	-2.53
FLT84-3PH	0.9998	Leading	1.47	0.9999	Leading	1.11	0.9994	Lagging	-2.47
FLT85-3PH	0.9998	Leading	1.36	0.9999	Leading	0.90	0.9994	Lagging	-2.54
FLT86-3PH	0.9998	Leading	1.20	0.9999	Leading	0.90	0.9993	Lagging	-2.60
FLT87-3PH	0.9998	Leading	1.29	0.9999	Leading	0.99	0.9994	Lagging	-2.62
FLT88-3PH	0.9997	Leading	1.76	0.9999	Leading	1.21	0.9996	Lagging	-2.18
FLT89-3PH	0.9999	Leading	1.27	0.9999	Leading	0.98	0.9994	Lagging	-2.64
FLT90-3PH	0.9999	Leading	0.83	0.9997	Leading	1.86	0.9996	Lagging	-2.09
FLT91-3PH	0.9990	Leading	3.24	0.9990	Leading	3.21	0.9999	Lagging	-0.74
FLT92-3PH	0.9995	Lagging	-2.34	0.9988	Lagging	-3.58	0.9955	Lagging	-6.97
FLT93-3PH	0.9998	Leading	1.49	0.9999	Leading	1.12	0.9994	Lagging	-2.44
FLT94-3PH	0.9998	Leading	1.38	0.9999	Leading	1.03	0.9994	Lagging	-2.54

Summary

The Power Factor Analysis shows that GEN-2013-005 has a power factor range of 0.9990 leading (absorbing) to 0.9936 lagging (supplying) for 2014 summer peak conditions, a power factor range of 0.9990 leading (absorbing) to 0.9946 lagging (supplying) for 2014 winter peak conditions, and a power factor range of 0.9931 lagging (supplying) to 0.9999 lagging (supplying) for 2023 summer peak conditions.

4.5 Study Project – GEN-2013-006

Approach

GEN-2013-006 was disabled and a generator was placed at the study project's point of interconnect bus. The generator was modeled with $P_{GEN} = 50.6$ MW, $Q_{Min} = -9999$ Mvar, and $Q_{Max} = 9999$ Mvar. All buses and transformers connected from the study project's POI bus to the GEN-2013-006 generator were disabled. The pre-project voltage at the POI (Tap Fort Randall to Columbus 230 kV - Bus 560006) for the 2014 summer peak conditions is 1.022 p.u., for the 2014 winter peak conditions is 1.020 p.u., and for the 2023 summer peak conditions is

1.032 p.u. Therefore, the scheduled voltage for the POI was set accordingly for each of the three cases.

Results

The power factor was calculated for 2014 summer, 2014 winter, and 2023 summer peak conditions. Table 4-5 shows the power factor results for GEN-2013-006. Note that a positive Q (Mvar) output illustrates that the generator is absorbing reactive power from the system, implying a leading power factor; a negative Q (Mvar) illustrates that the generator is supplying reactive power to the system, implying a lagging power factor.

Table 4-5
Power Factor Analysis: GEN-2013-006 ($P_{GEN}=50.6$ MW)*

Power Factor Analysis									
Power Factor Analysis: GEN-2013-006 ($P_{gen}=50.6$)									
Case	2014 Summer Peak			2014 Winter Peak			2023 Summer Peak		
	Power Factor		Q**(MVAR)	Power Factor		Q**(MVAR)	Power Factor		Q**(MVAR)
Base	0.9920	Leading	6.43	0.9938	Leading	5.66	0.9988	Lagging	-2.48
FLT01-3PH	0.9928	Leading	6.10	0.9944	Leading	5.39	0.9986	Lagging	-2.66
FLT02-3PH	0.9935	Leading	5.80	0.9949	Leading	5.12	0.9984	Lagging	-2.88
FLT03-3PH	0.9927	Leading	6.14	0.9944	Leading	5.37	0.9986	Lagging	-2.72
FLT04-3PH	0.9922	Leading	6.36	0.9940	Leading	5.59	0.9988	Lagging	-2.52
FLT05-3PH	0.9920	Leading	6.44	0.9938	Leading	5.68	0.9989	Lagging	-2.40
FLT06-3PH	0.9912	Leading	6.76	0.9932	Leading	5.91	0.9991	Lagging	-2.18
FLT07-3PH	0.9933	Leading	5.88	0.9946	Leading	5.28	0.9982	Lagging	-3.06
FLT08-3PH	0.9923	Leading	6.33	0.9941	Leading	5.52	0.9989	Lagging	-2.41
FLT09-3PH	0.9920	Leading	6.43	0.9938	Leading	5.66	0.9988	Lagging	-2.48
FLT10-3PH	0.9922	Leading	6.35	0.9941	Leading	5.53	0.9988	Lagging	-2.51
FLT11-3PH	0.9922	Leading	6.36	0.9940	Leading	5.56	0.9987	Lagging	-2.53
FLT12-3PH	0.9922	Leading	6.37	0.9940	Leading	5.57	0.9988	Lagging	-2.53
FLT13-3PH	0.9927	Leading	6.14	0.9937	Leading	5.70	0.9987	Lagging	-2.58
FLT14-3PH	0.9921	Leading	6.41	0.9938	Leading	5.66	0.9988	Lagging	-2.48
FLT15-3PH	0.9921	Leading	6.39	0.9940	Leading	5.58	0.9988	Lagging	-2.50
FLT16-3PH	0.9920	Leading	6.44	0.9938	Leading	5.68	0.9988	Lagging	-2.47
FLT17-3PH	0.9920	Leading	6.43	0.9938	Leading	5.67	0.9988	Lagging	-2.47
FLT18-3PH	0.9920	Leading	6.45	0.9938	Leading	5.67	0.9988	Lagging	-2.47
FLT19-3PH	0.9919	Leading	6.46	0.9938	Leading	5.68	0.9988	Lagging	-2.45
FLT20-3PH	0.9920	Leading	6.44	0.9938	Leading	5.66	0.9988	Lagging	-2.47
FLT21-3PH	0.9920	Leading	6.43	0.9938	Leading	5.65	0.9988	Lagging	-2.47
FLT22-3PH	0.9922	Leading	6.37	0.9939	Leading	5.61	0.9987	Lagging	-2.54
FLT23-3PH	0.9921	Leading	6.38	0.9939	Leading	5.62	0.9988	Lagging	-2.53
FLT24-3PH	0.9921	Leading	6.41	0.9938	Leading	5.65	0.9988	Lagging	-2.49
FLT25-3PH	0.9920	Leading	6.43	0.9938	Leading	5.66	0.9988	Lagging	-2.48
FLT26-3PH	0.9921	Leading	6.38	0.9939	Leading	5.63	0.9988	Lagging	-2.49
FLT27-3PH	0.9923	Leading	6.33	0.9939	Leading	5.60	0.9988	Lagging	-2.48
FLT28-3PH	0.9939	Leading	5.60	0.9957	Leading	4.71	0.9976	Lagging	-3.49
FLT29-3PH	0.9965	Leading	4.23	0.9988	Leading	2.48	0.9957	Lagging	-4.71
FLT30-3PH	0.9967	Leading	4.14	0.9990	Leading	2.27	0.9958	Lagging	-4.64
FLT31-3PH	0.9948	Leading	5.21	0.9963	Leading	4.34	0.9966	Lagging	-4.20
FLT32-3PH	0.9933	Leading	5.88	0.9955	Leading	4.82	0.9984	Lagging	-2.85
FLT33-3PH	0.9929	Leading	6.05	0.9948	Leading	5.19	0.9984	Lagging	-2.84
FLT34-3PH	0.9994	Leading	1.81	0.9998	Lagging	-1.11	0.9958	Lagging	-4.63
FLT35-3PH	0.9962	Leading	4.40	0.9968	Leading	4.03	0.9964	Lagging	-4.29

*The scheduled voltage for the POI (Tap Fort Randall to Columbus 230 kV) was 1.022 p.u. for 2014 summer peak conditions, 1.020 p.u. for 2014 winter peak conditions, and 1.032 p.u. for 2023 summer peak conditions.

**A positive Q (Mvar) output illustrates the generator is absorbing Mvars from the system, which implies a leading power factor; negative Q (Mvar) output shows the generator is supplying Mvars to the system implying a lagging power factor.

Table 4-5 (Continued)
Power Factor Analysis: GEN-2013-006 ($P_{GEN}=50.6$ MW)

Power Factor Analysis									
Power Factor Analysis: GEN-2013-006 ($P_{gen}=50.6$)									
Case	2014 Summer Peak			2014 Winter Peak			2023 Summer Peak		
	Power Factor		Q**(MVAR)	Power Factor		Q**(MVAR)	Power Factor		Q**(MVAR)
FLT36-3PH	0.9941	Leading	5.52	0.9958	Leading	4.68	0.9977	Lagging	-3.41
FLT37-3PH	0.9898	Leading	7.27	0.9921	Leading	6.39	0.9994	Lagging	-1.74
FLT38-3PH	0.9945	Leading	5.31	0.9965	Leading	4.26	0.9976	Lagging	-3.53
FLT39-3PH	0.9924	Leading	6.28	0.9951	Leading	5.01	0.9984	Lagging	-2.84
FLT40-3PH	0.9971	Leading	3.85	0.9984	Leading	2.86	0.9959	Lagging	-4.58
FLT41-3PH	0.9957	Leading	4.71	0.9956	Leading	4.76	0.9958	Lagging	-4.65
FLT42-3PH	0.9981	Leading	3.15	0.9996	Leading	1.40	0.9933	Lagging	-5.90
FLT43-3PH	0.9995	Leading	1.62	0.9986	Leading	2.67	0.9968	Lagging	-4.04
FLT44-3PH	0.9930	Leading	6.01	0.9946	Leading	5.29	0.9984	Lagging	-2.88
FLT45-3PH	0.9919	Leading	6.48	0.9936	Leading	5.74	0.9988	Lagging	-2.49
FLT46-3PH	0.9919	Leading	6.47	0.9937	Leading	5.71	0.9989	Lagging	-2.37
FLT47-3PH	0.9920	Leading	6.43	0.9938	Leading	5.66	0.9988	Lagging	-2.48
FLT48-3PH	0.9928	Leading	6.11	0.9947	Leading	5.23	0.9987	Lagging	-2.56
FLT49-3PH	0.9921	Leading	6.42	0.9938	Leading	5.68	0.9988	Lagging	-2.49
FLT50-3PH	0.9925	Leading	6.25	0.9940	Leading	5.57	0.9985	Lagging	-2.76
FLT51-3PH	0.9920	Leading	6.44	0.9938	Leading	5.66	0.9989	Lagging	-2.37
FLT52-3PH	0.9923	Leading	6.31	0.9940	Leading	5.56	0.9988	Lagging	-2.50
FLT53-3PH	0.9923	Leading	6.31	0.9941	Leading	5.52	0.9986	Lagging	-2.68
FLT54-3PH	0.9920	Leading	6.45	0.9938	Leading	5.67	0.9988	Lagging	-2.47
FLT55-3PH	0.9920	Leading	6.44	0.9937	Leading	5.70	0.9988	Lagging	-2.48
FLT56-3PH	0.9921	Leading	6.41	0.9939	Leading	5.61	0.9988	Lagging	-2.48
FLT57-3PH	0.9917	Leading	6.57	0.9937	Leading	5.73	0.9988	Lagging	-2.44
FLT58-3PH	0.9924	Leading	6.27	0.9938	Leading	5.66	0.9987	Lagging	-2.57
FLT59-3PH	0.9923	Leading	6.32	0.9939	Leading	5.63	0.9987	Lagging	-2.53
FLT60-3PH	0.9931	Leading	5.98	0.9945	Leading	5.33	0.9983	Lagging	-2.92
FLT61-3PH	0.9924	Leading	6.28	0.9936	Leading	5.77	0.9987	Lagging	-2.56
FLT62-3PH	0.9999	Lagging	-0.78	0.9927	Lagging	-6.17	0.9875	Lagging	-8.07
FLT63-3PH	0.9986	Lagging	-2.67	0.9873	Lagging	-8.13	0.9803	Lagging	-10.19
FLT64-3PH	0.9889	Leading	7.62	0.9921	Leading	6.41	0.9994	Lagging	-1.75
FLT65-3PH	0.9894	Leading	7.44	0.9923	Leading	6.31	0.9993	Lagging	-1.91
FLT66-3PH	0.9999	Leading	0.51	0.9999	Leading	0.87	0.9892	Lagging	-7.51
FLT67-3PH	0.9992	Leading	1.97	0.9991	Leading	2.16	0.9930	Lagging	-6.01
FLT68-3PH	0.9552	Lagging	-15.68	0.9636	Lagging	-14.03	0.9515	Lagging	-16.37
FLT69-3PH	0.9798	Leading	10.32	0.9801	Leading	10.26	0.9997	Leading	1.24
FLT70-3PH	0.9955	Leading	4.80	0.9983	Leading	2.91	0.9992	Lagging	-1.98
FLT71-3PH	0.9989	Lagging	-2.38	0.9948	Lagging	-5.16	0.9692	Lagging	-12.85
FLT72-3PH	0.9990	Leading	2.31	1.0000	Leading	0.11	0.9955	Lagging	-4.82
FLT73-3PH	0.9923	Leading	6.31	0.9942	Leading	5.48	0.9987	Lagging	-2.58
FLT74-3PH	0.9919	Leading	6.50	0.9937	Leading	5.70	0.9989	Lagging	-2.41
FLT75-3PH	0.9920	Leading	6.45	0.9937	Leading	5.68	0.9988	Lagging	-2.47

Table 4-5 (Continued)
Power Factor Analysis: GEN-2013-006 ($P_{GEN}=50.6$ MW)

Power Factor Analysis									
Power Factor Analysis: GEN-2013-006 ($P_{GEN}=50.6$)									
Case	2014 Summer Peak			2014 Winter Peak			2023 Summer Peak		
	Power Factor		Q**(MVAR)	Power Factor		Q**(MVAR)	Power Factor		Q**(MVAR)
FLT76-3PH	0.9921	Leading	6.40	0.9939	Leading	5.63	0.9988	Lagging	-2.50
FLT77-3PH	0.9921	Leading	6.39	0.9939	Leading	5.60	0.9988	Lagging	-2.52
FLT78-3PH	0.9920	Leading	6.44	0.9938	Leading	5.66	0.9988	Lagging	-2.46
FLT79-3PH	0.9922	Leading	6.34	0.9941	Leading	5.52	0.9987	Lagging	-2.54
FLT80-3PH	0.9881	Leading	7.89	0.9901	Leading	7.19	0.9995	Lagging	-1.62
FLT81-3PH	0.9921	Leading	6.39	0.9939	Leading	5.61	0.9988	Lagging	-2.50
FLT82-3PH	0.9919	Leading	6.48	0.9937	Leading	5.71	0.9988	Lagging	-2.44
FLT83-3PH	0.9921	Leading	6.41	0.9939	Leading	5.63	0.9988	Lagging	-2.49
FLT84-3PH	0.9915	Leading	6.62	0.9935	Leading	5.81	0.9989	Lagging	-2.35
FLT85-3PH	0.9922	Leading	6.38	0.9945	Leading	5.34	0.9988	Lagging	-2.51
FLT86-3PH	0.9930	Leading	6.01	0.9945	Leading	5.30	0.9993	Lagging	-2.70
FLT87-3PH	0.9926	Leading	6.20	0.9941	Leading	5.54	0.9986	Lagging	-2.68
FLT88-3PH	0.9898	Leading	7.27	0.9930	Leading	6.04	0.9994	Lagging	-1.69
FLT89-3PH	0.9926	Leading	6.17	0.9941	Leading	5.53	0.9986	Lagging	-2.73
FLT90-3PH	0.9948	Leading	5.16	0.9892	Leading	7.51	0.9996	Lagging	-1.49
FLT91-3PH	0.9786	Leading	10.64	0.9788	Leading	10.58	0.9995	Leading	1.56
FLT92-3PH	0.9992	Lagging	-2.00	0.9956	Lagging	-4.78	0.9710	Lagging	-12.47
FLT93-3PH	0.9914	Leading	6.67	0.9934	Leading	5.83	0.9990	Lagging	-2.28
FLT94-3PH	0.9921	Leading	6.41	0.9938	Leading	5.64	0.9988	Lagging	-2.51

Summary

The Power Factor Analysis shows that GEN-2013-006 has a power factor range of 0.9786 leading (absorbing) to 0.9552 lagging (supplying) for 2014 summer peak conditions, a power factor range of 0.9788 leading (absorbing) to 0.9873 lagging (supplying) for 2014 winter peak conditions, and a power factor range of 0.9995 leading (absorbing) to 0.9515 lagging (supplying) for 2023 summer peak conditions.

4.6 Study Project – GEN-2013-008

Approach

GEN-2013-008 was disabled and a generator was placed at the study project's point of interconnect bus. The generator was modeled with $P_{GEN} = 74.8$ MW, $Q_{Min} = -9999$ Mvar, and $Q_{Max} = 9999$ Mvar. All buses and transformers connected from the study project's POI bus to the GEN-2013-008 generator were disabled. The pre-project voltage at the POI (Steele City 115 kV - Bus 640426) for the 2014 summer peak conditions is 1.034 p.u., for the 2014 winter peak

conditions is 1.035 p.u., and for the 2023 summer peak conditions is 1.036 p.u. Therefore, the scheduled voltage for the POI was set accordingly for each of the three cases.

Results

The power factor was calculated for 2014 summer, 2014 winter, and 2023 summer peak conditions. Table 4-6 shows the power factor results for GEN-2013-008. Note that a positive Q (Mvar) output illustrates that the generator is absorbing reactive power from the system, implying a leading power factor; a negative Q (Mvar) illustrates that the generator is supplying reactive power to the system, implying a lagging power factor.

Table 4-6
Power Factor Analysis: GEN-2013-008 ($P_{GEN}=74.8$ MW)*

Power Factor Analysis									
Power Factor Analysis: GEN-2013-008 ($P_{gen}=74.8$)									
Case	2014 Summer Peak			2014 Winter Peak			2023 Summer Peak		
	Power Factor		Q**(MVAR)	Power Factor		Q**(MVAR)	Power Factor		Q**(MVAR)
Base	0.9958	Leading	6.89	0.9955	Leading	7.15	0.9963	Leading	6.45
FLT01-3PH	0.9961	Leading	6.60	0.9957	Leading	6.93	0.9965	Leading	6.26
FLT02-3PH	0.9966	Leading	6.21	0.9961	Leading	6.60	0.9968	Leading	5.96
FLT03-3PH	0.9988	Leading	3.61	0.9987	Leading	3.89	0.9990	Leading	3.37
FLT04-3PH	0.9977	Leading	5.12	0.9974	Leading	5.37	0.9979	Leading	4.80
FLT05-3PH	0.9980	Leading	4.70	0.9973	Leading	5.52	0.9984	Leading	4.20
FLT06-3PH	0.9957	Leading	6.97	0.9954	Leading	7.21	0.9962	Leading	6.50
FLT07-3PH	0.9965	Leading	6.29	0.9959	Leading	6.76	0.9969	Leading	5.95
FLT08-3PH	0.9959	Leading	6.82	0.9956	Leading	7.04	0.9963	Leading	6.46
FLT09-3PH	0.9963	Leading	6.48	0.9958	Leading	6.88	0.9967	Leading	6.13
FLT10-3PH	0.9999	Leading	1.06	1.0000	Leading	0.65	0.9988	Leading	3.73
FLT11-3PH	0.9978	Leading	5.00	0.9972	Leading	5.66	0.9979	Leading	4.88
FLT12-3PH	0.9977	Leading	5.13	0.9970	Leading	5.79	0.9978	Leading	5.01
FLT13-3PH	0.9885	Leading	11.44	0.9960	Leading	6.74	0.9956	Leading	7.05
FLT14-3PH	0.9917	Leading	9.70	0.9975	Leading	5.28	0.9973	Leading	5.49
FLT15-3PH	0.9778	Leading	16.04	0.9679	Leading	19.44	0.9819	Leading	14.41
FLT16-3PH	0.9957	Leading	6.95	0.9894	Leading	10.96	0.9976	Leading	5.22
FLT17-3PH	0.9958	Leading	6.91	0.9934	Leading	8.61	0.9960	Leading	6.72
FLT18-3PH	0.9962	Leading	6.56	0.9968	Leading	5.96	0.9967	Leading	6.07
FLT19-3PH	0.9884	Leading	11.48	0.9894	Leading	11.00	0.9921	Leading	9.49
FLT20-3PH	0.9953	Leading	7.26	0.9955	Leading	7.13	0.9959	Leading	6.76
FLT21-3PH	0.9957	Leading	6.99	0.9954	Leading	7.16	0.9961	Leading	6.59
FLT22-3PH	0.9958	Leading	6.86	0.9955	Leading	7.13	0.9963	Leading	6.42
FLT23-3PH	0.9958	Leading	6.86	0.9955	Leading	7.13	0.9963	Leading	6.42
FLT24-3PH	0.9958	Leading	6.86	0.9955	Leading	7.13	0.9963	Leading	6.43
FLT25-3PH	0.9958	Leading	6.87	0.9955	Leading	7.13	0.9963	Leading	6.43
FLT26-3PH	0.9959	Leading	6.83	0.9955	Leading	7.12	0.9964	Leading	6.38
FLT27-3PH	0.9959	Leading	6.79	0.9955	Leading	7.09	0.9963	Leading	6.44
FLT28-3PH	0.9967	Leading	6.07	0.9964	Leading	6.34	0.9968	Leading	5.95
FLT29-3PH	0.9964	Leading	6.36	0.9963	Leading	6.48	0.9969	Leading	5.92
FLT30-3PH	0.9969	Leading	5.94	0.9973	Leading	5.54	0.9972	Leading	5.64
FLT31-3PH	0.9960	Leading	6.72	0.9957	Leading	6.95	0.9964	Leading	6.35
FLT32-3PH	0.9963	Leading	6.47	0.9961	Leading	6.61	0.9966	Leading	6.17
FLT33-3PH	0.9961	Leading	6.66	0.9958	Leading	6.91	0.9965	Leading	6.27
FLT34-3PH	0.9961	Leading	6.64	0.9957	Leading	6.95	0.9966	Leading	6.15
FLT35-3PH	0.9963	Leading	6.47	0.9959	Leading	6.78	0.9966	Leading	6.15

*The scheduled voltage for the POI (Steele City 115 kV) was 1.034 p.u. for 2014 summer peak conditions, 1.035 p.u. for 2014 winter peak conditions, and 1.036 p.u. for 2023 summer peak conditions.

**A positive Q (Mvar) output illustrates the generator is absorbing Mvars from the system, which implies a leading power factor; negative Q (Mvar) output shows the generator is supplying Mvars to the system implying a lagging power factor.

Table 4-6 (Continued)
Power Factor Analysis: GEN-2013-008 ($P_{GEN}=74.8$ MW)

Power Factor Analysis									
Power Factor Analysis: GEN-2013-008 ($P_{gen}=74.8$)									
Case	2014 Summer Peak			2014 Winter Peak			2023 Summer Peak		
	Power Factor		Q**(MVAR)	Power Factor		Q**(MVAR)	Power Factor		Q**(MVAR)
FLT36-3PH	0.9958	Leading	6.89	0.9955	Leading	7.12	0.9963	Leading	6.49
FLT37-3PH	0.9961	Leading	6.67	0.9959	Leading	6.79	0.9965	Leading	6.28
FLT38-3PH	0.9956	Leading	7.00	0.9953	Leading	7.29	0.9962	Leading	6.51
FLT39-3PH	0.9970	Leading	5.80	0.9967	Leading	6.09	0.9970	Leading	5.78
FLT40-3PH	0.9965	Leading	6.28	0.9961	Leading	6.65	0.9967	Leading	6.07
FLT41-3PH	0.9961	Leading	6.60	0.9960	Leading	6.74	0.9968	Leading	6.00
FLT42-3PH	0.9962	Leading	6.52	0.9964	Leading	6.37	0.9966	Leading	6.18
FLT43-3PH	0.9961	Leading	6.67	0.9959	Leading	6.76	0.9960	Leading	6.70
FLT44-3PH	0.9960	Leading	6.70	0.9936	Leading	8.53	0.9964	Leading	6.41
FLT45-3PH	0.9998	Lagging	-1.60	0.9995	Lagging	-2.32	1.0000	Lagging	-0.56
FLT46-3PH	0.9972	Leading	5.61	0.9971	Leading	5.73	0.9989	Leading	3.45
FLT47-3PH	0.9958	Leading	6.89	0.9955	Leading	7.15	0.9963	Leading	6.45
FLT48-3PH	0.9954	Leading	7.22	0.9950	Leading	7.51	0.9959	Leading	6.81
FLT49-3PH	0.9959	Leading	6.83	0.9956	Leading	7.07	0.9964	Leading	6.40
FLT50-3PH	0.9963	Leading	6.48	0.9959	Leading	6.82	0.9968	Leading	6.01
FLT51-3PH	0.9958	Leading	6.88	0.9955	Leading	7.12	0.9963	Leading	6.47
FLT52-3PH	0.9962	Leading	6.54	0.9958	Leading	6.85	0.9966	Leading	6.22
FLT53-3PH	0.9958	Leading	6.91	0.9954	Leading	7.19	0.9963	Leading	6.46
FLT54-3PH	0.9958	Leading	6.89	0.9955	Leading	7.15	0.9963	Leading	6.45
FLT55-3PH	0.9957	Leading	6.92	0.9954	Leading	7.18	0.9963	Leading	6.45
FLT56-3PH	0.9958	Leading	6.90	0.9955	Leading	7.16	0.9963	Leading	6.46
FLT57-3PH	0.9958	Leading	6.89	0.9955	Leading	7.15	0.9963	Leading	6.42
FLT58-3PH	0.9958	Leading	6.87	0.9955	Leading	7.14	0.9963	Leading	6.45
FLT59-3PH	0.9958	Leading	6.87	0.9955	Leading	7.15	0.9963	Leading	6.44
FLT60-3PH	0.9974	Leading	5.39	0.9957	Leading	6.94	0.9978	Leading	4.97
FLT61-3PH	0.9961	Leading	6.64	0.9957	Leading	6.93	0.9965	Leading	6.26
FLT62-3PH	0.9959	Leading	6.82	0.9956	Leading	7.00	0.9964	Leading	6.38
FLT63-3PH	0.9958	Leading	6.90	0.9955	Leading	7.09	0.9963	Leading	6.45
FLT64-3PH	0.9958	Leading	6.87	0.9955	Leading	7.14	0.9963	Leading	6.44
FLT65-3PH	0.9958	Leading	6.87	0.9955	Leading	7.14	0.9963	Leading	6.44
FLT66-3PH	0.9960	Leading	6.71	0.9957	Leading	6.96	0.9965	Leading	6.31
FLT67-3PH	0.9960	Leading	6.72	0.9957	Leading	6.99	0.9964	Leading	6.34
FLT68-3PH	0.9954	Leading	7.17	0.9951	Leading	7.40	0.9961	Leading	6.63
FLT69-3PH	0.9958	Leading	6.86	0.9955	Leading	7.11	0.9963	Leading	6.42
FLT70-3PH	0.9958	Leading	6.92	0.9954	Leading	7.19	0.9963	Leading	6.43
FLT71-3PH	0.9959	Leading	6.80	0.9957	Leading	6.99	0.9964	Leading	6.38
FLT72-3PH	0.9959	Leading	6.80	0.9957	Leading	7.00	0.9964	Leading	6.34
FLT73-3PH	0.9966	Leading	6.22	0.9962	Leading	6.56	0.9969	Leading	5.88
FLT74-3PH	0.9957	Leading	6.94	0.9954	Leading	7.19	0.9963	Leading	6.49
FLT75-3PH	0.9958	Leading	6.86	0.9955	Leading	7.11	0.9963	Leading	6.45

Table 4-6 (Continued)
Power Factor Analysis: GEN-2013-008 ($P_{GEN}=74.8$ MW)

Power Factor Analysis									
Power Factor Analysis: GEN-2013-008 ($P_{gen}=74.8$)									
Case	2014 Summer Peak			2014 Winter Peak			2023 Summer Peak		
	Power Factor		Q**(MVAR)	Power Factor		Q**(MVAR)	Power Factor		Q**(MVAR)
FLT76-3PH	0.9961	Leading	6.59	0.9958	Leading	6.89	0.9966	Leading	6.14
FLT77-3PH	0.9959	Leading	6.81	0.9956	Leading	7.07	0.9964	Leading	6.38
FLT78-3PH	0.9960	Leading	6.70	0.9957	Leading	6.98	0.9965	Leading	6.29
FLT79-3PH	0.9964	Leading	6.39	0.9960	Leading	6.68	0.9968	Leading	6.04
FLT80-3PH	0.9981	Leading	4.64	0.9971	Leading	5.75	0.9974	Leading	5.36
FLT81-3PH	0.9972	Leading	5.62	0.9965	Leading	6.24	0.9973	Leading	5.47
FLT82-3PH	0.9999	Leading	1.09	0.9999	Lagging	-1.04	0.9999	Leading	1.23
FLT83-3PH	0.9977	Leading	5.10	0.9985	Leading	4.04	0.9995	Leading	2.28
FLT84-3PH	0.9958	Leading	6.84	0.9954	Leading	7.17	0.9963	Leading	6.43
FLT85-3PH	0.9970	Leading	5.76	0.9972	Leading	5.57	0.9973	Leading	5.48
FLT86-3PH	0.9957	Leading	6.90	0.9955	Leading	7.10	0.9962	Leading	6.50
FLT87-3PH	0.9958	Leading	6.87	0.9955	Leading	7.15	0.9963	Leading	6.44
FLT88-3PH	0.9959	Leading	6.76	0.9957	Leading	6.98	0.9964	Leading	6.33
FLT89-3PH	0.9958	Leading	6.88	0.9955	Leading	7.15	0.9963	Leading	6.44
FLT90-3PH	0.9958	Leading	6.87	0.9955	Leading	7.13	0.9963	Leading	6.43
FLT91-3PH	0.9958	Leading	6.86	0.9955	Leading	7.11	0.9963	Leading	6.42
FLT92-3PH	0.9959	Leading	6.80	0.9957	Leading	6.99	0.9964	Leading	6.39
FLT93-3PH	0.9956	Leading	7.05	0.9953	Leading	7.28	0.9962	Leading	6.57
FLT94-3PH	0.9957	Leading	7.00	0.9953	Leading	7.24	0.9962	Leading	6.54

Summary

The Power Factor Analysis shows that GEN-2013-008 has a power factor range of 0.9778 leading (absorbing) to 0.9998 lagging (supplying) for 2014 summer peak conditions, a power factor range of 0.9679 leading (absorbing) to 0.9955 lagging (supplying) for 2014 winter peak conditions, and a power factor range of 0.9819 leading (absorbing) to 1.000 lagging (supplying) for 2023 summer peak conditions.

4.7 Study Project – GEN-2013-014

Approach

GEN-2013-014 was disabled and a generator was placed at the study project's point of interconnect bus. The generator was modeled with $P_{GEN} = 25.5$ MW, $Q_{Min} = -9999$ Mvar, and $Q_{Max} = 9999$ Mvar. All buses and transformers connected from the study project's POI bus to the GEN-2013-014 generator were disabled. The pre-project voltage at the POI (Tap Pauline to Guide Rock 115 kV - Bus 560137) for the 2014 summer peak conditions is 1.036 p.u., for the

2014 winter peak conditions is 1.038 p.u., and for the 2023 summer peak conditions is 1.040 p.u. Therefore, the scheduled voltage for the POI was set accordingly for each of the three cases.

Results

The power factor was calculated for 2014 summer, 2014 winter, and 2023 summer peak conditions. Table 4-7 shows the power factor results for GEN-2013-014. Note that a positive Q (Mvar) output illustrates that the generator is absorbing reactive power from the system, implying a leading power factor; a negative Q (Mvar) illustrates that the generator is supplying reactive power to the system, implying a lagging power factor.

Table 4-7
Power Factor Analysis: GEN-2013-014 ($P_{GEN}=25.5$ MW)*

Power Factor Analysis									
Power Factor Analysis: GEN-2013-014 ($P_{gen}=25.5$)									
Case	2014 Summer Peak			2014 Winter Peak			2023 Summer Peak		
	Power Factor		Q**(MVAR)	Power Factor		Q**(MVAR)	Power Factor		Q**(MVAR)
Base	0.9898	Leading	3.67	0.9906	Leading	3.52	0.9925	Leading	3.14
FLT01-3PH	0.9909	Leading	3.46	0.9916	Leading	3.33	0.9931	Leading	3.01
FLT02-3PH	0.9926	Leading	3.13	0.9930	Leading	3.03	0.9942	Leading	2.76
FLT03-3PH	0.9946	Leading	2.66	0.9955	Leading	2.43	0.9963	Leading	2.19
FLT04-3PH	0.9921	Leading	3.22	0.9931	Leading	3.02	0.9943	Leading	2.73
FLT05-3PH	0.9923	Leading	3.18	0.9932	Leading	2.98	0.9943	Leading	2.74
FLT06-3PH	0.9873	Leading	4.11	0.9887	Leading	3.87	0.9906	Leading	3.52
FLT07-3PH	0.9924	Leading	3.17	0.9924	Leading	3.17	0.9947	Leading	2.63
FLT08-3PH	0.9901	Leading	3.61	0.9911	Leading	3.42	0.9924	Leading	3.16
FLT09-3PH	0.9898	Leading	3.68	0.9905	Leading	3.54	0.9924	Leading	3.16
FLT10-3PH	0.9941	Leading	2.78	0.9963	Leading	2.19	0.9945	Leading	2.69
FLT11-3PH	0.9925	Leading	3.15	0.9930	Leading	3.04	0.9944	Leading	2.70
FLT12-3PH	0.9923	Leading	3.18	0.9929	Leading	3.07	0.9943	Leading	2.73
FLT13-3PH	0.9816	Lagging	-4.96	0.9981	Leading	1.56	0.9990	Lagging	-1.16
FLT14-3PH	0.9913	Leading	3.39	0.9907	Leading	3.50	0.9925	Leading	3.13
FLT15-3PH	0.9920	Leading	3.24	0.9920	Leading	3.25	0.9938	Leading	2.85
FLT16-3PH	0.9905	Leading	3.53	0.9910	Leading	3.45	0.9932	Leading	2.98
FLT17-3PH	0.9897	Leading	3.69	0.9901	Leading	3.62	0.9922	Leading	3.20
FLT18-3PH	0.9901	Leading	3.61	0.9911	Leading	3.42	0.9927	Leading	3.10
FLT19-3PH	0.9914	Leading	3.36	0.9907	Leading	3.51	0.9939	Leading	2.83
FLT20-3PH	0.9899	Leading	3.65	0.9907	Leading	3.51	0.9926	Leading	3.11
FLT21-3PH	0.9898	Leading	3.66	0.9907	Leading	3.50	0.9926	Leading	3.13
FLT22-3PH	0.9900	Leading	3.64	0.9908	Leading	3.49	0.9927	Leading	3.10
FLT23-3PH	0.9900	Leading	3.64	0.9907	Leading	3.49	0.9927	Leading	3.11
FLT24-3PH	0.9899	Leading	3.65	0.9907	Leading	3.50	0.9926	Leading	3.12
FLT25-3PH	0.9898	Leading	3.67	0.9907	Leading	3.51	0.9925	Leading	3.13
FLT26-3PH	0.9900	Leading	3.64	0.9908	Leading	3.49	0.9926	Leading	3.12
FLT27-3PH	0.9904	Leading	3.57	0.9910	Leading	3.45	0.9926	Leading	3.12
FLT28-3PH	0.9957	Leading	2.36	0.9958	Leading	2.34	0.9982	Leading	1.54
FLT29-3PH	0.9996	Leading	0.70	0.9935	Leading	2.92	0.9996	Lagging	0.70
FLT30-3PH	0.9975	Leading	1.82	0.9938	Leading	2.86	0.9946	Leading	2.66
FLT31-3PH	0.9905	Leading	3.54	0.9911	Leading	3.42	0.9911	Leading	3.42
FLT32-3PH	0.9936	Leading	2.91	0.9939	Leading	2.84	0.9935	Leading	2.91
FLT33-3PH	0.9925	Leading	3.14	0.9934	Leading	2.95	0.9946	Leading	2.66
FLT34-3PH	0.9960	Leading	2.30	0.9950	Leading	2.56	0.9980	Leading	1.62
FLT35-3PH	0.9989	Leading	1.20	0.9984	Leading	1.47	0.9993	Leading	0.92

*The scheduled voltage for the POI (Tap Pauline to Guide Rock 115 kV) was 1.036 p.u. for 2014 summer peak conditions, 1.038 p.u. for 2014 winter peak conditions, and 1.040 p.u. for 2023 summer peak conditions.

**A positive Q (Mvar) output illustrates the generator is absorbing Mvars from the system, which implies a leading power factor; negative Q (Mvar) output shows the generator is supplying Mvars to the system implying a lagging power factor.

Table 4-7 (Continued)
Power Factor Analysis: GEN-2013-014 ($P_{GEN}=25.5$ MW)

Power Factor Analysis									
Power Factor Analysis: GEN-2013-014 ($P_{GEN}=25.5$)									
Case	2014 Summer Peak			2014 Winter Peak			2023 Summer Peak		
	Power Factor		Q**(MVAR)	Power Factor		Q**(MVAR)	Power Factor		Q**(MVAR)
FLT36-3PH	0.9861	Leading	4.30	0.9876	Leading	4.05	0.9884	Leading	3.92
FLT37-3PH	0.9850	Leading	4.47	0.9843	Leading	4.57	0.9889	Leading	3.83
FLT38-3PH	0.9870	Lagging	-4.15	0.9993	Leading	0.90	0.9995	Leading	0.80
FLT39-3PH	0.9862	Leading	4.28	0.9940	Leading	2.80	0.9966	Leading	2.10
FLT40-3PH	0.9902	Lagging	-3.61	0.9893	Lagging	-3.77	0.9955	Lagging	-2.42
FLT41-3PH	0.9979	Lagging	-1.64	0.9938	Lagging	-2.85	0.9999	Lagging	-0.39
FLT42-3PH	0.9977	Lagging	-1.75	0.9920	Lagging	-3.24	0.9957	Lagging	-2.37
FLT43-3PH	0.9990	Leading	1.16	0.9999	Leading	0.39	0.9937	Leading	2.88
FLT44-3PH	0.9399	Leading	9.26	0.9869	Leading	4.17	0.9622	Leading	7.22
FLT45-3PH	0.8688	Lagging	-14.53	0.9018	Lagging	-12.22	0.9717	Lagging	-6.20
FLT46-3PH	0.9889	Leading	3.83	0.9883	Leading	3.93	0.9825	Leading	4.84
FLT47-3PH	0.9898	Leading	3.67	0.9906	Leading	3.52	0.9925	Leading	3.14
FLT48-3PH	0.9760	Leading	5.69	0.9804	Leading	5.13	0.9566	Leading	7.77
FLT49-3PH	0.9892	Leading	3.78	0.9973	Leading	1.87	0.9914	Leading	3.36
FLT50-3PH	0.9998	Lagging	-0.45	1.0000	Lagging	-0.22	0.9988	Leading	1.20
FLT51-3PH	0.9919	Leading	3.26	0.9934	Leading	2.94	0.9956	Leading	2.39
FLT52-3PH	0.9999	Lagging	-0.33	1.0000	Leading	0.23	0.9997	Lagging	-0.60
FLT53-3PH	0.9895	Leading	3.73	0.9892	Leading	3.78	0.9941	Leading	2.78
FLT54-3PH	0.9898	Leading	3.68	0.9907	Leading	3.51	0.9926	Leading	3.12
FLT55-3PH	0.9891	Leading	3.80	0.9896	Leading	3.70	0.9925	Leading	3.14
FLT56-3PH	0.9893	Leading	3.76	0.9906	Leading	3.51	0.9921	Leading	3.22
FLT57-3PH	0.9875	Leading	4.07	0.9896	Leading	3.70	0.9921	Leading	3.22
FLT58-3PH	0.9878	Leading	4.03	0.9907	Leading	3.50	0.9898	Leading	3.66
FLT59-3PH	0.9902	Leading	3.60	0.9908	Leading	3.48	0.9925	Leading	3.14
FLT60-3PH	0.9999	Leading	0.31	0.9995	Leading	0.77	0.9999	Lagging	-0.43
FLT61-3PH	0.9970	Leading	1.99	0.9982	Leading	1.52	0.9981	Leading	1.58
FLT62-3PH	0.9909	Leading	3.47	0.9925	Leading	3.13	0.9934	Leading	2.96
FLT63-3PH	0.9912	Leading	3.40	0.9926	Leading	3.12	0.9935	Leading	2.91
FLT64-3PH	0.9907	Leading	3.51	0.9912	Leading	3.40	0.9930	Leading	3.04
FLT65-3PH	0.9905	Leading	3.54	0.9911	Leading	3.43	0.9928	Leading	3.07
FLT66-3PH	0.9935	Leading	2.92	0.9940	Leading	2.81	0.9950	Leading	2.56
FLT67-3PH	0.9933	Leading	2.97	0.9937	Leading	2.87	0.9947	Leading	2.64
FLT68-3PH	0.9962	Leading	2.22	0.9965	Leading	2.13	0.9973	Leading	1.87
FLT69-3PH	0.9905	Leading	3.54	0.9911	Leading	3.42	0.9932	Leading	2.99
FLT70-3PH	0.9883	Leading	3.94	0.9881	Leading	3.98	0.9929	Leading	3.05
FLT71-3PH	0.9937	Leading	2.88	0.9952	Leading	2.51	0.9956	Leading	2.39
FLT72-3PH	0.9917	Leading	3.31	0.9924	Leading	3.16	0.9953	Leading	2.49
FLT73-3PH	0.9909	Leading	3.46	0.9917	Leading	3.30	0.9933	Leading	2.97
FLT74-3PH	0.9893	Leading	3.76	0.9903	Leading	3.58	0.9921	Leading	3.23
FLT75-3PH	0.9895	Leading	3.72	0.9904	Leading	3.55	0.9924	Leading	3.17

Table 4-7 (Continued)
Power Factor Analysis: GEN-2013-014 ($P_{GEN}=125.8$ MW)

Power Factor Analysis									
Power Factor Analysis: GEN-2013-014 ($P_{gen}=25.5$)									
Case	2014 Summer Peak			2014 Winter Peak			2023 Summer Peak		
	Power Factor		Q**(MVAR)	Power Factor		Q**(MVAR)	Power Factor		Q**(MVAR)
FLT76-3PH	0.9899	Leading	3.65	0.9907	Leading	3.50	0.9926	Leading	3.12
FLT77-3PH	0.9901	Leading	3.62	0.9909	Leading	3.46	0.9927	Leading	3.09
FLT78-3PH	0.9898	Leading	3.67	0.9907	Leading	3.51	0.9925	Leading	3.14
FLT79-3PH	0.9906	Leading	3.52	0.9915	Leading	3.35	0.9931	Leading	3.02
FLT80-3PH	0.9765	Leading	5.63	0.9760	Leading	5.69	0.9859	Leading	4.33
FLT81-3PH	0.9917	Leading	3.30	0.9923	Leading	3.19	0.9938	Leading	2.85
FLT82-3PH	0.9903	Leading	3.58	0.9909	Leading	3.47	0.9929	Leading	3.05
FLT83-3PH	0.9904	Leading	3.56	0.9915	Leading	3.34	0.9932	Leading	2.98
FLT84-3PH	0.9891	Leading	3.79	0.9899	Leading	3.65	0.9920	Leading	3.24
FLT85-3PH	0.9448	Lagging	-8.85	0.9495	Lagging	-8.42	0.9530	Lagging	-8.11
FLT86-3PH	0.9995	Leading	3.60	0.9912	Leading	3.40	0.9922	Leading	3.20
FLT87-3PH	0.9901	Leading	3.61	0.9904	Leading	3.56	0.9925	Leading	3.15
FLT88-3PH	0.9996	Leading	0.74	0.9978	Leading	1.69	0.9999	Leading	0.27
FLT89-3PH	0.9898	Leading	3.68	0.9905	Leading	3.53	0.9925	Leading	3.14
FLT90-3PH	0.9907	Leading	3.50	0.9909	Leading	3.46	0.9931	Leading	3.02
FLT91-3PH	0.9904	Leading	3.56	0.9910	Leading	3.45	0.9931	Leading	3.01
FLT92-3PH	0.9936	Leading	2.91	0.9951	Leading	2.54	0.9955	Leading	2.41
FLT93-3PH	0.9879	Leading	4.01	0.9893	Leading	3.77	0.9912	Leading	3.41
FLT94-3PH	0.9898	Leading	3.67	0.9906	Leading	3.52	0.9926	Leading	3.13

Summary

The Power Factor Analysis shows that GEN-2013-014 has a power factor range of 0.9399 leading (absorbing) to 0.8688 lagging (supplying) for 2014 summer peak conditions, a power factor range of 0.9760 leading (absorbing) to 0.9018 lagging (supplying) for 2014 winter peak conditions, and a power factor range of 0.9566 leading (absorbing) to 0.9530 lagging (supplying) for 2023 summer peak conditions.

4.8 Study Project – GEN-2013-015

Approach

GEN-2013-015 was disabled and a generator was placed at the study project's point of interconnect bus. The generator was modeled with $P_{GEN} = 125.8$ MW, $Q_{Min} = -9999$ Mvar, and $Q_{Max} = 9999$ Mvar. All buses and transformers connected from the study project's POI bus to the GEN-2013-015 generator were disabled. The pre-project voltage at the POI (Tap Pauline to Hildreth 115 kV- Bus 560733) for the 2014 summer peak conditions is 1.040 p.u., for the

2014 winter peak conditions is 1.042 p.u., and for the 2023 summer peak conditions is 1.032 p.u. Therefore, the scheduled voltage for the POI was set accordingly for each of the three cases.

Results

The power factor was calculated for 2014 summer, 2014 winter, and 2023 summer peak conditions. Table 4-8 shows the power factor results for GEN-2013-015. Note that a positive Q (Mvar) output illustrates that the generator is absorbing reactive power from the system, implying a leading power factor; a negative Q (Mvar) illustrates that the generator is supplying reactive power to the system, implying a lagging power factor.

Table 4-8
Power Factor Analysis: GEN-2013-015 ($P_{GEN}=125.8$ MW)*

Power Factor Analysis									
Power Factor Analysis: GEN-2013-015 ($P_{gen}=125.8$)									
Case	2014 Summer Peak			2014 Winter Peak			2023 Summer Peak		
	Power Factor	Q**(MVAR)	Q**(MVAR)	Power Factor	Q**(MVAR)	Q**(MVAR)	Power Factor	Q**(MVAR)	Q**(MVAR)
Base	0.9934	Leading	14.51	0.9929	Leading	15.05	0.9988	Leading	6.08
FLT01-3PH	0.9936	Leading	14.34	0.9931	Leading	14.91	0.9989	Leading	5.98
FLT02-3PH	0.9938	Leading	14.10	0.9932	Leading	14.70	0.9989	Leading	5.81
FLT03-3PH	0.9939	Leading	13.98	0.9934	Leading	14.47	0.9990	Leading	5.60
FLT04-3PH	0.9936	Leading	14.29	0.9931	Leading	14.80	0.9989	Leading	5.89
FLT05-3PH	0.9935	Leading	14.42	0.9931	Leading	14.84	0.9988	Leading	6.09
FLT06-3PH	0.9931	Leading	14.81	0.9927	Leading	15.30	0.9987	Leading	6.34
FLT07-3PH	0.9938	Leading	14.13	0.9932	Leading	14.79	0.9990	Leading	5.70
FLT08-3PH	0.9935	Leading	14.46	0.9930	Leading	14.98	0.9988	Leading	6.10
FLT09-3PH	0.9934	Leading	14.54	0.9929	Leading	15.08	0.9988	Leading	6.11
FLT10-3PH	0.9936	Leading	14.25	0.9934	Leading	14.54	0.9989	Leading	5.95
FLT11-3PH	0.9937	Leading	14.24	0.9932	Leading	14.80	0.9989	Leading	5.86
FLT12-3PH	0.9936	Leading	14.25	0.9931	Leading	14.81	0.9989	Leading	5.87
FLT13-3PH	0.9941	Leading	13.75	0.9926	Leading	15.39	0.9988	Leading	6.27
FLT14-3PH	0.9935	Leading	14.45	0.9929	Leading	15.09	0.9988	Leading	6.09
FLT15-3PH	0.9938	Leading	14.04	0.9933	Leading	14.65	0.9990	Leading	5.73
FLT16-3PH	0.9935	Leading	14.39	0.9930	Leading	14.93	0.9989	Leading	5.98
FLT17-3PH	0.9934	Leading	14.52	0.9929	Leading	15.10	0.9988	Leading	6.13
FLT18-3PH	0.9935	Leading	14.46	0.9930	Leading	15.00	0.9988	Leading	6.05
FLT19-3PH	0.9937	Leading	14.18	0.9930	Leading	14.97	0.9989	Leading	5.78
FLT20-3PH	0.9934	Leading	14.47	0.9929	Leading	15.04	0.9988	Leading	6.04
FLT21-3PH	0.9934	Leading	14.49	0.9929	Leading	15.04	0.9988	Leading	6.06
FLT22-3PH	0.9934	Leading	14.48	0.9929	Leading	15.03	0.9988	Leading	6.05
FLT23-3PH	0.9934	Leading	14.49	0.9929	Leading	15.04	0.9988	Leading	6.06
FLT24-3PH	0.9934	Leading	14.49	0.9929	Leading	15.04	0.9988	Leading	6.07
FLT25-3PH	0.9934	Leading	14.50	0.9929	Leading	15.05	0.9988	Leading	6.08
FLT26-3PH	0.9934	Leading	14.48	0.9929	Leading	15.03	0.9988	Leading	6.07
FLT27-3PH	0.9935	Leading	14.43	0.9930	Leading	15.00	0.9988	Leading	6.07
FLT28-3PH	0.9943	Leading	13.46	0.9938	Leading	14.11	0.9993	Leading	4.84
FLT29-3PH	0.9957	Leading	11.65	0.9959	Leading	11.38	0.9997	Leading	3.14
FLT30-3PH	0.9944	Leading	13.31	0.9928	Leading	15.22	0.9988	Leading	6.19
FLT31-3PH	0.9935	Leading	14.41	0.9930	Leading	14.99	0.9987	Leading	6.30
FLT32-3PH	0.9940	Leading	13.90	0.9934	Leading	14.52	0.9989	Leading	5.90
FLT33-3PH	0.9938	Leading	14.09	0.9933	Leading	14.61	0.9990	Leading	5.72
FLT34-3PH	0.9944	Leading	13.40	0.9936	Leading	14.26	0.9992	Leading	4.91
FLT35-3PH	0.9950	Leading	12.59	0.9943	Leading	13.45	0.9994	Leading	4.41

*The scheduled voltage for the POI (Tap Pauline to Hildreth 115 kV) was 1.040 p.u. for 2014 summer peak conditions, 1.042 p.u. for 2014 winter peak conditions, and 1.032 p.u. for 2023 summer peak conditions.

**A positive Q (Mvar) output illustrates the generator is absorbing Mvars from the system, which implies a leading power factor; negative Q (Mvar) output shows the generator is supplying Mvars to the system implying a lagging power factor.

Table 4-8 (Continued)
Power Factor Analysis: GEN-2013-015 ($P_{GEN}=125.8$ MW)

Power Factor Analysis									
Power Factor Analysis: GEN-2013-015 ($P_{gen}=125.8$)									
Case	2014 Summer Peak			2014 Winter Peak			2023 Summer Peak		
	Power Factor		Q**(MVAR)	Power Factor		Q**(MVAR)	Power Factor		Q**(MVAR)
FLT36-3PH	0.9930	Leading	15.01	0.9925	Leading	15.49	0.9986	Leading	6.70
FLT37-3PH	0.9928	Leading	15.13	0.9921	Leading	15.88	0.9986	Leading	6.60
FLT38-3PH	0.9975	Leading	8.96	0.9980	Leading	7.99	1.0000	Leading	0.72
FLT39-3PH	0.9923	Leading	15.66	0.9930	Leading	14.96	0.9991	Leading	5.46
FLT40-3PH	0.9990	Leading	5.63	0.9989	Leading	5.95	1.0000	Lagging	-0.65
FLT41-3PH	0.9969	Leading	9.91	0.9973	Leading	9.25	0.9996	Leading	3.68
FLT42-3PH	0.9961	Leading	11.10	0.9963	Leading	10.81	0.9998	Leading	2.52
FLT43-3PH	0.9954	Leading	12.14	0.9953	Leading	12.22	0.9990	Leading	5.70
FLT44-3PH	0.9957	Leading	11.75	0.9955	Leading	12.01	0.9997	Leading	3.03
FLT45-3PH	0.9895	Leading	18.37	0.9897	Leading	18.20	0.9981	Leading	7.86
FLT46-3PH	0.9931	Leading	14.87	0.9926	Leading	15.34	0.9985	Leading	6.88
FLT47-3PH	0.9934	Leading	14.51	0.9929	Leading	15.05	0.9988	Leading	6.08
FLT48-3PH	1.0000	Leading	0.93	0.9997	Leading	2.92	0.9966	Lagging	-10.36
FLT49-3PH	0.9933	Leading	14.61	0.9940	Leading	13.87	0.9987	Leading	6.37
FLT50-3PH	0.9914	Leading	16.64	0.9937	Leading	14.16	0.9843	Leading	22.54
FLT51-3PH	0.9966	Leading	10.37	0.9957	Leading	11.72	0.9992	Lagging	-4.95
FLT52-3PH	0.9952	Leading	12.33	0.9932	Leading	14.76	0.9998	Lagging	-2.50
FLT53-3PH	0.9942	Leading	13.58	0.9933	Leading	14.66	0.9997	Leading	3.04
FLT54-3PH	0.9935	Leading	14.40	0.9930	Leading	14.97	0.9989	Leading	5.85
FLT55-3PH	0.9932	Leading	14.72	0.9926	Leading	15.37	0.9988	Leading	6.09
FLT56-3PH	0.9933	Leading	14.68	0.9930	Leading	15.01	0.9988	Leading	6.23
FLT57-3PH	0.9924	Leading	15.59	0.9924	Leading	15.63	0.9986	Leading	6.68
FLT58-3PH	0.9926	Leading	15.42	0.9929	Leading	15.08	0.9983	Leading	7.31
FLT59-3PH	0.9930	Leading	14.99	0.9929	Leading	15.08	0.9987	Leading	6.47
FLT60-3PH	0.9944	Leading	13.40	0.9942	Leading	13.62	0.9992	Leading	4.91
FLT61-3PH	0.9950	Leading	12.59	0.9943	Leading	13.50	0.9994	Leading	4.39
FLT62-3PH	0.9936	Leading	14.34	0.9932	Leading	14.74	0.9989	Leading	5.93
FLT63-3PH	0.9936	Leading	14.26	0.9932	Leading	14.70	0.9989	Leading	5.89
FLT64-3PH	0.9935	Leading	14.37	0.9930	Leading	14.95	0.9989	Leading	5.99
FLT65-3PH	0.9935	Leading	14.39	0.9930	Leading	14.97	0.9989	Leading	6.02
FLT66-3PH	0.9940	Leading	13.86	0.9935	Leading	14.45	0.9990	Leading	5.60
FLT67-3PH	0.9940	Leading	13.90	0.9934	Leading	14.49	0.9990	Leading	5.66
FLT68-3PH	0.9946	Leading	13.17	0.9941	Leading	13.76	0.9992	Leading	4.99
FLT69-3PH	0.9935	Leading	14.43	0.9930	Leading	15.01	0.9989	Leading	5.99
FLT70-3PH	0.9932	Leading	14.73	0.9925	Leading	15.51	0.9989	Leading	6.00
FLT71-3PH	0.9940	Leading	13.84	0.9937	Leading	14.21	0.9991	Leading	5.45
FLT72-3PH	0.9937	Leading	14.23	0.9931	Leading	14.88	0.9990	Leading	5.57
FLT73-3PH	0.9935	Leading	14.37	0.9931	Leading	14.90	0.9989	Leading	5.97
FLT74-3PH	0.9934	Leading	14.57	0.9929	Leading	15.10	0.9988	Leading	6.14
FLT75-3PH	0.9934	Leading	14.55	0.9929	Leading	15.08	0.9988	Leading	6.10

Table 4-8 (Continued)
Power Factor Analysis: GEN-2013-015 ($P_{GEN}=125.8$ MW)

Power Factor Analysis									
Power Factor Analysis: GEN-2013-015 ($P_{gen}=125.8$)									
Case	2014 Summer Peak			2014 Winter Peak			2023 Summer Peak		
	Power Factor		Q**(MVAR)	Power Factor		Q**(MVAR)	Power Factor		Q**(MVAR)
FLT76-3PH	0.9934	Leading	14.50	0.9929	Leading	15.04	0.9988	Leading	6.07
FLT77-3PH	0.9934	Leading	14.48	0.9930	Leading	15.01	0.9988	Leading	6.05
FLT78-3PH	0.9934	Leading	14.51	0.9929	Leading	15.05	0.9988	Leading	6.09
FLT79-3PH	0.9935	Leading	14.41	0.9930	Leading	14.94	0.9989	Leading	6.00
FLT80-3PH	0.9916	Leading	16.39	0.9910	Leading	17.00	0.9984	Leading	7.16
FLT81-3PH	0.9936	Leading	14.32	0.9931	Leading	14.89	0.9989	Leading	5.94
FLT82-3PH	0.9934	Leading	14.54	0.9929	Leading	15.09	0.9988	Leading	6.11
FLT83-3PH	0.9935	Leading	14.45	0.9930	Leading	14.96	0.9989	Leading	6.02
FLT84-3PH	0.9933	Leading	14.67	0.9928	Leading	15.21	0.9988	Leading	6.18
FLT85-3PH	0.9983	Leading	7.20	0.9920	Leading	15.91	0.9999	Leading	0.13
FLT86-3PH	0.9999	Leading	14.40	0.9931	Leading	14.90	0.9988	Leading	6.10
FLT87-3PH	0.9935	Leading	14.45	0.9929	Leading	15.08	0.9988	Leading	6.09
FLT88-3PH	0.9952	Leading	12.43	0.9941	Leading	13.72	0.9995	Leading	4.05
FLT89-3PH	0.9934	Leading	14.52	0.9929	Leading	15.07	0.9988	Leading	6.08
FLT90-3PH	0.9935	Leading	14.37	0.9929	Leading	15.02	0.9989	Leading	5.99
FLT91-3PH	0.9935	Leading	14.45	0.9929	Leading	15.04	0.9989	Leading	6.01
FLT92-3PH	0.9940	Leading	13.86	0.9937	Leading	14.23	0.9991	Leading	5.47
FLT93-3PH	0.9932	Leading	14.75	0.9928	Leading	15.23	0.9988	Leading	6.27
FLT94-3PH	0.9934	Leading	14.51	0.9929	Leading	15.06	0.9988	Leading	6.08

Summary

The Power Factor Analysis shows that GEN-2013-015 has a power factor range of 0.9895 leading (absorbing) to 1.000 leading (absorbing) for 2014 summer peak conditions, a power factor range of 0.9897 leading (absorbing) to 0.9931 lagging (supplying) for 2014 winter peak conditions, and a power factor range of 0.9981 leading (absorbing) to 0.9992 lagging (supplying) for 2023 summer peak conditions.

4.9 Study Project – GEN-2013-018

Approach

GEN-2013-018 was disabled and a generator was placed at the study project's point of interconnect bus. The generator was modeled with $P_{GEN} = 50.2$ MW, $Q_{Min} = -9999$ Mvar, and $Q_{Max} = 9999$ Mvar. All buses and transformers connected from the study project's POI bus to the GEN-2013-018 generator were disabled. The pre-project voltage at the POI (Tap S974 to Hydrocarbon 69 kV- Bus 560753) for the 2014 summer peak conditions is 1.036 p.u., for the 2014 winter peak conditions is 1.037 p.u., and for the 2023 summer peak conditions is 1.030 p.u. Therefore, the scheduled voltage for the POI was set accordingly for each of the three cases.

Results

The power factor was calculated for 2014 summer, 2014 winter, and 2023 summer peak conditions. Table 4-9 shows the power factor results for GEN-2013-018. Note that a positive Q (Mvar) output illustrates that the generator is absorbing reactive power from the system, implying a leading power factor; a negative Q (Mvar) illustrates that the generator is supplying reactive power to the system, implying a lagging power factor.

Table 4-9
Power Factor Analysis: GEN-2013-018 ($P_{GEN}=50.2$ MW)*

Power Factor Analysis									
Power Factor Analysis: GEN-2013-018 ($P_{gen}=50.2$)									
Case	2014 Summer Peak			2014 Winter Peak			2023 Summer Peak		
	Power Factor		Q**(MVAR)	Power Factor		Q**(MVAR)	Power Factor		Q**(MVAR)
Base	0.9928	Leading	6.06	0.9882	Leading	7.79	0.9936	Leading	5.69
FLT01-3PH	0.9926	Leading	6.14	0.9882	Leading	7.79	0.9937	Leading	5.68
FLT02-3PH	0.9936	Leading	5.70	0.9893	Leading	7.39	0.9944	Leading	5.33
FLT03-3PH	0.9940	Leading	5.50	0.9898	Leading	7.23	0.9946	Leading	5.25
FLT04-3PH	0.9930	Leading	5.99	0.9884	Leading	7.73	0.9936	Leading	5.69
FLT05-3PH	0.9924	Leading	6.22	0.9868	Leading	8.25	0.9930	Leading	5.95
FLT06-3PH	0.9352	Lagging	-19.01	0.9653	Lagging	-13.59	0.9458	Lagging	-17.24
FLT07-3PH	0.9936	Leading	5.72	0.9890	Leading	7.52	0.9943	Leading	5.37
FLT08-3PH	0.9928	Leading	6.07	0.9883	Leading	7.74	0.9938	Leading	5.63
FLT09-3PH	0.9929	Leading	6.02	0.9883	Leading	7.76	0.9937	Leading	5.66
FLT10-3PH	0.9929	Leading	6.01	0.9880	Leading	7.85	0.9936	Leading	5.69
FLT11-3PH	0.9923	Leading	6.27	0.9872	Leading	8.11	0.9934	Leading	5.80
FLT12-3PH	0.9923	Leading	6.26	0.9872	Leading	8.10	0.9934	Leading	5.79
FLT13-3PH	0.9939	Leading	5.55	0.9890	Leading	7.51	0.9946	Leading	5.25
FLT14-3PH	0.9928	Leading	6.07	0.9881	Leading	7.81	0.9936	Leading	5.70
FLT15-3PH	0.9941	Leading	5.48	0.9899	Leading	7.20	0.9946	Leading	5.25
FLT16-3PH	0.9933	Leading	5.83	0.9890	Leading	7.51	0.9941	Leading	5.50
FLT17-3PH	0.9928	Leading	6.04	0.9885	Leading	7.68	0.9937	Leading	5.64
FLT18-3PH	0.9931	Leading	5.95	0.9889	Leading	7.53	0.9938	Leading	5.60
FLT19-3PH	0.9940	Leading	5.50	0.9887	Leading	7.60	0.9947	Leading	5.20
FLT20-3PH	0.9928	Leading	6.05	0.9882	Leading	7.78	0.9936	Leading	5.69
FLT21-3PH	0.9928	Leading	6.06	0.9882	Leading	7.79	0.9936	Leading	5.69
FLT22-3PH	0.9928	Leading	6.05	0.9882	Leading	7.78	0.9936	Leading	5.68
FLT23-3PH	0.9928	Leading	6.05	0.9882	Leading	7.78	0.9937	Leading	5.68
FLT24-3PH	0.9928	Leading	6.06	0.9882	Leading	7.77	0.9936	Leading	5.68
FLT25-3PH	0.9928	Leading	6.05	0.9883	Leading	7.76	0.9937	Leading	5.67
FLT26-3PH	0.9929	Leading	6.01	0.9883	Leading	7.74	0.9939	Leading	5.59
FLT27-3PH	0.9929	Leading	6.03	0.9883	Leading	7.75	0.9937	Leading	5.66
FLT28-3PH	0.9938	Leading	5.63	0.9895	Leading	7.35	0.9945	Leading	5.30
FLT29-3PH	0.9936	Leading	5.71	0.9899	Leading	7.20	0.9941	Leading	5.48
FLT30-3PH	0.9939	Leading	5.59	0.9897	Leading	7.26	0.9947	Leading	5.19
FLT31-3PH	0.9934	Leading	5.79	0.9892	Leading	7.46	0.9942	Leading	5.42
FLT32-3PH	0.9937	Leading	5.64	0.9898	Leading	7.23	0.9944	Leading	5.34
FLT33-3PH	0.9934	Leading	5.78	0.9891	Leading	7.47	0.9942	Leading	5.44
FLT34-3PH	0.9934	Leading	5.78	0.9888	Leading	7.58	0.9946	Leading	5.26
FLT35-3PH	0.9943	Leading	5.38	0.9900	Leading	7.14	0.9949	Leading	5.08

*The scheduled voltage for the POI (Tap S974 to Hydrocarbon 69 kV) was 1.036 p.u. for 2014 summer peak conditions, 1.037 p.u. for 2014 winter peak conditions, and 1.030 p.u. for 2023 summer peak conditions.

**A positive Q (Mvar) output illustrates the generator is absorbing Mvars from the system, which implies a leading power factor; negative Q (Mvar) output shows the generator is supplying Mvars to the system implying a lagging power factor.

Table 4-9 (Continued)
Power Factor Analysis: GEN-2013-018 ($P_{GEN}=50.2$ MW)

Power Factor Analysis									
Power Factor Analysis: GEN-2013-018 ($P_{gen}=50.2$)									
Case	2014 Summer Peak			2014 Winter Peak			2023 Summer Peak		
	Power Factor		Q**(MVAR)	Power Factor		Q**(MVAR)	Power Factor		Q**(MVAR)
FLT36-3PH	0.9937	Leading	5.68	0.9894	Leading	7.38	0.9944	Leading	5.32
FLT37-3PH	0.9936	Leading	5.71	0.9898	Leading	7.23	0.9944	Leading	5.34
FLT38-3PH	0.9931	Leading	5.94	0.9886	Leading	7.65	0.9939	Leading	5.56
FLT39-3PH	0.9933	Leading	5.86	0.9890	Leading	7.52	0.9940	Leading	5.53
FLT40-3PH	0.9935	Leading	5.74	0.9891	Leading	7.48	0.9941	Leading	5.47
FLT41-3PH	0.9932	Leading	5.88	0.9886	Leading	7.63	0.9941	Leading	5.47
FLT42-3PH	0.9927	Leading	6.11	0.9882	Leading	7.77	0.9933	Leading	5.84
FLT43-3PH	0.9928	Leading	6.07	0.9886	Leading	7.64	0.9932	Leading	5.90
FLT44-3PH	0.9924	Leading	6.21	0.9877	Leading	7.94	0.9933	Leading	5.85
FLT45-3PH	0.9938	Leading	5.63	0.9894	Leading	7.35	0.9944	Leading	5.33
FLT46-3PH	0.9931	Leading	5.94	0.9884	Leading	7.71	0.9940	Leading	5.55
FLT47-3PH	0.9928	Leading	6.06	0.9882	Leading	7.79	0.9936	Leading	5.69
FLT48-3PH	0.9928	Leading	6.08	0.9882	Leading	7.79	0.9935	Leading	5.74
FLT49-3PH	0.9928	Leading	6.06	0.9882	Leading	7.78	0.9936	Leading	5.69
FLT50-3PH	0.9930	Leading	5.99	0.9884	Leading	7.73	0.9938	Leading	5.60
FLT51-3PH	0.9928	Leading	6.07	0.9882	Leading	7.79	0.9936	Leading	5.71
FLT52-3PH	0.9929	Leading	6.00	0.9884	Leading	7.73	0.9937	Leading	5.66
FLT53-3PH	0.9928	Leading	6.06	0.9882	Leading	7.78	0.9937	Leading	5.68
FLT54-3PH	0.9928	Leading	6.07	0.9882	Leading	7.79	0.9936	Leading	5.69
FLT55-3PH	0.9928	Leading	6.07	0.9882	Leading	7.80	0.9936	Leading	5.69
FLT56-3PH	0.9928	Leading	6.07	0.9882	Leading	7.78	0.9936	Leading	5.70
FLT57-3PH	0.9928	Leading	6.07	0.9882	Leading	7.79	0.9936	Leading	5.69
FLT58-3PH	0.9928	Leading	6.06	0.9882	Leading	7.78	0.9936	Leading	5.70
FLT59-3PH	0.9928	Leading	6.06	0.9882	Leading	7.78	0.9936	Leading	5.69
FLT60-3PH	0.9927	Leading	6.08	0.9878	Leading	7.92	0.9935	Leading	5.74
FLT61-3PH	0.9930	Leading	5.99	0.9883	Leading	7.74	0.9938	Leading	5.63
FLT62-3PH	0.9929	Leading	6.01	0.9886	Leading	7.66	0.9938	Leading	5.63
FLT63-3PH	0.9928	Leading	6.06	0.9884	Leading	7.72	0.9937	Leading	5.68
FLT64-3PH	0.9928	Leading	6.05	0.9882	Leading	7.78	0.9936	Leading	5.69
FLT65-3PH	0.9928	Leading	6.06	0.9882	Leading	7.78	0.9936	Leading	5.69
FLT66-3PH	0.9931	Leading	5.91	0.9887	Leading	7.63	0.9939	Leading	5.57
FLT67-3PH	0.9931	Leading	5.92	0.9886	Leading	7.64	0.9939	Leading	5.58
FLT68-3PH	0.9927	Leading	6.11	0.9881	Leading	7.81	0.9936	Leading	5.71
FLT69-3PH	0.9929	Leading	6.00	0.9884	Leading	7.71	0.9938	Leading	5.63
FLT70-3PH	0.9928	Leading	6.07	0.9883	Leading	7.76	0.9936	Leading	5.70
FLT71-3PH	0.9928	Leading	6.05	0.9883	Leading	7.75	0.9936	Leading	5.71
FLT72-3PH	0.9930	Leading	5.97	0.9887	Leading	7.61	0.9938	Leading	5.60
FLT73-3PH	0.9328	Leading	19.39	0.9501	Leading	16.48	0.9270	Leading	20.30
FLT74-3PH	0.9948	Lagging	-5.16	0.9999	Lagging	-0.71	0.9928	Lagging	-6.06
FLT75-3PH	0.9683	Leading	12.95	0.9674	Leading	13.14	0.9833	Leading	9.28

Table 4-9 (Continued)
Power Factor Analysis: GEN-2013-018 ($P_{GEN}=50.2$ MW)

Power Factor Analysis									
Power Factor Analysis: GEN-2013-018 ($P_{gen}=50.2$)									
Case	2014 Summer Peak			2014 Winter Peak			2023 Summer Peak		
	Power Factor		Q**(MVAR)	Power Factor		Q**(MVAR)	Power Factor		Q**(MVAR)
FLT76-3PH	0.9994	Leading	1.68	0.9965	Leading	4.23	0.9999	Leading	0.80
FLT77-3PH	0.9917	Leading	6.53	0.9880	Leading	7.86	0.9919	Leading	6.41
FLT78-3PH	0.9754	Leading	11.35	0.9729	Leading	11.93	0.9762	Leading	11.15
FLT79-3PH	0.9560	Leading	15.40	0.9579	Leading	15.05	0.9539	Leading	15.80
FLT80-3PH	0.9990	Leading	2.28	0.9964	Leading	4.27	0.9978	Leading	3.36
FLT81-3PH	0.9918	Leading	6.48	0.9864	Leading	8.36	0.9929	Leading	6.01
FLT82-3PH	0.9918	Leading	6.45	0.9868	Leading	8.24	0.9929	Leading	6.00
FLT83-3PH	0.9929	Leading	6.01	0.9884	Leading	7.70	0.9937	Leading	5.65
FLT84-3PH	0.9938	Leading	5.64	0.9890	Leading	7.51	0.9940	Leading	5.51
FLT85-3PH	0.9926	Leading	6.14	0.9880	Leading	7.84	0.9935	Leading	5.77
FLT86-3PH	0.9926	Leading	6.10	0.9881	Leading	7.80	0.9936	Leading	5.70
FLT87-3PH	0.9928	Leading	6.06	0.9882	Leading	7.78	0.9936	Leading	5.69
FLT88-3PH	0.9927	Leading	6.09	0.9882	Leading	7.77	0.9936	Leading	5.72
FLT89-3PH	0.9928	Leading	6.06	0.9882	Leading	7.79	0.9936	Leading	5.69
FLT90-3PH	0.9928	Leading	6.04	0.9883	Leading	7.75	0.9937	Leading	5.66
FLT91-3PH	0.9929	Leading	6.00	0.9884	Leading	7.71	0.9938	Leading	5.64
FLT92-3PH	0.9928	Leading	6.05	0.9883	Leading	7.75	0.9936	Leading	5.71
FLT93-3PH	0.9704	Lagging	-12.49	0.9906	Lagging	-6.92	0.9806	Lagging	-10.04
FLT94-3PH	0.9987	Lagging	-2.54	0.9999	Leading	0.74	0.9972	Lagging	-3.80

Summary

The Power Factor Analysis shows that GEN-2013-018 has a power factor range of 0.9328 leading (absorbing) to 0.9352 lagging (supplying) for 2014 summer peak conditions, a power factor range of 0.9501 leading (absorbing) to 0.9653 lagging (supplying) for 2014 winter peak conditions, and a power factor range of 0.9270 leading (absorbing) to 0.9458 lagging (supplying) for 2023 summer peak conditions.

SECTION 5: CONCLUSIONS

Stability Analysis

For the 2014 summer, 2014 winter, and 2023 summer peak power flows, the Stability Analysis determined that there was no voltage violations or wind turbine tripping that occurred from interconnecting GEN-2012-005, GEN-2013-002, GEN-2013-004, GEN-2013-005, GEN-2013-006, GEN-2013-008, GEN-2013-014, GEN-2013-015, or GEN-2013-018 at 100% output.

Power Factor Analysis

Refer to Table 5-1 for a table summary of the power factor analysis. The Power Factor Analysis shows that GEN-2012-005 has a power factor range of 0.9558 leading (absorbing) to 0.6473 lagging (supplying) for the three study cases, 2014 summer, 2014 winter, and 2023 summer peak conditions. The Power Factor Analysis shows that GEN-2013-002 has a power factor range of 0.8678 leading (absorbing) to 0.7935 lagging (supplying) for the three study cases. The Power Factor Analysis shows that GEN-2013-004 and GEN-2013-005 have a power factor range of 0.9990 leading (absorbing) to 0.9931 lagging (supplying) for the three study cases. The Power Factor Analysis shows that GEN-2013-006 has a power factor range of 0.9786 leading (absorbing) to 0.9515 lagging (supplying) for the three study cases. The Power Factor Analysis shows that GEN-2013-008 has a power factor range of 0.9679 leading (absorbing) to 0.9955 lagging (supplying) for the three study cases. The Power Factor Analysis shows that GEN-2013-014 has a power factor range of 0.9399 leading (absorbing) to 0.8688 lagging (supplying) for the three study cases. The Power Factor Analysis shows that GEN-2013-015 has a power factor range of 0.9895 leading (absorbing) to 0.9931 lagging (supplying) for the three study cases. The Power Factor Analysis shows that GEN-2013-018 has a power factor range of 0.9270 leading (absorbing) to 0.9352 lagging (supplying) for the three study cases.

**Table 5-1
Power Factor Analysis Summary**

Generator	Size (MW)	Power Factor Range			
GEN-2012-005	81.0	0.9558	Leading	0.6473	Lagging
GEN-2013-002	50.6	0.8678	Leading	0.7935	Lagging
GEN-2013-004	206.5	0.9990	Leading	0.9931	Lagging
GEN-2013-005	73.5	0.9990	Leading	0.9931	Lagging
GEN-2013-006	50.6	0.9786	Leading	0.9515	Lagging
GEN-2013-008	74.8	0.9679	Leading	0.9955	Lagging
GEN-2013-014	25.5	0.9399	Leading	0.8688	Lagging
GEN-2013-015	125.8	0.9895	Leading	0.9931	Lagging
GEN-2013-018	50.2	0.9270	Leading	0.9352	Lagging

P: Group 12 Dynamic Stability Analysis Report

See Excel Engineering, Inc report on next page.

SPP DISIS-2013-001 Group 12 Definitive Impact Study

Final Report for
Southwest Power Pool

Prepared by:
Excel Engineering, Inc.
Project # 130261

July 11, 2013

Principal Contributors:

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TABLE OF CONTENTS

0. CERTIFICATION	4
1. BACKGROUND AND SCOPE.....	5
2. EXECUTIVE SUMMARY	6
3. STUDY DEVELOPMENT AND ASSUMPTIONS.....	7
3.1 Simulation Tools	7
3.2 Models Used.....	7
3.3 Monitored Facilities.....	7
3.4 Performance Criteria.....	9
3.5 Performance Evaluation Methods.....	9
4. RESULTS AND OBSERVATIONS	13
4.1 Stability Analysis Results	13
4.2 Power Factor Requirements	16
4.3 Transient Voltage Analysis	16
5. CONCLUSIONS.....	17
Appendix A – 2014 Summer Peak Plots	
Appendix B – 2014 Winter Peak Plots	
Appendix C – 2023 Summer Peak Plots	
Appendix D – Project Model Data	
Appendix E – Transient Voltage Data	
Appendix F – SPP Transmission One-line Diagrams	

List of Figures

Figure 3-1	Power Flow One-line for GEN-2013-011.....	8
Figure 4-1	GEN-2013-001 Plot for Fault 11 – 3-Phase Fault on the Turk 138 kV (507454) to Turk 345 kV (507454) transformer, near Turk 138 kV	15
Figure 4-2	POI Voltages for Fault 11 – 3-Phase Fault on the Turk 138 kV (507454) to Turk 345 kV(507454) transformer, near Turk 138 kV	15

List of Tables

Table 1-1	Interconnection Request Evaluated in this Study	5
Table 1-2	Nearby Interconnection Requests Already in the Queue	5
Table 3-1	Fault Definitions for DISIS-2013-001 Group 12.....	10
Table 4-1	Summary of Stability Results	13
Table 4-2	Transient Voltage Results	16
Table 5-1	Interconnection Requests Evaluated in this Study.....	17

0. Certification

I hereby certify that this plan, specification, or report was prepared by me or under my direct supervision and that I am a duly Licensed Professional Engineer under the Laws of the States of **Arkansas and Texas**.

William Quaintance
Arkansas License Number 13865
Texas License Number 104268

Excel Engineering Inc
Arkansas Firm License Number 1809
Texas Firm License Number 7970

1. Background and Scope

The DISIS-2013-001 Group 12 Definitive Impact Study is a generation interconnection study performed by Excel Engineering, Inc. for its non-affiliated client, Southwest Power Pool (SPP). Its purpose is to study the impacts of interconnecting the projects shown in Table 1-1. The in-service date assumed for the generation addition was 2014.

Table 1-1 Interconnection Request Evaluated in this Study

Request	Size (MW)	Generator Type	Point of Interconnection	Gen Buses
GEN-2013-011	30.0 Increase (Pmax=683.0)	GENROU	Turk 138kV (507454)	509416

The prior-queued requests shown in Table 1-2 were included in this study and dispatched at 100% of rated capacity (except as noted *).

Table 1-2 Nearby Interconnection Requests Already in the Queue

Request	Size (MW)	Generator Type	Point of Interconnection	Gen Buses
None				

The study included stability analysis of the proposed interconnection request. A power factor analysis was not performed as there are no wind or solar generators.

A transient voltage data scan was completed to verify any bus voltages outside the bandwidth of 0.70 per unit to 1.20 per unit after the disturbance was cleared.

ATC (Available Transfer Capability) studies were not performed as part of this study. These studies will be required at the time transmission service is actually requested. Additional transmission upgrades may be required based on that analysis.

Study assumptions in general have been based on Excel’s knowledge of the electric power system and on the specific information and data provided by SPP. The accuracy of the conclusions contained within this study is sensitive to the assumptions made with respect to generation additions and transmission improvements being contemplated. Changes in the assumptions of the timing of other generation additions or transmission improvements will affect this study’s conclusions.

2. Executive Summary

The DISIS-2013-001 Group 12 Definitive Impact Study evaluated the impacts of interconnecting the Table 1-1 study project to the SPP transmission system.

The results were satisfactory for all the faults. There were no voltage violations for the electrical system 100 kV and above. All generators were stable for all faults.

Any change in system or plant models or assumptions could change these results.

3. Study Development and Assumptions

3.1 *Simulation Tools*

The Siemens Power Technologies, Inc. PSS/E power system simulation program Version 32.1 was used in this study.

3.2 *Models Used*

SPP provided its latest stability database cases for 2014 summer, 2014 winter, and 2023 summer peak seasons. These cases included the study and prior-queued projects. A power flow one-line diagram of the study project is shown in Figure 3-1.

The study plant transmission lines and substation transformers are modeled explicitly in the power flow cases. Steady-state and dynamic model data for the study plants are given in Appendix D.

One-line diagrams of the SPP 345 and 138 kV systems in the Group 12 area are shown in Appendix E.

No special modeling is required of line relays in these cases, except for the special modeling related to the wind and solar generation tripping.

3.3 *Monitored Facilities*

All generators and transmission buses in Areas 502, 520, 523, 524, 525, and 531 were monitored.

3.4 Performance Criteria

Wind generators must comply with FERC Order 661A on low voltage ride through for wind farms. There were no wind generators in this study.

Contingencies that resulted in a prior-queued project tripping off-line, if any, were re-run with the prior-queued project's voltage and frequency tripping disabled to check for stability issues.

3.5 Performance Evaluation Methods

A power factor analysis was not performed because the study project is not a wind farm.

ATC studies were not performed as part of this study. These studies will be required at the time transmission service is actually requested. Additional transmission facilities may be required based on subsequent ATC analysis.

Stability analysis was performed for each proposed interconnection request. Faults were simulated on transmission lines at the POIs and on other nearby transmission equipment. The faults in Table 3-1 were run for each case (three phase and single phase as noted).

Table 3-1 Fault Definitions for DISIS-2013-001 Group 12

Cont. No.	Contingency Name	Contingency Description
1	FLT01-3PH	3 phase fault on the Ashdown (507402) to Patterson (507431) 138kV line, near Ashdown. a. Apply fault at the Ashdown 138kV bus. b. Clear fault after 5 cycles by tripping the faulted line. c. Wait 20 cycles, and then re-close the line in (b) back into the fault. d. Leave fault on for 5 cycles, then trip the line in (b) and remove fault.
2	FLT02-1PH	<i>Single phase fault and sequence like previous</i>
3	FLT03-3PH	3 phase fault on the Hope (507453) to McNabb (504122) 115kV line, near Hope. a. Apply fault at the Hope 115kV bus. b. Clear fault after 5 cycles by tripping the faulted line. c. Wait 20 cycles, and then re-close the line in (b) back into the fault. d. Leave fault on for 5 cycles, then trip the line in (b) and remove fault.
4	FLT04-1PH	<i>Single phase fault and sequence like previous</i>
5	FLT05-3PH	3 phase fault on the SE Texarkana (508078) to Bann (508054) 138kV line, near SE Texarkana. a. Apply fault at the SE Texarkana 138kV bus. b. Clear fault after 5 cycles by tripping the faulted line. c. Wait 20 cycles, and then re-close the line in (b) back into the fault. d. Leave fault on for 5 cycles, then trip the line in (b) and remove fault.
6	FLT06-1PH	<i>Single phase fault and sequence like previous</i>
7	FLT07-3PH	3 phase fault on the SE Texarkana (508078) to Mandeville Tap (508105) 138kV line, near SE Texarkana. a. Apply fault at the SE Texarkana 138kV bus. b. Clear fault after 5 cycles by tripping the faulted line. c. Wait 20 cycles, and then re-close the line in (b) back into the fault. d. Leave fault on for 5 cycles, then trip the line in (b) and remove fault.
8	FLT08-1PH	<i>Single phase fault and sequence like previous</i>
9	FLT09-3PH	3 phase fault on the SE Texarkana (508078) 345kV to SE Texarkana (508077) 138kV/(508102) 13.2kV, near SE Texarkana. a. Apply fault at the SE Texarkana 138kV bus. b. Clear fault after 5 cycles by tripping the faulted transformer.
10	FLT10-3PH	3 phase fault on the Turk (507455) 345kV to Turk (507454) 138kV/(507457) 13.8kV, near Turk. a. Apply fault at the Turk 345kV bus. b. Clear fault after 5 cycles by tripping the faulted transformer.
11	FLT11-3PH	3 phase fault on the Turk (507454) 138kV to Turk (507455) 345kV/(507457) 13.8kV, near Turk. a. Apply fault at the Turk 138kV bus. b. Clear fault after 5 cycles by tripping the faulted transformer.

SPP DISIS-2013-001 Group 12 Definitive Impact Study

Cont. No.	Contingency Name	Contingency Description
12	FLT12-3PH	3 phase fault on the Turk (507454) 138kV to Turk (507456) 115kV/(507458) 13.2kV, near Turk. a. Apply fault at the Turk 138kV bus. b. Clear fault after 5 cycles by tripping the faulted transformer.
13	FLT13-3PH	3 phase fault on the Turk (507455) to NW Texarkana (508072) 345kV line, near Turk. a. Apply fault at the Turk 345kV bus. b. Clear fault after 5 cycles by tripping the faulted line. c. Wait 20 cycles, and then re-close the line in (b) back into the fault. d. Leave fault on for 5 cycles, then trip the line in (b) and remove fault.
14	FLT14-1PH	<i>Single phase fault and sequence like previous</i>
15	FLT15-3PH	3 phase fault on the NW Texarkana (508072) to Lydia (508298) 345kV line, near NW Texarkana. a. Apply fault at the NW Texarkana 345kV bus. b. Clear fault after 5 cycles by tripping the faulted line. c. Wait 20 cycles, and then re-close the line in (b) back into the fault. d. Leave fault on for 5 cycles, then trip the line in (b) and remove fault.
16	FLT16-1PH	<i>Single phase fault and sequence like previous</i>
17	FLT17-3PH	3 phase fault on the Lydia (508298) to Valliant (510911) 345kV line, near Lydia. a. Apply fault at the Lydia 345kV bus. b. Clear fault after 5 cycles by tripping the faulted line. c. Wait 20 cycles, and then re-close the line in (b) back into the fault. d. Leave fault on for 5 cycles, then trip the line in (b) and remove fault.
18	FLT18-1PH	<i>Single phase fault and sequence like previous</i>
19	FLT19-3PH	3 phase fault on the NW Texarkana (508072) to Welsh (508359) 345kV line, near NW Texarkana. a. Apply fault at the NW Texarkana 345kV bus. b. Clear fault after 5 cycles by tripping the faulted line. c. Wait 20 cycles, and then re-close the line in (b) back into the fault. d. Leave fault on for 5 cycles, then trip the line in (b) and remove fault.
20	FLT20-1PH	<i>Single phase fault and sequence like previous</i>
21	FLT21-3PH	3 phase fault on the Sugar Hill (508080) to NW Texarkana (508071) 138kV line, near Sugar Hill. a. Apply fault at the Sugar Hill 138kV bus. b. Clear fault after 5 cycles by tripping the faulted line. c. Wait 20 cycles, and then re-close the line in (b) back into the fault. d. Leave fault on for 5 cycles, then trip the line in (b) and remove fault.
22	FLT22-1PH	<i>Single phase fault and sequence like previous</i>
23	FLT23-3PH	3 phase fault on the Turk (507454) to Okay (507428) 138kV line, near Turk. a. Apply fault at the Turk 138kV bus. b. Clear fault after 5 cycles by tripping the faulted line. c. Wait 20 cycles, and then re-close the line in (b) back into the fault. d. Leave fault on for 5 cycles, then trip the line in (b) and remove fault.
24	FLT24-1PH	<i>Single phase fault and sequence like previous</i>

SPP DISIS-2013-001 Group 12 Definitive Impact Study

Cont. No.	Contingency Name	Contingency Description
25	FLT25-3PH	3 phase fault on the Turk (507454) to SE Texarkana (508078) 138kV line, near Turk. a. Apply fault at the Turk 138kV bus. b. Clear fault after 5 cycles by tripping the faulted line. c. Wait 20 cycles, and then re-close the line in (b) back into the fault. d. Leave fault on for 5 cycles, then trip the line in (b) and remove fault.
26	FLT26-1PH	<i>Single phase fault and sequence like previous</i>
27	FLT27-3PH	3 phase fault on the Turk (507454) to Sugar Hill (508080) 138kV line, near Turk. a. Apply fault at the Turk 138kV bus. b. Clear fault after 5 cycles by tripping the faulted line. c. Wait 20 cycles, and then re-close the line in (b) back into the fault. d. Leave fault on for 5 cycles, then trip the line in (b) and remove fault.
28	FLT28-1PH	<i>Single phase fault and sequence like previous</i>
29	FLT29-3PH	3 phase fault on the Turk (507454) to Mandeville Tap (508105) 138kV line, near Turk. a. Apply fault at the Turk 138kV bus. b. Clear fault after 5 cycles by tripping the faulted line. c. Wait 20 cycles, and then re-close the line in (b) back into the fault. d. Leave fault on for 5 cycles, then trip the line in (b) and remove fault.
30	FLT30-1PH	<i>Single phase fault and sequence like previous</i>
31	FLT31-3PH	Prior outage of the Turk (507455) to NW Texarkana (508072) 345kV line. 3 phase fault on the Turk (507454) to Sugar Hill (508080) 138kV line, near Turk. a. Prior outage of Turk – Northwest Texarkana 345kV. b. Apply fault at the Turk 138kV bus. c. Clear fault after 5 cycles by tripping the faulted line. d. Wait 20 cycles, and then re-close the line in (c) back into the fault. e. Leave fault on for 5 cycles, then trip the line in (c) and remove fault.
32	FLT32-3PH	Prior outage of the Turk (507455) to NW Texarkana (508072) 345kV line. 3 phase fault on the Turk (507454) to Okay (507428) 115kV line, near Turk. a. Prior outage of Turk – Northwest Texarkana 345kV. b. Apply fault at the Turk 138kV bus. c. Clear fault after 5 cycles by tripping the faulted line. d. Wait 20 cycles, and then re-close the line in (c) back into the fault. e. Leave fault on for 5 cycles, then trip the line in (c) and remove fault.

4. Results and Observations

4.1 Stability Analysis Results

Table 4-1 summarizes the results. Figure 4-1 shows representative summer peak season plots for faults at the POI's of the study project. Complete sets of plots for both 2014 and 2023 summer and winter peak seasons for each fault and each project are included in Appendices A, B and C.

Table 4-1 Summary of Stability Results

Cont. No.	Contingency Name	Contingency Description	2014 Summer Peak Results	2014 Winter Peak Results	2023 Summer Peak Results
1	FLT01-3PH	3 phase fault on the Ashdown (507402) to Patterson (507431) 138kV line, near Ashdown.	OK	OK	OK
2	FLT02-1PH	<i>Single phase fault and sequence like previous</i>	OK	OK	OK
3	FLT03-3PH	3 phase fault on the Hope (507453) to McNabb (504122) 115kV line, near Hope.	OK	OK	OK
4	FLT04-1PH	<i>Single phase fault and sequence like previous</i>	OK	OK	OK
5	FLT05-3PH	3 phase fault on the SE Texarkana (508078) to Bann (508054) 138kV line, near SE Texarkana.	OK	OK	OK
6	FLT06-1PH	<i>Single phase fault and sequence like previous</i>	OK	OK	OK
7	FLT07-3PH	3 phase fault on the SE Texarkana (508078) to Mandeville Tap (508105) 138kV line, near SE Texarkana.	OK	OK	OK
8	FLT08-1PH	<i>Single phase fault and sequence like previous</i>	OK	OK	OK
9	FLT09-3PH	3 phase fault on the SE Texarkana (508078) 345kV to SE Texarkana (508077) 138kV/(508102) 13.2kV, near SE Texarkana.	OK	OK	OK
10	FLT10-3PH	3 phase fault on the Turk (507455) 345kV to Turk (507454) 138kV/(507457) 13.8kV, near Turk.	OK	OK	OK
11	FLT11-3PH	3 phase fault on the Turk (507454) 138kV to Turk (507455) 345kV/(507457) 13.8kV, near Turk.	OK	OK	OK
12	FLT12-3PH	3 phase fault on the Turk (507454) 138kV to Turk (507456) 115kV/(507458) 13.2kV, near Turk.	OK	OK	OK
13	FLT13-3PH	3 phase fault on the Turk (507455) to NW Texarkana (508072) 345kV line, near Turk.	OK	OK	OK
14	FLT14-1PH	<i>Single phase fault and sequence like previous</i>	OK	OK	OK
15	FLT15-3PH	3 phase fault on the NW Texarkana (508072) to Lydia (508298) 345kV line, near NW Texarkana.	OK	OK	OK
16	FLT16-1PH	<i>Single phase fault and sequence like previous</i>	OK	OK	OK
17	FLT17-3PH	3 phase fault on the Lydia (508298) to Valliant (510911) 345kV line, near Lydia.	OK	OK	OK
18	FLT18-1PH	<i>Single phase fault and sequence like previous</i>	OK	OK	OK

SPP DISIS-2013-001 Group 12 Definitive Impact Study

Cont. No.	Contingency Name	Contingency Description	2014 Summer Peak Results	2014 Winter Peak Results	2023 Summer Peak Results
19	FLT19-3PH	3 phase fault on the NW Texarkana (508072) to Welsh (508359) 345kV line, near NW Texarkana.	OK	OK	OK
20	FLT20-1PH	<i>Single phase fault and sequence like previous</i>	OK	OK	OK
21	FLT21-3PH	3 phase fault on the Sugar Hill (508080) to NW Texarkana (508071) 138kV line, near Sugar Hill.	OK	OK	OK
22	FLT22-1PH	<i>Single phase fault and sequence like previous</i>	OK	OK	OK
23	FLT23-3PH	3 phase fault on the Turk (507454) to Okay (507428) 138kV line, near Turk.	OK	OK	OK
24	FLT24-1PH	<i>Single phase fault and sequence like previous</i>	OK	OK	OK
25	FLT25-3PH	3 phase fault on the Turk (507454) to SE Texarkana (508078) 138kV line, near Turk.	OK	OK	OK
26	FLT26-1PH	<i>Single phase fault and sequence like previous</i>	OK	OK	OK
27	FLT27-3PH	3 phase fault on the Turk (507454) to Sugar Hill (508080) 138kV line, near Turk.	OK	OK	OK
28	FLT28-1PH	<i>Single phase fault and sequence like previous</i>	OK	OK	OK
29	FLT29-3PH	3 phase fault on the Turk (507454) to Mandeville Tap (508105) 138kV line, near Turk.	OK	OK	OK
30	FLT30-1PH	<i>Single phase fault and sequence like previous</i>	OK	OK	OK
31	FLT31-3PH	Prior outage of the Turk (507455) to NW Texarkana (508072) 345kV line. 3 phase fault on the Turk (507454) to Sugar Hill (508080) 138kV line, near Turk.	OK	OK	OK
32	FLT32-3PH	Prior outage of the Turk (507455) to NW Texarkana (508072) 345kV line. 3 phase fault on the Turk (507454) to Okay (507428) 115kV line, near Turk.	OK	OK	OK

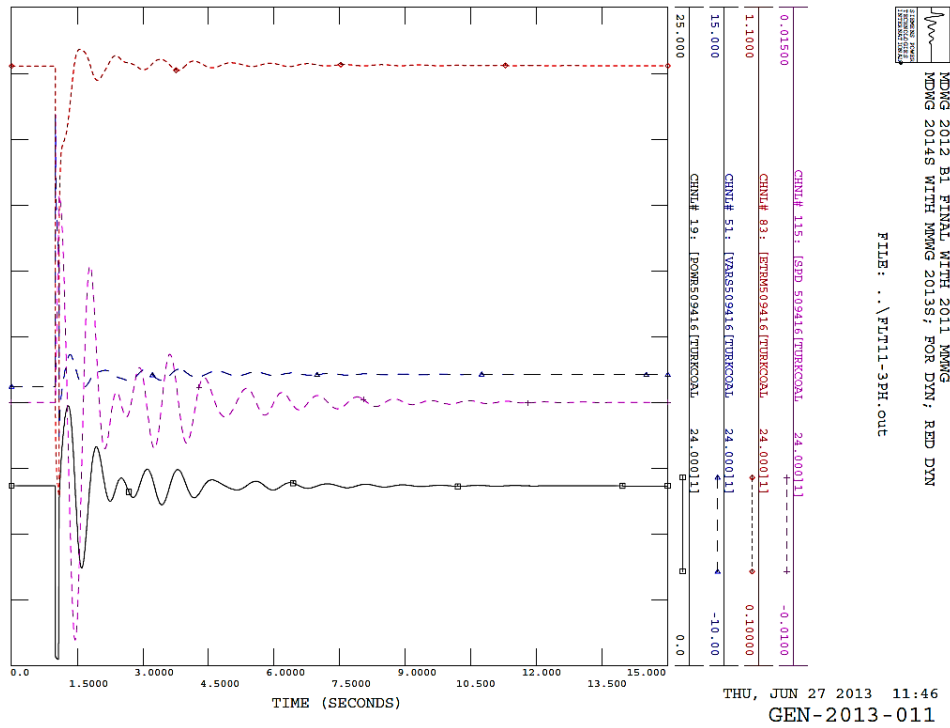


Figure 4-1 GEN-2013-001 Plot for Fault 11 – 3-Phase Fault on the Turk 138 kV (507454) to Turk 345 kV (507454) transformer, near Turk 138 kV

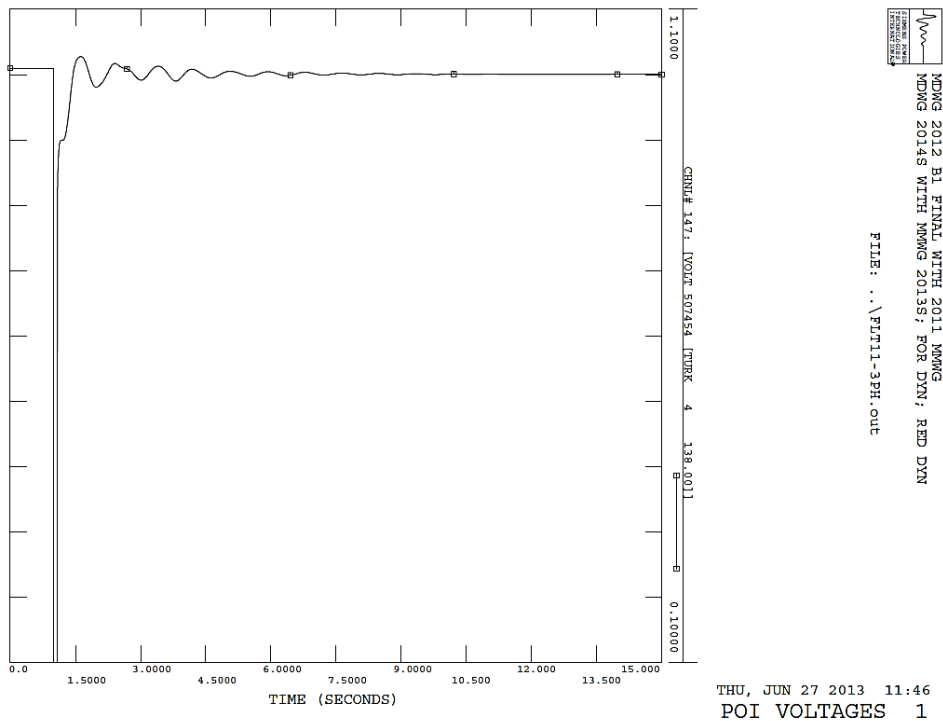


Figure 4-2 POI Voltages for Fault 11 – 3-Phase Fault on the Turk 138 kV (507454) to Turk 345 kV(507454) transformer, near Turk 138 kV

4.2 Power Factor Requirements

The power factor analysis was not required because no wind or solar generators were study projects.

4.3 Transient Voltage Analysis

The transient voltage analysis was completed on buses in the monitored areas above 100kV. The voltages were taken starting at the time the fault was removed. There were no voltages outside the limits as shown in Table 4-2.

Table 4-2 Transient Voltage Results

Filename	Vmin	Vmax	Bus#	BusName	BaseKV	2014 Winter		2014 Summer		2023 Summer	
						Time	Voltage	Time	Voltage	Time	Voltage
None	0.7	1.2	-	-	-	-	-	-	-	-	-

5. Conclusions

The DISIS-2013-001 Group 12 Definitive Impact Study evaluated the impacts of interconnecting the projects shown below in Table 5-1.

Table 5-1 Interconnection Requests Evaluated in this Study

Request	Size	Generator Type	Point of Interconnection	Gen Buses
GEN-2013-011	30.0 Increase (Pmax=683.0)	GENROU	Turk 138kV (507454)	509416

The results were satisfactory for all the faults. There were no voltage violations for the electrical system 100 kV and above. All generators were stable for all faults.

Any change in system or plant models or assumptions could change these results.

Appendix A – 2014 Summer Peak Plots

Appendix B – 2014 Winter Peak Plots

Appendix C – 2023 Summer Peak Plots

Appendix D – Project Model Data

Appendix E – Transient Voltage Data

Appendix F – SPP Transmission One-line Diagrams

Q: Group 14 Dynamic Stability Analysis Report

See Excel Engineering, Inc report on next page.

SPP DISIS-2013-001 Group 14 Definitive Impact Restudy

Final Report for
Southwest Power Pool

Prepared by:
Excel Engineering, Inc.
Project # 130262

July 18, 2013

Principal Contributors:

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William Quaintance, P.E.



TABLE OF CONTENTS

0. CERTIFICATION	4
1. BACKGROUND AND SCOPE.....	5
2. EXECUTIVE SUMMARY	6
3. STUDY DEVELOPMENT AND ASSUMPTIONS.....	7
3.1 Simulation Tools	7
3.2 Models Used.....	7
3.3 Monitored Facilities.....	7
3.4 Performance Criteria.....	9
3.5 Performance Evaluation Methods.....	9
4. RESULTS AND OBSERVATIONS	13
4.1 Stability Analysis Results	13
4.2 Power Factor Requirements	16
4.3 Transient Voltage Analysis	16
5. CONCLUSIONS.....	18
Appendix A – 2014 Summer Peak Plots	
Appendix B – 2014 Winter Peak Plots	
Appendix C – 2023 Summer Peak Plots	
Appendix D – Power Factor Details	
Appendix E – Project Model Data	
Appendix F – Transient Voltage Data	
Appendix G – SPP Transmission One-line Diagrams	

List of Figures

Figure 3-1	Power Flow One-line for GEN-2013-011.....	8
Figure 4-1	2014 Summer Peak - GEN-2013-007 Plot for Fault 21 – 3-Phase Fault on the GEN-2013-007 to Carter 138 kV line near GEN-2013-007	15
Figure 4-2	2014 Summer Peak - GEN-2013-007 Plot for Fault 21 – 3-Phase Fault on the GEN-2013-007 to Carter 138 kV line near GEN-2013-007	15
Figure 4-3	2014 Summer Peak LVRT Modified - GEN-2013-007 Plot for Fault 21 – 3-Phase Fault on the GEN-2013-007 to Carter 138 kV line near GEN-2013-007.....	Error!
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Figure 4-4	2014 Summer Peak LVRT Modified - GEN-2013-007 Plot for Fault 21 – 3-Phase Fault on the GEN-2013-007 to Carter 138 kV line near GEN-2013-007.....	Error!
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Figure 4-5	2014 Summer Peak - GEN-2013-007 Plot for Fault 29 – 3-Phase Fault on the Arbuckle 138/69 kV Tx	Error! Bookmark not defined.
Figure 4-6	2014 Summer Peak LVRT Modified - GEN-2013-007 Plot for Fault 29 – 3-Phase Fault on the Arbuckle 138/69 kV Tx	Error! Bookmark not defined.

List of Tables

Table 1-1	Interconnection Request Evaluated in this Study	5
Table 1-2	Nearby Interconnection Requests Already in the Queue	5
Table 3-1	Fault Definitions for DISIS-2013-001 Group 14.....	9
Table 4-1	Summary of Stability Results	13
Table 4-2	Transient Voltage Results	16
Table 5-1	Interconnection Requests Evaluated in this Study.....	18

0. Certification

I hereby certify that this plan, specification, or report was prepared by me or under my direct supervision and that I am a duly Licensed Professional Engineer under the Laws of the State of **Oklahoma**.

William Quaintance
Oklahoma License Number 24320

Excel Field Services, Inc.
Oklahoma Firm License Number 5844

1. Background and Scope

The DISIS-2013-001 Group 14 Definitive Impact Restudy is a generation interconnection study performed by Excel Engineering, Inc. for its non-affiliated client, Southwest Power Pool (SPP). Its purpose is to study the impacts of interconnecting the projects shown in Table 1-1. The in-service date assumed for the generation addition was 2014.

Table 1-1 Interconnection Request Evaluated in this Study

Request	Size (MW)	Generator Type	Point of Interconnection	Gen Bus
GEN-2013-007	100.0	Vestas 2.0MW V100 VCSS	Tap Prices Fall (514814) – Carter (515138) 138kV line (560719)	583573

The prior-queued requests shown in Table 1-2 were included in this study and dispatched at 100% of rated capacity.

Table 1-2 Nearby Interconnection Requests Already in the Queue

Request	Size (MW)	Generator Type	Point of Interconnection	Gen Bus
GEN-2011-040	110.4	Siemens 2.3MW	Tap Ratliff – Poolville 138kV (562038)	583000
GEN-2011-050	109.8	Vestas V90 1.8MW	Tap on the Rush Springs Tap – Marlow 138kV line (G11_050-TAP 138kV, 562081)	583100
GEN-2012-004 (see note)	151.8	Siemens 2.3MW	Tap Ratliff – Poolville 138kV (562038)	583000

Note: GEN-2012-004 is a 41.4MW increase to the existing GEN-2011-040 110.4MW for a total of 151.8MW

The study included stability analysis of each proposed interconnection request. Contingencies that resulted in a prior-queued project tripping off-line, if any, were re-run with the prior-queued project's voltage and frequency tripping relays disabled. A power factor analysis was performed for the wind and solar farms in Table 1-1.

A transient voltage data scan was completed to verify any bus voltages outside the bandwidth of 0.70 per unit to 1.20 per unit after the disturbance was cleared.

ATC (Available Transfer Capability) studies were not performed as part of this study. These studies will be required at the time transmission service is actually requested. Additional transmission upgrades may be required based on that analysis.

Study assumptions in general have been based on Excel's knowledge of the electric power system and on the specific information and data provided by SPP. The accuracy of the conclusions contained within this study is sensitive to the assumptions made with respect to

generation additions and transmission improvements being contemplated. Changes in the assumptions of the timing of other generation additions or transmission improvements will affect this study's conclusions.

2. Executive Summary

The DISIS-2013-001 Group 14 Definitive Impact Study evaluated the impacts of interconnecting the Table 1-1 study project to the SPP transmission system.

All generators remained stable and on-line for all tested faults. There were no dynamic voltage violations for the electrical system 100 kV and above. SPP damping criteria were met.

Final power factor requirements for the Group 14 project are listed in Table 4-3.

Any change in system or plant models or assumptions could change these results.

3. Study Development and Assumptions

3.1 *Simulation Tools*

The Siemens Power Technologies, Inc. PSS/E power system simulation program Version 32.1 was used in this study.

3.2 *Models Used*

SPP provided its latest stability database cases for 2014 summer, 2014 winter, and 2023 summer peak seasons. These cases included the study and prior-queued projects. A power flow one-line diagram of the study project is shown in Figure 3-1.

The study plant transmission lines and substation transformers are modeled explicitly in the power flow cases. Steady-state and dynamic model data for the study plants are given in Appendix E.

One-line diagrams of the SPP 345 and 138 kV systems in the Group 14 area are shown in Appendix G.

No special modeling is required of line relays in these cases, except for the special modeling related to the wind and solar generation tripping.

3.3 *Monitored Facilities*

All generators and transmission buses in Areas 520, 524, 525, 526, 531, 534, and 536 were monitored.

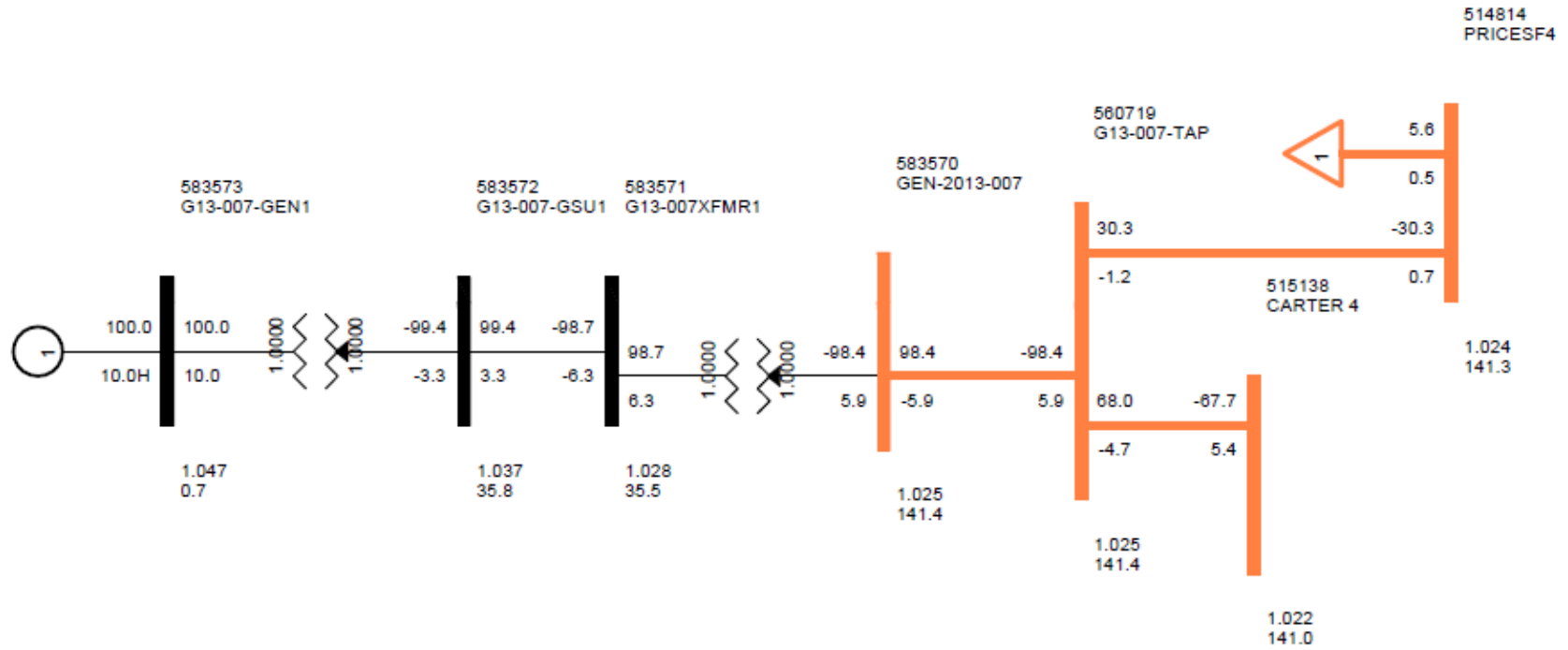


Figure 3-1 Power Flow One-line for GEN-2013-011

3.4 Performance Criteria

Wind generators must comply with FERC Order 661A on low voltage ride through for wind farms. Therefore, the wind generators should not trip off line for faults for under voltage relay actuation. If a wind generator trips off line, an appropriately sized SVC or STATCOM device may need to be specified to keep the wind generator on-line for the fault. SPP was consulted to determine if the addition of an SVC or STATCOM is warranted for the specific condition.

Contingencies that resulted in a prior-queued project tripping off-line, if any, were re-run with the prior-queued project’s voltage and frequency tripping disabled to check for stability issues.

3.5 Performance Evaluation Methods

A power factor analysis was performed for all study projects that are wind farms. The power factor analysis consisted of modeling a var generator in each wind farm holding a voltage schedule at the POI. The voltage schedule was set to the higher of the voltage with the wind farm off-line or 1.0 per unit.

If the required power factor at the POI is beyond the capability of the studied wind turbines, then capacitor banks would be considered. Factors used in sizing capacitor banks would include two requirements of FERC Order 661A: the ability of the wind farm to ride through low voltage with and without capacitor banks and the ability of the wind farm to recover to pre-fault voltage. If a wind generator trips on high voltage, a leading power factor may be required.

ATC studies were not performed as part of this study. These studies will be required at the time transmission service is actually requested. Additional transmission facilities may be required based on subsequent ATC analysis.

Stability analysis was performed for the proposed interconnection request. Faults were simulated on transmission lines at the POIs and on other nearby transmission equipment. The faults in Table 3-1 were run for each case (three phase and single phase as noted).

Table 3-1 Fault Definitions for DISIS-2013-001 Group 14

Cont. No.	Cont. Name	Description
1	FLT01-3PH	3 phase fault on the Arbuckle (515117) to Jollyville (515118) 138kV line, near Arbuckle. a. Apply fault at the Arbuckle 138kV bus. b. Clear fault after 5 cycles by tripping the faulted line. c. Wait 20 cycles, and then re-close the line in (b) back into the fault. d. Leave fault on for 5 cycles, then trip the line in (b) and remove fault.
2	FLT02-1PH	<i>Single phase fault and sequence like previous</i>

SPP DISIS-2013-001 Group 14 Definitive Impact Study

Cont. No.	Cont. Name	Description
3	FLT03-3PH	3 phase fault on the Arbuckle (515117) to Mill Creek Tap (515121) 138kV line, near Arbuckle. a. Apply fault at the Arbuckle 138kV bus. b. Clear fault after 5 cycles by tripping the faulted line. c. Wait 20 cycles, and then re-close the line in (b) back into the fault. d. Leave fault on for 5 cycles, then trip the line in (b) and remove fault.
4	FLT04-1PH	<i>Single phase fault and sequence like previous</i>
5	FLT05-3PH	3 phase fault on the Arbuckle (515117) to Blue River (515133) 138kV line, near Arbuckle. a. Apply fault at the Arbuckle 138kV bus. b. Clear fault after 5 cycles by tripping the faulted line. c. Wait 20 cycles, and then re-close the line in (b) back into the fault. d. Leave fault on for 5 cycles, then trip the line in (b) and remove fault.
6	FLT06-1PH	<i>Single phase fault and sequence like previous</i>
7	FLT07-3PH	3 phase fault on the Arbuckle (515117) to Oaklawn (515123) 138kV line, near Arbuckle. a. Apply fault at the Arbuckle 138kV bus. b. Clear fault after 5 cycles by tripping the faulted line. c. Wait 20 cycles, and then re-close the line in (b) back into the fault. d. Leave fault on for 5 cycles, then trip the line in (b) and remove fault.
8	FLT08-1PH	<i>Single phase fault and sequence like previous</i>
9	FLT09-3PH	3 phase fault on the Arbuckle (515117) to Berwyn Airpark (515173) 138kV line, near Arbuckle. a. Apply fault at the Arbuckle 138kV bus. b. Clear fault after 5 cycles by tripping the faulted line. c. Wait 20 cycles, and then re-close the line in (b) back into the fault. d. Leave fault on for 5 cycles, then trip the line in (b) and remove fault.
10	FLT10-1PH	<i>Single phase fault and sequence like previous</i>
11	FLT11-3PH	3 phase fault on the Arbuckle (515117) to Vanoss Tap (515174) 138kV line, near Arbuckle. a. Apply fault at the Arbuckle 138kV bus. b. Clear fault after 5 cycles by tripping the faulted line. c. Wait 20 cycles, and then re-close the line in (b) back into the fault. d. Leave fault on for 5 cycles, then trip the line in (b) and remove fault.
12	FLT12-1PH	<i>Single phase fault and sequence like previous</i>
13	FLT13-3PH	3 phase fault on the Carter (515138) to Chickasaw (515171) 138kV line, near Carter. a. Apply fault at the Carter 138kV bus. b. Clear fault after 5 cycles by tripping the faulted line. c. Wait 20 cycles, and then re-close the line in (b) back into the fault. d. Leave fault on for 5 cycles, then trip the line in (b) and remove fault.
14	FLT14-1PH	<i>Single phase fault and sequence like previous</i>
15	FLT15-3PH	3 phase fault on the Carter (515138) to Ardmore West (515372) 138kV line, near Carter. a. Apply fault at the Carter 138kV bus. b. Clear fault after 5 cycles by tripping the faulted line. c. Wait 20 cycles, and then re-close the line in (b) back into the fault. d. Leave fault on for 5 cycles, then trip the line in (b) and remove fault.
16	FLT16-1PH	<i>Single phase fault and sequence like previous</i>

SPP DISIS-2013-001 Group 14 Definitive Impact Study

Cont. No.	Cont. Name	Description
17	FLT17-3PH	3 phase fault on the Chickasaw (515171) to Total (515165) 138kV line, near Chickasaw. a. Apply fault at the Chickasaw 138kV bus. b. Clear fault after 5 cycles by tripping the faulted line. c. Wait 20 cycles, and then re-close the line in (b) back into the fault. d. Leave fault on for 5 cycles, then trip the line in (b) and remove fault.
18	FLT18-1PH	<i>Single phase fault and sequence like previous</i>
19	FLT19-3PH	3 phase fault on the Chickasaw (515171) to Foundation (515162) 138kV line, near Chickasaw. a. Apply fault at the Chickasaw 138kV bus. b. Clear fault after 5 cycles by tripping the faulted line. c. Wait 20 cycles, and then re-close the line in (b) back into the fault. d. Leave fault on for 5 cycles, then trip the line in (b) and remove fault.
20	FLT20-1PH	<i>Single phase fault and sequence like previous</i>
21	FLT21-3PH	3 phase fault on the GEN-2013-007 Tap (560719) to Carter (515138) 138kV line, near GEN-2013-007 Tap. a. Apply fault at the GEN-2013-007 Tap 138kV bus. b. Clear fault after 5 cycles by tripping the faulted line. c. Wait 20 cycles, and then re-close the line in (b) back into the fault. d. Leave fault on for 5 cycles, then trip the line in (b) and remove fault.
22	FLT22-1PH	<i>Single phase fault and sequence like previous</i>
23	FLT23-3PH	3 phase fault on the GEN-2013-007 Tap (560719) to Prices Falls (514814) 138kV line, near GEN-2013-007 Tap. a. Apply fault at the GEN-2013-007 Tap 138kV bus. b. Clear fault after 5 cycles by tripping the faulted line. c. Wait 20 cycles, and then re-close the line in (b) back into the fault. d. Leave fault on for 5 cycles, then trip the line in (b) and remove fault.
24	FLT24-1PH	<i>Single phase fault and sequence like previous</i>
25	FLT25-3PH	3 phase fault on the Sunnyside (515135) to Uniroyal (515137) 138kV line, near Sunnyside. a. Apply fault at the Sunnyside 138kV bus. b. Clear fault after 5 cycles by tripping the faulted line. c. Wait 20 cycles, and then re-close the line in (b) back into the fault. d. Leave fault on for 5 cycles, then trip the line in (b) and remove fault.
26	FLT26-1PH	<i>Single phase fault and sequence like previous</i>
27	FLT27-3PH	3 phase fault on the Sunnyside (515135) to Pooleville (515130) 138kV line, near Sunnyside. a. Apply fault at the Sunnyside 138kV bus. b. Clear fault after 5 cycles by tripping the faulted line. c. Wait 20 cycles, and then re-close the line in (b) back into the fault. d. Leave fault on for 5 cycles, then trip the line in (b) and remove fault.
28	FLT28-1PH	<i>Single phase fault and sequence like previous</i>
29	FLT29-3PH	3 phase fault on the Arbuckle 138kV (515117) to Arbuckle (515116) 69kV/(515702) 13.2kV transformer, near the 138kV bus. a. Apply fault at the Arbuckle 138kV bus. b. Clear fault after 5 cycles by tripping the faulted transformer.
30	FLT30-3PH	3 phase fault on the Chickasaw 138kV (515171) to Chickasaw (515170) 69kV/(515702) 13.2kV transformer ckt 1, near the 138kV bus. a. Apply fault at the Chickasaw 138kV bus. b. Clear fault after 5 cycles by tripping the faulted transformer.

SPP DISIS-2013-001 Group 14 Definitive Impact Study

Cont. No.	Cont. Name	Description
31	FLT31-3PH	3 phase fault on the Sunnyside 345kV (515136) to Sunnyside (515135) 138kV/(515762) 13.8kV transformer ckt 1, near the 345kV bus. a. Apply fault at the Sunnyside 345kV bus. b. Clear fault after 5 cycles by tripping the faulted transformer.
32	FLT32-3PH	3 phase fault on the Johnston Co 345kV (514809) to Johnston Co (514808) 138kV/(514810) 13.8kV transformer, near the 345kV bus. a. Apply fault at the Johnston Co 345kV bus. b. Clear fault after 5 cycles by tripping the faulted transformer.
33	FLT33-3PH	Prior outage of Jollyville (515118) to Arbuckle (515117) 138kV line, then – 3 phase fault on the Carter (515138) to Chickasaw (515171) 138kV line, near Carter. a. Apply fault at the Carter 138kV bus. b. Clear fault after 5 cycles by tripping the faulted line. c. Wait 20 cycles, and then re-close the line in (b) back into the fault. d. Leave fault on for 5 cycles, then trip the line in (b) and remove fault
34	FLT34-3PH	Prior outage of Jollyville (515118) to Arbuckle (515117) 138kV line, then – 3 phase fault on the Carter (515138) to Ardmore West (515372) 138kV line, near Carter. a. Apply fault at the Carter 138kV bus. b. Clear fault after 5 cycles by tripping the faulted line. c. Wait 20 cycles, and then re-close the line in (b) back into the fault. d. Leave fault on for 5 cycles, then trip the line in (b) and remove fault
35	FLT35-3PH	Prior outage of Carter (515138) to Ardmore West (515372) 138kV line, then – 3 phase fault on the Jollyville (515118) to Arbuckle (515372) 138kV line, near Jollyville. a. Apply fault at the Jollyville 138kV bus. b. Clear fault after 5 cycles by tripping the faulted line. c. Wait 20 cycles, and then re-close the line in (b) back into the fault. d. Leave fault on for 5 cycles, then trip the line in (b) and remove fault
36	FLT36-3PH	Prior outage of Carter (515138) to Chickasaw (515171) 138kV line, then – 3 phase fault on the Jollyville (515118) to Arbuckle (515372) 138kV line, near Jollyville. a. Apply fault at the Jollyville 138kV bus. b. Clear fault after 5 cycles by tripping the faulted line. c. Wait 20 cycles, and then re-close the line in (b) back into the fault. d. Leave fault on for 5 cycles, then trip the line in (b) and remove fault

4. Results and Observations

4.1 Stability Analysis Results

Table 4-1 summarizes the results. Figure 4-1 and Figure 4-2 shows representative summer peak season plots for faults at the POI's of the study project. Complete sets of plots for 2014 summer and winter peak and 2013 summer peak for each fault and each project are included in Appendices A, B and C.

All faults showed stable response with all generators remaining on line. Any oscillations seen were within the SPP damping criteria.

Table 4-1 Summary of Stability Results

Cont. No.	Contingency Name	Contingency Description	2014 Summer Peak Results	2014 Winter Peak Results	2023 Summer Peak Results
1	FLT01-3PH	3 phase fault on the Arbuckle (515117) to Jollyville (515118) 138kV line, near Arbuckle.	OK	OK	OK
2	FLT02-1PH	<i>Single phase fault and sequence like previous</i>	OK	OK	OK
3	FLT03-3PH	3 phase fault on the Arbuckle (515117) to Mill Creek Tap (515121) 138kV line, near Arbuckle.	OK	OK	OK
4	FLT04-1PH	<i>Single phase fault and sequence like previous</i>	OK	OK	OK
5	FLT05-3PH	3 phase fault on the Arbuckle (515117) to Blue River (515133) 138kV line, near Arbuckle.	OK	OK	OK
6	FLT06-1PH	<i>Single phase fault and sequence like previous</i>	OK	OK	OK
7	FLT07-3PH	3 phase fault on the Arbuckle (515117) to Oaklawn (515123) 138kV line, near Arbuckle.	OK	OK	OK
8	FLT08-1PH	<i>Single phase fault and sequence like previous</i>	OK	OK	OK
9	FLT09-3PH	3 phase fault on the Arbuckle (515117) to Berwyn Airpark (515173) 138kV line, near Arbuckle.	OK	OK	OK
10	FLT10-1PH	<i>Single phase fault and sequence like previous</i>	OK	OK	OK
11	FLT11-3PH	3 phase fault on the Arbuckle (515117) to Vanoss Tap (515174) 138kV line, near Arbuckle.	OK	OK	OK
12	FLT12-1PH	<i>Single phase fault and sequence like previous</i>	OK	OK	OK
13	FLT13-3PH	3 phase fault on the Carter (515138) to Chickasaw (515171) 138kV line, near Carter.	OK	OK	OK
14	FLT14-1PH	<i>Single phase fault and sequence like previous</i>	OK	OK	OK
15	FLT15-3PH	3 phase fault on the Carter (515138) to Ardmore West (515372) 138kV line, near Carter.	OK	OK	OK
16	FLT16-1PH	<i>Single phase fault and sequence like previous</i>	OK	OK	OK
17	FLT17-3PH	3 phase fault on the Chickasaw (515171) to Total (515165) 138kV line, near Chickasaw.	OK	OK	OK
18	FLT18-1PH	<i>Single phase fault and sequence like previous</i>	OK	OK	OK

SPP DISIS-2013-001 Group 14 Definitive Impact Study

Cont. No.	Contingency Name	Contingency Description	2014 Summer Peak Results	2014 Winter Peak Results	2023 Summer Peak Results
19	FLT19-3PH	3 phase fault on the Chickasaw (515171) to Foundation (515162) 138kV line, near Chickasaw.	OK	OK	OK
20	FLT20-1PH	<i>Single phase fault and sequence like previous</i>	OK	OK	OK
21	FLT21-3PH	3 phase fault on the GEN-2013-007 Tap (560719) to Carter (515138) 138kV line, near GEN-2013-007 Tap.	OK	OK	OK
22	FLT22-1PH	<i>Single phase fault and sequence like previous</i>	OK	OK	OK
23	FLT23-3PH	3 phase fault on the GEN-2013-007 Tap (560719) to Prices Falls (514814) 138kV line, near GEN-2013-007 Tap.	OK	OK	OK
24	FLT24-1PH	<i>Single phase fault and sequence like previous</i>	OK	OK	OK
25	FLT25-3PH	3 phase fault on the Sunnyside (515135) to Uniroyal (515137) 138kV line, near Sunnyside.	OK	OK	OK
26	FLT26-1PH	<i>Single phase fault and sequence like previous</i>	OK	OK	OK
27	FLT27-3PH	3 phase fault on the Sunnyside (515135) to Pooleville (515130) 138kV line, near Sunnyside.	OK	OK	OK
28	FLT28-1PH	<i>Single phase fault and sequence like previous</i>	OK	OK	OK
29	FLT29-3PH	3 phase fault on the Arbuckle 138kV (515117) to Arbuckle (515116) 69kV/(515702) 13.2kV transformer, near the 138kV bus.	OK	OK	OK
30	FLT30-3PH	3 phase fault on the Chickasaw 138kV (515171) to Chickasaw (515170) 69kV/(515702) 13.2kV transformer ckt 1, near the 138kV bus.	OK	OK	OK
31	FLT31-3PH	3 phase fault on the Sunnyside 345kV (515136) to Sunnyside (515135) 138kV/(515762) 13.8kV transformer ckt 1, near the 345kV bus.	OK	OK	OK
32	FLT32-3PH	3 phase fault on the Johnston Co 345kV (514809) to Johnston Co (514808) 138kV/(514810) 13.8kV transformer, near the 345kV bus.	OK	OK	OK
33	FLT33-3PH	Prior outage of Jollyville (515118) to Arbuckle (515117) 138kV line, then – 3 phase fault on the Carter (515138) to Chickasaw (515171) 138kV line, near Carter.	OK	OK	OK
34	FLT34-3PH	Prior outage of Jollyville (515118) to Arbuckle (515117) 138kV line, then – 3 phase fault on the Carter (515138) to Ardmore West (515372) 138kV line, near Carter.	OK	OK	OK
35	FLT35-3PH	Prior outage of Carter (515138) to Ardmore West (515372) 138kV line, then – 3 phase fault on the Jollyville (515118) to Arbuckle (515372) 138kV line, near Jollyville.	OK	OK	OK
36	FLT36-3PH	Prior outage of Carter (515138) to Chickasaw (515171) 138kV line, then – 3 phase fault on the Jollyville (515118) to Arbuckle (515372) 138kV line, near Jollyville.	OK	OK	OK

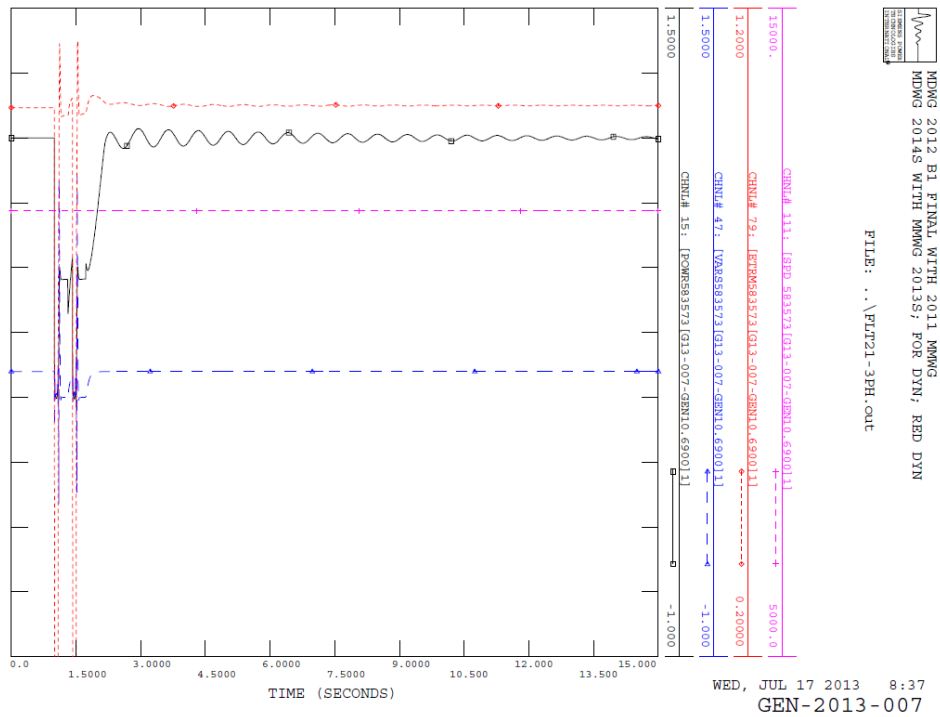


Figure 4-1 2014 Summer Peak - GEN-2013-007 Plot for Fault 21 – 3-Phase Fault on the GEN-2013-007 to Carter 138 kV line near GEN-2013-007

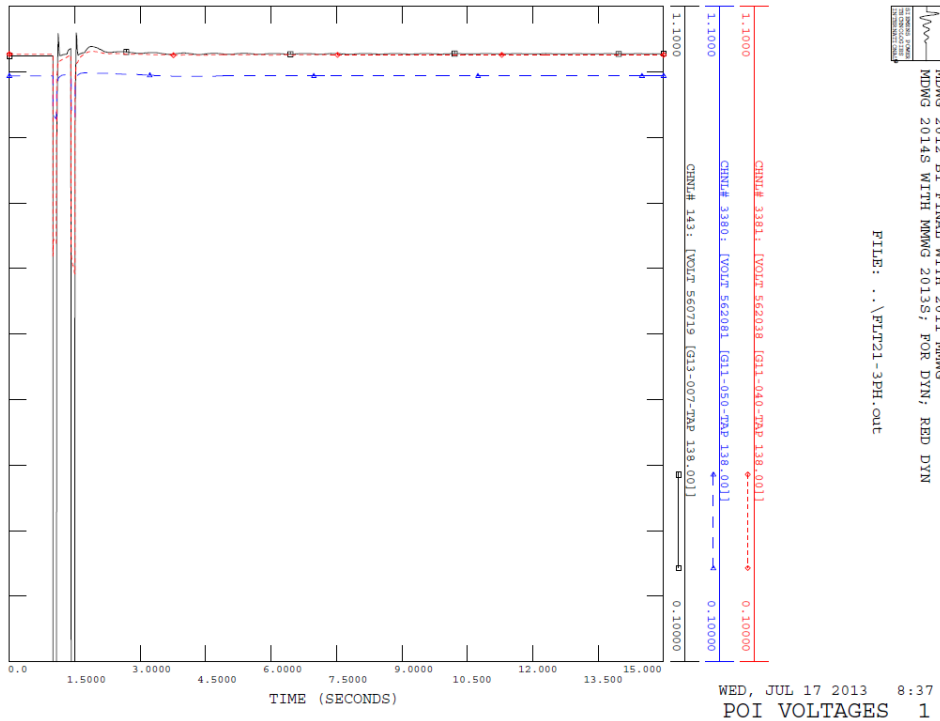


Figure 4-2 2014 Summer Peak - Voltage Plot for Fault 21 – 3-Phase Fault on the GEN-2013-007 to Carter 138 kV line near GEN-2013-007

4.2 Transient Voltage Analysis

The transient voltage analysis was completed on buses in the monitored areas above 100kV. The voltages were taken starting at the time the fault was removed. There were no voltages outside the limits as shown in Table 4-2. The transient voltage results are in Appendix F.

Table 4-2 Transient Voltage Results

Filename	Vmin	Vmax	Bus#	BusName	BaseKV	2014 Winter		2014 Summer		2023 Summer	
						Time	Voltage	Time	Voltage	Time	Voltage
None	0.7	1.2	-	-	-	-	-	-	-	-	-

4.3 Power Factor Requirements

All stability faults were tested as power flow contingencies to determine the power factor requirements for the wind and solar farm study projects to maintain scheduled voltage at their respective points of interconnection (POI). The voltage schedules are set equal to the voltages at the POIs before the projects are added, with a minimum of 1.0 per unit. Fictitious reactive power sources were added to the study projects to maintain scheduled voltage during all studied contingencies. The MW and Mvar injections from the study projects at the POIs were recorded and the resulting power factors were calculated for all contingencies for summer peak and winter peak cases. The most leading and most lagging power factors determine the minimum power factor range capability that the study projects must install before commercial operation.

If more than one study project shared a single POI, the projects were grouped together and a common power factor requirement was determined for those study projects. This ensures that none of the study projects is required to provide more or less than its fair share of the reactive power requirements at a single POI. *Prior-queued* projects at the same POI, if any, were not grouped with the study projects because their interconnection requirements were determined in previous studies. The voltage schedules of prior-queued and study projects at the same POI were coordinated.

Per FERC and SPP Tariff requirements, if the power factor needed to maintain scheduled voltage is less than 0.95 lagging, then the requirement is limited to 0.95 lagging. The lower limit for leading power factor requirement is also 0.95. If a project never operated leading under any contingency, then the leading requirement is set to 1.0. The same applies on the lagging side.

The final power factor requirements are shown in Table 4-3 below. These are only the minimum power factor ranges based on steady-state analysis.

The full details for each contingency in summer and winter peak cases are given in Appendix D.

Table 4-3. Power Factor Requirements ^a

Request	Size (MW)	Generator Model	Point of Interconnection	Final PF Requirement	
				Lagging ^b	Leading ^c
GEN-2013-007	100.0	Vestas 2.0MW V100 VCSS	Tap Prices Fall (514814) – Carter (515138) 138kV line (560719)	1.0	0.970

Notes:

- a. For each plant, the table shows the minimum required power factor capability at the point of interconnection that must be designed and installed with the plant. The power factor capability at the POI includes the net effect of the generators, transformers, line impedances, and any reactive compensation devices installed on the plant side of the meter. Installing more capability than the minimum requirement is acceptable.
- b. Lagging is when the generating plant is supplying reactive power to the transmission grid. In this situation, the alternating current sinusoid “lags” behind the alternating voltage sinusoid, meaning that the current peaks shortly after the voltage.
- c. Leading is when the generating plant is taking reactive power from the transmission grid. In this situation, the alternating current sinusoid “leads” the alternating voltage sinusoid, meaning that the current peaks shortly before the voltage.
- d. Electrical need is lower, but PF requirement limited to 0.95 by FERC order.

5. Conclusions

The DISIS-2013-001 Group 14 Definitive Impact Study evaluated the impacts of interconnecting the projects shown below in Table 5-1.

Table 5-1 Interconnection Requests Evaluated in this Study

Request	Size (MW)	Generator Type	Point of Interconnection	Gen Bus
GEN-2013-007	100.0	Vestas 2.0MW V100 VCSS	Tap Prices Fall (514814) – Carter (515138) 138kV line (560719)	583573

All generators remained stable and on-line for all tested faults. There were no dynamic voltage violations for the electrical system 100 kV and above. SPP damping criteria were met.

Final power factor requirements for the Group 14 project are listed in Table 4-3.

Any change in system or plant models or assumptions could change these results.

Appendix A – 2014 Summer Peak Plots

Appendix B – 2014 Winter Peak Plots

Appendix C – 2023 Summer Peak Plots

Appendix D – Power Factor Details

Appendix E – Project Model Data

Appendix F – Transient Voltage Data

Appendix G – SPP Transmission One-line Diagrams