Definitive Interconnection System Impact Study for Generation Interconnection Requests

(DISIS-2011-001)

July 2011

Generation Interconnection

SPP Southwest Power Pool

Revision History

Date or Version Number	Author	Change Description	Comments
7/29/2011	Southwest Power Pool	N/A	Report Issued

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 Impact Cluster Study. This Impact Study analyzes the interconnecting of multiple generation interconnection requests associated with new generation totaling approximately 6,802.7 MW of new generation which would be located within the transmission systems of Mid-Kansas Electric Power LLC (MKEC), Missouri Public Service (MIPU), Nebraska Public Power District (NPPD), Midwest Energy Inc. (MIDW), Oklahoma Gas and Electric (OKGE), Omaha Public Power District (OPPD), Southwestern Public Service (SPS), Sunflower Electric Power Corporation (SUNC), Westar Energy (WERE) and Western Farmers Electric Cooperative (WFEC). The various generation interconnection requests have differing proposed in-service dates[1]. The generation interconnection requests included in this 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 powerflow cases studied, 6,802.7 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 Order No. 661-A 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.

The total estimated minimum cost for interconnecting the DISIS-2011-001 interconnection customers is $1,322,000,000. These costs are shown in Appendix E and F. Interconnection Service to DISIS-2011-001 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 that were identified as shown in Appendix H.

[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 Customer's 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.

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 the Energy Resource (ER) Interconnection Request. Certain Interconnection Requests were studied for Network Resource Interconnection Service (NR). Those constraints are 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.

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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 Impact Study. The customers will be referred to in this study as the DISIS-2011-001 Interconnection Customers. This Impact Study analyzes the interconnecting of multiple generation interconnection requests associated with new generation totaling 6,802.7 MW of new generation which would be located within the transmission systems of American Electric Power (AEPW), Kansas City Power and Light (KCPL), Missouri Public Service (MIPU), Nebraska Public Power District (NPPD), Oklahoma Gas and Electric (OKGE), Southwestern Public Service (SPS), Sunflower Electric Power Corporation (SUNC), and Westar Energy (WERE). The various generation interconnection requests have differing proposed in-service dates[2]. The generation interconnection requests included in this 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 Definitive Interconnection System Impact Study is to identify the system constraints associated with connecting the generation to the area transmission system. The Impact and other subsequent Interconnection Studies are designed to identify attachment facilities, Network Upgrades and other Direct Assignment Facilities needed to accept power into the grid at each specific interconnection receipt point.

Model Development

Interconnection Requests Included in the Cluster

SPP has included all interconnection requests that submitted a Definitive Interconnection System Impact Study request no later than March 31, 2011 and were subsequently accepted by Southwest Power Pool under the terms of the Generator Interconnection Procedures (GIP) that became effective March 30, 2010.

Affected System Interconnection Requests - Also included in this Definitive Impact Study are two Affected System Studies all of which are on the Southwestern Public Service Company system. The Affected System Studies have been given the designation ASGI-2011-002 (Herring 115kV) and ASGI-2011-003 (Hendricks 115kV) respectively.

[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 Customer's that proceed to the Facility Study will be provided a new in-service date based on the competition of the Facility Study.

The interconnection requests that are included in this study are listed in Appendix A.

Previous Queued Projects

The previous queued projects included in this study are listed in Appendix B. In addition to the Base Case Upgrades, the previous queued projects 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.

Development of Base Cases

Powerflow - The 2010 series Transmission Service Request (TSR) Models 2011 spring, 2012 summer and winter peak, 2016 summer and winter peak, and 2021 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 using current dispatch orders.

Stability – The 2010 series SPP Model Development Working Group (MDWG) Models 2011 winter and 2011 summer were used as starting points for this study.

Base Case Upgrades

The following facilities are part of the SPP Transmission Expansion Plan or the Balanced Portfolio or recently approved Priority Projects. These facilities have been approved 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-2011-001 Customers have not been assigned cost for the below listed projects. The DISIS-2011-001 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 customers.

- Hitchland 345/230/115kV upgrades to be built by SPS for 2010/2011 in-service[3].
  - Hitchland – Moore County 230kV line
  - Hitchland – Perryton 230kV line
  - Hitchland – Texas County 115kV line
  - Hitchland – Hansford County 115kV line
  - Hitchland – Sherman County Tap 115kV line
- Valliant – Hugo – Sunnyside 345kV – assigned to Aggregate Study AG3-2006 Customers
- Wichita – Reno County – Summit 345kV to be built by WERE[4].
- Rose Hill – Sooner 345kV to be built by WERE/OKGE.
- Knob Hill – Steele City 115kV to be built by NPPD/WERE.
- Balanced Portfolio Projects[5]:

[3] Approved 230kV upgrades are based on SPP 2007 STEP. Upgrades may need to be re-evaluated in the system impact study.
[4] Approved based on an order of the Kansas Corporation Commission issued in Docket no. 07-WSEE-715-MIS
[5] Notice to Construct (NTC) issued June, 2009

    - Gracemont 345/138/13.2kV Autotransformer
    - Woodward– Tuco 345kV line
    - Iatan– Nashua 345kV line
    - Muskogee– Seminole 345kV line
    - Post Rock– Axtell 345kV line
    - Spearville– Post Rock 345kV line
    - Tap Stillwell – Swissvale 345kV line at West Gardner
- Priority Projects[6]:
    - Hitchland - Woodward double circuit 345kV
    - Woodward – Medicine Lodge double circuit 345kV
    - Spearville – Comanche (Clark) double circuit 345kV
    - Comanche (Clark) – Medicine Lodge double circuit 345kV
    - Medicine Lodge – Wichita double circuit 345kV
    - Medicine Lodge 345/138kV autotransformer

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-2011-001 study and are assumed to be in service. The DISIS-2011-001 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 GIA or withdraw from the interconnection queue. The DISIS-2011-001 Customer Generation Facilities in service dates may need to be delayed until the completion of the following upgrades.

- Finney – Holcomb 345kV ckt #2 line assigned to GEN-2006-044 interconnection customer[7].
- Central Plains – Setab 115kV transmission line assigned to GEN-2007-013 interconnection customer.
- Grassland 230/115kV autotransformer #2 assigned to 1st Cluster Interconnection Customers (100% to GEN-2008-016)
- Judson Large – North Judson Large – Spearville 115kV circuit #2 assigned to DISIS-2009-001-1 Interconnection Customers (100% to GEN-2008-079)
- Hitchland – Wheeler (Border) double circuit 345kV assigned to DISIS-2010-001 Interconnection Customers
- Madison County - Hoskins 230kV Ckt #1 assigned to DISIS-2010-001 Interconnection Customer
- Washita – Gracemont 138kV circuit #2 assigned to DISIS-2010-001 Interconnection Customers
- Post Rock 345/230kV autotransformer #2 assigned to DISIS-2010-001 Interconnection Customers.

[6] Notice to Construct (NTC) issued June, 2010. NTC for double circuit lines indicated that NTC may be revised at a later time to be built at a higher voltage.
[7] Based on Facility Study Posting November 2008

- Washita – Weatherford 138kV Ckt #1 assigned to DISIS-2010-001 Interconnection Customers
- Spearville 345/115kV autotransformer #1 assigned to DISIS-2010-001 Interconnection Customers
- Beaver County – Gray County 345kV Ckt #1 assigned to DISIS-2010-002 Interconnection Customers
- Medicine Lodge 345/115kV autotransformer #2 assigned to DISIS-2010-002 Interconnection Customers
- St. John – St. John 115kV Ckt #1 assigned to DISIS-2010-002 Interconnection Customers
- Northwest 345/138/13.8kV autotransformer circuit #1 assigned to DISIS-2010-002 NRIS Interconnection Customer Gen-2010-040

Potential Upgrades Not in the Base Case

Any potential upgrades that do not have a Notification to Construct (NTC) 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 in fifteen different regional groups based on geographical and electrical impacts. These groupings are shown in Appendix C.

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

Powerflow - For each group, the various wind generating plants were modeled at 80% nameplate of maximum generation. The wind generating plants in the other areas were modeled at 20% nameplate of maximum generation. This process created fifteen different scenarios with each group being studied at 80% nameplate rating. These projects were dispatched as Energy Resources with equal 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. Each interconnection request was also modeled separately at 100% nameplate for certain analyses.

Peaking units were not dispatched in the 2011 spring model. To study peaking units' impacts, the 2012 summer and winter, 2016 summer and winter, and 2021 summer peak 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.

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 fossil requests.

Identification of Network Constraints

The initial set of network constraints were found by using PTI 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 were being studied for Network Resource Interconnection Service were studied in the additional NRIS analysis to determine if any constraint had at least a 3% DF. If so, these constraints were considered for mitigation.

Determination of Cost Allocated Network Upgrades

Cost Allocated Network Upgrades of wind generation interconnection requests were determined using the 2011 spring model. Cost Allocated Network Upgrades of peaking units was determined using the 2016 summer peak model. A MUST FCITC analysis was performed to determine the Power Transfer Distribution Factors (PTDF), 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:

  Request X Impact Factor on Upgrade Project 1 = PTDF(%)(X) * MW(X) = X1

  Request Y Impact Factor on Upgrade Project 1 = PTDF(%)(Y) * MW(Y) = Y1

  Request Z Impact Factor on Upgrade Project 1 = PTDF(%)(Z) * 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 Z1 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.

Interconnection Facilities

The requirement to interconnect the 6,802.7 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 $1,322,000,000. Interconnection Facilities specific to each generation interconnection request are listed in Appendix E.

A list of constraints with greater than or equal to a 20% OTDF that were identified and used for mitigation are listed in Appendix G. Other Network Constraints in the MIPU, NPPD, OKGE, SPS, SUNC, and WERE transmission systems that were identified 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.

A preliminary one-line drawing for each generation interconnection request are listed in Appendix D. Figure 1 depicts the major transmission line Network Upgrades needed to support the interconnection of the generation amounts requested in this study.

Powerflow

Powerflow Analysis Methodology

The Southwest Power Pool (SPP) Criteria states that:

> "The transmission system of the SPP region shall be planned and constructed so that the contingencies as set forth in the Criteria will meet the applicable *NERC Reliability Standards* for transmission planning. All MDWG power flow models shall be tested to verify compliance with the System Performance Standards from NERC Table 1 – Category A."

The ACCC function of PSS/E was used to simulate single contingencies in portions or all of the modeled control areas of American Electric Power (AEPW), Kansas City Power and Light (KCPL), Missouri Public Service (MIPU), Nebraska Public Power District (NPPD), Oklahoma Gas and Electric (OKGE), Southwestern Public Service (SPS), Sunflower Electric Power Corporation (SUNC), and Westar Energy (WERE) and other control areas were applied and the resulting scenarios analyzed. This satisfies the "more probable" contingency testing criteria mandated by NERC and the SPP criteria.

Powerflow Analysis

A powerflow analysis was conducted for each Interconnection Customer's facility using modified versions of the 2011 spring peak, 2012 summer and winter peak, the 2016 summer and winter peak, and the 2021 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 (ER) Interconnection Request. The available seasonal models used were through the 2021 Summer Peak. Certain requests that requested Network Resource Interconnection Service (NRIS) had an additional analysis conducted for sinking the energy 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 additional criteria violations will occur on the MIPU, NPPD, MIDW, OKGE, OPPD, SPS, SUNC, WERE and WFEC transmission systems under steady state and contingency conditions in the peak seasons.

Cluster Group 1 (Woodward Area)

In addition to the 3,544.4 MW of previously queued generation in the area, 1,197.6 MW of new interconnection service was studied. The requests in this group cause constraints in the Woodward – Northwest and Woodward – Medicine Lodge corridors. To relieve these issues a new 345kV station, Matthewson, is needed to tie the Tatonga – Northwest and Woodring – Cimarron 345kV circuits. In addition, second 345kV circuits are needed between Tatonga – Matthewson and Matthewson – Cimarron. These upgrades are also needed for Groups 2 and 3 because of the extreme power flow bias from West to East. Additionally, for interconnection customers that requested NRIS service, a number of additional upgrades were identified in the Northwest – Woodward corridor and in the Kansas area.

Cluster Group 2 (Hitchland Area)

In addition to the 3,512.8 MW of previously queued generation in the area, 913.5 MW of new interconnection service was studied. A new 345kV line from the GEN-2008-047 Tap (Beaver County) – Comanche is needed for the loss of the GEN-2007-040 Tap (Gray County) – Spearville 345kV. This new line is also needed for dynamic stability as well as a second 345kV circuit from Oklaunion to Lawton Eastside. The upgrades around Tataonga and Matthewson in Group 1 are also needed.

Cluster Group 3 (Spearville Area)

In addition to the 3,760.6 MW of previously queued generation in the area, 1,848.1 MW of new interconnection service was studied. Significant outlet constraints are identified in the area due to the amount of generation requesting interconnection. Due to voltage collapse after contingency, power flow requires a single circuit 345kV from Spearville – Mullergren – Circle and in order to initialize the models to begin analysis stability analysis requires a second 345kV circuit along the same corridor. As in group 2, the 345kV line from the GEN-2008-047 Tap (Beaver County) – Comanche is also required. The 345kV upgrades from group 1 are also needed.

Cluster Group 4 (Mingo/NW Kansas Group)

In addition to the 924.2 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 5 (Amarillo Area)

In addition to the 2,132.6 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 6 (South Texas Panhandle/New Mexico)

In addition to the 1,640.3 MW of previously queued generation in the area, 2,248.4 MW of new interconnection service was studied. Extreme outlet issues constrain the two largest requests in this group. In order to accommodate the new requests, the Midland – Hobbs 230kV and the Borden – Grassland 230kV transmission must be converted to 345kV operation. Additionally, new 345kV lines from Midland – Yoakum – TUCO, Midland – Borden, Grassland – Jones – TUCO, and a second Lawton Eastside – Oklaunion 345kV circuit are needed to satisfy power flow criteria. Finally, two new 345/230kV autotransformers (Yoakum and Jones) and two separate 100MVar banks (Borden and Oklaunion) of reactive compensation are required to fully integrate the new requests into the system.

Cluster Group 7 (Southwestern Oklahoma)

In addition to the 2,394.6 MW of previously queued generation in the area, 501.2 MW of new interconnection service was studied. Due to outlet issues at Hobart Junction, Hobart Junction – Hobart – Roosevelt Tap – Snyder 69kV must be converted to 138kV operation and Hobart Junction – Carnegie – Southwestern Station 138kV must be rebuilt. Also, because GEN-2011-007 contributes to overloads on the Matthewson-Cimarron 345kV line, it is allocated with cost responsibility for those upgrades.

Cluster Group 8 (South Central Kansas/North Oklahoma)

In addition to the 3,351.5 MW of previously queued generation in the area, 4.5 MW of new interconnection service was studied. No new constraints were found in this area.

Cluster Group 9 (Northeast Nebraska)

In addition to the 1,009.3 MW of previously queued generation in the area, 120.0 MW of new interconnection service was studied. To integrate the new request located in this area, the Twin Church – Hoskins 230kV will need to have work done to raise the ratings of the line.

Cluster Group 10 (North Nebraska)

In addition to the 345.3 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 11 (North Central Kansas)

In addition to the 1,294.1 MW of previously queued generation in the area, 201.0 MW of new interconnection service was studied. To integrate the new interconnection request the Rice – Circle 115kV must be converted to 230kV operation, Rice County – Lyons 115kV must be rebuilt, the ratings on the Lyons – Wheatland 115kV must be raised, and 30MVar of capacitors must be installed at Lyons.

Cluster Group 12 (Northwest Arkansas)

In addition to the 0.0 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 13 (Northwest Missouri)

In addition to the 2,597.4 MW of previously queued generation in the area, 274.6 MW of new interconnection service was studied. The constraints in this group are being caused by outlet issues near Beatrice, NE. To relieve these, a new 115kV line is needed between Crete and the GEN-2010-047 Tap.

Cluster Group 14 (South Central Oklahoma)

In addition to the 950.0 MW of previously queued generation in the area, 101.7 MW of new interconnection service was studied. No new constraints were found in this area.

Cluster Group 15 (Southwest Nebraska)

In addition to the 89.7 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.

Stability Analysis

A stability analysis was conducted for each Interconnection Customer's facility using modified versions of the 2011 summer and 2011 winter peak models. The stability analysis was conducted with all upgrades in service that were identified in the powerflow 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.

Cluster Group 1 (Woodward Area)

The Group 1 stability study was conducted by S&C Electric (S&C). The stability analysis indicates that requests in Group 1 will be stable for each contingency specified by SPP and the nearby areas will retain angular, frequency and voltage stability. With the power factor requirements and all network upgrades in service, all interconnection request in Group 1 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-2011-015	300.6	Vestas V90 1.8MW	Tap Tatonga – Woodward 345kV	0.97	0.99
GEN-2011-019	299	Siemens 2.3MW	Woodward 345kV	0.95	0.95
GEN-2011-020	299	Siemens 2.3MW	Woodward 345kV	0.97	0.95
GEN-2011-024	299	Siemens 2.3MW	Tatonga 345kV	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 2 (Hitchland Area)

The Group 2 stability study was conducted by Excel Engineering, Inc . This group analysis was performed with different scenarios to accommodate the differing in service dates of the combined cycle generation in Group 6. . Some stability problems were found during the contingency analysis, to fix these problems the following adjustments and upgrades were used; add a second 345kV line from Lawton Eastside – Oklaunion and add a new 345kV line from Beaver Co to Clark Co. In order to improve the voltage profile 200 MVAr were added to the GEN-2011-021 Point of Interconnection. With the power factor requirements and all network upgrades in service, all interconnection request in Group 2 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-2011-012	104.5	GE 2.75MW	Tap Moore County - Hitchland 230kV	0.96	0.97
GEN-2011-014	201	Siemens 3.0MW	Tap Hitchland - Woodward 345kV	0.95	1.0
GEN-2011-021	299	Siemens 2.3MW	Tap Hitchland - Woodward 345kV	0.95	0.98
GEN-2011-022	299	Siemens 2.3MW	Hitchland 345kV	0.95	1.0
ASGI-2011-002	10	DeWind 2.0MW	Herring 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 3 (Spearville Area)

The Group 3 stability study was conducted by S&C Electric (S&C). The stability analysis indicates that requests in Group 3 will be stable for each contingency specified by SPP and the nearby areas will retain angular, frequency and voltage stability. Stability issues were observed in the Post Rock area. These issues were determined to be caused by the placement of fixed line reactors in the power flow model at Post Rock. If these reactors are able to be switched on and off for different power flow conditions, the stability issues will be alleviated. With the power factor requirements

and all network upgrades in service, all interconnection request 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-2010-029	450	Vestas V90 1.8MW	Spearville 345kV	0.96	1.0
GEN-2011-008	600	GE 1.6MW	Clark County 345kV	0.95	1.0
GEN-2011-016	200.1	Siemens 2.3MW	Spearville 345kV	0.95	0.99
GEN-2011-017	299	Siemens 2.3MW	Tap Spearville - Knoll 345kV	0.95	1.0
GEN-2011-023	299	Siemens 2.3MW	Tap Clark - Spearville 345kV	0.99	0.99

*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 (Mingo Area)

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

Cluster Group 5 (Amarillo Area)

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

Cluster Group 6 (South Texas Panhandle/New Mexico)

The Group 6 stability study was conducted by Excel Engineering, Inc. The Group 6 stability analysis was conducted in three different parts to accommodate the addition of 1,500MW of requested generation at Midland County. As the 1,500MW was requested to be interconnected in three stages with the last stage to be installed in 2019, an additional model was made to simulate 2019 load conditions. The upgrades and solutions needed are shown in the appendices. With the power factor requirements and all network upgrades in service, all interconnection request in Group 6 will meet FERC Order #661A low voltage ride through (LVRT) requirements and the transmission system will remain stable. Plots are available on request.

Power Factor Requirements:

Request	Size (MW)	Generator Model	Point of Interconnection	Power Factor Requirement at POI	
				Lagging (supplying)	Leading (absorbing)
GEN-2010-020	20	Emerson Inverter	Roswell 115kV	0.95	0.95
GEN-2010-058	20	Emerson Inverter	Chaves County 115kV	0.98	0.98
GEN-2010-059	516/480	GE Combined Cycle	Midland 345kV	0.95	0.95
GEN-2010-060	992/960	GE Combined Cycle	Midland 345kV	0.95	0.95
GEN-2011-025	80	GE 1.6MW	Tap Floyd County - Crosby County 115kV	0.97	0.95
ASGI-2011-003	10	Sany 2.0MW	Hendricks 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 7 (Southwest Oklahoma Area)

The Group 7 stability analysis was conducted by PTerra Consulting. The results showed neither angular nor voltage instability problems in the SPP system for all contingencies analized. With the power factor requirements and all network upgrades in service, all interconnection request in Group 7 will meet FERC Order #661A low voltage ride through (LVRT) requirements and the transmission system will remain stable.

Power Factor Requirements:

Request	Size (MW)	Generator Model	Point of Interconnection	Power Factor Requirement at POI	
				Lagging (supplying)	Leading (absorbing)
GEN-2011-007	250	RePower 2.05MW	Tap Cimarron - Woodring 345kV	0.97	0.95
GEN-2011-009	150.4	GE 1.6MW	Hobart 138kV	0.99	0.99
GEN-2011-010	100.8	GE 1.6MW	Minco 345kV	0.99	0.99

*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 8 (South Central Kansas/North Oklahoma)

The Group 8 stability analysis was conducted by ABB Inc. The results showed neither angular nor voltage instability problems in the SPP system for all contingencies analized. With the power factor requirements and all network upgrades in service, all interconnection request in Group 8 will meet FERC Order #661A low voltage ride through (LVRT) requirements and the transmission system will remain stable.

Power Factor Requirements:

Request	Size (MW)	Generator Model	Point of Interconnection	Power Factor Requirement at POI	
				Lagging (supplying)	Leading (absorbing)
GEN-2010-055	4.5	GENROU	Wekiwa 138kV	0.95	0.95

Cluster Group 9 (Northeast Nebraska Area)

The Group 9 stability analysis was conducted by Power-tek Global Inc. There are no impacts on the stability performance of the SPP system for the contingencies simulated, the studied request stays on-line and stable. With the power factor requirements and all network upgrades in service, all interconnection request in Group 9 will meet FERC Order #661A low voltage ride through (LVRT) requirements and the transmission system will remain stable.

Power Factor Requirements:

Request	Size (MW)	Generator Model	Point of Interconnection	Power Factor Requirement at POI	
				Lagging (supplying)	Leading (absorbing)
GEN-2011-027	120	Nordex 2.5MW	Tap Twin Church – Hoskins 230kV	0.98	1.0

*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 10 (North Nebraska Area)

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

Cluster Group 11 (North Central Kansas Area)

The Group 11 stability analysis was conducted by ABB Inc. The results showed neither angular nor voltage instability problems in the SPP system for all contingencies analized. With the power factor requirements and all network upgrades in service, all interconnection request in Group 8 will meet FERC Order #661A low voltage ride through (LVRT) requirements and the transmission system will remain stable.

Power Factor Requirements:

Request	Size (MW)	Generator Model	Point of Interconnection	Power Factor Requirement at POI	
				Lagging (supplying)	Leading (absorbing)
GEN-2010-057	201	GE 1.5MW	Rice County 230kV	0.98	1.0

*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)

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

Cluster Group 13 (Northwest Missouri Area)

The Group 13 stability analysis was conducted by Mitsubishi Electric, Inc. The stability analysis determined that no generator tripping or system instability occurs from interconnecting Group 13 projects. With the power factor requirements and all network upgrades in service, all interconnection request in Group 13 will meet FERC Order #661A low voltage ride through (LVRT) requirements and the transmission system will remain stable.

Power Factor Requirements:

Request	Size (MW)	Generator Model	Point of Interconnection	Power Factor Requirement at POI	
				Lagging (supplying)	Leading (absorbing)
GEN-2010-056	151	Vestas V90 1.8MW	Tap Saint Joseph - Cooper 345kV	1.0	0.95
GEN-2011-011	50	GENROU	Iatan 345kV	0.95	0.95
GEN-2011-018	73.6	Siemens 2.3MW	Steele City 115kV	1.0	0.98

*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 14 (South Central Oklahoma)

The Group 14 stability analysis was conducted by Black & Veatch. The South Central Oklahoma stability analysis revealed no stability issues with the study requests. The stability analysis determined that no generator tripping or system instability occurs from interconnecting Group 14 projects. With the power factor requirements and all network upgrades in service, all interconnection request in Group 13 will meet FERC Order #661A low voltage ride through (LVRT) requirements and the transmission system will remain stable.

Power Factor Requirements:

Request	Size (MW)	Generator Model	Point of Interconnection	Power Factor Requirement at POI	
				Lagging (supplying)	Leading (absorbing)
GEN-2011-013	101.7	Vestas V90 1.8MW	Sunnyside 345kV	0.99	0.97

*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 15 (Southwest Nebraska Area)

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

Conclusion

The minimum cost of interconnecting 6,802.7 MW of new interconnection requests included in this Definitive Interconnection System Impact Study is estimated at $1,322,000,000 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 I 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).

Appendix

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*
GEN-2010-020	20.0	ER	SPS	Roswell 115kV	Roswell 115kV		12/31/2014
GEN-2010-029	450.0	NR	SUNC	Spearville 345kV	Spearville 345kV	12/31/2013	12/31/2014
GEN-2010-055	4.5	ER	AEPW	Wekiwa 138kV	Wekiwa 138kV	12/31/2011	TBD
GEN-2010-056	151.2	ER/NR	MIPU	Tap Saint Joseph - Cooper 345kV	Tap Saint Joseph - Cooper 345kV	6/1/2012	TBD
GEN-2010-057	201.0	ER/NR	MIDW	Rice County 230kV	Rice County 230kV	8/1/2012	TBD
GEN-2010-058	20.0	ER	SPS	Chaves County 115kV	Chaves County 115kV	12/31/2011	12/31/2014
GEN-2010-059	516.0	ER	SPS	Midland 345kV	Midland 345kV	4/1/2013	12/31/2014
GEN-2010-060	992.0	ER	SPS	Midland 345kV	Midland 345kV	6/1/2014	12/31/2014
GEN-2011-007	250.0	NR	OKGE	Tap Cimarron - Woodring 345kV	Tap Cimarron - Woodring 345kV (Matthewson 345kV)	11/30/2011	12/31/2014
GEN-2011-008	600.0	ER	SUNC	Clark County 345kV	Clark County 345kV	12/1/2015	12/1/2015
GEN-2011-009	150.4	ER	AEPW	Hobart 138kV	Hobart 138kV	12/1/2013	TBD
GEN-2011-010	100.8	ER	OKGE	Minco 345kV	Minco 345kV	12/1/2012	TBD
GEN-2011-011	50.0	ER	KCPL	Iatan 345kV	Iatan 345kV	12/31/2010	TBD
GEN-2011-012	104.5	ER/NR	SPS	Tap Moore County - Hitchland 230kV	Tap Moore County - Hitchland 230kV	12/31/2012	12/31/2014
GEN-2011-013	101.7	ER/NR	OKGE	Sunnyside 345kV	Sunnyside 345kV	12/31/2012	TBD
GEN-2011-014	201.0	ER/NR	OKGE	Tap Hitchland - Woodward 345kV	Tap Hitchland - Woodward 345kV	12/31/2013	12/31/2014
GEN-2011-015	300.6	ER/NR	OKGE	Tap Tatonga - Woodward 345kV	Tap Tatonga - Woodward 345kV	8/31/2013	12/31/2014
GEN-2011-016	200.1	ER/NR	SUNC	Spearville 345kV	Spearville 345kV	12/1/2013	12/31/2014
GEN-2011-017	299.0	ER/NR	SUNC	Tap Spearville - Knoll 345kV	Tap Spearville - Knoll 345kV	12/1/2013	12/31/2014
GEN-2011-018	73.6	ER/NR	NPPD	Steele City 115kV	Steele City 115kV	12/1/2013	
GEN-2011-019	299.0	ER/NR	OKGE	Woodward 345kV	Woodward 345kV	12/31/2012	12/31/2014
GEN-2011-020	299.0	ER/NR	OKGE	Woodward 345kV	Woodward 345kV	12/31/2012	12/31/2014
GEN-2011-021	299.0	ER/NR	SPS	Tap Hitchland - Woodward 345kV	Tap Hitchland - Woodward 345kV	12/31/2012	12/31/2014
GEN-2011-022	299.0	ER/NR	SPS	Hitchland 345kV	Hitchland 345kV	12/31/2012	12/31/2014
GEN-2011-023	299.0	ER/NR	SUNC	Tap Clark - Spearville 345kV	Clark 345kV	12/31/2012	12/31/2014
GEN-2011-024	299.0	ER/NR	OKGE	Tatonga 345kV	Tatonga 345kV	12/31/2012	12/31/2014
GEN-2011-025	82.3	ER	SPS	Tap Floyd County - Crosby County 115kV	Tap Floyd County - Crosby County 115kV	6/30/2012	12/31/2014
GEN-2011-027	120.0	ER/NR	NPPD	Tap Twin Church - Hoskins 230kV	Tap Twin Church - Hoskins 230kV	12/31/2012	TBD
ASGI-2011-002	10.0	ER	SPS	Herring 115kV	Herring 115kV		TBD
ASGI-2011-003	10.0	ER	SPS	Hendricks 115kV	Hendricks 115kV		TBD
TOTAL	**6,802.7**						

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

B: Prior Queued Interconnection Requests

Request	Amount	Area	Requested/Proposed Point of Interconnection	Status or In-Service Date
GEN-2001-014	96.0	WFEC	Fort Supply 138kV	On-Line
GEN-2001-026	74.0	WFEC	Washita 138kV	On-Line
GEN-2001-033	180.0	SPS	San Juan Mesa Tap 230kV	On-Line
GEN-2001-036	80.0	SPS	Caprock Tap 115kV	On-Line
GEN-2001-037	100.0	OKGE	Windfarm Switching 138kV	On-Line
GEN-2001-039A	105.0	MKEC	Tap Greensburg - Judson-Large 115kV	On Schedule for 2011
GEN-2001-039M	100.0	SUNC	Central Plains Tap 115kV	On-Line
GEN-2002-004	200.0	WERE	Latham 345kV	On-Line at 150MW
GEN-2002-005	120.0	WFEC	Red Hills Tap 138kV	On-Line
GEN-2002-008	240.0	SPS	Hitchland 345kV	On-Line at 120MW
GEN-2002-009	80.0	SPS	Hansford County 115kV	On-Line
GEN-2002-022	240.0	SPS	Bushland 230kV	On-Line at 160MW
GEN-2002-025A	150.0	MKEC	Spearville 230kV	On-Line at 100.5MW
GEN-2003-004	100.0	WFEC	Washita 138kV	On-Line
GEN-2003-005	100.0	WFEC	Anadarko - Paradise 138kV	On Line
GEN-2003-006A	200.0	MKEC	Elm Creek 230kV	On-Line
GEN-2003-013	198.0	SPS	Hitchland - Finney 345kV	On Schedule for 2012
GEN-2003-019	250.0	MIDW	Smoky Hills Tap 230kV	On-Line
GEN-2003-020	160.0	SPS	Martin 115kV	On-Line at 80MW
GEN-2003-022	120.0	AEPW	Washita 138kV	On-Line
GEN-2004-023	20.6	WFEC	Washita 138kV	On-Line
GEN-2004-014	154.5	MKEC	Spearville 230kV	On Schedule for 2011
GEN-2004-020	27.0	AEPW	Washita 138kV	On-Line
GEN-2005-003	30.6	WFEC	Washita 138kV	On-Line
GEN-2005-005	18.0	OKGE	Windfarm Tap 138kV	IA Pending
GEN-2005-008	120.0	OKGE	Woodward 138kV	On-Line
GEN-2005-012	250.0	SUNC	Spearville 345kV	On Schedule for 2012
GEN-2005-013	201.0	WERE	Tap Latham - Neosho	On Schedule for 2012
GEN-2005-017	340.0	SPS	Tap Hitchland - Potter County 345kV	On Suspension
GEN-2006-002	101.0	AEPW	Grapevine - Elk City 230kV	On-Line
GEN-2006-006	205.5	MKEC	Spearville 230kV	IA Pending
GEN-2006-014	300.0	MIPU	Tap Maryville – Clarinda and tie Midway (WFARMS) 161kV	On Suspension
GEN-2006-017	300.0	MIPU	Tap Maryville – Clarinda and tie Midway (WFARMS) 161kV	On Suspension
GEN-2006-018	170.0	SPS	Tuco 230kV	On Schedule for 2011
GEN-2006-020S	18.9	SPS	DWS Frisco Tap	On Schedule for 12/31/2011
GEN-2006-020N	42.0	NPPD	Bloomfield 115kV	On-Line
GEN-2006-021	101.0	MKEC	Flat Ridge Tap 138kV	On-Line
GEN-2006-022	150.0	MKEC	Ninnescah Tap 115kV	On Suspension
GEN-2006-024S	19.8	WFEC	South Buffalo Tap 69kV	On-Line
GEN-2006-026	502.0	SPS	Hobbs 230kV	On-Line
GEN-2006-031	75.0	MIDW	Knoll 115kV	On-Line
GEN-2006-032	200.0	MIDW	South Hays 230kV	On Suspension
GEN-2006-034	81.0	SUNC	Tap Kanarado - Sharon Springs 115kV	On Suspension
GEN-2006-035	225.0	AEPW	Tap Grapevine - Elk City 230kV	On Schedule for 2011
GEN-2006-037N1	75.0	NPPD	Broken Bow 115kV	On Suspension
GEN-2006-038N019	80.0	NPPD	Petersburg 115kV	On-Line
GEN-2006-038	750.0	WFEC	Hugo 345kV	On Suspension
GEN-2006-038N005	80.0	NPPD	Broken Bow 115kV	On-Line
GEN-2006-039	400.0	SPS	Tap and Tie both Potter County - Plant X 230kV and Bushland - Deaf Smith 230kV	On Suspension
GEN-2006-040	108.0	SUNC	Mingo 115kV	On Schedule for 2010
GEN-2006-043	99.0	AEPW	Grapevine - Elk City 230kV	On Line
GEN-2006-044	370.0	SPS	Hitchland 345kV	On Schedule for 2014
GEN-2006-044N	40.5	NPPD	Tap Neligh – Petersburg 115kV	On Schedule for 12/2011
GEN-2006-044N02	100.5	NPPD	GEN-2008-086N02 230kV	Under Study (DISIS-2010-001)
GEN-2006-045	240.0	SPS	Tap and Tie both Potter County - Plant X 230kV and Bushland - Deaf Smith 230kV	On Suspension
GEN-2006-046	131.0	OKGE	Dewey 138kV	On-Line

Request	Amount	Area	Requested/Proposed Point of Interconnection	Status or In-Service Date
GEN-2006-047	240.0	SPS	Tap and Tie both Potter County - Plant X 230kV and Bushland - Deaf Smith 230kV	On Schedule for 2013
GEN-2006-049	400.0	SPS	Hitchland - Finney 345kV	On Schedule for 2014
GEN-2007-002	160.0	SPS	Grapevine 115kV	On Suspension
GEN-2007-006	160.0	OKGE	Roman Nose 138kV	On Suspension
GEN-2007-011	135.0	SUNC	Syracuse 115kV	On Schedule
GEN-2007-011N08	81.0	NPPD	Bloomfield 115kV	On-Line
GEN-2007-013	99.0	SUNC	Selkirk 115kV	On Suspension
GEN-2007-015	135.0	WERE	Tap Humboldt – Kelly 161kV	On Suspension
GEN-2007-017	100.5	MIPU	Tap Maryville – Clarinda and tie Midway (WFARMS) 161kV	On Suspension
GEN-2007-021	201.0	OKGE	Tatonga 345kV	On Schedule for 2014
GEN-2007-025	300.0	WERE	Tap Woodring – Wichita 345kV	On Suspension
GEN-2007-032	150.0	WFEC	Tap Clinton Junction – Clinton 138kV	OnSchedule for 2012
GEN-2007-038	200.0	SUNC	Spearville 345kV	On Schedule for 2015
GEN-2007-040	200.1	SUNC	Tap Holcomb – Spearville 345kV	On Schedule for 2012
GEN-2007-043	200.0	OKGE	Tap Lawton Eastside – Cimarron 345kV	On-Line (100MW)
GEN-2007-044	300.0	OKGE	Tatonga 345kV	On Schedule for 2014
GEN-2007-046	199.5	SPS	Tap & Tie Texas County – Hitchland & DWS Frisco Tap – Hitchland 115kV	On Schedule for 2014
GEN-2007-048	400.0	SPS	Tap Amarillo South – Swisher 230kV	On Schedule for 2014
GEN-2007-050	170.0	OKGE	Woodward 138kV	On-Line
GEN-2007-051	200.0	WFEC	Mooreland 138kV	On Schedule for 2014
GEN-2007-052	150.0	WFEC	Anadarko 138kV	On-Line
GEN-2007-053	110.0	MIPU	Tap Maryville – Clarinda and tie Midway (WFARMS) 161kV	On Schedule for 2013
GEN-2007-057	34.5	SPS	Moore County East 115kV	On Schedule for 2014
GEN-2007-062	765.0	OKGE	Woodward 345kV	On Schedule for 2014
GEN-2008-003	101.0	OKGE	Woodward EHV 138kV	On-Line
GEN-2008-008	60.0	SPS	Graham 115kV	On Schedule for 2014
GEN-2008-009	60.0	SPS	San Juan Mesa Tap 230kV	On Schedule for 2014
GEN-2008-013	300.0	OKGE	Tap Woodring – Wichita 345kV	On Schedule for 2013
GEN-2008-014	150.0	SPS	Tap Tuco – Oklaunion 345kV	On Schedule for 2014
GEN-2008-016	248.0	SPS	Grassland 230kV	IA Pending
GEN-2008-017	300.0	SUNC	Setab 345kV	On Schedule for 2012
GEN-2008-018	405.0	SPS	Finney 345kV	IA Pending
GEN-2008-019	300.0	OKGE	Tatonga 345kV	On Schedule for 2015
GEN-2008-021	42.0	WERE	Wolf Creek 345kV	IA Pending
GEN-2008-022	300.0	SPS	Tap Eddy – Tolk 345kV	IA Pending
GEN-2008-023	150.0	AEPW	Hobart Junction 138kV	On Schedule for 2012
GEN-2008-025	101.2	SUNC	Ruleton 115kV	On Schedule for 2015
GEN-2008-029	250.5	OKGE	Woodward EHV 138kV	On Schedule for 2014
GEN-2008-037	101.0	WFEC	Tap Washita – Blue Canyon 138kV	IA Pending
GEN-2008-044	197.8	OKGE	Tatonga 345kV	IA Pending
GEN-2008-046	200.0	OKGE	Sunnyside 345kV	IA Pending
GEN-2008-047	300.0	SPS	Tap Hitchland - Woodward 345kV	IA Pending
GEN-2008-051	322.0	SPS	Potter 345kV	On Schedule for 2014
GEN-2008-071	76.8	OKGE	Newkirk 138kV	IA Pending
GEN-2008-079	100.5	MKEC	Tap Judson Large – Cudahy 115kV	On Schedule for 2012
GEN-2008-086N02	200.0	NPPD	Tap Ft. Randall – Columbus 230kV	On Schedule for 2014
GEN-2008-088	50.6	SPS	Vega 69kV	IA Pending
GEN-2008-092	201.0	MIDW	Knoll 115kV	IA Pending
GEN-2008-098	100.8	WERE	Tap Wolf Creek – LaCygne 345kV	IA Pending
GEN-2008-110	299.2	SPS	Hitchland 345kV	IA Pending
GEN-2008-119O	60.0	OPPD	Tap Humboldt – Kelly 161kV	On-Line
GEN-2008-123N	89.7	NPPD	Tap Guide - Pauline 115kV	IA Pending
GEN-2008-124	200.1	SUNC	Spearville 345kV	On Schedule for 2014
GEN-2008-127	200.1	WERE	Tap Sooner – Rose Hill 345kV	On Schedule for 2012
GEN-2008-129	80.0	MIPU	Pleasant Hill 161kV	On-Line
GEN-2009-008	199.5	SUNC	South Hays 230kV	IA Pending
GEN-2009-011	50.0	MKEC	Tap Plainville – Phillipsburg 115kV	On Schedule for 2014
GEN-2009-016	141.0	AEPW	Falcon Road 138kV	On Schedule for 2012
GEN-2009-017	60.0	SPS	Tap Pembrook – Stiles 138kV	Under Study (DISIS-2009-001)
GEN-2009-020	48.6	MIDW	Tap Bazine – Nekoma 69kV	IA Pending
GEN-2009-025	60.0	OKGE	Tap Deer Creek – Sinclair 69kV	On Suspension
GEN-2009-030	100.8	WFEC	Weatherford 138kV	IA Pending

Request	Amount	Area	Requested/Proposed Point of Interconnection	Status or In-Service Date
GEN-2009-040	73.8	WERE	Tap Smittyville - Knob Hill 115kV	On Schedule for 2012
GEN-2009-060	84.0	WFEC	Gotebo 69kV	IA Pending
GEN-2009-062	115.0	MKEC	Hugoton 115kV	Under Study (DISIS-2010-001)
GEN-2009-067S	20.0	SPS	7 Rivers 69kV	IA Pending
GEN-2010-001	300.0	OKGE	Tap Hitchland – Woodward 345kV	Under Study (DISIS-2010-002
GEN-2010-003	100.8	WERE	GEN-2008-098 345kV	IA Pending
GEN-2010-005	300.0	WERE	GEN-2007-025 345kV	IA Pending
GEN-2010-006	205.0	SPS	Jones 230kV	On-Line
GEN-2010-007	73.8	SPS	Tap Pringle - Riverview 115kV	IA Pending
GEN-2010-008	64.4	WFEC	Fargo 69kV	IA Pending
GEN-2010-009	165.6	SUNC	Gray County 345kV	IA Pending
GEN-2010-010	100.5	NPPD	Madison County 230kV	IA Pending
GEN-2010-011	29.7	OKGE	Tatonga 345kV	On Schedule for 2011
GEN-2010-014	360.0	SPS	Hitchland 345kV	IA Pending
GEN-2010-015	200.1	SUNC	Spearville 345kV	IA Pending
GEN-2010-016	199.8	SUNC	Tap Spearville - Knoll 345kV	IA Pending
GEN-2010-036	4.6	WERE	6th Street 115kV	Under Study (DISIS-2010-002)
GEN-2010-040	300.0	OKGE	Cimarron 345kV	Under Study (DISIS-2010-002)
GEN-2010-041	10.5	OPPD	S 1399 161kV	Under Study (DISIS-2010-002)
GEN-2010-043	320.0	WFEC	Mooreland 138kV	Under Study (DISIS-2010-002)
GEN-2010-045	197.8	SUNC	Tap Holcomb – Spearville 345kV	Under Study (DISIS-2010-002)
GEN-2010-046	56.0	SPS	Tuco 230kV	Under Study (DISIS-2010-002)
GEN-2010-047	72.0	NPPD	Tap Beatrice – Harbine 115kV	Under Study (DISIS-2010-002)
GEN-2010-048	70.0	MIDW	Tap Beach Station – Redline 115kV	Under Study (DISIS-2010-002)
GEN-2010-049	49.6	SUNC	Pratt 115kV	Under Study (DISIS-2010-002)
GEN-2010-051	200.0	NPPD	TAP TWIN CHURCH – HOSKINS 230kV	Under Study (DISIS-2010-002)
GEN-2010-052	301.3	SUNC	FINNEY 345kV	Under Study (DISIS-2010-002)
GEN-2010-053	199.8	SUNC	COMANCHE 345kV	Under Study (DISIS-2010-002)
Broken Bow	8.3	NPPD	Genoa 115kV	On-Line
Ord	10.8	NPPD	Bloomfield 115kV	On-Line
Stuart	2.1	NPPD	Petersburg 115kV	On-Line
Ainsworth	75.0	NPPD	Ainsworth Wind Tap 115kV	On-Line
Rosebud	30.0	NPPD	St. Francis 115kV	On-Line
Wolf Creek	1,170.0	WERE	Wolf Creek 345kV	On-Line
Genoa	4.0	NPPD	Genoa 115kV	On-Line
ASGI-2010-001	400.0	AECI	Tap Cooper – Fairport 345kV	AECI queue Affected Study
ASGI-2010-002	201.0	AECI	Lathrop 161kV	AECI queue Affected Study
ASGI-2010-003	300.0	AECI	Maryville 161kV	AECI queue Affected Study
ASGI-2010-004	50.0	AECI	Tap Queen City – Lancaster 69kV	AECI queue Affected Study
ASGI-2010-005	99.0	AECI	Lathrop 161kV	AECI queue Affected Study
ASGI-2010-006	150.0	AECI	Tap Fairfax – Fairfax Tap 138kV	AECI queue Affected Study
ASGI-2010-007	150.0	AECI	Tap Fairfax – Fairfax Tap 138kV	AECI queue Affected Study
ASGI-2010-008	100.0	AECI	Maryville 161kV	AECI queue Affected Study
ASGI-2010-009	201.0	AECI	Osborn 161kV	AECI queue Affected Study
ASGI-2010-010	42.0	SPS	Lovington 115kV	Affected Study
ASGI-2010-011	48.0	SPS	Texas County 69kV	Affected Study
ASGI-2010-020	50.0	SPS	Tap (LE) Tatum – (LE) Crossroads 69kV	Under Study (DISIS-2010-002)
ASGI-2010-021	36.6	SPS	Tap (LE) Saunders Tap – (LE) Anderson 69kV	Under Study (DISIS-2010-002)
ASGI-2011-001	28.8	SPS	LE-Lovington 115kV	Affected Study

Request	Amount	Area	Requested/Proposed Point of Interconnection	Status or In-Service Date
Llano Estacado	80.0	SPS	Llano Wind Farm Tap 115kV	On-Line
SPS DISTRIBUTED	90.0	SPS	Dumas_19ST 115kV	On-Line
			Etter 115kV	On-Line
			Sherman 115kV	On-Line
			Spearman 115kV	On-Line
			Texas County 115kV	On-Line
Montezuma	110.0	MKEC	Haggard 115kV	On-Line
TOTAL	27,646.8			

C: Study Groupings

Cluster	Request	Amount	Area	Proposed Point of Interconnection
Prior Queued	GEN-2001-014	96.0	WFEC	Fort Supply 138kV
	GEN-2001-037	100.0	OKGE	Windfarm Switching 138kV
	GEN-2005-005	18.0	OKGE	Windfarm Tap 138kV
	GEN-2005-008	120.0	OKGE	Woodward 138kV
	GEN-2006-024S	20.0	WFEC	South Buffalo Tap 69kV
	GEN-2006-046	131.0	OKGE	Dewey 138kV
	GEN-2007-006	160.0	OKGE	Roman Nose 138kV
	GEN-2007-021	201.0	OKGE	Tatonga 345kV
	GEN-2007-044	300.0	OKGE	Tatonga 345kV
	GEN-2007-050	170.0	OKGE	Woodward 138kV
	GEN-2007-051	200.0	WFEC	Mooreland 138kV
	GEN-2007-062	765.0	OKGE	Woodward 345kV
	GEN-2008-003	101.0	OKGE	Woodward EHV 138kV
	GEN-2008-019	300.0	OKGE	Tatonga 345kV
	GEN-2008-029	250.5	OKGE	Woodward EHV 138kV
	GEN-2008-044	197.8	OKGE	Tatonga 345kV
	GEN-2010-008	64.4	WFEC	Fargo 69kV
	GEN-2010-011	29.7	OKGE	Tatonga 345kV
	GEN-2010-043	320.0	WFEC	Mooreland 138kV
PRIOR QUEUED SUBTOTAL		**3,544.4**		
Cluster	**Request**	**Amount**	**Area**	**Proposed Point of Interconnection**
Woodward	GEN-2011-015	300.6	OKGE	Tap Tatonga – Woodward 345kV
	GEN-2011-019	299.0	OKGE	Woodward 345kV
	GEN-2011-020	299.0	OKGE	Woodward 345kV
	GEN-2011-024	299.0	OKGE	Tatonga 345kV
Group 1 WOODWARD SUBTOTAL		**1,197.6**		
AREA TOTAL		**4,742.0**		

Cluster	Request	Amount	Area	Proposed Point of Interconnection
Prior Queued	SPS Distribution	90.0	SPS	Various
	ASGI-2010-011	48.0	SPS	Texas County 69kV
	GEN-2002-008	240.0	SPS	Hitchland 345kV
	GEN-2002-009	80.0	SPS	Hansford County 115kV
	GEN-2003-013	198.0	SPS	Tap Hitchland - Finney 345kV
	GEN-2003-020	160.0	SPS	Martin 115kV
	GEN-2005-017	340.0	SPS	Tap Hitchland - Potter County 345kV
	GEN-2006-020S	20.0	SPS	DWS Frisco Tap
	GEN-2006-044	370.0	SPS	Hitchland 345kV
	GEN-2006-049	400.0	SPS	Tap Hitchland - Finney 345kV
	GEN-2007-046	200.0	SPS	Tap & Tie Texas County – Hitchland & DWS Frisco Tap – Hitchland 115kV
	GEN-2007-057	35.0	SPS	Moore County East 115kV
	GEN-2008-047	300.0	SPS	Tap Hitchland - Woodward 345kV
	GEN-2008-110	299.2	SPS	Hitchland 345kV
	GEN-2010-001	300.0	WFEC	GEN-2008-047 Tap 345kV
	GEN-2010-007	73.8	SPS	Tap Pringle – Riverview 115kV
	GEN-2010-014	358.8	SPS	Hitchland 345kV
PRIOR QUEUED SUBTOTAL		**3,512.8**		
Cluster	**Request**	**Amount**	**Area**	**Proposed Point of Interconnection**
Hitchland	GEN-2011-012	104.5	SPS	Tap Moore County - Hitchland 230kV
	GEN-2011-014	201.0	SPS	Tap Hitchland - Woodward 345kV
	GEN-2011-021	299.0	SPS	Tap Hitchland - Woodward 345kV
	GEN-2011-022	299.0	SPS	Hitchland 345kV
	ASGI-2011-002	10.0	SPS	Herring 115kV
Group 2 HITCHLAND SUBTOTAL		**913.5**		
AREA TOTAL		**4,426.3**		

Cluster	Request	Amount	Area	Proposed Point of Interconnection
Prior Queued	Montezuma	110.0	MKEC	Haggard 115kV
	GEN-2001-039A	105.0	MKEC	Tap Greensburg - Judson-Large 115kV
	GEN-2002-025A	150.0	MKEC	Spearville 230kV
	GEN-2004-014	154.5	MKEC	Spearville 230kV
	GEN-2005-012	250.0	SUNC	Spearville 345kV
	GEN-2006-006	205.5	MKEC	Spearville 230kV
	GEN-2006-021	101.0	MKEC	Flat Ridge Tap 138kV
	GEN-2006-022	150.0	MKEC	Ninnescah Tap 115kV
	GEN-2007-038	200.0	SUNC	Spearville 345kV
	GEN-2007-040	200.0	SUNC	Tap Holcomb – Spearville 345kV
	GEN-2008-018	405.0	SUNC	Finney 345kV
	GEN-2008-079	100.5	MKEC	Tap Fort Dodge – Cudahy 115kV
	GEN-2008-124	200.1	SUNC	Spearville 345kV
	GEN-2009-062	115.0	SUNC	Hugoton 115kV
	GEN-2010-009	165.6	SUNC	Gray County 345kV
	GEN-2010-015	200.1	SUNC	Spearville 345kV
	GEN-2010-016	199.8	SUNC	Tap Spearville – Knoll 345kV
	GEN-2010-045	197.8	SUNC	Tap Holcomb – Spearville 345kV
	GEN-2010-049	49.6	MKEC	Pratt 115kV
	GEN-2010-052	301.3	SPS	Finney 345kV
	GEN-2010-053	199.8	SUNC	Comanche 345kV
PRIOR QUEUED SUBTOTAL		**3,760.6**		
Cluster	**Request**	**Amount**	**Area**	**Proposed Point of Interconnection**
Spearville	GEN-2010-029	450.0	SUNC	Spearville 345kV
	GEN-2011-008	600.0	WFEC	Clark County 345kV
	GEN-2011-016	200.1	SUNC	Spearville 345kV
	GEN-2011-017	299.0	SUNC	Tap Spearville - Knoll 345kV
	GEN-2011-023	299.0	SUNC	Clark 345kV
Group 3 SPEARVILLE SUBTOTAL		**1,848.1**		
AREA TOTAL		**5,608.7**		

Cluster	Request	Amount	Area	Proposed Point of Interconnection
Prior Queued	GEN-2001-039M	100.0	SUNC	Central Plains Tap 115kV
	GEN-2006-034	81.0	SUNC	Tap Kanarado - Sharon Springs 115kV
	GEN-2006-040	108.0	SUNC	Mingo 115kV
	GEN-2007-011	135.0	SUNC	Syracuse 115kV
	GEN-2007-013	99.0	SUNC	Selkirk 115kV
	GEN-2008-017	300.0	SUNC	Setab 345kV
	GEN-2008-025	101.2	SUNC	Ruleton 115kV
PRIOR QUEUED SUBTOTAL		**924.2**		
Group 4 MINGO/NW KANSAS SUBTOTAL		**0.0**		
AREA TOTAL		**924.2**		

Cluster	Request	Amount	Area	Proposed Point of Interconnection
Prior Queued	Llano Estacado	80.0	SPS	Llano Estacado Tap 115kV
	GEN-2002-022	240.0	SPS	Bushland 230kV
	GEN-2006-039	400.0	SPS	Tap and Tie both Potter County - Plant X 230kV and Bushland - Deaf Smith 230kV
	GEN-2006-045	240.0	SPS	Tap and Tie both Potter County - Plant X 230kV and Bushland - Deaf Smith 230kV
	GEN-2006-047	240.0	SPS	Tap and Tie both Potter County - Plant X 230kV and Bushland - Deaf Smith 230kV
	GEN-2007-002	160.0	SPS	Grapevine 115kV
	GEN-2007-048	400.0	SPS	Tap Amarillo South – Swisher 230kV
	GEN-2008-051	322.0	SPS	Potter 345kV
	GEN-2008-088	50.6	SPS	Vega 69kV
PRIOR QUEUED SUBTOTAL		**1,842.6**		
Group 5 AMARILLO SUBTOTAL		**0.0**		
AREA TOTAL		**1,842.6**		

Cluster	Request	Amount	Area	Proposed Point of Interconnection
Prior Queued	ASGI-2010-010	42.0	SPS	Lovington 115kV
	ASGI-2010-020	50.0	SPS	Tap (LE) Tatum – (LE) Crossroads 69kV
	ASGI-2010-021	36.6	SPS	Tap (LE) Saunders Tap – (LE) Anderson 69kV
	ASGI-2011-001	28.8	SPS	LE-Lovington 115kV
	GEN-2001-033	180.0	SPS	San Juan Mesa Tap 230kV
	GEN-2001-036	80.0	SPS	Caprock Tap 115kV
	GEN-2006-018	170.0	SPS	Tuco 230kV
	GEN-2006-026	502.0	SPS	Hobbs 230kV
	GEN-2008-008	60.0	SPS	Graham 115kV
	GEN-2008-009	60.0	SPS	San Juan Mesa Tap 230kV
	GEN-2008-014	150.0	SPS	Tap Tuco – Oklaunion 345kV
	GEN-2008-016	248.0	SPS	Grassland 230kV
	GEN-2008-022	300.0	SPS	Tap Eddy – Tolk 345kV
	GEN-2009-017	60.0	SPS	Tap Pembrook – Stiles 138kV
	GEN-2009-067S	20.0	SPS	7 Rivers 69kV
	GEN-2010-006	205.0	SPS	Jones 230kV
	GEN-2010-046	56.0	SPS	Tuco 230kV
PRIOR QUEUED SUBTOTAL		**2,248.4**		
Cluster	**Request**	**Amount**	**Area**	**Proposed Point of Interconnection**
S-TX Panhandle New Mexico	GEN-2010-020	20.0	SPS	Roswell 115kV
	GEN-2010-058	20.0	SPS	Chaves County 115kV
	GEN-2010-059	516.0	SPS	Midland 345kV
	GEN-2010-060	992.0	SPS	Midland 345kV
	GEN-2011-025	82.3	SPS	Tap Floyd County - Crosby County 115kV
	ASGI-2011-003	10.0	SPS	Hendricks 115kV
Group 6 S-TX Panhandle/NM SUBTOTAL		**1,640.3**		
AREA TOTAL		**3,888.7**		

Cluster	Request	Amount	Area	Proposed Point of Interconnection
Prior Queued	GEN-2001-026	74.0	WFEC	Washita 138kV
	GEN-2002-005	120.0	WFEC	Red Hills Tap 138kV
	GEN-2003-004	101.0	WFEC	Washita 138kV
	GEN-2003-005	100.0	WFEC	Anadarko - Paradise 138kV
	GEN-2003-022	120.0	AEPW	Washita 138kV
	GEN-2004-020	27.0	AEPW	Washita 138kV
	GEN-2004-023	21.0	WFEC	Washita 138kV
	GEN-2005-003	31.0	WFEC	Washita 138kV
	GEN-2006-002	101.0	AEPW	Grapevine - Elk City 230kV
	GEN-2006-035	225.0	AEPW	Grapevine - Elk City 230kV
	GEN-2006-043	99.0	AEPW	Grapevine - Elk City 230kV
	GEN-2007-032	150.0	WFEC	Tap Clinton Junction – Clinton 138kV
	GEN-2007-043	200.0	OKGE	Tap Lawton Eastside – Cimarron 345kV
	GEN-2007-052	150.0	WFEC	Anadarko 138kV
	GEN-2008-023	150.0	AEPW	Hobart Junction 138kV
	GEN-2008-037	100.8	WFEC	Tap Washita – Blue Canyon 138kV
	GEN-2009-016	140.0	AEPW	Falcon Road 138kV
	GEN-2009-030	100.8	WFEC	Weatherford 138kV
	GEN-2009-060	84.0	WFEC	Gotebo 69kV
	GEN-2010-040	300.0	OKGE	Cimarron 345kV
PRIOR QUEUED SUBTOTAL		**2,394.6**		
Cluster	**Request**	**Amount**	**Area**	**Proposed Point of Interconnection**
SW Oklahoma	GEN-2011-007	250.0	OKGE	Tap Cimarron - Woodring 345kV (Matthewson 345kV)
	GEN-2011-009	150.4	AEPW	Hobart 138kV
	GEN-2011-010	100.8	OKGE	Minco 345kV
Group 7 SW OKLAHOMA SUBTOTAL		**501.2**		
AREA TOTAL		**2,895.8**		

Cluster	Request	Amount	Area	Proposed Point of Interconnection
Prior Queued	Wolf Creek	1,170.0	WERE	Wolf Creek 345kV
	ASGI-2010-006	150.0	AECI	Tap Fairfax – Fairfax Tap 138kV
	ASGI-2010-007	150.0	AECI	Tap Fairfax – Fairfax Tap 138kV
	GEN-2002-004	200.0	WERE	Latham 345kV
	GEN-2005-013	201.0	WERE	Tap Latham - Neosho
	GEN-2007-025	300.0	WERE	Tap Woodring – Wichita 345kV
	GEN-2008-013	300.0	OKGE	Tap Woodring – Wichita 345kV
	GEN-2008-021	42.0	WERE	Wolf Creek 25kV
	GEN-2008-071	76.8	OKGE	Newkirk 138kV
	GEN-2008-098	100.8	WERE	Tap Wolf Creek – LaCygne 345kV
	GEN-2008-127	200.1	WERE	Tap Sooner – Rose Hill 345kV
	GEN-2009-025	60.0	OKGE	Tap Deer Creek – Sinclair 69kV
	GEN-2010-003	100.8	WERE	GEN-2008-098 345kV
	GEN-2010-005	300.0	WERE	GEN-2007-025 345kV
PRIOR QUEUED SUBTOTAL		**3,351.5**		
Cluster	**Request**	**Amount**	**Area**	**Proposed Point of Interconnection**
N-OK/S-KS	GEN-2010-055	4.5	AEPW	Wekiwa 138kV
Group 8 N-OK/S-KS SUBTOTAL		**4.5**		
AREA TOTAL		**3,356.0**		

Cluster	Request	Amount	Area	Proposed Point of Interconnection
Prior Queued	Genoa	4.0	NPPD	Genoa 115kV
	Ainsworth	75.0	NPPD	Ainsworth Wind Tap 115kV
	Rosebud Project	30.0	NPPD	St. Francis 115kV
	Broken Bow	8.3	NPPD	Genoa 115kV
	Ord	10.8	NPPD	Bloomfield 115kV
	Stuart	2.1	NPPD	Petersburg 115kV
	GEN-2006-020N	42.0	NPPD	Bloomfield 115kV
	GEN-2006-037N1	75.0	NPPD	Broken Bow 115kV
	GEN-2006-038N005	80.0	NPPD	Broken Bow 115kV
	GEN-2006-038N019	80.0	NPPD	Petersburg 115kV
	GEN-2006-044N	40.5	NPPD	Tap Neligh – Petersburg 115kV
	GEN-2006-044N02	100.5	NPPD	GEN-2008-086N02 230kV
	GEN-2007-011N08	81.0	NPPD	Bloomfield 115kV
	GEN-2008-086N02	200.0	NPPD	Tap Ft. Randall – Columbus 230kV
	GEN-2010-010	100.5	NPPD	Madison County 230kV
	GEN-2010-051	200.0	NPPD	Tap Twin Church – Hoskins 230kV
PRIOR QUEUED SUBTOTAL		**1,129.7**		
Cluster	**Request**	**Amount**	**Area**	**Proposed Point of Interconnection**
N Nebraska	GEN-2011-027	120.0	NPPD	Tap Twin Church - Hoskins 230kV
Group 9/10 N NEBRASKA SUBTOTAL		**120.0**		
AREA TOTAL		**1,249.7**		

Cluster	Request	Amount	Area	Proposed Point of Interconnection
Prior Queued	GEN-2003-006A	200.0	MKEC	Elm Creek 230kV
	GEN-2003-019	250.0	MIDW	Smoky Hills Tap 230kV
	GEN-2006-031	75.0	MIDW	Knoll 115kV
	GEN-2006-032	200.0	MIDW	South Hays 230kV
	GEN-2008-092	201.0	MIDW	Knoll 115kV
	GEN-2009-008	199.5	SUNC	South Hays 230kV
	GEN-2009-011	50.0	MKEC	Tap Plainville – Phillipsburg 115kV
	GEN-2009-020	48.6	MIDW	Tap Bazine – Nekoma 69kV
	GEN-2010-048	70.0	MIDW	Tap Beach Station – Redline 115kV
PRIOR QUEUED SUBTOTAL		**1,294.1**		
Cluster	**Request**	**Amount**	**Area**	**Proposed Point of Interconnection**
North Kansas	GEN-2010-057	201.0	MIDW	Rice County 230kV
Group 11 NORTH KANSAS SUBTOTAL		**201.0**		
AREA TOTAL		**1,495.1**		

Cluster	Request	Amount	Area	Proposed Point of Interconnection
	PRIOR QUEUED SUBTOTAL	0.0		
	Group 12 NW AR SUBTOTAL	0.0		
	AREA TOTAL	0.0		

Cluster	Request	Amount	Area	Proposed Point of Interconnection
Prior Queued	ASGI-2010-001	400.0	AECI	Tap Cooper – Fairport 345kV
	ASGI-2010-002	201.0	AECI	Lathrop 161kV
	ASGI-2010-003	300.0	AECI	Maryville 161kV
	ASGI-2010-004	50.0	AECI	Tap Queen City – Lancaster 69kV
	ASGI-2010-005	99.0	AECI	Lathrop 161kV
	ASGI-2010-008	100.0	AECI	Maryville 161kV
	ASGI-2010-009	201.0	AECI	Osborn 161kV
	GEN-2006-014	300.0	MIPU	Tap Maryville – Clarinda 161kV & Tie to Midway 161kV
	GEN-2006-017	300.0	MIPU	Tap Maryville – Clarinda 161kV & Tie to Midway 161kV
	GEN-2007-015	135.0	WERE	Tap Humboldt – Kelly 161kV
	GEN-2007-017	100.5	MIPU	Tap Maryville – Clarinda 161kV & Tie to Midway 161kV
	GEN-2007-053	110.0	MIPU	Tap Maryville – Clarinda 161kV & Tie to Midway 161kV
	GEN-2008-119O	60.0	OPPD	Tap Humboldt – Kelly 161kV
	GEN-2008-129	80.0	MIPU	Pleasant Hill 161kV
	GEN-2009-040	73.8	WERE	Tap Smittyville – Knob Hill 115kV
	GEN-2010-036	4.6	WERE	6th Street 115kV
	GEN-2010-041	10.5	OPPD	S 1399 161kV
	GEN-2010-047	72.0	NPPD	Tap Beatrice – Harbine 115kV
	PRIOR QUEUED SUBTOTAL	2,597.4		
Cluster	Request	Amount	Area	Proposed Point of Interconnection
NW Missouri	GEN-2010-056	151.0	MIPU	Tap Saint Joseph - Cooper 345kV
	GEN-2011-011	50.0	KCPL	Iatan 345kV
	GEN-2011-018	73.6	NPPD	Steele City 115kV
	Group 13 NORTHWEST MISSOURI SUBTOTAL	274.6		
	AREA TOTAL	2,872.0		

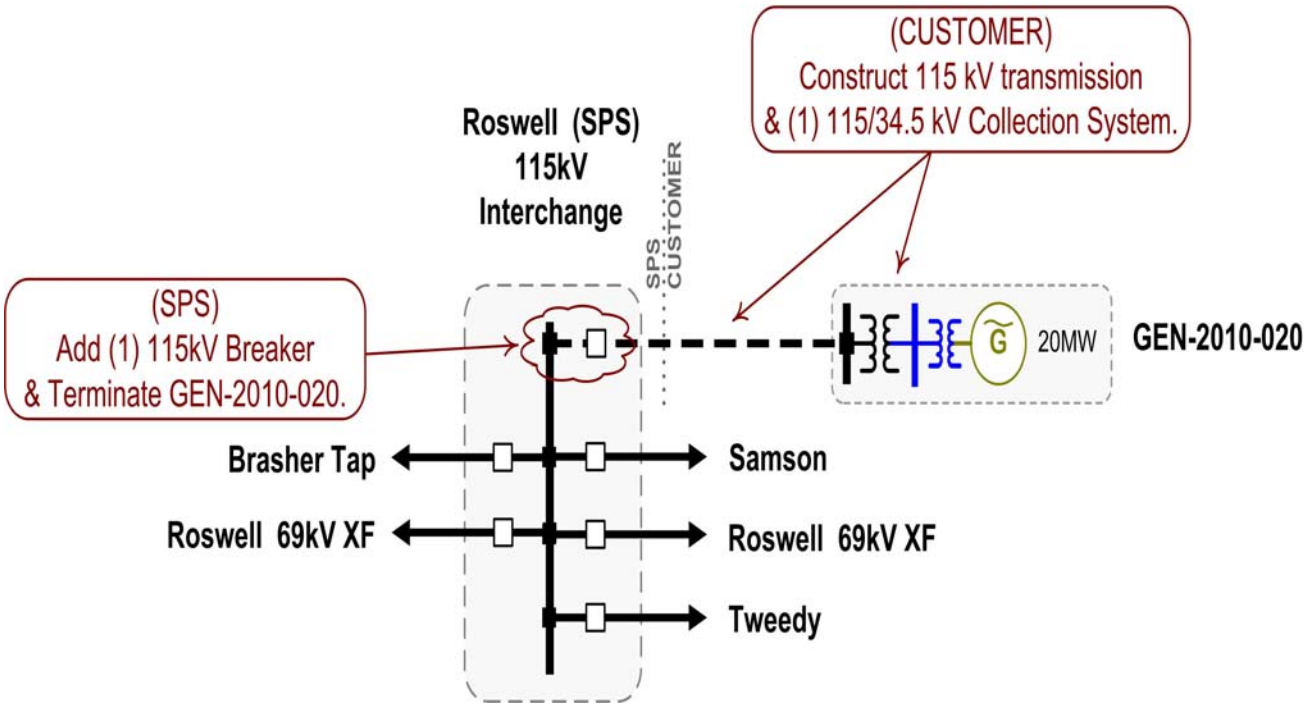
Cluster	Request	Amount	Area	Proposed Point of Interconnection
Prior Queued	GEN-2006-038	750.0	WFEC	Hugo 345kV
	GEN-2008-046	200.0	OKGE	Sunnyside 345kV
	PRIOR QUEUED SUBTOTAL	950.0		
Cluster	Request	Amount	Area	Proposed Point of Interconnection
S-OKLAHOMA	GEN-2011-013	101.7	OKGE	Sunnyside 345kV
	Group 14 SOUTH OKLAHOMA SUBTOTAL	101.7		
	AREA TOTAL	1,051.7		

Cluster	Request	Amount	Area	Proposed Point of Interconnection
Prior Queued	GEN-2008-123N	89.7	NPPD	Tap Guide – Pauline 115kV
	PRIOR QUEUED SUBTOTAL	89.7		
	Group 15 SOUTH NEBRASKA	0.0		
	AREA TOTAL	89.7		

CLUSTER TOTAL (CURRENT STUDY)	6,802.7 MW
CLUSTER TOTAL (INCLUDING PRIOR QUEUED)	34,449.5 MW

D: Proposed Point of Interconnection One line Diagrams

GEN-2010-020



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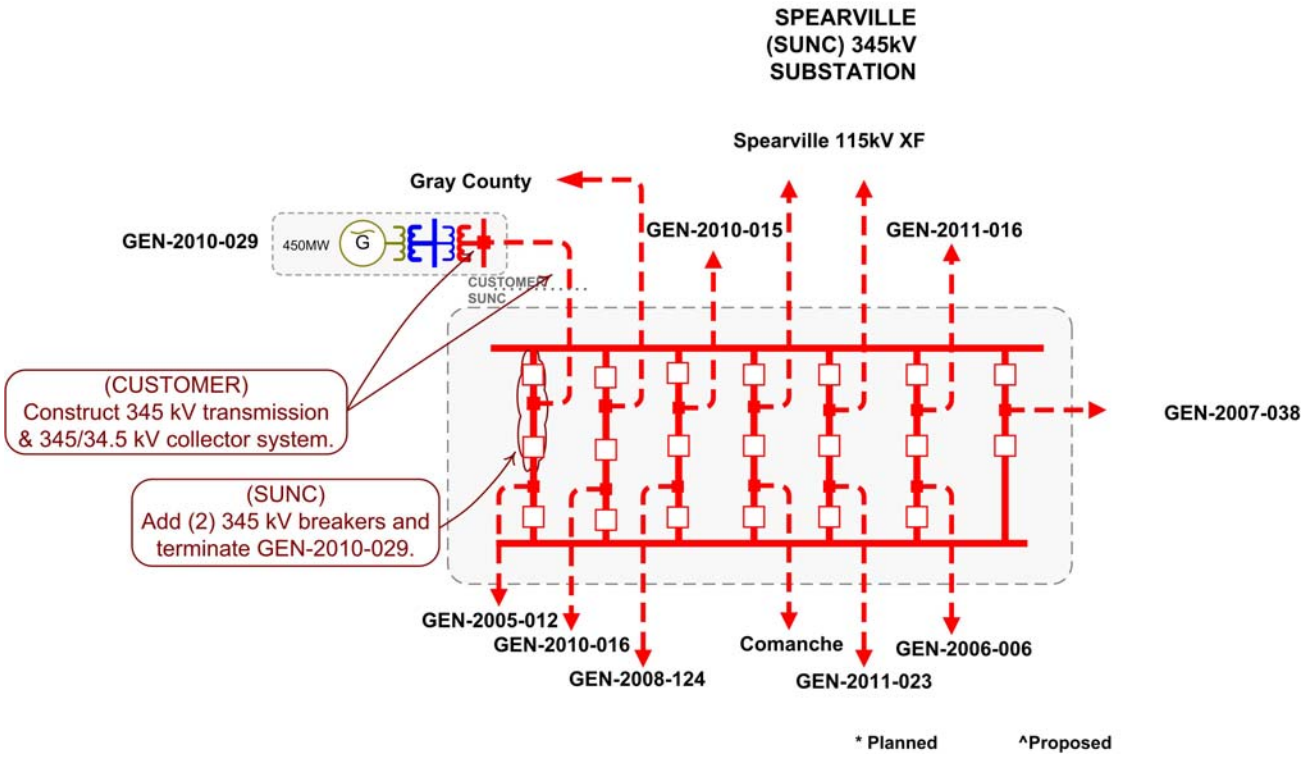

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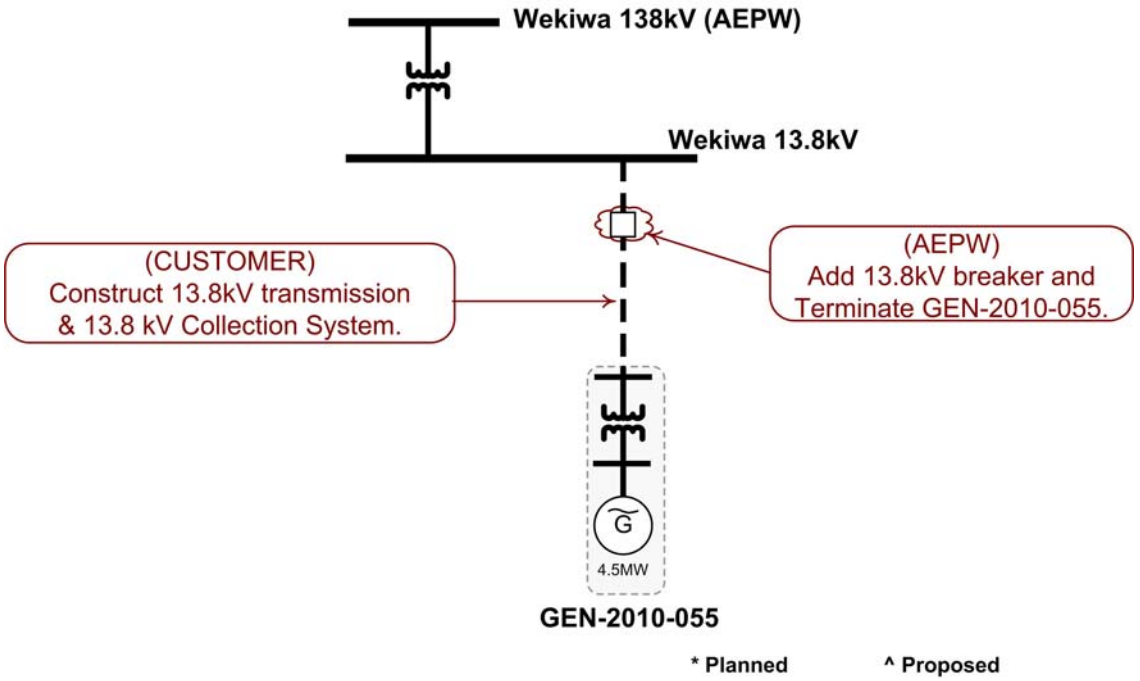

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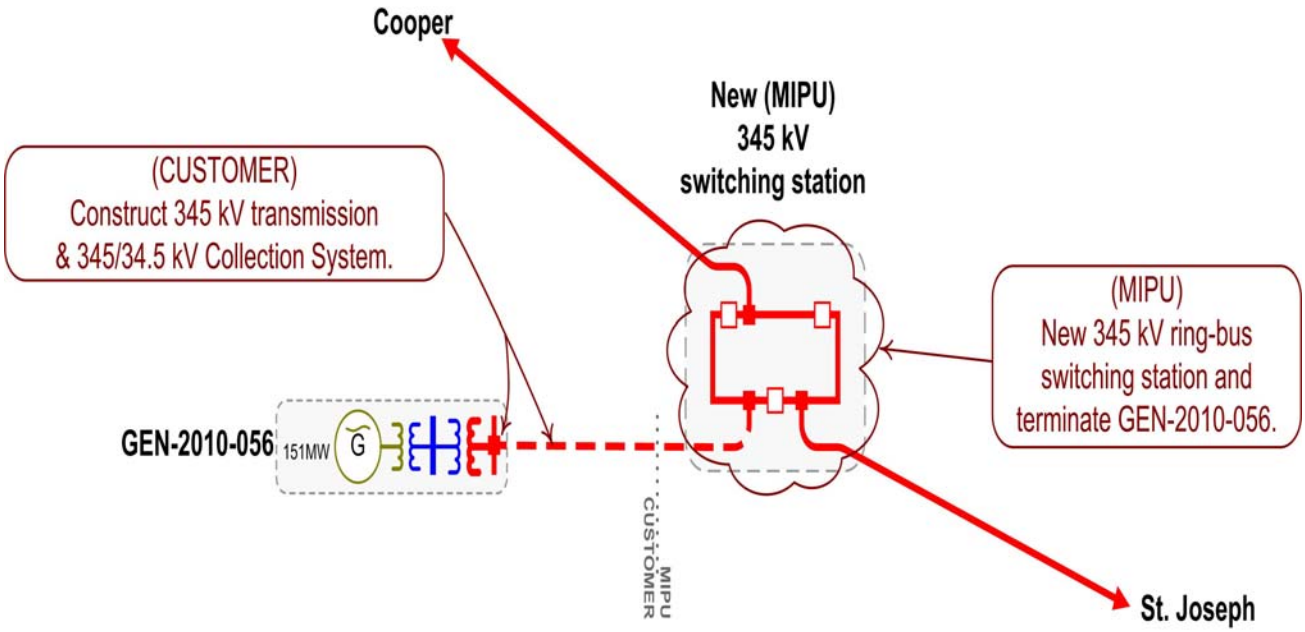

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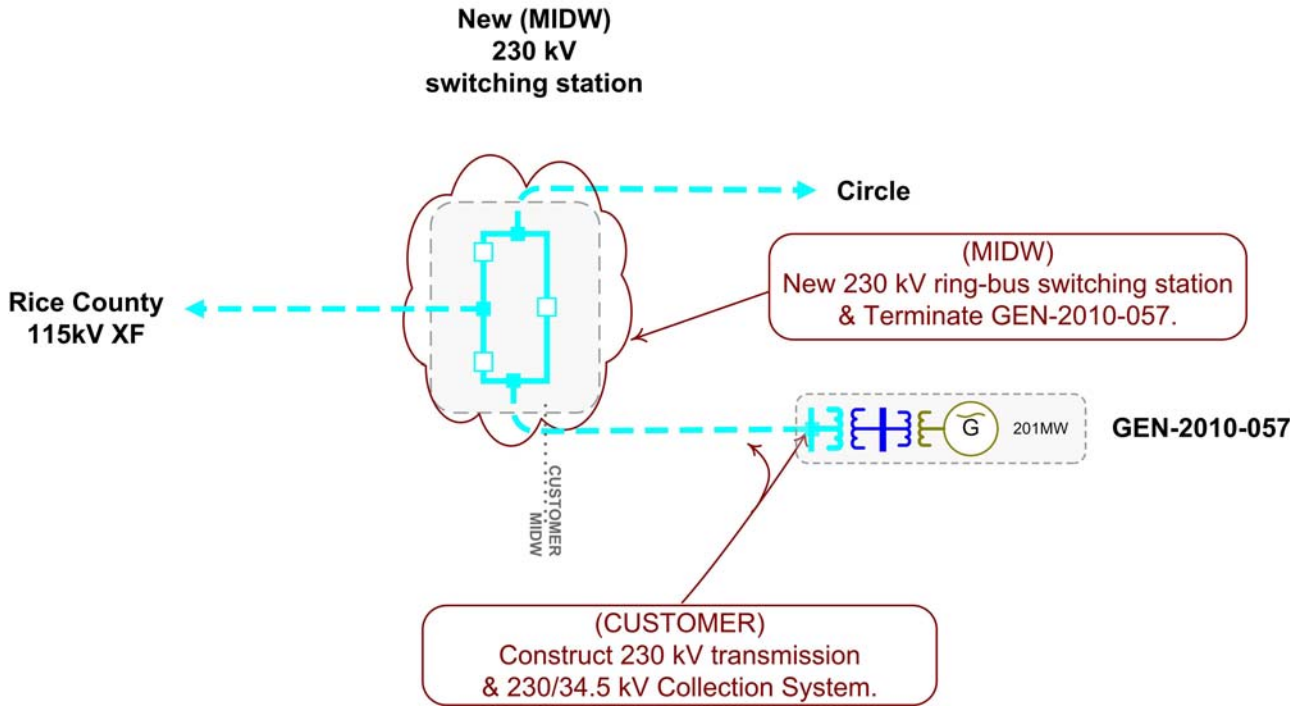

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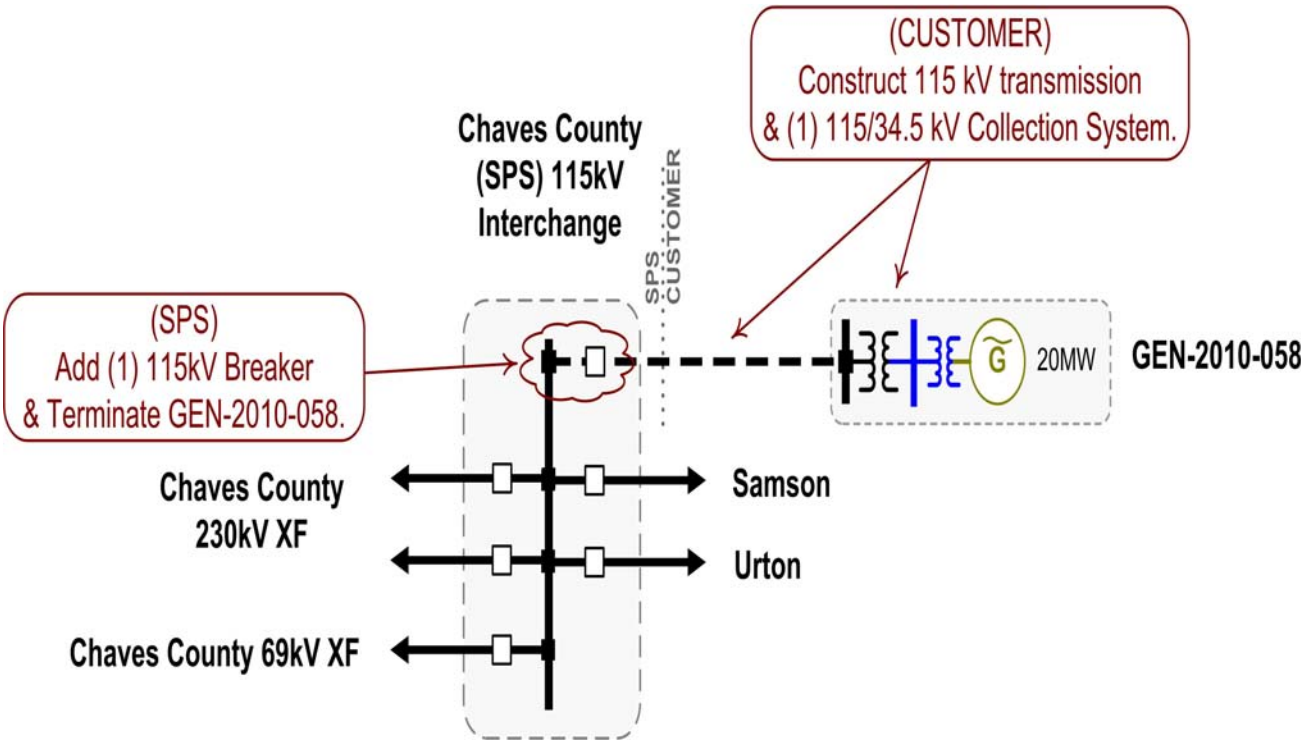

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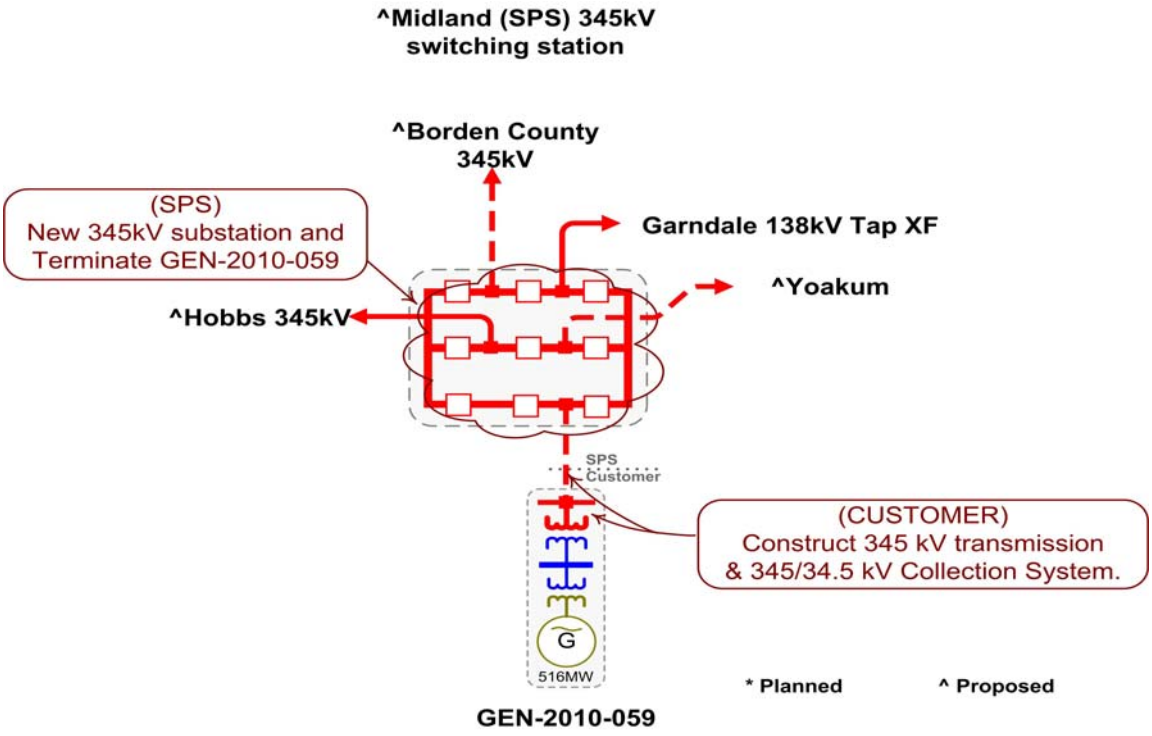

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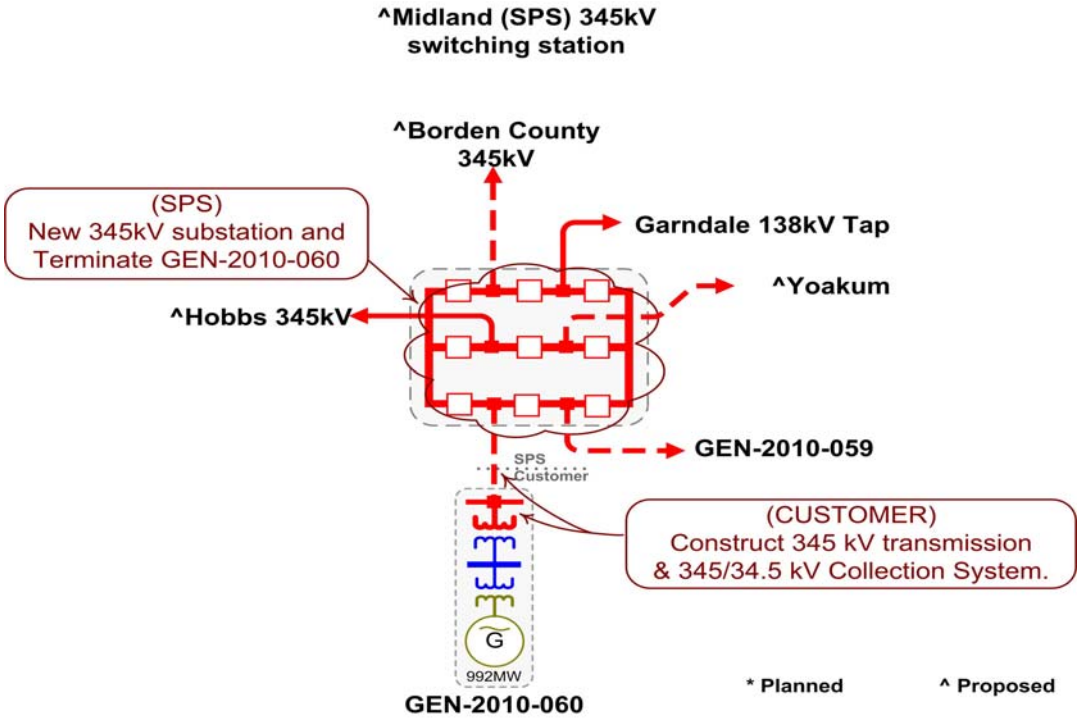
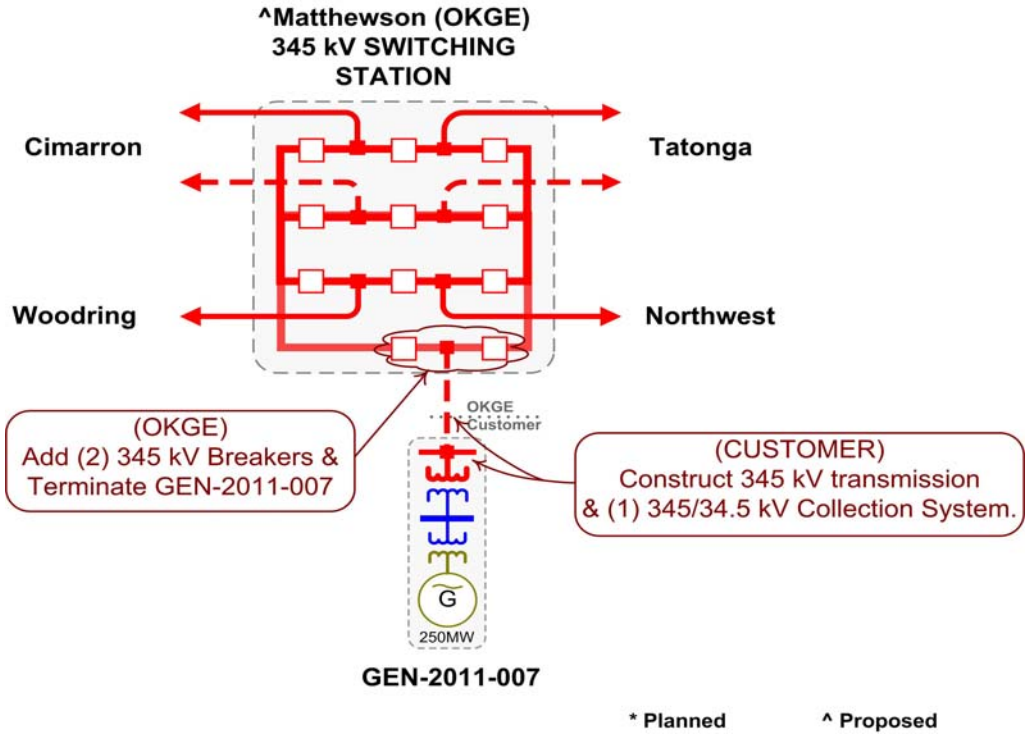


GEN-2011-007



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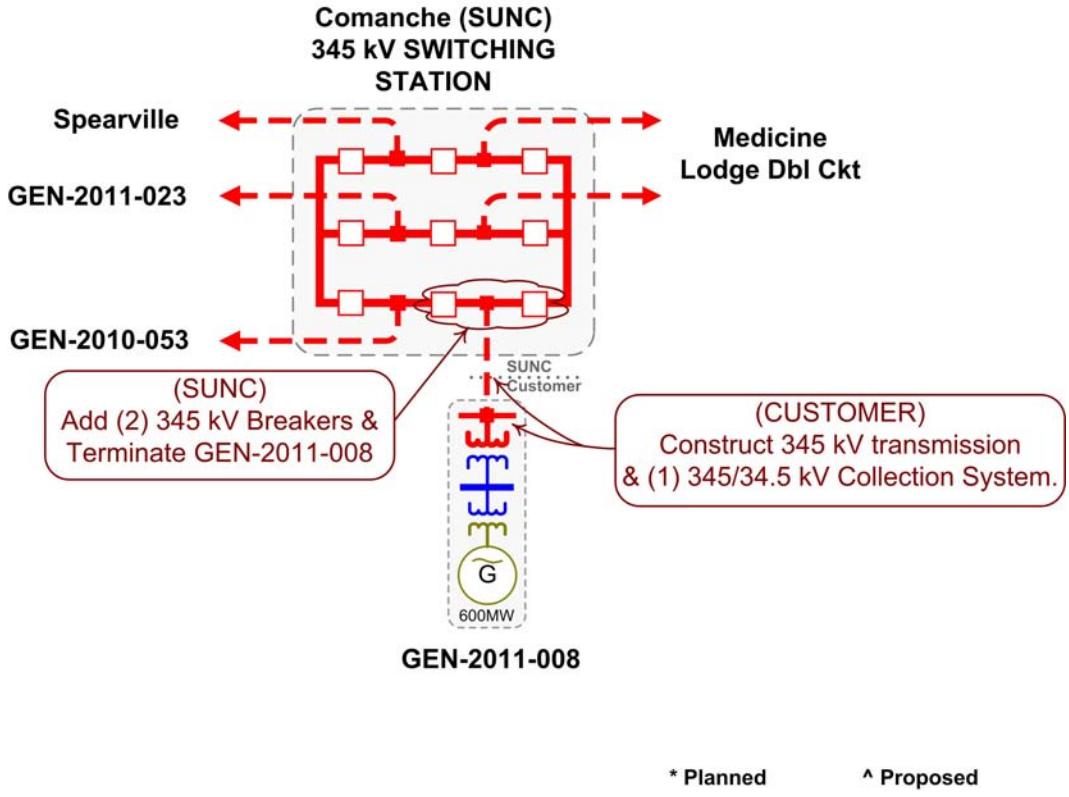

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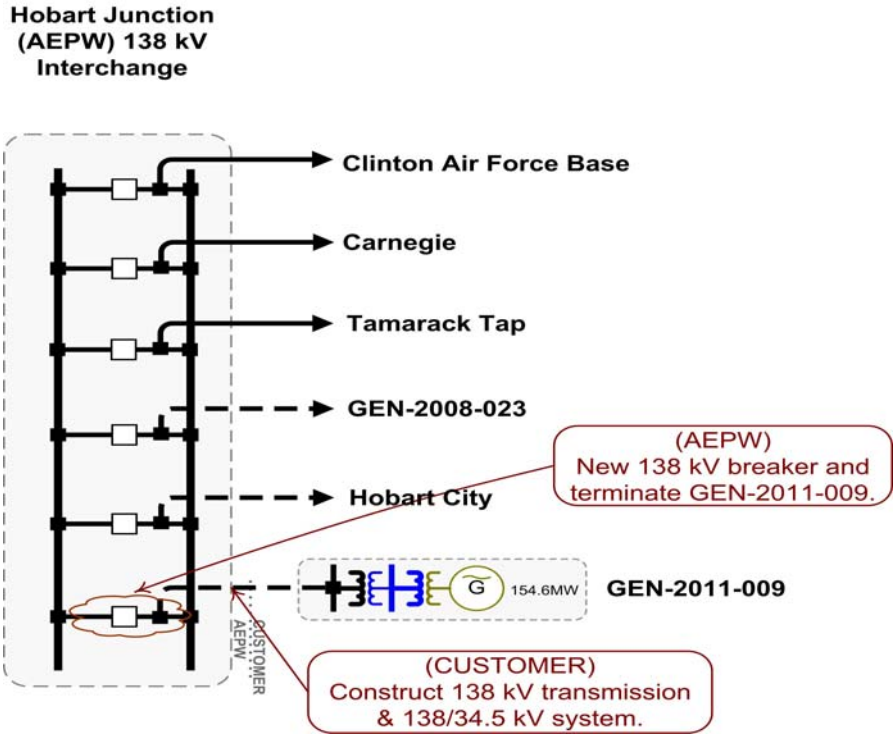

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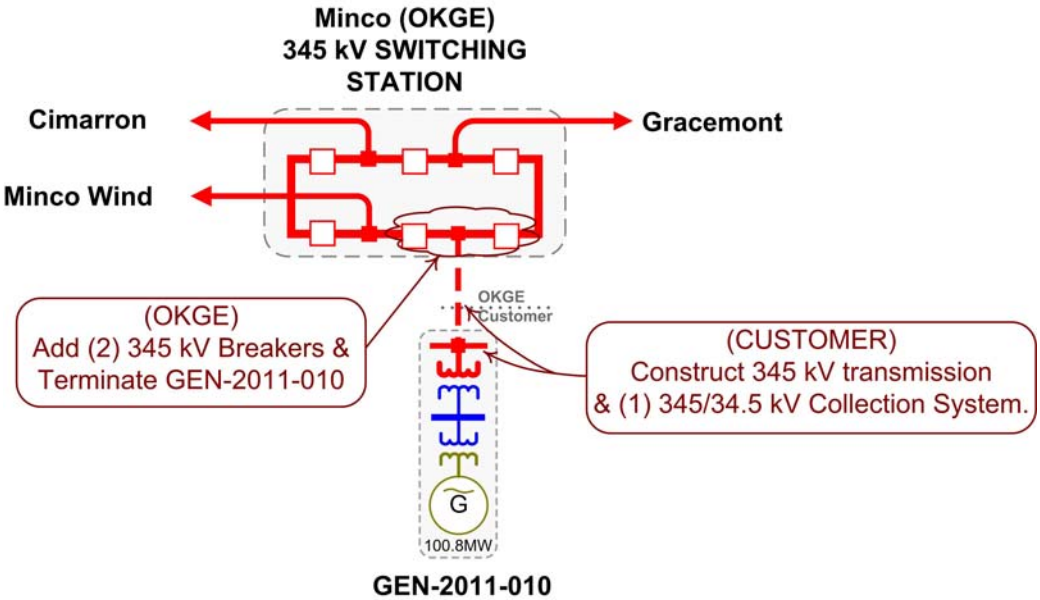

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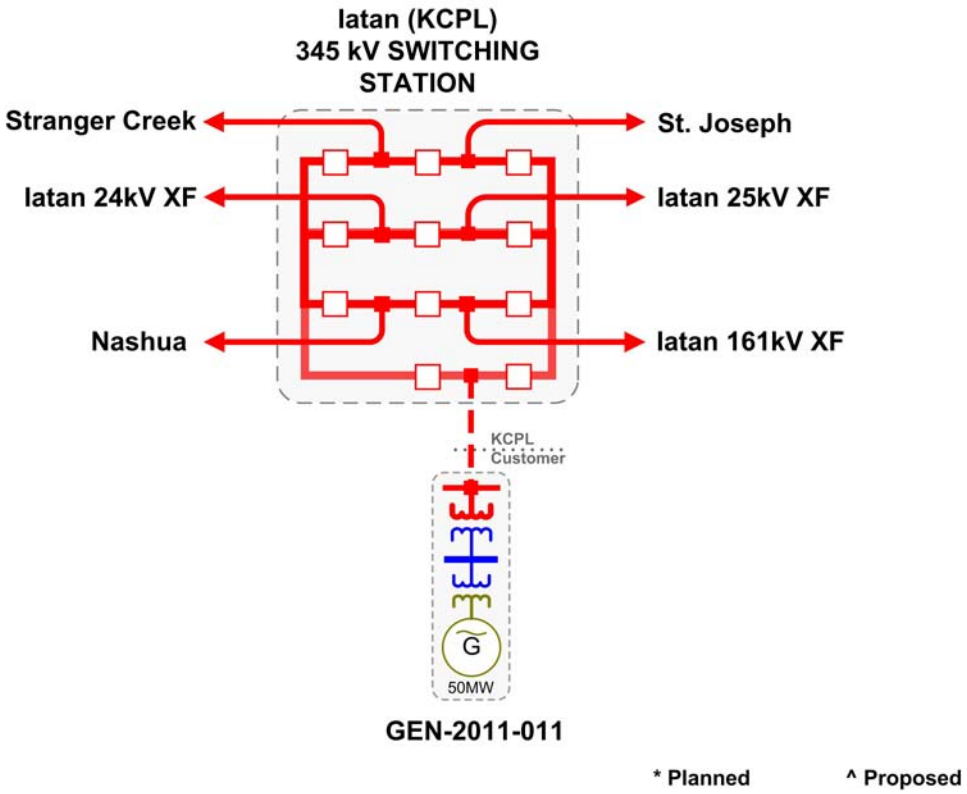
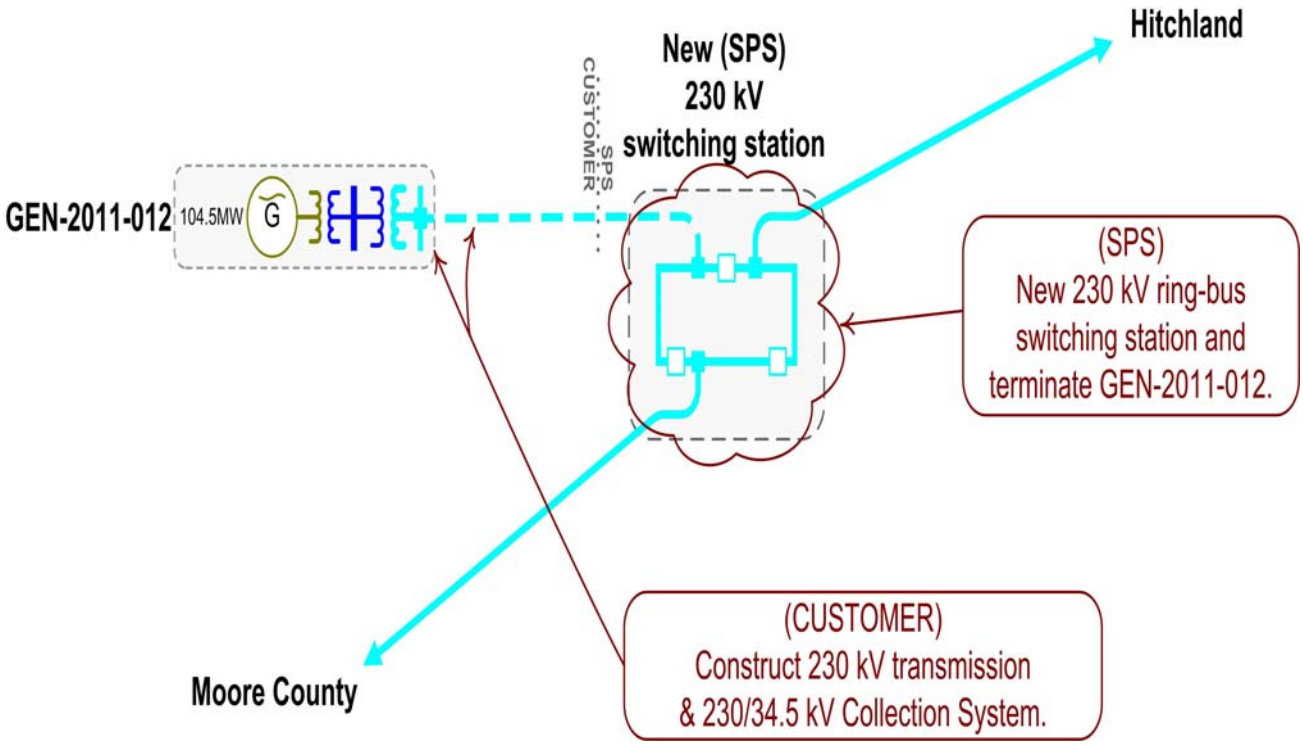
GEN-2011-011



GEN-2011-012



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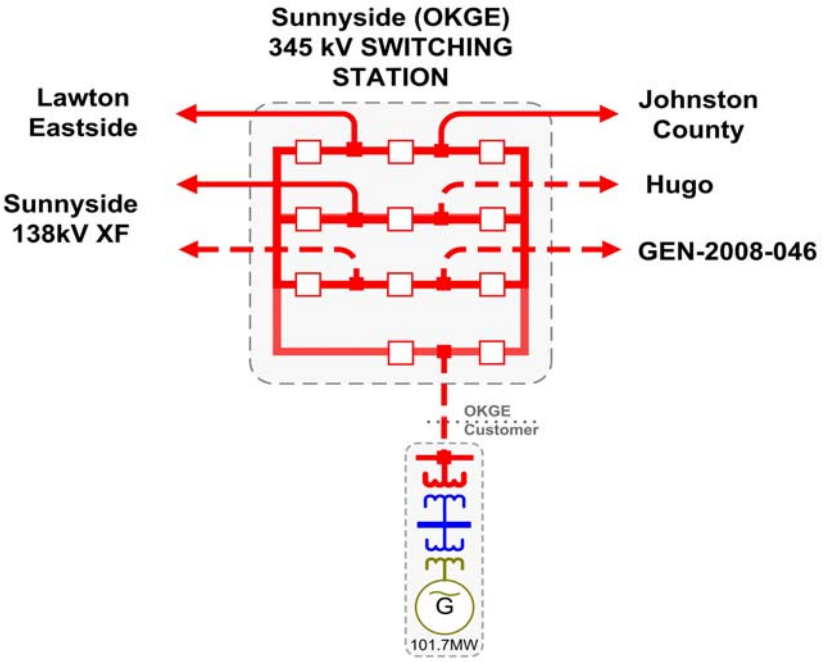
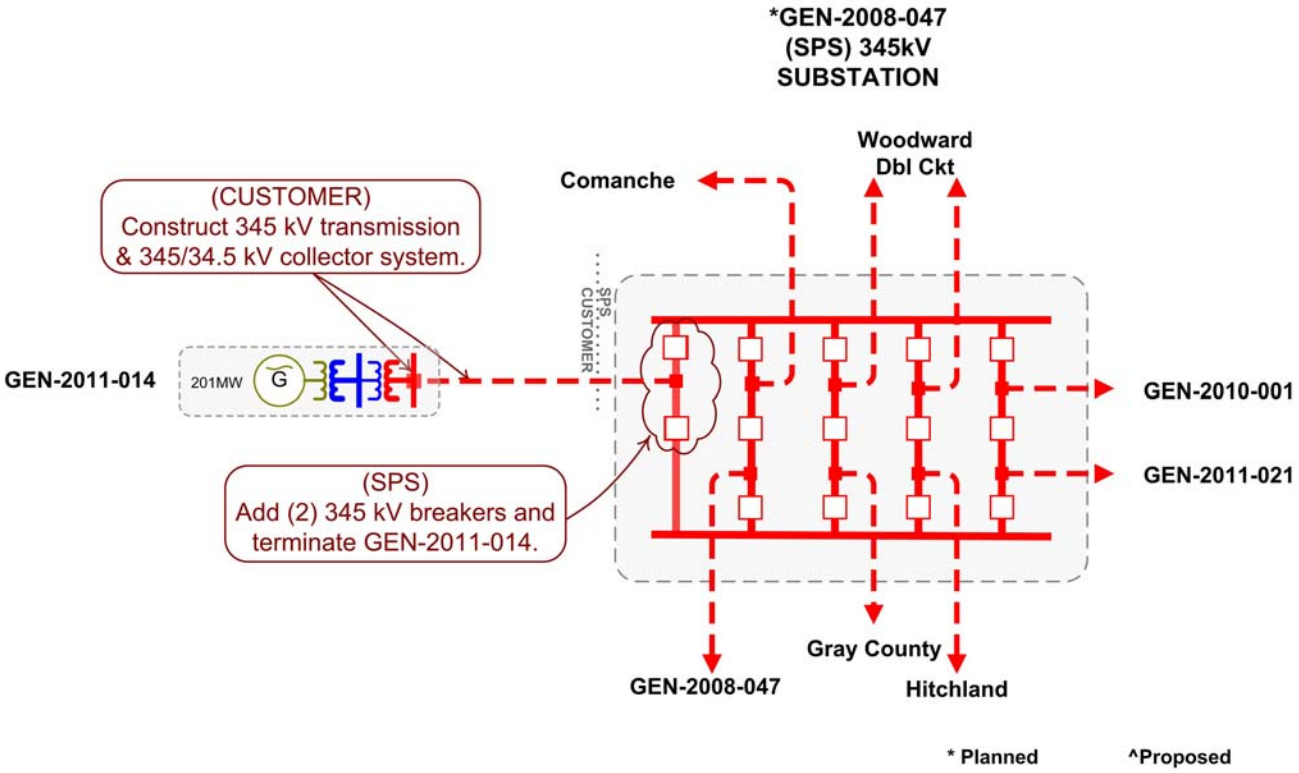


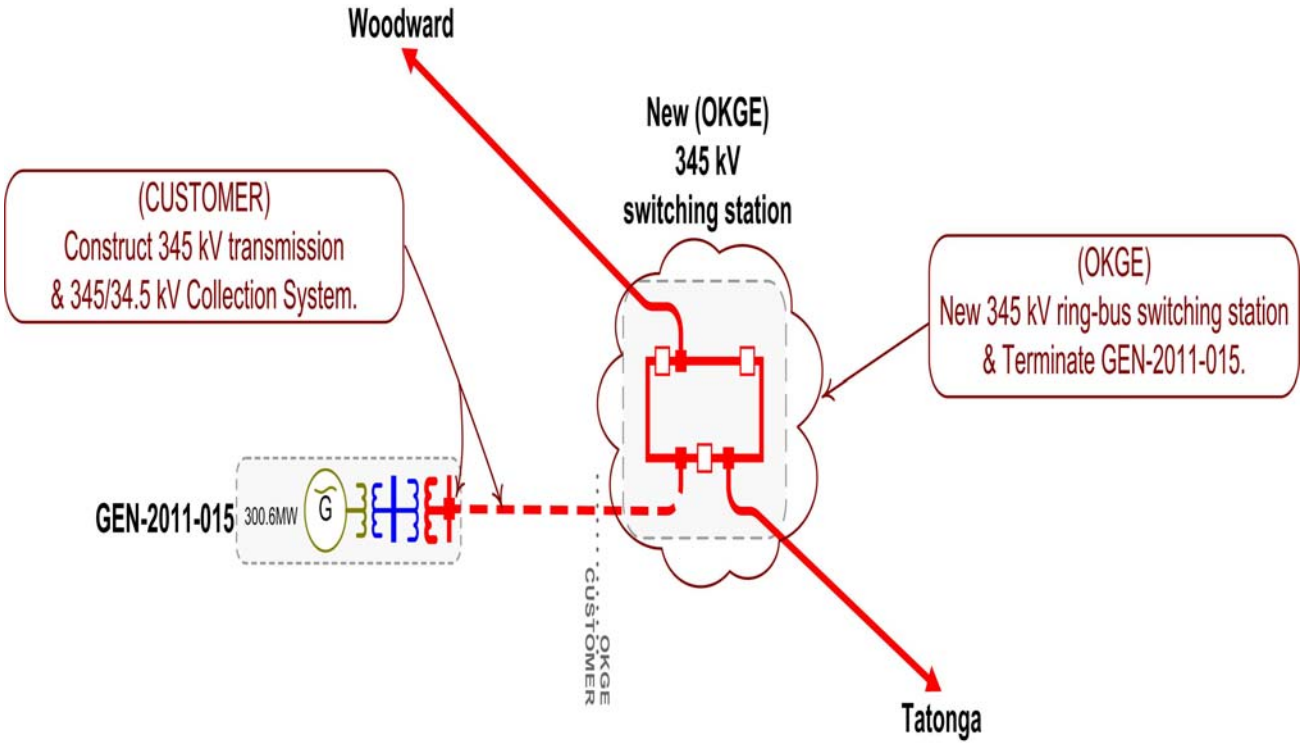
* Planned ^ Proposed

GEN-2011-014



* Planned ^Proposed

GEN-2011-015



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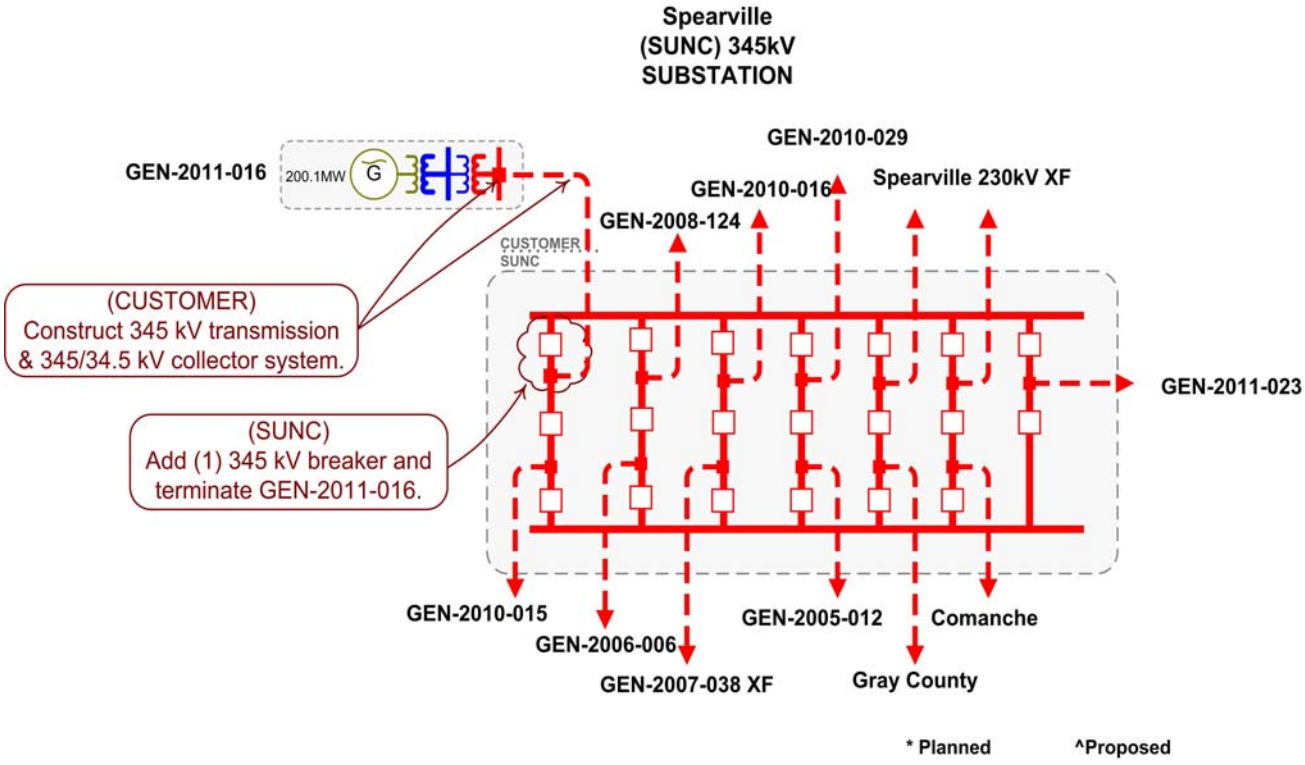

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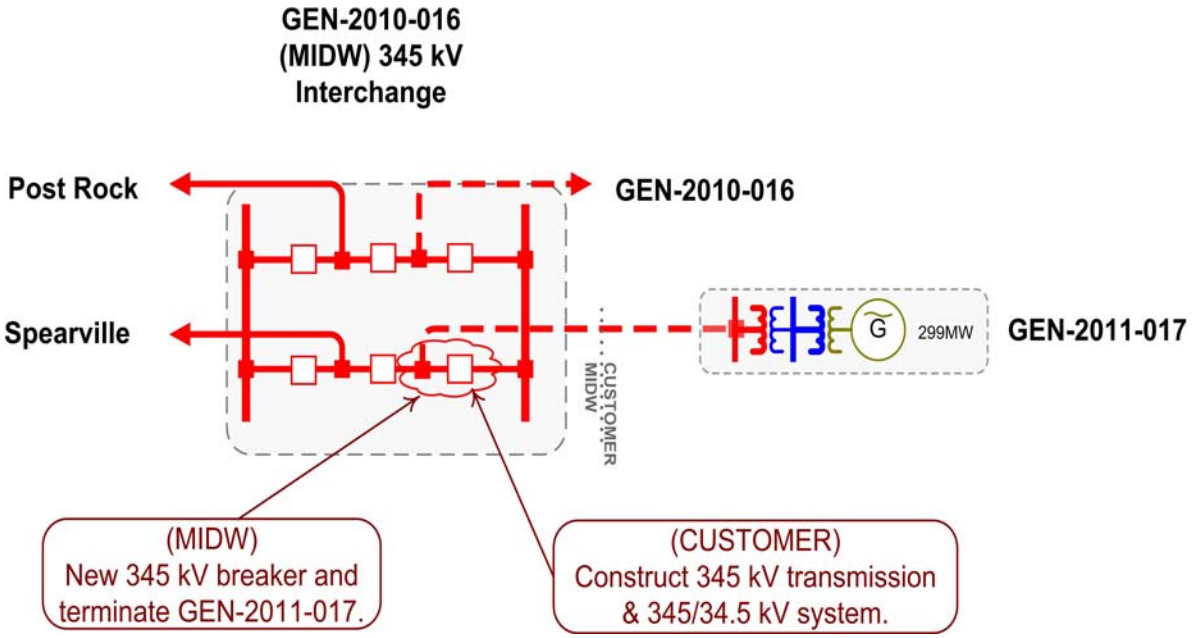

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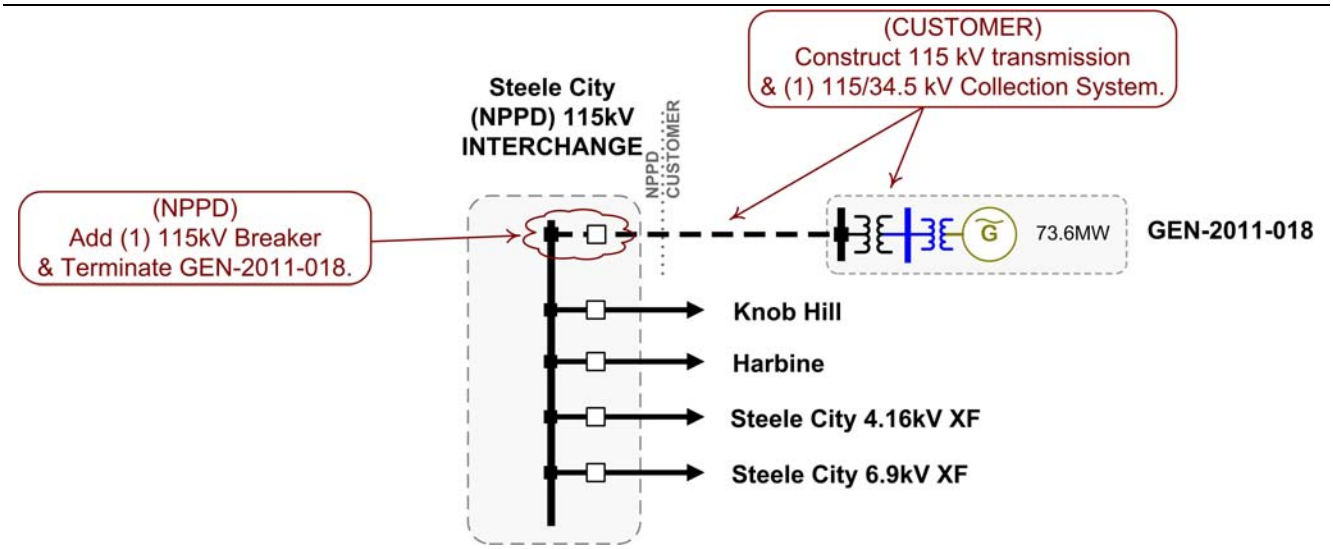

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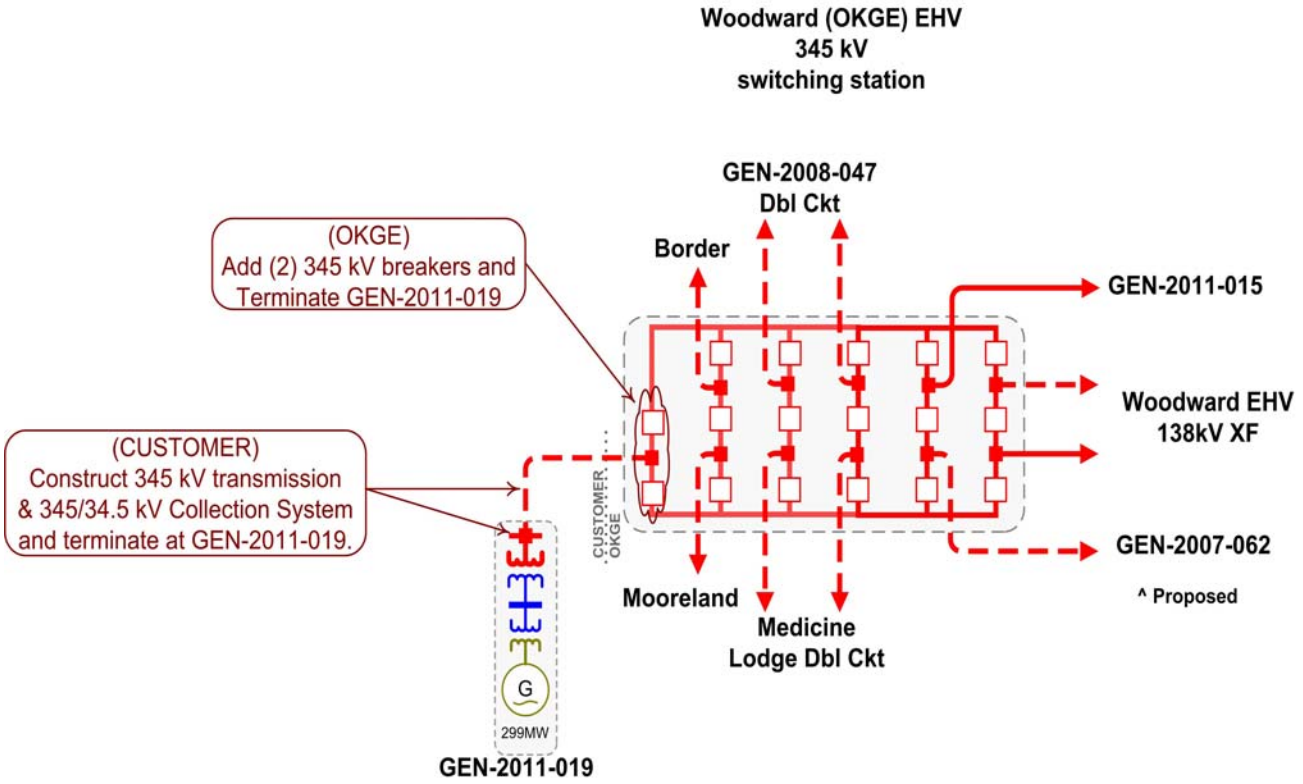

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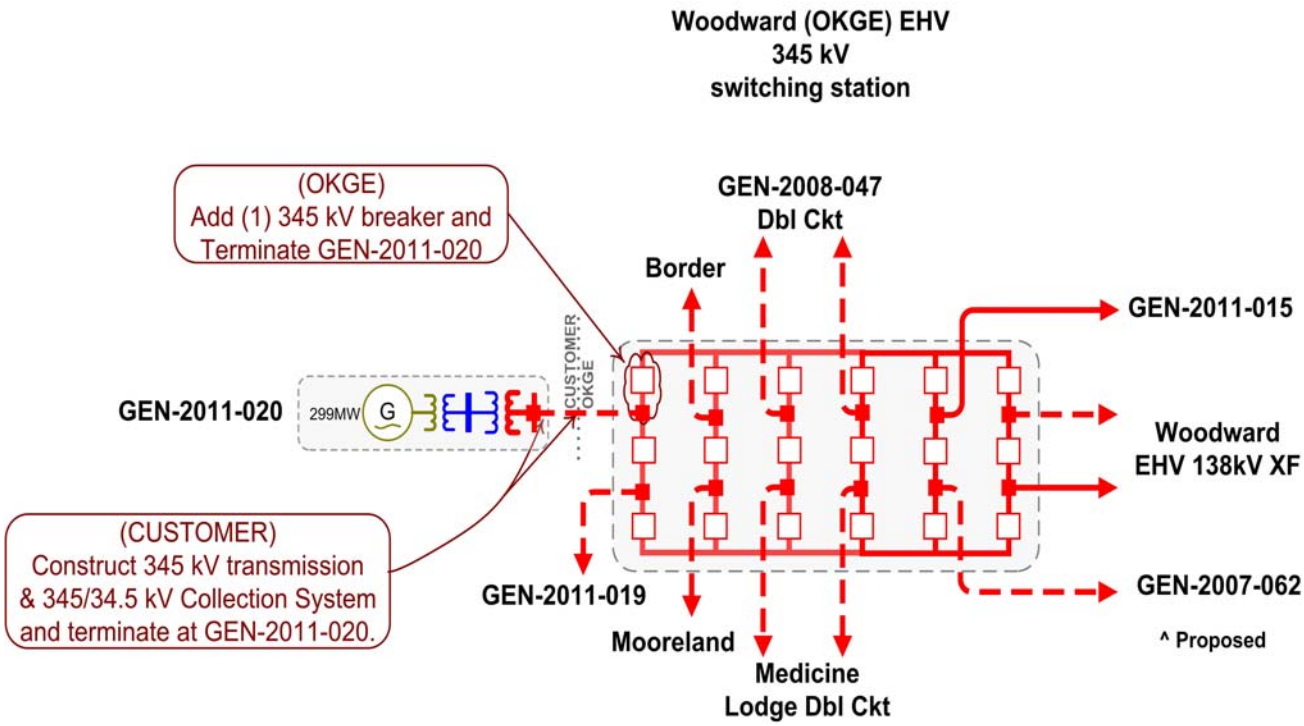

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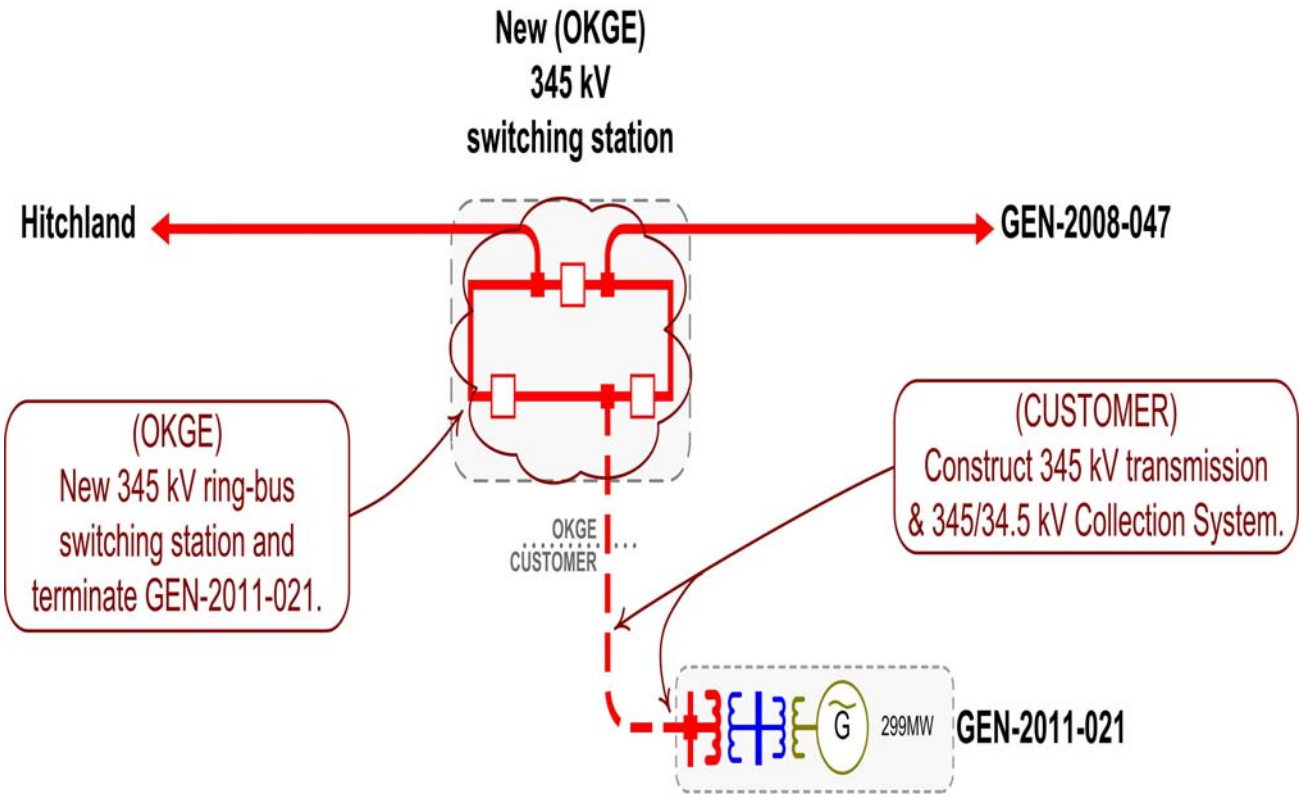

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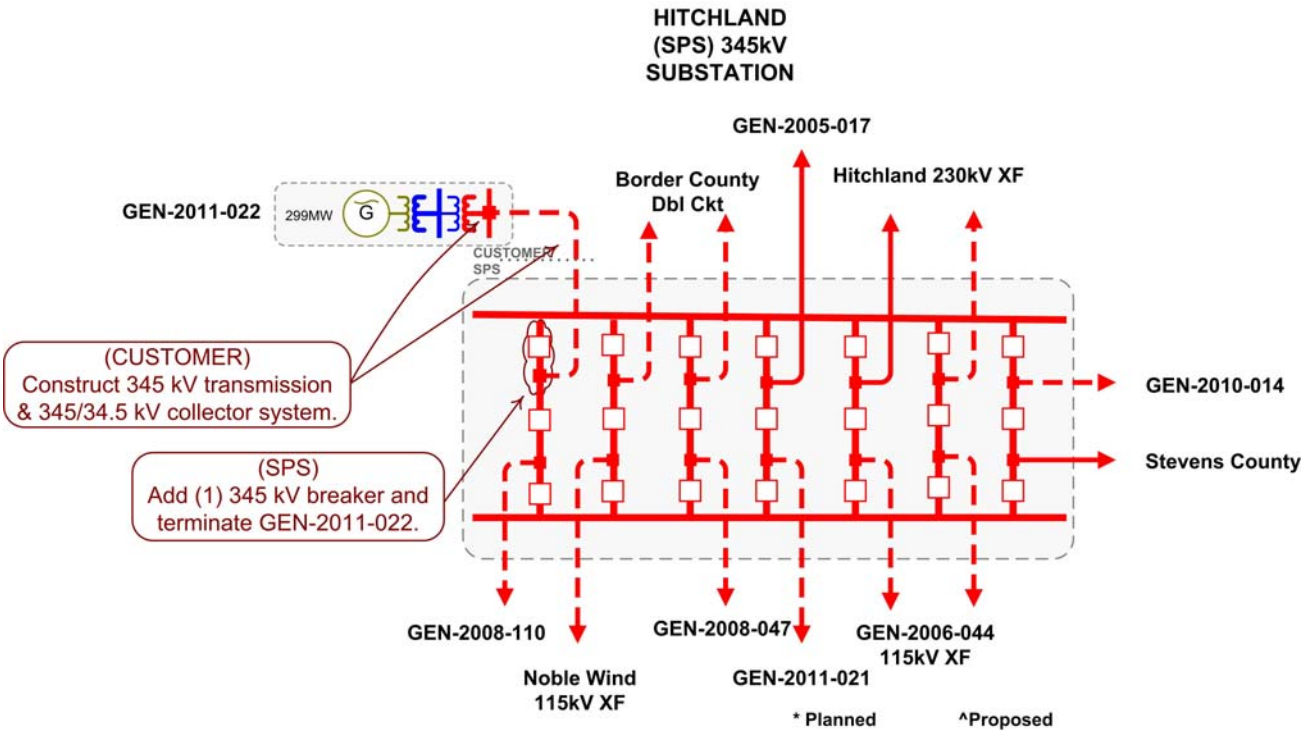

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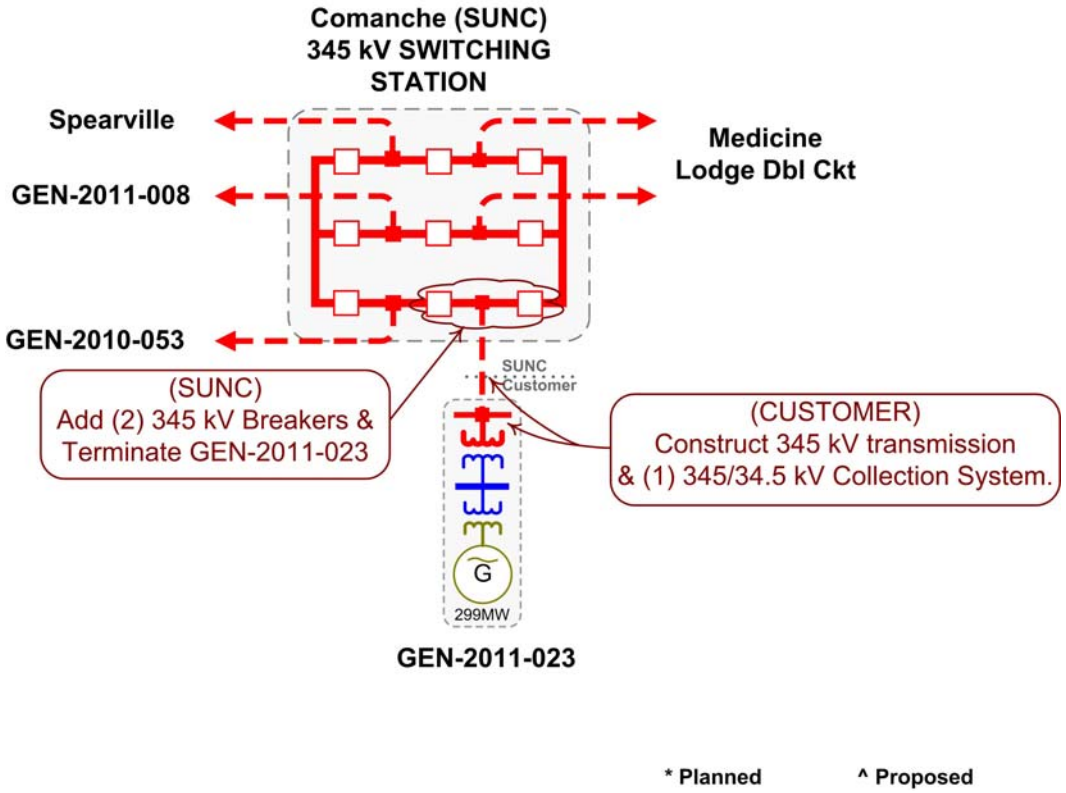
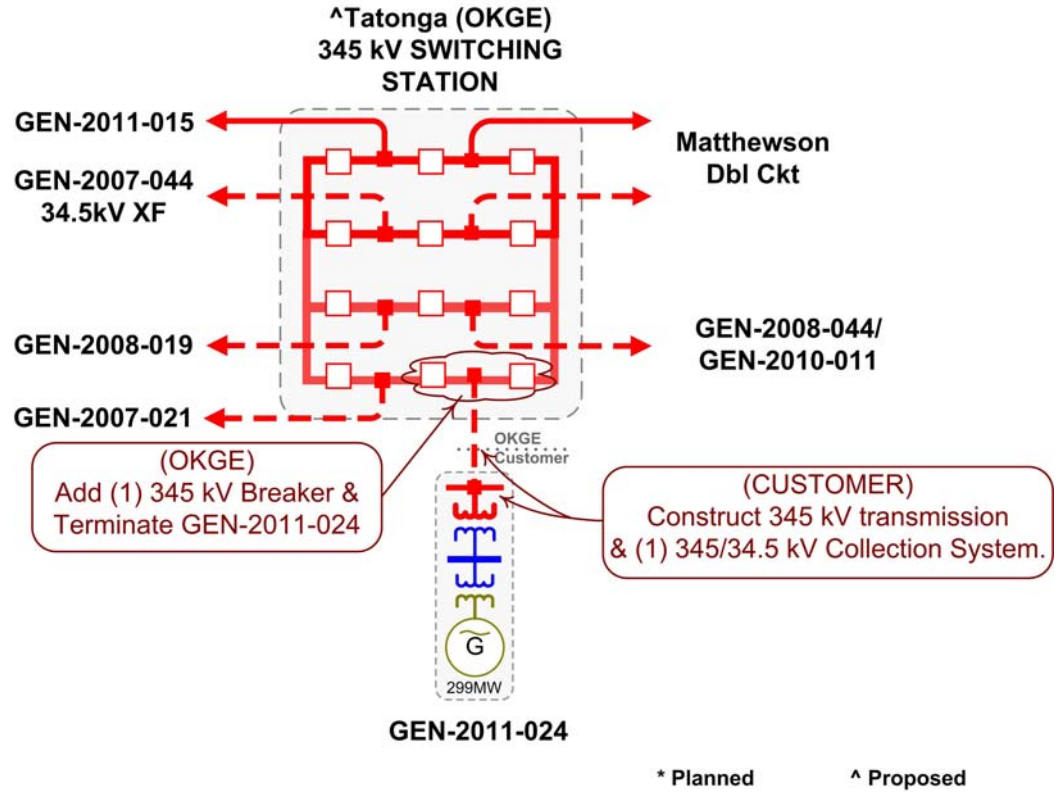


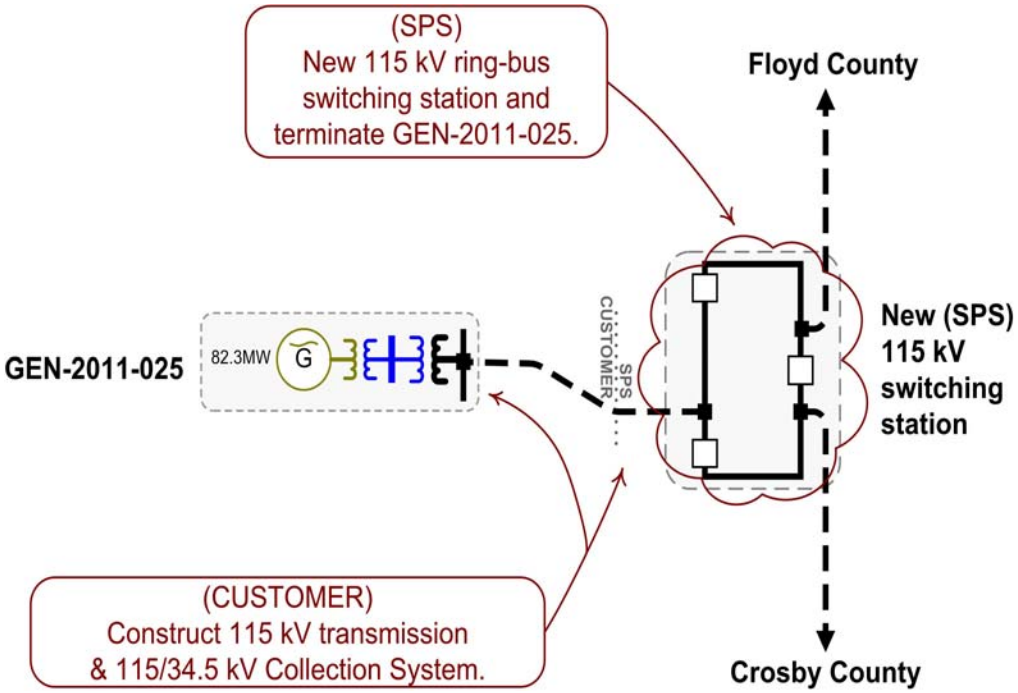
* Planned ^ Proposed

GEN-2011-024



* Planned ^ Proposed

GEN-2011-025



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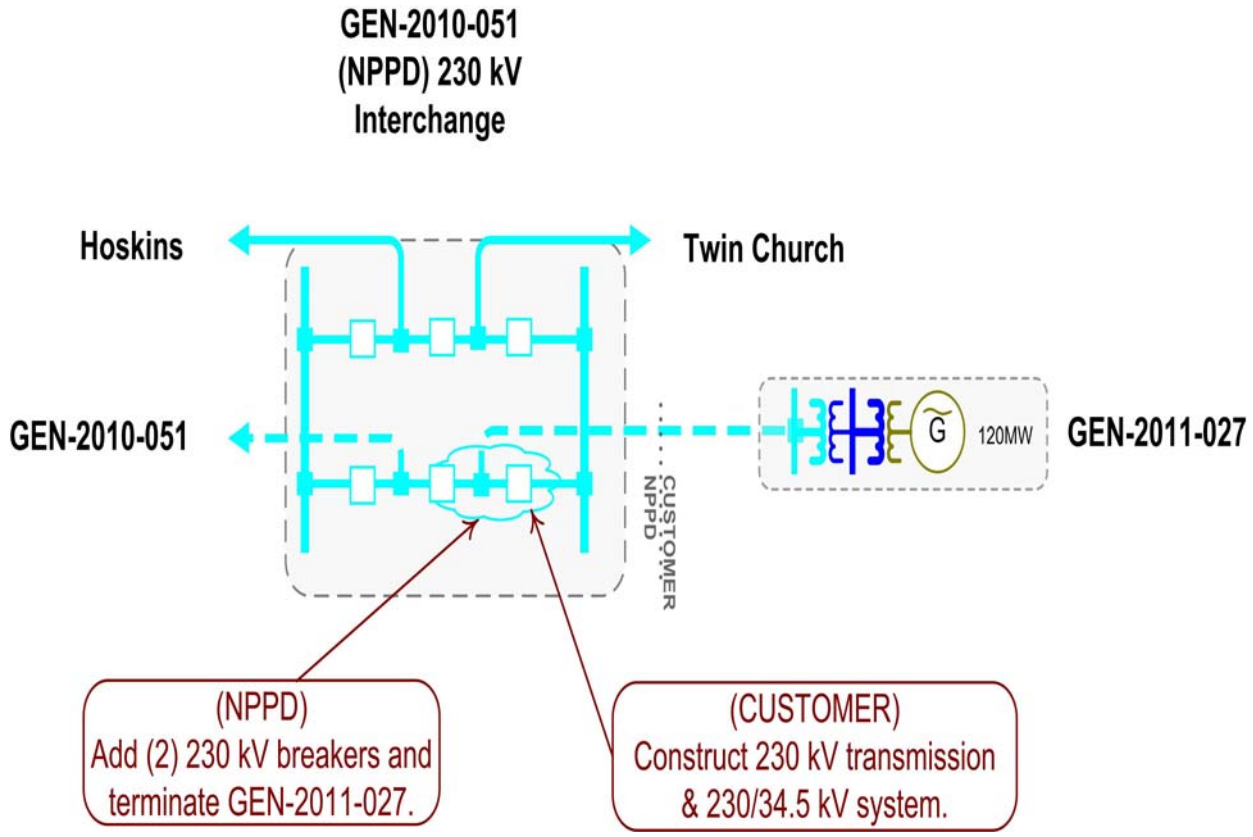
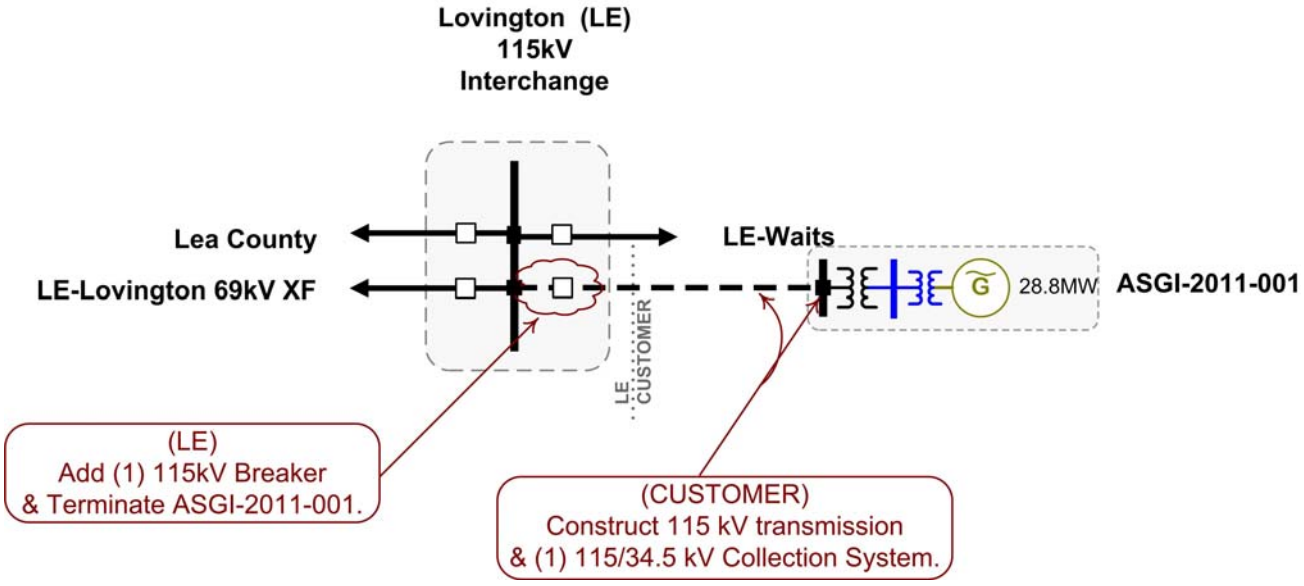


ASGI-2011-001



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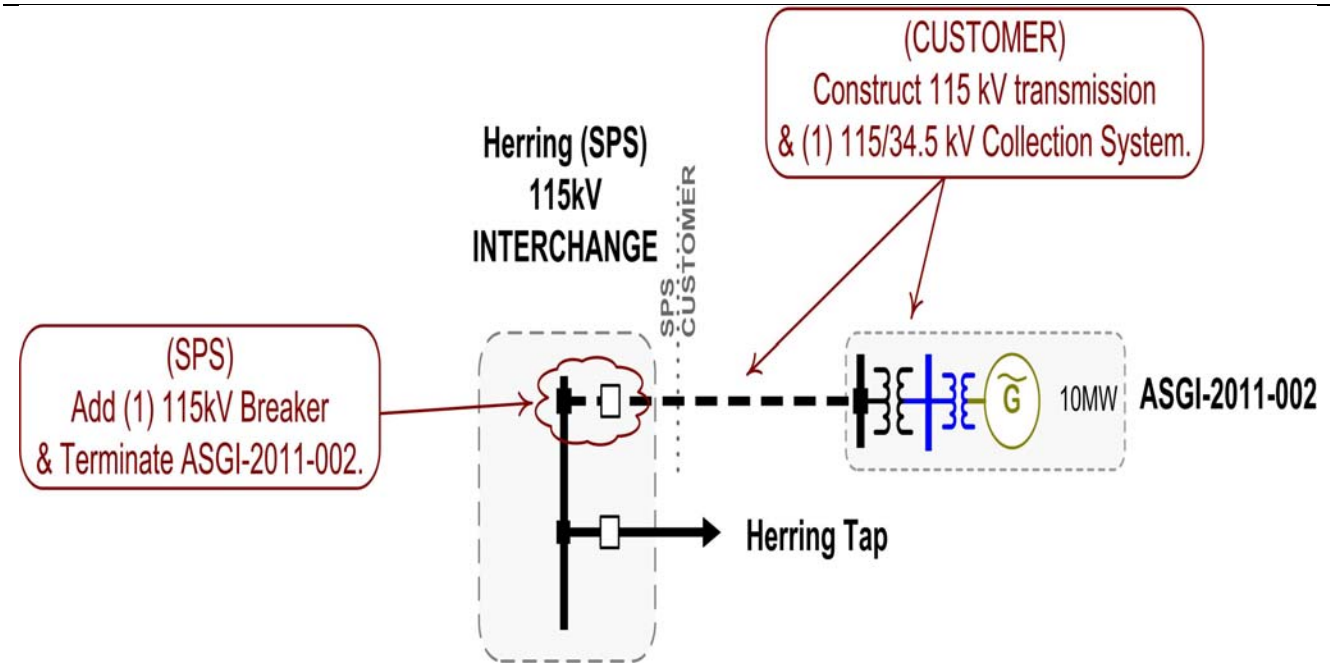

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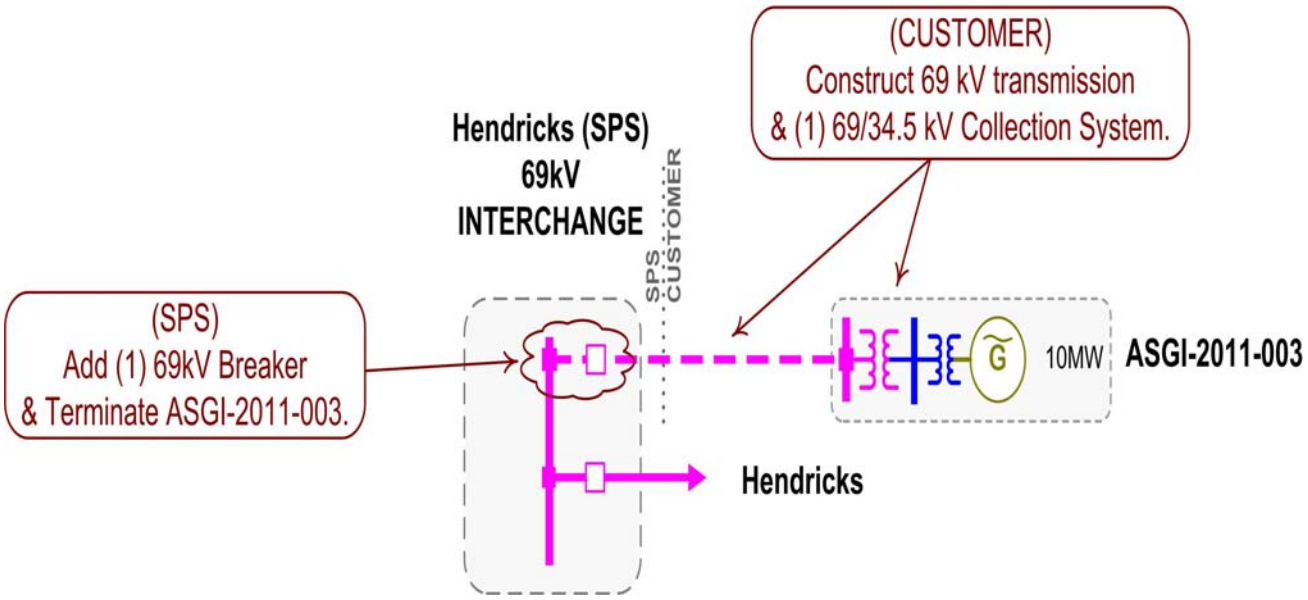

E: Cost Allocation per Interconnection Request (Including Prior Queued Upgrades)

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.

E. Cost Allocation Per Request

(Including Perviously Allocated Network Upgrades*)

Interconnection Request and Upgrades	Upgrade Type	Allocated Cost	Upgrade Cost
ASGI 2011-002			
ASGI 2011-002 Interconnection Costs See Oneline Diagram.	Current Study	$0.00	$0.00
Jones - Tuco 345kV Build new 345kV line from Jones - Tuco	Current Study	$53,478.25	$20,000,000.00
Lawton Eastside - Oklaunion 345kV CKT 2 Build 2nd 345kV circuit from Lawton Eastside - Oklaunion	Current Study	$1,445,138.10	$105,000,000.00
Yoakum - Tuco 345kV Build new 345kV line from Yoakum - Tuco	Current Study	$209,049.05	$100,000,000.00
Beaver - Woodward 345kV Dbl CKT Priority Project: Hitchland - Woodward Dbl 345kV CKT (Total Project E&C Cost Shown)	Previously Allocated		$247,005,793.00
Border - Tuco Interchange 345KV CKT 1 Balanced Portfolio: Tuco - Woodward 345kV (Total Project E&C Cost Shown)	Previously Allocated		$148,727,500.00
Border - Woodward 345KV CKT 1 Balanced Portfolio: Tuco - Woodward 345kV (Total Project E&C Cost Shown)	Previously Allocated		$148,727,500.00
Gracemont Transformer 345/138/13.8KV CKT 1 Priority Project: Gracemont Transformer 345/138/13.8KV CKT 1 (Total Project E&C Cost Shown)	Previously Allocated		$8,000,000.00
Hitchland - Beaver 345kV Dbl CKT Priority Project: Hitchland - Woodward Dbl 345kV CKT (Total Project E&C Cost Shown)	Previously Allocated		$247,005,793.00
Hitchland - Border 345 kV Dbl CKT Build approximately 105 miles of 345kV and SVC at Hitchland.	Previously Allocated		$224,831,940.00
Medicine Lodge - Wichita 345KV Dbl CKT Priority Project: Spearville - Comanche - Med Lodge - Wichita Dbl 345kV CKT (Total Project E&C Cost Shown.)	Previously Allocated		$356,300,000.00
Medicine Lodge - Woodward 345KV Dbl CKT Priority Project: Med Lodge - Woodward Dbl 345kV CKT (Total Project E&C Cost Shown)	Previously Allocated		$194,972,759.00
Medicine Lodge 345/138KV Transformer CKT 1 Priority Project: Spearville - Comanche - Med Lodge - Wichita Dbl 345kV CKT (Total Project E&C Cost Shown.)	Previously Allocated		$356,300,000.00
Washita - Weatherford 138kV CKT 1 Build approximately 50 miles of 138kV.	Previously Allocated		$22,435,002.00
	Current Study Total	$1,707,665.40	

* 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
ASGI 2011-003			
ASGI 2011-003 Interconnection Costs See Oneline Diagram.	Current Study	$0.00	$0.00
Jones - Tuco 345kV Build new 345kV line from Jones - Tuco	Current Study	$292,966.34	$20,000,000.00
Lawton Eastside - Oklaunion 345kV CKT 2 Build 2nd 345kV circuit from Lawton Eastside - Oklaunion	Current Study	$2,145,559.52	$105,000,000.00
Midland - Hobbs 345kV conversion Convert from 230kV to 345kV operation	Current Study	$60,139.03	$20,000,000.00
Beaver - Woodward 345kV Dbl CKT Priority Project: Hitchland - Woodward Dbl 345kV CKT (Total Project E&C Cost Shown)	Previously Allocated		$247,005,793.00
Border - Tuco Interchange 345KV CKT 1 Balanced Portfolio: Tuco - Woodward 345kV (Total Project E&C Cost Shown)	Previously Allocated		$148,727,500.00
Border - Woodward 345KV CKT 1 Balanced Portfolio: Tuco - Woodward 345kV (Total Project E&C Cost Shown)	Previously Allocated		$148,727,500.00
Hitchland - Beaver 345kV Dbl CKT Priority Project: Hitchland - Woodward Dbl 345kV CKT (Total Project E&C Cost Shown)	Previously Allocated		$247,005,793.00
Medicine Lodge - Wichita 345KV Dbl CKT Priority Project: Spearville - Comanche - Med Lodge - Wichita Dbl 345kV CKT (Total Project E&C Cost Shown.)	Previously Allocated		$356,300,000.00
Medicine Lodge - Woodward 345KV Dbl CKT Priority Project: Med Lodge - Woodward Dbl 345kV CKT (Total Project E&C Cost Shown)	Previously Allocated		$194,972,759.00
	Current Study Total	$2,498,664.89	
GEN-2010-020			
Borden - Grassland 345kV conversion Convert from 230kV to 345kV operation	Current Study	$91,328.06	$20,000,000.00
GEN-2010-020 Interconnection Costs See Oneline Diagram.	Current Study	$1,300,000.00	$1,300,000.00
Grassland - Jones 345kV Build new 345kV line from Grassland - Jones	Current Study	$91,328.06	$20,000,000.00
Jones - Tuco 345kV Build new 345kV line from Jones - Tuco	Current Study	$124,606.93	$20,000,000.00
Lawton Eastside - Oklaunion 345kV CKT 2 Build 2nd 345kV circuit from Lawton Eastside - Oklaunion	Current Study	$1,037,960.82	$105,000,000.00

* 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
Midland - Borden 345kV Build new 345kV line from Midland - Borden	Current Study	$273,969.86	$60,000,000.00
Midland - Yoakum 345kV Build new 345kV line from Midland - Yoakum	Current Study	$181,515.44	$85,000,000.00
Plant X - Tolk East 230kV Rebuild approximately 10 miles of 230kV	Current Study	$193,707.29	$5,000,000.00
Plant X - Tolk West 230kV Rebuild approximately 10 miles of 230kV	Current Study	$192,187.08	$5,000,000.00
Yoakum - Tuco 345kV Build new 345kV line from Yoakum - Tuco	Current Study	$941,478.95	$100,000,000.00
Beaver - Woodward 345kV Dbl CKT Priority Project: Hitchland - Woodward Dbl 345kV CKT (Total Project E&C Cost Shown)	Previously Allocated		$247,005,793.00
Border - Tuco Interchange 345KV CKT 1 Balanced Portfolio: Tuco - Woodward 345kV (Total Project E&C Cost Shown)	Previously Allocated		$148,727,500.00
Border - Woodward 345KV CKT 1 Balanced Portfolio: Tuco - Woodward 345kV (Total Project E&C Cost Shown)	Previously Allocated		$148,727,500.00
Hitchland - Beaver 345kV Dbl CKT Priority Project: Hitchland - Woodward Dbl 345kV CKT (Total Project E&C Cost Shown)	Previously Allocated		$247,005,793.00
Medicine Lodge - Wichita 345KV Dbl CKT Priority Project: Spearville - Comanche - Med Lodge - Wichita Dbl 345kV CKT (Total Project E&C Cost Shown.)	Previously Allocated		$356,300,000.00
Medicine Lodge - Woodward 345KV Dbl CKT Priority Project: Med Lodge - Woodward Dbl 345kV CKT (Total Project E&C Cost Shown)	Previously Allocated		$194,972,759.00
Medicine Lodge 345/138KV Transformer CKT 1 Priority Project: Spearville - Comanche - Med Lodge - Wichita Dbl 345kV CKT (Total Project E&C Cost Shown.)	Previously Allocated		$356,300,000.00
	Current Study Total	$4,428,082.49	
GEN-2010-029			
Beaver - Commanche 345kV Build approximately 65 Miles of 345kV from Beaver - Commanche	Current Study	$16,985,505.32	$120,000,000.00
Benton - Wichita 345kV NRIS upgrade: Replace terminal equipment at Benton and Wichita	Current Study	$202,194.98	$979,609.00
Circle - Reno 345kV Dbl CKT Build new 345kV line from Circle - Reno	Current Study	$2,722,692.62	$10,075,470.70

* 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
GEN-2010-029 Interconnection Costs See Oneline Diagram.	Current Study	$7,500,000.00	$7,500,000.00
Matthewson - Cimarron 345kV CKT 2 Build second 345kV circuit from Matthewson - Cimarron	Current Study	$1,489,990.17	$20,000,000.00
Mullegren - Circle 345kV Dbl CKT Build new 345kV line from Mullergreen - Circle	Current Study	$35,670,336.01	$132,000,000.00
Spearville - Mullergreen 345kV Dbl CKT Build new 345kV line from Spearville - Mullergreen	Current Study	$32,244,264.58	$124,000,000.00
Tatonga - Matthewson 345kV CKT 2 Build second 345kV circuit from Tatonga - Matthewson	Current Study	$3,903,643.80	$60,000,000.00
Axtell - PostRock 345KV CKT 1 Balanced Portfolio: Spearville - PostRock - Axtell 345kV CKT (Total Project E&C Cost Shown)	Previously Allocated		$112,700,000.00
Beaver County - Gray County 345kV Build approximately 90 miles of 345kV from Beaver County - Gray County	Previously Allocated		$196,609,050.00
Border - Tuco Interchange 345KV CKT 1 Balanced Portfolio: Tuco - Woodward 345kV (Total Project E&C Cost Shown)	Previously Allocated		$148,727,500.00
Medicine Lodge - Wichita 345KV Dbl CKT Priority Project: Spearville - Comanche - Med Lodge - Wichita Dbl 345kV CKT (Total Project E&C Cost Shown.)	Previously Allocated		$356,300,000.00
Medicine Lodge - Woodward 345KV Dbl CKT Priority Project: Med Lodge - Woodward Dbl 345kV CKT (Total Project E&C Cost Shown)	Previously Allocated		$194,972,759.00
Medicine Lodge 345/115kV transformer Install new 345/115kV transformer at Medicine Lodge	Previously Allocated		$10,000,000.00
Medicine Lodge 345/138KV Transformer CKT 1 Priority Project: Spearville - Comanche - Med Lodge - Wichita Dbl 345kV CKT (Total Project E&C Cost Shown.)	Previously Allocated		$356,300,000.00
Post Rock 345/230/13.8KV Autotransformer CKT 1 Balanced Portfolio: Spearville - PostRock - Axtell 345kV CKT (Total Project E&C Cost Shown)	Previously Allocated		$112,700,000.00
PostRock - GEN-2010-016 Tap 345KV CKT 1 Balanced Portfolio: Spearville - PostRock - Axtell 345kV CKT (Total Project E&C Cost Shown)	Previously Allocated		$112,700,000.00
Spearville - GEN-2010-016 Tap 345KV CKT 1 Balanced Portfolio: Spearville - PostRock - Axtell 345kV CKT (Total Project E&C Cost Shown)	Previously Allocated		$112,700,000.00
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		$11,250,000.00
	Current Study Total	$100,718,627.48	

* 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
GEN-2010-055			
GEN-2010-055 Interconnection Costs See Oneline Diagram.	Current Study	$500,000.00	$500,000.00
	Current Study Total	$500,000.00	
GEN-2010-056			
GEN-2010-056 Interconnection Costs See Oneline Diagram.	Current Study	$9,000,000.00	$9,000,000.00
	Current Study Total	$9,000,000.00	
GEN-2010-057			
Benton - Wichita 345kV NRIS upgrade: Replace terminal equipment at Benton and Wichita	Current Study	$112,428.16	$979,609.00
GEN-2010-057 Interconnection Costs See Oneline Diagram.	Current Study	$1,600,000.00	$1,600,000.00
Lyons - Wheatland 115kV Replace CTs	Current Study	$80,000.00	$80,000.00
Lyons Cap bank Install 2x15MVar cap bank	Current Study	$1,000,000.00	$1,000,000.00
Rice County - Circle 230kV Conversion Convert from 115kV to 230kV operation	Current Study	$6,000,000.00	$6,000,000.00
Rice County - Lyons 115kV Rebuild line to 1000 Amps	Current Study	$5,000,000.00	$5,000,000.00
Rice County 230/115kV transformer Install 230/115kV transformer at Rice County substation	Current Study	$4,700,000.00	$4,700,000.00
Wheatland - Lyons 115kV Rerate circuit to 1000 amps	Current Study	$0.00	$0.00
Axtell - PostRock 345KV CKT 1 Balanced Portfolio: Spearville - PostRock - Axtell 345kV CKT (Total Project E&C Cost Shown)	Previously Allocated		$112,700,000.00
	Current Study Total	$18,492,428.16	
GEN-2010-058			
Borden - Grassland 345kV conversion Convert from 230kV to 345kV operation	Current Study	$89,375.20	$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
GEN-2010-058 Interconnection Costs See Oneline Diagram.	Current Study	$1,300,000.00	$1,300,000.00
Grassland - Jones 345kV Build new 345kV line from Grassland - Jones	Current Study	$89,375.20	$20,000,000.00
Jones - Tuco 345kV Build new 345kV line from Jones - Tuco	Current Study	$123,040.33	$20,000,000.00
Lawton Eastside - Oklaunion 345kV CKT 2 Build 2nd 345kV circuit from Lawton Eastside - Oklaunion	Current Study	$1,035,439.60	$105,000,000.00
Midland - Borden 345kV Build new 345kV line from Midland - Borden	Current Study	$268,127.92	$60,000,000.00
Midland - Yoakum 345kV Build new 345kV line from Midland - Yoakum	Current Study	$177,259.63	$85,000,000.00
Plant X - Tolk East 230kV Rebuild approximately 10 miles of 230kV	Current Study	$199,132.82	$5,000,000.00
Plant X - Tolk West 230kV Rebuild approximately 10 miles of 230kV	Current Study	$197,513.68	$5,000,000.00
Yoakum - Tuco 345kV Build new 345kV line from Yoakum - Tuco	Current Study	$924,457.93	$100,000,000.00
Beaver - Woodward 345kV Dbl CKT Priority Project: Hitchland - Woodward Dbl 345kV CKT (Total Project E&C Cost Shown)	Previously Allocated		$247,005,793.00
Border - Tuco Interchange 345KV CKT 1 Balanced Portfolio: Tuco - Woodward 345kV (Total Project E&C Cost Shown)	Previously Allocated		$148,727,500.00
Border - Woodward 345KV CKT 1 Balanced Portfolio: Tuco - Woodward 345kV (Total Project E&C Cost Shown)	Previously Allocated		$148,727,500.00
Hitchland - Beaver 345kV Dbl CKT Priority Project: Hitchland - Woodward Dbl 345kV CKT (Total Project E&C Cost Shown)	Previously Allocated		$247,005,793.00
Medicine Lodge - Wichita 345KV Dbl CKT Priority Project: Spearville - Comanche - Med Lodge - Wichita Dbl 345kV CKT (Total Project E&C Cost Shown.)	Previously Allocated		$356,300,000.00
Medicine Lodge - Woodward 345KV Dbl CKT Priority Project: Med Lodge - Woodward Dbl 345kV CKT (Total Project E&C Cost Shown)	Previously Allocated		$194,972,759.00
Medicine Lodge 345/138KV Transformer CKT 1 Priority Project: Spearville - Comanche - Med Lodge - Wichita Dbl 345kV CKT (Total Project E&C Cost Shown.)	Previously Allocated		$356,300,000.00
	Current Study Total	$4,403,722.31	

* 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
GEN-2010-059			
Borden - Grassland 345kV conversion Convert from 230kV to 345kV operation	Current Study	$6,606,432.25	$20,000,000.00
GEN-2010-059 Interconnection Costs See Oneline Diagram.	Current Study	$6,000,000.00	$6,000,000.00
Grassland - Jones 345kV Build new 345kV line from Grassland - Jones	Current Study	$6,606,432.25	$20,000,000.00
Jones - Tuco 345kV Build new 345kV line from Jones - Tuco	Current Study	$6,296,808.75	$20,000,000.00
Lawton Eastside - Oklaunion 345kV CKT 2 Build 2nd 345kV circuit from Lawton Eastside - Oklaunion	Current Study	$29,087,506.59	$105,000,000.00
Midland - Borden 345kV Build new 345kV line from Midland - Borden	Current Study	$19,819,300.74	$60,000,000.00
Midland - Hobbs 345kV conversion Convert from 230kV to 345kV operation	Current Study	$6,607,764.45	$20,000,000.00
Midland - Yoakum 345kV Build new 345kV line from Midland - Yoakum	Current Study	$28,213,741.64	$85,000,000.00
Plant X - Tolk East 230kV Rebuild approximately 10 miles of 230kV	Current Study	$1,535,719.96	$5,000,000.00
Plant X - Tolk West 230kV Rebuild approximately 10 miles of 230kV	Current Study	$1,536,766.41	$5,000,000.00
Yoakum - Tuco 345kV Build new 345kV line from Yoakum - Tuco	Current Study	$32,641,671.35	$100,000,000.00
Beaver - Woodward 345kV Dbl CKT Priority Project: Hitchland - Woodward Dbl 345kV CKT (Total Project E&C Cost Shown)	Previously Allocated		$247,005,793.00
Border - Tuco Interchange 345KV CKT 1 Balanced Portfolio: Tuco - Woodward 345kV (Total Project E&C Cost Shown)	Previously Allocated		$148,727,500.00
Border - Woodward 345KV CKT 1 Balanced Portfolio: Tuco - Woodward 345kV (Total Project E&C Cost Shown)	Previously Allocated		$148,727,500.00
Hitchland - Beaver 345kV Dbl CKT Priority Project: Hitchland - Woodward Dbl 345kV CKT (Total Project E&C Cost Shown)	Previously Allocated		$247,005,793.00
Medicine Lodge - Wichita 345KV Dbl CKT Priority Project: Spearville - Comanche - Med Lodge - Wichita Dbl 345kV CKT (Total Project E&C Cost Shown.)	Previously Allocated		$356,300,000.00

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Interconnection Request and Upgrades	Upgrade Type	Allocated Cost	Upgrade Cost
Medicine Lodge - Woodward 345KV Dbl CKT Priority Project: Med Lodge - Woodward Dbl 345kV CKT (Total Project E&C Cost Shown)	Previously Allocated		$194,972,759.00
Medicine Lodge 345/138KV Transformer CKT 1 Priority Project: Spearville - Comanche - Med Lodge - Wichita Dbl 345kV CKT (Total Project E&C Cost Shown.)	Previously Allocated		$356,300,000.00
	Current Study Total	$144,952,144.39	
GEN-2010-060			
Borden - Grassland 345kV conversion Convert from 230kV to 345kV operation	Current Study	$13,212,864.49	$20,000,000.00
GEN-2010-060 Interconnection Costs See Oneline Diagram.	Current Study	$6,000,000.00	$6,000,000.00
Grassland - Jones 345kV Build new 345kV line from Grassland - Jones	Current Study	$13,212,864.49	$20,000,000.00
Jones - Tuco 345kV Build new 345kV line from Jones - Tuco	Current Study	$12,593,617.50	$20,000,000.00
Lawton Eastside - Oklaunion 345kV CKT 2 Build 2nd 345kV circuit from Lawton Eastside - Oklaunion	Current Study	$58,175,013.18	$105,000,000.00
Midland - Borden 345kV Build new 345kV line from Midland - Borden	Current Study	$39,638,601.48	$60,000,000.00
Midland - Hobbs 345kV conversion Convert from 230kV to 345kV operation	Current Study	$13,215,528.91	$20,000,000.00
Midland - Yoakum 345kV Build new 345kV line from Midland - Yoakum	Current Study	$56,427,483.29	$85,000,000.00
Plant X - Tolk East 230kV Rebuild approximately 10 miles of 230kV	Current Study	$3,071,439.92	$5,000,000.00
Plant X - Tolk West 230kV Rebuild approximately 10 miles of 230kV	Current Study	$3,073,532.82	$5,000,000.00
Yoakum - Tuco 345kV Build new 345kV line from Yoakum - Tuco	Current Study	$65,283,342.71	$100,000,000.00
Beaver - Woodward 345kV Dbl CKT Priority Project: Hitchland - Woodward Dbl 345kV CKT (Total Project E&C Cost Shown)	Previously Allocated		$247,005,793.00
Border - Tuco Interchange 345KV CKT 1 Balanced Portfolio: Tuco - Woodward 345kV (Total Project E&C Cost Shown)	Previously Allocated		$148,727,500.00

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Interconnection Request and Upgrades	Upgrade Type	Allocated Cost	Upgrade Cost
Border - Woodward 345KV CKT 1 Balanced Portfolio: Tuco - Woodward 345kV (Total Project E&C Cost Shown)	Previously Allocated		$148,727,500.00
Hitchland - Beaver 345kV Dbl CKT Priority Project: Hitchland - Woodward Dbl 345kV CKT (Total Project E&C Cost Shown)	Previously Allocated		$247,005,793.00
Medicine Lodge - Wichita 345KV Dbl CKT Priority Project: Spearville - Comanche - Med Lodge - Wichita Dbl 345kV CKT (Total Project E&C Cost Shown.)	Previously Allocated		$356,300,000.00
Medicine Lodge - Woodward 345KV Dbl CKT Priority Project: Med Lodge - Woodward Dbl 345kV CKT (Total Project E&C Cost Shown)	Previously Allocated		$194,972,759.00
Medicine Lodge 345/138KV Transformer CKT 1 Priority Project: Spearville - Comanche - Med Lodge - Wichita Dbl 345kV CKT (Total Project E&C Cost Shown.)	Previously Allocated		$356,300,000.00
	Current Study Total	$283,904,288.79	

GEN-2011-007

Benton - Wichita 345kV NRIS upgrade: Replace terminal equipment at Benton and Wichita	Current Study	$17,538.73	$979,609.00
Cimarron - Czech Hall 138kV NRIS upgrade: Rebuild approximately 6 miles of 138kV line	Current Study	$1,718,435.30	$6,000,000.00
Cimarron - Haymaker 138kV NRIS upgrade: Rebuild approximately 5 miles of 138kV line	Current Study	$5,000,000.00	$5,000,000.00
GEN-2011-007 Interconnection Costs See Oneline Diagram.	Current Study	$10,000,000.00	$10,000,000.00
Matthewson - Cimarron 345kV CKT 2 Build second 345kV circuit from Matthewson - Cimarron	Current Study	$2,019,671.88	$20,000,000.00
Border - Tuco Interchange 345KV CKT 1 Balanced Portfolio: Tuco - Woodward 345kV (Total Project E&C Cost Shown)	Previously Allocated		$148,727,500.00
Border - Woodward 345KV CKT 1 Balanced Portfolio: Tuco - Woodward 345kV (Total Project E&C Cost Shown)	Previously Allocated		$148,727,500.00
Medicine Lodge - Woodward 345KV Dbl CKT Priority Project: Med Lodge - Woodward Dbl 345kV CKT (Total Project E&C Cost Shown)	Previously Allocated		$194,972,759.00
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		$11,250,000.00
	Current Study Total	$18,755,645.91	

GEN-2011-008

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Interconnection Request and Upgrades	Upgrade Type	Allocated Cost	Upgrade Cost
Beaver - Commanche 345kV Build approximately 65 Miles of 345kV from Beaver - Commanche	Current Study	$34,999,999.78	$120,000,000.00
Circle - Reno 345kV Dbl CKT Build new 345kV line from Circle - Reno	Current Study	$2,553,799.15	$10,075,470.70
GEN-2011-008 Interconnection Costs See Oneline Diagram.	Current Study	$5,000,000.00	$5,000,000.00
Matthewson - Cimarron 345kV CKT 2 Build second 345kV circuit from Matthewson - Cimarron	Current Study	$2,080,339.18	$20,000,000.00
Mullegren - Circle 345kV Dbl CKT Build new 345kV line from Mullergreen - Circle	Current Study	$33,457,641.56	$132,000,000.00
Spearville - Mullergreen 345kV Dbl CKT Build new 345kV line from Spearville - Mullergreen	Current Study	$30,244,095.43	$124,000,000.00
Tatonga - Matthewson 345kV CKT 2 Build second 345kV circuit from Tatonga - Matthewson	Current Study	$5,555,955.36	$60,000,000.00
Axtell - PostRock 345KV CKT 1 Balanced Portfolio: Spearville - PostRock - Axtell 345kV CKT (Total Project E&C Cost Shown)	Previously Allocated		$112,700,000.00
Beaver County - Gray County 345kV Build approximately 90 miles of 345kV from Beaver County - Gray County	Previously Allocated		$196,609,050.00
Border - Tuco Interchange 345KV CKT 1 Balanced Portfolio: Tuco - Woodward 345kV (Total Project E&C Cost Shown)	Previously Allocated		$148,727,500.00
Medicine Lodge - Wichita 345KV Dbl CKT Priority Project: Spearville - Comanche - Med Lodge - Wichita Dbl 345kV CKT (Total Project E&C Cost Shown.)	Previously Allocated		$356,300,000.00
Medicine Lodge - Woodward 345KV Dbl CKT Priority Project: Med Lodge - Woodward Dbl 345kV CKT (Total Project E&C Cost Shown)	Previously Allocated		$194,972,759.00
Medicine Lodge 345/138KV Transformer CKT 1 Priority Project: Spearville - Comanche - Med Lodge - Wichita Dbl 345kV CKT (Total Project E&C Cost Shown.)	Previously Allocated		$356,300,000.00
Post Rock 345/230/13.8KV Autotransformer CKT 1 Balanced Portfolio: Spearville - PostRock - Axtell 345kV CKT (Total Project E&C Cost Shown)	Previously Allocated		$112,700,000.00
PostRock - GEN-2010-016 Tap 345KV CKT 1 Balanced Portfolio: Spearville - PostRock - Axtell 345kV CKT (Total Project E&C Cost Shown)	Previously Allocated		$112,700,000.00
Spearville - GEN-2010-016 Tap 345KV CKT 1 Balanced Portfolio: Spearville - PostRock - Axtell 345kV CKT (Total Project E&C Cost Shown)	Previously Allocated		$112,700,000.00

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Interconnection Request and Upgrades	Upgrade Type	Allocated Cost	Upgrade Cost
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		$11,250,000.00
	Current Study Total	$113,891,830.46	
GEN-2011-009			
GEN-2011-009 Interconnection Costs See Oneline Diagram.	Current Study	$2,000,000.00	$2,000,000.00
Hobart Junction - Snyder 138kV conversion Convert from 69kV to 138kV operation	Current Study	$37,000,000.00	$37,000,000.00
Hobart Junction - Southwest 138kV Rebuild Hobart - Southwest 138kV	Current Study	$43,000,000.00	$43,000,000.00
Hobart Junction terminal equipment Replace 138kV switches at Hobart Junction	Current Study	$100,000.00	$100,000.00
Clinton Junction - Elk City 138kV Rebuild 24 miles of 138kV from Clinton Junction - Elk City	Previously Allocated		$20,300,007.00
Gracemont Transformer 345/138/13.8KV CKT 1 Priority Project: Gracemont Transformer 345/138/13.8KV CKT 1 (Total Project E&C Cost Shown)	Previously Allocated		$8,000,000.00
Washita - Gracemont 138kV CKT 2 Build approximately 11 miles of 138kV.	Previously Allocated		$5,621,986.00
Washita - Weatherford 138kV CKT 1 Build approximately 50 miles of 138kV.	Previously Allocated		$22,435,002.00
	Current Study Total	$82,100,000.00	
GEN-2011-010			
GEN-2011-010 Interconnection Costs See Oneline Diagram.	Current Study	$3,000,000.00	$3,000,000.00
	Current Study Total	$3,000,000.00	
GEN-2011-011			
GEN-2011-011 Interconnection Costs See Oneline Diagram.	Current Study	$0.00	$0.00
	Current Study Total	$0.00	
GEN-2011-012			
Beaver - Commanche 345kV Build approximately 65 Miles of 345kV from Beaver - Commanche	Current Study	$3,124,933.84	$120,000,000.00

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Interconnection Request and Upgrades	Upgrade Type	Allocated Cost	Upgrade Cost
GEN-2011-012 Interconnection Costs See Oneline Diagram.	Current Study	$4,000,000.00	$4,000,000.00
Lawton Eastside - Oklaunion 345kV CKT 2 Build 2nd 345kV circuit from Lawton Eastside - Oklaunion	Current Study	$1,647,383.53	$105,000,000.00
Matthewson - Cimarron 345kV CKT 2 Build second 345kV circuit from Matthewson - Cimarron	Current Study	$267,459.48	$20,000,000.00
Tatonga - Matthewson 345kV CKT 2 Build second 345kV circuit from Tatonga - Matthewson	Current Study	$1,096,276.64	$60,000,000.00
Beaver - Woodward 345kV Dbl CKT Priority Project: Hitchland - Woodward Dbl 345kV CKT (Total Project E&C Cost Shown)	Previously Allocated		$247,005,793.00
Beaver County - Gray County 345kV Build approximately 90 miles of 345kV from Beaver County - Gray County	Previously Allocated		$196,609,050.00
Border - Tuco Interchange 345KV CKT 1 Balanced Portfolio: Tuco - Woodward 345kV (Total Project E&C Cost Shown)	Previously Allocated		$148,727,500.00
Border - Woodward 345KV CKT 1 Balanced Portfolio: Tuco - Woodward 345kV (Total Project E&C Cost Shown)	Previously Allocated		$148,727,500.00
Finney Switching Station - Holcomb 345KV CKT 2 Per GEN-2006-044 Facility Study	Previously Allocated		$6,299,839.00
Hitchland - Beaver 345kV Dbl CKT Priority Project: Hitchland - Woodward Dbl 345kV CKT (Total Project E&C Cost Shown)	Previously Allocated		$247,005,793.00
Hitchland - Border 345 kV Dbl CKT Build approximately 105 miles of 345kV and SVC at Hitchland.	Previously Allocated		$224,831,940.00
Medicine Lodge - Wichita 345KV Dbl CKT Priority Project: Spearville - Comanche - Med Lodge - Wichita Dbl 345kV CKT (Total Project E&C Cost Shown.)	Previously Allocated		$356,300,000.00
Medicine Lodge - Woodward 345KV Dbl CKT Priority Project: Med Lodge - Woodward Dbl 345kV CKT (Total Project E&C Cost Shown)	Previously Allocated		$194,972,759.00
Medicine Lodge 345/138KV Transformer CKT 1 Priority Project: Spearville - Comanche - Med Lodge - Wichita Dbl 345kV CKT (Total Project E&C Cost Shown.)	Previously Allocated		$356,300,000.00
	Current Study Total	$10,136,053.49	

GEN-2011-013

GEN-2011-013 Interconnection Costs See Oneline Diagram.	Current Study	$3,000,000.00	$3,000,000.00

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Interconnection Request and Upgrades	Upgrade Type	Allocated Cost	Upgrade Cost
	Current Study Total	$3,000,000.00	
GEN-2011-014			
Beaver - Commanche 345kV Build approximately 65 Miles of 345kV from Beaver - Commanche	Current Study	$9,543,343.38	$120,000,000.00
GEN-2011-014 Interconnection Costs See Oneline Diagram.	Current Study	$5,000,000.00	$5,000,000.00
Lawton Eastside - Oklaunion 345kV CKT 2 Build 2nd 345kV circuit from Lawton Eastside - Oklaunion	Current Study	$957,612.10	$105,000,000.00
Matthewson - Cimarron 345kV CKT 2 Build second 345kV circuit from Matthewson - Cimarron	Current Study	$774,196.86	$20,000,000.00
Tatonga - Matthewson 345kV CKT 2 Build second 345kV circuit from Tatonga - Matthewson	Current Study	$2,529,394.87	$60,000,000.00
Beaver - Woodward 345kV Dbl CKT Priority Project: Hitchland - Woodward Dbl 345kV CKT (Total Project E&C Cost Shown)	Previously Allocated		$247,005,793.00
Beaver County - Gray County 345kV Build approximately 90 miles of 345kV from Beaver County - Gray County	Previously Allocated		$196,609,050.00
Border - Tuco Interchange 345KV CKT 1 Balanced Portfolio: Tuco - Woodward 345kV (Total Project E&C Cost Shown)	Previously Allocated		$148,727,500.00
Border - Woodward 345KV CKT 1 Balanced Portfolio: Tuco - Woodward 345kV (Total Project E&C Cost Shown)	Previously Allocated		$148,727,500.00
Finney Switching Station - Holcomb 345KV CKT 2 Per GEN-2006-044 Facility Study	Previously Allocated		$6,299,839.00
Hitchland - Border 345 kV Dbl CKT Build approximately 105 miles of 345kV and SVC at Hitchland.	Previously Allocated		$224,831,940.00
Medicine Lodge - Wichita 345KV Dbl CKT Priority Project: Spearville - Comanche - Med Lodge - Wichita Dbl 345kV CKT (Total Project E&C Cost Shown.)	Previously Allocated		$356,300,000.00
Medicine Lodge - Woodward 345KV Dbl CKT Priority Project: Med Lodge - Woodward Dbl 345kV CKT (Total Project E&C Cost Shown)	Previously Allocated		$194,972,759.00
Medicine Lodge 345/138KV Transformer CKT 1 Priority Project: Spearville - Comanche - Med Lodge - Wichita Dbl 345kV CKT (Total Project E&C Cost Shown.)	Previously Allocated		$356,300,000.00
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		$11,250,000.00

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Interconnection Request and Upgrades	Upgrade Type	Allocated Cost	Upgrade Cost
	Current Study Total	$18,804,547.21	
GEN-2011-015			
Benton - Wichita 345kV NRIS upgrade: Replace terminal equipment at Benton and Wichita	Current Study	$68,234.91	$979,609.00
Cimarron - Czech Hall 138kV NRIS upgrade: Rebuild approximately 6 miles of 138kV line	Current Study	$1,063,478.05	$6,000,000.00
Cleo Corner - Glass Mountain 138kV NRIS upgrade: Rebuild approximately 26 miles of 138kV line	Current Study	$5,489,377.68	$24,000,000.00
Cleo Corner - Meno Tap 138kV NRIS upgrade: Rebuild approximately 16 miles of 138kV line	Current Study	$3,435,565.03	$15,000,000.00
El Reno - Roman Nose 138kV NRIS upgrade: Rebuild approximately 27 miles of 138kV line	Current Study	$5,302,379.51	$25,000,000.00
GEN-2011-015 Interconnection Costs See Oneline Diagram.	Current Study	$10,000,000.00	$10,000,000.00
Glass Mountain - Mooreland 138kV NRIS upgrade: Rebuild appproximatley 24 miles of 138kV line	Current Study	$3,842,564.38	$16,800,000.00
Matthewson - Cimarron 345kV CKT 2 Build second 345kV circuit from Matthewson - Cimarron	Current Study	$2,411,622.15	$20,000,000.00
Mooreland - Nine Mile 138kV NRIS upgrade:	Current Study	$3,907,356.73	$15,000,000.00
Moorewood Switch - Nine Mile 138kV NRIS upgrade:	Current Study	$1,302,452.24	$5,000,000.00
Roman Nose - Southard 138kV NRIS upgrade: Rebuild approximately 17 miles of 138kV line	Current Study	$3,393,522.89	$16,000,000.00
Spearville - Mullergreen 345kV Dbl CKT Build new 345kV line from Spearville - Mullergreen	Current Study	$2,997,255.83	$124,000,000.00
Tatonga - Matthewson 345kV CKT 2 Build second 345kV circuit from Tatonga - Matthewson	Current Study	$9,416,660.62	$60,000,000.00
Border - Tuco Interchange 345KV CKT 1 Balanced Portfolio: Tuco - Woodward 345kV (Total Project E&C Cost Shown)	Previously Allocated		$148,727,500.00
Border - Woodward 345KV CKT 1 Balanced Portfolio: Tuco - Woodward 345kV (Total Project E&C Cost Shown)	Previously Allocated		$148,727,500.00

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Interconnection Request and Upgrades	Upgrade Type	Allocated Cost	Upgrade Cost
Medicine Lodge - Wichita 345KV Dbl CKT Priority Project: Spearville - Comanche - Med Lodge - Wichita Dbl 345kV CKT (Total Project E&C Cost Shown.)	Previously Allocated		$356,300,000.00
Medicine Lodge - Woodward 345KV Dbl CKT Priority Project: Med Lodge - Woodward Dbl 345kV CKT (Total Project E&C Cost Shown)	Previously Allocated		$194,972,759.00
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		$11,250,000.00
	Current Study Total	$52,630,470.02	
GEN-2011-016			
Beaver - Commanche 345kV Build approximately 65 Miles of 345kV from Beaver - Commanche	Current Study	$7,549,113.48	$120,000,000.00
Benton - Wichita 345kV NRIS upgrade: Replace terminal equipment at Benton and Wichita	Current Study	$89,864.43	$979,609.00
Circle - Reno 345kV Dbl CKT Build new 345kV line from Circle - Reno	Current Study	$1,210,085.61	$10,075,470.70
GEN-2011-016 Interconnection Costs See Oneline Diagram.	Current Study	$7,500,000.00	$7,500,000.00
Matthewson - Cimarron 345kV CKT 2 Build second 345kV circuit from Matthewson - Cimarron	Current Study	$662,217.85	$20,000,000.00
Mullegren - Circle 345kV Dbl CKT Build new 345kV line from Mullergreen - Circle	Current Study	$15,853,482.67	$132,000,000.00
Spearville - Mullergreen 345kV Dbl CKT Build new 345kV line from Spearville - Mullergreen	Current Study	$14,330,784.26	$124,000,000.00
Tatonga - Matthewson 345kV CKT 2 Build second 345kV circuit from Tatonga - Matthewson	Current Study	$1,734,952.80	$60,000,000.00
Axtell - PostRock 345KV CKT 1 Balanced Portfolio: Spearville - PostRock - Axtell 345kV CKT (Total Project E&C Cost Shown)	Previously Allocated		$112,700,000.00
Beaver County - Gray County 345kV Build approximately 90 miles of 345kV from Beaver County - Gray County	Previously Allocated		$196,609,050.00
Border - Tuco Interchange 345KV CKT 1 Balanced Portfolio: Tuco - Woodward 345kV (Total Project E&C Cost Shown)	Previously Allocated		$148,727,500.00
Medicine Lodge - Wichita 345KV Dbl CKT Priority Project: Spearville - Comanche - Med Lodge - Wichita Dbl 345kV CKT (Total Project E&C Cost Shown.)	Previously Allocated		$356,300,000.00

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Interconnection Request and Upgrades	Upgrade Type	Allocated Cost	Upgrade Cost
Medicine Lodge - Woodward 345KV Dbl CKT Priority Project: Med Lodge - Woodward Dbl 345kV CKT (Total Project E&C Cost Shown)	Previously Allocated		$194,972,759.00
Medicine Lodge 345/115kV transformer Install new 345/115kV transformer at Medicine Lodge	Previously Allocated		$10,000,000.00
Medicine Lodge 345/138KV Transformer CKT 1 Priority Project: Spearville - Comanche - Med Lodge - Wichita Dbl 345kV CKT (Total Project E&C Cost Shown.)	Previously Allocated		$356,300,000.00
Post Rock 345/230/13.8KV Autotransformer CKT 1 Balanced Portfolio: Spearville - PostRock - Axtell 345kV CKT (Total Project E&C Cost Shown)	Previously Allocated		$112,700,000.00
PostRock - GEN-2010-016 Tap 345KV CKT 1 Balanced Portfolio: Spearville - PostRock - Axtell 345kV CKT (Total Project E&C Cost Shown)	Previously Allocated		$112,700,000.00
Spearville - GEN-2010-016 Tap 345KV CKT 1 Balanced Portfolio: Spearville - PostRock - Axtell 345kV CKT (Total Project E&C Cost Shown)	Previously Allocated		$112,700,000.00
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		$11,250,000.00
	Current Study Total	$48,930,501.10	
GEN-2011-017			
Beaver - Commanche 345kV Build approximately 65 Miles of 345kV from Beaver - Commanche	Current Study	$9,683,538.17	$120,000,000.00
Benton - Wichita 345kV NRIS upgrade: Replace terminal equipment at Benton and Wichita	Current Study	$121,582.27	$979,609.00
Circle - Reno 345kV Dbl CKT Build new 345kV line from Circle - Reno	Current Study	$1,326,103.82	$10,075,470.70
GEN-2011-017 Interconnection Costs See Oneline Diagram.	Current Study	$4,000,000.00	$4,000,000.00
Matthewson - Cimarron 345kV CKT 2 Build second 345kV circuit from Matthewson - Cimarron	Current Study	$919,339.83	$20,000,000.00
Mullegren - Circle 345kV Dbl CKT Build new 345kV line from Mullergreen - Circle	Current Study	$17,373,451.81	$132,000,000.00
Spearville - Mullergreen 345kV Dbl CKT Build new 345kV line from Spearville - Mullergreen	Current Study	$15,704,763.10	$124,000,000.00
Tatonga - Matthewson 345kV CKT 2 Build second 345kV circuit from Tatonga - Matthewson	Current Study	$2,281,276.09	$60,000,000.00

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Interconnection Request and Upgrades	Upgrade Type	Allocated Cost	Upgrade Cost
Axtell - PostRock 345KV CKT 1 Balanced Portfolio: Spearville - PostRock - Axtell 345kV CKT (Total Project E&C Cost Shown)	Previously Allocated		$112,700,000.00
Beaver County - Gray County 345kV Build approximately 90 miles of 345kV from Beaver County - Gray County	Previously Allocated		$196,609,050.00
Border - Tuco Interchange 345KV CKT 1 Balanced Portfolio: Tuco - Woodward 345kV (Total Project E&C Cost Shown)	Previously Allocated		$148,727,500.00
Medicine Lodge - Wichita 345KV Dbl CKT Priority Project: Spearville - Comanche - Med Lodge - Wichita Dbl 345kV CKT (Total Project E&C Cost Shown.)	Previously Allocated		$356,300,000.00
Medicine Lodge - Woodward 345KV Dbl CKT Priority Project: Med Lodge - Woodward Dbl 345kV CKT (Total Project E&C Cost Shown)	Previously Allocated		$194,972,759.00
Medicine Lodge 345/115kV transformer Install new 345/115kV transformer at Medicine Lodge	Previously Allocated		$10,000,000.00
Post Rock 345/230/13.8KV Autotransformer CKT 1 Balanced Portfolio: Spearville - PostRock - Axtell 345kV CKT (Total Project E&C Cost Shown)	Previously Allocated		$112,700,000.00
PostRock - GEN-2010-016 Tap 345KV CKT 1 Balanced Portfolio: Spearville - PostRock - Axtell 345kV CKT (Total Project E&C Cost Shown)	Previously Allocated		$112,700,000.00
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		$11,250,000.00
	Current Study Total	$51,410,055.09	
GEN-2011-018			
GEN 2010-047 Tap - Crete 115kV CKT 1 Build approximately 35 miles of new 115kV line	Current Study	$20,800,000.00	$20,800,000.00
GEN-2011-018 Interconnection Costs See Oneline Diagram.	Current Study	$3,000,000.00	$3,000,000.00
GEN 2010-047 - Harbine 115kV Rebuild approximately 6 miles of 115kV from Harbine - GEN 2010-047 Tap	Previously Allocated		$3,200,000.00
	Current Study Total	$23,800,000.00	
GEN-2011-019			
Benton - Wichita 345kV NRIS upgrade: Replace terminal equipment at Benton and Wichita	Current Study	$94,506.75	$979,609.00
Cedardale - Mooreland 138kV NRIS upgrade: Rebuild approximately 21miles of 138kV line	Current Study	$4,500,000.00	$9,000,000.00

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Interconnection Request and Upgrades	Upgrade Type	Allocated Cost	Upgrade Cost
Cedardale - Okeene 138kV NRIS upgrade: Rebuild approximately 37miles of 138kV line	Current Study	$7,500,000.00	$15,000,000.00
Cimarron - Czech Hall 138kV NRIS upgrade: Rebuild approximately 6 miles of 138kV line	Current Study	$1,105,263.16	$6,000,000.00
Circle - Reno 345kV Dbl CKT Build new 345kV line from Circle - Reno	Current Study	$360,999.62	$10,075,470.70
Cleo Corner - Glass Mountain 138kV NRIS upgrade: Rebuild approximately 26 miles of 138kV line	Current Study	$9,255,311.16	$24,000,000.00
Cleo Corner - Meno Tap 138kV NRIS upgrade: Rebuild approximately 16 miles of 138kV line	Current Study	$5,782,217.48	$15,000,000.00
Dover Switch - Okeene 138kV NRIS upgrade: Rebuild approximately 27 miles of 138kV line	Current Study	$5,500,000.00	$11,000,000.00
El Reno - Roman Nose 138kV NRIS upgrade: Rebuild approximately 27 miles of 138kV line	Current Study	$9,848,810.25	$25,000,000.00
Evans Energy Center - Maize 138kV NRIS upgrade: Replace terminal equipment	Current Study	$125,000.00	$250,000.00
GEN-2011-019 Interconnection Costs See Oneline Diagram.	Current Study	$6,000,000.00	$6,000,000.00
Glass Mountain - Mooreland 138kV NRIS upgrade: Rebuild appproximatley 24 miles of 138kV line	Current Study	$6,478,717.81	$16,800,000.00
Matthewson - Cimarron 345kV CKT 2 Build second 345kV circuit from Matthewson - Cimarron	Current Study	$1,473,121.21	$20,000,000.00
Mooreland - Nine Mile 138kV NRIS upgrade:	Current Study	$5,546,321.63	$15,000,000.00
Moorewood Switch - Nine Mile 138kV NRIS upgrade:	Current Study	$1,848,773.88	$5,000,000.00
Mullegren - Circle 345kV Dbl CKT Build new 345kV line from Mullergreen - Circle	Current Study	$4,729,501.10	$132,000,000.00
Roman Nose - Southard 138kV NRIS upgrade: Rebuild approximately 17 miles of 138kV line	Current Study	$6,303,238.56	$16,000,000.00
Spearville - Mullergreen 345kV Dbl CKT Build new 345kV line from Spearville - Mullergreen	Current Study	$4,275,241.05	$124,000,000.00

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Interconnection Request and Upgrades	Upgrade Type	Allocated Cost	Upgrade Cost
Tatonga - Matthewson 345kV CKT 2 Build second 345kV circuit from Tatonga - Matthewson	Current Study	$4,909,409.29	$60,000,000.00
Border - Tuco Interchange 345KV CKT 1 Balanced Portfolio: Tuco - Woodward 345kV (Total Project E&C Cost Shown)	Previously Allocated		$148,727,500.00
Border - Woodward 345KV CKT 1 Balanced Portfolio: Tuco - Woodward 345kV (Total Project E&C Cost Shown)	Previously Allocated		$148,727,500.00
Medicine Lodge - Wichita 345KV Dbl CKT Priority Project: Spearville - Comanche - Med Lodge - Wichita Dbl 345kV CKT (Total Project E&C Cost Shown.)	Previously Allocated		$356,300,000.00
Medicine Lodge - Woodward 345KV Dbl CKT Priority Project: Med Lodge - Woodward Dbl 345kV CKT (Total Project E&C Cost Shown)	Previously Allocated		$194,972,759.00
Medicine Lodge 345/138KV Transformer CKT 1 Priority Project: Spearville - Comanche - Med Lodge - Wichita Dbl 345kV CKT (Total Project E&C Cost Shown.)	Previously Allocated		$356,300,000.00
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		$11,250,000.00
	Current Study Total	$85,636,432.95	
GEN-2011-020			
Benton - Wichita 345kV NRIS upgrade: Replace terminal equipment at Benton and Wichita	Current Study	$94,506.75	$979,609.00
Cedardale - Mooreland 138kV NRIS upgrade: Rebuild approximately 21miles of 138kV line	Current Study	$4,500,000.00	$9,000,000.00
Cedardale - Okeene 138kV NRIS upgrade: Rebuild approximately 37miles of 138kV line	Current Study	$7,500,000.00	$15,000,000.00
Cimarron - Czech Hall 138kV NRIS upgrade: Rebuild approximately 6 miles of 138kV line	Current Study	$1,105,263.16	$6,000,000.00
Circle - Reno 345kV Dbl CKT Build new 345kV line from Circle - Reno	Current Study	$360,999.62	$10,075,470.70
Cleo Corner - Glass Mountain 138kV NRIS upgrade: Rebuild approximately 26 miles of 138kV line	Current Study	$9,255,311.16	$24,000,000.00
Cleo Corner - Meno Tap 138kV NRIS upgrade: Rebuild approximately 16 miles of 138kV line	Current Study	$5,782,217.48	$15,000,000.00
Dover Switch - Okeene 138kV NRIS upgrade: Rebuild approximately 27 miles of 138kV line	Current Study	$5,500,000.00	$11,000,000.00

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Interconnection Request and Upgrades	Upgrade Type	Allocated Cost	Upgrade Cost
El Reno - Roman Nose 138kV NRIS upgrade: Rebuild approximately 27 miles of 138kV line	Current Study	$9,848,810.25	$25,000,000.00
Evans Energy Center - Maize 138kV NRIS upgrade: Replace terminal equipment	Current Study	$125,000.00	$250,000.00
GEN-2011-020 Interconnection Costs See Oneline Diagram.	Current Study	$6,000,000.00	$6,000,000.00
Glass Mountain - Mooreland 138kV NRIS upgrade: Rebuild appproximatley 24 miles of 138kV line	Current Study	$6,478,717.81	$16,800,000.00
Matthewson - Cimarron 345kV CKT 2 Build second 345kV circuit from Matthewson - Cimarron	Current Study	$1,473,121.21	$20,000,000.00
Mooreland - Nine Mile 138kV NRIS upgrade:	Current Study	$5,546,321.63	$15,000,000.00
Moorewood Switch - Nine Mile 138kV NRIS upgrade:	Current Study	$1,848,773.88	$5,000,000.00
Mullegren - Circle 345kV Dbl CKT Build new 345kV line from Mullergreen - Circle	Current Study	$4,729,501.10	$132,000,000.00
Roman Nose - Southard 138kV NRIS upgrade: Rebuild approximately 17 miles of 138kV line	Current Study	$6,303,238.56	$16,000,000.00
Spearville - Mullergreen 345kV Dbl CKT Build new 345kV line from Spearville - Mullergreen	Current Study	$4,275,241.05	$124,000,000.00
Tatonga - Matthewson 345kV CKT 2 Build second 345kV circuit from Tatonga - Matthewson	Current Study	$4,909,409.29	$60,000,000.00
Border - Tuco Interchange 345KV CKT 1 Balanced Portfolio: Tuco - Woodward 345kV (Total Project E&C Cost Shown)	Previously Allocated		$148,727,500.00
Border - Woodward 345KV CKT 1 Balanced Portfolio: Tuco - Woodward 345kV (Total Project E&C Cost Shown)	Previously Allocated		$148,727,500.00
Medicine Lodge - Wichita 345KV Dbl CKT Priority Project: Spearville - Comanche - Med Lodge - Wichita Dbl 345kV CKT (Total Project E&C Cost Shown.)	Previously Allocated		$356,300,000.00
Medicine Lodge - Woodward 345KV Dbl CKT Priority Project: Med Lodge - Woodward Dbl 345kV CKT (Total Project E&C Cost Shown)	Previously Allocated		$194,972,759.00
Medicine Lodge 345/138KV Transformer CKT 1 Priority Project: Spearville - Comanche - Med Lodge - Wichita Dbl 345kV CKT (Total Project E&C Cost Shown.)	Previously Allocated		$356,300,000.00

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Interconnection Request and Upgrades	Upgrade Type	Allocated Cost	Upgrade Cost
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		$11,250,000.00
	Current Study Total	$85,636,432.95	
GEN-2011-021			
Beaver - Commanche 345kV Build approximately 65 Miles of 345kV from Beaver - Commanche	Current Study	$14,196,316.78	$120,000,000.00
GEN-2011-021 Interconnection Costs See Oneline Diagram.	Current Study	$10,000,000.00	$10,000,000.00
Lawton Eastside - Oklaunion 345kV CKT 2 Build 2nd 345kV circuit from Lawton Eastside - Oklaunion	Current Study	$1,424,507.55	$105,000,000.00
Matthewson - Cimarron 345kV CKT 2 Build second 345kV circuit from Matthewson - Cimarron	Current Study	$1,151,665.97	$20,000,000.00
Tatonga - Matthewson 345kV CKT 2 Build second 345kV circuit from Tatonga - Matthewson	Current Study	$3,762,632.18	$60,000,000.00
Beaver - Woodward 345kV Dbl CKT Priority Project: Hitchland - Woodward Dbl 345kV CKT (Total Project E&C Cost Shown)	Previously Allocated		$247,005,793.00
Beaver County - Gray County 345kV Build approximately 90 miles of 345kV from Beaver County - Gray County	Previously Allocated		$196,609,050.00
Border - Tuco Interchange 345KV CKT 1 Balanced Portfolio: Tuco - Woodward 345kV (Total Project E&C Cost Shown)	Previously Allocated		$148,727,500.00
Border - Woodward 345KV CKT 1 Balanced Portfolio: Tuco - Woodward 345kV (Total Project E&C Cost Shown)	Previously Allocated		$148,727,500.00
Finney Switching Station - Holcomb 345KV CKT 2 Per GEN-2006-044 Facility Study	Previously Allocated		$6,299,839.00
Hitchland - Border 345 kV Dbl CKT Build approximately 105 miles of 345kV and SVC at Hitchland.	Previously Allocated		$224,831,940.00
Medicine Lodge - Wichita 345KV Dbl CKT Priority Project: Spearville - Comanche - Med Lodge - Wichita Dbl 345kV CKT (Total Project E&C Cost Shown.)	Previously Allocated		$356,300,000.00
Medicine Lodge - Woodward 345KV Dbl CKT Priority Project: Med Lodge - Woodward Dbl 345kV CKT (Total Project E&C Cost Shown)	Previously Allocated		$194,972,759.00
Medicine Lodge 345/138KV Transformer CKT 1 Priority Project: Spearville - Comanche - Med Lodge - Wichita Dbl 345kV CKT (Total Project E&C Cost Shown.)	Previously Allocated		$356,300,000.00

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Interconnection Request and Upgrades	Upgrade Type	Allocated Cost	Upgrade Cost
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		$11,250,000.00
	Current Study Total	$30,535,122.48	
GEN-2011-022			
Beaver - Commanche 345kV Build approximately 65 Miles of 345kV from Beaver - Commanche	Current Study	$9,553,851.47	$120,000,000.00
GEN-2011-022 Interconnection Costs See Oneline Diagram.	Current Study	$3,000,000.00	$3,000,000.00
Lawton Eastside - Oklaunion 345kV CKT 2 Build 2nd 345kV circuit from Lawton Eastside - Oklaunion	Current Study	$3,363,709.43	$105,000,000.00
Matthewson - Cimarron 345kV CKT 2 Build second 345kV circuit from Matthewson - Cimarron	Current Study	$945,912.48	$20,000,000.00
Tatonga - Matthewson 345kV CKT 2 Build second 345kV circuit from Tatonga - Matthewson	Current Study	$3,421,300.23	$60,000,000.00
Beaver - Woodward 345kV Dbl CKT Priority Project: Hitchland - Woodward Dbl 345kV CKT (Total Project E&C Cost Shown)	Previously Allocated		$247,005,793.00
Beaver County - Gray County 345kV Build approximately 90 miles of 345kV from Beaver County - Gray County	Previously Allocated		$196,609,050.00
Border - Tuco Interchange 345KV CKT 1 Balanced Portfolio: Tuco - Woodward 345kV (Total Project E&C Cost Shown)	Previously Allocated		$148,727,500.00
Border - Woodward 345KV CKT 1 Balanced Portfolio: Tuco - Woodward 345kV (Total Project E&C Cost Shown)	Previously Allocated		$148,727,500.00
Finney Switching Station - Holcomb 345KV CKT 2 Per GEN-2006-044 Facility Study	Previously Allocated		$6,299,839.00
Hitchland - Beaver 345kV Dbl CKT Priority Project: Hitchland - Woodward Dbl 345kV CKT (Total Project E&C Cost Shown)	Previously Allocated		$247,005,793.00
Hitchland - Border 345 kV Dbl CKT Build approximately 105 miles of 345kV and SVC at Hitchland.	Previously Allocated		$224,831,940.00
Medicine Lodge - Wichita 345KV Dbl CKT Priority Project: Spearville - Comanche - Med Lodge - Wichita Dbl 345kV CKT (Total Project E&C Cost Shown.)	Previously Allocated		$356,300,000.00
Medicine Lodge - Woodward 345KV Dbl CKT Priority Project: Med Lodge - Woodward Dbl 345kV CKT (Total Project E&C Cost Shown)	Previously Allocated		$194,972,759.00

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Interconnection Request and Upgrades	Upgrade Type	Allocated Cost	Upgrade Cost
Medicine Lodge 345/138KV Transformer CKT 1 Priority Project: Spearville - Comanche - Med Lodge - Wichita Dbl 345kV CKT (Total Project E&C Cost Shown.)	Previously Allocated		$356,300,000.00
	Current Study Total	$20,284,773.61	

GEN-2011-023

Beaver - Commanche 345kV Build approximately 65 Miles of 345kV from Beaver - Commanche	Current Study	$14,363,397.79	$120,000,000.00
Benton - Wichita 345kV NRIS upgrade: Replace terminal equipment at Benton and Wichita	Current Study	$137,706.01	$979,609.00
Circle - Reno 345kV Dbl CKT Build new 345kV line from Circle - Reno	Current Study	$1,540,790.27	$10,075,470.70
GEN-2011-023 Interconnection Costs See Oneline Diagram.	Current Study	$5,000,000.00	$5,000,000.00
Matthewson - Cimarron 345kV CKT 2 Build second 345kV circuit from Matthewson - Cimarron	Current Study	$1,013,266.76	$20,000,000.00
Mullegren - Circle 345kV Dbl CKT Build new 345kV line from Mullergreen - Circle	Current Study	$20,186,085.75	$132,000,000.00
Spearville - Mullergreen 345kV Dbl CKT Build new 345kV line from Spearville - Mullergreen	Current Study	$18,247,248.62	$124,000,000.00
Tatonga - Matthewson 345kV CKT 2 Build second 345kV circuit from Tatonga - Matthewson	Current Study	$2,680,929.14	$60,000,000.00
Axtell - PostRock 345KV CKT 1 Balanced Portfolio: Spearville - PostRock - Axtell 345kV CKT (Total Project E&C Cost Shown)	Previously Allocated		$112,700,000.00
Beaver County - Gray County 345kV Build approximately 90 miles of 345kV from Beaver County - Gray County	Previously Allocated		$196,609,050.00
Border - Tuco Interchange 345KV CKT 1 Balanced Portfolio: Tuco - Woodward 345kV (Total Project E&C Cost Shown)	Previously Allocated		$148,727,500.00
Medicine Lodge - Wichita 345KV Dbl CKT Priority Project: Spearville - Comanche - Med Lodge - Wichita Dbl 345kV CKT (Total Project E&C Cost Shown.)	Previously Allocated		$356,300,000.00
Medicine Lodge - Woodward 345KV Dbl CKT Priority Project: Med Lodge - Woodward Dbl 345kV CKT (Total Project E&C Cost Shown)	Previously Allocated		$194,972,759.00
Medicine Lodge 345/138KV Transformer CKT 1 Priority Project: Spearville - Comanche - Med Lodge - Wichita Dbl 345kV CKT (Total Project E&C Cost Shown.)	Previously Allocated		$356,300,000.00

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Interconnection Request and Upgrades	Upgrade Type	Allocated Cost	Upgrade Cost
Post Rock 345/230/13.8KV Autotransformer CKT 1 Balanced Portfolio: Spearville - PostRock - Axtell 345kV CKT (Total Project E&C Cost Shown)	Previously Allocated		$112,700,000.00
PostRock - GEN-2010-016 Tap 345KV CKT 1 Balanced Portfolio: Spearville - PostRock - Axtell 345kV CKT (Total Project E&C Cost Shown)	Previously Allocated		$112,700,000.00
Spearville - GEN-2010-016 Tap 345KV CKT 1 Balanced Portfolio: Spearville - PostRock - Axtell 345kV CKT (Total Project E&C Cost Shown)	Previously Allocated		$112,700,000.00
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		$11,250,000.00
	Current Study Total	$63,169,424.34	
GEN-2011-024			
Benton - Wichita 345kV NRIS upgrade: Replace terminal equipment at Benton and Wichita	Current Study	$41,045.99	$979,609.00
Cimarron - Czech Hall 138kV NRIS upgrade: Rebuild approximately 6 miles of 138kV line	Current Study	$1,007,560.34	$6,000,000.00
GEN-2011-024 Interconnection Costs See Oneline Diagram.	Current Study	$5,000,000.00	$5,000,000.00
Matthewson - Cimarron 345kV CKT 2 Build second 345kV circuit from Matthewson - Cimarron	Current Study	$3,318,074.96	$20,000,000.00
Spearville - Mullergreen 345kV Dbl CKT Build new 345kV line from Spearville - Mullergreen	Current Study	$1,681,106.09	$124,000,000.00
Tatonga - Matthewson 345kV CKT 2 Build second 345kV circuit from Tatonga - Matthewson	Current Study	$13,798,159.70	$60,000,000.00
Border - Tuco Interchange 345KV CKT 1 Balanced Portfolio: Tuco - Woodward 345kV (Total Project E&C Cost Shown)	Previously Allocated		$148,727,500.00
Border - Woodward 345KV CKT 1 Balanced Portfolio: Tuco - Woodward 345kV (Total Project E&C Cost Shown)	Previously Allocated		$148,727,500.00
Medicine Lodge - Wichita 345KV Dbl CKT Priority Project: Spearville - Comanche - Med Lodge - Wichita Dbl 345kV CKT (Total Project E&C Cost Shown.)	Previously Allocated		$356,300,000.00
Medicine Lodge - Woodward 345KV Dbl CKT Priority Project: Med Lodge - Woodward Dbl 345kV CKT (Total Project E&C Cost Shown)	Previously Allocated		$194,972,759.00
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		$11,250,000.00

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Interconnection Request and Upgrades	Upgrade Type	Allocated Cost	Upgrade Cost
	Current Study Total	$24,845,947.08	
GEN-2011-025			
GEN-2011-025 Interconnection Costs See Oneline Diagram.	Current Study	$3,000,000.00	$3,000,000.00
Jones - Tuco 345kV Build new 345kV line from Jones - Tuco	Current Study	$515,481.91	$20,000,000.00
Lawton Eastside - Oklaunion 345kV CKT 2 Build 2nd 345kV circuit from Lawton Eastside - Oklaunion	Current Study	$4,680,169.59	$105,000,000.00
Midland - Hobbs 345kV conversion Convert from 230kV to 345kV operation	Current Study	$116,567.61	$20,000,000.00
Beaver - Woodward 345kV Dbl CKT Priority Project: Hitchland - Woodward Dbl 345kV CKT (Total Project E&C Cost Shown)	Previously Allocated		$247,005,793.00
Border - Tuco Interchange 345KV CKT 1 Balanced Portfolio: Tuco - Woodward 345kV (Total Project E&C Cost Shown)	Previously Allocated		$148,727,500.00
Border - Woodward 345KV CKT 1 Balanced Portfolio: Tuco - Woodward 345kV (Total Project E&C Cost Shown)	Previously Allocated		$148,727,500.00
Hitchland - Beaver 345kV Dbl CKT Priority Project: Hitchland - Woodward Dbl 345kV CKT (Total Project E&C Cost Shown)	Previously Allocated		$247,005,793.00
Medicine Lodge - Wichita 345KV Dbl CKT Priority Project: Spearville - Comanche - Med Lodge - Wichita Dbl 345kV CKT (Total Project E&C Cost Shown.)	Previously Allocated		$356,300,000.00
Medicine Lodge - Woodward 345KV Dbl CKT Priority Project: Med Lodge - Woodward Dbl 345kV CKT (Total Project E&C Cost Shown)	Previously Allocated		$194,972,759.00
Medicine Lodge 345/138KV Transformer CKT 1 Priority Project: Spearville - Comanche - Med Lodge - Wichita Dbl 345kV CKT (Total Project E&C Cost Shown.)	Previously Allocated		$356,300,000.00
	Current Study Total	$8,312,219.11	
GEN-2011-027			
GEN-2011-027 Interconnection Costs See Oneline Diagram.	Current Study	$6,000,000.00	$6,000,000.00
Albion - Petersbug 115kV CKT 1	Previously Allocated		$900,000.00
	Current Study Total	$6,000,000.00	
	TOTAL CURRENT STUDY COSTS:	**$1,321,485,079.71**	

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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 2011-002 Interconnection Costs		**$0.00**
See Oneline Diagram.		
	ASGI 2011-002	$0.00
	Total Allocated Costs	**$0.00**
ASGI 2011-003 Interconnection Costs		**$0.00**
See Oneline Diagram.		
	ASGI 2011-003	$0.00
	Total Allocated Costs	**$0.00**
Beaver - Commanche 345kV		**$120,000,000.00**
Build approximately 65 Miles of 345kV from Beaver - Commanche		
	GEN-2010-029	$16,985,505.32
	GEN-2011-008	$34,999,999.78
	GEN-2011-012	$3,124,933.84
	GEN-2011-014	$9,543,343.38
	GEN-2011-016	$7,549,113.48
	GEN-2011-017	$9,683,538.17
	GEN-2011-021	$14,196,316.78
	GEN-2011-022	$9,553,851.47
	GEN-2011-023	$14,363,397.79
	Total Allocated Costs	**$120,000,000.00**
Benton - Wichita 345kV		**$979,609.00**
NRIS upgrade: Replace terminal equipment at Benton and Wichita		
	GEN-2010-029	$202,194.98
	GEN-2010-057	$112,428.16
	GEN-2011-007	$17,538.73
	GEN-2011-015	$68,234.91
	GEN-2011-016	$89,864.43
	GEN-2011-017	$121,582.27
	GEN-2011-019	$94,506.75
	GEN-2011-020	$94,506.75
	GEN-2011-023	$137,706.01
	GEN-2011-024	$41,045.99
	Total Allocated Costs	**$979,609.00**

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

Borden - Grassland 345kV conversion **$20,000,000.00**

Convert from 230kV to 345kV operation

GEN-2010-020	$91,328.06
GEN-2010-058	$89,375.20
GEN-2010-059	$6,606,432.25
GEN-2010-060	$13,212,864.49
Total Allocated Costs	**$20,000,000.00**

Cedardale - Mooreland 138kV **$9,000,000.00**

NRIS upgrade: Rebuild approximately 21miles of 138kV line

GEN-2011-019	$4,500,000.00
GEN-2011-020	$4,500,000.00
Total Allocated Costs	**$9,000,000.00**

Cedardale - Okeene 138kV **$15,000,000.00**

NRIS upgrade: Rebuild approximately 37miles of 138kV line

GEN-2011-019	$7,500,000.00
GEN-2011-020	$7,500,000.00
Total Allocated Costs	**$15,000,000.00**

Cimarron - Czech Hall 138kV **$6,000,000.00**

NRIS upgrade: Rebuild approximately 6 miles of 138kV line

GEN-2011-007	$1,718,435.30
GEN-2011-015	$1,063,478.05
GEN-2011-019	$1,105,263.16
GEN-2011-020	$1,105,263.16
GEN-2011-024	$1,007,560.34
Total Allocated Costs	**$6,000,000.00**

Cimarron - Haymaker 138kV **$5,000,000.00**

NRIS upgrade: Rebuild approximately 5 miles of 138kV line

GEN-2011-007	$5,000,000.00
Total Allocated Costs	**$5,000,000.00**

Circle - Reno 345kV Dbl CKT **$10,075,470.70**

Build new 345kV line from Circle - Reno

GEN-2010-029	$2,722,692.62
GEN-2011-008	$2,553,799.15
GEN-2011-016	$1,210,085.61
GEN-2011-017	$1,326,103.82

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

	GEN-2011-019	$360,999.62
	GEN-2011-020	$360,999.62
	GEN-2011-023	$1,540,790.27
	Total Allocated Costs	**$10,075,470.70**

Cleo Corner - Glass Mountain 138kV **$24,000,000.00**

NRIS upgrade: Rebuild approximately 26 miles of 138kV line

	GEN-2011-015	$5,489,377.68
	GEN-2011-019	$9,255,311.16
	GEN-2011-020	$9,255,311.16
	Total Allocated Costs	**$24,000,000.00**

Cleo Corner - Meno Tap 138kV **$15,000,000.00**

NRIS upgrade: Rebuild approximately 16 miles of 138kV line

	GEN-2011-015	$3,435,565.03
	GEN-2011-019	$5,782,217.48
	GEN-2011-020	$5,782,217.48
	Total Allocated Costs	**$15,000,000.00**

Dover Switch - Okeene 138kV **$11,000,000.00**

NRIS upgrade: Rebuild approximately 27 miles of 138kV line

	GEN-2011-019	$5,500,000.00
	GEN-2011-020	$5,500,000.00
	Total Allocated Costs	**$11,000,000.00**

El Reno - Roman Nose 138kV **$25,000,000.00**

NRIS upgrade: Rebuild approximately 27 miles of 138kV line

	GEN-2011-015	$5,302,379.51
	GEN-2011-019	$9,848,810.25
	GEN-2011-020	$9,848,810.25
	Total Allocated Costs	**$25,000,000.00**

Evans Energy Center - Maize 138kV **$250,000.00**

NRIS upgrade: Replace terminal equipment

	GEN-2011-019	$125,000.00
	GEN-2011-020	$125,000.00
	Total Allocated Costs	**$250,000.00**

GEN 2010-047 Tap - Crete 115kV CKT 1 **$20,800,000.00**

Build approximately 35 miles of new 115kV line

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

	GEN-2011-018	$20,800,000.00
	Total Allocated Costs	**$20,800,000.00**

GEN-2010-020 Interconnection Costs **$1,300,000.00**

See Oneline Diagram.

	GEN-2010-020	$1,300,000.00
	Total Allocated Costs	**$1,300,000.00**

GEN-2010-029 Interconnection Costs **$7,500,000.00**

See Oneline Diagram.

	GEN-2010-029	$7,500,000.00
	Total Allocated Costs	**$7,500,000.00**

GEN-2010-055 Interconnection Costs **$500,000.00**

See Oneline Diagram.

	GEN-2010-055	$500,000.00
	Total Allocated Costs	**$500,000.00**

GEN-2010-056 Interconnection Costs **$9,000,000.00**

See Oneline Diagram.

	GEN-2010-056	$9,000,000.00
	Total Allocated Costs	**$9,000,000.00**

GEN-2010-057 Interconnection Costs **$1,600,000.00**

See Oneline Diagram.

	GEN-2010-057	$1,600,000.00
	Total Allocated Costs	**$1,600,000.00**

GEN-2010-058 Interconnection Costs **$1,300,000.00**

See Oneline Diagram.

	GEN-2010-058	$1,300,000.00
	Total Allocated Costs	**$1,300,000.00**

GEN-2010-059 Interconnection Costs **$6,000,000.00**

See Oneline Diagram.

	GEN-2010-059	$6,000,000.00
	Total Allocated Costs	**$6,000,000.00**

GEN-2010-060 Interconnection Costs **$6,000,000.00**

See Oneline Diagram.

	GEN-2010-060	$6,000,000.00

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

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

GEN-2011-007 Interconnection Costs **$10,000,000.00**

See Oneline Diagram.

GEN-2011-007	$10,000,000.00	
Total Allocated Costs	**$10,000,000.00**	

GEN-2011-008 Interconnection Costs **$5,000,000.00**

See Oneline Diagram.

GEN-2011-008	$5,000,000.00	
Total Allocated Costs	**$5,000,000.00**	

GEN-2011-009 Interconnection Costs **$2,000,000.00**

See Oneline Diagram.

GEN-2011-009	$2,000,000.00	
Total Allocated Costs	**$2,000,000.00**	

GEN-2011-010 Interconnection Costs **$3,000,000.00**

See Oneline Diagram.

GEN-2011-010	$3,000,000.00	
Total Allocated Costs	**$3,000,000.00**	

GEN-2011-011 Interconnection Costs **$0.00**

See Oneline Diagram.

GEN-2011-011	$0.00	
Total Allocated Costs	**$0.00**	

GEN-2011-012 Interconnection Costs **$4,000,000.00**

See Oneline Diagram.

GEN-2011-012	$4,000,000.00	
Total Allocated Costs	**$4,000,000.00**	

GEN-2011-013 Interconnection Costs **$3,000,000.00**

See Oneline Diagram.

GEN-2011-013	$3,000,000.00	
Total Allocated Costs	**$3,000,000.00**	

GEN-2011-014 Interconnection Costs **$5,000,000.00**

See Oneline Diagram.

GEN-2011-014	$5,000,000.00	

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

	Total Allocated Costs	**$5,000,000.00**

GEN-2011-015 Interconnection Costs **$10,000,000.00**

See Oneline Diagram.

	GEN-2011-015	$10,000,000.00
	Total Allocated Costs	**$10,000,000.00**

GEN-2011-016 Interconnection Costs **$7,500,000.00**

See Oneline Diagram.

	GEN-2011-016	$7,500,000.00
	Total Allocated Costs	**$7,500,000.00**

GEN-2011-017 Interconnection Costs **$4,000,000.00**

See Oneline Diagram.

	GEN-2011-017	$4,000,000.00
	Total Allocated Costs	**$4,000,000.00**

GEN-2011-018 Interconnection Costs **$3,000,000.00**

See Oneline Diagram.

	GEN-2011-018	$3,000,000.00
	Total Allocated Costs	**$3,000,000.00**

GEN-2011-019 Interconnection Costs **$6,000,000.00**

See Oneline Diagram.

	GEN-2011-019	$6,000,000.00
	Total Allocated Costs	**$6,000,000.00**

GEN-2011-020 Interconnection Costs **$6,000,000.00**

See Oneline Diagram.

	GEN-2011-020	$6,000,000.00
	Total Allocated Costs	**$6,000,000.00**

GEN-2011-021 Interconnection Costs **$10,000,000.00**

See Oneline Diagram.

	GEN-2011-021	$10,000,000.00
	Total Allocated Costs	**$10,000,000.00**

GEN-2011-022 Interconnection Costs **$3,000,000.00**

See Oneline Diagram.

	GEN-2011-022	$3,000,000.00

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

	Total Allocated Costs	**$3,000,000.00**

GEN-2011-023 Interconnection Costs **$5,000,000.00**

See Oneline Diagram.

GEN-2011-023	$5,000,000.00
Total Allocated Costs	**$5,000,000.00**

GEN-2011-024 Interconnection Costs **$5,000,000.00**

See Oneline Diagram.

GEN-2011-024	$5,000,000.00
Total Allocated Costs	**$5,000,000.00**

GEN-2011-025 Interconnection Costs **$3,000,000.00**

See Oneline Diagram.

GEN-2011-025	$3,000,000.00
Total Allocated Costs	**$3,000,000.00**

GEN-2011-027 Interconnection Costs **$6,000,000.00**

See Oneline Diagram.

GEN-2011-027	$6,000,000.00
Total Allocated Costs	**$6,000,000.00**

Glass Mountain - Mooreland 138kV **$16,800,000.00**

NRIS upgrade: Rebuild appproximatley 24 miles of 138kV line

GEN-2011-015	$3,842,564.38
GEN-2011-019	$6,478,717.81
GEN-2011-020	$6,478,717.81
Total Allocated Costs	**$16,800,000.00**

Grassland - Jones 345kV **$20,000,000.00**

Build new 345kV line from Grassland - Jones

GEN-2010-020	$91,328.06
GEN-2010-058	$89,375.20
GEN-2010-059	$6,606,432.25
GEN-2010-060	$13,212,864.49
Total Allocated Costs	**$20,000,000.00**

Hobart Junction - Snyder 138kV conversion **$37,000,000.00**

Convert from 69kV to 138kV operation

GEN-2011-009	$37,000,000.00

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

Total Allocated Costs	**$37,000,000.00**	

Hobart Junction - Southwest 138kV **$43,000,000.00**

Rebuild Hobart - Southwest 138kV

GEN-2011-009	$43,000,000.00
Total Allocated Costs	**$43,000,000.00**

Hobart Junction terminal equipment **$100,000.00**

Replace 138kV switches at Hobart Junction

GEN-2011-009	$100,000.00
Total Allocated Costs	**$100,000.00**

Jones - Tuco 345kV **$20,000,000.00**

Build new 345kV line from Jones - Tuco

ASGI 2011-002	$53,478.25
ASGI 2011-003	$292,966.34
GEN-2010-020	$124,606.93
GEN-2010-058	$123,040.33
GEN-2010-059	$6,296,808.75
GEN-2010-060	$12,593,617.50
GEN-2011-025	$515,481.91
Total Allocated Costs	**$20,000,000.00**

Lawton Eastside - Oklaunion 345kV CKT 2 **$105,000,000.00**

Build 2nd 345kV circuit from Lawton Eastside - Oklaunion

ASGI 2011-002	$1,445,138.10
ASGI 2011-003	$2,145,559.52
GEN-2010-020	$1,037,960.82
GEN-2010-058	$1,035,439.60
GEN-2010-059	$29,087,506.59
GEN-2010-060	$58,175,013.18
GEN-2011-012	$1,647,383.53
GEN-2011-014	$957,612.10
GEN-2011-021	$1,424,507.55
GEN-2011-022	$3,363,709.43
GEN-2011-025	$4,680,169.59
Total Allocated Costs	**$105,000,000.00**

Lyons - Wheatland 115kV **$80,000.00**

Replace CTs

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

	GEN-2010-057	$80,000.00
	Total Allocated Costs	**$80,000.00**

Lyons Cap bank **$1,000,000.00**

Install 2x15MVar cap bank

	GEN-2010-057	$1,000,000.00
	Total Allocated Costs	**$1,000,000.00**

Matthewson - Cimarron 345kV CKT 2 **$20,000,000.00**

Build second 345kV circuit from Matthewson - Cimarron

	GEN-2010-029	$1,489,990.17
	GEN-2011-007	$2,019,671.88
	GEN-2011-008	$2,080,339.18
	GEN-2011-012	$267,459.48
	GEN-2011-014	$774,196.86
	GEN-2011-015	$2,411,622.15
	GEN-2011-016	$662,217.85
	GEN-2011-017	$919,339.83
	GEN-2011-019	$1,473,121.21
	GEN-2011-020	$1,473,121.21
	GEN-2011-021	$1,151,665.97
	GEN-2011-022	$945,912.48
	GEN-2011-023	$1,013,266.76
	GEN-2011-024	$3,318,074.96
	Total Allocated Costs	**$20,000,000.00**

Midland - Borden 345kV **$60,000,000.00**

Build new 345kV line from Midland - Borden

	GEN-2010-020	$273,969.86
	GEN-2010-058	$268,127.92
	GEN-2010-059	$19,819,300.74
	GEN-2010-060	$39,638,601.48
	Total Allocated Costs	**$60,000,000.00**

Midland - Hobbs 345kV conversion **$20,000,000.00**

Convert from 230kV to 345kV operation

	ASGI 2011-003	$60,139.03
	GEN-2010-059	$6,607,764.45
	GEN-2010-060	$13,215,528.91

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

	GEN-2011-025	$116,567.61
	Total Allocated Costs	**$20,000,000.00**

Midland - Yoakum 345kV **$85,000,000.00**

Build new 345kV line from Midland - Yoakum

	GEN-2010-020	$181,515.44
	GEN-2010-058	$177,259.63
	GEN-2010-059	$28,213,741.64
	GEN-2010-060	$56,427,483.29
	Total Allocated Costs	**$85,000,000.00**

Mooreland - Nine Mile 138kV **$15,000,000.00**

NRIS upgrade:

	GEN-2011-015	$3,907,356.73
	GEN-2011-019	$5,546,321.63
	GEN-2011-020	$5,546,321.63
	Total Allocated Costs	**$15,000,000.00**

Moorewood Switch - Nine Mile 138kV **$5,000,000.00**

NRIS upgrade:

	GEN-2011-015	$1,302,452.24
	GEN-2011-019	$1,848,773.88
	GEN-2011-020	$1,848,773.88
	Total Allocated Costs	**$5,000,000.00**

Mullegren - Circle 345kV Dbl CKT **$132,000,000.00**

Build new 345kV line from Mullergreen - Circle

	GEN-2010-029	$35,670,336.01
	GEN-2011-008	$33,457,641.56
	GEN-2011-016	$15,853,482.67
	GEN-2011-017	$17,373,451.81
	GEN-2011-019	$4,729,501.10
	GEN-2011-020	$4,729,501.10
	GEN-2011-023	$20,186,085.75
	Total Allocated Costs	**$132,000,000.00**

Plant X - Tolk East 230kV **$5,000,000.00**

Rebuild approximately 10 miles of 230kV

	GEN-2010-020	$193,707.29
	GEN-2010-058	$199,132.82

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

	GEN-2010-059	$1,535,719.96
	GEN-2010-060	$3,071,439.92
	Total Allocated Costs	**$5,000,000.00**

Plant X - Tolk West 230kV **$5,000,000.00**

Rebuild approximately 10 miles of 230kV

	GEN-2010-020	$192,187.08
	GEN-2010-058	$197,513.68
	GEN-2010-059	$1,536,766.41
	GEN-2010-060	$3,073,532.82
	Total Allocated Costs	**$5,000,000.00**

Rice County - Circle 230kV Conversion **$6,000,000.00**

Convert from 115kV to 230kV operation

	GEN-2010-057	$6,000,000.00
	Total Allocated Costs	**$6,000,000.00**

Rice County - Lyons 115kV **$5,000,000.00**

Rebuild line to 1000 Amps

	GEN-2010-057	$5,000,000.00
	Total Allocated Costs	**$5,000,000.00**

Rice County 230/115kV transformer **$4,700,000.00**

Install 230/115kV transformer at Rice County substation

	GEN-2010-057	$4,700,000.00
	Total Allocated Costs	**$4,700,000.00**

Roman Nose - Southard 138kV **$16,000,000.00**

NRIS upgrade: Rebuild approximately 17 miles of 138kV line

	GEN-2011-015	$3,393,522.89
	GEN-2011-019	$6,303,238.56
	GEN-2011-020	$6,303,238.56
	Total Allocated Costs	**$16,000,000.00**

Spearville - Mullergreen 345kV Dbl CKT **$124,000,000.00**

Build new 345kV line from Spearville - Mullergreen

	GEN-2010-029	$32,244,264.58
	GEN-2011-008	$30,244,095.43
	GEN-2011-015	$2,997,255.83
	GEN-2011-016	$14,330,784.26

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

	GEN-2011-017	$15,704,763.10
	GEN-2011-019	$4,275,241.05
	GEN-2011-020	$4,275,241.05
	GEN-2011-023	$18,247,248.62
	GEN-2011-024	$1,681,106.09
	Total Allocated Costs	**$124,000,000.00**

Tatonga - Matthewson 345kV CKT 2 **$60,000,000.00**

Build second 345kV circuit from Tatonga - Matthewson

	GEN-2010-029	$3,903,643.80
	GEN-2011-008	$5,555,955.36
	GEN-2011-012	$1,096,276.64
	GEN-2011-014	$2,529,394.87
	GEN-2011-015	$9,416,660.62
	GEN-2011-016	$1,734,952.80
	GEN-2011-017	$2,281,276.09
	GEN-2011-019	$4,909,409.29
	GEN-2011-020	$4,909,409.29
	GEN-2011-021	$3,762,632.18
	GEN-2011-022	$3,421,300.23
	GEN-2011-023	$2,680,929.14
	GEN-2011-024	$13,798,159.70
	Total Allocated Costs	**$60,000,000.00**

Wheatland - Lyons 115kV **$0.00**

Rerate circuit to 1000 amps

	GEN-2010-057	$0.00
	Total Allocated Costs	**$0.00**

Yoakum - Tuco 345kV **$100,000,000.00**

Build new 345kV line from Yoakum - Tuco

	ASGI 2011-002	$209,049.05
	GEN-2010-020	$941,478.95
	GEN-2010-058	$924,457.93
	GEN-2010-059	$32,641,671.35
	GEN-2010-060	$65,283,342.71
	Total Allocated Costs	**$100,000,000.00**

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

G: Powerflow Analysis (Constraints 20% TDF and above)

SOURCE	DIRECTION	MONTCOMMONNAME	RATEB	TDF	TC%LOADING	CONTNAME
ASGI_2011_002	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.20791	116.3511	'LAWTON EASTSIDE - OKLAUNION 345KV CKT 1'
ASGI_2011_002	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.20791	109.3695	'G08-14T 345.00 - OKLAUNION 345KV CKT 1'
ASGI_2011_002	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.20791	108.4536	'G08-14T 345.00 - TUCO INTERCHANGE 345KV CKT 1'
ASGI_2011_002	'TO->FROM'	'G11-015T 345.00 - WWRDEHV7 345.00 345KV CKT 1'	1195	0.20791	111.4524	'LAWTON EASTSIDE - OKLAUNION 345KV CKT 1'
ASGI_2011_002	'TO->FROM'	'G11-015T 345.00 - WWRDEHV7 345.00 345KV CKT 1'	1195	0.20791	104.4057	'G08-14T 345.00 - OKLAUNION 345KV CKT 1'
ASGI_2011_002	'TO->FROM'	'G11-015T 345.00 - WWRDEHV7 345.00 345KV CKT 1'	1195	0.20791	103.4862	'G08-14T 345.00 - TUCO INTERCHANGE 345KV CKT 1'
ASGI_2011_002		Non Converged Contingency	0	0.24833	-	'DBL-G0847-WO'
ASGI_2011_003		Non Converged Contingency	1176	0.26752	-	'LAWTON EASTSIDE - OKLAUNION 345KV CKT 1'
ASGI_2011_003		Non Converged Contingency	1052	0.26067	-	'G08-14T 345.00 - OKLAUNION 345KV CKT 1'
ASGI_2011_003	'FROM->TO'	'TUCO INTERCHANGE (GE M1022338) 345/230/13.2KV TRANSFORMER CKT 1'	560	0.45833	108.6944	'TUCO INTERCHANGE (UPDATE DATA) 345/230/13.2KV TRANSFORMER CKT 2'
ASGI_2011_003	'FROM->TO'	'TUCO INTERCHANGE (GE M1022338) 345/230/13.2KV TRANSFORMER CKT 1'	560	0.45833	109.6505	'TUCO INTERCHANGE (UPDATE DATA) 345/230/13.2KV TRANSFORMER CKT 2'
ASGI_2011_003	'FROM->TO'	'TUCO INTERCHANGE (GE M1022338) 345/230/13.2KV TRANSFORMER CKT 1'	560	0.45587	108.954	'TUCO INTERCHANGE (UPDATE DATA) 345/230/13.2KV TRANSFORMER CKT 2'
ASGI_2011_003	'FROM->TO'	'TUCO INTERCHANGE (GE M1022338) 345/230/13.2KV TRANSFORMER CKT 1'	560	0.45587	109.5589	'TUCO INTERCHANGE (UPDATE DATA) 345/230/13.2KV TRANSFORMER CKT 2'
ASGI_2011_003	'FROM->TO'	'TUCO INTERCHANGE (UPDATE DATA) 345/230/13.2KV TRANSFORMER CKT 2'	560	0.44669	106.3289	'TUCO INTERCHANGE (GE M1022338) 345/230/13.2KV TRANSFORMER CKT 1'
ASGI_2011_003	'FROM->TO'	'TUCO INTERCHANGE (UPDATE DATA) 345/230/13.2KV TRANSFORMER CKT 2'	560	0.44669	107.1653	'TUCO INTERCHANGE (GE M1022338) 345/230/13.2KV TRANSFORMER CKT 1'
ASGI_2011_003	'FROM->TO'	'TUCO INTERCHANGE (UPDATE DATA) 345/230/13.2KV TRANSFORMER CKT 2'	560	0.44426	106.471	'TUCO INTERCHANGE (GE M1022338) 345/230/13.2KV TRANSFORMER CKT 1'
ASGI_2011_003	'FROM->TO'	'TUCO INTERCHANGE (UPDATE DATA) 345/230/13.2KV TRANSFORMER CKT 2'	560	0.44426	107.075	'TUCO INTERCHANGE (GE M1022338) 345/230/13.2KV TRANSFORMER CKT 1'
ASGI_2011_003	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.22068	116.3511	'LAWTON EASTSIDE - OKLAUNION 345KV CKT 1'
ASGI_2011_003	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.22068	109.3695	'G08-14T 345.00 - OKLAUNION 345KV CKT 1'
ASGI_2011_003	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.22068	108.4536	'G08-14T 345.00 - TUCO INTERCHANGE 345KV CKT 1'
ASGI_2011_003	'TO->FROM'	'G11-015T 345.00 - WWRDEHV7 345.00 345KV CKT 1'	1195	0.22068	111.4524	'LAWTON EASTSIDE - OKLAUNION 345KV CKT 1'
ASGI_2011_003	'TO->FROM'	'G11-015T 345.00 - WWRDEHV7 345.00 345KV CKT 1'	1195	0.22068	104.4057	'G08-14T 345.00 - OKLAUNION 345KV CKT 1'
ASGI_2011_003	'TO->FROM'	'G11-015T 345.00 - WWRDEHV7 345.00 345KV CKT 1'	1195	0.22068	103.4862	'G08-14T 345.00 - TUCO INTERCHANGE 345KV CKT 1'
G10_020	'FROM->TO'	'LEA COUNTY INTERCHANGE - YOAKUM COUNTY INTERCHANGE 230KV CKT 1'	351	0.26081	100.0792	'CHAVESCO 345.00 - TOLK STATION 345KV CKT 1'
G10_020	'FROM->TO'	'LEA COUNTY INTERCHANGE - YOAKUM COUNTY INTERCHANGE 230KV CKT 1'	351	0.26082	100.0775	'CHAVESCO 345.00 - TOLK STATION 345KV CKT 1'
G10_020	'FROM->TO'	'TUCO INTERCHANGE (GE M1022338) 345/230/13.2KV TRANSFORMER CKT 1'	560	0.40138	109.3814	'TUCO INTERCHANGE (UPDATE DATA) 345/230/13.2KV TRANSFORMER CKT 2'
G10_020	'FROM->TO'	'TUCO INTERCHANGE (GE M1022338) 345/230/13.2KV TRANSFORMER CKT 1'	560	0.40138	110.3123	'TUCO INTERCHANGE (UPDATE DATA) 345/230/13.2KV TRANSFORMER CKT 2'
G10_020	'FROM->TO'	'TUCO INTERCHANGE (GE M1022338) 345/230/13.2KV TRANSFORMER CKT 1'	560	0.39884	108.954	'TUCO INTERCHANGE (UPDATE DATA) 345/230/13.2KV TRANSFORMER CKT 2'
G10_020	'FROM->TO'	'TUCO INTERCHANGE (GE M1022338) 345/230/13.2KV TRANSFORMER CKT 1'	560	0.39884	109.5589	'TUCO INTERCHANGE (UPDATE DATA) 345/230/13.2KV TRANSFORMER CKT 2'
G10_020	'FROM->TO'	'TUCO INTERCHANGE (UPDATE DATA) 345/230/13.2KV TRANSFORMER CKT 2'	560	0.39119	106.9961	'TUCO INTERCHANGE (GE M1022338) 345/230/13.2KV TRANSFORMER CKT 1'
G10_020	'FROM->TO'	'TUCO INTERCHANGE (UPDATE DATA) 345/230/13.2KV TRANSFORMER CKT 2'	560	0.39119	107.8201	'TUCO INTERCHANGE (GE M1022338) 345/230/13.2KV TRANSFORMER CKT 1'
G10_020	'FROM->TO'	'TUCO INTERCHANGE (UPDATE DATA) 345/230/13.2KV TRANSFORMER CKT 2'	560	0.38869	106.471	'TUCO INTERCHANGE (GE M1022338) 345/230/13.2KV TRANSFORMER CKT 1'
G10_020	'FROM->TO'	'TUCO INTERCHANGE (UPDATE DATA) 345/230/13.2KV TRANSFORMER CKT 2'	560	0.38869	107.075	'TUCO INTERCHANGE (GE M1022338) 345/230/13.2KV TRANSFORMER CKT 1'
G10_020	'TO->FROM'	'PLANT X STATION - TOLK STATION EAST 230KV CKT 2'	502	0.29334	155.0772	'PLANT X STATION - TOLK STATION WEST 230KV CKT 1'
G10_020	'TO->FROM'	'PLANT X STATION - TOLK STATION EAST 230KV CKT 2'	502	0.29334	155.0772	'PLANT X STATION - TOLK STATION WEST 230KV CKT 1'
G10_020	'TO->FROM'	'PLANT X STATION - TOLK STATION EAST 230KV CKT 2'	502	0.19732	105.8688	'TOLK STATION EAST - TUCO INTERCHANGE 230KV CKT 1'
G10_020	'TO->FROM'	'PLANT X STATION - TOLK STATION EAST 230KV CKT 2'	502	0.19732	105.8688	'TOLK STATION EAST - TUCO INTERCHANGE 230KV CKT 1'
G10_020	'TO->FROM'	'PLANT X STATION - TOLK STATION EAST 230KV CKT 2'	502	0.29334	155.0772	'PLANT X STATION - TOLK STATION WEST 230KV CKT 1'
G10_020	'TO->FROM'	'PLANT X STATION - TOLK STATION EAST 230KV CKT 2'	502	0.19732	105.8688	'TOLK STATION EAST - TUCO INTERCHANGE 230KV CKT 1'
G10_020	'TO->FROM'	'PLANT X STATION - TOLK STATION EAST 230KV CKT 2'	502	0.29334	155.0772	'PLANT X STATION - TOLK STATION WEST 230KV CKT 1'
G10_020	'TO->FROM'	'PLANT X STATION - TOLK STATION EAST 230KV CKT 2'	502	0.19732	105.8688	'TOLK STATION EAST - TUCO INTERCHANGE 230KV CKT 1'
G10_020	'TO->FROM'	'PLANT X STATION - TOLK STATION WEST 230KV CKT 1'	502	0.29592	156.3172	'PLANT X STATION - TOLK STATION EAST 230KV CKT 2'
G10_020	'TO->FROM'	'PLANT X STATION - TOLK STATION WEST 230KV CKT 1'	502	0.20528	110.3132	'TOLK STATION EAST - TUCO INTERCHANGE 230KV CKT 1'
G10_020	'TO->FROM'	'PLANT X STATION - TOLK STATION WEST 230KV CKT 1'	502	0.29592	156.3172	'PLANT X STATION - TOLK STATION EAST 230KV CKT 2'
G10_020	'TO->FROM'	'PLANT X STATION - TOLK STATION WEST 230KV CKT 1'	502	0.20528	110.3132	'TOLK STATION EAST - TUCO INTERCHANGE 230KV CKT 1'
G10_020	'TO->FROM'	'PLANT X STATION - TOLK STATION WEST 230KV CKT 1'	502	0.29592	156.3172	'PLANT X STATION - TOLK STATION EAST 230KV CKT 2'
G10_020	'TO->FROM'	'PLANT X STATION - TOLK STATION WEST 230KV CKT 1'	502	0.20528	110.3132	'TOLK STATION EAST - TUCO INTERCHANGE 230KV CKT 1'
G10_020	'TO->FROM'	'PLANT X STATION - TOLK STATION WEST 230KV CKT 1'	502	0.29592	156.3172	'PLANT X STATION - TOLK STATION EAST 230KV CKT 2'
G10_020	'TO->FROM'	'PLANT X STATION - TOLK STATION WEST 230KV CKT 1'	502	0.20528	110.3132	'TOLK STATION EAST - TUCO INTERCHANGE 230KV CKT 1'
G10_020	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.21689	116.3511	'LAWTON EASTSIDE - OKLAUNION 345KV CKT 1'
G10_020	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.21689	109.3695	'G08-14T 345.00 - OKLAUNION 345KV CKT 1'
G10_020	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.21689	108.4536	'G08-14T 345.00 - TUCO INTERCHANGE 345KV CKT 1'
G10_020	'TO->FROM'	'G11-015T 345.00 - WWRDEHV7 345.00 345KV CKT 1'	1195	0.21689	111.4524	'LAWTON EASTSIDE - OKLAUNION 345KV CKT 1'
G10_020	'TO->FROM'	'G11-015T 345.00 - WWRDEHV7 345.00 345KV CKT 1'	1195	0.21689	104.4057	'G08-14T 345.00 - OKLAUNION 345KV CKT 1'

SOURCE	DIRECTION	MONTCOMMONNAME	RATEB	TDF	TC%LOADING	CONTNAME
G10_020	'TO->FROM'	'G11-015T 345.00 - WWRDEHV7 345.00 345KV CKT 1'	1195	0.21689	103.4862	'G08-14T 345.00 - TUCO INTERCHANGE 345KV CKT 1'
G10_029		Non Converged Contingency	0	0.39247	-	'DBL-SPRVL-CO'
G10_029		Non Converged Contingency	0	0.39247	-	'DBL-COM-MEDL'
G10_029		Non Converged Contingency	0	0.27158	-	'DBL-MEDLO-WI'
G10_029		Non Converged Contingency	0	0.3926	-	'DBL-COM-MEDL'
G10_029		Non Converged Contingency	0	0.27199	-	'DBL-MEDLO-WI'
G10_029		Non Converged Contingency	1328	0.30999	-	'GRAY CO 345.00 - SPEARVILLE 345KV CKT 1'
G10_029		Non Converged Contingency	0	0.39224	-	'DBL-SPRVL-CO'
G10_029		Non Converged Contingency	0	0.39224	-	'DBL-COM-MEDL'
G10_029		Non Converged Contingency	0	0.26113	-	'DBL-MEDLO-WI'
G10_029		Non Converged Contingency	0	0.39236	-	'DBL-COM-MEDL'
G10_029		Non Converged Contingency	0	0.26152	-	'DBL-MEDLO-WI'
G10_029		Non Converged Contingency	0	0.24267	-	'DBL-MEDLO-WI'
G10_029		Non Converged Contingency	0	0.39237	-	'DBL-SPRVL-CO'
G10_029		Non Converged Contingency	0	0.39237	-	'DBL-COM-MEDL'
G10_029		Non Converged Contingency	0	0.26106	-	'DBL-MEDLO-WI'
G10_029		Non Converged Contingency	0	0.39248	-	'DBL-COM-MEDL'
G10_029		Non Converged Contingency	0	0.26143	-	'DBL-MEDLO-WI'
G10_055		Non Converged Contingency	0	0.20854	-	'SPP-AEPW-12'
G10_055		Non Converged Contingency	0	0.20911	-	'SPP-AEPW-19'
G10_055		Non Converged Contingency	0	0.2058	-	'SPP-AEPW-12'
G10_055		Non Converged Contingency	0	0.20629	-	'SPP-AEPW-19'
G10_057	'TO->FROM'	'LYONS - RICE_CO 115KV CKT 1'	128	1	151.6744	'CIRCLE - RICECO 230.00 230KV CKT 1'
G10_057	'TO->FROM'	'LYONS - RICE_CO 115KV CKT 1'	128	1	117.3557	'CIRCLE - RICECO 230.00 230KV CKT 1'
G10_057	'FROM->TO'	'LYONS - WHEATLAND 115KV CKT 1'	55	0.2198	101.7299	'CIRCLE - EAST MCPHERSON 230KV CKT 1'
G10_057	'FROM->TO'	'LYONS - WHEATLAND 115KV CKT 1'	55	1	314.2232	'CIRCLE - RICECO 230.00 230KV CKT 1'
G10_057	'FROM->TO'	'LYONS - WHEATLAND 115KV CKT 1'	55	0.22255	106.4006	'CIRCLE (CIRCLE1X) 230/115/13.8KV TRANSFORMER CKT 1'
G10_057	'FROM->TO'	'LYONS - WHEATLAND 115KV CKT 1'	55	1	235.5527	'CIRCLE - RICECO 230.00 230KV CKT 1'
G10_057	'TO->FROM'	'LYONS - RICE_CO 115KV CKT 1'	128	1	147.9465	'CIRCLE - RICECO 230.00 230KV CKT 1'
G10_057	'FROM->TO'	'LYONS - WHEATLAND 115KV CKT 1'	55	1	292.3078	'CIRCLE - RICECO 230.00 230KV CKT 1'
G10_057	'TO->FROM'	'LYONS - RICE_CO 115KV CKT 1'	128	1	152.2257	'CIRCLE - RICECO 230.00 230KV CKT 1'
G10_057	'FROM->TO'	'LYONS - WHEATLAND 115KV CKT 1'	55	1	318.2959	'CIRCLE - RICECO 230.00 230KV CKT 1'
G10_057	'TO->FROM'	'LYONS - RICE_CO 115KV CKT 1'	128	1	147.5102	'CIRCLE - RICECO 230.00 230KV CKT 1'
G10_057	'FROM->TO'	'LYONS - WHEATLAND 115KV CKT 1'	55	1	290.4147	'CIRCLE - RICECO 230.00 230KV CKT 1'
G10_057	'TO->FROM'	'LYONS - RICE_CO 115KV CKT 1'	128	1	151.8337	'CIRCLE - RICECO 230.00 230KV CKT 1'
G10_057	'FROM->TO'	'LYONS - WHEATLAND 115KV CKT 1'	55	1	316.9408	'CIRCLE - RICECO 230.00 230KV CKT 1'
G10_057		Non Converged Contingency	280	0.79481	-	'CIRCLE - RICECO 230.00 230KV CKT 1'
G10_057		Non Converged Contingency	280	0.79221	-	'CIRCLE - RICECO 230.00 230KV CKT 1'
G10_057		Non Converged Contingency	280	0.79303	-	'CIRCLE - RICECO 230.00 230KV CKT 1'
G10_057		Non Converged Contingency	280	0.79158	-	'CIRCLE - RICECO 230.00 230KV CKT 1'
G10_057		Non Converged Contingency	280	0.79299	-	'CIRCLE - RICECO 230.00 230KV CKT 1'
G10_057		Non Converged Contingency	280	0.79197	-	'CIRCLE - RICECO 230.00 230KV CKT 1'
G10_057		Non Converged Contingency	280	0.79808	-	'CIRCLE - RICECO 230.00 230KV CKT 1'
G10_057		Non Converged Contingency	280	0.79785	-	'CIRCLE - RICECO 230.00 230KV CKT 1'
G10_058	'FROM->TO'	'LEA COUNTY INTERCHANGE - YOAKUM COUNTY INTERCHANGE 230KV CKT 1'	351	0.2524	100.0792	'CHAVESCO 345.00 - TOLK STATION 345KV CKT 1'
G10_058	'FROM->TO'	'LEA COUNTY INTERCHANGE - YOAKUM COUNTY INTERCHANGE 230KV CKT 1'	351	0.25241	100.0775	'CHAVESCO 345.00 - TOLK STATION 345KV CKT 1'
G10_058		Non Converged Contingency	1052	0.22579	-	'G08-14T 345.00 - OKLAUNION 345KV CKT 1'
G10_058	'FROM->TO'	'TUCO INTERCHANGE (GE M1022338) 345/230/13.2KV TRANSFORMER CKT 1'	560	0.40038	111.0835	'TUCO INTERCHANGE (UPDATE DATA) 345/230/13.2KV TRANSFORMER CKT 2'
G10_058	'FROM->TO'	'TUCO INTERCHANGE (GE M1022338) 345/230/13.2KV TRANSFORMER CKT 1'	560	0.40038	111.9408	'TUCO INTERCHANGE (UPDATE DATA) 345/230/13.2KV TRANSFORMER CKT 2'
G10_058	'FROM->TO'	'TUCO INTERCHANGE (GE M1022338) 345/230/13.2KV TRANSFORMER CKT 1'	560	0.39821	108.954	'TUCO INTERCHANGE (UPDATE DATA) 345/230/13.2KV TRANSFORMER CKT 2'
G10_058	'FROM->TO'	'TUCO INTERCHANGE (GE M1022338) 345/230/13.2KV TRANSFORMER CKT 1'	560	0.39821	109.5589	'TUCO INTERCHANGE (UPDATE DATA) 345/230/13.2KV TRANSFORMER CKT 2'
G10_058	'FROM->TO'	'TUCO INTERCHANGE (UPDATE DATA) 345/230/13.2KV TRANSFORMER CKT 2'	560	0.39022	108.6143	'TUCO INTERCHANGE (GE M1022338) 345/230/13.2KV TRANSFORMER CKT 1'
G10_058	'FROM->TO'	'TUCO INTERCHANGE (UPDATE DATA) 345/230/13.2KV TRANSFORMER CKT 2'	560	0.39022	109.4023	'TUCO INTERCHANGE (GE M1022338) 345/230/13.2KV TRANSFORMER CKT 1'
G10_058	'FROM->TO'	'TUCO INTERCHANGE (UPDATE DATA) 345/230/13.2KV TRANSFORMER CKT 2'	560	0.38808	106.471	'TUCO INTERCHANGE (GE M1022338) 345/230/13.2KV TRANSFORMER CKT 1'

SOURCE	DIRECTION	MONTCOMMONNAME	RATEB	TDF	TC%LOADING	CONTNAME
G10_058	'FROM->TO'	'TUCO INTERCHANGE (UPDATE DATA) 345/230/13.2KV TRANSFORMER CKT 2'	560	0.38808	107.075	'TUCO INTERCHANGE (GE M1022338) 345/230/13.2KV TRANSFORMER CKT 1'
G10_058	'TO->FROM'	'PLANT X STATION - TOLK STATION EAST 230KV CKT 2'	502	0.29799	155.0772	'PLANT X STATION - TOLK STATION WEST 230KV CKT 1'
G10_058	'TO->FROM'	'PLANT X STATION - TOLK STATION EAST 230KV CKT 2'	502	0.20072	105.8688	'TOLK STATION EAST - TUCO INTERCHANGE 230KV CKT 1'
G10_058	'TO->FROM'	'PLANT X STATION - TOLK STATION EAST 230KV CKT 2'	502	0.29799	155.0772	'PLANT X STATION - TOLK STATION WEST 230KV CKT 1'
G10_058	'TO->FROM'	'PLANT X STATION - TOLK STATION EAST 230KV CKT 2'	502	0.20072	105.8688	'TOLK STATION EAST - TUCO INTERCHANGE 230KV CKT 1'
G10_058	'TO->FROM'	'PLANT X STATION - TOLK STATION EAST 230KV CKT 2'	502	0.29799	155.0772	'PLANT X STATION - TOLK STATION WEST 230KV CKT 1'
G10_058	'TO->FROM'	'PLANT X STATION - TOLK STATION EAST 230KV CKT 2'	502	0.20072	105.8688	'TOLK STATION EAST - TUCO INTERCHANGE 230KV CKT 1'
G10_058	'TO->FROM'	'PLANT X STATION - TOLK STATION EAST 230KV CKT 2'	502	0.29799	155.0772	'PLANT X STATION - TOLK STATION WEST 230KV CKT 1'
G10_058	'TO->FROM'	'PLANT X STATION - TOLK STATION EAST 230KV CKT 2'	502	0.20072	105.8688	'TOLK STATION EAST - TUCO INTERCHANGE 230KV CKT 1'
G10_058	'TO->FROM'	'PLANT X STATION - TOLK STATION WEST 230KV CKT 1'	502	0.30061	156.3172	'PLANT X STATION - TOLK STATION EAST 230KV CKT 2'
G10_058	'TO->FROM'	'PLANT X STATION - TOLK STATION WEST 230KV CKT 1'	502	0.20879	110.3132	'TOLK STATION EAST - TUCO INTERCHANGE 230KV CKT 1'
G10_058	'TO->FROM'	'PLANT X STATION - TOLK STATION WEST 230KV CKT 1'	502	0.30061	156.3172	'PLANT X STATION - TOLK STATION EAST 230KV CKT 2'
G10_058	'TO->FROM'	'PLANT X STATION - TOLK STATION WEST 230KV CKT 1'	502	0.20879	110.3132	'TOLK STATION EAST - TUCO INTERCHANGE 230KV CKT 1'
G10_058	'TO->FROM'	'PLANT X STATION - TOLK STATION WEST 230KV CKT 1'	502	0.19119	107.7804	'G08-14T 345.00 - OKLAUNION 345KV CKT 1'
G10_058	'TO->FROM'	'PLANT X STATION - TOLK STATION WEST 230KV CKT 1'	502	0.30061	156.3172	'PLANT X STATION - TOLK STATION EAST 230KV CKT 2'
G10_058	'TO->FROM'	'PLANT X STATION - TOLK STATION WEST 230KV CKT 1'	502	0.20879	110.3132	'TOLK STATION EAST - TUCO INTERCHANGE 230KV CKT 1'
G10_058	'TO->FROM'	'PLANT X STATION - TOLK STATION WEST 230KV CKT 1'	502	0.19119	107.6858	'G08-14T 345.00 - TUCO INTERCHANGE 345KV CKT 1'
G10_058	'TO->FROM'	'PLANT X STATION - TOLK STATION WEST 230KV CKT 1'	502	0.19119	107.7804	'G08-14T 345.00 - OKLAUNION 345KV CKT 1'
G10_058	'TO->FROM'	'PLANT X STATION - TOLK STATION WEST 230KV CKT 1'	502	0.30061	156.3172	'PLANT X STATION - TOLK STATION EAST 230KV CKT 2'
G10_058	'TO->FROM'	'PLANT X STATION - TOLK STATION WEST 230KV CKT 1'	502	0.20879	110.3132	'TOLK STATION EAST - TUCO INTERCHANGE 230KV CKT 1'
G10_058	'TO->FROM'	'PLANT X STATION - TOLK STATION WEST 230KV CKT 1'	502	0.19119	107.6858	'G08-14T 345.00 - TUCO INTERCHANGE 345KV CKT 1'
G10_058	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.21686	116.3511	'LAWTON EASTSIDE - OKLAUNION 345KV CKT 1'
G10_058	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.21686	109.3695	'G08-14T 345.00 - OKLAUNION 345KV CKT 1'
G10_058	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.21686	108.4536	'G08-14T 345.00 - TUCO INTERCHANGE 345KV CKT 1'
G10_058	'TO->FROM'	'G11-015T 345.00 - WWRDEHV7 345.00 345KV CKT 1'	1195	0.21686	111.4524	'LAWTON EASTSIDE - OKLAUNION 345KV CKT 1'
G10_058	'TO->FROM'	'G11-015T 345.00 - WWRDEHV7 345.00 345KV CKT 1'	1195	0.21686	104.4057	'G08-14T 345.00 - OKLAUNION 345KV CKT 1'
G10_058	'TO->FROM'	'G11-015T 345.00 - WWRDEHV7 345.00 345KV CKT 1'	1195	0.21686	103.4862	'G08-14T 345.00 - TUCO INTERCHANGE 345KV CKT 1'
G10_059_11G	'FROM->TO'	'HOBBS INTERCHANGE 230/115KV TRANSFORMER CKT 1'	150	0.68727	198.2474	'HOBBS INTERCHANGE - LEA COUNTY INTERCHANGE 230KV CKT 1'
G10_059_11G		Non Converged Contingency	478	0.7764	-	'HOBBS INTERCHANGE - MIDLAND COUNTY INTERCHANGE 230KV CKT 1'
G10_059_11G	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.21817	116.3511	'LAWTON EASTSIDE - OKLAUNION 345KV CKT 1'
G10_059_11G	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.21817	109.3695	'G08-14T 345.00 - OKLAUNION 345KV CKT 1'
G10_059_11G	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.21817	108.4536	'G08-14T 345.00 - TUCO INTERCHANGE 345KV CKT 1'
G10_059_11G	'TO->FROM'	'G11-015T 345.00 - WWRDEHV7 345.00 345KV CKT 1'	1195	0.21817	111.4524	'LAWTON EASTSIDE - OKLAUNION 345KV CKT 1'
G10_059_11G	'TO->FROM'	'G11-015T 345.00 - WWRDEHV7 345.00 345KV CKT 1'	1195	0.21817	104.4057	'G08-14T 345.00 - OKLAUNION 345KV CKT 1'
G10_059_11G	'TO->FROM'	'G11-015T 345.00 - WWRDEHV7 345.00 345KV CKT 1'	1195	0.21817	103.4862	'G08-14T 345.00 - TUCO INTERCHANGE 345KV CKT 1'
G10_059_12SP	'FROM->TO'	'HOBBS INTERCHANGE 230/115KV TRANSFORMER CKT 1'	150	0.69001	178.5205	'HOBBS INTERCHANGE - LEA COUNTY INTERCHANGE 230KV CKT 1'
G10_059_12SP		Non Converged Contingency	478	0.77571	-	'HOBBS INTERCHANGE - MIDLAND COUNTY INTERCHANGE 230KV CKT 1'
G10_059_12WP	'FROM->TO'	'HOBBS INTERCHANGE 230/115KV TRANSFORMER CKT 1'	150	0.69591	187.1246	'HOBBS INTERCHANGE - LEA COUNTY INTERCHANGE 230KV CKT 1'
G10_059_12WP	'FROM->TO'	'HOBBS INTERCHANGE 230/115KV TRANSFORMER CKT 1'	150	0.69591	187.1246	'HOBBS INTERCHANGE - LEA COUNTY INTERCHANGE 230KV CKT 1'
G10_059_16SP	'TO->FROM'	'AMOCO SWITCHING STATION - YOAKUM COUNTY INTERCHANGE 230KV CKT 1'	351	0.21157	100	'CAPROCK REC-MCDONALD - CAPROCK REC-TRIANGLE 138KV CKT 1'
G10_059_16SP	'TO->FROM'	'AMOCO SWITCHING STATION - YOAKUM COUNTY INTERCHANGE 230KV CKT 1'	351	0.2459	111.2099	'CAPROCK REC-MCDONALD - CAPROCK REC-PHILLIPS 138KV CKT 1'
G10_059_16SP	'TO->FROM'	'AMOCO SWITCHING STATION - YOAKUM COUNTY INTERCHANGE 230KV CKT 1'	351	0.2459	113.0546	'CAPROCK REC-PHILLIPS - CAPROCK REC-TATE 138KV CKT 1'
G10_059_16SP	'TO->FROM'	'AMOCO SWITCHING STATION - YOAKUM COUNTY INTERCHANGE 230KV CKT 1'	351	0.2394	102.8327	'TOLK STATION WEST - YOAKUM COUNTY INTERCHANGE 230KV CKT 1'
G10_059_16SP	'TO->FROM'	'AMOCO SWITCHING STATION - YOAKUM COUNTY INTERCHANGE 230KV CKT 1'	351	0.20392	101.4138	'TERRY COUNTY INTERCHANGE - WOLFFORTH INTERCHANGE 115KV CKT 1'
G10_059_16SP	'TO->FROM'	'AMOCO SWITCHING STATION - YOAKUM COUNTY INTERCHANGE 230KV CKT 1'	351	0.2459	101.006	'BORDEN COUNTY INTERCHANGE - GRASSLAND INTERCHANGE 230KV CKT 1'
G10_059_16SP	'TO->FROM'	'AMOCO SWITCHING STATION - YOAKUM COUNTY INTERCHANGE 230KV CKT 1'	351	0.20125	101.5094	'CUNNINGHAM STATION - EDDY COUNTY INTERCHANGE 230KV CKT 1'
G10_059_16SP	'TO->FROM'	'AMOCO SWITCHING STATION - YOAKUM COUNTY INTERCHANGE 230KV CKT 1'	351	0.2459	113.6399	'MIDLAND 7345.00 (LIKE WICHITA) 345/138/13.8KV TRANSFORMER CKT 1'
G10_059_16SP	'TO->FROM'	'AMOCO SWITCHING STATION - YOAKUM COUNTY INTERCHANGE 230KV CKT 1'	351	0.2459	101.0068	'SPP-SWPS-K48'
G10_059_16SP	'TO->FROM'	'AMOCO SWITCHING STATION - YOAKUM COUNTY INTERCHANGE 230KV CKT 1'	351	0.24589	110.9049	'CAPROCK REC-MCDONALD - CAPROCK REC-PHILLIPS 138KV CKT 1'
G10_059_16SP	'TO->FROM'	'AMOCO SWITCHING STATION - YOAKUM COUNTY INTERCHANGE 230KV CKT 1'	351	0.24589	112.7619	'CAPROCK REC-PHILLIPS - CAPROCK REC-TATE 138KV CKT 1'
G10_059_16SP	'TO->FROM'	'AMOCO SWITCHING STATION - YOAKUM COUNTY INTERCHANGE 230KV CKT 1'	351	0.23942	102.7288	'TOLK STATION WEST - YOAKUM COUNTY INTERCHANGE 230KV CKT 1'
G10_059_16SP	'TO->FROM'	'AMOCO SWITCHING STATION - YOAKUM COUNTY INTERCHANGE 230KV CKT 1'	351	0.20391	101.0641	'TERRY COUNTY INTERCHANGE - WOLFFORTH INTERCHANGE 115KV CKT 1'
G10_059_16SP	'TO->FROM'	'AMOCO SWITCHING STATION - YOAKUM COUNTY INTERCHANGE 230KV CKT 1'	351	0.24589	100.7059	'BORDEN COUNTY INTERCHANGE - GRASSLAND INTERCHANGE 230KV CKT 1'
G10_059_16SP	'TO->FROM'	'AMOCO SWITCHING STATION - YOAKUM COUNTY INTERCHANGE 230KV CKT 1'	351	0.20125	101.2672	'CUNNINGHAM STATION - EDDY COUNTY INTERCHANGE 230KV CKT 1'

SOURCE	DIRECTION	MONTCOMMONNAME	RATEB	TDF	TC%LOADING	CONTNAME
G10_059_16SP	'TO->FROM'	'AMOCO SWITCHING STATION - YOAKUM COUNTY INTERCHANGE 230KV CKT 1'	351	0.24589	113.3308	'MIDLAND 7345.00 (LIKE WICHITA) 345/138/13.8KV TRANSFORMER CKT 1'
G10_059_16SP	'TO->FROM'	'CAPROCK REC-GRADY - CAPROCK REC-TRIANGLE 138KV CKT 1'	176	0.21144	100	'HOBBS INTERCHANGE - LEA COUNTY INTERCHANGE 230KV CKT 1'
G10_059_16SP	'TO->FROM'	'CAPROCK REC-MCDONALD - CAPROCK REC-PHILLIPS 138KV CKT 1'	271	0.20594	113.9	'BASE CASE'
G10_059_16SP	'TO->FROM'	'CAPROCK REC-MCDONALD - CAPROCK REC-PHILLIPS 138KV CKT 1'	271	0.30014	122.1413	'HOBBS INTERCHANGE - LEA COUNTY INTERCHANGE 230KV CKT 1'
G10_059_16SP	'TO->FROM'	'CAPROCK REC-MCDONALD - CAPROCK REC-PHILLIPS 138KV CKT 1'	271	0.20592	113.5797	'BASE CASE'
G10_059_16SP	'TO->FROM'	'CAPROCK REC-MCDONALD - CAPROCK REC-PHILLIPS 138KV CKT 1'	271	0.30013	121.9267	'HOBBS INTERCHANGE - LEA COUNTY INTERCHANGE 230KV CKT 1'
G10_059_16SP	'TO->FROM'	'CAPROCK REC-PHILLIPS - CAPROCK REC-TATE 138KV CKT 1'	271	0.20594	125.2122	'BASE CASE'
G10_059_16SP	'TO->FROM'	'CAPROCK REC-PHILLIPS - CAPROCK REC-TATE 138KV CKT 1'	271	0.21083	101.6601	'TOLK STATION EAST - TUCO INTERCHANGE 230KV CKT 1'
G10_059_16SP	'TO->FROM'	'CAPROCK REC-PHILLIPS - CAPROCK REC-TATE 138KV CKT 1'	271	0.21845	100	'AMOCO SWITCHING STATION - SUNDOWN INTERCHANGE 230KV CKT 1'
G10_059_16SP	'TO->FROM'	'CAPROCK REC-PHILLIPS - CAPROCK REC-TATE 138KV CKT 1'	271	0.21423	101.269	'SUNDOWN INTERCHANGE - WOLFFORTH INTERCHANGE 230KV CKT 1'
G10_059_16SP	'TO->FROM'	'CAPROCK REC-PHILLIPS - CAPROCK REC-TATE 138KV CKT 1'	271	0.21845	105.0082	'AMOCO SWITCHING STATION - YOAKUM COUNTY INTERCHANGE 230KV CKT 1'
G10_059_16SP	'TO->FROM'	'CAPROCK REC-PHILLIPS - CAPROCK REC-TATE 138KV CKT 1'	271	0.2359	108.2156	'LEA COUNTY INTERCHANGE - YOAKUM COUNTY INTERCHANGE 230KV CKT 1'
G10_059_16SP	'TO->FROM'	'CAPROCK REC-PHILLIPS - CAPROCK REC-TATE 138KV CKT 1'	271	0.21357	101.0076	'CUNNINGHAM STATION - EDDY COUNTY INTERCHANGE 230KV CKT 1'
G10_059_16SP	'TO->FROM'	'CAPROCK REC-PHILLIPS - CAPROCK REC-TATE 138KV CKT 1'	271	0.22216	101.0157	'CUNNINGHAM STATION - LEA COUNTY INTERCHANGE 230KV CKT 1'
G10_059_16SP	'TO->FROM'	'CAPROCK REC-PHILLIPS - CAPROCK REC-TATE 138KV CKT 1'	271	0.30014	132.3879	'HOBBS INTERCHANGE - LEA COUNTY INTERCHANGE 230KV CKT 1'
G10_059_16SP	'TO->FROM'	'CAPROCK REC-PHILLIPS - CAPROCK REC-TATE 138KV CKT 1'	271	0.20592	124.883	'BASE CASE'
G10_059_16SP	'TO->FROM'	'CAPROCK REC-PHILLIPS - CAPROCK REC-TATE 138KV CKT 1'	271	0.2108	101.3132	'TOLK STATION EAST - TUCO INTERCHANGE 230KV CKT 1'
G10_059_16SP	'TO->FROM'	'CAPROCK REC-PHILLIPS - CAPROCK REC-TATE 138KV CKT 1'	271	0.2142	100.8955	'SUNDOWN INTERCHANGE - WOLFFORTH INTERCHANGE 230KV CKT 1'
G10_059_16SP	'TO->FROM'	'CAPROCK REC-PHILLIPS - CAPROCK REC-TATE 138KV CKT 1'	271	0.21843	104.7249	'AMOCO SWITCHING STATION - YOAKUM COUNTY INTERCHANGE 230KV CKT 1'
G10_059_16SP	'TO->FROM'	'CAPROCK REC-PHILLIPS - CAPROCK REC-TATE 138KV CKT 1'	271	0.23588	107.9567	'LEA COUNTY INTERCHANGE - YOAKUM COUNTY INTERCHANGE 230KV CKT 1'
G10_059_16SP	'TO->FROM'	'CAPROCK REC-PHILLIPS - CAPROCK REC-TATE 138KV CKT 1'	271	0.21356	100.7768	'CUNNINGHAM STATION - EDDY COUNTY INTERCHANGE 230KV CKT 1'
G10_059_16SP	'TO->FROM'	'CAPROCK REC-PHILLIPS - CAPROCK REC-TATE 138KV CKT 1'	271	0.22214	100.7806	'CUNNINGHAM STATION - LEA COUNTY INTERCHANGE 230KV CKT 1'
G10_059_16SP	'TO->FROM'	'CAPROCK REC-PHILLIPS - CAPROCK REC-TATE 138KV CKT 1'	271	0.30013	132.1467	'HOBBS INTERCHANGE - LEA COUNTY INTERCHANGE 230KV CKT 1'
G10_059_16SP	'FROM->TO'	'CUNNINGHAM STATION - EDDY COUNTY INTERCHANGE 230KV CKT 1'	351	0.20631	105.8138	'CUNNINGHAM STATION - POTASH JUNCTION INTERCHANGE 230KV CKT 1'
G10_059_16SP	'FROM->TO'	'CUNNINGHAM STATION - EDDY COUNTY INTERCHANGE 230KV CKT 1'	351	0.20633	106.0398	'CUNNINGHAM STATION - POTASH JUNCTION INTERCHANGE 230KV CKT 1'
G10_059_16SP	'FROM->TO'	'HOBBS INTERCHANGE - LEA COUNTY INTERCHANGE 115KV CKT 1'	239	0.24315	123.364	'HOBBS INTERCHANGE - LEA COUNTY INTERCHANGE 230KV CKT 1'
G10_059_16SP	'FROM->TO'	'HOBBS INTERCHANGE - LEA COUNTY INTERCHANGE 115KV CKT 1'	239	0.24316	123.3829	'HOBBS INTERCHANGE - LEA COUNTY INTERCHANGE 230KV CKT 1'
G10_059_16SP	'FROM->TO'	'HOBBS INTERCHANGE - LEA COUNTY INTERCHANGE 230KV CKT 1'	617	0.70105	125.7867	'BASE CASE'
G10_059_16SP	'FROM->TO'	'HOBBS INTERCHANGE - LEA COUNTY INTERCHANGE 230KV CKT 1'	617	0.78545	106.5771	'CAPROCK REC-KOCH - CAPROCK REC-VEALMOOR 138KV CKT 1'
G10_059_16SP	'FROM->TO'	'HOBBS INTERCHANGE - LEA COUNTY INTERCHANGE 230KV CKT 1'	617	0.78545	106.6602	'CAPROCK REC-KOCH - CAPROCK REC-REED 138KV CKT 1'
G10_059_16SP	'FROM->TO'	'HOBBS INTERCHANGE - LEA COUNTY INTERCHANGE 230KV CKT 1'	617	0.78545	106.9485	'CAPROCK REC-GRADY - CAPROCK REC-REED 138KV CKT 1'
G10_059_16SP	'FROM->TO'	'HOBBS INTERCHANGE - LEA COUNTY INTERCHANGE 230KV CKT 1'	617	0.78545	107.8465	'CAPROCK REC-GRADY - CAPROCK REC-TRIANGLE 138KV CKT 1'
G10_059_16SP	'FROM->TO'	'HOBBS INTERCHANGE - LEA COUNTY INTERCHANGE 230KV CKT 1'	617	0.78545	109.1618	'CAPROCK REC-MCDONALD - CAPROCK REC-TRIANGLE 138KV CKT 1'
G10_059_16SP	'FROM->TO'	'HOBBS INTERCHANGE - LEA COUNTY INTERCHANGE 230KV CKT 1'	617	0.72499	101.4718	'CAPROCK REC-NEW SCHWARTZ - CAPROCK REC-PEMBROOK 138KV CKT 1'
G10_059_16SP	'FROM->TO'	'HOBBS INTERCHANGE - LEA COUNTY INTERCHANGE 230KV CKT 1'	617	0.72499	102.5575	'CAPROCK REC-NEW SCHWARTZ - CR-1956 4138.00 138KV CKT 1'
G10_059_16SP	'FROM->TO'	'HOBBS INTERCHANGE - LEA COUNTY INTERCHANGE 230KV CKT 1'	617	0.72499	100.9925	'CAPROCK REC-PEMBROOK - G09-17T 138.00 138KV CKT 1'
G10_059_16SP	'FROM->TO'	'HOBBS INTERCHANGE - LEA COUNTY INTERCHANGE 230KV CKT 1'	617	0.72499	102.8875	'CAPROCK REC-MCDONALD - CR-1956 4138.00 138KV CKT 1'
G10_059_16SP	'FROM->TO'	'HOBBS INTERCHANGE - LEA COUNTY INTERCHANGE 230KV CKT 1'	617	0.72499	100.4927	'CAPROCK REC-ST LAWRENCE - CAPROCK REC-STILES 138KV CKT 1'
G10_059_16SP	'FROM->TO'	'HOBBS INTERCHANGE - LEA COUNTY INTERCHANGE 230KV CKT 1'	617	0.72499	101.174	'CAPROCK REC-STILES - G09-17T 138.00 138KV CKT 1'
G10_059_16SP	'FROM->TO'	'HOBBS INTERCHANGE - LEA COUNTY INTERCHANGE 230KV CKT 1'	617	0.8843	129.6073	'CAPROCK REC-MCDONALD - CAPROCK REC-PHILLIPS 138KV CKT 1'
G10_059_16SP	'FROM->TO'	'HOBBS INTERCHANGE - LEA COUNTY INTERCHANGE 230KV CKT 1'	617	0.8843	132.8702	'CAPROCK REC-PHILLIPS - CAPROCK REC-TATE 138KV CKT 1'
G10_059_16SP	'FROM->TO'	'HOBBS INTERCHANGE - LEA COUNTY INTERCHANGE 230KV CKT 1'	617	0.8843	111.4188	'BORDEN COUNTY INTERCHANGE - GRASSLAND INTERCHANGE 230KV CKT 1'
G10_059_16SP	'FROM->TO'	'HOBBS INTERCHANGE - LEA COUNTY INTERCHANGE 230KV CKT 1'	617	0.68993	100.8185	'HOBBS INTERCHANGE - LEA COUNTY INTERCHANGE 115KV CKT 1'
G10_059_16SP	'FROM->TO'	'HOBBS INTERCHANGE - LEA COUNTY INTERCHANGE 230KV CKT 1'	617	0.78635	105.2554	'HOBBS INTERCHANGE 230/115KV TRANSFORMER CKT 1'
G10_059_16SP	'FROM->TO'	'HOBBS INTERCHANGE - LEA COUNTY INTERCHANGE 230KV CKT 1'	617	0.8843	133.9028	'MIDLAND 7345.00 (LIKE WICHITA) 345/138/13.8KV TRANSFORMER CKT 1'
G10_059_16SP	'FROM->TO'	'HOBBS INTERCHANGE - LEA COUNTY INTERCHANGE 230KV CKT 1'	617	0.8843	111.4186	'SPP-SWPS-K48'
G10_059_16SP	'FROM->TO'	'HOBBS INTERCHANGE - LEA COUNTY INTERCHANGE 230KV CKT 1'	617	0.70107	125.9117	'BASE CASE'
G10_059_16SP	'FROM->TO'	'HOBBS INTERCHANGE - LEA COUNTY INTERCHANGE 230KV CKT 1'	617	0.78547	106.6381	'CAPROCK REC-KOCH - CAPROCK REC-VEALMOOR 138KV CKT 1'
G10_059_16SP	'FROM->TO'	'HOBBS INTERCHANGE - LEA COUNTY INTERCHANGE 230KV CKT 1'	617	0.78547	106.7202	'CAPROCK REC-KOCH - CAPROCK REC-REED 138KV CKT 1'
G10_059_16SP	'FROM->TO'	'HOBBS INTERCHANGE - LEA COUNTY INTERCHANGE 230KV CKT 1'	617	0.78547	107.0098	'CAPROCK REC-GRADY - CAPROCK REC-REED 138KV CKT 1'
G10_059_16SP	'FROM->TO'	'HOBBS INTERCHANGE - LEA COUNTY INTERCHANGE 230KV CKT 1'	617	0.78547	107.9074	'CAPROCK REC-GRADY - CAPROCK REC-TRIANGLE 138KV CKT 1'
G10_059_16SP	'FROM->TO'	'HOBBS INTERCHANGE - LEA COUNTY INTERCHANGE 230KV CKT 1'	617	0.78547	109.2223	'CAPROCK REC-MCDONALD - CAPROCK REC-TRIANGLE 138KV CKT 1'
G10_059_16SP	'FROM->TO'	'HOBBS INTERCHANGE - LEA COUNTY INTERCHANGE 230KV CKT 1'	617	0.72501	101.5546	'CAPROCK REC-NEW SCHWARTZ - CAPROCK REC-PEMBROOK 138KV CKT 1'
G10_059_16SP	'FROM->TO'	'HOBBS INTERCHANGE - LEA COUNTY INTERCHANGE 230KV CKT 1'	617	0.72501	102.6329	'CAPROCK REC-NEW SCHWARTZ - CR-1956 4138.00 138KV CKT 1'

SOURCE	DIRECTION	MONTCOMMONNAME	RATEB	TDF	TC%LOADING	CONTNAME
G10_059_16SP	'FROM->TO'	'HOBBS INTERCHANGE - LEA COUNTY INTERCHANGE 230KV CKT 1'	617	0.72501	101.0759	'CAPROCK REC-PEMBROOK - G09-17T 138.00 138KV CKT 1'
G10_059_16SP	'FROM->TO'	'HOBBS INTERCHANGE - LEA COUNTY INTERCHANGE 230KV CKT 1'	617	0.72501	102.9626	'CAPROCK REC-MCDONALD - CR-1956 4138.00 138KV CKT 1'
G10_059_16SP	'FROM->TO'	'HOBBS INTERCHANGE - LEA COUNTY INTERCHANGE 230KV CKT 1'	617	0.72501	100.5786	'CAPROCK REC-ST LAWRENCE - CAPROCK REC-STILES 138KV CKT 1'
G10_059_16SP	'FROM->TO'	'HOBBS INTERCHANGE - LEA COUNTY INTERCHANGE 230KV CKT 1'	617	0.72501	101.2589	'CAPROCK REC-STILES - G09-17T 138.00 138KV CKT 1'
G10_059_16SP	'FROM->TO'	'HOBBS INTERCHANGE - LEA COUNTY INTERCHANGE 230KV CKT 1'	617	0.88431	129.6239	'CAPROCK REC-MCDONALD - CAPROCK REC-PHILLIPS 138KV CKT 1'
G10_059_16SP	'FROM->TO'	'HOBBS INTERCHANGE - LEA COUNTY INTERCHANGE 230KV CKT 1'	617	0.88431	132.8872	'CAPROCK REC-PHILLIPS - CAPROCK REC-TATE 138KV CKT 1'
G10_059_16SP	'FROM->TO'	'HOBBS INTERCHANGE - LEA COUNTY INTERCHANGE 230KV CKT 1'	617	0.88431	111.4453	'BORDEN COUNTY INTERCHANGE - GRASSLAND INTERCHANGE 230KV CKT 1'
G10_059_16SP	'FROM->TO'	'HOBBS INTERCHANGE - LEA COUNTY INTERCHANGE 230KV CKT 1'	617	0.68995	100.9115	'HOBBS INTERCHANGE - LEA COUNTY INTERCHANGE 115KV CKT 1'
G10_059_16SP	'FROM->TO'	'HOBBS INTERCHANGE - LEA COUNTY INTERCHANGE 230KV CKT 1'	617	0.78637	105.3438	'HOBBS INTERCHANGE 230/115KV TRANSFORMER CKT 1'
G10_059_16SP	'FROM->TO'	'HOBBS INTERCHANGE - LEA COUNTY INTERCHANGE 230KV CKT 1'	617	0.88431	133.9192	'MIDLAND 7345.00 (LIKE WICHITA) 345/138/13.8KV TRANSFORMER CKT 1'
G10_059_16SP	'FROM->TO'	'HOBBS INTERCHANGE 230/115KV TRANSFORMER CKT 1'	150	0.69378	422.9123	'HOBBS INTERCHANGE - LEA COUNTY INTERCHANGE 230KV CKT 1'
G10_059_16SP	'FROM->TO'	'HOBBS INTERCHANGE 230/115KV TRANSFORMER CKT 1'	150	0.6938	422.9377	'HOBBS INTERCHANGE - LEA COUNTY INTERCHANGE 230KV CKT 1'
G10_059_16SP	'FROM->TO'	'HOBBS_INT 7345.00 (LIKE POTTER) 345/230/13.2KV TRANSFORMER CKT 1'	559	1	125.6444	'CAPROCK REC-MCDONALD - CAPROCK REC-PHILLIPS 138KV CKT 1'
G10_059_16SP	'FROM->TO'	'HOBBS_INT 7345.00 (LIKE POTTER) 345/230/13.2KV TRANSFORMER CKT 1'	559	1	121.0307	'CAPROCK REC-MCDONALD - CAPROCK REC-PHILLIPS 138KV CKT 1'
G10_059_16SP	'FROM->TO'	'HOBBS_INT 7345.00 (LIKE POTTER) 345/230/13.2KV TRANSFORMER CKT 1'	559	1	129.9668	'CAPROCK REC-PHILLIPS - CAPROCK REC-TATE 138KV CKT 1'
G10_059_16SP	'FROM->TO'	'HOBBS_INT 7345.00 (LIKE POTTER) 345/230/13.2KV TRANSFORMER CKT 1'	559	1	124.911	'CAPROCK REC-PHILLIPS - CAPROCK REC-TATE 138KV CKT 1'
G10_059_16SP	'FROM->TO'	'HOBBS_INT 7345.00 (LIKE POTTER) 345/230/13.2KV TRANSFORMER CKT 1'	559	1	101.0793	'BORDEN COUNTY INTERCHANGE - GRASSLAND INTERCHANGE 230KV CKT 1'
G10_059_16SP	'FROM->TO'	'HOBBS_INT 7345.00 (LIKE POTTER) 345/230/13.2KV TRANSFORMER CKT 1'	559	1	131.3272	'MIDLAND 7345.00 (LIKE WICHITA) 345/138/13.8KV TRANSFORMER CKT 1'
G10_059_16SP	'FROM->TO'	'HOBBS_INT 7345.00 (LIKE POTTER) 345/230/13.2KV TRANSFORMER CKT 1'	559	1	126.1307	'MIDLAND 7345.00 (LIKE WICHITA) 345/138/13.8KV TRANSFORMER CKT 1'
G10_059_16SP	'FROM->TO'	'HOBBS_INT 7345.00 (LIKE POTTER) 345/230/13.2KV TRANSFORMER CKT 1'	559	1	101.0791	'SPP-SWPS-K48'
G10_059_16SP	'FROM->TO'	'HOBBS_INT 7345.00 (LIKE POTTER) 345/230/13.2KV TRANSFORMER CKT 1'	559	1	125.6451	'CAPROCK REC-MCDONALD - CAPROCK REC-PHILLIPS 138KV CKT 1'
G10_059_16SP	'FROM->TO'	'HOBBS_INT 7345.00 (LIKE POTTER) 345/230/13.2KV TRANSFORMER CKT 1'	559	1	121.0312	'CAPROCK REC-MCDONALD - CAPROCK REC-PHILLIPS 138KV CKT 1'
G10_059_16SP	'FROM->TO'	'HOBBS_INT 7345.00 (LIKE POTTER) 345/230/13.2KV TRANSFORMER CKT 1'	559	1	129.9676	'CAPROCK REC-PHILLIPS - CAPROCK REC-TATE 138KV CKT 1'
G10_059_16SP	'FROM->TO'	'HOBBS_INT 7345.00 (LIKE POTTER) 345/230/13.2KV TRANSFORMER CKT 1'	559	1	124.9115	'CAPROCK REC-PHILLIPS - CAPROCK REC-TATE 138KV CKT 1'
G10_059_16SP	'FROM->TO'	'HOBBS_INT 7345.00 (LIKE POTTER) 345/230/13.2KV TRANSFORMER CKT 1'	559	1	101.0794	'BORDEN COUNTY INTERCHANGE - GRASSLAND INTERCHANGE 230KV CKT 1'
G10_059_16SP	'FROM->TO'	'HOBBS_INT 7345.00 (LIKE POTTER) 345/230/13.2KV TRANSFORMER CKT 1'	559	1	131.328	'MIDLAND 7345.00 (LIKE WICHITA) 345/138/13.8KV TRANSFORMER CKT 1'
G10_059_16SP	'FROM->TO'	'HOBBS_INT 7345.00 (LIKE POTTER) 345/230/13.2KV TRANSFORMER CKT 1'	559	1	126.1312	'MIDLAND 7345.00 (LIKE WICHITA) 345/138/13.8KV TRANSFORMER CKT 1'
G10_059_16SP	'FROM->TO'	'LEA COUNTY INTERCHANGE - YOAKUM COUNTY INTERCHANGE 230KV CKT 1'	351	0.33838	100.0826	'CAPROCK REC-MCDONALD - CAPROCK REC-TRIANGLE 138KV CKT 1'
G10_059_16SP	'FROM->TO'	'LEA COUNTY INTERCHANGE - YOAKUM COUNTY INTERCHANGE 230KV CKT 1'	351	0.38425	115.9977	'CAPROCK REC-MCDONALD - CAPROCK REC-PHILLIPS 138KV CKT 1'
G10_059_16SP	'FROM->TO'	'LEA COUNTY INTERCHANGE - YOAKUM COUNTY INTERCHANGE 230KV CKT 1'	351	0.38425	118.4156	'CAPROCK REC-PHILLIPS - CAPROCK REC-TATE 138KV CKT 1'
G10_059_16SP	'FROM->TO'	'LEA COUNTY INTERCHANGE - YOAKUM COUNTY INTERCHANGE 230KV CKT 1'	351	0.36384	100.0792	'CHAVESCO 345.00 - TOLK STATION 345KV CKT 1'
G10_059_16SP	'FROM->TO'	'LEA COUNTY INTERCHANGE - YOAKUM COUNTY INTERCHANGE 230KV CKT 1'	351	0.38425	101.7795	'BORDEN COUNTY INTERCHANGE - GRASSLAND INTERCHANGE 230KV CKT 1'
G10_059_16SP	'FROM->TO'	'LEA COUNTY INTERCHANGE - YOAKUM COUNTY INTERCHANGE 230KV CKT 1'	351	0.32198	101.9638	'JOHNSON_DRW3115.00 - TAYLOR SWITCHING STATION 115KV CKT 1'
G10_059_16SP	'FROM->TO'	'LEA COUNTY INTERCHANGE - YOAKUM COUNTY INTERCHANGE 230KV CKT 1'	351	0.33416	106.9769	'CUNNINGHAM STATION - EDDY COUNTY INTERCHANGE 230KV CKT 1'
G10_059_16SP	'FROM->TO'	'LEA COUNTY INTERCHANGE - YOAKUM COUNTY INTERCHANGE 230KV CKT 1'	351	0.38856	109.3983	'CUNNINGHAM STATION - LEA COUNTY INTERCHANGE 230KV CKT 1'
G10_059_16SP	'FROM->TO'	'LEA COUNTY INTERCHANGE - YOAKUM COUNTY INTERCHANGE 230KV CKT 1'	351	0.31591	100.9335	'CUNNINGHAM STATION - POTASH JUNCTION INTERCHANGE 230KV CKT 1'
G10_059_16SP	'FROM->TO'	'LEA COUNTY INTERCHANGE - YOAKUM COUNTY INTERCHANGE 230KV CKT 1'	351	0.38425	119.1813	'MIDLAND 7345.00 (LIKE WICHITA) 345/138/13.8KV TRANSFORMER CKT 1'
G10_059_16SP	'FROM->TO'	'LEA COUNTY INTERCHANGE - YOAKUM COUNTY INTERCHANGE 230KV CKT 1'	351	0.38425	101.7797	'SPP-SWPS-K48'
G10_059_16SP	'FROM->TO'	'LEA COUNTY INTERCHANGE - YOAKUM COUNTY INTERCHANGE 230KV CKT 1'	351	0.33838	100	'CAPROCK REC-MCDONALD - CAPROCK REC-TRIANGLE 138KV CKT 1'
G10_059_16SP	'FROM->TO'	'LEA COUNTY INTERCHANGE - YOAKUM COUNTY INTERCHANGE 230KV CKT 1'	351	0.38424	115.8658	'CAPROCK REC-MCDONALD - CAPROCK REC-PHILLIPS 138KV CKT 1'
G10_059_16SP	'FROM->TO'	'LEA COUNTY INTERCHANGE - YOAKUM COUNTY INTERCHANGE 230KV CKT 1'	351	0.38424	118.2959	'CAPROCK REC-PHILLIPS - CAPROCK REC-TATE 138KV CKT 1'
G10_059_16SP	'FROM->TO'	'LEA COUNTY INTERCHANGE - YOAKUM COUNTY INTERCHANGE 230KV CKT 1'	351	0.36385	100.0775	'CHAVESCO 345.00 - TOLK STATION 345KV CKT 1'
G10_059_16SP	'FROM->TO'	'LEA COUNTY INTERCHANGE - YOAKUM COUNTY INTERCHANGE 230KV CKT 1'	351	0.38424	101.6368	'BORDEN COUNTY INTERCHANGE - GRASSLAND INTERCHANGE 230KV CKT 1'
G10_059_16SP	'FROM->TO'	'LEA COUNTY INTERCHANGE - YOAKUM COUNTY INTERCHANGE 230KV CKT 1'	351	0.32198	101.8745	'JOHNSON_DRW3115.00 - TAYLOR SWITCHING STATION 115KV CKT 1'
G10_059_16SP	'FROM->TO'	'LEA COUNTY INTERCHANGE - YOAKUM COUNTY INTERCHANGE 230KV CKT 1'	351	0.33416	106.9365	'CUNNINGHAM STATION - EDDY COUNTY INTERCHANGE 230KV CKT 1'
G10_059_16SP	'FROM->TO'	'LEA COUNTY INTERCHANGE - YOAKUM COUNTY INTERCHANGE 230KV CKT 1'	351	0.38857	109.3845	'CUNNINGHAM STATION - LEA COUNTY INTERCHANGE 230KV CKT 1'
G10_059_16SP	'FROM->TO'	'LEA COUNTY INTERCHANGE - YOAKUM COUNTY INTERCHANGE 230KV CKT 1'	351	0.31591	100.8707	'CUNNINGHAM STATION - POTASH JUNCTION INTERCHANGE 230KV CKT 1'
G10_059_16SP	'FROM->TO'	'LEA COUNTY INTERCHANGE - YOAKUM COUNTY INTERCHANGE 230KV CKT 1'	351	0.38424	119.0573	'MIDLAND 7345.00 (LIKE WICHITA) 345/138/13.8KV TRANSFORMER CKT 1'
G10_059_16SP		Non Converged Contingency	1623	0.79406	-	'HOBBS_INT 7345.00 - MIDLAND 7345.00 345KV CKT 1'
G10_059_16SP		Non Converged Contingency	559	0.79406	-	'HOBBS_INT 7345.00 (LIKE POTTER) 345/230/13.2KV TRANSFORMER CKT 1'
G10_059_16SP		Non Converged Contingency	1623	0.79408	-	'HOBBS_INT 7345.00 - MIDLAND 7345.00 345KV CKT 1'
G10_059_16SP		Non Converged Contingency	559	0.79408	-	'HOBBS_INT 7345.00 (LIKE POTTER) 345/230/13.2KV TRANSFORMER CKT 1'
G10_059_16SP	'TO->FROM'	'AMOCO SWITCHING STATION - YOAKUM COUNTY INTERCHANGE 230KV CKT 1'	351	0.21169	100	'CAPROCK REC-MCDONALD - CAPROCK REC-TRIANGLE 138KV CKT 1'
G10_059_16SP	'TO->FROM'	'AMOCO SWITCHING STATION - YOAKUM COUNTY INTERCHANGE 230KV CKT 1'	351	0.24592	111.2015	'CAPROCK REC-MCDONALD - CAPROCK REC-PHILLIPS 138KV CKT 1'

SOURCE	DIRECTION	MONTCOMMONNAME	RATEB	TDF	TC%LOADING	CONTNAME
G10_059_16SP	'TO->FROM'	'AMOCO SWITCHING STATION - YOAKUM COUNTY INTERCHANGE 230KV CKT 1'	351	0.24592	113.0509	'CAPROCK REC-PHILLIPS - CAPROCK REC-TATE 138KV CKT 1'
G10_059_16SP	'TO->FROM'	'AMOCO SWITCHING STATION - YOAKUM COUNTY INTERCHANGE 230KV CKT 1'	351	0.23974	102.8439	'TOLK STATION WEST - YOAKUM COUNTY INTERCHANGE 230KV CKT 1'
G10_059_16SP	'TO->FROM'	'AMOCO SWITCHING STATION - YOAKUM COUNTY INTERCHANGE 230KV CKT 1'	351	0.20415	101.419	'TERRY COUNTY INTERCHANGE - WOLFFORTH INTERCHANGE 115KV CKT 1'
G10_059_16SP	'TO->FROM'	'AMOCO SWITCHING STATION - YOAKUM COUNTY INTERCHANGE 230KV CKT 1'	351	0.24592	100.9855	'BORDEN COUNTY INTERCHANGE - GRASSLAND INTERCHANGE 230KV CKT 1'
G10_059_16SP	'TO->FROM'	'AMOCO SWITCHING STATION - YOAKUM COUNTY INTERCHANGE 230KV CKT 1'	351	0.20137	101.4744	'CUNNINGHAM STATION - EDDY COUNTY INTERCHANGE 230KV CKT 1'
G10_059_16SP	'TO->FROM'	'AMOCO SWITCHING STATION - YOAKUM COUNTY INTERCHANGE 230KV CKT 1'	351	0.24592	113.6361	'MIDLAND 7345.00 (LIKE WICHITA) 345/138/13.8KV TRANSFORMER CKT 1'
G10_059_16SP	'TO->FROM'	'CAPROCK REC-MCDONALD - CAPROCK REC-PHILLIPS 138KV CKT 1'	271	0.20537	113.6905	'BASE CASE'
G10_059_16SP	'TO->FROM'	'CAPROCK REC-PHILLIPS - CAPROCK REC-TATE 138KV CKT 1'	271	0.20537	124.997	'BASE CASE'
G10_059_16SP	'TO->FROM'	'CAPROCK REC-PHILLIPS - CAPROCK REC-TATE 138KV CKT 1'	271	0.21027	101.4989	'TOLK STATION EAST - TUCO INTERCHANGE 230KV CKT 1'
G10_059_16SP	'TO->FROM'	'CAPROCK REC-PHILLIPS - CAPROCK REC-TATE 138KV CKT 1'	271	0.21369	101.1064	'SUNDOWN INTERCHANGE - WOLFFORTH INTERCHANGE 230KV CKT 1'
G10_059_16SP	'TO->FROM'	'CAPROCK REC-PHILLIPS - CAPROCK REC-TATE 138KV CKT 1'	271	0.2179	104.8476	'AMOCO SWITCHING STATION - YOAKUM COUNTY INTERCHANGE 230KV CKT 1'
G10_059_16SP	'TO->FROM'	'CAPROCK REC-PHILLIPS - CAPROCK REC-TATE 138KV CKT 1'	271	0.23578	108.1917	'HOBBS INTERCHANGE - YOAKUM COUNTY INTERCHANGE 230KV CKT 1'
G10_059_16SP	'TO->FROM'	'CAPROCK REC-PHILLIPS - CAPROCK REC-TATE 138KV CKT 1'	271	0.21304	100.8653	'CUNNINGHAM STATION - EDDY COUNTY INTERCHANGE 230KV CKT 1'
G10_059_16SP	'TO->FROM'	'CAPROCK REC-PHILLIPS - CAPROCK REC-TATE 138KV CKT 1'	271	0.22194	100.748	'CUNNINGHAM STATION - HOBBS INTERCHANGE 230KV CKT 1'
G10_059_16SP	'FROM->TO'	'CUNNINGHAM STATION - EDDY COUNTY INTERCHANGE 230KV CKT 1'	351	0.20686	106.1547	'CUNNINGHAM STATION - POTASH JUNCTION INTERCHANGE 230KV CKT 1'
G10_059_16SP	'FROM->TO'	'HOBBS_INT 7345.00 (LIKE POTTER) 345/230/13.2KV TRANSFORMER CKT 1'	559	1	125.7207	'CAPROCK REC-MCDONALD - CAPROCK REC-PHILLIPS 138KV CKT 1'
G10_059_16SP	'FROM->TO'	'HOBBS_INT 7345.00 (LIKE POTTER) 345/230/13.2KV TRANSFORMER CKT 1'	559	1	121.0811	'CAPROCK REC-MCDONALD - CAPROCK REC-PHILLIPS 138KV CKT 1'
G10_059_16SP	'FROM->TO'	'HOBBS_INT 7345.00 (LIKE POTTER) 345/230/13.2KV TRANSFORMER CKT 1'	559	1	130.0438	'CAPROCK REC-PHILLIPS - CAPROCK REC-TATE 138KV CKT 1'
G10_059_16SP	'FROM->TO'	'HOBBS_INT 7345.00 (LIKE POTTER) 345/230/13.2KV TRANSFORMER CKT 1'	559	1	124.9623	'CAPROCK REC-PHILLIPS - CAPROCK REC-TATE 138KV CKT 1'
G10_059_16SP	'FROM->TO'	'HOBBS_INT 7345.00 (LIKE POTTER) 345/230/13.2KV TRANSFORMER CKT 1'	559	1	101.0793	'BORDEN COUNTY INTERCHANGE - GRASSLAND INTERCHANGE 230KV CKT 1'
G10_059_16SP	'FROM->TO'	'HOBBS_INT 7345.00 (LIKE POTTER) 345/230/13.2KV TRANSFORMER CKT 1'	559	1	131.4044	'MIDLAND 7345.00 (LIKE WICHITA) 345/138/13.8KV TRANSFORMER CKT 1'
G10_059_16SP	'FROM->TO'	'HOBBS_INT 7345.00 (LIKE POTTER) 345/230/13.2KV TRANSFORMER CKT 1'	559	1	126.1823	'MIDLAND 7345.00 (LIKE WICHITA) 345/138/13.8KV TRANSFORMER CKT 1'
G10_059_16SP		Non Converged Contingency	1623	0.79463	-	'HOBBS_INT 7345.00 - MIDLAND 7345.00 345KV CKT 1'
G10_059_16SP		Non Converged Contingency	559	0.79463	-	'HOBBS_INT 7345.00 (LIKE POTTER) 345/230/13.2KV TRANSFORMER CKT 1'
G10_059_16SP	'TO->FROM'	'AMOCO SWITCHING STATION - YOAKUM COUNTY INTERCHANGE 230KV CKT 1'	351	0.25178	104.75	'GRASSLAND 345.00 - JONES 345.00 345KV CKT 1'
G10_059_16SP	'TO->FROM'	'AMOCO SWITCHING STATION - YOAKUM COUNTY INTERCHANGE 230KV CKT 1'	351	0.21752	100	'CAPROCK REC-KOCH - CAPROCK REC-VEALMOOR 138KV CKT 1'
G10_059_16SP	'TO->FROM'	'AMOCO SWITCHING STATION - YOAKUM COUNTY INTERCHANGE 230KV CKT 1'	351	0.21752	100.0844	'CAPROCK REC-KOCH - CAPROCK REC-REED 138KV CKT 1'
G10_059_16SP	'TO->FROM'	'AMOCO SWITCHING STATION - YOAKUM COUNTY INTERCHANGE 230KV CKT 1'	351	0.21752	100.2723	'CAPROCK REC-GRADY - CAPROCK REC-REED 138KV CKT 1'
G10_059_16SP	'TO->FROM'	'AMOCO SWITCHING STATION - YOAKUM COUNTY INTERCHANGE 230KV CKT 1'	351	0.21752	100.7871	'CAPROCK REC-GRADY - CAPROCK REC-TRIANGLE 138KV CKT 1'
G10_059_16SP	'TO->FROM'	'AMOCO SWITCHING STATION - YOAKUM COUNTY INTERCHANGE 230KV CKT 1'	351	0.21752	101.5485	'CAPROCK REC-MCDONALD - CAPROCK REC-TRIANGLE 138KV CKT 1'
G10_059_16SP	'TO->FROM'	'AMOCO SWITCHING STATION - YOAKUM COUNTY INTERCHANGE 230KV CKT 1'	351	0.25178	112.1937	'CAPROCK REC-MCDONALD - CAPROCK REC-PHILLIPS 138KV CKT 1'
G10_059_16SP	'TO->FROM'	'AMOCO SWITCHING STATION - YOAKUM COUNTY INTERCHANGE 230KV CKT 1'	351	0.25178	113.842	'CAPROCK REC-PHILLIPS - CAPROCK REC-TATE 138KV CKT 1'
G10_059_16SP	'TO->FROM'	'AMOCO SWITCHING STATION - YOAKUM COUNTY INTERCHANGE 230KV CKT 1'	351	0.23934	103.1719	'TOLK STATION WEST - YOAKUM COUNTY INTERCHANGE 230KV CKT 1'
G10_059_16SP	'TO->FROM'	'AMOCO SWITCHING STATION - YOAKUM COUNTY INTERCHANGE 230KV CKT 1'	351	0.20905	102.9087	'TERRY COUNTY INTERCHANGE - WOLFFORTH INTERCHANGE 115KV CKT 1'
G10_059_16SP	'TO->FROM'	'AMOCO SWITCHING STATION - YOAKUM COUNTY INTERCHANGE 230KV CKT 1'	351	0.25178	102.7989	'BORDEN COUNTY INTERCHANGE - GRASSLAND 345.00 345KV CKT 1'
G10_059_16SP	'TO->FROM'	'AMOCO SWITCHING STATION - YOAKUM COUNTY INTERCHANGE 230KV CKT 1'	351	0.20509	102.7561	'CUNNINGHAM STATION - EDDY COUNTY INTERCHANGE 230KV CKT 1'
G10_059_16SP	'TO->FROM'	'AMOCO SWITCHING STATION - YOAKUM COUNTY INTERCHANGE 230KV CKT 1'	351	0.21511	100.3068	'CUNNINGHAM STATION - HOBBS INTERCHANGE 230KV CKT 1'
G10_059_16SP	'TO->FROM'	'AMOCO SWITCHING STATION - YOAKUM COUNTY INTERCHANGE 230KV CKT 1'	351	0.25178	114.3638	'MIDLAND 7345.00 (LIKE WICHITA) 345/138/13.8KV TRANSFORMER CKT 1'
G10_059_16SP	'TO->FROM'	'AMOCO SWITCHING STATION - YOAKUM COUNTY INTERCHANGE 230KV CKT 1'	351	0.19836	100.938	'COCHRAN INTERCHANGE - LEHMAN SUB 115KV CKT 1'
G10_059_16SP	'TO->FROM'	'AMOCO SWITCHING STATION - YOAKUM COUNTY INTERCHANGE 230KV CKT 1'	351	0.19836	101.6479	'LEHMAN SUB - LYNTEGAR REC-PLAINS 115KV CKT 1'
G10_059_16SP	'TO->FROM'	'AMOCO SWITCHING STATION - YOAKUM COUNTY INTERCHANGE 230KV CKT 1'	351	0.19864	101.5354	'DENVER CITY INTERCHANGE N. - TERRY COUNTY INTERCHANGE 115KV CKT 1'
G10_059_16SP	'TO->FROM'	'AMOCO SWITCHING STATION - YOAKUM COUNTY INTERCHANGE 230KV CKT 1'	351	0.19836	105.2772	'LEA COUNTY REC-PLAINS INTERCHANGE - YOAKUM COUNTY INTERCHANGE 115KV CKT 1'
G10_059_16SP	'TO->FROM'	'AMOCO SWITCHING STATION - YOAKUM COUNTY INTERCHANGE 230KV CKT 1'	351	0.19836	102.1488	'LEA COUNTY REC-PLAINS INTERCHANGE - LYNTEGAR REC-PLAINS 115KV CKT 1'
G10_059_16SP	'TO->FROM'	'CAPROCK REC-MCDONALD - CAPROCK REC-PHILLIPS 138KV CKT 1'	271	0.22447	120.7286	'BASE CASE'
G10_059_16SP	'TO->FROM'	'CAPROCK REC-MCDONALD - CAPROCK REC-PHILLIPS 138KV CKT 1'	271	0.23701	101.4521	'AMOCO SWITCHING STATION - YOAKUM COUNTY INTERCHANGE 230KV CKT 1'
G10_059_16SP	'TO->FROM'	'CAPROCK REC-MCDONALD - CAPROCK REC-PHILLIPS 138KV CKT 1'	271	0.25524	105.0178	'HOBBS INTERCHANGE - YOAKUM COUNTY INTERCHANGE 230KV CKT 1'
G10_059_16SP	'TO->FROM'	'CAPROCK REC-PHILLIPS - CAPROCK REC-TATE 138KV CKT 1'	271	0.22447	132.1467	'BASE CASE'
G10_059_16SP	'TO->FROM'	'CAPROCK REC-PHILLIPS - CAPROCK REC-TATE 138KV CKT 1'	271	0.22686	103.0332	'DEAF SMITH COUNTY INTERCHANGE - PLANT X STATION 230KV CKT 1'
G10_059_16SP	'TO->FROM'	'CAPROCK REC-PHILLIPS - CAPROCK REC-TATE 138KV CKT 1'	271	0.23051	103.2136	'OASIS INTERCHANGE - SAN JUAN MESA TAP 230KV CKT 1'
G10_059_16SP	'TO->FROM'	'CAPROCK REC-PHILLIPS - CAPROCK REC-TATE 138KV CKT 1'	271	0.22736	103.819	'NEWHART 6230.00 - PLANT X STATION 230KV CKT 1'
G10_059_16SP	'TO->FROM'	'CAPROCK REC-PHILLIPS - CAPROCK REC-TATE 138KV CKT 1'	271	0.22936	107.8309	'TOLK STATION EAST - TUCO INTERCHANGE 230KV CKT 1'
G10_059_16SP	'TO->FROM'	'CAPROCK REC-PHILLIPS - CAPROCK REC-TATE 138KV CKT 1'	271	0.2397	104.4714	'CHAVESCO 345.00 - TOLK STATION 345KV CKT 1'
G10_059_16SP	'TO->FROM'	'CAPROCK REC-PHILLIPS - CAPROCK REC-TATE 138KV CKT 1'	271	0.22678	103.1012	'DOUD SUB - YUMA INTERCHANGE 115KV CKT 1'
G10_059_16SP	'TO->FROM'	'CAPROCK REC-PHILLIPS - CAPROCK REC-TATE 138KV CKT 1'	271	0.23408	104.271	'LUBBOCK SOUTH INTERCHANGE - WOLFFORTH INTERCHANGE 230KV CKT 1'

SOURCE	DIRECTION	MONTCOMMONNAME	RATEB	TDF	TC%LOADING	CONTNAME
G10_059_16SP	'TO->FROM'	'CAPROCK REC-PHILLIPS - CAPROCK REC-TATE 138KV CKT 1'	271	0.23701	105.3871	'AMOCO SWITCHING STATION - SUNDOWN INTERCHANGE 230KV CKT 1'
G10_059_16SP	'TO->FROM'	'CAPROCK REC-PHILLIPS - CAPROCK REC-TATE 138KV CKT 1'	271	0.23342	106.4414	'SUNDOWN INTERCHANGE - WOLFFORTH INTERCHANGE 230KV CKT 1'
G10_059_16SP	'TO->FROM'	'CAPROCK REC-PHILLIPS - CAPROCK REC-TATE 138KV CKT 1'	271	0.23701	110.4324	'AMOCO SWITCHING STATION - YOAKUM COUNTY INTERCHANGE 230KV CKT 1'
G10_059_16SP	'TO->FROM'	'CAPROCK REC-PHILLIPS - CAPROCK REC-TATE 138KV CKT 1'	271	0.22678	103.7909	'WOLFFORTH INTERCHANGE - YUMA INTERCHANGE 115KV CKT 1'
G10_059_16SP	'TO->FROM'	'CAPROCK REC-PHILLIPS - CAPROCK REC-TATE 138KV CKT 1'	271	0.22977	104.2218	'TERRY COUNTY INTERCHANGE - WOLFFORTH INTERCHANGE 115KV CKT 1'
G10_059_16SP	'TO->FROM'	'CAPROCK REC-PHILLIPS - CAPROCK REC-TATE 138KV CKT 1'	271	0.22638	103.0569	'DENVER CITY INTERCHANGE N. - TERRY COUNTY INTERCHANGE 115KV CKT 1'
G10_059_16SP	'TO->FROM'	'CAPROCK REC-PHILLIPS - CAPROCK REC-TATE 138KV CKT 1'	271	0.25524	114.0716	'HOBBS INTERCHANGE - YOAKUM COUNTY INTERCHANGE 230KV CKT 1'
G10_059_16SP	'TO->FROM'	'CAPROCK REC-PHILLIPS - CAPROCK REC-TATE 138KV CKT 1'	271	0.22697	103.1191	'JOHNSON_DRW3115.00 - TAYLOR SWITCHING STATION 115KV CKT 1'
G10_059_16SP	'TO->FROM'	'CAPROCK REC-PHILLIPS - CAPROCK REC-TATE 138KV CKT 1'	271	0.22714	103.6231	'CHAVES COUNTY INTERCHANGE - EDDY COUNTY INTERCHANGE 230KV CKT 1'
G10_059_16SP	'TO->FROM'	'CAPROCK REC-PHILLIPS - CAPROCK REC-TATE 138KV CKT 1'	271	0.23241	106.7622	'CUNNINGHAM STATION - EDDY COUNTY INTERCHANGE 230KV CKT 1'
G10_059_16SP	'TO->FROM'	'CAPROCK REC-PHILLIPS - CAPROCK REC-TATE 138KV CKT 1'	271	0.2397	103.399	'CHAVESCO 345.00 - EDDY COUNTY INTERCHANGE 345KV CKT 1'
G10_059_16SP	'TO->FROM'	'CAPROCK REC-PHILLIPS - CAPROCK REC-TATE 138KV CKT 1'	271	0.24152	106.4933	'CUNNINGHAM STATION - HOBBS INTERCHANGE 230KV CKT 1'
G10_059_16SP	'TO->FROM'	'CAPROCK REC-PHILLIPS - CAPROCK REC-TATE 138KV CKT 1'	271	0.22799	104.5427	'CUNNINGHAM STATION - POTASH JUNCTION INTERCHANGE 230KV CKT 1'
G10_059_16SP	'TO->FROM'	'CAPROCK REC-PHILLIPS - CAPROCK REC-TATE 138KV CKT 1'	271	0.22671	103.1021	'PECOS INTERCHANGE - POTASH JUNCTION INTERCHANGE 230KV CKT 1'
G10_059_16SP	'TO->FROM'	'CAPROCK REC-PHILLIPS - CAPROCK REC-TATE 138KV CKT 1'	271	0.2397	104.4061	'TOLK STATION (ABBXNL844501) 345/230/13.2KV TRANSFORMER CKT 1'
G10_059_16SP	'TO->FROM'	'CAPROCK REC-PHILLIPS - CAPROCK REC-TATE 138KV CKT 1'	271	0.22704	103.526	'JONES 345.00 (UPDATE DATA) 345/230/13.8KV TRANSFORMER CKT 1'
G10_059_16SP	'TO->FROM'	'CAPROCK REC-PHILLIPS - CAPROCK REC-TATE 138KV CKT 1'	271	0.2397	103.4073	'EDDY COUNTY INTERCHANGE (ABB AEM30711) 345/230/13.2KV TRANSFORMER CKT 1'
G10_059_16SP	'TO->FROM'	'CAPROCK REC-PHILLIPS - CAPROCK REC-TATE 138KV CKT 1'	271	0.2184	105.9796	'HOBBS INTERCHANGE - YOAKUM COUNTY INTERCHANGE 230KV CKT 1'
G10_059_16SP	'TO->FROM'	'CAPROCK REC-PHILLIPS - CAPROCK REC-TATE 138KV CKT 1'	271	0.19842	102.9733	'AMOCO SWITCHING STATION - YOAKUM COUNTY INTERCHANGE 230KV CKT 1'
G10_059_16SP	'FROM->TO'	'CUNNINGHAM STATION - EDDY COUNTY INTERCHANGE 230KV CKT 1'	351	0.19748	104.1643	'CUNNINGHAM STATION - POTASH JUNCTION INTERCHANGE 230KV CKT 1'
G10_059_16SP	'FROM->TO'	'HOBBS INTERCHANGE (WH 7000751) 230/115/13.2KV TRANSFORMER CKT 2'	150	0.19632	100.586	'CUNNINGHAM STATION - HOBBS INTERCHANGE 230KV CKT 1'
G10_059_16SP	'FROM->TO'	'HOBBS INTERCHANGE 230/115KV TRANSFORMER CKT 1'	150	0.20672	105.8781	'CUNNINGHAM STATION - HOBBS INTERCHANGE 230KV CKT 1'
G10_059_16SP	'FROM->TO'	'HOBBS_INT 7345.00 (LIKE POTTER) 345/230/13.2KV TRANSFORMER CKT 1'	559	1	105.8592	'GRASSLAND 345.00 - JONES 345.00 345KV CKT 1'
G10_059_16SP	'FROM->TO'	'HOBBS_INT 7345.00 (LIKE POTTER) 345/230/13.2KV TRANSFORMER CKT 1'	559	1	102.999	'GRASSLAND 345.00 - JONES 345.00 345KV CKT 1'
G10_059_16SP	'FROM->TO'	'HOBBS_INT 7345.00 (LIKE POTTER) 345/230/13.2KV TRANSFORMER CKT 1'	559	1	125.7188	'CAPROCK REC-MCDONALD - CAPROCK REC-PHILLIPS 138KV CKT 1'
G10_059_16SP	'FROM->TO'	'HOBBS_INT 7345.00 (LIKE POTTER) 345/230/13.2KV TRANSFORMER CKT 1'	559	1	121.0798	'CAPROCK REC-MCDONALD - CAPROCK REC-PHILLIPS 138KV CKT 1'
G10_059_16SP	'FROM->TO'	'HOBBS_INT 7345.00 (LIKE POTTER) 345/230/13.2KV TRANSFORMER CKT 1'	559	1	130.0428	'CAPROCK REC-PHILLIPS - CAPROCK REC-TATE 138KV CKT 1'
G10_059_16SP	'FROM->TO'	'HOBBS_INT 7345.00 (LIKE POTTER) 345/230/13.2KV TRANSFORMER CKT 1'	559	1	124.9616	'CAPROCK REC-PHILLIPS - CAPROCK REC-TATE 138KV CKT 1'
G10_059_16SP	'FROM->TO'	'HOBBS_INT 7345.00 (LIKE POTTER) 345/230/13.2KV TRANSFORMER CKT 1'	559	1	100.7352	'BORDEN COUNTY INTERCHANGE - GRASSLAND 345.00 345KV CKT 1'
G10_059_16SP	'FROM->TO'	'HOBBS_INT 7345.00 (LIKE POTTER) 345/230/13.2KV TRANSFORMER CKT 1'	559	1	131.4037	'MIDLAND 7345.00 (LIKE WICHITA) 345/138/13.8KV TRANSFORMER CKT 1'
G10_059_16SP	'FROM->TO'	'HOBBS_INT 7345.00 (LIKE POTTER) 345/230/13.2KV TRANSFORMER CKT 1'	559	1	126.1818	'MIDLAND 7345.00 (LIKE WICHITA) 345/138/13.8KV TRANSFORMER CKT 1'
G10_059_16SP	'FROM->TO'	'HOBBS_INT 7345.00 (LIKE POTTER) 345/230/13.2KV TRANSFORMER CKT 1'	559	1	131.4261	'MIDLAND 7345.00 (LIKE WICHITA) 345/138/13.8KV TRANSFORMER CKT 1'
G10_059_16SP	'FROM->TO'	'HOBBS_INT 7345.00 (LIKE POTTER) 345/230/13.2KV TRANSFORMER CKT 1'	559	1	126.1968	'MIDLAND 7345.00 (LIKE WICHITA) 345/138/13.8KV TRANSFORMER CKT 1'
G10_059_16SP	'FROM->TO'	'HOBBS_INT 7345.00 (LIKE POTTER) 345/230/13.2KV TRANSFORMER CKT 1'	559	1	105.8593	'GRASSLAND 345.00 - JONES 345.00 345KV CKT 1'
G10_059_16SP	'FROM->TO'	'HOBBS_INT 7345.00 (LIKE POTTER) 345/230/13.2KV TRANSFORMER CKT 1'	559	1	102.999	'GRASSLAND 345.00 - JONES 345.00 345KV CKT 1'
G10_059_16SP	'FROM->TO'	'HOBBS_INT 7345.00 (LIKE POTTER) 345/230/13.2KV TRANSFORMER CKT 1'	559	1	125.74	'CAPROCK REC-MCDONALD - CAPROCK REC-PHILLIPS 138KV CKT 1'
G10_059_16SP	'FROM->TO'	'HOBBS_INT 7345.00 (LIKE POTTER) 345/230/13.2KV TRANSFORMER CKT 1'	559	1	121.0938	'CAPROCK REC-MCDONALD - CAPROCK REC-PHILLIPS 138KV CKT 1'
G10_059_16SP	'FROM->TO'	'HOBBS_INT 7345.00 (LIKE POTTER) 345/230/13.2KV TRANSFORMER CKT 1'	559	1	130.0649	'CAPROCK REC-PHILLIPS - CAPROCK REC-TATE 138KV CKT 1'
G10_059_16SP	'FROM->TO'	'HOBBS_INT 7345.00 (LIKE POTTER) 345/230/13.2KV TRANSFORMER CKT 1'	559	1	124.9764	'CAPROCK REC-PHILLIPS - CAPROCK REC-TATE 138KV CKT 1'
G10_059_16SP	'FROM->TO'	'HOBBS_INT 7345.00 (LIKE POTTER) 345/230/13.2KV TRANSFORMER CKT 1'	559	1	100.7352	'BORDEN COUNTY INTERCHANGE - GRASSLAND 345.00 345KV CKT 1'
G10_059_16SP		Non Converged Contingency	1623	0.77553	-	'HOBBS_INT 7345.00 - MIDLAND 7345.00 345KV CKT 1'
G10_059_16SP		Non Converged Contingency	559	0.77553	-	'HOBBS_INT 7345.00 (LIKE POTTER) 345/230/13.2KV TRANSFORMER CKT 1'
G10_059_16SP		Non Converged Contingency	1623	0.80849	-	'HOBBS_INT 7345.00 - MIDLAND 7345.00 345KV CKT 1'
G10_059_16SP		Non Converged Contingency	559	0.80849	-	'HOBBS_INT 7345.00 (LIKE POTTER) 345/230/13.2KV TRANSFORMER CKT 1'
G10_059_16SP	'TO->FROM'	'AMOCO SWITCHING STATION - YOAKUM COUNTY INTERCHANGE 230KV CKT 1'	351	0.25446	109.0374	'TUCO INTERCHANGE - YOAKUM 7 345.00 345KV CKT 1'
G10_059_16WP	'TO->FROM'	'CAPROCK REC-GRADY - CAPROCK REC-TRIANGLE 138KV CKT 1'	176	0.21105	103.5219	'HOBBS INTERCHANGE - LEA COUNTY INTERCHANGE 230KV CKT 1'
G10_059_16WP	'TO->FROM'	'CAPROCK REC-GRADY - CAPROCK REC-TRIANGLE 138KV CKT 1'	176	0.21101	103.4891	'HOBBS INTERCHANGE - LEA COUNTY INTERCHANGE 230KV CKT 1'
G10_059_16WP	'TO->FROM'	'CAPROCK REC-MCDONALD - CAPROCK REC-PHILLIPS 138KV CKT 1'	271	0.20567	107.2183	'BASE CASE'
G10_059_16WP	'TO->FROM'	'CAPROCK REC-MCDONALD - CAPROCK REC-PHILLIPS 138KV CKT 1'	271	0.29959	121.8565	'HOBBS INTERCHANGE - LEA COUNTY INTERCHANGE 230KV CKT 1'
G10_059_16WP	'TO->FROM'	'CAPROCK REC-MCDONALD - CAPROCK REC-PHILLIPS 138KV CKT 1'	271	0.20561	107.1833	'BASE CASE'
G10_059_16WP	'TO->FROM'	'CAPROCK REC-MCDONALD - CAPROCK REC-PHILLIPS 138KV CKT 1'	271	0.29953	121.836	'HOBBS INTERCHANGE - LEA COUNTY INTERCHANGE 230KV CKT 1'
G10_059_16WP	'TO->FROM'	'CAPROCK REC-PHILLIPS - CAPROCK REC-TATE 138KV CKT 1'	271	0.20567	116.2615	'BASE CASE'
G10_059_16WP	'TO->FROM'	'CAPROCK REC-PHILLIPS - CAPROCK REC-TATE 138KV CKT 1'	271	0.29959	130.1445	'HOBBS INTERCHANGE - LEA COUNTY INTERCHANGE 230KV CKT 1'
G10_059_16WP	'TO->FROM'	'CAPROCK REC-PHILLIPS - CAPROCK REC-TATE 138KV CKT 1'	271	0.20561	116.2258	'BASE CASE'

SOURCE	DIRECTION	MONTCOMMONNAME	RATEB	TDF	TC%LOADING	CONTNAME
G10_059_16WP	'TO->FROM'	'CAPROCK REC-PHILLIPS - CAPROCK REC-TATE 138KV CKT 1'	271	0.29953	130.1263	'HOBBS INTERCHANGE - LEA COUNTY INTERCHANGE 230KV CKT 1'
G10_059_16WP	'FROM->TO'	'HOBBS INTERCHANGE - LEA COUNTY INTERCHANGE 115KV CKT 1'	264	0.24264	103.7049	'HOBBS INTERCHANGE - LEA COUNTY INTERCHANGE 230KV CKT 1'
G10_059_16WP	'FROM->TO'	'HOBBS INTERCHANGE - LEA COUNTY INTERCHANGE 115KV CKT 1'	264	0.24262	103.7399	'HOBBS INTERCHANGE - LEA COUNTY INTERCHANGE 230KV CKT 1'
G10_059_16WP	'FROM->TO'	'HOBBS INTERCHANGE - LEA COUNTY INTERCHANGE 230KV CKT 1'	693	0.69889	108.4583	'BASE CASE'
G10_059_16WP	'FROM->TO'	'HOBBS INTERCHANGE - LEA COUNTY INTERCHANGE 230KV CKT 1'	693	0.88192	117.9508	'CAPROCK REC-MCDONALD - CAPROCK REC-PHILLIPS 138KV CKT 1'
G10_059_16WP	'FROM->TO'	'HOBBS INTERCHANGE - LEA COUNTY INTERCHANGE 230KV CKT 1'	693	0.88192	120.4354	'CAPROCK REC-PHILLIPS - CAPROCK REC-TATE 138KV CKT 1'
G10_059_16WP	'FROM->TO'	'HOBBS INTERCHANGE - LEA COUNTY INTERCHANGE 230KV CKT 1'	693	0.88192	103.326	'BORDEN COUNTY INTERCHANGE - GRASSLAND INTERCHANGE 230KV CKT 1'
G10_059_16WP	'FROM->TO'	'HOBBS INTERCHANGE - LEA COUNTY INTERCHANGE 230KV CKT 1'	693	0.78394	100.0778	'HOBBS INTERCHANGE 230/115KV TRANSFORMER CKT 1'
G10_059_16WP	'FROM->TO'	'HOBBS INTERCHANGE - LEA COUNTY INTERCHANGE 230KV CKT 1'	693	0.88192	121.477	'MIDLAND 7345.00 (LIKE WICHITA) 345/138/13.8KV TRANSFORMER CKT 1'
G10_059_16WP	'FROM->TO'	'HOBBS INTERCHANGE - LEA COUNTY INTERCHANGE 230KV CKT 1'	693	0.88192	103.326	'SPP-SWPS-K48'
G10_059_16WP	'FROM->TO'	'HOBBS INTERCHANGE - LEA COUNTY INTERCHANGE 230KV CKT 1'	693	0.69889	108.4694	'BASE CASE'
G10_059_16WP	'FROM->TO'	'HOBBS INTERCHANGE - LEA COUNTY INTERCHANGE 230KV CKT 1'	693	0.88186	117.9521	'CAPROCK REC-MCDONALD - CAPROCK REC-PHILLIPS 138KV CKT 1'
G10_059_16WP	'FROM->TO'	'HOBBS INTERCHANGE - LEA COUNTY INTERCHANGE 230KV CKT 1'	693	0.88186	120.4364	'CAPROCK REC-PHILLIPS - CAPROCK REC-TATE 138KV CKT 1'
G10_059_16WP	'FROM->TO'	'HOBBS INTERCHANGE - LEA COUNTY INTERCHANGE 230KV CKT 1'	693	0.88186	103.3274	'BORDEN COUNTY INTERCHANGE - GRASSLAND INTERCHANGE 230KV CKT 1'
G10_059_16WP	'FROM->TO'	'HOBBS INTERCHANGE - LEA COUNTY INTERCHANGE 230KV CKT 1'	693	0.78395	100.0866	'HOBBS INTERCHANGE 230/115KV TRANSFORMER CKT 1'
G10_059_16WP	'FROM->TO'	'HOBBS INTERCHANGE - LEA COUNTY INTERCHANGE 230KV CKT 1'	693	0.88186	121.4786	'MIDLAND 7345.00 (LIKE WICHITA) 345/138/13.8KV TRANSFORMER CKT 1'
G10_059_16WP	'FROM->TO'	'HOBBS INTERCHANGE - LEA COUNTY INTERCHANGE 230KV CKT 1'	693	0.88186	103.3274	'SPP-SWPS-K48'
G10_059_16WP	'FROM->TO'	'HOBBS INTERCHANGE 230/115KV TRANSFORMER CKT 1'	150	0.69166	456.2719	'HOBBS INTERCHANGE - LEA COUNTY INTERCHANGE 230KV CKT 1'
G10_059_16WP	'FROM->TO'	'HOBBS INTERCHANGE 230/115KV TRANSFORMER CKT 1'	150	0.69167	456.3802	'HOBBS INTERCHANGE - LEA COUNTY INTERCHANGE 230KV CKT 1'
G10_059_16WP	'FROM->TO'	'HOBBS INTERCHANGE 230/115KV TRANSFORMER CKT 1'	150	0.1981	121.0655	'CUNNINGHAM STATION - LEA COUNTY INTERCHANGE 230KV CKT 1'
G10_059_16WP	'FROM->TO'	'HOBBS INTERCHANGE 230/115KV TRANSFORMER CKT 1'	150	0.19813	121.088	'CUNNINGHAM STATION - LEA COUNTY INTERCHANGE 230KV CKT 1'
G10_059_16WP	'FROM->TO'	'HOBBS_INT 7345.00 (LIKE POTTER) 345/230/13.2KV TRANSFORMER CKT 1'	559	0.88906	103.2281	'CAPROCK REC-KOCH - CAPROCK REC-VEALMOOR 138KV CKT 1'
G10_059_16WP	'FROM->TO'	'HOBBS_INT 7345.00 (LIKE POTTER) 345/230/13.2KV TRANSFORMER CKT 1'	559	0.88906	100.3564	'CAPROCK REC-KOCH - CAPROCK REC-VEALMOOR 138KV CKT 1'
G10_059_16WP	'FROM->TO'	'HOBBS_INT 7345.00 (LIKE POTTER) 345/230/13.2KV TRANSFORMER CKT 1'	559	0.88906	103.2392	'CAPROCK REC-KOCH - CAPROCK REC-REED 138KV CKT 1'
G10_059_16WP	'FROM->TO'	'HOBBS_INT 7345.00 (LIKE POTTER) 345/230/13.2KV TRANSFORMER CKT 1'	559	0.88906	100.3639	'CAPROCK REC-KOCH - CAPROCK REC-REED 138KV CKT 1'
G10_059_16WP	'FROM->TO'	'HOBBS_INT 7345.00 (LIKE POTTER) 345/230/13.2KV TRANSFORMER CKT 1'	559	0.88906	103.6921	'CAPROCK REC-GRADY - CAPROCK REC-REED 138KV CKT 1'
G10_059_16WP	'FROM->TO'	'HOBBS_INT 7345.00 (LIKE POTTER) 345/230/13.2KV TRANSFORMER CKT 1'	559	0.88906	100.7827	'CAPROCK REC-GRADY - CAPROCK REC-REED 138KV CKT 1'
G10_059_16WP	'FROM->TO'	'HOBBS_INT 7345.00 (LIKE POTTER) 345/230/13.2KV TRANSFORMER CKT 1'	559	0.88906	104.9163	'CAPROCK REC-GRADY - CAPROCK REC-TRIANGLE 138KV CKT 1'
G10_059_16WP	'FROM->TO'	'HOBBS_INT 7345.00 (LIKE POTTER) 345/230/13.2KV TRANSFORMER CKT 1'	559	0.88906	101.9282	'CAPROCK REC-GRADY - CAPROCK REC-TRIANGLE 138KV CKT 1'
G10_059_16WP	'FROM->TO'	'HOBBS_INT 7345.00 (LIKE POTTER) 345/230/13.2KV TRANSFORMER CKT 1'	559	0.88906	106.2345	'CAPROCK REC-MCDONALD - CAPROCK REC-TRIANGLE 138KV CKT 1'
G10_059_16WP	'FROM->TO'	'HOBBS_INT 7345.00 (LIKE POTTER) 345/230/13.2KV TRANSFORMER CKT 1'	559	0.88906	103.1581	'CAPROCK REC-MCDONALD - CAPROCK REC-TRIANGLE 138KV CKT 1'
G10_059_16WP	'FROM->TO'	'HOBBS_INT 7345.00 (LIKE POTTER) 345/230/13.2KV TRANSFORMER CKT 1'	559	1	132.3286	'CAPROCK REC-MCDONALD - CAPROCK REC-PHILLIPS 138KV CKT 1'
G10_059_16WP	'FROM->TO'	'HOBBS_INT 7345.00 (LIKE POTTER) 345/230/13.2KV TRANSFORMER CKT 1'	559	1	127.0384	'CAPROCK REC-MCDONALD - CAPROCK REC-PHILLIPS 138KV CKT 1'
G10_059_16WP	'FROM->TO'	'HOBBS_INT 7345.00 (LIKE POTTER) 345/230/13.2KV TRANSFORMER CKT 1'	559	1	135.8065	'CAPROCK REC-PHILLIPS - CAPROCK REC-TATE 138KV CKT 1'
G10_059_16WP	'FROM->TO'	'HOBBS_INT 7345.00 (LIKE POTTER) 345/230/13.2KV TRANSFORMER CKT 1'	559	1	130.1261	'CAPROCK REC-PHILLIPS - CAPROCK REC-TATE 138KV CKT 1'
G10_059_16WP	'FROM->TO'	'HOBBS_INT 7345.00 (LIKE POTTER) 345/230/13.2KV TRANSFORMER CKT 1'	559	1	111.5807	'BORDEN COUNTY INTERCHANGE - GRASSLAND INTERCHANGE 230KV CKT 1'
G10_059_16WP	'FROM->TO'	'HOBBS_INT 7345.00 (LIKE POTTER) 345/230/13.2KV TRANSFORMER CKT 1'	559	1	108.1456	'BORDEN COUNTY INTERCHANGE - GRASSLAND INTERCHANGE 230KV CKT 1'
G10_059_16WP	'FROM->TO'	'HOBBS_INT 7345.00 (LIKE POTTER) 345/230/13.2KV TRANSFORMER CKT 1'	559	1	137.2562	'MIDLAND 7345.00 (LIKE WICHITA) 345/138/13.8KV TRANSFORMER CKT 1'
G10_059_16WP	'FROM->TO'	'HOBBS_INT 7345.00 (LIKE POTTER) 345/230/13.2KV TRANSFORMER CKT 1'	559	1	131.4125	'MIDLAND 7345.00 (LIKE WICHITA) 345/138/13.8KV TRANSFORMER CKT 1'
G10_059_16WP	'FROM->TO'	'HOBBS_INT 7345.00 (LIKE POTTER) 345/230/13.2KV TRANSFORMER CKT 1'	559	1	111.5808	'SPP-SWPS-K48'
G10_059_16WP	'FROM->TO'	'HOBBS_INT 7345.00 (LIKE POTTER) 345/230/13.2KV TRANSFORMER CKT 1'	559	1	108.1457	'SPP-SWPS-K48'
G10_059_16WP	'FROM->TO'	'HOBBS_INT 7345.00 (LIKE POTTER) 345/230/13.2KV TRANSFORMER CKT 1'	559	0.88909	103.2339	'CAPROCK REC-KOCH - CAPROCK REC-VEALMOOR 138KV CKT 1'
G10_059_16WP	'FROM->TO'	'HOBBS_INT 7345.00 (LIKE POTTER) 345/230/13.2KV TRANSFORMER CKT 1'	559	0.88909	100.362	'CAPROCK REC-KOCH - CAPROCK REC-VEALMOOR 138KV CKT 1'
G10_059_16WP	'FROM->TO'	'HOBBS_INT 7345.00 (LIKE POTTER) 345/230/13.2KV TRANSFORMER CKT 1'	559	0.88909	103.245	'CAPROCK REC-KOCH - CAPROCK REC-REED 138KV CKT 1'
G10_059_16WP	'FROM->TO'	'HOBBS_INT 7345.00 (LIKE POTTER) 345/230/13.2KV TRANSFORMER CKT 1'	559	0.88909	100.3694	'CAPROCK REC-KOCH - CAPROCK REC-REED 138KV CKT 1'
G10_059_16WP	'FROM->TO'	'HOBBS_INT 7345.00 (LIKE POTTER) 345/230/13.2KV TRANSFORMER CKT 1'	559	0.88909	103.6979	'CAPROCK REC-GRADY - CAPROCK REC-REED 138KV CKT 1'
G10_059_16WP	'FROM->TO'	'HOBBS_INT 7345.00 (LIKE POTTER) 345/230/13.2KV TRANSFORMER CKT 1'	559	0.88909	100.7882	'CAPROCK REC-GRADY - CAPROCK REC-REED 138KV CKT 1'
G10_059_16WP	'FROM->TO'	'HOBBS_INT 7345.00 (LIKE POTTER) 345/230/13.2KV TRANSFORMER CKT 1'	559	0.88909	104.9219	'CAPROCK REC-GRADY - CAPROCK REC-TRIANGLE 138KV CKT 1'
G10_059_16WP	'FROM->TO'	'HOBBS_INT 7345.00 (LIKE POTTER) 345/230/13.2KV TRANSFORMER CKT 1'	559	0.88909	101.9336	'CAPROCK REC-GRADY - CAPROCK REC-TRIANGLE 138KV CKT 1'
G10_059_16WP	'FROM->TO'	'HOBBS_INT 7345.00 (LIKE POTTER) 345/230/13.2KV TRANSFORMER CKT 1'	559	0.88909	106.24	'CAPROCK REC-MCDONALD - CAPROCK REC-TRIANGLE 138KV CKT 1'
G10_059_16WP	'FROM->TO'	'HOBBS_INT 7345.00 (LIKE POTTER) 345/230/13.2KV TRANSFORMER CKT 1'	559	0.88909	103.1634	'CAPROCK REC-MCDONALD - CAPROCK REC-TRIANGLE 138KV CKT 1'
G10_059_16WP	'FROM->TO'	'HOBBS_INT 7345.00 (LIKE POTTER) 345/230/13.2KV TRANSFORMER CKT 1'	559	1	132.3287	'CAPROCK REC-MCDONALD - CAPROCK REC-PHILLIPS 138KV CKT 1'
G10_059_16WP	'FROM->TO'	'HOBBS_INT 7345.00 (LIKE POTTER) 345/230/13.2KV TRANSFORMER CKT 1'	559	1	127.0385	'CAPROCK REC-MCDONALD - CAPROCK REC-PHILLIPS 138KV CKT 1'
G10_059_16WP	'FROM->TO'	'HOBBS_INT 7345.00 (LIKE POTTER) 345/230/13.2KV TRANSFORMER CKT 1'	559	1	135.8064	'CAPROCK REC-PHILLIPS - CAPROCK REC-TATE 138KV CKT 1'

SOURCE	DIRECTION	MONTCOMMONNAME	RATEB	TDF	TC%LOADING	CONTNAME
G10_059_16WP	'FROM->TO'	'HOBBS_INT 7345.00 (LIKE POTTER) 345/230/13.2KV TRANSFORMER CKT 1'	559	1	130.1261	'CAPROCK REC-PHILLIPS - CAPROCK REC-TATE 138KV CKT 1'
G10_059_16WP	'FROM->TO'	'HOBBS_INT 7345.00 (LIKE POTTER) 345/230/13.2KV TRANSFORMER CKT 1'	559	1	111.5807	'BORDEN COUNTY INTERCHANGE - GRASSLAND INTERCHANGE 230KV CKT 1'
G10_059_16WP	'FROM->TO'	'HOBBS_INT 7345.00 (LIKE POTTER) 345/230/13.2KV TRANSFORMER CKT 1'	559	1	108.1456	'BORDEN COUNTY INTERCHANGE - GRASSLAND INTERCHANGE 230KV CKT 1'
G10_059_16WP	'FROM->TO'	'HOBBS_INT 7345.00 (LIKE POTTER) 345/230/13.2KV TRANSFORMER CKT 1'	559	1	137.2564	'MIDLAND 7345.00 (LIKE WICHITA) 345/138/13.8KV TRANSFORMER CKT 1'
G10_059_16WP	'FROM->TO'	'HOBBS_INT 7345.00 (LIKE POTTER) 345/230/13.2KV TRANSFORMER CKT 1'	559	1	131.4126	'MIDLAND 7345.00 (LIKE WICHITA) 345/138/13.8KV TRANSFORMER CKT 1'
G10_059_16WP	'FROM->TO'	'HOBBS_INT 7345.00 (LIKE POTTER) 345/230/13.2KV TRANSFORMER CKT 1'	559	1	111.5808	'SPP-SWPS-K48'
G10_059_16WP	'FROM->TO'	'HOBBS_INT 7345.00 (LIKE POTTER) 345/230/13.2KV TRANSFORMER CKT 1'	559	1	108.1457	'SPP-SWPS-K48'
G10_059_16WP	'FROM->TO'	'LEA COUNTY INTERCHANGE - YOAKUM COUNTY INTERCHANGE 230KV CKT 1'	361	0.38377	102.3977	'CAPROCK REC-MCDONALD - CAPROCK REC-PHILLIPS 138KV CKT 1'
G10_059_16WP	'FROM->TO'	'LEA COUNTY INTERCHANGE - YOAKUM COUNTY INTERCHANGE 230KV CKT 1'	361	0.38377	104.4485	'CAPROCK REC-PHILLIPS - CAPROCK REC-TATE 138KV CKT 1'
G10_059_16WP	'FROM->TO'	'LEA COUNTY INTERCHANGE - YOAKUM COUNTY INTERCHANGE 230KV CKT 1'	361	0.38377	105.3051	'MIDLAND 7345.00 (LIKE WICHITA) 345/138/13.8KV TRANSFORMER CKT 1'
G10_059_16WP	'FROM->TO'	'LEA COUNTY INTERCHANGE - YOAKUM COUNTY INTERCHANGE 230KV CKT 1'	361	0.38368	102.3881	'CAPROCK REC-MCDONALD - CAPROCK REC-PHILLIPS 138KV CKT 1'
G10_059_16WP	'FROM->TO'	'LEA COUNTY INTERCHANGE - YOAKUM COUNTY INTERCHANGE 230KV CKT 1'	361	0.38368	104.4363	'CAPROCK REC-PHILLIPS - CAPROCK REC-TATE 138KV CKT 1'
G10_059_16WP	'FROM->TO'	'LEA COUNTY INTERCHANGE - YOAKUM COUNTY INTERCHANGE 230KV CKT 1'	361	0.38368	105.2965	'MIDLAND 7345.00 (LIKE WICHITA) 345/138/13.8KV TRANSFORMER CKT 1'
G10_059_16WP		Non Converged Contingency	1684	0.79433	-	'HOBBS_INT 7345.00 - MIDLAND 7345.00 345KV CKT 1'
G10_059_16WP		Non Converged Contingency	559	0.79433	-	'HOBBS_INT 7345.00 (LIKE POTTER) 345/230/13.2KV TRANSFORMER CKT 1'
G10_059_16WP		Non Converged Contingency	1684	0.79439	-	'HOBBS_INT 7345.00 - MIDLAND 7345.00 345KV CKT 1'
G10_059_16WP		Non Converged Contingency	559	0.79439	-	'HOBBS_INT 7345.00 (LIKE POTTER) 345/230/13.2KV TRANSFORMER CKT 1'
G10_059_16WP	'FROM->TO'	'TUCO INTERCHANGE (GE M1022338) 345/230/13.2KV TRANSFORMER CKT 1'	560	0.42222	109.5005	'TUCO INTERCHANGE (UPDATE DATA) 345/230/13.2KV TRANSFORMER CKT 2'
G10_059_16WP	'FROM->TO'	'TUCO INTERCHANGE (GE M1022338) 345/230/13.2KV TRANSFORMER CKT 1'	560	0.42222	110.4246	'TUCO INTERCHANGE (UPDATE DATA) 345/230/13.2KV TRANSFORMER CKT 2'
G10_059_16WP	'FROM->TO'	'TUCO INTERCHANGE (GE M1022338) 345/230/13.2KV TRANSFORMER CKT 1'	560	0.42	108.954	'TUCO INTERCHANGE (UPDATE DATA) 345/230/13.2KV TRANSFORMER CKT 2'
G10_059_16WP	'FROM->TO'	'TUCO INTERCHANGE (GE M1022338) 345/230/13.2KV TRANSFORMER CKT 1'	560	0.42	109.5589	'TUCO INTERCHANGE (UPDATE DATA) 345/230/13.2KV TRANSFORMER CKT 2'
G10_059_16WP	'FROM->TO'	'TUCO INTERCHANGE (UPDATE DATA) 345/230/13.2KV TRANSFORMER CKT 2'	560	0.4115	107.0935	'TUCO INTERCHANGE (GE M1022338) 345/230/13.2KV TRANSFORMER CKT 1'
G10_059_16WP	'FROM->TO'	'TUCO INTERCHANGE (UPDATE DATA) 345/230/13.2KV TRANSFORMER CKT 2'	560	0.4115	107.9143	'TUCO INTERCHANGE (GE M1022338) 345/230/13.2KV TRANSFORMER CKT 1'
G10_059_16WP	'FROM->TO'	'TUCO INTERCHANGE (UPDATE DATA) 345/230/13.2KV TRANSFORMER CKT 2'	560	0.40931	106.471	'TUCO INTERCHANGE (GE M1022338) 345/230/13.2KV TRANSFORMER CKT 1'
G10_059_16WP	'FROM->TO'	'TUCO INTERCHANGE (UPDATE DATA) 345/230/13.2KV TRANSFORMER CKT 2'	560	0.40931	107.075	'TUCO INTERCHANGE (GE M1022338) 345/230/13.2KV TRANSFORMER CKT 1'
G10_059_16WP	'TO->FROM'	'CAPROCK REC-MCDONALD - CAPROCK REC-PHILLIPS 138KV CKT 1'	271	0.20511	106.9914	'BASE CASE'
G10_059_16WP	'TO->FROM'	'CAPROCK REC-PHILLIPS - CAPROCK REC-TATE 138KV CKT 1'	271	0.20511	116.0299	'BASE CASE'
G10_059_16WP	'FROM->TO'	'HOBBS INTERCHANGE 230/115KV TRANSFORMER CKT 1'	150	0.20492	123.2924	'CUNNINGHAM STATION - HOBBS INTERCHANGE 230KV CKT 1'
G10_059_16WP	'FROM->TO'	'HOBBS INTERCHANGE 230/115KV TRANSFORMER CKT 1'	150	0.19546	113.8258	'CUNNINGHAM STATION - HOBBS INTERCHANGE 230KV CKT 1'
G10_059_16WP	'FROM->TO'	'HOBBS_INT 7345.00 (LIKE POTTER) 345/230/13.2KV TRANSFORMER CKT 1'	559	0.8894	103.366	'CAPROCK REC-KOCH - CAPROCK REC-VEALMOOR 138KV CKT 1'
G10_059_16WP	'FROM->TO'	'HOBBS_INT 7345.00 (LIKE POTTER) 345/230/13.2KV TRANSFORMER CKT 1'	559	0.8894	100.4627	'CAPROCK REC-KOCH - CAPROCK REC-VEALMOOR 138KV CKT 1'
G10_059_16WP	'FROM->TO'	'HOBBS_INT 7345.00 (LIKE POTTER) 345/230/13.2KV TRANSFORMER CKT 1'	559	0.8894	103.3777	'CAPROCK REC-KOCH - CAPROCK REC-REED 138KV CKT 1'
G10_059_16WP	'FROM->TO'	'HOBBS_INT 7345.00 (LIKE POTTER) 345/230/13.2KV TRANSFORMER CKT 1'	559	0.8894	100.4705	'CAPROCK REC-KOCH - CAPROCK REC-REED 138KV CKT 1'
G10_059_16WP	'FROM->TO'	'HOBBS_INT 7345.00 (LIKE POTTER) 345/230/13.2KV TRANSFORMER CKT 1'	559	0.8894	103.8343	'CAPROCK REC-GRADY - CAPROCK REC-REED 138KV CKT 1'
G10_059_16WP	'FROM->TO'	'HOBBS_INT 7345.00 (LIKE POTTER) 345/230/13.2KV TRANSFORMER CKT 1'	559	0.8894	100.891	'CAPROCK REC-GRADY - CAPROCK REC-REED 138KV CKT 1'
G10_059_16WP	'FROM->TO'	'HOBBS_INT 7345.00 (LIKE POTTER) 345/230/13.2KV TRANSFORMER CKT 1'	559	0.8894	105.0668	'CAPROCK REC-GRADY - CAPROCK REC-TRIANGLE 138KV CKT 1'
G10_059_16WP	'FROM->TO'	'HOBBS_INT 7345.00 (LIKE POTTER) 345/230/13.2KV TRANSFORMER CKT 1'	559	0.8894	102.0423	'CAPROCK REC-GRADY - CAPROCK REC-TRIANGLE 138KV CKT 1'
G10_059_16WP	'FROM->TO'	'HOBBS_INT 7345.00 (LIKE POTTER) 345/230/13.2KV TRANSFORMER CKT 1'	559	0.8894	106.3947	'CAPROCK REC-MCDONALD - CAPROCK REC-TRIANGLE 138KV CKT 1'
G10_059_16WP	'FROM->TO'	'HOBBS_INT 7345.00 (LIKE POTTER) 345/230/13.2KV TRANSFORMER CKT 1'	559	0.8894	103.2785	'CAPROCK REC-MCDONALD - CAPROCK REC-TRIANGLE 138KV CKT 1'
G10_059_16WP	'FROM->TO'	'HOBBS_INT 7345.00 (LIKE POTTER) 345/230/13.2KV TRANSFORMER CKT 1'	559	1	132.9174	'CAPROCK REC-MCDONALD - CAPROCK REC-PHILLIPS 138KV CKT 1'
G10_059_16WP	'FROM->TO'	'HOBBS_INT 7345.00 (LIKE POTTER) 345/230/13.2KV TRANSFORMER CKT 1'	559	1	127.4335	'CAPROCK REC-MCDONALD - CAPROCK REC-PHILLIPS 138KV CKT 1'
G10_059_16WP	'FROM->TO'	'HOBBS_INT 7345.00 (LIKE POTTER) 345/230/13.2KV TRANSFORMER CKT 1'	559	1	136.482	'CAPROCK REC-PHILLIPS - CAPROCK REC-TATE 138KV CKT 1'
G10_059_16WP	'FROM->TO'	'HOBBS_INT 7345.00 (LIKE POTTER) 345/230/13.2KV TRANSFORMER CKT 1'	559	1	130.5841	'CAPROCK REC-PHILLIPS - CAPROCK REC-TATE 138KV CKT 1'
G10_059_16WP	'FROM->TO'	'HOBBS_INT 7345.00 (LIKE POTTER) 345/230/13.2KV TRANSFORMER CKT 1'	559	1	111.7243	'BORDEN COUNTY INTERCHANGE - GRASSLAND INTERCHANGE 230KV CKT 1'
G10_059_16WP	'FROM->TO'	'HOBBS_INT 7345.00 (LIKE POTTER) 345/230/13.2KV TRANSFORMER CKT 1'	559	1	108.2397	'BORDEN COUNTY INTERCHANGE - GRASSLAND INTERCHANGE 230KV CKT 1'
G10_059_16WP	'FROM->TO'	'HOBBS_INT 7345.00 (LIKE POTTER) 345/230/13.2KV TRANSFORMER CKT 1'	559	1	137.967	'MIDLAND 7345.00 (LIKE WICHITA) 345/138/13.8KV TRANSFORMER CKT 1'
G10_059_16WP	'FROM->TO'	'HOBBS_INT 7345.00 (LIKE POTTER) 345/230/13.2KV TRANSFORMER CKT 1'	559	1	131.8967	'MIDLAND 7345.00 (LIKE WICHITA) 345/138/13.8KV TRANSFORMER CKT 1'
G10_059_16WP	'FROM->TO'	'HOBBS_INT 7345.00 (LIKE POTTER) 345/230/13.2KV TRANSFORMER CKT 1'	559	1	111.7244	'SPP-SWPS-K48'
G10_059_16WP	'FROM->TO'	'HOBBS_INT 7345.00 (LIKE POTTER) 345/230/13.2KV TRANSFORMER CKT 1'	559	1	108.2398	'SPP-SWPS-K48'
G10_059_16WP	'FROM->TO'	'HOBBS_INT 7345.00 (LIKE POTTER) 345/230/13.2KV TRANSFORMER CKT 1'	559	0.90309	103.2719	'CAPROCK REC-KOCH - CAPROCK REC-VEALMOOR 138KV CKT 1'
G10_059_16WP	'FROM->TO'	'HOBBS_INT 7345.00 (LIKE POTTER) 345/230/13.2KV TRANSFORMER CKT 1'	559	0.90309	100.3723	'CAPROCK REC-KOCH - CAPROCK REC-VEALMOOR 138KV CKT 1'
G10_059_16WP	'FROM->TO'	'HOBBS_INT 7345.00 (LIKE POTTER) 345/230/13.2KV TRANSFORMER CKT 1'	559	0.90309	103.2831	'CAPROCK REC-KOCH - CAPROCK REC-REED 138KV CKT 1'
G10_059_16WP	'FROM->TO'	'HOBBS_INT 7345.00 (LIKE POTTER) 345/230/13.2KV TRANSFORMER CKT 1'	559	0.90309	100.3799	'CAPROCK REC-KOCH - CAPROCK REC-REED 138KV CKT 1'
G10_059_16WP	'FROM->TO'	'HOBBS_INT 7345.00 (LIKE POTTER) 345/230/13.2KV TRANSFORMER CKT 1'	559	0.90309	103.74	'CAPROCK REC-GRADY - CAPROCK REC-REED 138KV CKT 1'

SOURCE	DIRECTION	MONTCOMMONNAME	RATEB	TDF	TC%LOADING	CONTNAME
G10_059_16WP	'FROM->TO'	'HOBBS_INT 7345.00 (LIKE POTTER) 345/230/13.2KV TRANSFORMER CKT 1'	559	0.90309	100.8012	'CAPROCK REC-GRADY - CAPROCK REC-REED 138KV CKT 1'
G10_059_16WP	'FROM->TO'	'HOBBS_INT 7345.00 (LIKE POTTER) 345/230/13.2KV TRANSFORMER CKT 1'	559	0.90309	104.9712	'CAPROCK REC-GRADY - CAPROCK REC-TRIANGLE 138KV CKT 1'
G10_059_16WP	'FROM->TO'	'HOBBS_INT 7345.00 (LIKE POTTER) 345/230/13.2KV TRANSFORMER CKT 1'	559	0.90309	101.9513	'CAPROCK REC-GRADY - CAPROCK REC-TRIANGLE 138KV CKT 1'
G10_059_16WP	'FROM->TO'	'HOBBS_INT 7345.00 (LIKE POTTER) 345/230/13.2KV TRANSFORMER CKT 1'	559	0.90309	106.2995	'CAPROCK REC-MCDONALD - CAPROCK REC-TRIANGLE 138KV CKT 1'
G10_059_16WP	'FROM->TO'	'HOBBS_INT 7345.00 (LIKE POTTER) 345/230/13.2KV TRANSFORMER CKT 1'	559	0.90309	103.1881	'CAPROCK REC-MCDONALD - CAPROCK REC-TRIANGLE 138KV CKT 1'
G10_059_16WP	'FROM->TO'	'HOBBS_INT 7345.00 (LIKE POTTER) 345/230/13.2KV TRANSFORMER CKT 1'	559	1	132.9007	'CAPROCK REC-MCDONALD - CAPROCK REC-PHILLIPS 138KV CKT 1'
G10_059_16WP	'FROM->TO'	'HOBBS_INT 7345.00 (LIKE POTTER) 345/230/13.2KV TRANSFORMER CKT 1'	559	1	127.4222	'CAPROCK REC-MCDONALD - CAPROCK REC-PHILLIPS 138KV CKT 1'
G10_059_16WP	'FROM->TO'	'HOBBS_INT 7345.00 (LIKE POTTER) 345/230/13.2KV TRANSFORMER CKT 1'	559	1	136.4624	'CAPROCK REC-PHILLIPS - CAPROCK REC-TATE 138KV CKT 1'
G10_059_16WP	'FROM->TO'	'HOBBS_INT 7345.00 (LIKE POTTER) 345/230/13.2KV TRANSFORMER CKT 1'	559	1	130.5707	'CAPROCK REC-PHILLIPS - CAPROCK REC-TATE 138KV CKT 1'
G10_059_16WP	'FROM->TO'	'HOBBS_INT 7345.00 (LIKE POTTER) 345/230/13.2KV TRANSFORMER CKT 1'	559	1	111.7243	'BORDEN COUNTY INTERCHANGE - GRASSLAND INTERCHANGE 230KV CKT 1'
G10_059_16WP	'FROM->TO'	'HOBBS_INT 7345.00 (LIKE POTTER) 345/230/13.2KV TRANSFORMER CKT 1'	559	1	108.2398	'BORDEN COUNTY INTERCHANGE - GRASSLAND INTERCHANGE 230KV CKT 1'
G10_059_16WP	'FROM->TO'	'HOBBS_INT 7345.00 (LIKE POTTER) 345/230/13.2KV TRANSFORMER CKT 1'	559	1	137.8954	'MIDLAND 7345.00 (LIKE WICHITA) 345/138/13.8KV TRANSFORMER CKT 1'
G10_059_16WP	'FROM->TO'	'HOBBS_INT 7345.00 (LIKE POTTER) 345/230/13.2KV TRANSFORMER CKT 1'	559	1	131.8477	'MIDLAND 7345.00 (LIKE WICHITA) 345/138/13.8KV TRANSFORMER CKT 1'
G10_059_16WP	'FROM->TO'	'HOBBS_INT 7345.00 (LIKE POTTER) 345/230/13.2KV TRANSFORMER CKT 1'	559	1	111.7242	'SPP-SWPS-K48'
G10_059_16WP	'FROM->TO'	'HOBBS_INT 7345.00 (LIKE POTTER) 345/230/13.2KV TRANSFORMER CKT 1'	559	1	108.2396	'SPP-SWPS-K48'
G10_059_16WP		Non Converged Contingency	1684	0.79489	-	'HOBBS_INT 7345.00 - MIDLAND 7345.00 345KV CKT 1'
G10_059_16WP		Non Converged Contingency	559	0.79489	-	'HOBBS_INT 7345.00 (LIKE POTTER) 345/230/13.2KV TRANSFORMER CKT 1'
G10_059_16WP		Non Converged Contingency	1684	0.82028	-	'HOBBS_INT 7345.00 - MIDLAND 7345.00 345KV CKT 1'
G10_059_16WP		Non Converged Contingency	559	0.82028	-	'HOBBS_INT 7345.00 (LIKE POTTER) 345/230/13.2KV TRANSFORMER CKT 1'
G10_059_16WP	'FROM->TO'	'TUCO INTERCHANGE (GE M1022338) 345/230/13.2KV TRANSFORMER CKT 1'	560	0.42218	109.4983	'TUCO INTERCHANGE (UPDATE DATA) 345/230/13.2KV TRANSFORMER CKT 2'
G10_059_16WP	'FROM->TO'	'TUCO INTERCHANGE (GE M1022338) 345/230/13.2KV TRANSFORMER CKT 1'	560	0.42218	110.4226	'TUCO INTERCHANGE (UPDATE DATA) 345/230/13.2KV TRANSFORMER CKT 2'
G10_059_16WP	'FROM->TO'	'TUCO INTERCHANGE (UPDATE DATA) 345/230/13.2KV TRANSFORMER CKT 2'	560	0.41146	107.1003	'TUCO INTERCHANGE (GE M1022338) 345/230/13.2KV TRANSFORMER CKT 1'
G10_059_16WP	'FROM->TO'	'TUCO INTERCHANGE (UPDATE DATA) 345/230/13.2KV TRANSFORMER CKT 2'	560	0.41146	107.9209	'TUCO INTERCHANGE (GE M1022338) 345/230/13.2KV TRANSFORMER CKT 1'
G10_059_16WP	'TO->FROM'	'CAPROCK REC-MCDONALD - CAPROCK REC-PHILLIPS 138KV CKT 1'	271	0.22399	115.1052	'BASE CASE'
G10_059_16WP	'TO->FROM'	'CAPROCK REC-PHILLIPS - CAPROCK REC-TATE 138KV CKT 1'	271	0.22399	124.2323	'BASE CASE'
G10_059_16WP	'TO->FROM'	'CAPROCK REC-PHILLIPS - CAPROCK REC-TATE 138KV CKT 1'	271	0.22874	101.6385	'TOLK STATION EAST - TUCO INTERCHANGE 230KV CKT 1'
G10_059_16WP	'TO->FROM'	'CAPROCK REC-PHILLIPS - CAPROCK REC-TATE 138KV CKT 1'	271	0.23286	100.1175	'SUNDOWN INTERCHANGE - WOLFFORTH INTERCHANGE 230KV CKT 1'
G10_059_16WP	'TO->FROM'	'CAPROCK REC-PHILLIPS - CAPROCK REC-TATE 138KV CKT 1'	271	0.23645	102.8035	'AMOCO SWITCHING STATION - YOAKUM COUNTY INTERCHANGE 230KV CKT 1'
G10_059_16WP	'TO->FROM'	'CAPROCK REC-PHILLIPS - CAPROCK REC-TATE 138KV CKT 1'	271	0.25472	106.5395	'HOBBS INTERCHANGE - YOAKUM COUNTY INTERCHANGE 230KV CKT 1'
G10_059_16WP	'TO->FROM'	'CAPROCK REC-PHILLIPS - CAPROCK REC-TATE 138KV CKT 1'	271	0.24096	100.9265	'CUNNINGHAM STATION - HOBBS INTERCHANGE 230KV CKT 1'
G10_059_16WP	'TO->FROM'	'CAPROCK REC-PHILLIPS - CAPROCK REC-TATE 138KV CKT 1'	271	0.21744	101.9073	'HOBBS INTERCHANGE - YOAKUM COUNTY INTERCHANGE 230KV CKT 1'
G10_059_16WP	'FROM->TO'	'HOBBS INTERCHANGE 230/115KV TRANSFORMER CKT 1'	150	0.20139	122.1624	'CUNNINGHAM STATION - HOBBS INTERCHANGE 230KV CKT 1'
G10_059_16WP	'FROM->TO'	'HOBBS_INT 7345.00 (LIKE POTTER) 345/230/13.2KV TRANSFORMER CKT 1'	559	0.88168	102.4138	'CAPROCK REC-KOCH - CAPROCK REC-VEALMOOR 138KV CKT 1'
G10_059_16WP	'FROM->TO'	'HOBBS_INT 7345.00 (LIKE POTTER) 345/230/13.2KV TRANSFORMER CKT 1'	559	0.88168	102.4332	'CAPROCK REC-KOCH - CAPROCK REC-REED 138KV CKT 1'
G10_059_16WP	'FROM->TO'	'HOBBS_INT 7345.00 (LIKE POTTER) 345/230/13.2KV TRANSFORMER CKT 1'	559	0.88168	102.8951	'CAPROCK REC-GRADY - CAPROCK REC-REED 138KV CKT 1'
G10_059_16WP	'FROM->TO'	'HOBBS_INT 7345.00 (LIKE POTTER) 345/230/13.2KV TRANSFORMER CKT 1'	559	0.88168	100	'CAPROCK REC-GRADY - CAPROCK REC-REED 138KV CKT 1'
G10_059_16WP	'FROM->TO'	'HOBBS_INT 7345.00 (LIKE POTTER) 345/230/13.2KV TRANSFORMER CKT 1'	559	0.88168	104.1459	'CAPROCK REC-GRADY - CAPROCK REC-TRIANGLE 138KV CKT 1'
G10_059_16WP	'FROM->TO'	'HOBBS_INT 7345.00 (LIKE POTTER) 345/230/13.2KV TRANSFORMER CKT 1'	559	0.88168	101.1674	'CAPROCK REC-GRADY - CAPROCK REC-TRIANGLE 138KV CKT 1'
G10_059_16WP	'FROM->TO'	'HOBBS_INT 7345.00 (LIKE POTTER) 345/230/13.2KV TRANSFORMER CKT 1'	559	0.88168	105.5593	'CAPROCK REC-MCDONALD - CAPROCK REC-TRIANGLE 138KV CKT 1'
G10_059_16WP	'FROM->TO'	'HOBBS_INT 7345.00 (LIKE POTTER) 345/230/13.2KV TRANSFORMER CKT 1'	559	0.88168	102.483	'CAPROCK REC-MCDONALD - CAPROCK REC-TRIANGLE 138KV CKT 1'
G10_059_16WP	'FROM->TO'	'HOBBS_INT 7345.00 (LIKE POTTER) 345/230/13.2KV TRANSFORMER CKT 1'	559	1	132.9155	'CAPROCK REC-MCDONALD - CAPROCK REC-PHILLIPS 138KV CKT 1'
G10_059_16WP	'FROM->TO'	'HOBBS_INT 7345.00 (LIKE POTTER) 345/230/13.2KV TRANSFORMER CKT 1'	559	1	127.4322	'CAPROCK REC-MCDONALD - CAPROCK REC-PHILLIPS 138KV CKT 1'
G10_059_16WP	'FROM->TO'	'HOBBS_INT 7345.00 (LIKE POTTER) 345/230/13.2KV TRANSFORMER CKT 1'	559	1	136.4802	'CAPROCK REC-PHILLIPS - CAPROCK REC-TATE 138KV CKT 1'
G10_059_16WP	'FROM->TO'	'HOBBS_INT 7345.00 (LIKE POTTER) 345/230/13.2KV TRANSFORMER CKT 1'	559	1	130.5829	'CAPROCK REC-PHILLIPS - CAPROCK REC-TATE 138KV CKT 1'
G10_059_16WP	'FROM->TO'	'HOBBS_INT 7345.00 (LIKE POTTER) 345/230/13.2KV TRANSFORMER CKT 1'	559	1	111.434	'BORDEN COUNTY INTERCHANGE - GRASSLAND 345.00 345KV CKT 1'
G10_059_16WP	'FROM->TO'	'HOBBS_INT 7345.00 (LIKE POTTER) 345/230/13.2KV TRANSFORMER CKT 1'	559	1	108.1014	'BORDEN COUNTY INTERCHANGE - GRASSLAND 345.00 345KV CKT 1'
G10_059_16WP	'FROM->TO'	'HOBBS_INT 7345.00 (LIKE POTTER) 345/230/13.2KV TRANSFORMER CKT 1'	559	1	116.5461	'GRASSLAND 345.00 - JONES 345.00 345KV CKT 1'
G10_059_16WP	'FROM->TO'	'HOBBS_INT 7345.00 (LIKE POTTER) 345/230/13.2KV TRANSFORMER CKT 1'	559	1	112.7742	'GRASSLAND 345.00 - JONES 345.00 345KV CKT 1'
G10_059_16WP	'FROM->TO'	'HOBBS_INT 7345.00 (LIKE POTTER) 345/230/13.2KV TRANSFORMER CKT 1'	559	1	137.9651	'MIDLAND 7345.00 (LIKE WICHITA) 345/138/13.8KV TRANSFORMER CKT 1'
G10_059_16WP	'FROM->TO'	'HOBBS_INT 7345.00 (LIKE POTTER) 345/230/13.2KV TRANSFORMER CKT 1'	559	1	131.8954	'MIDLAND 7345.00 (LIKE WICHITA) 345/138/13.8KV TRANSFORMER CKT 1'
G10_059_16WP	'FROM->TO'	'HOBBS_INT 7345.00 (LIKE POTTER) 345/230/13.2KV TRANSFORMER CKT 1'	559	0.89928	103.2058	'CAPROCK REC-KOCH - CAPROCK REC-VEALMOOR 138KV CKT 1'
G10_059_16WP	'FROM->TO'	'HOBBS_INT 7345.00 (LIKE POTTER) 345/230/13.2KV TRANSFORMER CKT 1'	559	0.89928	100.3086	'CAPROCK REC-KOCH - CAPROCK REC-VEALMOOR 138KV CKT 1'
G10_059_16WP	'FROM->TO'	'HOBBS_INT 7345.00 (LIKE POTTER) 345/230/13.2KV TRANSFORMER CKT 1'	559	0.89928	103.2223	'CAPROCK REC-KOCH - CAPROCK REC-REED 138KV CKT 1'
G10_059_16WP	'FROM->TO'	'HOBBS_INT 7345.00 (LIKE POTTER) 345/230/13.2KV TRANSFORMER CKT 1'	559	0.89928	100.3207	'CAPROCK REC-KOCH - CAPROCK REC-REED 138KV CKT 1'

SOURCE	DIRECTION	MONTCOMMONNAME	RATEB	TDF	TC%LOADING	CONTNAME
G10_059_16WP	'FROM->TO'	'HOBBS_INT 7345.00 (LIKE POTTER) 345/230/13.2KV TRANSFORMER CKT 1'	559	0.89928	103.6813	'CAPROCK REC-GRADY - CAPROCK REC-REED 138KV CKT 1'
G10_059_16WP	'FROM->TO'	'HOBBS_INT 7345.00 (LIKE POTTER) 345/230/13.2KV TRANSFORMER CKT 1'	559	0.89928	100.7449	'CAPROCK REC-GRADY - CAPROCK REC-REED 138KV CKT 1'
G10_059_16WP	'FROM->TO'	'HOBBS_INT 7345.00 (LIKE POTTER) 345/230/13.2KV TRANSFORMER CKT 1'	559	0.89928	104.9249	'CAPROCK REC-GRADY - CAPROCK REC-TRIANGLE 138KV CKT 1'
G10_059_16WP	'FROM->TO'	'HOBBS_INT 7345.00 (LIKE POTTER) 345/230/13.2KV TRANSFORMER CKT 1'	559	0.89928	101.9081	'CAPROCK REC-GRADY - CAPROCK REC-TRIANGLE 138KV CKT 1'
G10_059_16WP	'FROM->TO'	'HOBBS_INT 7345.00 (LIKE POTTER) 345/230/13.2KV TRANSFORMER CKT 1'	559	0.89928	106.329	'CAPROCK REC-MCDONALD - CAPROCK REC-TRIANGLE 138KV CKT 1'
G10_059_16WP	'FROM->TO'	'HOBBS_INT 7345.00 (LIKE POTTER) 345/230/13.2KV TRANSFORMER CKT 1'	559	0.89928	103.2137	'CAPROCK REC-MCDONALD - CAPROCK REC-TRIANGLE 138KV CKT 1'
G10_059_16WP	'FROM->TO'	'HOBBS_INT 7345.00 (LIKE POTTER) 345/230/13.2KV TRANSFORMER CKT 1'	559	1	132.9038	'CAPROCK REC-MCDONALD - CAPROCK REC-PHILLIPS 138KV CKT 1'
G10_059_16WP	'FROM->TO'	'HOBBS_INT 7345.00 (LIKE POTTER) 345/230/13.2KV TRANSFORMER CKT 1'	559	1	127.4243	'CAPROCK REC-MCDONALD - CAPROCK REC-PHILLIPS 138KV CKT 1'
G10_059_16WP	'FROM->TO'	'HOBBS_INT 7345.00 (LIKE POTTER) 345/230/13.2KV TRANSFORMER CKT 1'	559	1	136.4641	'CAPROCK REC-PHILLIPS - CAPROCK REC-TATE 138KV CKT 1'
G10_059_16WP	'FROM->TO'	'HOBBS_INT 7345.00 (LIKE POTTER) 345/230/13.2KV TRANSFORMER CKT 1'	559	1	130.5719	'CAPROCK REC-PHILLIPS - CAPROCK REC-TATE 138KV CKT 1'
G10_059_16WP	'FROM->TO'	'HOBBS_INT 7345.00 (LIKE POTTER) 345/230/13.2KV TRANSFORMER CKT 1'	559	1	111.434	'BORDEN COUNTY INTERCHANGE - GRASSLAND 345.00 345KV CKT 1'
G10_059_16WP	'FROM->TO'	'HOBBS_INT 7345.00 (LIKE POTTER) 345/230/13.2KV TRANSFORMER CKT 1'	559	1	108.1014	'BORDEN COUNTY INTERCHANGE - GRASSLAND 345.00 345KV CKT 1'
G10_059_16WP	'FROM->TO'	'HOBBS_INT 7345.00 (LIKE POTTER) 345/230/13.2KV TRANSFORMER CKT 1'	559	1	116.5462	'GRASSLAND 345.00 - JONES 345.00 345KV CKT 1'
G10_059_16WP	'FROM->TO'	'HOBBS_INT 7345.00 (LIKE POTTER) 345/230/13.2KV TRANSFORMER CKT 1'	559	1	112.7743	'GRASSLAND 345.00 - JONES 345.00 345KV CKT 1'
G10_059_16WP	'FROM->TO'	'HOBBS_INT 7345.00 (LIKE POTTER) 345/230/13.2KV TRANSFORMER CKT 1'	559	1	137.8996	'MIDLAND 7345.00 (LIKE WICHITA) 345/138/13.8KV TRANSFORMER CKT 1'
G10_059_16WP	'FROM->TO'	'HOBBS_INT 7345.00 (LIKE POTTER) 345/230/13.2KV TRANSFORMER CKT 1'	559	1	131.8504	'MIDLAND 7345.00 (LIKE WICHITA) 345/138/13.8KV TRANSFORMER CKT 1'
G10_059_16WP		Non Converged Contingency	1684	0.77601	-	'HOBBS_INT 7345.00 - MIDLAND 7345.00 345KV CKT 1'
G10_059_16WP		Non Converged Contingency	559	0.77601	-	'HOBBS_INT 7345.00 (LIKE POTTER) 345/230/13.2KV TRANSFORMER CKT 1'
G10_059_16WP		Non Converged Contingency	1684	0.80932	-	'HOBBS_INT 7345.00 - MIDLAND 7345.00 345KV CKT 1'
G10_059_16WP		Non Converged Contingency	559	0.80932	-	'HOBBS_INT 7345.00 (LIKE POTTER) 345/230/13.2KV TRANSFORMER CKT 1'
G10_060_11G	'FROM->TO'	'HOBBS INTERCHANGE 230/115KV TRANSFORMER CKT 1'	150	0.68727	198.2474	'HOBBS INTERCHANGE - LEA COUNTY INTERCHANGE 230KV CKT 1'
G10_060_11G		Non Converged Contingency	478	0.7764	-	'HOBBS INTERCHANGE - MIDLAND COUNTY INTERCHANGE 230KV CKT 1'
G10_060_16SP	'TO->FROM'	'AMOCO SWITCHING STATION - YOAKUM COUNTY INTERCHANGE 230KV CKT 1'	351	0.21157	100	'CAPROCK REC-MCDONALD - CAPROCK REC-TRIANGLE 138KV CKT 1'
G10_060_16SP	'TO->FROM'	'AMOCO SWITCHING STATION - YOAKUM COUNTY INTERCHANGE 230KV CKT 1'	351	0.2459	111.2098	'CAPROCK REC-MCDONALD - CAPROCK REC-PHILLIPS 138KV CKT 1'
G10_060_16SP	'TO->FROM'	'AMOCO SWITCHING STATION - YOAKUM COUNTY INTERCHANGE 230KV CKT 1'	351	0.2459	113.0545	'CAPROCK REC-PHILLIPS - CAPROCK REC-TATE 138KV CKT 1'
G10_060_16SP	'TO->FROM'	'AMOCO SWITCHING STATION - YOAKUM COUNTY INTERCHANGE 230KV CKT 1'	351	0.2394	102.8327	'TOLK STATION WEST - YOAKUM COUNTY INTERCHANGE 230KV CKT 1'
G10_060_16SP	'TO->FROM'	'AMOCO SWITCHING STATION - YOAKUM COUNTY INTERCHANGE 230KV CKT 1'	351	0.20392	101.4137	'TERRY COUNTY INTERCHANGE - WOLFFORTH INTERCHANGE 115KV CKT 1'
G10_060_16SP	'TO->FROM'	'AMOCO SWITCHING STATION - YOAKUM COUNTY INTERCHANGE 230KV CKT 1'	351	0.2459	101.0059	'BORDEN COUNTY INTERCHANGE - GRASSLAND INTERCHANGE 230KV CKT 1'
G10_060_16SP	'TO->FROM'	'AMOCO SWITCHING STATION - YOAKUM COUNTY INTERCHANGE 230KV CKT 1'	351	0.20125	101.5093	'CUNNINGHAM STATION - EDDY COUNTY INTERCHANGE 230KV CKT 1'
G10_060_16SP	'TO->FROM'	'AMOCO SWITCHING STATION - YOAKUM COUNTY INTERCHANGE 230KV CKT 1'	351	0.2459	113.6398	'MIDLAND 7345.00 (LIKE WICHITA) 345/138/13.8KV TRANSFORMER CKT 1'
G10_060_16SP	'TO->FROM'	'AMOCO SWITCHING STATION - YOAKUM COUNTY INTERCHANGE 230KV CKT 1'	351	0.2459	101.0067	'SPP-SWPS-K48'
G10_060_16SP	'TO->FROM'	'AMOCO SWITCHING STATION - YOAKUM COUNTY INTERCHANGE 230KV CKT 1'	351	0.24589	110.9049	'CAPROCK REC-MCDONALD - CAPROCK REC-PHILLIPS 138KV CKT 1'
G10_060_16SP	'TO->FROM'	'AMOCO SWITCHING STATION - YOAKUM COUNTY INTERCHANGE 230KV CKT 1'	351	0.24589	112.7619	'CAPROCK REC-PHILLIPS - CAPROCK REC-TATE 138KV CKT 1'
G10_060_16SP	'TO->FROM'	'AMOCO SWITCHING STATION - YOAKUM COUNTY INTERCHANGE 230KV CKT 1'	351	0.23942	102.7288	'TOLK STATION WEST - YOAKUM COUNTY INTERCHANGE 230KV CKT 1'
G10_060_16SP	'TO->FROM'	'AMOCO SWITCHING STATION - YOAKUM COUNTY INTERCHANGE 230KV CKT 1'	351	0.20391	101.0641	'TERRY COUNTY INTERCHANGE - WOLFFORTH INTERCHANGE 115KV CKT 1'
G10_060_16SP	'TO->FROM'	'AMOCO SWITCHING STATION - YOAKUM COUNTY INTERCHANGE 230KV CKT 1'	351	0.24589	100.7059	'BORDEN COUNTY INTERCHANGE - GRASSLAND INTERCHANGE 230KV CKT 1'
G10_060_16SP	'TO->FROM'	'AMOCO SWITCHING STATION - YOAKUM COUNTY INTERCHANGE 230KV CKT 1'	351	0.20125	101.2672	'CUNNINGHAM STATION - EDDY COUNTY INTERCHANGE 230KV CKT 1'
G10_060_16SP	'TO->FROM'	'AMOCO SWITCHING STATION - YOAKUM COUNTY INTERCHANGE 230KV CKT 1'	351	0.24589	113.3308	'MIDLAND 7345.00 (LIKE WICHITA) 345/138/13.8KV TRANSFORMER CKT 1'
G10_060_16SP	'TO->FROM'	'CAPROCK REC-GRADY - CAPROCK REC-TRIANGLE 138KV CKT 1'	176	0.21144	100	'HOBBS INTERCHANGE - LEA COUNTY INTERCHANGE 230KV CKT 1'
G10_060_16SP	'TO->FROM'	'CAPROCK REC-MCDONALD - CAPROCK REC-PHILLIPS 138KV CKT 1'	271	0.20594	113.8999	'BASE CASE'
G10_060_16SP	'TO->FROM'	'CAPROCK REC-MCDONALD - CAPROCK REC-PHILLIPS 138KV CKT 1'	271	0.30014	122.1413	'HOBBS INTERCHANGE - LEA COUNTY INTERCHANGE 230KV CKT 1'
G10_060_16SP	'TO->FROM'	'CAPROCK REC-MCDONALD - CAPROCK REC-PHILLIPS 138KV CKT 1'	271	0.20592	113.5797	'BASE CASE'
G10_060_16SP	'TO->FROM'	'CAPROCK REC-MCDONALD - CAPROCK REC-PHILLIPS 138KV CKT 1'	271	0.30013	121.9267	'HOBBS INTERCHANGE - LEA COUNTY INTERCHANGE 230KV CKT 1'
G10_060_16SP	'TO->FROM'	'CAPROCK REC-PHILLIPS - CAPROCK REC-TATE 138KV CKT 1'	271	0.20594	125.2122	'BASE CASE'
G10_060_16SP	'TO->FROM'	'CAPROCK REC-PHILLIPS - CAPROCK REC-TATE 138KV CKT 1'	271	0.21083	101.66	'TOLK STATION EAST - TUCO INTERCHANGE 230KV CKT 1'
G10_060_16SP	'TO->FROM'	'CAPROCK REC-PHILLIPS - CAPROCK REC-TATE 138KV CKT 1'	271	0.21845	100	'AMOCO SWITCHING STATION - SUNDOWN INTERCHANGE 230KV CKT 1'
G10_060_16SP	'TO->FROM'	'CAPROCK REC-PHILLIPS - CAPROCK REC-TATE 138KV CKT 1'	271	0.21423	101.2689	'SUNDOWN INTERCHANGE - WOLFFORTH INTERCHANGE 230KV CKT 1'
G10_060_16SP	'TO->FROM'	'CAPROCK REC-PHILLIPS - CAPROCK REC-TATE 138KV CKT 1'	271	0.21845	105.0081	'AMOCO SWITCHING STATION - YOAKUM COUNTY INTERCHANGE 230KV CKT 1'
G10_060_16SP	'TO->FROM'	'CAPROCK REC-PHILLIPS - CAPROCK REC-TATE 138KV CKT 1'	271	0.2359	108.2155	'LEA COUNTY INTERCHANGE - YOAKUM COUNTY INTERCHANGE 230KV CKT 1'
G10_060_16SP	'TO->FROM'	'CAPROCK REC-PHILLIPS - CAPROCK REC-TATE 138KV CKT 1'	271	0.21357	101.0075	'CUNNINGHAM STATION - EDDY COUNTY INTERCHANGE 230KV CKT 1'
G10_060_16SP	'TO->FROM'	'CAPROCK REC-PHILLIPS - CAPROCK REC-TATE 138KV CKT 1'	271	0.22216	101.0156	'CUNNINGHAM STATION - LEA COUNTY INTERCHANGE 230KV CKT 1'
G10_060_16SP	'TO->FROM'	'CAPROCK REC-PHILLIPS - CAPROCK REC-TATE 138KV CKT 1'	271	0.30014	132.3879	'HOBBS INTERCHANGE - LEA COUNTY INTERCHANGE 230KV CKT 1'
G10_060_16SP	'TO->FROM'	'CAPROCK REC-PHILLIPS - CAPROCK REC-TATE 138KV CKT 1'	271	0.20592	124.883	'BASE CASE'
G10_060_16SP	'TO->FROM'	'CAPROCK REC-PHILLIPS - CAPROCK REC-TATE 138KV CKT 1'	271	0.2108	101.3132	'TOLK STATION EAST - TUCO INTERCHANGE 230KV CKT 1'

SOURCE	DIRECTION	MONTCOMMONNAME	RATEB	TDF	TC%LOADING	CONTNAME
G10_060_16SP	'TO->FROM'	'CAPROCK REC-PHILLIPS - CAPROCK REC-TATE 138KV CKT 1'	271	0.2142	100.8955	'SUNDOWN INTERCHANGE - WOLFFORTH INTERCHANGE 230KV CKT 1'
G10_060_16SP	'TO->FROM'	'CAPROCK REC-PHILLIPS - CAPROCK REC-TATE 138KV CKT 1'	271	0.21843	104.7249	'AMOCO SWITCHING STATION - YOAKUM COUNTY INTERCHANGE 230KV CKT 1'
G10_060_16SP	'TO->FROM'	'CAPROCK REC-PHILLIPS - CAPROCK REC-TATE 138KV CKT 1'	271	0.23588	107.9567	'LEA COUNTY INTERCHANGE - YOAKUM COUNTY INTERCHANGE 230KV CKT 1'
G10_060_16SP	'TO->FROM'	'CAPROCK REC-PHILLIPS - CAPROCK REC-TATE 138KV CKT 1'	271	0.21356	100.7768	'CUNNINGHAM STATION - EDDY COUNTY INTERCHANGE 230KV CKT 1'
G10_060_16SP	'TO->FROM'	'CAPROCK REC-PHILLIPS - CAPROCK REC-TATE 138KV CKT 1'	271	0.22214	100.7806	'CUNNINGHAM STATION - LEA COUNTY INTERCHANGE 230KV CKT 1'
G10_060_16SP	'TO->FROM'	'CAPROCK REC-PHILLIPS - CAPROCK REC-TATE 138KV CKT 1'	271	0.30013	132.1467	'HOBBS INTERCHANGE - LEA COUNTY INTERCHANGE 230KV CKT 1'
G10_060_16SP	'FROM->TO'	'CUNNINGHAM STATION - EDDY COUNTY INTERCHANGE 230KV CKT 1'	351	0.20631	105.8139	'CUNNINGHAM STATION - POTASH JUNCTION INTERCHANGE 230KV CKT 1'
G10_060_16SP	'FROM->TO'	'CUNNINGHAM STATION - EDDY COUNTY INTERCHANGE 230KV CKT 1'	351	0.20633	106.0398	'CUNNINGHAM STATION - POTASH JUNCTION INTERCHANGE 230KV CKT 1'
G10_060_16SP	'FROM->TO'	'HOBBS INTERCHANGE - LEA COUNTY INTERCHANGE 115KV CKT 1'	239	0.24315	123.364	'HOBBS INTERCHANGE - LEA COUNTY INTERCHANGE 230KV CKT 1'
G10_060_16SP	'FROM->TO'	'HOBBS INTERCHANGE - LEA COUNTY INTERCHANGE 115KV CKT 1'	239	0.24316	123.3829	'HOBBS INTERCHANGE - LEA COUNTY INTERCHANGE 230KV CKT 1'
G10_060_16SP	'FROM->TO'	'HOBBS INTERCHANGE - LEA COUNTY INTERCHANGE 230KV CKT 1'	617	0.70105	125.7867	'BASE CASE'
G10_060_16SP	'FROM->TO'	'HOBBS INTERCHANGE - LEA COUNTY INTERCHANGE 230KV CKT 1'	617	0.78545	106.5771	'CAPROCK REC-KOCH - CAPROCK REC-VEALMOOR 138KV CKT 1'
G10_060_16SP	'FROM->TO'	'HOBBS INTERCHANGE - LEA COUNTY INTERCHANGE 230KV CKT 1'	617	0.78545	106.6603	'CAPROCK REC-KOCH - CAPROCK REC-REED 138KV CKT 1'
G10_060_16SP	'FROM->TO'	'HOBBS INTERCHANGE - LEA COUNTY INTERCHANGE 230KV CKT 1'	617	0.78545	106.9486	'CAPROCK REC-GRADY - CAPROCK REC-REED 138KV CKT 1'
G10_060_16SP	'FROM->TO'	'HOBBS INTERCHANGE - LEA COUNTY INTERCHANGE 230KV CKT 1'	617	0.78545	107.8465	'CAPROCK REC-GRADY - CAPROCK REC-TRIANGLE 138KV CKT 1'
G10_060_16SP	'FROM->TO'	'HOBBS INTERCHANGE - LEA COUNTY INTERCHANGE 230KV CKT 1'	617	0.78545	109.1619	'CAPROCK REC-MCDONALD - CAPROCK REC-TRIANGLE 138KV CKT 1'
G10_060_16SP	'FROM->TO'	'HOBBS INTERCHANGE - LEA COUNTY INTERCHANGE 230KV CKT 1'	617	0.72499	101.4719	'CAPROCK REC-NEW SCHWARTZ - CAPROCK REC-PEMBROOK 138KV CKT 1'
G10_060_16SP	'FROM->TO'	'HOBBS INTERCHANGE - LEA COUNTY INTERCHANGE 230KV CKT 1'	617	0.72499	102.5575	'CAPROCK REC-NEW SCHWARTZ - CR-1956 4138.00 138KV CKT 1'
G10_060_16SP	'FROM->TO'	'HOBBS INTERCHANGE - LEA COUNTY INTERCHANGE 230KV CKT 1'	617	0.72499	100.9925	'CAPROCK REC-PEMBROOK - G09-17T 138.00 138KV CKT 1'
G10_060_16SP	'FROM->TO'	'HOBBS INTERCHANGE - LEA COUNTY INTERCHANGE 230KV CKT 1'	617	0.72499	102.8875	'CAPROCK REC-MCDONALD - CR-1956 4138.00 138KV CKT 1'
G10_060_16SP	'FROM->TO'	'HOBBS INTERCHANGE - LEA COUNTY INTERCHANGE 230KV CKT 1'	617	0.72499	100.4927	'CAPROCK REC-ST LAWRENCE - CAPROCK REC-STILES 138KV CKT 1'
G10_060_16SP	'FROM->TO'	'HOBBS INTERCHANGE - LEA COUNTY INTERCHANGE 230KV CKT 1'	617	0.72499	101.174	'CAPROCK REC-STILES - G09-17T 138.00 138KV CKT 1'
G10_060_16SP	'FROM->TO'	'HOBBS INTERCHANGE - LEA COUNTY INTERCHANGE 230KV CKT 1'	617	0.8843	129.6073	'CAPROCK REC-MCDONALD - CAPROCK REC-PHILLIPS 138KV CKT 1'
G10_060_16SP	'FROM->TO'	'HOBBS INTERCHANGE - LEA COUNTY INTERCHANGE 230KV CKT 1'	617	0.8843	132.8702	'CAPROCK REC-PHILLIPS - CAPROCK REC-TATE 138KV CKT 1'
G10_060_16SP	'FROM->TO'	'HOBBS INTERCHANGE - LEA COUNTY INTERCHANGE 230KV CKT 1'	617	0.8843	111.4188	'BORDEN COUNTY INTERCHANGE - GRASSLAND INTERCHANGE 230KV CKT 1'
G10_060_16SP	'FROM->TO'	'HOBBS INTERCHANGE - LEA COUNTY INTERCHANGE 230KV CKT 1'	617	0.68993	100.8186	'HOBBS INTERCHANGE - LEA COUNTY INTERCHANGE 115KV CKT 1'
G10_060_16SP	'FROM->TO'	'HOBBS INTERCHANGE - LEA COUNTY INTERCHANGE 230KV CKT 1'	617	0.78635	105.2554	'HOBBS INTERCHANGE 230/115KV TRANSFORMER CKT 1'
G10_060_16SP	'FROM->TO'	'HOBBS INTERCHANGE - LEA COUNTY INTERCHANGE 230KV CKT 1'	617	0.8843	133.9028	'MIDLAND 7345.00 (LIKE WICHITA) 345/138/13.8KV TRANSFORMER CKT 1'
G10_060_16SP	'FROM->TO'	'HOBBS INTERCHANGE - LEA COUNTY INTERCHANGE 230KV CKT 1'	617	0.8843	111.4186	'SPP-SWPS-K48'
G10_060_16SP	'FROM->TO'	'HOBBS INTERCHANGE - LEA COUNTY INTERCHANGE 230KV CKT 1'	617	0.70107	125.9117	'BASE CASE'
G10_060_16SP	'FROM->TO'	'HOBBS INTERCHANGE - LEA COUNTY INTERCHANGE 230KV CKT 1'	617	0.78547	106.6381	'CAPROCK REC-KOCH - CAPROCK REC-VEALMOOR 138KV CKT 1'
G10_060_16SP	'FROM->TO'	'HOBBS INTERCHANGE - LEA COUNTY INTERCHANGE 230KV CKT 1'	617	0.78547	106.7202	'CAPROCK REC-KOCH - CAPROCK REC-REED 138KV CKT 1'
G10_060_16SP	'FROM->TO'	'HOBBS INTERCHANGE - LEA COUNTY INTERCHANGE 230KV CKT 1'	617	0.78547	107.0098	'CAPROCK REC-GRADY - CAPROCK REC-REED 138KV CKT 1'
G10_060_16SP	'FROM->TO'	'HOBBS INTERCHANGE - LEA COUNTY INTERCHANGE 230KV CKT 1'	617	0.78547	107.9074	'CAPROCK REC-GRADY - CAPROCK REC-TRIANGLE 138KV CKT 1'
G10_060_16SP	'FROM->TO'	'HOBBS INTERCHANGE - LEA COUNTY INTERCHANGE 230KV CKT 1'	617	0.78547	109.2223	'CAPROCK REC-MCDONALD - CAPROCK REC-TRIANGLE 138KV CKT 1'
G10_060_16SP	'FROM->TO'	'HOBBS INTERCHANGE - LEA COUNTY INTERCHANGE 230KV CKT 1'	617	0.72501	101.5546	'CAPROCK REC-NEW SCHWARTZ - CAPROCK REC-PEMBROOK 138KV CKT 1'
G10_060_16SP	'FROM->TO'	'HOBBS INTERCHANGE - LEA COUNTY INTERCHANGE 230KV CKT 1'	617	0.72501	102.6329	'CAPROCK REC-NEW SCHWARTZ - CR-1956 4138.00 138KV CKT 1'
G10_060_16SP	'FROM->TO'	'HOBBS INTERCHANGE - LEA COUNTY INTERCHANGE 230KV CKT 1'	617	0.72501	101.0759	'CAPROCK REC-PEMBROOK - G09-17T 138.00 138KV CKT 1'
G10_060_16SP	'FROM->TO'	'HOBBS INTERCHANGE - LEA COUNTY INTERCHANGE 230KV CKT 1'	617	0.72501	102.9626	'CAPROCK REC-MCDONALD - CR-1956 4138.00 138KV CKT 1'
G10_060_16SP	'FROM->TO'	'HOBBS INTERCHANGE - LEA COUNTY INTERCHANGE 230KV CKT 1'	617	0.72501	100.5786	'CAPROCK REC-ST LAWRENCE - CAPROCK REC-STILES 138KV CKT 1'
G10_060_16SP	'FROM->TO'	'HOBBS INTERCHANGE - LEA COUNTY INTERCHANGE 230KV CKT 1'	617	0.72501	101.2589	'CAPROCK REC-STILES - G09-17T 138.00 138KV CKT 1'
G10_060_16SP	'FROM->TO'	'HOBBS INTERCHANGE - LEA COUNTY INTERCHANGE 230KV CKT 1'	617	0.88431	129.6239	'CAPROCK REC-MCDONALD - CAPROCK REC-PHILLIPS 138KV CKT 1'
G10_060_16SP	'FROM->TO'	'HOBBS INTERCHANGE - LEA COUNTY INTERCHANGE 230KV CKT 1'	617	0.88431	132.8872	'CAPROCK REC-PHILLIPS - CAPROCK REC-TATE 138KV CKT 1'
G10_060_16SP	'FROM->TO'	'HOBBS INTERCHANGE - LEA COUNTY INTERCHANGE 230KV CKT 1'	617	0.88431	111.4453	'BORDEN COUNTY INTERCHANGE - GRASSLAND INTERCHANGE 230KV CKT 1'
G10_060_16SP	'FROM->TO'	'HOBBS INTERCHANGE - LEA COUNTY INTERCHANGE 230KV CKT 1'	617	0.68995	100.9115	'HOBBS INTERCHANGE - LEA COUNTY INTERCHANGE 115KV CKT 1'
G10_060_16SP	'FROM->TO'	'HOBBS INTERCHANGE - LEA COUNTY INTERCHANGE 230KV CKT 1'	617	0.78637	105.3438	'HOBBS INTERCHANGE 230/115KV TRANSFORMER CKT 1'
G10_060_16SP	'FROM->TO'	'HOBBS INTERCHANGE - LEA COUNTY INTERCHANGE 230KV CKT 1'	617	0.88431	133.9192	'MIDLAND 7345.00 (LIKE WICHITA) 345/138/13.8KV TRANSFORMER CKT 1'
G10_060_16SP	'FROM->TO'	'HOBBS INTERCHANGE 230/115KV TRANSFORMER CKT 1'	150	0.69378	422.9123	'HOBBS INTERCHANGE - LEA COUNTY INTERCHANGE 230KV CKT 1'
G10_060_16SP	'FROM->TO'	'HOBBS INTERCHANGE 230/115KV TRANSFORMER CKT 1'	150	0.6938	422.9377	'HOBBS INTERCHANGE - LEA COUNTY INTERCHANGE 230KV CKT 1'
G10_060_16SP	'FROM->TO'	'HOBBS_INT 7345.00 (LIKE POTTER) 345/230/13.2KV TRANSFORMER CKT 1'	559	1	125.6444	'CAPROCK REC-MCDONALD - CAPROCK REC-PHILLIPS 138KV CKT 1'
G10_060_16SP	'FROM->TO'	'HOBBS_INT 7345.00 (LIKE POTTER) 345/230/13.2KV TRANSFORMER CKT 1'	559	1	121.0307	'CAPROCK REC-MCDONALD - CAPROCK REC-PHILLIPS 138KV CKT 1'
G10_060_16SP	'FROM->TO'	'HOBBS_INT 7345.00 (LIKE POTTER) 345/230/13.2KV TRANSFORMER CKT 1'	559	1	129.9668	'CAPROCK REC-PHILLIPS - CAPROCK REC-TATE 138KV CKT 1'
G10_060_16SP	'FROM->TO'	'HOBBS_INT 7345.00 (LIKE POTTER) 345/230/13.2KV TRANSFORMER CKT 1'	559	1	124.911	'CAPROCK REC-PHILLIPS - CAPROCK REC-TATE 138KV CKT 1'
G10_060_16SP	'FROM->TO'	'HOBBS_INT 7345.00 (LIKE POTTER) 345/230/13.2KV TRANSFORMER CKT 1'	559	1	101.0793	'BORDEN COUNTY INTERCHANGE - GRASSLAND INTERCHANGE 230KV CKT 1'

SOURCE	DIRECTION	MONTCOMMONNAME	RATEB	TDF	TC%LOADING	CONTNAME
G10_060_16SP	'FROM->TO'	'HOBBS_INT 7345.00 (LIKE POTTER) 345/230/13.2KV TRANSFORMER CKT 1'	559	1	131.3272	'MIDLAND 7345.00 (LIKE WICHITA) 345/138/13.8KV TRANSFORMER CKT 1'
G10_060_16SP	'FROM->TO'	'HOBBS_INT 7345.00 (LIKE POTTER) 345/230/13.2KV TRANSFORMER CKT 1'	559	1	126.1307	'MIDLAND 7345.00 (LIKE WICHITA) 345/138/13.8KV TRANSFORMER CKT 1'
G10_060_16SP	'FROM->TO'	'HOBBS_INT 7345.00 (LIKE POTTER) 345/230/13.2KV TRANSFORMER CKT 1'	559	1	101.0791	'SPP-SWPS-K48'
G10_060_16SP	'FROM->TO'	'HOBBS_INT 7345.00 (LIKE POTTER) 345/230/13.2KV TRANSFORMER CKT 1'	559	1	125.6451	'CAPROCK REC-MCDONALD - CAPROCK REC-PHILLIPS 138KV CKT 1'
G10_060_16SP	'FROM->TO'	'HOBBS_INT 7345.00 (LIKE POTTER) 345/230/13.2KV TRANSFORMER CKT 1'	559	1	121.0312	'CAPROCK REC-MCDONALD - CAPROCK REC-PHILLIPS 138KV CKT 1'
G10_060_16SP	'FROM->TO'	'HOBBS_INT 7345.00 (LIKE POTTER) 345/230/13.2KV TRANSFORMER CKT 1'	559	1	129.9676	'CAPROCK REC-PHILLIPS - CAPROCK REC-TATE 138KV CKT 1'
G10_060_16SP	'FROM->TO'	'HOBBS_INT 7345.00 (LIKE POTTER) 345/230/13.2KV TRANSFORMER CKT 1'	559	1	124.9115	'CAPROCK REC-PHILLIPS - CAPROCK REC-TATE 138KV CKT 1'
G10_060_16SP	'FROM->TO'	'HOBBS_INT 7345.00 (LIKE POTTER) 345/230/13.2KV TRANSFORMER CKT 1'	559	1	101.0794	'BORDEN COUNTY INTERCHANGE - GRASSLAND INTERCHANGE 230KV CKT 1'
G10_060_16SP	'FROM->TO'	'HOBBS_INT 7345.00 (LIKE POTTER) 345/230/13.2KV TRANSFORMER CKT 1'	559	1	131.328	'MIDLAND 7345.00 (LIKE WICHITA) 345/138/13.8KV TRANSFORMER CKT 1'
G10_060_16SP	'FROM->TO'	'HOBBS_INT 7345.00 (LIKE POTTER) 345/230/13.2KV TRANSFORMER CKT 1'	559	1	126.1312	'MIDLAND 7345.00 (LIKE WICHITA) 345/138/13.8KV TRANSFORMER CKT 1'
G10_060_16SP	'FROM->TO'	'LEA COUNTY INTERCHANGE - YOAKUM COUNTY INTERCHANGE 230KV CKT 1'	351	0.33838	100.0826	'CAPROCK REC-MCDONALD - CAPROCK REC-TRIANGLE 138KV CKT 1'
G10_060_16SP	'FROM->TO'	'LEA COUNTY INTERCHANGE - YOAKUM COUNTY INTERCHANGE 230KV CKT 1'	351	0.38425	115.9977	'CAPROCK REC-MCDONALD - CAPROCK REC-PHILLIPS 138KV CKT 1'
G10_060_16SP	'FROM->TO'	'LEA COUNTY INTERCHANGE - YOAKUM COUNTY INTERCHANGE 230KV CKT 1'	351	0.38425	118.4156	'CAPROCK REC-PHILLIPS - CAPROCK REC-TATE 138KV CKT 1'
G10_060_16SP	'FROM->TO'	'LEA COUNTY INTERCHANGE - YOAKUM COUNTY INTERCHANGE 230KV CKT 1'	351	0.36384	100.0792	'CHAVESCO 345.00 - TOLK STATION 345KV CKT 1'
G10_060_16SP	'FROM->TO'	'LEA COUNTY INTERCHANGE - YOAKUM COUNTY INTERCHANGE 230KV CKT 1'	351	0.38425	101.7794	'BORDEN COUNTY INTERCHANGE - GRASSLAND INTERCHANGE 230KV CKT 1'
G10_060_16SP	'FROM->TO'	'LEA COUNTY INTERCHANGE - YOAKUM COUNTY INTERCHANGE 230KV CKT 1'	351	0.32198	101.9638	'JOHNSON_DRW3115.00 - TAYLOR SWITCHING STATION 115KV CKT 1'
G10_060_16SP	'FROM->TO'	'LEA COUNTY INTERCHANGE - YOAKUM COUNTY INTERCHANGE 230KV CKT 1'	351	0.33416	106.9769	'CUNNINGHAM STATION - EDDY COUNTY INTERCHANGE 230KV CKT 1'
G10_060_16SP	'FROM->TO'	'LEA COUNTY INTERCHANGE - YOAKUM COUNTY INTERCHANGE 230KV CKT 1'	351	0.38856	109.3983	'CUNNINGHAM STATION - LEA COUNTY INTERCHANGE 230KV CKT 1'
G10_060_16SP	'FROM->TO'	'LEA COUNTY INTERCHANGE - YOAKUM COUNTY INTERCHANGE 230KV CKT 1'	351	0.31591	100.9335	'CUNNINGHAM STATION - POTASH JUNCTION INTERCHANGE 230KV CKT 1'
G10_060_16SP	'FROM->TO'	'LEA COUNTY INTERCHANGE - YOAKUM COUNTY INTERCHANGE 230KV CKT 1'	351	0.38425	119.1813	'MIDLAND 7345.00 (LIKE WICHITA) 345/138/13.8KV TRANSFORMER CKT 1'
G10_060_16SP	'FROM->TO'	'LEA COUNTY INTERCHANGE - YOAKUM COUNTY INTERCHANGE 230KV CKT 1'	351	0.38425	101.7797	'SPP-SWPS-K48'
G10_060_16SP	'FROM->TO'	'LEA COUNTY INTERCHANGE - YOAKUM COUNTY INTERCHANGE 230KV CKT 1'	351	0.33838	100	'CAPROCK REC-MCDONALD - CAPROCK REC-TRIANGLE 138KV CKT 1'
G10_060_16SP	'FROM->TO'	'LEA COUNTY INTERCHANGE - YOAKUM COUNTY INTERCHANGE 230KV CKT 1'	351	0.38424	115.8658	'CAPROCK REC-MCDONALD - CAPROCK REC-PHILLIPS 138KV CKT 1'
G10_060_16SP	'FROM->TO'	'LEA COUNTY INTERCHANGE - YOAKUM COUNTY INTERCHANGE 230KV CKT 1'	351	0.38424	118.2959	'CAPROCK REC-PHILLIPS - CAPROCK REC-TATE 138KV CKT 1'
G10_060_16SP	'FROM->TO'	'LEA COUNTY INTERCHANGE - YOAKUM COUNTY INTERCHANGE 230KV CKT 1'	351	0.36385	100.0775	'CHAVESCO 345.00 - TOLK STATION 345KV CKT 1'
G10_060_16SP	'FROM->TO'	'LEA COUNTY INTERCHANGE - YOAKUM COUNTY INTERCHANGE 230KV CKT 1'	351	0.38424	101.6368	'BORDEN COUNTY INTERCHANGE - GRASSLAND INTERCHANGE 230KV CKT 1'
G10_060_16SP	'FROM->TO'	'LEA COUNTY INTERCHANGE - YOAKUM COUNTY INTERCHANGE 230KV CKT 1'	351	0.32198	101.8745	'JOHNSON_DRW3115.00 - TAYLOR SWITCHING STATION 115KV CKT 1'
G10_060_16SP	'FROM->TO'	'LEA COUNTY INTERCHANGE - YOAKUM COUNTY INTERCHANGE 230KV CKT 1'	351	0.33416	106.9365	'CUNNINGHAM STATION - EDDY COUNTY INTERCHANGE 230KV CKT 1'
G10_060_16SP	'FROM->TO'	'LEA COUNTY INTERCHANGE - YOAKUM COUNTY INTERCHANGE 230KV CKT 1'	351	0.38857	109.3845	'CUNNINGHAM STATION - LEA COUNTY INTERCHANGE 230KV CKT 1'
G10_060_16SP	'FROM->TO'	'LEA COUNTY INTERCHANGE - YOAKUM COUNTY INTERCHANGE 230KV CKT 1'	351	0.31591	100.8707	'CUNNINGHAM STATION - POTASH JUNCTION INTERCHANGE 230KV CKT 1'
G10_060_16SP	'FROM->TO'	'LEA COUNTY INTERCHANGE - YOAKUM COUNTY INTERCHANGE 230KV CKT 1'	351	0.38424	119.0573	'MIDLAND 7345.00 (LIKE WICHITA) 345/138/13.8KV TRANSFORMER CKT 1'
G10_060_16SP		Non Converged Contingency	1623	0.79406	-	'HOBBS_INT 7345.00 - MIDLAND 7345.00 345KV CKT 1'
G10_060_16SP		Non Converged Contingency	559	0.79406	-	'HOBBS_INT 7345.00 (LIKE POTTER) 345/230/13.2KV TRANSFORMER CKT 1'
G10_060_16SP		Non Converged Contingency	1623	0.79408	-	'HOBBS_INT 7345.00 - MIDLAND 7345.00 345KV CKT 1'
G10_060_16SP		Non Converged Contingency	559	0.79408	-	'HOBBS_INT 7345.00 (LIKE POTTER) 345/230/13.2KV TRANSFORMER CKT 1'
G10_060_16SP	'TO->FROM'	'AMOCO SWITCHING STATION - YOAKUM COUNTY INTERCHANGE 230KV CKT 1'	351	0.2117	100	'CAPROCK REC-MCDONALD - CAPROCK REC-TRIANGLE 138KV CKT 1'
G10_060_16SP	'TO->FROM'	'AMOCO SWITCHING STATION - YOAKUM COUNTY INTERCHANGE 230KV CKT 1'	351	0.24592	111.2014	'CAPROCK REC-MCDONALD - CAPROCK REC-PHILLIPS 138KV CKT 1'
G10_060_16SP	'TO->FROM'	'AMOCO SWITCHING STATION - YOAKUM COUNTY INTERCHANGE 230KV CKT 1'	351	0.24592	113.0508	'CAPROCK REC-PHILLIPS - CAPROCK REC-TATE 138KV CKT 1'
G10_060_16SP	'TO->FROM'	'AMOCO SWITCHING STATION - YOAKUM COUNTY INTERCHANGE 230KV CKT 1'	351	0.23974	102.8438	'TOLK STATION WEST - YOAKUM COUNTY INTERCHANGE 230KV CKT 1'
G10_060_16SP	'TO->FROM'	'AMOCO SWITCHING STATION - YOAKUM COUNTY INTERCHANGE 230KV CKT 1'	351	0.20415	101.4189	'TERRY COUNTY INTERCHANGE - WOLFFORTH INTERCHANGE 115KV CKT 1'
G10_060_16SP	'TO->FROM'	'AMOCO SWITCHING STATION - YOAKUM COUNTY INTERCHANGE 230KV CKT 1'	351	0.24592	100.9855	'BORDEN COUNTY INTERCHANGE - GRASSLAND INTERCHANGE 230KV CKT 1'
G10_060_16SP	'TO->FROM'	'AMOCO SWITCHING STATION - YOAKUM COUNTY INTERCHANGE 230KV CKT 1'	351	0.20137	101.4744	'CUNNINGHAM STATION - EDDY COUNTY INTERCHANGE 230KV CKT 1'
G10_060_16SP	'TO->FROM'	'AMOCO SWITCHING STATION - YOAKUM COUNTY INTERCHANGE 230KV CKT 1'	351	0.24592	113.636	'MIDLAND 7345.00 (LIKE WICHITA) 345/138/13.8KV TRANSFORMER CKT 1'
G10_060_16SP	'TO->FROM'	'CAPROCK REC-MCDONALD - CAPROCK REC-PHILLIPS 138KV CKT 1'	271	0.20537	113.6904	'BASE CASE'
G10_060_16SP	'TO->FROM'	'CAPROCK REC-PHILLIPS - CAPROCK REC-TATE 138KV CKT 1'	271	0.20537	124.9969	'BASE CASE'
G10_060_16SP	'TO->FROM'	'CAPROCK REC-PHILLIPS - CAPROCK REC-TATE 138KV CKT 1'	271	0.21027	101.4988	'TOLK STATION EAST - TUCO INTERCHANGE 230KV CKT 1'
G10_060_16SP	'TO->FROM'	'CAPROCK REC-PHILLIPS - CAPROCK REC-TATE 138KV CKT 1'	271	0.21369	101.1063	'SUNDOWN INTERCHANGE - WOLFFORTH INTERCHANGE 230KV CKT 1'
G10_060_16SP	'TO->FROM'	'CAPROCK REC-PHILLIPS - CAPROCK REC-TATE 138KV CKT 1'	271	0.2179	104.8476	'AMOCO SWITCHING STATION - YOAKUM COUNTY INTERCHANGE 230KV CKT 1'
G10_060_16SP	'TO->FROM'	'CAPROCK REC-PHILLIPS - CAPROCK REC-TATE 138KV CKT 1'	271	0.23578	108.1916	'HOBBS INTERCHANGE - YOAKUM COUNTY INTERCHANGE 230KV CKT 1'
G10_060_16SP	'TO->FROM'	'CAPROCK REC-PHILLIPS - CAPROCK REC-TATE 138KV CKT 1'	271	0.21304	100.8653	'CUNNINGHAM STATION - EDDY COUNTY INTERCHANGE 230KV CKT 1'
G10_060_16SP	'TO->FROM'	'CAPROCK REC-PHILLIPS - CAPROCK REC-TATE 138KV CKT 1'	271	0.22194	100.748	'CUNNINGHAM STATION - HOBBS INTERCHANGE 230KV CKT 1'
G10_060_16SP	'FROM->TO'	'CUNNINGHAM STATION - EDDY COUNTY INTERCHANGE 230KV CKT 1'	351	0.20686	106.1547	'CUNNINGHAM STATION - POTASH JUNCTION INTERCHANGE 230KV CKT 1'
G10_060_16SP	'FROM->TO'	'HOBBS_INT 7345.00 (LIKE POTTER) 345/230/13.2KV TRANSFORMER CKT 1'	559	1	125.7207	'CAPROCK REC-MCDONALD - CAPROCK REC-PHILLIPS 138KV CKT 1'
G10_060_16SP	'FROM->TO'	'HOBBS_INT 7345.00 (LIKE POTTER) 345/230/13.2KV TRANSFORMER CKT 1'	559	1	121.0811	'CAPROCK REC-MCDONALD - CAPROCK REC-PHILLIPS 138KV CKT 1'

SOURCE	DIRECTION	MONTCOMMONNAME	RATEB	TDF	TC%LOADING	CONTNAME
G10_060_16SP	'FROM->TO'	'HOBBS_INT 7345.00 (LIKE POTTER) 345/230/13.2KV TRANSFORMER CKT 1'	559	1	130.0438	'CAPROCK REC-PHILLIPS - CAPROCK REC-TATE 138KV CKT 1'
G10_060_16SP	'FROM->TO'	'HOBBS_INT 7345.00 (LIKE POTTER) 345/230/13.2KV TRANSFORMER CKT 1'	559	1	124.9623	'CAPROCK REC-PHILLIPS - CAPROCK REC-TATE 138KV CKT 1'
G10_060_16SP	'FROM->TO'	'HOBBS_INT 7345.00 (LIKE POTTER) 345/230/13.2KV TRANSFORMER CKT 1'	559	1	101.0793	'BORDEN COUNTY INTERCHANGE - GRASSLAND INTERCHANGE 230KV CKT 1'
G10_060_16SP	'FROM->TO'	'HOBBS_INT 7345.00 (LIKE POTTER) 345/230/13.2KV TRANSFORMER CKT 1'	559	1	131.4044	'MIDLAND 7345.00 (LIKE WICHITA) 345/138/13.8KV TRANSFORMER CKT 1'
G10_060_16SP	'FROM->TO'	'HOBBS_INT 7345.00 (LIKE POTTER) 345/230/13.2KV TRANSFORMER CKT 1'	559	1	126.1823	'MIDLAND 7345.00 (LIKE WICHITA) 345/138/13.8KV TRANSFORMER CKT 1'
G10_060_16SP		Non Converged Contingency	1623	0.79463	-	'HOBBS_INT 7345.00 - MIDLAND 7345.00 345KV CKT 1'
G10_060_16SP		Non Converged Contingency	559	0.79463	-	'HOBBS_INT 7345.00 (LIKE POTTER) 345/230/13.2KV TRANSFORMER CKT 1'
G10_060_16SP	'TO->FROM'	'AMOCO SWITCHING STATION - YOAKUM COUNTY INTERCHANGE 230KV CKT 1'	351	0.25178	104.7499	'GRASSLAND 345.00 - JONES 345.00 345KV CKT 1'
G10_060_16SP	'TO->FROM'	'AMOCO SWITCHING STATION - YOAKUM COUNTY INTERCHANGE 230KV CKT 1'	351	0.21752	100	'CAPROCK REC-KOCH - CAPROCK REC-VEALMOOR 138KV CKT 1'
G10_060_16SP	'TO->FROM'	'AMOCO SWITCHING STATION - YOAKUM COUNTY INTERCHANGE 230KV CKT 1'	351	0.21752	100.0843	'CAPROCK REC-KOCH - CAPROCK REC-REED 138KV CKT 1'
G10_060_16SP	'TO->FROM'	'AMOCO SWITCHING STATION - YOAKUM COUNTY INTERCHANGE 230KV CKT 1'	351	0.21752	100.2722	'CAPROCK REC-GRADY - CAPROCK REC-REED 138KV CKT 1'
G10_060_16SP	'TO->FROM'	'AMOCO SWITCHING STATION - YOAKUM COUNTY INTERCHANGE 230KV CKT 1'	351	0.21752	100.7871	'CAPROCK REC-GRADY - CAPROCK REC-TRIANGLE 138KV CKT 1'
G10_060_16SP	'TO->FROM'	'AMOCO SWITCHING STATION - YOAKUM COUNTY INTERCHANGE 230KV CKT 1'	351	0.21752	101.5485	'CAPROCK REC-MCDONALD - CAPROCK REC-TRIANGLE 138KV CKT 1'
G10_060_16SP	'TO->FROM'	'AMOCO SWITCHING STATION - YOAKUM COUNTY INTERCHANGE 230KV CKT 1'	351	0.25178	112.1937	'CAPROCK REC-MCDONALD - CAPROCK REC-PHILLIPS 138KV CKT 1'
G10_060_16SP	'TO->FROM'	'AMOCO SWITCHING STATION - YOAKUM COUNTY INTERCHANGE 230KV CKT 1'	351	0.25178	113.8419	'CAPROCK REC-PHILLIPS - CAPROCK REC-TATE 138KV CKT 1'
G10_060_16SP	'TO->FROM'	'AMOCO SWITCHING STATION - YOAKUM COUNTY INTERCHANGE 230KV CKT 1'	351	0.23934	103.1718	'TOLK STATION WEST - YOAKUM COUNTY INTERCHANGE 230KV CKT 1'
G10_060_16SP	'TO->FROM'	'AMOCO SWITCHING STATION - YOAKUM COUNTY INTERCHANGE 230KV CKT 1'	351	0.20905	102.9086	'TERRY COUNTY INTERCHANGE - WOLFFORTH INTERCHANGE 115KV CKT 1'
G10_060_16SP	'TO->FROM'	'AMOCO SWITCHING STATION - YOAKUM COUNTY INTERCHANGE 230KV CKT 1'	351	0.25178	102.7988	'BORDEN COUNTY INTERCHANGE - GRASSLAND 345.00 345KV CKT 1'
G10_060_16SP	'TO->FROM'	'AMOCO SWITCHING STATION - YOAKUM COUNTY INTERCHANGE 230KV CKT 1'	351	0.20509	102.7561	'CUNNINGHAM STATION - EDDY COUNTY INTERCHANGE 230KV CKT 1'
G10_060_16SP	'TO->FROM'	'AMOCO SWITCHING STATION - YOAKUM COUNTY INTERCHANGE 230KV CKT 1'	351	0.21511	100.3067	'CUNNINGHAM STATION - HOBBS INTERCHANGE 230KV CKT 1'
G10_060_16SP	'TO->FROM'	'AMOCO SWITCHING STATION - YOAKUM COUNTY INTERCHANGE 230KV CKT 1'	351	0.25178	114.3637	'MIDLAND 7345.00 (LIKE WICHITA) 345/138/13.8KV TRANSFORMER CKT 1'
G10_060_16SP	'TO->FROM'	'AMOCO SWITCHING STATION - YOAKUM COUNTY INTERCHANGE 230KV CKT 1'	351	0.19836	100.9379	'COCHRAN INTERCHANGE - LEHMAN SUB 115KV CKT 1'
G10_060_16SP	'TO->FROM'	'AMOCO SWITCHING STATION - YOAKUM COUNTY INTERCHANGE 230KV CKT 1'	351	0.19836	101.6479	'LEHMAN SUB - LYNTEGAR REC-PLAINS 115KV CKT 1'
G10_060_16SP	'TO->FROM'	'AMOCO SWITCHING STATION - YOAKUM COUNTY INTERCHANGE 230KV CKT 1'	351	0.19864	101.5353	'DENVER CITY INTERCHANGE N. - TERRY COUNTY INTERCHANGE 115KV CKT 1'
G10_060_16SP	'TO->FROM'	'AMOCO SWITCHING STATION - YOAKUM COUNTY INTERCHANGE 230KV CKT 1'	351	0.19836	105.2771	'LEA COUNTY REC-PLAINS INTERCHANGE - YOAKUM COUNTY INTERCHANGE 115KV CKT 1'
G10_060_16SP	'TO->FROM'	'AMOCO SWITCHING STATION - YOAKUM COUNTY INTERCHANGE 230KV CKT 1'	351	0.19836	102.1487	'LEA COUNTY REC-PLAINS INTERCHANGE - LYNTEGAR REC-PLAINS 115KV CKT 1'
G10_060_16SP	'TO->FROM'	'CAPROCK REC-MCDONALD - CAPROCK REC-PHILLIPS 138KV CKT 1'	271	0.22447	120.7286	'BASE CASE'
G10_060_16SP	'TO->FROM'	'CAPROCK REC-MCDONALD - CAPROCK REC-PHILLIPS 138KV CKT 1'	271	0.23701	101.452	'AMOCO SWITCHING STATION - YOAKUM COUNTY INTERCHANGE 230KV CKT 1'
G10_060_16SP	'TO->FROM'	'CAPROCK REC-MCDONALD - CAPROCK REC-PHILLIPS 138KV CKT 1'	271	0.25524	105.0178	'HOBBS INTERCHANGE - YOAKUM COUNTY INTERCHANGE 230KV CKT 1'
G10_060_16SP	'TO->FROM'	'CAPROCK REC-PHILLIPS - CAPROCK REC-TATE 138KV CKT 1'	271	0.22447	132.1467	'BASE CASE'
G10_060_16SP	'TO->FROM'	'CAPROCK REC-PHILLIPS - CAPROCK REC-TATE 138KV CKT 1'	271	0.22686	103.0331	'DEAF SMITH COUNTY INTERCHANGE - PLANT X STATION 230KV CKT 1'
G10_060_16SP	'TO->FROM'	'CAPROCK REC-PHILLIPS - CAPROCK REC-TATE 138KV CKT 1'	271	0.23051	103.2135	'OASIS INTERCHANGE - SAN JUAN MESA TAP 230KV CKT 1'
G10_060_16SP	'TO->FROM'	'CAPROCK REC-PHILLIPS - CAPROCK REC-TATE 138KV CKT 1'	271	0.22736	103.8189	'NEWHART 6230.00 - PLANT X STATION 230KV CKT 1'
G10_060_16SP	'TO->FROM'	'CAPROCK REC-PHILLIPS - CAPROCK REC-TATE 138KV CKT 1'	271	0.22936	107.8309	'TOLK STATION EAST - TUCO INTERCHANGE 230KV CKT 1'
G10_060_16SP	'TO->FROM'	'CAPROCK REC-PHILLIPS - CAPROCK REC-TATE 138KV CKT 1'	271	0.2397	104.4713	'CHAVESCO 345.00 - TOLK STATION 345KV CKT 1'
G10_060_16SP	'TO->FROM'	'CAPROCK REC-PHILLIPS - CAPROCK REC-TATE 138KV CKT 1'	271	0.22678	103.1012	'DOUD SUB - YUMA INTERCHANGE 115KV CKT 1'
G10_060_16SP	'TO->FROM'	'CAPROCK REC-PHILLIPS - CAPROCK REC-TATE 138KV CKT 1'	271	0.23408	104.2709	'LUBBOCK SOUTH INTERCHANGE - WOLFFORTH INTERCHANGE 230KV CKT 1'
G10_060_16SP	'TO->FROM'	'CAPROCK REC-PHILLIPS - CAPROCK REC-TATE 138KV CKT 1'	271	0.23701	105.3871	'AMOCO SWITCHING STATION - SUNDOWN INTERCHANGE 230KV CKT 1'
G10_060_16SP	'TO->FROM'	'CAPROCK REC-PHILLIPS - CAPROCK REC-TATE 138KV CKT 1'	271	0.23342	106.4413	'SUNDOWN INTERCHANGE - WOLFFORTH INTERCHANGE 230KV CKT 1'
G10_060_16SP	'TO->FROM'	'CAPROCK REC-PHILLIPS - CAPROCK REC-TATE 138KV CKT 1'	271	0.23701	110.4324	'AMOCO SWITCHING STATION - YOAKUM COUNTY INTERCHANGE 230KV CKT 1'
G10_060_16SP	'TO->FROM'	'CAPROCK REC-PHILLIPS - CAPROCK REC-TATE 138KV CKT 1'	271	0.22678	103.7908	'WOLFFORTH INTERCHANGE - YUMA INTERCHANGE 115KV CKT 1'
G10_060_16SP	'TO->FROM'	'CAPROCK REC-PHILLIPS - CAPROCK REC-TATE 138KV CKT 1'	271	0.22977	104.2217	'TERRY COUNTY INTERCHANGE - WOLFFORTH INTERCHANGE 115KV CKT 1'
G10_060_16SP	'TO->FROM'	'CAPROCK REC-PHILLIPS - CAPROCK REC-TATE 138KV CKT 1'	271	0.22638	103.0568	'DENVER CITY INTERCHANGE N. - TERRY COUNTY INTERCHANGE 115KV CKT 1'
G10_060_16SP	'TO->FROM'	'CAPROCK REC-PHILLIPS - CAPROCK REC-TATE 138KV CKT 1'	271	0.25524	114.0715	'HOBBS INTERCHANGE - YOAKUM COUNTY INTERCHANGE 230KV CKT 1'
G10_060_16SP	'TO->FROM'	'CAPROCK REC-PHILLIPS - CAPROCK REC-TATE 138KV CKT 1'	271	0.22697	103.1191	'JOHNSON_DRW3115.00 - TAYLOR SWITCHING STATION 115KV CKT 1'
G10_060_16SP	'TO->FROM'	'CAPROCK REC-PHILLIPS - CAPROCK REC-TATE 138KV CKT 1'	271	0.22714	103.623	'CHAVES COUNTY INTERCHANGE - EDDY COUNTY INTERCHANGE 230KV CKT 1'
G10_060_16SP	'TO->FROM'	'CAPROCK REC-PHILLIPS - CAPROCK REC-TATE 138KV CKT 1'	271	0.23241	106.7621	'CUNNINGHAM STATION - EDDY COUNTY INTERCHANGE 230KV CKT 1'
G10_060_16SP	'TO->FROM'	'CAPROCK REC-PHILLIPS - CAPROCK REC-TATE 138KV CKT 1'	271	0.2397	103.3989	'CHAVESCO 345.00 - EDDY COUNTY INTERCHANGE 345KV CKT 1'
G10_060_16SP	'TO->FROM'	'CAPROCK REC-PHILLIPS - CAPROCK REC-TATE 138KV CKT 1'	271	0.24152	106.4932	'CUNNINGHAM STATION - HOBBS INTERCHANGE 230KV CKT 1'
G10_060_16SP	'TO->FROM'	'CAPROCK REC-PHILLIPS - CAPROCK REC-TATE 138KV CKT 1'	271	0.22799	104.5427	'CUNNINGHAM STATION - POTASH JUNCTION INTERCHANGE 230KV CKT 1'
G10_060_16SP	'TO->FROM'	'CAPROCK REC-PHILLIPS - CAPROCK REC-TATE 138KV CKT 1'	271	0.22671	103.1021	'PECOS INTERCHANGE - POTASH JUNCTION INTERCHANGE 230KV CKT 1'
G10_060_16SP	'TO->FROM'	'CAPROCK REC-PHILLIPS - CAPROCK REC-TATE 138KV CKT 1'	271	0.2397	104.4061	'TOLK STATION (ABBXNL844501) 345/230/13.2KV TRANSFORMER CKT 1'
G10_060_16SP	'TO->FROM'	'CAPROCK REC-PHILLIPS - CAPROCK REC-TATE 138KV CKT 1'	271	0.22704	103.5259	'JONES 345.00 (UPDATE DATA) 345/230/13.8KV TRANSFORMER CKT 1'
G10_060_16SP	'TO->FROM'	'CAPROCK REC-PHILLIPS - CAPROCK REC-TATE 138KV CKT 1'	271	0.2397	103.4073	'EDDY COUNTY INTERCHANGE (ABB AEM30711) 345/230/13.2KV TRANSFORMER CKT 1'

SOURCE	DIRECTION	MONTCOMMONNAME	RATEB	TDF	TC%LOADING	CONTNAME
G10_060_16SP	'TO->FROM'	'CAPROCK REC-PHILLIPS - CAPROCK REC-TATE 138KV CKT 1'	271	0.2184	105.9796	'HOBBS INTERCHANGE - YOAKUM COUNTY INTERCHANGE 230KV CKT 1'
G10_060_16SP	'TO->FROM'	'CAPROCK REC-PHILLIPS - CAPROCK REC-TATE 138KV CKT 1'	271	0.19842	102.9733	'AMOCO SWITCHING STATION - YOAKUM COUNTY INTERCHANGE 230KV CKT 1'
G10_060_16SP	'FROM->TO'	'CUNNINGHAM STATION - EDDY COUNTY INTERCHANGE 230KV CKT 1'	351	0.19748	104.1643	'CUNNINGHAM STATION - POTASH JUNCTION INTERCHANGE 230KV CKT 1'
G10_060_16SP	'FROM->TO'	'HOBBS INTERCHANGE (WH 7000751) 230/115/13.2KV TRANSFORMER CKT 2'	150	0.19632	100.586	'CUNNINGHAM STATION - HOBBS INTERCHANGE 230KV CKT 1'
G10_060_16SP	'FROM->TO'	'HOBBS INTERCHANGE 230/115KV TRANSFORMER CKT 1'	150	0.20672	105.8781	'CUNNINGHAM STATION - HOBBS INTERCHANGE 230KV CKT 1'
G10_060_16SP	'FROM->TO'	'HOBBS_INT 7345.00 (LIKE POTTER) 345/230/13.2KV TRANSFORMER CKT 1'	559	1	105.8593	'GRASSLAND 345.00 - JONES 345.00 345KV CKT 1'
G10_060_16SP	'FROM->TO'	'HOBBS_INT 7345.00 (LIKE POTTER) 345/230/13.2KV TRANSFORMER CKT 1'	559	1	102.999	'GRASSLAND 345.00 - JONES 345.00 345KV CKT 1'
G10_060_16SP	'FROM->TO'	'HOBBS_INT 7345.00 (LIKE POTTER) 345/230/13.2KV TRANSFORMER CKT 1'	559	1	125.7188	'CAPROCK REC-MCDONALD - CAPROCK REC-PHILLIPS 138KV CKT 1'
G10_060_16SP	'FROM->TO'	'HOBBS_INT 7345.00 (LIKE POTTER) 345/230/13.2KV TRANSFORMER CKT 1'	559	1	121.0798	'CAPROCK REC-MCDONALD - CAPROCK REC-PHILLIPS 138KV CKT 1'
G10_060_16SP	'FROM->TO'	'HOBBS_INT 7345.00 (LIKE POTTER) 345/230/13.2KV TRANSFORMER CKT 1'	559	1	130.0428	'CAPROCK REC-PHILLIPS - CAPROCK REC-TATE 138KV CKT 1'
G10_060_16SP	'FROM->TO'	'HOBBS_INT 7345.00 (LIKE POTTER) 345/230/13.2KV TRANSFORMER CKT 1'	559	1	124.9616	'CAPROCK REC-PHILLIPS - CAPROCK REC-TATE 138KV CKT 1'
G10_060_16SP	'FROM->TO'	'HOBBS_INT 7345.00 (LIKE POTTER) 345/230/13.2KV TRANSFORMER CKT 1'	559	1	100.7352	'BORDEN COUNTY INTERCHANGE - GRASSLAND 345.00 345KV CKT 1'
G10_060_16SP	'FROM->TO'	'HOBBS_INT 7345.00 (LIKE POTTER) 345/230/13.2KV TRANSFORMER CKT 1'	559	1	131.4037	'MIDLAND 7345.00 (LIKE WICHITA) 345/138/13.8KV TRANSFORMER CKT 1'
G10_060_16SP	'FROM->TO'	'HOBBS_INT 7345.00 (LIKE POTTER) 345/230/13.2KV TRANSFORMER CKT 1'	559	1	126.1818	'MIDLAND 7345.00 (LIKE WICHITA) 345/138/13.8KV TRANSFORMER CKT 1'
G10_060_16SP	'FROM->TO'	'HOBBS_INT 7345.00 (LIKE POTTER) 345/230/13.2KV TRANSFORMER CKT 1'	559	1	131.4261	'MIDLAND 7345.00 (LIKE WICHITA) 345/138/13.8KV TRANSFORMER CKT 1'
G10_060_16SP	'FROM->TO'	'HOBBS_INT 7345.00 (LIKE POTTER) 345/230/13.2KV TRANSFORMER CKT 1'	559	1	126.1968	'MIDLAND 7345.00 (LIKE WICHITA) 345/138/13.8KV TRANSFORMER CKT 1'
G10_060_16SP	'FROM->TO'	'HOBBS_INT 7345.00 (LIKE POTTER) 345/230/13.2KV TRANSFORMER CKT 1'	559	1	105.8593	'GRASSLAND 345.00 - JONES 345.00 345KV CKT 1'
G10_060_16SP	'FROM->TO'	'HOBBS_INT 7345.00 (LIKE POTTER) 345/230/13.2KV TRANSFORMER CKT 1'	559	1	102.999	'GRASSLAND 345.00 - JONES 345.00 345KV CKT 1'
G10_060_16SP	'FROM->TO'	'HOBBS_INT 7345.00 (LIKE POTTER) 345/230/13.2KV TRANSFORMER CKT 1'	559	1	125.74	'CAPROCK REC-MCDONALD - CAPROCK REC-PHILLIPS 138KV CKT 1'
G10_060_16SP	'FROM->TO'	'HOBBS_INT 7345.00 (LIKE POTTER) 345/230/13.2KV TRANSFORMER CKT 1'	559	1	121.0938	'CAPROCK REC-MCDONALD - CAPROCK REC-PHILLIPS 138KV CKT 1'
G10_060_16SP	'FROM->TO'	'HOBBS_INT 7345.00 (LIKE POTTER) 345/230/13.2KV TRANSFORMER CKT 1'	559	1	130.0649	'CAPROCK REC-PHILLIPS - CAPROCK REC-TATE 138KV CKT 1'
G10_060_16SP	'FROM->TO'	'HOBBS_INT 7345.00 (LIKE POTTER) 345/230/13.2KV TRANSFORMER CKT 1'	559	1	124.9764	'CAPROCK REC-PHILLIPS - CAPROCK REC-TATE 138KV CKT 1'
G10_060_16SP	'FROM->TO'	'HOBBS_INT 7345.00 (LIKE POTTER) 345/230/13.2KV TRANSFORMER CKT 1'	559	1	100.7352	'BORDEN COUNTY INTERCHANGE - GRASSLAND 345.00 345KV CKT 1'
G10_060_16SP		Non Converged Contingency	1623	0.77553	-	'HOBBS_INT 7345.00 - MIDLAND 7345.00 345KV CKT 1'
G10_060_16SP		Non Converged Contingency	559	0.77553	-	'HOBBS_INT 7345.00 (LIKE POTTER) 345/230/13.2KV TRANSFORMER CKT 1'
G10_060_16SP		Non Converged Contingency	1623	0.80849	-	'HOBBS_INT 7345.00 - MIDLAND 7345.00 345KV CKT 1'
G10_060_16SP		Non Converged Contingency	559	0.80849	-	'HOBBS_INT 7345.00 (LIKE POTTER) 345/230/13.2KV TRANSFORMER CKT 1'
G10_060_16SP	'TO->FROM'	'AMOCO SWITCHING STATION - YOAKUM COUNTY INTERCHANGE 230KV CKT 1'	351	0.25446	109.0373	'TUCO INTERCHANGE - YOAKUM 7 345.00 345KV CKT 1'
G10_060_16WP	'TO->FROM'	'CAPROCK REC-GRADY - CAPROCK REC-TRIANGLE 138KV CKT 1'	176	0.21105	103.5219	'HOBBS INTERCHANGE - LEA COUNTY INTERCHANGE 230KV CKT 1'
G10_060_16WP	'TO->FROM'	'CAPROCK REC-GRADY - CAPROCK REC-TRIANGLE 138KV CKT 1'	176	0.21101	103.4891	'HOBBS INTERCHANGE - LEA COUNTY INTERCHANGE 230KV CKT 1'
G10_060_16WP	'TO->FROM'	'CAPROCK REC-MCDONALD - CAPROCK REC-PHILLIPS 138KV CKT 1'	271	0.20567	107.2183	'BASE CASE'
G10_060_16WP	'TO->FROM'	'CAPROCK REC-MCDONALD - CAPROCK REC-PHILLIPS 138KV CKT 1'	271	0.29959	121.8565	'HOBBS INTERCHANGE - LEA COUNTY INTERCHANGE 230KV CKT 1'
G10_060_16WP	'TO->FROM'	'CAPROCK REC-MCDONALD - CAPROCK REC-PHILLIPS 138KV CKT 1'	271	0.20561	107.1833	'BASE CASE'
G10_060_16WP	'TO->FROM'	'CAPROCK REC-MCDONALD - CAPROCK REC-PHILLIPS 138KV CKT 1'	271	0.29953	121.836	'HOBBS INTERCHANGE - LEA COUNTY INTERCHANGE 230KV CKT 1'
G10_060_16WP	'TO->FROM'	'CAPROCK REC-PHILLIPS - CAPROCK REC-TATE 138KV CKT 1'	271	0.20567	116.2615	'BASE CASE'
G10_060_16WP	'TO->FROM'	'CAPROCK REC-PHILLIPS - CAPROCK REC-TATE 138KV CKT 1'	271	0.29959	130.1445	'HOBBS INTERCHANGE - LEA COUNTY INTERCHANGE 230KV CKT 1'
G10_060_16WP	'TO->FROM'	'CAPROCK REC-PHILLIPS - CAPROCK REC-TATE 138KV CKT 1'	271	0.20561	116.2258	'BASE CASE'
G10_060_16WP	'TO->FROM'	'CAPROCK REC-PHILLIPS - CAPROCK REC-TATE 138KV CKT 1'	271	0.29953	130.1263	'HOBBS INTERCHANGE - LEA COUNTY INTERCHANGE 230KV CKT 1'
G10_060_16WP	'FROM->TO'	'HOBBS INTERCHANGE - LEA COUNTY INTERCHANGE 115KV CKT 1'	264	0.24264	103.7049	'HOBBS INTERCHANGE - LEA COUNTY INTERCHANGE 230KV CKT 1'
G10_060_16WP	'FROM->TO'	'HOBBS INTERCHANGE - LEA COUNTY INTERCHANGE 115KV CKT 1'	264	0.24262	103.7399	'HOBBS INTERCHANGE - LEA COUNTY INTERCHANGE 230KV CKT 1'
G10_060_16WP	'FROM->TO'	'HOBBS INTERCHANGE - LEA COUNTY INTERCHANGE 230KV CKT 1'	693	0.69889	108.4584	'BASE CASE'
G10_060_16WP	'FROM->TO'	'HOBBS INTERCHANGE - LEA COUNTY INTERCHANGE 230KV CKT 1'	693	0.88192	117.9508	'CAPROCK REC-MCDONALD - CAPROCK REC-PHILLIPS 138KV CKT 1'
G10_060_16WP	'FROM->TO'	'HOBBS INTERCHANGE - LEA COUNTY INTERCHANGE 230KV CKT 1'	693	0.88192	120.4354	'CAPROCK REC-PHILLIPS - CAPROCK REC-TATE 138KV CKT 1'
G10_060_16WP	'FROM->TO'	'HOBBS INTERCHANGE - LEA COUNTY INTERCHANGE 230KV CKT 1'	693	0.88192	103.326	'BORDEN COUNTY INTERCHANGE - GRASSLAND INTERCHANGE 230KV CKT 1'
G10_060_16WP	'FROM->TO'	'HOBBS INTERCHANGE - LEA COUNTY INTERCHANGE 230KV CKT 1'	693	0.78394	100.0778	'HOBBS INTERCHANGE 230/115KV TRANSFORMER CKT 1'
G10_060_16WP	'FROM->TO'	'HOBBS INTERCHANGE - LEA COUNTY INTERCHANGE 230KV CKT 1'	693	0.88192	121.477	'MIDLAND 7345.00 (LIKE WICHITA) 345/138/13.8KV TRANSFORMER CKT 1'
G10_060_16WP	'FROM->TO'	'HOBBS INTERCHANGE - LEA COUNTY INTERCHANGE 230KV CKT 1'	693	0.88192	103.326	'SPP-SWPS-K48'
G10_060_16WP	'FROM->TO'	'HOBBS INTERCHANGE - LEA COUNTY INTERCHANGE 230KV CKT 1'	693	0.69889	108.4694	'BASE CASE'
G10_060_16WP	'FROM->TO'	'HOBBS INTERCHANGE - LEA COUNTY INTERCHANGE 230KV CKT 1'	693	0.88186	117.9521	'CAPROCK REC-MCDONALD - CAPROCK REC-PHILLIPS 138KV CKT 1'
G10_060_16WP	'FROM->TO'	'HOBBS INTERCHANGE - LEA COUNTY INTERCHANGE 230KV CKT 1'	693	0.88186	120.4364	'CAPROCK REC-PHILLIPS - CAPROCK REC-TATE 138KV CKT 1'
G10_060_16WP	'FROM->TO'	'HOBBS INTERCHANGE - LEA COUNTY INTERCHANGE 230KV CKT 1'	693	0.88186	103.3274	'BORDEN COUNTY INTERCHANGE - GRASSLAND INTERCHANGE 230KV CKT 1'
G10_060_16WP	'FROM->TO'	'HOBBS INTERCHANGE - LEA COUNTY INTERCHANGE 230KV CKT 1'	693	0.78395	100.0866	'HOBBS INTERCHANGE 230/115KV TRANSFORMER CKT 1'
G10_060_16WP	'FROM->TO'	'HOBBS INTERCHANGE - LEA COUNTY INTERCHANGE 230KV CKT 1'	693	0.88186	121.4786	'MIDLAND 7345.00 (LIKE WICHITA) 345/138/13.8KV TRANSFORMER CKT 1'
G10_060_16WP	'FROM->TO'	'HOBBS INTERCHANGE - LEA COUNTY INTERCHANGE 230KV CKT 1'	693	0.88186	103.3274	'SPP-SWPS-K48'

SOURCE	DIRECTION	MONTCOMMONNAME	RATEB	TDF	TC%LOADING	CONTNAME
G10_060_16WP	'FROM->TO'	'HOBBS INTERCHANGE 230/115KV TRANSFORMER CKT 1'	150	0.69166	456.2719	'HOBBS INTERCHANGE - LEA COUNTY INTERCHANGE 230KV CKT 1'
G10_060_16WP	'FROM->TO'	'HOBBS INTERCHANGE 230/115KV TRANSFORMER CKT 1'	150	0.69167	456.3802	'HOBBS INTERCHANGE - LEA COUNTY INTERCHANGE 230KV CKT 1'
G10_060_16WP	'FROM->TO'	'HOBBS INTERCHANGE 230/115KV TRANSFORMER CKT 1'	150	0.1981	121.0655	'CUNNINGHAM STATION - LEA COUNTY INTERCHANGE 230KV CKT 1'
G10_060_16WP	'FROM->TO'	'HOBBS INTERCHANGE 230/115KV TRANSFORMER CKT 1'	150	0.19813	121.088	'CUNNINGHAM STATION - LEA COUNTY INTERCHANGE 230KV CKT 1'
G10_060_16WP	'FROM->TO'	'HOBBS_INT 7345.00 (LIKE POTTER) 345/230/13.2KV TRANSFORMER CKT 1'	559	0.88906	103.2281	'CAPROCK REC-KOCH - CAPROCK REC-VEALMOOR 138KV CKT 1'
G10_060_16WP	'FROM->TO'	'HOBBS_INT 7345.00 (LIKE POTTER) 345/230/13.2KV TRANSFORMER CKT 1'	559	0.88906	100.3564	'CAPROCK REC-KOCH - CAPROCK REC-VEALMOOR 138KV CKT 1'
G10_060_16WP	'FROM->TO'	'HOBBS_INT 7345.00 (LIKE POTTER) 345/230/13.2KV TRANSFORMER CKT 1'	559	0.88906	103.2392	'CAPROCK REC-KOCH - CAPROCK REC-REED 138KV CKT 1'
G10_060_16WP	'FROM->TO'	'HOBBS_INT 7345.00 (LIKE POTTER) 345/230/13.2KV TRANSFORMER CKT 1'	559	0.88906	100.3639	'CAPROCK REC-KOCH - CAPROCK REC-REED 138KV CKT 1'
G10_060_16WP	'FROM->TO'	'HOBBS_INT 7345.00 (LIKE POTTER) 345/230/13.2KV TRANSFORMER CKT 1'	559	0.88906	103.6921	'CAPROCK REC-GRADY - CAPROCK REC-REED 138KV CKT 1'
G10_060_16WP	'FROM->TO'	'HOBBS_INT 7345.00 (LIKE POTTER) 345/230/13.2KV TRANSFORMER CKT 1'	559	0.88906	100.7827	'CAPROCK REC-GRADY - CAPROCK REC-REED 138KV CKT 1'
G10_060_16WP	'FROM->TO'	'HOBBS_INT 7345.00 (LIKE POTTER) 345/230/13.2KV TRANSFORMER CKT 1'	559	0.88906	104.9163	'CAPROCK REC-GRADY - CAPROCK REC-TRIANGLE 138KV CKT 1'
G10_060_16WP	'FROM->TO'	'HOBBS_INT 7345.00 (LIKE POTTER) 345/230/13.2KV TRANSFORMER CKT 1'	559	0.88906	101.9282	'CAPROCK REC-GRADY - CAPROCK REC-TRIANGLE 138KV CKT 1'
G10_060_16WP	'FROM->TO'	'HOBBS_INT 7345.00 (LIKE POTTER) 345/230/13.2KV TRANSFORMER CKT 1'	559	0.88906	106.2345	'CAPROCK REC-MCDONALD - CAPROCK REC-TRIANGLE 138KV CKT 1'
G10_060_16WP	'FROM->TO'	'HOBBS_INT 7345.00 (LIKE POTTER) 345/230/13.2KV TRANSFORMER CKT 1'	559	0.88906	103.1581	'CAPROCK REC-MCDONALD - CAPROCK REC-TRIANGLE 138KV CKT 1'
G10_060_16WP	'FROM->TO'	'HOBBS_INT 7345.00 (LIKE POTTER) 345/230/13.2KV TRANSFORMER CKT 1'	559	1	132.3286	'CAPROCK REC-MCDONALD - CAPROCK REC-PHILLIPS 138KV CKT 1'
G10_060_16WP	'FROM->TO'	'HOBBS_INT 7345.00 (LIKE POTTER) 345/230/13.2KV TRANSFORMER CKT 1'	559	1	127.0384	'CAPROCK REC-MCDONALD - CAPROCK REC-PHILLIPS 138KV CKT 1'
G10_060_16WP	'FROM->TO'	'HOBBS_INT 7345.00 (LIKE POTTER) 345/230/13.2KV TRANSFORMER CKT 1'	559	1	135.8065	'CAPROCK REC-PHILLIPS - CAPROCK REC-TATE 138KV CKT 1'
G10_060_16WP	'FROM->TO'	'HOBBS_INT 7345.00 (LIKE POTTER) 345/230/13.2KV TRANSFORMER CKT 1'	559	1	130.1261	'CAPROCK REC-PHILLIPS - CAPROCK REC-TATE 138KV CKT 1'
G10_060_16WP	'FROM->TO'	'HOBBS_INT 7345.00 (LIKE POTTER) 345/230/13.2KV TRANSFORMER CKT 1'	559	1	111.5807	'BORDEN COUNTY INTERCHANGE - GRASSLAND INTERCHANGE 230KV CKT 1'
G10_060_16WP	'FROM->TO'	'HOBBS_INT 7345.00 (LIKE POTTER) 345/230/13.2KV TRANSFORMER CKT 1'	559	1	108.1456	'BORDEN COUNTY INTERCHANGE - GRASSLAND INTERCHANGE 230KV CKT 1'
G10_060_16WP	'FROM->TO'	'HOBBS_INT 7345.00 (LIKE POTTER) 345/230/13.2KV TRANSFORMER CKT 1'	559	1	137.2562	'MIDLAND 7345.00 (LIKE WICHITA) 345/138/13.8KV TRANSFORMER CKT 1'
G10_060_16WP	'FROM->TO'	'HOBBS_INT 7345.00 (LIKE POTTER) 345/230/13.2KV TRANSFORMER CKT 1'	559	1	131.4125	'MIDLAND 7345.00 (LIKE WICHITA) 345/138/13.8KV TRANSFORMER CKT 1'
G10_060_16WP	'FROM->TO'	'HOBBS_INT 7345.00 (LIKE POTTER) 345/230/13.2KV TRANSFORMER CKT 1'	559	1	111.5808	'SPP-SWPS-K48'
G10_060_16WP	'FROM->TO'	'HOBBS_INT 7345.00 (LIKE POTTER) 345/230/13.2KV TRANSFORMER CKT 1'	559	1	108.1457	'SPP-SWPS-K48'
G10_060_16WP	'FROM->TO'	'HOBBS_INT 7345.00 (LIKE POTTER) 345/230/13.2KV TRANSFORMER CKT 1'	559	0.88909	103.2339	'CAPROCK REC-KOCH - CAPROCK REC-VEALMOOR 138KV CKT 1'
G10_060_16WP	'FROM->TO'	'HOBBS_INT 7345.00 (LIKE POTTER) 345/230/13.2KV TRANSFORMER CKT 1'	559	0.88909	100.362	'CAPROCK REC-KOCH - CAPROCK REC-VEALMOOR 138KV CKT 1'
G10_060_16WP	'FROM->TO'	'HOBBS_INT 7345.00 (LIKE POTTER) 345/230/13.2KV TRANSFORMER CKT 1'	559	0.88909	103.245	'CAPROCK REC-KOCH - CAPROCK REC-REED 138KV CKT 1'
G10_060_16WP	'FROM->TO'	'HOBBS_INT 7345.00 (LIKE POTTER) 345/230/13.2KV TRANSFORMER CKT 1'	559	0.88909	100.3694	'CAPROCK REC-KOCH - CAPROCK REC-REED 138KV CKT 1'
G10_060_16WP	'FROM->TO'	'HOBBS_INT 7345.00 (LIKE POTTER) 345/230/13.2KV TRANSFORMER CKT 1'	559	0.88909	103.6979	'CAPROCK REC-GRADY - CAPROCK REC-REED 138KV CKT 1'
G10_060_16WP	'FROM->TO'	'HOBBS_INT 7345.00 (LIKE POTTER) 345/230/13.2KV TRANSFORMER CKT 1'	559	0.88909	100.7882	'CAPROCK REC-GRADY - CAPROCK REC-REED 138KV CKT 1'
G10_060_16WP	'FROM->TO'	'HOBBS_INT 7345.00 (LIKE POTTER) 345/230/13.2KV TRANSFORMER CKT 1'	559	0.88909	104.9219	'CAPROCK REC-GRADY - CAPROCK REC-TRIANGLE 138KV CKT 1'
G10_060_16WP	'FROM->TO'	'HOBBS_INT 7345.00 (LIKE POTTER) 345/230/13.2KV TRANSFORMER CKT 1'	559	0.88909	101.9336	'CAPROCK REC-GRADY - CAPROCK REC-TRIANGLE 138KV CKT 1'
G10_060_16WP	'FROM->TO'	'HOBBS_INT 7345.00 (LIKE POTTER) 345/230/13.2KV TRANSFORMER CKT 1'	559	0.88909	106.24	'CAPROCK REC-MCDONALD - CAPROCK REC-TRIANGLE 138KV CKT 1'
G10_060_16WP	'FROM->TO'	'HOBBS_INT 7345.00 (LIKE POTTER) 345/230/13.2KV TRANSFORMER CKT 1'	559	0.88909	103.1634	'CAPROCK REC-MCDONALD - CAPROCK REC-TRIANGLE 138KV CKT 1'
G10_060_16WP	'FROM->TO'	'HOBBS_INT 7345.00 (LIKE POTTER) 345/230/13.2KV TRANSFORMER CKT 1'	559	1	132.3287	'CAPROCK REC-MCDONALD - CAPROCK REC-PHILLIPS 138KV CKT 1'
G10_060_16WP	'FROM->TO'	'HOBBS_INT 7345.00 (LIKE POTTER) 345/230/13.2KV TRANSFORMER CKT 1'	559	1	127.0385	'CAPROCK REC-MCDONALD - CAPROCK REC-PHILLIPS 138KV CKT 1'
G10_060_16WP	'FROM->TO'	'HOBBS_INT 7345.00 (LIKE POTTER) 345/230/13.2KV TRANSFORMER CKT 1'	559	1	135.8064	'CAPROCK REC-PHILLIPS - CAPROCK REC-TATE 138KV CKT 1'
G10_060_16WP	'FROM->TO'	'HOBBS_INT 7345.00 (LIKE POTTER) 345/230/13.2KV TRANSFORMER CKT 1'	559	1	130.1261	'CAPROCK REC-PHILLIPS - CAPROCK REC-TATE 138KV CKT 1'
G10_060_16WP	'FROM->TO'	'HOBBS_INT 7345.00 (LIKE POTTER) 345/230/13.2KV TRANSFORMER CKT 1'	559	1	111.5807	'BORDEN COUNTY INTERCHANGE - GRASSLAND INTERCHANGE 230KV CKT 1'
G10_060_16WP	'FROM->TO'	'HOBBS_INT 7345.00 (LIKE POTTER) 345/230/13.2KV TRANSFORMER CKT 1'	559	1	108.1456	'BORDEN COUNTY INTERCHANGE - GRASSLAND INTERCHANGE 230KV CKT 1'
G10_060_16WP	'FROM->TO'	'HOBBS_INT 7345.00 (LIKE POTTER) 345/230/13.2KV TRANSFORMER CKT 1'	559	1	137.2564	'MIDLAND 7345.00 (LIKE WICHITA) 345/138/13.8KV TRANSFORMER CKT 1'
G10_060_16WP	'FROM->TO'	'HOBBS_INT 7345.00 (LIKE POTTER) 345/230/13.2KV TRANSFORMER CKT 1'	559	1	131.4126	'MIDLAND 7345.00 (LIKE WICHITA) 345/138/13.8KV TRANSFORMER CKT 1'
G10_060_16WP	'FROM->TO'	'HOBBS_INT 7345.00 (LIKE POTTER) 345/230/13.2KV TRANSFORMER CKT 1'	559	1	111.5808	'SPP-SWPS-K48'
G10_060_16WP	'FROM->TO'	'HOBBS_INT 7345.00 (LIKE POTTER) 345/230/13.2KV TRANSFORMER CKT 1'	559	1	108.1457	'SPP-SWPS-K48'
G10_060_16WP	'FROM->TO'	'LEA COUNTY INTERCHANGE - YOAKUM COUNTY INTERCHANGE 230KV CKT 1'	361	0.38377	102.3977	'CAPROCK REC-MCDONALD - CAPROCK REC-PHILLIPS 138KV CKT 1'
G10_060_16WP	'FROM->TO'	'LEA COUNTY INTERCHANGE - YOAKUM COUNTY INTERCHANGE 230KV CKT 1'	361	0.38377	104.4485	'CAPROCK REC-PHILLIPS - CAPROCK REC-TATE 138KV CKT 1'
G10_060_16WP	'FROM->TO'	'LEA COUNTY INTERCHANGE - YOAKUM COUNTY INTERCHANGE 230KV CKT 1'	361	0.38377	105.3051	'MIDLAND 7345.00 (LIKE WICHITA) 345/138/13.8KV TRANSFORMER CKT 1'
G10_060_16WP	'FROM->TO'	'LEA COUNTY INTERCHANGE - YOAKUM COUNTY INTERCHANGE 230KV CKT 1'	361	0.38368	102.3881	'CAPROCK REC-MCDONALD - CAPROCK REC-PHILLIPS 138KV CKT 1'
G10_060_16WP	'FROM->TO'	'LEA COUNTY INTERCHANGE - YOAKUM COUNTY INTERCHANGE 230KV CKT 1'	361	0.38368	104.4363	'CAPROCK REC-PHILLIPS - CAPROCK REC-TATE 138KV CKT 1'
G10_060_16WP	'FROM->TO'	'LEA COUNTY INTERCHANGE - YOAKUM COUNTY INTERCHANGE 230KV CKT 1'	361	0.38368	105.2965	'MIDLAND 7345.00 (LIKE WICHITA) 345/138/13.8KV TRANSFORMER CKT 1'
G10_060_16WP		Non Converged Contingency	1684	0.79433	-	'HOBBS_INT 7345.00 - MIDLAND 7345.00 345KV CKT 1'
G10_060_16WP		Non Converged Contingency	559	0.79433	-	'HOBBS_INT 7345.00 (LIKE POTTER) 345/230/13.2KV TRANSFORMER CKT 1'
G10_060_16WP		Non Converged Contingency	1684	0.79439	-	'HOBBS_INT 7345.00 - MIDLAND 7345.00 345KV CKT 1'
G10_060_16WP		Non Converged Contingency	559	0.79439	-	'HOBBS_INT 7345.00 (LIKE POTTER) 345/230/13.2KV TRANSFORMER CKT 1'

SOURCE	DIRECTION	MONTCOMMONNAME	RATEB	TDF	TC%LOADING	CONTNAME
G10_060_16WP	'FROM->TO'	'TUCO INTERCHANGE (GE_M1022338) 345/230/13.2KV TRANSFORMER CKT 1'	560	0.42222	109.5002	'TUCO INTERCHANGE (UPDATE DATA) 345/230/13.2KV TRANSFORMER CKT 2'
G10_060_16WP	'FROM->TO'	'TUCO INTERCHANGE (GE_M1022338) 345/230/13.2KV TRANSFORMER CKT 1'	560	0.42222	110.4244	'TUCO INTERCHANGE (UPDATE DATA) 345/230/13.2KV TRANSFORMER CKT 2'
G10_060_16WP	'FROM->TO'	'TUCO INTERCHANGE (GE_M1022338) 345/230/13.2KV TRANSFORMER CKT 1'	560	0.42	108.954	'TUCO INTERCHANGE (UPDATE DATA) 345/230/13.2KV TRANSFORMER CKT 2'
G10_060_16WP	'FROM->TO'	'TUCO INTERCHANGE (GE_M1022338) 345/230/13.2KV TRANSFORMER CKT 1'	560	0.42	109.5589	'TUCO INTERCHANGE (UPDATE DATA) 345/230/13.2KV TRANSFORMER CKT 2'
G10_060_16WP	'FROM->TO'	'TUCO INTERCHANGE (UPDATE DATA) 345/230/13.2KV TRANSFORMER CKT 2'	560	0.4115	107.0932	'TUCO INTERCHANGE (GE_M1022338) 345/230/13.2KV TRANSFORMER CKT 1'
G10_060_16WP	'FROM->TO'	'TUCO INTERCHANGE (UPDATE DATA) 345/230/13.2KV TRANSFORMER CKT 2'	560	0.4115	107.9141	'TUCO INTERCHANGE (GE_M1022338) 345/230/13.2KV TRANSFORMER CKT 1'
G10_060_16WP	'FROM->TO'	'TUCO INTERCHANGE (UPDATE DATA) 345/230/13.2KV TRANSFORMER CKT 2'	560	0.40931	106.471	'TUCO INTERCHANGE (GE_M1022338) 345/230/13.2KV TRANSFORMER CKT 1'
G10_060_16WP	'FROM->TO'	'TUCO INTERCHANGE (UPDATE DATA) 345/230/13.2KV TRANSFORMER CKT 2'	560	0.40931	107.075	'TUCO INTERCHANGE (GE_M1022338) 345/230/13.2KV TRANSFORMER CKT 1'
G10_060_16WP	'TO->FROM'	'CAPROCK REC-MCDONALD - CAPROCK REC-PHILLIPS 138KV CKT 1'	271	0.20511	106.9914	'BASE CASE'
G10_060_16WP	'TO->FROM'	'CAPROCK REC-PHILLIPS - CAPROCK REC-TATE 138KV CKT 1'	271	0.20511	116.0299	'BASE CASE'
G10_060_16WP	'FROM->TO'	'HOBBS INTERCHANGE 230/115KV TRANSFORMER CKT 1'	150	0.20492	123.2924	'CUNNINGHAM STATION - HOBBS INTERCHANGE 230KV CKT 1'
G10_060_16WP	'FROM->TO'	'HOBBS INTERCHANGE 230/115KV TRANSFORMER CKT 1'	150	0.19546	113.8258	'CUNNINGHAM STATION - HOBBS INTERCHANGE 230KV CKT 1'
G10_060_16WP	'FROM->TO'	'HOBBS_INT 7345.00 (LIKE POTTER) 345/230/13.2KV TRANSFORMER CKT 1'	559	0.8894	103.366	'CAPROCK REC-KOCH - CAPROCK REC-VEALMOOR 138KV CKT 1'
G10_060_16WP	'FROM->TO'	'HOBBS_INT 7345.00 (LIKE POTTER) 345/230/13.2KV TRANSFORMER CKT 1'	559	0.8894	100.4627	'CAPROCK REC-KOCH - CAPROCK REC-VEALMOOR 138KV CKT 1'
G10_060_16WP	'FROM->TO'	'HOBBS_INT 7345.00 (LIKE POTTER) 345/230/13.2KV TRANSFORMER CKT 1'	559	0.8894	103.3777	'CAPROCK REC-KOCH - CAPROCK REC-REED 138KV CKT 1'
G10_060_16WP	'FROM->TO'	'HOBBS_INT 7345.00 (LIKE POTTER) 345/230/13.2KV TRANSFORMER CKT 1'	559	0.8894	100.4705	'CAPROCK REC-KOCH - CAPROCK REC-REED 138KV CKT 1'
G10_060_16WP	'FROM->TO'	'HOBBS_INT 7345.00 (LIKE POTTER) 345/230/13.2KV TRANSFORMER CKT 1'	559	0.8894	103.8343	'CAPROCK REC-GRADY - CAPROCK REC-REED 138KV CKT 1'
G10_060_16WP	'FROM->TO'	'HOBBS_INT 7345.00 (LIKE POTTER) 345/230/13.2KV TRANSFORMER CKT 1'	559	0.8894	100.891	'CAPROCK REC-GRADY - CAPROCK REC-REED 138KV CKT 1'
G10_060_16WP	'FROM->TO'	'HOBBS_INT 7345.00 (LIKE POTTER) 345/230/13.2KV TRANSFORMER CKT 1'	559	0.8894	105.0668	'CAPROCK REC-GRADY - CAPROCK REC-TRIANGLE 138KV CKT 1'
G10_060_16WP	'FROM->TO'	'HOBBS_INT 7345.00 (LIKE POTTER) 345/230/13.2KV TRANSFORMER CKT 1'	559	0.8894	102.0423	'CAPROCK REC-GRADY - CAPROCK REC-TRIANGLE 138KV CKT 1'
G10_060_16WP	'FROM->TO'	'HOBBS_INT 7345.00 (LIKE POTTER) 345/230/13.2KV TRANSFORMER CKT 1'	559	0.8894	106.3947	'CAPROCK REC-MCDONALD - CAPROCK REC-TRIANGLE 138KV CKT 1'
G10_060_16WP	'FROM->TO'	'HOBBS_INT 7345.00 (LIKE POTTER) 345/230/13.2KV TRANSFORMER CKT 1'	559	0.8894	103.2785	'CAPROCK REC-MCDONALD - CAPROCK REC-TRIANGLE 138KV CKT 1'
G10_060_16WP	'FROM->TO'	'HOBBS_INT 7345.00 (LIKE POTTER) 345/230/13.2KV TRANSFORMER CKT 1'	559	1	132.9174	'CAPROCK REC-MCDONALD - CAPROCK REC-PHILLIPS 138KV CKT 1'
G10_060_16WP	'FROM->TO'	'HOBBS_INT 7345.00 (LIKE POTTER) 345/230/13.2KV TRANSFORMER CKT 1'	559	1	127.4335	'CAPROCK REC-MCDONALD - CAPROCK REC-PHILLIPS 138KV CKT 1'
G10_060_16WP	'FROM->TO'	'HOBBS_INT 7345.00 (LIKE POTTER) 345/230/13.2KV TRANSFORMER CKT 1'	559	1	136.482	'CAPROCK REC-PHILLIPS - CAPROCK REC-TATE 138KV CKT 1'
G10_060_16WP	'FROM->TO'	'HOBBS_INT 7345.00 (LIKE POTTER) 345/230/13.2KV TRANSFORMER CKT 1'	559	1	130.5841	'CAPROCK REC-PHILLIPS - CAPROCK REC-TATE 138KV CKT 1'
G10_060_16WP	'FROM->TO'	'HOBBS_INT 7345.00 (LIKE POTTER) 345/230/13.2KV TRANSFORMER CKT 1'	559	1	111.7243	'BORDEN COUNTY INTERCHANGE - GRASSLAND INTERCHANGE 230KV CKT 1'
G10_060_16WP	'FROM->TO'	'HOBBS_INT 7345.00 (LIKE POTTER) 345/230/13.2KV TRANSFORMER CKT 1'	559	1	108.2397	'BORDEN COUNTY INTERCHANGE - GRASSLAND INTERCHANGE 230KV CKT 1'
G10_060_16WP	'FROM->TO'	'HOBBS_INT 7345.00 (LIKE POTTER) 345/230/13.2KV TRANSFORMER CKT 1'	559	1	137.967	'MIDLAND 7345.00 (LIKE WICHITA) 345/138/13.8KV TRANSFORMER CKT 1'
G10_060_16WP	'FROM->TO'	'HOBBS_INT 7345.00 (LIKE POTTER) 345/230/13.2KV TRANSFORMER CKT 1'	559	1	131.8967	'MIDLAND 7345.00 (LIKE WICHITA) 345/138/13.8KV TRANSFORMER CKT 1'
G10_060_16WP	'FROM->TO'	'HOBBS_INT 7345.00 (LIKE POTTER) 345/230/13.2KV TRANSFORMER CKT 1'	559	1	111.7244	'SPP-SWPS-K48'
G10_060_16WP	'FROM->TO'	'HOBBS_INT 7345.00 (LIKE POTTER) 345/230/13.2KV TRANSFORMER CKT 1'	559	1	108.2398	'SPP-SWPS-K48'
G10_060_16WP	'FROM->TO'	'HOBBS_INT 7345.00 (LIKE POTTER) 345/230/13.2KV TRANSFORMER CKT 1'	559	0.90309	103.2719	'CAPROCK REC-KOCH - CAPROCK REC-VEALMOOR 138KV CKT 1'
G10_060_16WP	'FROM->TO'	'HOBBS_INT 7345.00 (LIKE POTTER) 345/230/13.2KV TRANSFORMER CKT 1'	559	0.90309	100.3723	'CAPROCK REC-KOCH - CAPROCK REC-VEALMOOR 138KV CKT 1'
G10_060_16WP	'FROM->TO'	'HOBBS_INT 7345.00 (LIKE POTTER) 345/230/13.2KV TRANSFORMER CKT 1'	559	0.90309	103.2831	'CAPROCK REC-KOCH - CAPROCK REC-REED 138KV CKT 1'
G10_060_16WP	'FROM->TO'	'HOBBS_INT 7345.00 (LIKE POTTER) 345/230/13.2KV TRANSFORMER CKT 1'	559	0.90309	100.3799	'CAPROCK REC-KOCH - CAPROCK REC-REED 138KV CKT 1'
G10_060_16WP	'FROM->TO'	'HOBBS_INT 7345.00 (LIKE POTTER) 345/230/13.2KV TRANSFORMER CKT 1'	559	0.90309	103.74	'CAPROCK REC-GRADY - CAPROCK REC-REED 138KV CKT 1'
G10_060_16WP	'FROM->TO'	'HOBBS_INT 7345.00 (LIKE POTTER) 345/230/13.2KV TRANSFORMER CKT 1'	559	0.90309	100.8012	'CAPROCK REC-GRADY - CAPROCK REC-REED 138KV CKT 1'
G10_060_16WP	'FROM->TO'	'HOBBS_INT 7345.00 (LIKE POTTER) 345/230/13.2KV TRANSFORMER CKT 1'	559	0.90309	104.9712	'CAPROCK REC-GRADY - CAPROCK REC-TRIANGLE 138KV CKT 1'
G10_060_16WP	'FROM->TO'	'HOBBS_INT 7345.00 (LIKE POTTER) 345/230/13.2KV TRANSFORMER CKT 1'	559	0.90309	101.9513	'CAPROCK REC-GRADY - CAPROCK REC-TRIANGLE 138KV CKT 1'
G10_060_16WP	'FROM->TO'	'HOBBS_INT 7345.00 (LIKE POTTER) 345/230/13.2KV TRANSFORMER CKT 1'	559	0.90309	106.2995	'CAPROCK REC-MCDONALD - CAPROCK REC-TRIANGLE 138KV CKT 1'
G10_060_16WP	'FROM->TO'	'HOBBS_INT 7345.00 (LIKE POTTER) 345/230/13.2KV TRANSFORMER CKT 1'	559	0.90309	103.1881	'CAPROCK REC-MCDONALD - CAPROCK REC-TRIANGLE 138KV CKT 1'
G10_060_16WP	'FROM->TO'	'HOBBS_INT 7345.00 (LIKE POTTER) 345/230/13.2KV TRANSFORMER CKT 1'	559	1	132.9007	'CAPROCK REC-MCDONALD - CAPROCK REC-PHILLIPS 138KV CKT 1'
G10_060_16WP	'FROM->TO'	'HOBBS_INT 7345.00 (LIKE POTTER) 345/230/13.2KV TRANSFORMER CKT 1'	559	1	127.4222	'CAPROCK REC-MCDONALD - CAPROCK REC-PHILLIPS 138KV CKT 1'
G10_060_16WP	'FROM->TO'	'HOBBS_INT 7345.00 (LIKE POTTER) 345/230/13.2KV TRANSFORMER CKT 1'	559	1	136.4624	'CAPROCK REC-PHILLIPS - CAPROCK REC-TATE 138KV CKT 1'
G10_060_16WP	'FROM->TO'	'HOBBS_INT 7345.00 (LIKE POTTER) 345/230/13.2KV TRANSFORMER CKT 1'	559	1	130.5707	'CAPROCK REC-PHILLIPS - CAPROCK REC-TATE 138KV CKT 1'
G10_060_16WP	'FROM->TO'	'HOBBS_INT 7345.00 (LIKE POTTER) 345/230/13.2KV TRANSFORMER CKT 1'	559	1	111.7243	'BORDEN COUNTY INTERCHANGE - GRASSLAND INTERCHANGE 230KV CKT 1'
G10_060_16WP	'FROM->TO'	'HOBBS_INT 7345.00 (LIKE POTTER) 345/230/13.2KV TRANSFORMER CKT 1'	559	1	108.2398	'BORDEN COUNTY INTERCHANGE - GRASSLAND INTERCHANGE 230KV CKT 1'
G10_060_16WP	'FROM->TO'	'HOBBS_INT 7345.00 (LIKE POTTER) 345/230/13.2KV TRANSFORMER CKT 1'	559	1	137.8954	'MIDLAND 7345.00 (LIKE WICHITA) 345/138/13.8KV TRANSFORMER CKT 1'
G10_060_16WP	'FROM->TO'	'HOBBS_INT 7345.00 (LIKE POTTER) 345/230/13.2KV TRANSFORMER CKT 1'	559	1	131.8477	'MIDLAND 7345.00 (LIKE WICHITA) 345/138/13.8KV TRANSFORMER CKT 1'
G10_060_16WP	'FROM->TO'	'HOBBS_INT 7345.00 (LIKE POTTER) 345/230/13.2KV TRANSFORMER CKT 1'	559	1	111.7242	'SPP-SWPS-K48'
G10_060_16WP	'FROM->TO'	'HOBBS_INT 7345.00 (LIKE POTTER) 345/230/13.2KV TRANSFORMER CKT 1'	559	1	108.2396	'SPP-SWPS-K48'
G10_060_16WP		Non Converged Contingency	1684	0.79489	-	'HOBBS_INT 7345.00 - MIDLAND 7345.00 345KV CKT 1'
G10_060_16WP		Non Converged Contingency	559	0.79489	-	'HOBBS_INT 7345.00 (LIKE POTTER) 345/230/13.2KV TRANSFORMER CKT 1'

SOURCE	DIRECTION	MONTCOMMONNAME	RATEB	TDF	TC%LOADING	CONTNAME
G10_060_16WP		Non Converged Contingency	1684	0.82028	-	'HOBBS_INT 7345.00 - MIDLAND 7345.00 345KV CKT 1'
G10_060_16WP		Non Converged Contingency	559	0.82028	-	'HOBBS_INT 7345.00 (LIKE POTTER) 345/230/13.2KV TRANSFORMER CKT 1'
G10_060_16WP	'FROM->TO'	'TUCO INTERCHANGE (GE M1022338) 345/230/13.2KV TRANSFORMER CKT 1'	560	0.42218	109.4981	'TUCO INTERCHANGE (UPDATE DATA) 345/230/13.2KV TRANSFORMER CKT 2'
G10_060_16WP	'FROM->TO'	'TUCO INTERCHANGE (GE M1022338) 345/230/13.2KV TRANSFORMER CKT 1'	560	0.42218	110.4224	'TUCO INTERCHANGE (UPDATE DATA) 345/230/13.2KV TRANSFORMER CKT 2'
G10_060_16WP	'FROM->TO'	'TUCO INTERCHANGE (UPDATE DATA) 345/230/13.2KV TRANSFORMER CKT 2'	560	0.41146	107.1	'TUCO INTERCHANGE (GE M1022338) 345/230/13.2KV TRANSFORMER CKT 1'
G10_060_16WP	'FROM->TO'	'TUCO INTERCHANGE (UPDATE DATA) 345/230/13.2KV TRANSFORMER CKT 2'	560	0.41146	107.9207	'TUCO INTERCHANGE (GE M1022338) 345/230/13.2KV TRANSFORMER CKT 1'
G10_060_16WP	'TO->FROM'	'CAPROCK REC-MCDONALD - CAPROCK REC-PHILLIPS 138KV CKT 1'	271	0.22399	115.1052	'BASE CASE'
G10_060_16WP	'TO->FROM'	'CAPROCK REC-PHILLIPS - CAPROCK REC-TATE 138KV CKT 1'	271	0.22399	124.2323	'BASE CASE'
G10_060_16WP	'TO->FROM'	'CAPROCK REC-PHILLIPS - CAPROCK REC-TATE 138KV CKT 1'	271	0.22874	101.6385	'TOLK STATION EAST - TUCO INTERCHANGE 230KV CKT 1'
G10_060_16WP	'TO->FROM'	'CAPROCK REC-PHILLIPS - CAPROCK REC-TATE 138KV CKT 1'	271	0.23286	100.1174	'SUNDOWN INTERCHANGE - WOLFFORTH INTERCHANGE 230KV CKT 1'
G10_060_16WP	'TO->FROM'	'CAPROCK REC-PHILLIPS - CAPROCK REC-TATE 138KV CKT 1'	271	0.23645	102.8034	'AMOCO SWITCHING STATION - YOAKUM COUNTY INTERCHANGE 230KV CKT 1'
G10_060_16WP	'TO->FROM'	'CAPROCK REC-PHILLIPS - CAPROCK REC-TATE 138KV CKT 1'	271	0.25472	106.5395	'HOBBS INTERCHANGE - YOAKUM COUNTY INTERCHANGE 230KV CKT 1'
G10_060_16WP	'TO->FROM'	'CAPROCK REC-PHILLIPS - CAPROCK REC-TATE 138KV CKT 1'	271	0.24096	100.9265	'CUNNINGHAM STATION - HOBBS INTERCHANGE 230KV CKT 1'
G10_060_16WP	'TO->FROM'	'CAPROCK REC-PHILLIPS - CAPROCK REC-TATE 138KV CKT 1'	271	0.21744	101.9073	'HOBBS INTERCHANGE - YOAKUM COUNTY INTERCHANGE 230KV CKT 1'
G10_060_16WP	'FROM->TO'	'HOBBS INTERCHANGE 230/115KV TRANSFORMER CKT 1'	150	0.20139	122.1624	'CUNNINGHAM STATION - HOBBS INTERCHANGE 230KV CKT 1'
G10_060_16WP	'FROM->TO'	'HOBBS_INT 7345.00 (LIKE POTTER) 345/230/13.2KV TRANSFORMER CKT 1'	559	0.88168	102.4138	'CAPROCK REC-KOCH - CAPROCK REC-VEALMOOR 138KV CKT 1'
G10_060_16WP	'FROM->TO'	'HOBBS_INT 7345.00 (LIKE POTTER) 345/230/13.2KV TRANSFORMER CKT 1'	559	0.88168	102.4332	'CAPROCK REC-KOCH - CAPROCK REC-REED 138KV CKT 1'
G10_060_16WP	'FROM->TO'	'HOBBS_INT 7345.00 (LIKE POTTER) 345/230/13.2KV TRANSFORMER CKT 1'	559	0.88168	102.8951	'CAPROCK REC-GRADY - CAPROCK REC-REED 138KV CKT 1'
G10_060_16WP	'FROM->TO'	'HOBBS_INT 7345.00 (LIKE POTTER) 345/230/13.2KV TRANSFORMER CKT 1'	559	0.88168	100	'CAPROCK REC-GRADY - CAPROCK REC-REED 138KV CKT 1'
G10_060_16WP	'FROM->TO'	'HOBBS_INT 7345.00 (LIKE POTTER) 345/230/13.2KV TRANSFORMER CKT 1'	559	0.88168	104.1459	'CAPROCK REC-GRADY - CAPROCK REC-TRIANGLE 138KV CKT 1'
G10_060_16WP	'FROM->TO'	'HOBBS_INT 7345.00 (LIKE POTTER) 345/230/13.2KV TRANSFORMER CKT 1'	559	0.88168	101.1674	'CAPROCK REC-GRADY - CAPROCK REC-TRIANGLE 138KV CKT 1'
G10_060_16WP	'FROM->TO'	'HOBBS_INT 7345.00 (LIKE POTTER) 345/230/13.2KV TRANSFORMER CKT 1'	559	0.88168	105.5593	'CAPROCK REC-MCDONALD - CAPROCK REC-TRIANGLE 138KV CKT 1'
G10_060_16WP	'FROM->TO'	'HOBBS_INT 7345.00 (LIKE POTTER) 345/230/13.2KV TRANSFORMER CKT 1'	559	0.88168	102.483	'CAPROCK REC-MCDONALD - CAPROCK REC-TRIANGLE 138KV CKT 1'
G10_060_16WP	'FROM->TO'	'HOBBS_INT 7345.00 (LIKE POTTER) 345/230/13.2KV TRANSFORMER CKT 1'	559	1	132.9155	'CAPROCK REC-MCDONALD - CAPROCK REC-PHILLIPS 138KV CKT 1'
G10_060_16WP	'FROM->TO'	'HOBBS_INT 7345.00 (LIKE POTTER) 345/230/13.2KV TRANSFORMER CKT 1'	559	1	127.4322	'CAPROCK REC-MCDONALD - CAPROCK REC-PHILLIPS 138KV CKT 1'
G10_060_16WP	'FROM->TO'	'HOBBS_INT 7345.00 (LIKE POTTER) 345/230/13.2KV TRANSFORMER CKT 1'	559	1	136.4802	'CAPROCK REC-PHILLIPS - CAPROCK REC-TATE 138KV CKT 1'
G10_060_16WP	'FROM->TO'	'HOBBS_INT 7345.00 (LIKE POTTER) 345/230/13.2KV TRANSFORMER CKT 1'	559	1	130.5829	'CAPROCK REC-PHILLIPS - CAPROCK REC-TATE 138KV CKT 1'
G10_060_16WP	'FROM->TO'	'HOBBS_INT 7345.00 (LIKE POTTER) 345/230/13.2KV TRANSFORMER CKT 1'	559	1	111.434	'BORDEN COUNTY INTERCHANGE - GRASSLAND 345.00 345KV CKT 1'
G10_060_16WP	'FROM->TO'	'HOBBS_INT 7345.00 (LIKE POTTER) 345/230/13.2KV TRANSFORMER CKT 1'	559	1	108.1014	'BORDEN COUNTY INTERCHANGE - GRASSLAND 345.00 345KV CKT 1'
G10_060_16WP	'FROM->TO'	'HOBBS_INT 7345.00 (LIKE POTTER) 345/230/13.2KV TRANSFORMER CKT 1'	559	1	116.5461	'GRASSLAND 345.00 - JONES 345.00 345KV CKT 1'
G10_060_16WP	'FROM->TO'	'HOBBS_INT 7345.00 (LIKE POTTER) 345/230/13.2KV TRANSFORMER CKT 1'	559	1	112.7742	'GRASSLAND 345.00 - JONES 345.00 345KV CKT 1'
G10_060_16WP	'FROM->TO'	'HOBBS_INT 7345.00 (LIKE POTTER) 345/230/13.2KV TRANSFORMER CKT 1'	559	1	137.9651	'MIDLAND 7345.00 (LIKE WICHITA) 345/138/13.8KV TRANSFORMER CKT 1'
G10_060_16WP	'FROM->TO'	'HOBBS_INT 7345.00 (LIKE POTTER) 345/230/13.2KV TRANSFORMER CKT 1'	559	1	131.8954	'MIDLAND 7345.00 (LIKE WICHITA) 345/138/13.8KV TRANSFORMER CKT 1'
G10_060_16WP	'FROM->TO'	'HOBBS_INT 7345.00 (LIKE POTTER) 345/230/13.2KV TRANSFORMER CKT 1'	559	0.89928	103.2058	'CAPROCK REC-KOCH - CAPROCK REC-VEALMOOR 138KV CKT 1'
G10_060_16WP	'FROM->TO'	'HOBBS_INT 7345.00 (LIKE POTTER) 345/230/13.2KV TRANSFORMER CKT 1'	559	0.89928	100.3086	'CAPROCK REC-KOCH - CAPROCK REC-VEALMOOR 138KV CKT 1'
G10_060_16WP	'FROM->TO'	'HOBBS_INT 7345.00 (LIKE POTTER) 345/230/13.2KV TRANSFORMER CKT 1'	559	0.89928	103.2223	'CAPROCK REC-KOCH - CAPROCK REC-REED 138KV CKT 1'
G10_060_16WP	'FROM->TO'	'HOBBS_INT 7345.00 (LIKE POTTER) 345/230/13.2KV TRANSFORMER CKT 1'	559	0.89928	100.3207	'CAPROCK REC-KOCH - CAPROCK REC-REED 138KV CKT 1'
G10_060_16WP	'FROM->TO'	'HOBBS_INT 7345.00 (LIKE POTTER) 345/230/13.2KV TRANSFORMER CKT 1'	559	0.89928	103.6813	'CAPROCK REC-GRADY - CAPROCK REC-REED 138KV CKT 1'
G10_060_16WP	'FROM->TO'	'HOBBS_INT 7345.00 (LIKE POTTER) 345/230/13.2KV TRANSFORMER CKT 1'	559	0.89928	100.7449	'CAPROCK REC-GRADY - CAPROCK REC-REED 138KV CKT 1'
G10_060_16WP	'FROM->TO'	'HOBBS_INT 7345.00 (LIKE POTTER) 345/230/13.2KV TRANSFORMER CKT 1'	559	0.89928	104.9249	'CAPROCK REC-GRADY - CAPROCK REC-TRIANGLE 138KV CKT 1'
G10_060_16WP	'FROM->TO'	'HOBBS_INT 7345.00 (LIKE POTTER) 345/230/13.2KV TRANSFORMER CKT 1'	559	0.89928	101.9081	'CAPROCK REC-GRADY - CAPROCK REC-TRIANGLE 138KV CKT 1'
G10_060_16WP	'FROM->TO'	'HOBBS_INT 7345.00 (LIKE POTTER) 345/230/13.2KV TRANSFORMER CKT 1'	559	0.89928	106.329	'CAPROCK REC-MCDONALD - CAPROCK REC-TRIANGLE 138KV CKT 1'
G10_060_16WP	'FROM->TO'	'HOBBS_INT 7345.00 (LIKE POTTER) 345/230/13.2KV TRANSFORMER CKT 1'	559	0.89928	103.2137	'CAPROCK REC-MCDONALD - CAPROCK REC-TRIANGLE 138KV CKT 1'
G10_060_16WP	'FROM->TO'	'HOBBS_INT 7345.00 (LIKE POTTER) 345/230/13.2KV TRANSFORMER CKT 1'	559	1	132.9038	'CAPROCK REC-MCDONALD - CAPROCK REC-PHILLIPS 138KV CKT 1'
G10_060_16WP	'FROM->TO'	'HOBBS_INT 7345.00 (LIKE POTTER) 345/230/13.2KV TRANSFORMER CKT 1'	559	1	127.4243	'CAPROCK REC-MCDONALD - CAPROCK REC-PHILLIPS 138KV CKT 1'
G10_060_16WP	'FROM->TO'	'HOBBS_INT 7345.00 (LIKE POTTER) 345/230/13.2KV TRANSFORMER CKT 1'	559	1	136.4641	'CAPROCK REC-PHILLIPS - CAPROCK REC-TATE 138KV CKT 1'
G10_060_16WP	'FROM->TO'	'HOBBS_INT 7345.00 (LIKE POTTER) 345/230/13.2KV TRANSFORMER CKT 1'	559	1	130.5719	'CAPROCK REC-PHILLIPS - CAPROCK REC-TATE 138KV CKT 1'
G10_060_16WP	'FROM->TO'	'HOBBS_INT 7345.00 (LIKE POTTER) 345/230/13.2KV TRANSFORMER CKT 1'	559	1	111.434	'BORDEN COUNTY INTERCHANGE - GRASSLAND 345.00 345KV CKT 1'
G10_060_16WP	'FROM->TO'	'HOBBS_INT 7345.00 (LIKE POTTER) 345/230/13.2KV TRANSFORMER CKT 1'	559	1	108.1014	'BORDEN COUNTY INTERCHANGE - GRASSLAND 345.00 345KV CKT 1'
G10_060_16WP	'FROM->TO'	'HOBBS_INT 7345.00 (LIKE POTTER) 345/230/13.2KV TRANSFORMER CKT 1'	559	1	116.5462	'GRASSLAND 345.00 - JONES 345.00 345KV CKT 1'
G10_060_16WP	'FROM->TO'	'HOBBS_INT 7345.00 (LIKE POTTER) 345/230/13.2KV TRANSFORMER CKT 1'	559	1	112.7743	'GRASSLAND 345.00 - JONES 345.00 345KV CKT 1'
G10_060_16WP	'FROM->TO'	'HOBBS_INT 7345.00 (LIKE POTTER) 345/230/13.2KV TRANSFORMER CKT 1'	559	1	137.8996	'MIDLAND 7345.00 (LIKE WICHITA) 345/138/13.8KV TRANSFORMER CKT 1'
G10_060_16WP	'FROM->TO'	'HOBBS_INT 7345.00 (LIKE POTTER) 345/230/13.2KV TRANSFORMER CKT 1'	559	1	131.8504	'MIDLAND 7345.00 (LIKE WICHITA) 345/138/13.8KV TRANSFORMER CKT 1'
G10_060_16WP		Non Converged Contingency	1684	0.77601	-	'HOBBS_INT 7345.00 - MIDLAND 7345.00 345KV CKT 1'

SOURCE	DIRECTION	MONTCOMMONNAME	RATEB	TDF	TC%LOADING	CONTNAME
G10_060_16WP		Non Converged Contingency	559	0.77601	-	'HOBBS_INT 7345.00 (LIKE POTTER) 345/230/13.2KV TRANSFORMER CKT 1'
G10_060_16WP		Non Converged Contingency	1684	0.80932	-	'HOBBS_INT 7345.00 - MIDLAND 7345.00 345KV CKT 1'
G10_060_16WP		Non Converged Contingency	559	0.80932	-	'HOBBS_INT 7345.00 (LIKE POTTER) 345/230/13.2KV TRANSFORMER CKT 1'
G11_007	'TO->FROM'	'CIMARRON - MATTHEWSON 345.00 345KV CKT 1'	956	0.53349	149.8055	'MATTHEWSON 345.00 - NORTHWEST 345KV CKT 1'
G11_007	'TO->FROM'	'CIMARRON - MATTHEWSON 345.00 345KV CKT 1'	956	0.52957	127.5919	'MATTHEWSON 345.00 - NORTHWEST 345KV CKT 1'
G11_007	'TO->FROM'	'CIMARRON - MATTHEWSON 345.00 345KV CKT 1'	956	0.53071	128.9848	'MATTHEWSON 345.00 - NORTHWEST 345KV CKT 1'
G11_007	'FROM->TO'	'MATTHEWSON 345.00 - NORTHWEST 345KV CKT 1'	1195	0.59052	132.3797	'CIMARRON - MATTHEWSON 345.00 345KV CKT 1'
G11_007	'FROM->TO'	'MATTHEWSON 345.00 - NORTHWEST 345KV CKT 1'	1195	0.58579	113.3461	'CIMARRON - MATTHEWSON 345.00 345KV CKT 1'
G11_007	'FROM->TO'	'MATTHEWSON 345.00 - NORTHWEST 345KV CKT 1'	1195	0.58734	113.064	'CIMARRON - MATTHEWSON 345.00 345KV CKT 1'
G11_007	'TO->FROM'	'CIMARRON - MATTHEWSON 345.00 345KV CKT 1'	956	0.52889	126.9879	'MATTHEWSON 345.00 - NORTHWEST 345KV CKT 1'
G11_007	'FROM->TO'	'MATTHEWSON 345.00 - NORTHWEST 345KV CKT 1'	1195	0.58511	112.6244	'CIMARRON - MATTHEWSON 345.00 345KV CKT 1'
G11_008		Non Converged Contingency	0	0.52183	-	'DBL-COM-MEDL'
G11_008		Non Converged Contingency	0	0.3262	-	'DBL-MEDLO-WI'
G11_008		Non Converged Contingency	0	0.522	-	'DBL-COM-MEDL'
G11_008		Non Converged Contingency	0	0.32649	-	'DBL-MEDLO-WI'
G11_008		Non Converged Contingency	0	0.52161	-	'DBL-COM-MEDL'
G11_008		Non Converged Contingency	0	0.31592	-	'DBL-MEDLO-WI'
G11_008		Non Converged Contingency	0	0.52177	-	'DBL-COM-MEDL'
G11_008		Non Converged Contingency	0	0.31619	-	'DBL-MEDLO-WI'
G11_008		Non Converged Contingency	0	0.28965	-	'DBL-MEDLO-WI'
G11_008		Non Converged Contingency	0	0.52173	-	'DBL-COM-MEDL'
G11_008		Non Converged Contingency	0	0.31582	-	'DBL-MEDLO-WI'
G11_008		Non Converged Contingency	0	0.52188	-	'DBL-COM-MEDL'
G11_008		Non Converged Contingency	0	0.31609	-	'DBL-MEDLO-WI'
G11_009	'TO->FROM'	'CARNEGIE - HOBART JUNCTION 138KV CKT 1'	171	0.37205	125.3835	'BASE CASE'
G11_009	'TO->FROM'	'CARNEGIE - HOBART JUNCTION 138KV CKT 1'	171	0.37774	112.7306	'HINTON - WEATHERFORD JCT. 138KV CKT 1'
G11_009	'TO->FROM'	'CARNEGIE - HOBART JUNCTION 138KV CKT 1'	171	0.37774	112.6783	'CAN_GAS4 138.00 - HINTON 138KV CKT 1'
G11_009	'TO->FROM'	'CARNEGIE - HOBART JUNCTION 138KV CKT 1'	171	0.39611	112.3902	'ALTUS JUNCTION - SNYDER 138KV CKT 1'
G11_009	'TO->FROM'	'CARNEGIE - HOBART JUNCTION 138KV CKT 1'	171	0.44156	124.2869	'CACHE - SNYDER 138KV CKT 1'
G11_009	'TO->FROM'	'CARNEGIE - HOBART JUNCTION 138KV CKT 1'	171	0.45212	128.7328	'ALTUS JUNCTION - OMPA-ALTUS PARK 138KV CKT 1'
G11_009	'TO->FROM'	'CARNEGIE - HOBART JUNCTION 138KV CKT 1'	171	0.38976	110.4234	'HOBART - ROOSEVELT TAP 69KV CKT 1'
G11_009	'TO->FROM'	'CARNEGIE - HOBART JUNCTION 138KV CKT 1'	171	0.38976	109.9174	'ROOSEVELT TAP - SNYDER 69KV CKT 1'
G11_009	'TO->FROM'	'CARNEGIE - HOBART JUNCTION 138KV CKT 1'	171	0.36952	111.998	'LAWTON EASTSIDE - OKLAUNION 345KV CKT 1'
G11_009	'TO->FROM'	'CARNEGIE - HOBART JUNCTION 138KV CKT 1'	171	0.3983	122.6515	'CLINTON JUNCTION - ELK CITY 138KV CKT 1'
G11_009	'TO->FROM'	'CARNEGIE - HOBART JUNCTION 138KV CKT 1'	171	0.37971	103.0963	'ELK CITY - RHWIND4 138.00 138KV CKT 1'
G11_009	'TO->FROM'	'CARNEGIE - HOBART JUNCTION 138KV CKT 1'	171	0.37304	107.1581	'ELK CITY - ELK CITY 69KV CKT 1'
G11_009	'TO->FROM'	'CARNEGIE - HOBART JUNCTION 138KV CKT 1'	171	0.45212	136.94	'HOBART JUNCTION - OMPA-ALTUS TAMARACK 138KV CKT 1'
G11_009	'TO->FROM'	'CARNEGIE - HOBART JUNCTION 138KV CKT 1'	171	0.38976	113.9699	'HOBART - HOBART JUNCTION 69KV CKT 1'
G11_009	'TO->FROM'	'CARNEGIE - HOBART JUNCTION 138KV CKT 1'	171	0.37053	103.0228	'NORGE ROAD - SOUTHWESTERN STATION 138KV CKT 1'
G11_009	'TO->FROM'	'CARNEGIE - HOBART JUNCTION 138KV CKT 1'	171	0.37012	102.7039	'ELGIN JUNCTION - SOUTHWESTERN STATION 138KV CKT 1'
G11_009	'TO->FROM'	'CARNEGIE - HOBART JUNCTION 138KV CKT 1'	171	0.36406	111.8476	'SOUTHWESTERN STATION - WASHITA 138KV CKT 1'
G11_009	'TO->FROM'	'CARNEGIE - HOBART JUNCTION 138KV CKT 1'	171	0.37532	107.4018	'CLINTON JUNCTION - CLINTON NATURAL GAS TAP 138KV CKT 1'
G11_009	'TO->FROM'	'CARNEGIE - HOBART JUNCTION 138KV CKT 1'	171	0.44156	122.5638	'LAWTON 112TH & WEST GORE - LAWTON AIRGAS TAP 138KV CKT 1'
G11_009	'TO->FROM'	'CARNEGIE - HOBART JUNCTION 138KV CKT 1'	171	0.37774	113.3812	'WEATHERFORD JCT. - WEATHERFORD SOUTHEAST 138KV CKT 1'
G11_009	'TO->FROM'	'CARNEGIE - HOBART JUNCTION 138KV CKT 1'	171	0.37532	110.4648	'WEATHERFORD SOUTHEAST - WEATHERFORD TAP 138KV CKT 1'
G11_009	'TO->FROM'	'CARNEGIE - HOBART JUNCTION 138KV CKT 1'	171	0.44156	123.3867	'CACHE - LAWTON AIRGAS TAP 138KV CKT 1'
G11_009	'TO->FROM'	'CARNEGIE - HOBART JUNCTION 138KV CKT 1'	171	0.37532	107.2582	'CLINTON NATURAL GAS TAP - WEATHERFORD WIND FARM 138KV CKT 1'
G11_009	'TO->FROM'	'CARNEGIE - HOBART JUNCTION 138KV CKT 1'	171	0.37532	110.8885	'WEATHERFORD TAP - WEATHERFORD WIND FARM 138KV CKT 1'
G11_009	'TO->FROM'	'CARNEGIE - HOBART JUNCTION 138KV CKT 1'	171	0.37774	112.4943	'CAN_GAS4 138.00 - JENSEN ROAD 138KV CKT 1'
G11_009	'TO->FROM'	'CARNEGIE - HOBART JUNCTION 138KV CKT 1'	171	0.39347	118.1051	'STLN-DEMARC6230.00 - SWEETWT6 230.00 230KV CKT 1'
G11_009	'TO->FROM'	'CARNEGIE - HOBART JUNCTION 138KV CKT 1'	171	0.37461	103.0473	'MCLEAN RURAL SUB - SHAMROCK 115KV CKT 1'
G11_009	'TO->FROM'	'CARNEGIE - HOBART JUNCTION 138KV CKT 1'	171	0.36678	102.8052	'GRACMNT7 345.00 - MINCO 7 345.00 345KV CKT 1'
G11_009	'TO->FROM'	'CARNEGIE - HOBART JUNCTION 138KV CKT 1'	171	0.37514	108.2741	'JENSEN ROAD - JENSEN TAP 138KV CKT 1'
G11_009	'TO->FROM'	'CARNEGIE - HOBART JUNCTION 138KV CKT 1'	171	0.37197	113.2929	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'

SOURCE	DIRECTION	MONTCOMMONNAME	RATEB	TDF	TC%LOADING	CONTNAME
G11_009	'TO->FROM'	'CARNEGIE - HOBART JUNCTION 138KV CKT 1'	171	0.37197	108.7725	'G11-015T 345.00 - WWRDEHV7 345.00 345KV CKT 1'
G11_009	'TO->FROM'	'CARNEGIE - HOBART JUNCTION 138KV CKT 1'	171	0.37197	109.622	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'
G11_009	'TO->FROM'	'CARNEGIE - HOBART JUNCTION 138KV CKT 1'	171	0.37526	106.75	'ALTUS - ALTUS SW 69KV CKT 1'
G11_009	'TO->FROM'	'CARNEGIE - HOBART JUNCTION 138KV CKT 1'	171	0.37526	106.8248	'ALTUS - RUSSELL 69KV CKT 1'
G11_009	'TO->FROM'	'CARNEGIE - HOBART JUNCTION 138KV CKT 1'	171	0.37029	102.2623	'ANADARKO - POCASSETT 138KV CKT 1'
G11_009	'TO->FROM'	'CARNEGIE - HOBART JUNCTION 138KV CKT 1'	171	0.37388	108.8588	'BINGER NIJECT - ONEY 138KV CKT 1'
G11_009	'TO->FROM'	'CARNEGIE - HOBART JUNCTION 138KV CKT 1'	171	0.37388	109.2077	'BINGER NIJECT - SICKLES 138KV CKT 1'
G11_009	'TO->FROM'	'CARNEGIE - HOBART JUNCTION 138KV CKT 1'	171	0.37989	117.2883	'CLINTON - WEATHERFORD 138KV CKT 1'
G11_009	'TO->FROM'	'CARNEGIE - HOBART JUNCTION 138KV CKT 1'	171	0.37989	117.5264	'CLINTON - G07-32T 138.00 138KV CKT 1'
G11_009	'TO->FROM'	'CARNEGIE - HOBART JUNCTION 138KV CKT 1'	171	0.37296	107.5104	'GOTEBO - MOUNTAIN VIEW 69KV CKT 1'
G11_009	'TO->FROM'	'CARNEGIE - HOBART JUNCTION 138KV CKT 1'	171	0.37388	109.5539	'HYDRO - SICKLES 138KV CKT 1'
G11_009	'TO->FROM'	'CARNEGIE - HOBART JUNCTION 138KV CKT 1'	171	0.37388	109.742	'HYDRO - WEATHERFORD 138KV CKT 1'
G11_009	'TO->FROM'	'CARNEGIE - HOBART JUNCTION 138KV CKT 1'	171	0.38792	113.6832	'MOORELAND - NINMILE 4 138.00 138KV CKT 1'
G11_009	'TO->FROM'	'CARNEGIE - HOBART JUNCTION 138KV CKT 1'	171	0.37971	108.3148	'MOREWOOD SW - RHWIND4 138.00 138KV CKT 1'
G11_009	'TO->FROM'	'CARNEGIE - HOBART JUNCTION 138KV CKT 1'	171	0.38792	113.6873	'MOREWOOD SW - NINMILE 4 138.00 138KV CKT 1'
G11_009	'TO->FROM'	'CARNEGIE - HOBART JUNCTION 138KV CKT 1'	171	0.37296	107.3388	'MOUNTAIN VIEW - PINE RIDGE 69KV CKT 1'
G11_009	'TO->FROM'	'CARNEGIE - HOBART JUNCTION 138KV CKT 1'	171	0.37388	108.7331	'ONEY - WASHITA 138KV CKT 1'
G11_009	'TO->FROM'	'CARNEGIE - HOBART JUNCTION 138KV CKT 1'	171	0.37494	103.0367	'BLUCAN5 4 138.00 - PARADISE 138KV CKT 1'
G11_009	'TO->FROM'	'CARNEGIE - HOBART JUNCTION 138KV CKT 1'	171	0.37296	107.1508	'PINE RIDGE - WASHITA 69KV CKT 1'
G11_009	'TO->FROM'	'CARNEGIE - HOBART JUNCTION 138KV CKT 1'	171	0.37029	102.3666	'POCASSETT - TUTTLE 138KV CKT 1'
G11_009	'TO->FROM'	'CARNEGIE - HOBART JUNCTION 138KV CKT 1'	171	0.37029	102.6198	'SUNSHINE CANYON - TUTTLE 138KV CKT 1'
G11_009	'TO->FROM'	'CARNEGIE - HOBART JUNCTION 138KV CKT 1'	171	0.37395	109.5469	'WASHITA - WEATHERFORD 138KV CKT 1'
G11_009	'TO->FROM'	'CARNEGIE - HOBART JUNCTION 138KV CKT 1'	171	0.37278	106.7733	'G05-17T 345.00 - Hitchland Interchange 345KV CKT 1'
G11_009	'TO->FROM'	'CARNEGIE - HOBART JUNCTION 138KV CKT 1'	171	0.39347	116.4122	'GRAPEVINE INTERCHANGE - STATELINE INTERCHANGE 230KV CKT 1'
G11_009	'TO->FROM'	'CARNEGIE - HOBART JUNCTION 138KV CKT 1'	171	0.38497	107.9254	'GRAPEVINE INTERCHANGE - NICHOLS STATION 230KV CKT 1'
G11_009	'TO->FROM'	'CARNEGIE - HOBART JUNCTION 138KV CKT 1'	171	0.39347	118.1051	'STATELINE INTERCHANGE - STLN-DEMARC6230.00 230KV CKT 1'
G11_009	'TO->FROM'	'CARNEGIE - HOBART JUNCTION 138KV CKT 1'	171	0.37461	102.7549	'MCCLELLAN SUB - MCLEAN RURAL SUB 115KV CKT 1'
G11_009	'TO->FROM'	'CARNEGIE - HOBART JUNCTION 138KV CKT 1'	171	0.37461	102.6337	'KIRBY SWITCHING STATION - MCCLELLAN SUB 115KV CKT 1'
G11_009	'TO->FROM'	'CARNEGIE - HOBART JUNCTION 138KV CKT 1'	171	0.37236	107.1246	'G07-48T 230.00 - SWISHER COUNTY INTERCHANGE 230KV CKT 1'
G11_009	'TO->FROM'	'CARNEGIE - HOBART JUNCTION 138KV CKT 1'	171	0.45212	134.151	'OMPA-ALTUS TAMARACK - OMPVET-4 138.00 138KV CKT 1'
G11_009	'TO->FROM'	'CARNEGIE - HOBART JUNCTION 138KV CKT 1'	171	0.45212	131.449	'OMPA-ALTUS PARK - OMPVET-4 138.00 138KV CKT 1'
G11_009	'TO->FROM'	'CARNEGIE - HOBART JUNCTION 138KV CKT 1'	171	0.38014	106.81	'SNYDER (SNYDER) 138/69/13.8KV TRANSFORMER CKT 1'
G11_009	'TO->FROM'	'CARNEGIE - HOBART JUNCTION 138KV CKT 1'	171	0.37304	107.8804	'ELK CITY (ELKCTY-4) 138/69/13.8KV TRANSFORMER CKT 1'
G11_009	'TO->FROM'	'CARNEGIE - HOBART JUNCTION 138KV CKT 1'	171	0.38976	114.1458	'HOBART JUNCTION (HOB-JCT) 138/69/13.8KV TRANSFORMER CKT 1'
G11_009	'TO->FROM'	'CARNEGIE - HOBART JUNCTION 138KV CKT 1'	171	0.37461	103.0445	'SHAMROCK (SHAMRCK1) 115/69/14.4KV TRANSFORMER CKT 1'
G11_009	'TO->FROM'	'CARNEGIE - HOBART JUNCTION 138KV CKT 1'	171	0.37514	108.2989	'OGE3TERM10'
G11_009	'TO->FROM'	'CARNEGIE - HOBART JUNCTION 138KV CKT 1'	171	0.39347	118.1051	'SPP-SWPS-02'
G11_009	'TO->FROM'	'CARNEGIE - HOBART JUNCTION 138KV CKT 1'	171	0.39412	115.5473	'SPP-SWPS-03'
G11_009	'TO->FROM'	'CARNEGIE - HOBART JUNCTION 138KV CKT 1'	171	0.37461	103.1868	'SPP-SWPS-T54'
G11_009	'TO->FROM'	'CARNEGIE - HOBART JUNCTION 138KV CKT 1'	171	0.37226	109.2324	'BASE CASE'
G11_009	'TO->FROM'	'CARNEGIE - HOBART JUNCTION 138KV CKT 1'	171	0.44181	108.8135	'CACHE - SNYDER 138KV CKT 1'
G11_009	'TO->FROM'	'CARNEGIE - HOBART JUNCTION 138KV CKT 1'	171	0.45235	112.363	'ALTUS JUNCTION - OMPA-ALTUS PARK 138KV CKT 1'
G11_009	'TO->FROM'	'CARNEGIE - HOBART JUNCTION 138KV CKT 1'	171	0.39858	108.0098	'CLINTON JUNCTION - ELK CITY 138KV CKT 1'
G11_009	'TO->FROM'	'CARNEGIE - HOBART JUNCTION 138KV CKT 1'	171	0.45235	120.5338	'HOBART JUNCTION - OMPA-ALTUS TAMARACK 138KV CKT 1'
G11_009	'TO->FROM'	'CARNEGIE - HOBART JUNCTION 138KV CKT 1'	171	0.44181	106.7024	'LAWTON 112TH & WEST GORE - LAWTON AIRGAS TAP 138KV CKT 1'
G11_009	'TO->FROM'	'CARNEGIE - HOBART JUNCTION 138KV CKT 1'	171	0.44181	107.9137	'CACHE - LAWTON AIRGAS TAP 138KV CKT 1'
G11_009	'TO->FROM'	'CARNEGIE - HOBART JUNCTION 138KV CKT 1'	171	0.39365	103.5543	'STLN-DEMARC6230.00 - SWEETWT6 230.00 230KV CKT 1'
G11_009	'TO->FROM'	'CARNEGIE - HOBART JUNCTION 138KV CKT 1'	171	0.38013	103.3305	'CLINTON - WEATHERFORD 138KV CKT 1'
G11_009	'TO->FROM'	'CARNEGIE - HOBART JUNCTION 138KV CKT 1'	171	0.38013	103.5713	'CLINTON - G07-32T 138.00 138KV CKT 1'
G11_009	'TO->FROM'	'CARNEGIE - HOBART JUNCTION 138KV CKT 1'	171	0.39365	101.8142	'GRAPEVINE INTERCHANGE - STATELINE INTERCHANGE 230KV CKT 1'
G11_009	'TO->FROM'	'CARNEGIE - HOBART JUNCTION 138KV CKT 1'	171	0.39365	103.5543	'STATELINE INTERCHANGE - STLN-DEMARC6230.00 230KV CKT 1'
G11_009	'TO->FROM'	'CARNEGIE - HOBART JUNCTION 138KV CKT 1'	171	0.45235	117.7637	'OMPA-ALTUS TAMARACK - OMPVET-4 138.00 138KV CKT 1'
G11_009	'TO->FROM'	'CARNEGIE - HOBART JUNCTION 138KV CKT 1'	171	0.45235	115.0726	'OMPA-ALTUS PARK - OMPVET-4 138.00 138KV CKT 1'
G11_009	'TO->FROM'	'CARNEGIE - HOBART JUNCTION 138KV CKT 1'	171	0.39365	103.5543	'SPP-SWPS-02'

SOURCE	DIRECTION	MONTCOMMONNAME	RATEB	TDF	TC%LOADING	CONTNAME
G11_009	'TO->FROM'	'CARNEGIE - HOBART JUNCTION 138KV CKT 1'	171	0.3943	100.9015	'SPP-SWPS-03'
G11_009	'FROM->TO'	'CARNEGIE - SOUTHWESTERN STATION 138KV CKT 1'	171	0.37205	113.2096	'BASE CASE'
G11_009	'FROM->TO'	'CARNEGIE - SOUTHWESTERN STATION 138KV CKT 1'	171	0.37774	109.8221	'HINTON - WEATHERFORD JCT. 138KV CKT 1'
G11_009	'FROM->TO'	'CARNEGIE - SOUTHWESTERN STATION 138KV CKT 1'	171	0.37774	109.7699	'CAN_GAS4 138.00 - HINTON 138KV CKT 1'
G11_009	'FROM->TO'	'CARNEGIE - SOUTHWESTERN STATION 138KV CKT 1'	171	0.39611	109.4964	'ALTUS JUNCTION - SNYDER 138KV CKT 1'
G11_009	'FROM->TO'	'CARNEGIE - SOUTHWESTERN STATION 138KV CKT 1'	171	0.44156	121.4003	'CACHE - SNYDER 138KV CKT 1'
G11_009	'FROM->TO'	'CARNEGIE - SOUTHWESTERN STATION 138KV CKT 1'	171	0.45212	125.848	'ALTUS JUNCTION - OMPA-ALTUS PARK 138KV CKT 1'
G11_009	'FROM->TO'	'CARNEGIE - SOUTHWESTERN STATION 138KV CKT 1'	171	0.38976	107.527	'HOBART - ROOSEVELT TAP 69KV CKT 1'
G11_009	'FROM->TO'	'CARNEGIE - SOUTHWESTERN STATION 138KV CKT 1'	171	0.38976	107.0211	'ROOSEVELT TAP - SNYDER 69KV CKT 1'
G11_009	'FROM->TO'	'CARNEGIE - SOUTHWESTERN STATION 138KV CKT 1'	171	0.36952	109.0928	'LAWTON EASTSIDE - OKLAUNION 345KV CKT 1'
G11_009	'FROM->TO'	'CARNEGIE - SOUTHWESTERN STATION 138KV CKT 1'	171	0.3983	119.7685	'CLINTON JUNCTION - ELK CITY 138KV CKT 1'
G11_009	'FROM->TO'	'CARNEGIE - SOUTHWESTERN STATION 138KV CKT 1'	171	0.37304	104.2616	'ELK CITY - ELK CITY 69KV CKT 1'
G11_009	'FROM->TO'	'CARNEGIE - SOUTHWESTERN STATION 138KV CKT 1'	171	0.45212	134.0577	'HOBART JUNCTION - OMPA-ALTUS TAMARACK 138KV CKT 1'
G11_009	'FROM->TO'	'CARNEGIE - SOUTHWESTERN STATION 138KV CKT 1'	171	0.38976	111.0753	'HOBART - HOBART JUNCTION 69KV CKT 1'
G11_009	'FROM->TO'	'CARNEGIE - SOUTHWESTERN STATION 138KV CKT 1'	171	0.37053	100.1195	'NORGE ROAD - SOUTHWESTERN STATION 138KV CKT 1'
G11_009	'FROM->TO'	'CARNEGIE - SOUTHWESTERN STATION 138KV CKT 1'	171	0.36794	100.3049	'ANADARKO - SOUTHWESTERN STATION 138KV CKT 1'
G11_009	'FROM->TO'	'CARNEGIE - SOUTHWESTERN STATION 138KV CKT 1'	171	0.36406	108.9567	'SOUTHWESTERN STATION - WASHITA 138KV CKT 1'
G11_009	'FROM->TO'	'CARNEGIE - SOUTHWESTERN STATION 138KV CKT 1'	171	0.37532	104.5004	'CLINTON JUNCTION - CLINTON NATURAL GAS TAP 138KV CKT 1'
G11_009	'FROM->TO'	'CARNEGIE - SOUTHWESTERN STATION 138KV CKT 1'	171	0.44156	119.6762	'LAWTON 112TH & WEST GORE - LAWTON AIRGAS TAP 138KV CKT 1'
G11_009	'FROM->TO'	'CARNEGIE - SOUTHWESTERN STATION 138KV CKT 1'	171	0.37774	110.4712	'WEATHERFORD JCT. - WEATHERFORD SOUTHEAST 138KV CKT 1'
G11_009	'FROM->TO'	'CARNEGIE - SOUTHWESTERN STATION 138KV CKT 1'	171	0.37532	107.5596	'WEATHERFORD SOUTHEAST - WEATHERFORD TAP 138KV CKT 1'
G11_009	'FROM->TO'	'CARNEGIE - SOUTHWESTERN STATION 138KV CKT 1'	171	0.44156	120.4999	'CACHE - LAWTON AIRGAS TAP 138KV CKT 1'
G11_009	'FROM->TO'	'CARNEGIE - SOUTHWESTERN STATION 138KV CKT 1'	171	0.37532	104.3571	'CLINTON NATURAL GAS TAP - WEATHERFORD WIND FARM 138KV CKT 1'
G11_009	'FROM->TO'	'CARNEGIE - SOUTHWESTERN STATION 138KV CKT 1'	171	0.37532	107.982	'WEATHERFORD TAP - WEATHERFORD WIND FARM 138KV CKT 1'
G11_009	'FROM->TO'	'CARNEGIE - SOUTHWESTERN STATION 138KV CKT 1'	171	0.37774	109.5864	'CAN_GAS4 138.00 - JENSEN ROAD 138KV CKT 1'
G11_009	'FROM->TO'	'CARNEGIE - SOUTHWESTERN STATION 138KV CKT 1'	171	0.39347	115.1986	'STLN-DEMARC6230.00 - SWEETWT6 230.00 230KV CKT 1'
G11_009	'FROM->TO'	'CARNEGIE - SOUTHWESTERN STATION 138KV CKT 1'	171	0.37514	105.3706	'JENSEN ROAD - JENSEN TAP 138KV CKT 1'
G11_009	'FROM->TO'	'CARNEGIE - SOUTHWESTERN STATION 138KV CKT 1'	171	0.37197	110.3877	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'
G11_009	'FROM->TO'	'CARNEGIE - SOUTHWESTERN STATION 138KV CKT 1'	171	0.37197	105.8719	'G11-015T 345.00 - WWRDEHV7 345.00 345KV CKT 1'
G11_009	'FROM->TO'	'CARNEGIE - SOUTHWESTERN STATION 138KV CKT 1'	171	0.37197	106.7219	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'
G11_009	'FROM->TO'	'CARNEGIE - SOUTHWESTERN STATION 138KV CKT 1'	171	0.37526	103.8505	'ALTUS - ALTUS SW 69KV CKT 1'
G11_009	'FROM->TO'	'CARNEGIE - SOUTHWESTERN STATION 138KV CKT 1'	171	0.37526	103.9258	'ALTUS - RUSSELL 69KV CKT 1'
G11_009	'FROM->TO'	'CARNEGIE - SOUTHWESTERN STATION 138KV CKT 1'	171	0.37388	105.9645	'BINGER NIJECT - ONEY 138KV CKT 1'
G11_009	'FROM->TO'	'CARNEGIE - SOUTHWESTERN STATION 138KV CKT 1'	171	0.37388	106.3134	'BINGER NIJECT - SICKLES 138KV CKT 1'
G11_009	'FROM->TO'	'CARNEGIE - SOUTHWESTERN STATION 138KV CKT 1'	171	0.37989	114.4045	'CLINTON - WEATHERFORD 138KV CKT 1'
G11_009	'FROM->TO'	'CARNEGIE - SOUTHWESTERN STATION 138KV CKT 1'	171	0.37989	114.6469	'CLINTON - G07-32T 138.00 138KV CKT 1'
G11_009	'FROM->TO'	'CARNEGIE - SOUTHWESTERN STATION 138KV CKT 1'	171	0.37296	104.6148	'GOTEBO - MOUNTAIN VIEW 69KV CKT 1'
G11_009	'FROM->TO'	'CARNEGIE - SOUTHWESTERN STATION 138KV CKT 1'	171	0.37388	106.6593	'HYDRO - SICKLES 138KV CKT 1'
G11_009	'FROM->TO'	'CARNEGIE - SOUTHWESTERN STATION 138KV CKT 1'	171	0.37388	106.8472	'HYDRO - WEATHERFORD 138KV CKT 1'
G11_009	'FROM->TO'	'CARNEGIE - SOUTHWESTERN STATION 138KV CKT 1'	171	0.38792	110.7845	'MOORELAND - NINMILE 4 138.00 138KV CKT 1'
G11_009	'FROM->TO'	'CARNEGIE - SOUTHWESTERN STATION 138KV CKT 1'	171	0.37971	105.4173	'MOREWOOD SW - RHWIND4 138.00 138KV CKT 1'
G11_009	'FROM->TO'	'CARNEGIE - SOUTHWESTERN STATION 138KV CKT 1'	171	0.38792	110.7885	'MOREWOOD SW - NINMILE 4 138.00 138KV CKT 1'
G11_009	'FROM->TO'	'CARNEGIE - SOUTHWESTERN STATION 138KV CKT 1'	171	0.37296	104.4432	'MOUNTAIN VIEW - PINE RIDGE 69KV CKT 1'
G11_009	'FROM->TO'	'CARNEGIE - SOUTHWESTERN STATION 138KV CKT 1'	171	0.37388	105.8387	'ONEY - WASHITA 138KV CKT 1'
G11_009	'FROM->TO'	'CARNEGIE - SOUTHWESTERN STATION 138KV CKT 1'	171	0.37494	100.1361	'BLUCAN5 4 138.00 - PARADISE 138KV CKT 1'
G11_009	'FROM->TO'	'CARNEGIE - SOUTHWESTERN STATION 138KV CKT 1'	171	0.37296	104.2611	'PINE RIDGE - WASHITA 69KV CKT 1'
G11_009	'FROM->TO'	'CARNEGIE - SOUTHWESTERN STATION 138KV CKT 1'	171	0.37395	106.6506	'WASHITA - WEATHERFORD 138KV CKT 1'
G11_009	'FROM->TO'	'CARNEGIE - SOUTHWESTERN STATION 138KV CKT 1'	171	0.39347	113.5092	'GRAPEVINE INTERCHANGE - STATELINE INTERCHANGE 230KV CKT 1'
G11_009	'FROM->TO'	'CARNEGIE - SOUTHWESTERN STATION 138KV CKT 1'	171	0.38497	105.0266	'GRAPEVINE INTERCHANGE - NICHOLS STATION 230KV CKT 1'
G11_009	'FROM->TO'	'CARNEGIE - SOUTHWESTERN STATION 138KV CKT 1'	171	0.39347	115.1986	'STATELINE INTERCHANGE - STLN-DEMARC6230.00 230KV CKT 1'
G11_009	'FROM->TO'	'CARNEGIE - SOUTHWESTERN STATION 138KV CKT 1'	171	0.37236	104.2268	'G07-48T 230.00 - SWISHER COUNTY INTERCHANGE 230KV CKT 1'
G11_009	'FROM->TO'	'CARNEGIE - SOUTHWESTERN STATION 138KV CKT 1'	171	0.45212	131.2692	'OMPA-ALTUS TAMARACK - OMPVET-4 138.00 138KV CKT 1'
G11_009	'FROM->TO'	'CARNEGIE - SOUTHWESTERN STATION 138KV CKT 1'	171	0.45212	128.5658	'OMPA-ALTUS PARK - OMPVET-4 138.00 138KV CKT 1'
G11_009	'FROM->TO'	'CARNEGIE - SOUTHWESTERN STATION 138KV CKT 1'	171	0.38014	103.9078	'SNYDER (SNYDER) 138/69/13.8KV TRANSFORMER CKT 1'

SOURCE	DIRECTION	MONTCOMMONNAME	RATEB	TDF	TC%LOADING	CONTNAME
G11_009	'FROM->TO'	'CARNEGIE - SOUTHWESTERN STATION 138KV CKT 1'	171	0.37304	104.9841	'ELK CITY (ELKCTY-4) 138/69/13.8KV TRANSFORMER CKT 1'
G11_009	'FROM->TO'	'CARNEGIE - SOUTHWESTERN STATION 138KV CKT 1'	171	0.38976	111.2503	'HOBART JUNCTION (HOB-JCT) 138/69/13.8KV TRANSFORMER CKT 1'
G11_009	'FROM->TO'	'CARNEGIE - SOUTHWESTERN STATION 138KV CKT 1'	171	0.37514	105.3954	'OGE3TERM10'
G11_009	'FROM->TO'	'CARNEGIE - SOUTHWESTERN STATION 138KV CKT 1'	171	0.39347	115.1986	'SPP-SWPS-02'
G11_009	'FROM->TO'	'CARNEGIE - SOUTHWESTERN STATION 138KV CKT 1'	171	0.39412	112.6438	'SPP-SWPS-03'
G11_009	'FROM->TO'	'CARNEGIE - SOUTHWESTERN STATION 138KV CKT 1'	171	0.44181	105.9221	'CACHE - SNYDER 138KV CKT 1'
G11_009	'FROM->TO'	'CARNEGIE - SOUTHWESTERN STATION 138KV CKT 1'	171	0.45235	109.4739	'ALTUS JUNCTION - OMPA-ALTUS PARK 138KV CKT 1'
G11_009	'FROM->TO'	'CARNEGIE - SOUTHWESTERN STATION 138KV CKT 1'	171	0.39858	105.1229	'CLINTON JUNCTION - ELK CITY 138KV CKT 1'
G11_009	'FROM->TO'	'CARNEGIE - SOUTHWESTERN STATION 138KV CKT 1'	171	0.45235	117.6498	'HOBART JUNCTION - OMPA-ALTUS TAMARACK 138KV CKT 1'
G11_009	'FROM->TO'	'CARNEGIE - SOUTHWESTERN STATION 138KV CKT 1'	171	0.44181	103.8113	'LAWTON 112TH & WEST GORE - LAWTON AIRGAS TAP 138KV CKT 1'
G11_009	'FROM->TO'	'CARNEGIE - SOUTHWESTERN STATION 138KV CKT 1'	171	0.44181	105.0219	'CACHE - LAWTON AIRGAS TAP 138KV CKT 1'
G11_009	'FROM->TO'	'CARNEGIE - SOUTHWESTERN STATION 138KV CKT 1'	171	0.39365	100.6481	'STLN-DEMARC6230.00 - SWEETWT6 230.00 230KV CKT 1'
G11_009	'FROM->TO'	'CARNEGIE - SOUTHWESTERN STATION 138KV CKT 1'	171	0.38013	100.4436	'CLINTON - WEATHERFORD 138KV CKT 1'
G11_009	'FROM->TO'	'CARNEGIE - SOUTHWESTERN STATION 138KV CKT 1'	171	0.38013	100.6847	'CLINTON - G07-32T 138.00 138KV CKT 1'
G11_009	'FROM->TO'	'CARNEGIE - SOUTHWESTERN STATION 138KV CKT 1'	171	0.39365	100.6481	'STATELINE INTERCHANGE - STLN-DEMARC6230.00 230KV CKT 1'
G11_009	'FROM->TO'	'CARNEGIE - SOUTHWESTERN STATION 138KV CKT 1'	171	0.45235	114.8788	'OMPA-ALTUS TAMARACK - OMPVET-4 138.00 138KV CKT 1'
G11_009	'FROM->TO'	'CARNEGIE - SOUTHWESTERN STATION 138KV CKT 1'	171	0.45235	112.1858	'OMPA-ALTUS PARK - OMPVET-4 138.00 138KV CKT 1'
G11_009	'FROM->TO'	'CARNEGIE - SOUTHWESTERN STATION 138KV CKT 1'	171	0.39365	100.6481	'SPP-SWPS-02'
G11_009	'FROM->TO'	'HOBART JUNCTION - OMPA-ALTUS TAMARACK 138KV CKT 1'	143	0.2039	102.7339	'HINTON - WEATHERFORD JCT. 138KV CKT 1'
G11_009	'FROM->TO'	'HOBART JUNCTION - OMPA-ALTUS TAMARACK 138KV CKT 1'	143	0.2039	102.6935	'CAN_GAS4 138.00 - HINTON 138KV CKT 1'
G11_009	'FROM->TO'	'HOBART JUNCTION - OMPA-ALTUS TAMARACK 138KV CKT 1'	143	0.23115	108.1507	'HOBART - ROOSEVELT TAP 69KV CKT 1'
G11_009	'FROM->TO'	'HOBART JUNCTION - OMPA-ALTUS TAMARACK 138KV CKT 1'	143	0.23115	107.1785	'ROOSEVELT TAP - SNYDER 69KV CKT 1'
G11_009	'FROM->TO'	'HOBART JUNCTION - OMPA-ALTUS TAMARACK 138KV CKT 1'	143	0.32519	139.3571	'CARNEGIE - HOBART JUNCTION 138KV CKT 1'
G11_009	'FROM->TO'	'HOBART JUNCTION - OMPA-ALTUS TAMARACK 138KV CKT 1'	143	0.32519	138.1361	'CARNEGIE - SOUTHWESTERN STATION 138KV CKT 1'
G11_009	'FROM->TO'	'HOBART JUNCTION - OMPA-ALTUS TAMARACK 138KV CKT 1'	143	0.19966	100.2877	'LAWTON EASTSIDE - OKLAUNION 345KV CKT 1'
G11_009	'FROM->TO'	'HOBART JUNCTION - OMPA-ALTUS TAMARACK 138KV CKT 1'	143	0.20991	104.4551	'CLINTON JUNCTION - ELK CITY 138KV CKT 1'
G11_009	'FROM->TO'	'HOBART JUNCTION - OMPA-ALTUS TAMARACK 138KV CKT 1'	143	0.20256	101.4594	'ELK CITY - ELK CITY 69KV CKT 1'
G11_009	'FROM->TO'	'HOBART JUNCTION - OMPA-ALTUS TAMARACK 138KV CKT 1'	143	0.23115	116.3203	'HOBART - HOBART JUNCTION 69KV CKT 1'
G11_009	'FROM->TO'	'HOBART JUNCTION - OMPA-ALTUS TAMARACK 138KV CKT 1'	143	0.2039	103.2547	'WEATHERFORD JCT. - WEATHERFORD SOUTHEAST 138KV CKT 1'
G11_009	'FROM->TO'	'HOBART JUNCTION - OMPA-ALTUS TAMARACK 138KV CKT 1'	143	0.20254	100.9275	'WEATHERFORD SOUTHEAST - WEATHERFORD TAP 138KV CKT 1'
G11_009	'FROM->TO'	'HOBART JUNCTION - OMPA-ALTUS TAMARACK 138KV CKT 1'	143	0.20254	101.2626	'WEATHERFORD TAP - WEATHERFORD WIND FARM 138KV CKT 1'
G11_009	'FROM->TO'	'HOBART JUNCTION - OMPA-ALTUS TAMARACK 138KV CKT 1'	143	0.2039	102.5456	'CAN_GAS4 138.00 - JENSEN ROAD 138KV CKT 1'
G11_009	'FROM->TO'	'HOBART JUNCTION - OMPA-ALTUS TAMARACK 138KV CKT 1'	143	0.21689	109.7949	'STLN-DEMARC6230.00 - SWEETWT6 230.00 230KV CKT 1'
G11_009	'FROM->TO'	'HOBART JUNCTION - OMPA-ALTUS TAMARACK 138KV CKT 1'	143	0.20256	100	'CARTER JCT - DILL JCT 69KV CKT 1'
G11_009	'FROM->TO'	'HOBART JUNCTION - OMPA-ALTUS TAMARACK 138KV CKT 1'	143	0.20256	100	'CARTER JCT - LAKE CREEK 69KV CKT 1'
G11_009	'FROM->TO'	'HOBART JUNCTION - OMPA-ALTUS TAMARACK 138KV CKT 1'	143	0.20283	100.728	'CLINTON - WEATHERFORD 138KV CKT 1'
G11_009	'FROM->TO'	'HOBART JUNCTION - OMPA-ALTUS TAMARACK 138KV CKT 1'	143	0.20283	100.8045	'CLINTON - G07-32T 138.00 138KV CKT 1'
G11_009	'FROM->TO'	'HOBART JUNCTION - OMPA-ALTUS TAMARACK 138KV CKT 1'	143	0.20256	100.4724	'DILL JCT - ELK CITY 69KV CKT 1'
G11_009	'FROM->TO'	'HOBART JUNCTION - OMPA-ALTUS TAMARACK 138KV CKT 1'	143	0.20853	102.1493	'MOORELAND - NINMILE 4 138.00 138KV CKT 1'
G11_009	'FROM->TO'	'HOBART JUNCTION - OMPA-ALTUS TAMARACK 138KV CKT 1'	143	0.20853	102.1541	'MOREWOOD SW - NINMILE 4 138.00 138KV CKT 1'
G11_009	'FROM->TO'	'HOBART JUNCTION - OMPA-ALTUS TAMARACK 138KV CKT 1'	143	0.2016	101.0969	'GRAPEVINE INTERCHANGE 230/115KV TRANSFORMER CKT 1'
G11_009	'FROM->TO'	'HOBART JUNCTION - OMPA-ALTUS TAMARACK 138KV CKT 1'	143	0.21689	108.0514	'GRAPEVINE INTERCHANGE - STATELINE INTERCHANGE 230KV CKT 1'
G11_009	'FROM->TO'	'HOBART JUNCTION - OMPA-ALTUS TAMARACK 138KV CKT 1'	143	0.21689	109.7949	'STATELINE INTERCHANGE - STLN-DEMARC6230.00 230KV CKT 1'
G11_009	'FROM->TO'	'HOBART JUNCTION - OMPA-ALTUS TAMARACK 138KV CKT 1'	143	0.20256	103.7021	'ELK CITY (ELKCTY-4) 138/69/13.8KV TRANSFORMER CKT 1'
G11_009	'FROM->TO'	'HOBART JUNCTION - OMPA-ALTUS TAMARACK 138KV CKT 1'	143	0.23115	116.468	'HOBART JUNCTION (HOB-JCT) 138/69/13.8KV TRANSFORMER CKT 1'
G11_009	'FROM->TO'	'HOBART JUNCTION - OMPA-ALTUS TAMARACK 138KV CKT 1'	143	0.20528	100.3044	'GRACMNT7 345.00 (BANK 1) 345/138/13.8KV TRANSFORMER CKT 1'
G11_009	'FROM->TO'	'HOBART JUNCTION - OMPA-ALTUS TAMARACK 138KV CKT 1'	143	0.21689	109.7949	'SPP-SWPS-02'
G11_009	'FROM->TO'	'HOBART JUNCTION - OMPA-ALTUS TAMARACK 138KV CKT 1'	143	0.21583	109.8328	'SPP-SWPS-03'
G11_009	'FROM->TO'	'HOBART JUNCTION - OMPA-ALTUS TAMARACK 138KV CKT 1'	143	0.32528	124.5996	'CARNEGIE - HOBART JUNCTION 138KV CKT 1'
G11_009	'FROM->TO'	'HOBART JUNCTION - OMPA-ALTUS TAMARACK 138KV CKT 1'	143	0.32528	123.3969	'CARNEGIE - SOUTHWESTERN STATION 138KV CKT 1'
G11_009	'FROM->TO'	'HOBART JUNCTION - OMPA-ALTUS TAMARACK 138KV CKT 1'	143	0.2312	105.7913	'HOBART - HOBART JUNCTION 69KV CKT 1'
G11_009	'FROM->TO'	'HOBART JUNCTION - OMPA-ALTUS TAMARACK 138KV CKT 1'	143	0.2312	105.9293	'HOBART JUNCTION (HOB-JCT) 138/69/13.8KV TRANSFORMER CKT 1'
G11_009	'FROM->TO'	'HOBART JUNCTION - OMPA-ALTUS TAMARACK 138KV CKT 1'	143	0.19868	102.6745	'GRANITE - LAKE CREEK 69KV CKT 1'
G11_009	'FROM->TO'	'HOBART JUNCTION - OMPA-ALTUS TAMARACK 138KV CKT 1'	143	0.19868	102.3282	'GRANITE - OMPA-MANGUM 69KV CKT 1'

SOURCE	DIRECTION	MONTCOMMONNAME	RATEB	TDF	TC%LOADING	CONTNAME
G11_009	'FROM->TO'	'HOBART JUNCTION - OMPA-ALTUS TAMARACK 138KV CKT 1'	143	0.19868	101.4665	'OMPA-MANGUM - RUSSELL 69KV CKT 1'
G11_009	'TO->FROM'	'CARNEGIE - HOBART JUNCTION 138KV CKT 1'	143	0.45117	102.8864	'HOBART JUNCTION - OMPA-ALTUS TAMARACK 138KV CKT 1'
G11_009	'FROM->TO'	'HOBART JUNCTION - OMPA-ALTUS TAMARACK 138KV CKT 1'	143	0.33894	104.6471	'CARNEGIE - HOBART JUNCTION 138KV CKT 1'
G11_009	'FROM->TO'	'HOBART JUNCTION - OMPA-ALTUS TAMARACK 138KV CKT 1'	143	0.33894	102.8786	'CARNEGIE - SOUTHWESTERN STATION 138KV CKT 1'
G11_009	'TO->FROM'	'CARNEGIE - HOBART JUNCTION 138KV CKT 1'	143	0.39436	105.1167	'ALTUS JUNCTION - SNYDER 138KV CKT 1'
G11_009	'TO->FROM'	'CARNEGIE - HOBART JUNCTION 138KV CKT 1'	143	0.396	101.0558	'CACHE - SNYDER 138KV CKT 1'
G11_009	'TO->FROM'	'CARNEGIE - HOBART JUNCTION 138KV CKT 1'	143	0.45055	118.7654	'ALTUS JUNCTION - OMPA-ALTUS PARK 138KV CKT 1'
G11_009	'TO->FROM'	'CARNEGIE - HOBART JUNCTION 138KV CKT 1'	143	0.38376	100.8376	'HOBART - ROOSEVELT TAP 69KV CKT 1'
G11_009	'TO->FROM'	'CARNEGIE - HOBART JUNCTION 138KV CKT 1'	143	0.38376	100.2701	'ROOSEVELT TAP - SNYDER 69KV CKT 1'
G11_009	'TO->FROM'	'CARNEGIE - HOBART JUNCTION 138KV CKT 1'	143	0.56054	106.0742	'CLINTON AIR FORCE BASE TAP - ELK CITY 138KV CKT 1'
G11_009	'TO->FROM'	'CARNEGIE - HOBART JUNCTION 138KV CKT 1'	143	0.56054	107.6288	'CLINTON AIR FORCE BASE TAP - HOBART JUNCTION 138KV CKT 1'
G11_009	'TO->FROM'	'CARNEGIE - HOBART JUNCTION 138KV CKT 1'	143	0.38817	119.537	'CLINTON JUNCTION - ELK CITY 138KV CKT 1'
G11_009	'TO->FROM'	'CARNEGIE - HOBART JUNCTION 138KV CKT 1'	143	0.38376	105.1909	'HOBART - HOBART JUNCTION 69KV CKT 1'
G11_009	'TO->FROM'	'CARNEGIE - HOBART JUNCTION 138KV CKT 1'	143	0.36911	100.2462	'WEATHERFORD JCT. - WEATHERFORD SOUTHEAST 138KV CKT 1'
G11_009	'TO->FROM'	'CARNEGIE - HOBART JUNCTION 138KV CKT 1'	143	0.396	100.4809	'CACHE - LAWTON AIRGAS TAP 138KV CKT 1'
G11_009	'TO->FROM'	'CARNEGIE - HOBART JUNCTION 138KV CKT 1'	143	0.36331	104.0446	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'
G11_009	'TO->FROM'	'CARNEGIE - HOBART JUNCTION 138KV CKT 1'	143	0.36331	101.5806	'G11-015T 345.00 - WWRDEHV7 345.00 345KV CKT 1'
G11_009	'TO->FROM'	'CARNEGIE - HOBART JUNCTION 138KV CKT 1'	143	0.36331	102.0169	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'
G11_009	'TO->FROM'	'CARNEGIE - HOBART JUNCTION 138KV CKT 1'	143	0.37073	100.6867	'CLINTON - WEATHERFORD 138KV CKT 1'
G11_009	'TO->FROM'	'CARNEGIE - HOBART JUNCTION 138KV CKT 1'	143	0.37073	101.0715	'CLINTON - G07-32T 138.00 138KV CKT 1'
G11_009	'TO->FROM'	'CARNEGIE - HOBART JUNCTION 138KV CKT 1'	143	0.36099	102.5743	'G08-14T 345.00 - TUCO INTERCHANGE 345KV CKT 1'
G11_009	'TO->FROM'	'CARNEGIE - HOBART JUNCTION 138KV CKT 1'	143	0.45055	121.2503	'OMPA-ALTUS PARK - OMPVET-4 138.00 138KV CKT 1'
G11_009	'TO->FROM'	'CARNEGIE - HOBART JUNCTION 138KV CKT 1'	143	0.38376	105.1897	'HOBART JUNCTION (HOB-JCT) 138/69/13.8KV TRANSFORMER CKT 1'
G11_009	'TO->FROM'	'CARNEGIE - HOBART JUNCTION 138KV CKT 1'	143	0.45055	126.2243	'HOBART JUNCTION - OMPA-ALTUS TAMARACK 138KV CKT 1'
G11_009	'FROM->TO'	'CARNEGIE - SOUTHWESTERN STATION 138KV CKT 1'	171	0.45055	102.8128	'HOBART JUNCTION - OMPA-ALTUS TAMARACK 138KV CKT 1'
G11_009	'FROM->TO'	'HOBART JUNCTION - OMPA-ALTUS TAMARACK 138KV CKT 1'	143	0.3388	108.9447	'CARNEGIE - HOBART JUNCTION 138KV CKT 1'
G11_009	'FROM->TO'	'HOBART JUNCTION - OMPA-ALTUS TAMARACK 138KV CKT 1'	143	0.3388	107.7632	'CARNEGIE - SOUTHWESTERN STATION 138KV CKT 1'
G11_009		Non Converged Contingency	339	0.21124	-	'OMPA-ALTUS TAMARACK - OMPVET-4 138.00 138KV CKT 1'
G11_009		Non Converged Contingency	339	0.21124	-	'OMPA-ALTUS TAMARACK - OMPVET-4 138.00 138KV CKT 1'
G11_009	'TO->FROM'	'CARNEGIE - HOBART JUNCTION 138KV CKT 1'	151	0.45077	103.7368	'HOBART JUNCTION - OMPA-ALTUS TAMARACK 138KV CKT 1'
G11_009	'FROM->TO'	'HOBART JUNCTION - OMPA-ALTUS TAMARACK 138KV CKT 1'	143	0.33901	110.6067	'CARNEGIE - HOBART JUNCTION 138KV CKT 1'
G11_009	'FROM->TO'	'HOBART JUNCTION - OMPA-ALTUS TAMARACK 138KV CKT 1'	143	0.33901	108.7678	'CARNEGIE - SOUTHWESTERN STATION 138KV CKT 1'
G11_009	'FROM->TO'	'HOBART JUNCTION - OMPA-ALTUS TAMARACK 138KV CKT 1'	143	0.24154	103.3546	'HOBART - HOBART JUNCTION 69KV CKT 1'
G11_009	'FROM->TO'	'HOBART JUNCTION - OMPA-ALTUS TAMARACK 138KV CKT 1'	143	0.24154	103.4899	'HOBART JUNCTION (HOB-JCT) 138/69/13.8KV TRANSFORMER CKT 1'
G11_009	'TO->FROM'	'CARNEGIE - HOBART JUNCTION 138KV CKT 1'	171	0.45021	100.8523	'ALTUS JUNCTION - OMPA-ALTUS PARK 138KV CKT 1'
G11_009	'TO->FROM'	'CARNEGIE - HOBART JUNCTION 138KV CKT 1'	171	0.38775	103.4786	'CLINTON JUNCTION - ELK CITY 138KV CKT 1'
G11_009	'FROM->TO'	'CARNEGIE - SOUTHWESTERN STATION 138KV CKT 1'	171	0.38775	100.6139	'CLINTON JUNCTION - ELK CITY 138KV CKT 1'
G11_009	'FROM->TO'	'HOBART JUNCTION - OMPA-ALTUS TAMARACK 138KV CKT 1'	143	0.3389	110.9581	'CARNEGIE - HOBART JUNCTION 138KV CKT 1'
G11_009	'FROM->TO'	'HOBART JUNCTION - OMPA-ALTUS TAMARACK 138KV CKT 1'	143	0.3389	109.7086	'CARNEGIE - SOUTHWESTERN STATION 138KV CKT 1'
G11_009		Non Converged Contingency	143	0.21152	-	'HOBART JUNCTION - OMPA-ALTUS TAMARACK 138KV CKT 1'
G11_009		Non Converged Contingency	339	0.21152	-	'OMPA-ALTUS TAMARACK - OMPVET-4 138.00 138KV CKT 1'
G11_009		Non Converged Contingency	287	0.21152	-	'OMPA-ALTUS PARK - OMPVET-4 138.00 138KV CKT 1'
G11_012		Non Converged Contingency	0	0.20939	-	'DBL-MEDLO-WI'
G11_012		Non Converged Contingency	0	0.26804	-	'DBL-G0847-WO'
G11_012	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.22406	116.9115	'LAWTON EASTSIDE - OKLAUNION 345KV CKT 1'
G11_012	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.22406	109.8947	'G08-14T 345.00 - OKLAUNION 345KV CKT 1'
G11_012	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.20377	100.7888	'CLINTON JUNCTION - ELK CITY 138KV CKT 1'
G11_012	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.20743	102.799	'ELK CITY 230KV - SWEETWT6 230.00 230KV CKT 1'
G11_012	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.20743	101.3863	'SPP-SWPS-02'
G11_012	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.20743	100.9854	'SPP-SWPS-02A'
G11_012	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.20767	102.1125	'SPP-SWPS-03'
G11_012	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.20743	101.3863	'STLN-DEMARC6230.00 - SWEETWT6 230.00 230KV CKT 1'
G11_012	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.20131	100.9516	'G08-13T 345.00 - WOODRING 345KV CKT 1'
G11_012	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.20301	101.1362	'CLEO CORNER - GLASS MOUNTAIN 138KV CKT 1'

SOURCE	DIRECTION	MONTCOMMONNAME	RATEB	TDF	TC%LOADING	CONTNAME
G11_012	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.2041	101.2324	'CLEO CORNER - MEN TAP 138KV CKT 1'
G11_012	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.20452	102.2077	'DEWEY - SOUTHARD 138KV CKT 1'
G11_012	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.20301	101.2257	'GLASS MOUNTAIN - MOORELAND 138KV CKT 1'
G11_012	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.2041	101.2054	'IMO TAP - MEN TAP 138KV CKT 1'
G11_012	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.20452	102.5818	'EL RENO - ROMAN NOSE 138KV CKT 1'
G11_012	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.20452	101.8124	'ROMAN NOSE - SOUTHARD 138KV CKT 1'
G11_012	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.20348	100.7538	'MOORELAND 345.00 - WWRDEHV7 345.00 345KV CKT 1'
G11_012	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.21395	105.0211	'MED-LDG5 345.00 - WWRDEHV7 345.00 345KV CKT 1'
G11_012	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.21395	105.0211	'MED-LDG5 345.00 - WWRDEHV7 345.00 345KV CKT 2'
G11_012	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.20178	100.5936	'CEDARDALE - MOORELAND 138KV CKT 1'
G11_012	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.20178	100.5515	'CEDARDALE - OKEENE 138KV CKT 1'
G11_012	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.20743	101.72	'GRAPEVINE INTERCHANGE - STATELINE INTERCHANGE 230KV CKT 1'
G11_012	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.20365	100.8819	'GRAPEVINE INTERCHANGE - NICHOLS STATION 230KV CKT 1'
G11_012	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.2054	101.2079	'BORDER 7345.00 - TUCO INTERCHANGE 345KV CKT 1'
G11_012	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.20743	101.3863	'STATELINE INTERCHANGE - STLN-DEMARC6230.00 230KV CKT 1'
G11_012	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.21056	102.2118	'FINNEY SWITCHING STATION - STEVENSCO 345.00 345KV CKT 1'
G11_012	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.22406	108.9533	'G08-14T 345.00 - TUCO INTERCHANGE 345KV CKT 1'
G11_012	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.20432	102.7089	'G10-16T 345.00 - POSTROCK7 345.00 345KV CKT 1'
G11_012	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.20232	100.4266	'AXTELL - POSTROCK7 345.00 345KV CKT 1'
G11_012	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.2048	100.9906	'HOLCOMB - SETAB 345KV CKT 1'
G11_012	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.20651	102.5682	'MINGO - SETAB 345KV CKT 1'
G11_012	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.20734	102.5793	'MINGO - RED WILLOW 345KV CKT 1'
G11_012	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.21387	104.5946	'GRAY CO 345.00 - SPEARVILLE 345KV CKT 1'
G11_012	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.20432	101.7224	'G10-16T 345.00 - SPEARVILLE 345KV CKT 1'
G11_012	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.20464	100.7092	'BENTON - WICHITA 345KV CKT 1'
G11_012	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.21154	106.9295	'MED-LDG5 345.00 - WICHITA 345KV CKT 1'
G11_012	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.21154	106.9295	'MED-LDG5 345.00 - WICHITA 345KV CKT 2'
G11_012	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.20131	100	'G08-13T 345.00 - SUMNERCO 345.00 345KV CKT 1'
G11_012	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.21142	100.8723	'2008-047T 345.00 - GRAY CO 345.00 345KV CKT 1'
G11_012	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.20743	102.7985	'ELK CITY 230KV (ELKCTY-6) 230/138/13.8KV TRANSFORMER CKT 1'
G11_012	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.20348	100.743	'MOORELAND 345.00 (MRLNDAUTO) 345/138/13.8KV TRANSFORMER CKT 1'
G11_012	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.22445	116.3511	'LAWTON EASTSIDE - OKLAUNION 345KV CKT 1'
G11_012	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.22445	109.3695	'G08-14T 345.00 - OKLAUNION 345KV CKT 1'
G11_012	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.204	100.5551	'CLINTON JUNCTION - ELK CITY 138KV CKT 1'
G11_012	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.20767	102.4599	'ELK CITY 230KV - SWEETWT6 230.00 230KV CKT 1'
G11_012	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.20767	101.0983	'STLN-DEMARC6230.00 - SWEETWT6 230.00 230KV CKT 1'
G11_012	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.20792	101.7816	'SPP-SWPS-03'
G11_012	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.20152	100.718	'G08-13T 345.00 - WOODRING 345KV CKT 1'
G11_012	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.20323	100.9396	'CLEO CORNER - GLASS MOUNTAIN 138KV CKT 1'
G11_012	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.20431	101.0115	'CLEO CORNER - MEN TAP 138KV CKT 1'
G11_012	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.20474	101.9975	'DEWEY - SOUTHARD 138KV CKT 1'
G11_012	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.20323	101.0292	'GLASS MOUNTAIN - MOORELAND 138KV CKT 1'
G11_012	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.20431	100.9846	'IMO TAP - MEN TAP 138KV CKT 1'
G11_012	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.20474	102.3701	'EL RENO - ROMAN NOSE 138KV CKT 1'
G11_012	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.20474	101.6003	'ROMAN NOSE - SOUTHARD 138KV CKT 1'
G11_012	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.2037	100.5087	'MOORELAND 345.00 - WWRDEHV7 345.00 345KV CKT 1'
G11_012	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.21418	104.7633	'MED-LDG5 345.00 - WWRDEHV7 345.00 345KV CKT 1'
G11_012	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.21418	104.7633	'MED-LDG5 345.00 - WWRDEHV7 345.00 345KV CKT 2'
G11_012	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.202	100.3798	'CEDARDALE - MOORELAND 138KV CKT 1'
G11_012	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.202	100.3373	'CEDARDALE - OKEENE 138KV CKT 1'
G11_012	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.20767	101.3779	'GRAPEVINE INTERCHANGE - STATELINE INTERCHANGE 230KV CKT 1'
G11_012	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.20388	100.6346	'GRAPEVINE INTERCHANGE - NICHOLS STATION 230KV CKT 1'
G11_012	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.20555	101.134	'BORDER 7345.00 - TUCO INTERCHANGE 345KV CKT 1'
G11_012	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.20767	101.0983	'STATELINE INTERCHANGE - STLN-DEMARC6230.00 230KV CKT 1'

SOURCE	DIRECTION	MONTCOMMONNAME	RATEB	TDF	TC%LOADING	CONTNAME
G11_012	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.2108	101.9392	'FINNEY SWITCHING STATION - STEVENSCO 345.00 345KV CKT 1'
G11_012	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.22445	108.4536	'G08-14T 345.00 - TUCO INTERCHANGE 345KV CKT 1'
G11_012	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.20452	102.5419	'G10-16T 345.00 - POSTROCK7 345.00 345KV CKT 1'
G11_012	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.20253	100.2513	'AXTELL - POSTROCK7 345.00 345KV CKT 1'
G11_012	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.20501	100.7955	'HOLCOMB - SETAB 345KV CKT 1'
G11_012	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.20671	102.4111	'MINGO - SETAB 345KV CKT 1'
G11_012	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.20755	102.4204	'MINGO - RED WILLOW 345KV CKT 1'
G11_012	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.21409	104.2969	'GRAY CO 345.00 - SPEARVILLE 345KV CKT 1'
G11_012	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.20452	101.5518	'G10-16T 345.00 - SPEARVILLE 345KV CKT 1'
G11_012	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.20485	100.5296	'BENTON - WICHITA 345KV CKT 1'
G11_012	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.21175	106.7794	'MED-LDG5 345.00 - WICHITA 345KV CKT 1'
G11_012	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.21175	106.7794	'MED-LDG5 345.00 - WICHITA 345KV CKT 2'
G11_012	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.21167	100.5819	'2008-047T 345.00 - GRAY CO 345.00 345KV CKT 1'
G11_012	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.20767	102.4593	'ELK CITY 230KV (ELKCTY-6) 230/138/13.8KV TRANSFORMER CKT 1'
G11_012	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.2037	100.4878	'MOORELAND 345.00 (MRLNDAUTO) 345/138/13.8KV TRANSFORMER CKT 1'
G11_012	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.20767	101.0983	'SPP-SWPS-02'
G11_012	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.20767	100.6318	'SPP-SWPS-02A'
G11_012	'TO->FROM'	'G11-015T 345.00 - WWRDEHV7 345.00 345KV CKT 1'	1195	0.22406	112.0129	'LAWTON EASTSIDE - OKLAUNION 345KV CKT 1'
G11_012	'TO->FROM'	'G11-015T 345.00 - WWRDEHV7 345.00 345KV CKT 1'	1195	0.22406	104.9272	'G08-14T 345.00 - OKLAUNION 345KV CKT 1'
G11_012	'TO->FROM'	'G11-015T 345.00 - WWRDEHV7 345.00 345KV CKT 1'	1195	0.21395	100	'MED-LDG5 345.00 - WWRDEHV7 345.00 345KV CKT 1'
G11_012	'TO->FROM'	'G11-015T 345.00 - WWRDEHV7 345.00 345KV CKT 1'	1195	0.21395	100	'MED-LDG5 345.00 - WWRDEHV7 345.00 345KV CKT 2'
G11_012	'TO->FROM'	'G11-015T 345.00 - WWRDEHV7 345.00 345KV CKT 1'	1195	0.22406	103.9806	'G08-14T 345.00 - TUCO INTERCHANGE 345KV CKT 1'
G11_012	'TO->FROM'	'G11-015T 345.00 - WWRDEHV7 345.00 345KV CKT 1'	1195	0.21154	101.8483	'MED-LDG5 345.00 - WICHITA 345KV CKT 1'
G11_012	'TO->FROM'	'G11-015T 345.00 - WWRDEHV7 345.00 345KV CKT 1'	1195	0.21154	101.8483	'MED-LDG5 345.00 - WICHITA 345KV CKT 2'
G11_012	'TO->FROM'	'G11-015T 345.00 - WWRDEHV7 345.00 345KV CKT 1'	1195	0.22445	111.4524	'LAWTON EASTSIDE - OKLAUNION 345KV CKT 1'
G11_012	'TO->FROM'	'G11-015T 345.00 - WWRDEHV7 345.00 345KV CKT 1'	1195	0.22445	104.4057	'G08-14T 345.00 - OKLAUNION 345KV CKT 1'
G11_012	'TO->FROM'	'G11-015T 345.00 - WWRDEHV7 345.00 345KV CKT 1'	1195	0.22445	103.4862	'G08-14T 345.00 - TUCO INTERCHANGE 345KV CKT 1'
G11_012	'TO->FROM'	'G11-015T 345.00 - WWRDEHV7 345.00 345KV CKT 1'	1195	0.21175	101.7039	'MED-LDG5 345.00 - WICHITA 345KV CKT 1'
G11_012	'TO->FROM'	'G11-015T 345.00 - WWRDEHV7 345.00 345KV CKT 1'	1195	0.21175	101.7039	'MED-LDG5 345.00 - WICHITA 345KV CKT 2'
G11_012		Non Converged Contingency	0	0.20356	-	'DBL-MEDLO-WI'
G11_012		Non Converged Contingency	0	0.30502	-	'DBL-G0847-WO'
G11_014		Non Converged Contingency	0	0.23069	-	'DBL-MEDLO-WI'
G11_014	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.20078	129.7928	'LAWTON EASTSIDE - OKLAUNION 345KV CKT 1'
G11_014	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.20078	124.0786	'G08-14T 345.00 - OKLAUNION 345KV CKT 1'
G11_014	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.20281	126.9844	'MED-LDG5 345.00 - WWRDEHV7 345.00 345KV CKT 1'
G11_014	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.20281	126.9844	'MED-LDG5 345.00 - WWRDEHV7 345.00 345KV CKT 2'
G11_014	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.20078	123.3315	'G08-14T 345.00 - TUCO INTERCHANGE 345KV CKT 1'
G11_014	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.2007	122.3677	'GRAY CO 345.00 - SPEARVILLE 345KV CKT 1'
G11_014	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.19972	126.5147	'MED-LDG5 345.00 - WICHITA 345KV CKT 1'
G11_014	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.19972	126.5147	'MED-LDG5 345.00 - WICHITA 345KV CKT 2'
G11_014	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.20457	121.01	'2008-047T 345.00 - GRAY CO 345.00 345KV CKT 1'
G11_014	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.19998	100	'2008-047T 345.00 - GRAY CO 345.00 345KV CKT 1'
G11_014	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.19847	123.7118	'BORDER 7345.00 - TUCO INTERCHANGE 345KV CKT 1'
G11_014	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.19811	104.0401	'MED-LDG5 345.00 - WWRDEHV7 345.00 345KV CKT 1'
G11_014	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.19811	104.0401	'MED-LDG5 345.00 - WWRDEHV7 345.00 345KV CKT 2'
G11_014	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.19601	102.6201	'GRAY CO 345.00 - SPEARVILLE 345KV CKT 1'
G11_014	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.19504	105.4346	'MED-LDG5 345.00 - WICHITA 345KV CKT 1'
G11_014	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.19504	105.4346	'MED-LDG5 345.00 - WICHITA 345KV CKT 2'
G11_014	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.19816	102.2155	'MED-LDG5 345.00 - WWRDEHV7 345.00 345KV CKT 1'
G11_014	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.19816	102.2155	'MED-LDG5 345.00 - WWRDEHV7 345.00 345KV CKT 2'
G11_014	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.19604	100.8335	'GRAY CO 345.00 - SPEARVILLE 345KV CKT 1'
G11_014	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.19505	103.6121	'MED-LDG5 345.00 - WICHITA 345KV CKT 1'
G11_014	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.19505	103.6121	'MED-LDG5 345.00 - WICHITA 345KV CKT 2'
G11_014	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.23083	100.1884	'DOLET HILLS - SOUTHWEST SHREVEPORT 345KV CKT 1'

SOURCE	DIRECTION	MONTCOMMONNAME	RATEB	TDF	TC%LOADING	CONTNAME
G11_014	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.23124	100.3465	'NORTHEAST STATION - ONETA 345KV CKT 1'
G11_014	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.23075	100.1267	'NORTHEAST STATION - TULSA NORTH 345KV CKT 1'
G11_014	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.23174	100.5567	'HINTON - WEATHERFORD JCT. 138KV CKT 1'
G11_014	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.23174	100.5451	'CAN_GAS4 138.00 - HINTON 138KV CKT 1'
G11_014	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.23211	100.5403	'CARNEGIE - HOBART JUNCTION 138KV CKT 1'
G11_014	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.23211	100.4949	'CARNEGIE - SOUTHWESTERN STATION 138KV CKT 1'
G11_014	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.23289	101.2871	'CLINTON AIR FORCE BASE TAP - ELK CITY 138KV CKT 1'
G11_014	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.23289	101.2357	'CLINTON AIR FORCE BASE TAP - HOBART JUNCTION 138KV CKT 1'
G11_014	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.24435	118.9423	'LAWTON EASTSIDE - OKLAUNION 345KV CKT 1'
G11_014	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.24435	111.8235	'G08-14T 345.00 - OKLAUNION 345KV CKT 1'
G11_014	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.23424	102.6013	'CLINTON JUNCTION - ELK CITY 138KV CKT 1'
G11_014	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.23284	100.5623	'ELK CITY - RHWIND4 138.00 138KV CKT 1'
G11_014	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.23231	100.7014	'LAWTON EASTSIDE - SUNNYSIDE 345KV CKT 1'
G11_014	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.23083	100.5706	'GRACMNT7 345.00 - LAWTON EASTSIDE 345KV CKT 1'
G11_014	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.23145	100.3547	'CLINTON JUNCTION - CLINTON NATURAL GAS TAP 138KV CKT 1'
G11_014	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.23218	100.2345	'CLINTON JUNCTION - G07-32T 138.00 138KV CKT 1'
G11_014	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.23174	100.6973	'WEATHERFORD JCT. - WEATHERFORD SOUTHEAST 138KV CKT 1'
G11_014	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.23389	104.553	'ELK CITY 230KV - SWEETWT6 230.00 230KV CKT 1'
G11_014	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.23135	100.3801	'NUNDRWD - WAYSIDE 230KV CKT 1'
G11_014	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.23123	100.226	'STEGALL - WAYSIDE 230KV CKT 1'
G11_014	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.23134	100.6665	'STEGALL - STEGALL TRANSFORMER 230KV CKT 1'
G11_014	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.23134	100.6747	'STEGALL TY 345/230KV TRANSFORMER CKT 1'
G11_014	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.23114	100.1462	'KCPL-OPGD01A'
G11_014	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.23114	100.1519	'KCPL-OPGD06A'
G11_014	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.23134	100.6658	'TRF-STEGALL'
G11_014	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.23387	100.6757	'OGE3TERM1'
G11_014	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.23124	100.2042	'OGE3TERM2'
G11_014	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.23197	100.3765	'OGE3TERM10'
G11_014	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.23389	103.1722	'SPP-SWPS-02'
G11_014	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.23389	102.7374	'SPP-SWPS-02A'
G11_014	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.23399	103.9025	'SPP-SWPS-03'
G11_014	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.23132	100.259	'SPP-SWPS-T53'
G11_014	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.23157	100.4919	'SPP-SWPS-T54'
G11_014	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.23285	101.1197	'SPP-MKEC-05'
G11_014	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.23285	101.4996	'SPP-MKEC-08'
G11_014	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.23285	101.123	'SPP-WERE-34'
G11_014	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.23168	100.1845	'WRTOD1104'
G11_014	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.23164	100.8523	'WRTOD400'
G11_014	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.23121	100.1068	'AI43'
G11_014	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.23149	100.2396	'OVERTON-TRF'
G11_014	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.23113	100.4146	'FIELD NORTH - LKFLDXL3 345KV CKT 1'
G11_014	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.23145	100.4171	'WEATHERFORD SOUTHEAST - WEATHERFORD TAP 138KV CKT 1'
G11_014	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.23145	100.3247	'CLINTON NATURAL GAS TAP - WEATHERFORD WIND FARM 138KV CKT 1'
G11_014	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.23145	100.5046	'WEATHERFORD TAP - WEATHERFORD WIND FARM 138KV CKT 1'
G11_014	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.23174	100.5056	'CAN_GAS4 138.00 - JENSEN ROAD 138KV CKT 1'
G11_014	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.23389	103.1722	'STLN-DEMARC6230.00 - SWEETWT6 230.00 230KV CKT 1'
G11_014	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.23121	100.1287	'CLARENDON - CLARENDON REC 69KV CKT 1'
G11_014	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.23157	100.2503	'CHILDRESS - HOLLIS TAP 138KV CKT 1'
G11_014	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.23201	100.6655	'CHILDRESS - LAKE PAULINE 138KV CKT 1'
G11_014	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.23157	100.2611	'HOLLIS TAP - WELLINGTON 138KV CKT 1'
G11_014	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.23157	100.3487	'SHAMROCK - WELLINGTON 138KV CKT 1'
G11_014	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.23157	100.4909	'MCLEAN RURAL SUB - SHAMROCK 115KV CKT 1'
G11_014	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.23149	100.1974	'LAKE PAULINE - RUSSELL 138KV CKT 1'
G11_014	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.23361	100.5899	'WAUKOMIS - WAUKOMIS TAP 138KV CKT 1'

SOURCE	DIRECTION	MONTCOMMONNAME	RATEB	TDF	TC%LOADING	CONTNAME
G11_014	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.23361	100.6339	'HENESSEY - WAUKOMIS 138KV CKT 1'
G11_014	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.23165	100.2374	'MARSHALL - WOODRING 138KV CKT 1'
G11_014	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.2355	102.6581	'G08-13T 345.00 - WOODRING 345KV CKT 1'
G11_014	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.23221	100.3959	'KNOBHILL - SALINE 69KV CKT 1'
G11_014	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.23221	100.3674	'HELENAT2 69.000 - SALINE 69KV CKT 1'
G11_014	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.23221	100.2624	'GOLTRY - IMO 69KV CKT 1'
G11_014	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.23221	100.2836	'GOLTRY - HELENAT2 69.000 69KV CKT 1'
G11_014	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.23202	100.1293	'IMO TAP - SOUTH 4TH ST 138KV CKT 1'
G11_014	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.23165	100.2306	'COTTONWOOD CREEK - MARSHALL 138KV CKT 1'
G11_014	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.23361	100.7339	'DOVER SW - HENESSEY 138KV CKT 1'
G11_014	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.23639	103.0063	'CLEO CORNER - GLASS MOUNTAIN 138KV CKT 1'
G11_014	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.23757	103.0953	'CLEO CORNER - MEN TAP 138KV CKT 1'
G11_014	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.23233	100.3008	'FPL SWITCH - WOODWARD 138KV CKT 1'
G11_014	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.23376	101.1365	'DEWEY - IODINE 138KV CKT 1'
G11_014	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.23853	104.0747	'DEWEY - SOUTHARD 138KV CKT 1'
G11_014	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.23639	103.0963	'GLASS MOUNTAIN - MOORELAND 138KV CKT 1'
G11_014	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.23757	103.0682	'IMO TAP - MEN TAP 138KV CKT 1'
G11_014	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.23237	100.9417	'KNOBHILL - MOORELAND 138KV CKT 1'
G11_014	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.23376	101.209	'IODINE - WWRDEHV4 138.00 138KV CKT 1'
G11_014	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.23053	101.439	'CIMARRON - MINCO 7 345.00 345KV CKT 1'
G11_014	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.23053	100.8488	'GRACMNT7 345.00 - MINCO 7 345.00 345KV CKT 1'
G11_014	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.2285	100.2387	'SOONER - SPRING CREEK 345KV CKT 1'
G11_014	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.23853	104.448	'EL RENO - ROMAN NOSE 138KV CKT 1'
G11_014	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.23193	100.2283	'CIMARRON - EL RENO 138KV CKT 1'
G11_014	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.23171	100.2746	'JENSEN ROAD - JENSEN TAP 138KV CKT 1'
G11_014	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.23853	103.676	'ROMAN NOSE - SOUTHARD 138KV CKT 1'
G11_014	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.2285	100.2284	'NORTHWEST - SPRING CREEK 345KV CKT 1'
G11_014	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.23122	100.2001	'MORRISON - STILLWATER 138KV CKT 1'
G11_014	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.23116	100.1126	'MCELROY - STILLWATER 138KV CKT 1'
G11_014	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.23832	102.5754	'MOORELAND 345.00 - WWRDEHV7 345.00 345KV CKT 1'
G11_014	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.24884	107.0549	'MED-LDG5 345.00 - WWRDEHV7 345.00 345KV CKT 1'
G11_014	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.24884	107.0549	'MED-LDG5 345.00 - WWRDEHV7 345.00 345KV CKT 2'
G11_014	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.23233	100.453	'FPL SWITCH - MOORELAND 138KV CKT 1'
G11_014	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.23175	100.129	'ARAPAHO - HAMON BUTLER 69KV CKT 1'
G11_014	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.23175	100.1275	'ARAPAHO - INDUSTRIAL PARK 69KV CKT 1'
G11_014	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.23172	100.096	'CALUMET - WATONGA SW 69KV CKT 1'
G11_014	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.2316	100.1708	'CANTON - OKEENE 69KV CKT 1'
G11_014	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.2316	100.2009	'CANTON - TALOGA 69KV CKT 1'
G11_014	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.23513	102.4282	'CEDARDALE - MOORELAND 138KV CKT 1'
G11_014	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.23513	102.3856	'CEDARDALE - OKEENE 138KV CKT 1'
G11_014	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.23218	100.4693	'CLINTON - WEATHERFORD 138KV CKT 1'
G11_014	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.23218	100.4888	'CLINTON - G07-32T 138.00 138KV CKT 1'
G11_014	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.23471	101.7765	'DOVER SW - OKEENE 138KV CKT 1'
G11_014	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.23158	100.1083	'GOTEBO - MOUNTAIN VIEW 69KV CKT 1'
G11_014	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.23175	100.1297	'HAMON BUTLER - PUTNAM 69KV CKT 1'
G11_014	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.23178	100.25	'MOORELAND - TALOGA 138KV CKT 1'
G11_014	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.23476	100.949	'MOORELAND - NINMILE 4 138.00 138KV CKT 1'
G11_014	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.23284	100.2528	'MOREWOOD SW - RHWIND4 138.00 138KV CKT 1'
G11_014	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.23476	100.938	'MOREWOOD SW - NINMILE 4 138.00 138KV CKT 1'
G11_014	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.23189	100.29	'OKEENE - WATONGA SW 69KV CKT 1'
G11_014	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.23175	100.1521	'PUTNAM - TALOGA 69KV CKT 1'
G11_014	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.23788	100.5711	'Hitchland Interchange - STEVENSCO 345.00 345KV CKT 1'
G11_014	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.23389	103.4718	'GRAPEVINE INTERCHANGE - STATELINE INTERCHANGE 230KV CKT 1'
G11_014	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.23281	102.6948	'GRAPEVINE INTERCHANGE - NICHOLS STATION 230KV CKT 1'

SOURCE	DIRECTION	MONTCOMMONNAME	RATEB	TDF	TC%LOADING	CONTNAME
G11_014	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.24547	103.0895	'BORDER 7345.00 - TUCO INTERCHANGE 345KV CKT 1'
G11_014	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.23389	103.1722	'STATELINE INTERCHANGE - STLN-DEMARC6230.00 230KV CKT 1'
G11_014	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.23157	100.5651	'MCCLELLAN SUB - MCLEAN RURAL SUB 115KV CKT 1'
G11_014	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.23157	100.5806	'KIRBY SWITCHING STATION - MCCLELLAN SUB 115KV CKT 1'
G11_014	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.23788	104.1259	'FINNEY SWITCHING STATION - STEVENSCO 345.00 345KV CKT 1'
G11_014	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.23132	100.2928	'NICHOLS STATION - YARNELL SUB 115KV CKT 1'
G11_014	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.23132	100.2972	'CONWAY SUB - YARNELL SUB 115KV CKT 1'
G11_014	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.23132	100.2359	'CONWAY SUB - KIRBY SWITCHING STATION 115KV CKT 1'
G11_014	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.23181	100.388	'AMARILLO SOUTH INTERCHANGE - G07-48T 230.00 230KV CKT 1'
G11_014	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.23181	100.2876	'DEAF SMITH COUNTY INTERCHANGE - S-RANDLCO 230.00 230KV CKT 1'
G11_014	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.23147	100.2841	'SWISHER COUNTY INTERCHANGE - TUCO INTERCHANGE 230KV CKT 1'
G11_014	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.23181	100.7082	'G07-48T 230.00 - SWISHER COUNTY INTERCHANGE 230KV CKT 1'
G11_014	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.23068	100.393	'TOLK STATION EAST - TUCO INTERCHANGE 230KV CKT 1'
G11_014	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.24435	110.8685	'G08-14T 345.00 - TUCO INTERCHANGE 345KV CKT 1'
G11_014	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.23173	100.578	'KNOLL 230 - POSTROCK6 230.00 230KV CKT 1'
G11_014	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.23248	100.9757	'KNOLL 230 - SMOKYHL6 230.00 230KV CKT 1'
G11_014	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.23771	104.6823	'G10-16T 345.00 - POSTROCK7 345.00 345KV CKT 1'
G11_014	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.23554	102.3478	'AXTELL - POSTROCK7 345.00 345KV CKT 1'
G11_014	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.23248	101.4431	'SMOKYHL6 230.00 - SUMMIT 230KV CKT 1'
G11_014	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.23148	100.3009	'ST JOHN - ST_JOHN 115KV CKT 1'
G11_014	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.23738	102.897	'HOLCOMB - SETAB 345KV CKT 1'
G11_014	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.23905	104.5552	'MINGO - SETAB 345KV CKT 1'
G11_014	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.23994	104.5732	'MINGO - RED WILLOW 345KV CKT 1'
G11_014	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.24773	106.5714	'GRAY CO 345.00 - SPEARVILLE 345KV CKT 1'
G11_014	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.23771	103.6802	'G10-16T 345.00 - SPEARVILLE 345KV CKT 1'
G11_014	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.23161	100.7997	'HOYT - JEFFERY ENERGY CENTER 345KV CKT 1'
G11_014	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.2317	100.4532	'HOYT - STRANGER CREEK 345KV CKT 1'
G11_014	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.23183	100.1501	'EMPORIA ENERGY CENTER - SWISSVALE 345KV CKT 1'
G11_014	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.23219	100.2701	'EMPORIA ENERGY CENTER - WICHITA 345KV CKT 1'
G11_014	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.23109	100.161	'CRAIG - STRANGER CREEK 345KV CKT 1'
G11_014	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.23217	100.3189	'SWISSVALE - WEST GARDNER 345KV CKT 1'
G11_014	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.23486	101.022	'BENTON - ROSE HILL 345KV CKT 1'
G11_014	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.23811	102.5951	'BENTON - WICHITA 345KV CKT 1'
G11_014	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.23133	101.5013	'LACYGNE - NEOSHO 345KV CKT 1'
G11_014	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.23305	100.9484	'G05-13T 345.00 - NEOSHO 345KV CKT 1'
G11_014	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.23305	100.488	'LATHAMS7 345.00 - ROSE HILL 345KV CKT 1'
G11_014	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.24572	108.9997	'MED-LDG5 345.00 - WICHITA 345KV CKT 1'
G11_014	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.24572	108.9997	'MED-LDG5 345.00 - WICHITA 345KV CKT 2'
G11_014	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.23146	100.3246	'ANDERSONCO 345.00 - WOLF CREEK 345KV CKT 1'
G11_014	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.23305	100.7742	'G05-13T 345.00 - LATHAMS7 345.00 345KV CKT 1'
G11_014	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.23275	101.3444	'CIRCLE - MULLERGREN 230KV CKT 1'
G11_014	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.23285	100.9947	'CLEARWATER - GILL ENERGY CENTER WEST 138KV CKT 1'
G11_014	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.23285	101.1051	'CLEARWATER - MILAN TAP 138KV CKT 1'
G11_014	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.23113	100.6176	'EVANS ENERGY CENTER NORTH - EVANS ENERGY CENTER SOUTH 138KV CKT 1'
G11_014	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.23285	101.4196	'FLATRDG3 - HARPER 138KV CKT 1'
G11_014	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.23285	101.0609	'FLATRDG3 - MEDICINE LODGE 138KV CKT 1'
G11_014	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.23138	100.1315	'NINNESC3 115.00 - PRATT 115KV CKT 1'
G11_014	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.23138	100.1075	'NINNESC3 115.00 - ST JOHN 115KV CKT 1'
G11_014	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.23285	101.2561	'HARPER - MILAN TAP 138KV CKT 1'
G11_014	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.23183	100.3254	'MED-LDG5 345.00 345/138KV TRANSFORMER CKT 1'
G11_014	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.23276	101.2706	'MULLERGREN - SPEARVILLE 230KV CKT 1'
G11_014	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.23114	100.1245	'HAWTHORN - NASHUA 345KV CKT 1'
G11_014	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.23146	100.3773	'ANDERSONCO 345.00 - LACYGNE 345KV CKT 1'
G11_014	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.2355	101.6939	'G08-13T 345.00 - SUMNERCO 345.00 345KV CKT 1'

SOURCE	DIRECTION	MONTCOMMONNAME	RATEB	TDF	TC%LOADING	CONTNAME
G11_014	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.25261	102.8634	'2008-047T 345.00 - GRAY CO 345.00 345KV CKT 1'
G11_014	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.23264	101.0013	'AXTELL - PAULINE 345KV CKT 1'
G11_014	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.23485	101.2525	'GERALD GENTLEMAN STATION - RED WILLOW 345KV CKT 1'
G11_014	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.23137	100.417	'GERALD GENTLEMAN STATION - SWEETWATER 345KV CKT 1'
G11_014	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.23129	100.2492	'GERALD GENTLEMAN STATION - SWEETWATER 345KV CKT 2'
G11_014	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.23172	100.2382	'MCCOOL - MOORE 345KV CKT 1'
G11_014	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.23172	100.3728	'GRAND ISLAND - MCCOOL 345KV CKT 1'
G11_014	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.23253	100.8781	'MOORE - PAULINE 345KV CKT 1'
G11_014	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.23253	101.4341	'GRAND ISLAND - SWEETWATER 345KV CKT 1'
G11_014	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.23119	100.1916	'LAKEOVER - MCADAMS 500KV CKT 1'
G11_014	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.23128	100.1877	'MCADAMS - WOLF CREEK 500KV CKT 1'
G11_014	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.23389	104.556	'ELK CITY 230KV (ELKCTY-6) 230/138/13.8KV TRANSFORMER CKT 1'
G11_014	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.23157	100.342	'SHAMROCK (SHAMRCK2) 138/69/14.4KV TRANSFORMER CKT 1'
G11_014	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.23157	100.4898	'SHAMROCK (SHAMRCK1) 115/69/14.4KV TRANSFORMER CKT 1'
G11_014	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.23237	100.9253	'KNOBHILL (KNOBHIL4) 138/69/13.2KV TRANSFORMER CKT 1'
G11_014	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.23117	100.2608	'SUNNYSIDE (SUNNYSD3) 345/138/13.8KV TRANSFORMER CKT 1'
G11_014	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.23016	100.5282	'ARKANSAS NUCLEAR ONE - FT SMITH 500KV CKT 1'
G11_014	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.23832	102.5551	'MOORELAND 345.00 (MRLNDAUTO) 345/138/13.8KV TRANSFORMER CKT 1'
G11_014	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.23808	100.4491	'POTTER COUNTY INTERCHANGE (WAUK 90343-A) 345/230/13.2KV TRANSFORMER CKT 1'
G11_014	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.23148	100.2652	'7OVERTON 345.00 - SIBLEY 345KV CKT 1'
G11_014	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.23111	100.1693	'CLINTON - MONTROSE 161KV CKT 1'
G11_014	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.23132	100.2282	'BROOKLINE - MORGAN 345KV CKT 1'
G11_014	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.23154	100.2464	'RED WILLOW (R.WIL T1) 345/115/13.8KV TRANSFORMER CKT 1'
G11_014	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.23111	100.3185	'8DANIEL 500.00 - MCKNIGHT 500KV CKT 1'
G11_014	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.24445	116.3511	'LAWTON EASTSIDE - OKLAUNION 345KV CKT 1'
G11_014	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.24445	109.3695	'G08-14T 345.00 - OKLAUNION 345KV CKT 1'
G11_014	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.23425	100.5551	'CLINTON JUNCTION - ELK CITY 138KV CKT 1'
G11_014	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.23391	102.4599	'ELK CITY 230KV - SWEETWT6 230.00 230KV CKT 1'
G11_014	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.23391	101.0983	'STLN-DEMARC6230.00 - SWEETWT6 230.00 230KV CKT 1'
G11_014	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.23401	101.7816	'SPP-SWPS-03'
G11_014	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.23545	100.718	'G08-13T 345.00 - WOODRING 345KV CKT 1'
G11_014	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.2364	100.9396	'CLEO CORNER - GLASS MOUNTAIN 138KV CKT 1'
G11_014	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.23758	101.0115	'CLEO CORNER - MEN TAP 138KV CKT 1'
G11_014	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.23853	101.9975	'DEWEY - SOUTHARD 138KV CKT 1'
G11_014	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.2364	101.0292	'GLASS MOUNTAIN - MOORELAND 138KV CKT 1'
G11_014	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.23758	100.9846	'IMO TAP - MEN TAP 138KV CKT 1'
G11_014	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.23853	102.3701	'EL RENO - ROMAN NOSE 138KV CKT 1'
G11_014	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.23853	101.6003	'ROMAN NOSE - SOUTHARD 138KV CKT 1'
G11_014	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.23831	100.5087	'MOORELAND 345.00 - WWRDEHV7 345.00 345KV CKT 1'
G11_014	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.2489	104.7633	'MED-LDG5 345.00 - WWRDEHV7 345.00 345KV CKT 1'
G11_014	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.2489	104.7633	'MED-LDG5 345.00 - WWRDEHV7 345.00 345KV CKT 2'
G11_014	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.23514	100.3798	'CEDARDALE - MOORELAND 138KV CKT 1'
G11_014	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.23514	100.3373	'CEDARDALE - OKEENE 138KV CKT 1'
G11_014	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.23391	101.3779	'GRAPEVINE INTERCHANGE - STATELINE INTERCHANGE 230KV CKT 1'
G11_014	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.23282	100.6346	'GRAPEVINE INTERCHANGE - NICHOLS STATION 230KV CKT 1'
G11_014	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.24537	101.134	'BORDER 7345.00 - TUCO INTERCHANGE 345KV CKT 1'
G11_014	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.23391	101.0983	'STATELINE INTERCHANGE - STLN-DEMARC6230.00 230KV CKT 1'
G11_014	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.23792	101.9392	'FINNEY SWITCHING STATION - STEVENSCO 345.00 345KV CKT 1'
G11_014	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.24445	108.4536	'G08-14T 345.00 - TUCO INTERCHANGE 345KV CKT 1'
G11_014	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.23773	102.5419	'G10-16T 345.00 - POSTROCK7 345.00 345KV CKT 1'
G11_014	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.23555	100.2513	'AXTELL - POSTROCK7 345.00 345KV CKT 1'
G11_014	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.2374	100.7955	'HOLCOMB - SETAB 345KV CKT 1'
G11_014	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.23907	102.4111	'MINGO - SETAB 345KV CKT 1'
G11_014	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.23996	102.4204	'MINGO - RED WILLOW 345KV CKT 1'

SOURCE	DIRECTION	MONTCOMMONNAME	RATEB	TDF	TC%LOADING	CONTNAME
G11_014	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.24777	104.2969	'GRAY CO 345.00 - SPEARVILLE 345KV CKT 1'
G11_014	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.23773	101.5518	'G10-16T 345.00 - SPEARVILLE 345KV CKT 1'
G11_014	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.23812	100.5296	'BENTON - WICHITA 345KV CKT 1'
G11_014	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.24574	106.7794	'MED-LDG5 345.00 - WICHITA 345KV CKT 1'
G11_014	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.24574	106.7794	'MED-LDG5 345.00 - WICHITA 345KV CKT 2'
G11_014	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.25266	100.5819	'2008-047T 345.00 - GRAY CO 345.00 345KV CKT 1'
G11_014	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.23391	102.4593	'ELK CITY 230KV (ELKCTY-6) 230/138/13.8KV TRANSFORMER CKT 1'
G11_014	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.23831	100.4878	'MOORELAND 345.00 (MRLNDAUTO) 345/138/13.8KV TRANSFORMER CKT 1'
G11_014	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.23391	101.0983	'SPP-SWPS-02'
G11_014	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.23391	100.6318	'SPP-SWPS-02A'
G11_014	'TO->FROM'	'G11-015T 345.00 - WWRDEHV7 345.00 345KV CKT 1'	1195	0.24435	114.0627	'LAWTON EASTSIDE - OKLAUNION 345KV CKT 1'
G11_014	'TO->FROM'	'G11-015T 345.00 - WWRDEHV7 345.00 345KV CKT 1'	1195	0.24435	106.9117	'G08-14T 345.00 - OKLAUNION 345KV CKT 1'
G11_014	'TO->FROM'	'G11-015T 345.00 - WWRDEHV7 345.00 345KV CKT 1'	1195	0.24884	102.0566	'MED-LDG5 345.00 - WWRDEHV7 345.00 345KV CKT 1'
G11_014	'TO->FROM'	'G11-015T 345.00 - WWRDEHV7 345.00 345KV CKT 1'	1195	0.24884	102.0566	'MED-LDG5 345.00 - WWRDEHV7 345.00 345KV CKT 2'
G11_014	'TO->FROM'	'G11-015T 345.00 - WWRDEHV7 345.00 345KV CKT 1'	1195	0.24435	105.9506	'G08-14T 345.00 - TUCO INTERCHANGE 345KV CKT 1'
G11_014	'TO->FROM'	'G11-015T 345.00 - WWRDEHV7 345.00 345KV CKT 1'	1195	0.24773	101.8921	'GRAY CO 345.00 - SPEARVILLE 345KV CKT 1'
G11_014	'TO->FROM'	'G11-015T 345.00 - WWRDEHV7 345.00 345KV CKT 1'	1195	0.24572	103.9492	'MED-LDG5 345.00 - WICHITA 345KV CKT 1'
G11_014	'TO->FROM'	'G11-015T 345.00 - WWRDEHV7 345.00 345KV CKT 1'	1195	0.24572	103.9492	'MED-LDG5 345.00 - WICHITA 345KV CKT 2'
G11_014	'TO->FROM'	'G11-015T 345.00 - WWRDEHV7 345.00 345KV CKT 1'	1195	0.24445	111.4524	'LAWTON EASTSIDE - OKLAUNION 345KV CKT 1'
G11_014	'TO->FROM'	'G11-015T 345.00 - WWRDEHV7 345.00 345KV CKT 1'	1195	0.24445	104.4057	'G08-14T 345.00 - OKLAUNION 345KV CKT 1'
G11_014	'TO->FROM'	'G11-015T 345.00 - WWRDEHV7 345.00 345KV CKT 1'	1195	0.24445	103.4862	'G08-14T 345.00 - TUCO INTERCHANGE 345KV CKT 1'
G11_014	'TO->FROM'	'G11-015T 345.00 - WWRDEHV7 345.00 345KV CKT 1'	1195	0.24574	101.7039	'MED-LDG5 345.00 - WICHITA 345KV CKT 1'
G11_014	'TO->FROM'	'G11-015T 345.00 - WWRDEHV7 345.00 345KV CKT 1'	1195	0.24574	101.7039	'MED-LDG5 345.00 - WICHITA 345KV CKT 2'
G11_014	'FROM->TO'	'MATTHEWSON 345.00 - NORTHWEST 345KV CKT 1'	1195	0.20191	132.3797	'CIMARRON - MATTHEWSON 345.00 345KV CKT 1'
G11_014	'FROM->TO'	'MATTHEWSON 345.00 - NORTHWEST 345KV CKT 1'	1195	0.1975	114.3173	'CIMARRON - MATTHEWSON 345.00 345KV CKT 1'
G11_014	'FROM->TO'	'MATTHEWSON 345.00 - NORTHWEST 345KV CKT 1'	1195	0.19718	113.3461	'CIMARRON - MATTHEWSON 345.00 345KV CKT 1'
G11_014	'FROM->TO'	'MATTHEWSON 345.00 - NORTHWEST 345KV CKT 1'	1195	0.19872	113.064	'CIMARRON - MATTHEWSON 345.00 345KV CKT 1'
G11_014	'TO->FROM'	'MATTHEWSON 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.19504	124.3769	'MATTHEWSON 345.00 - TATONGA7 345.00 345KV CKT 2'
G11_014	'TO->FROM'	'MATTHEWSON 345.00 - TATONGA7 345.00 345KV CKT 2'	1195	0.19504	124.3769	'MATTHEWSON 345.00 - TATONGA7 345.00 345KV CKT 1'
G11_014		Non Converged Contingency	0	0.21212	-	'DBL-MEDLO-WI'
G11_014		Non Converged Contingency	1195	0.2327	-	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'
G11_014		Non Converged Contingency	0	0.2275	-	'DBL-MEDLO-WI'
G11_014		Non Converged Contingency	0	0.21201	-	'DBL-MEDLO-WI'
G11_014		Non Converged Contingency	0	0.47976	-	'DBL-G0847-WO'
G11_015	'FROM->TO'	'G11-015T 345.00 - WWRDEHV7 345.00 345KV CKT 1'	1195	1	119.2614	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'
G11_015	'FROM->TO'	'G11-015T 345.00 - WWRDEHV7 345.00 345KV CKT 1'	1195	1	113.4438	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'
G11_015	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.35547	121.1544	'BASE CASE'
G11_015	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.35549	120.8257	'DOLET HILLS 345/230KV TRANSFORMER CKT 1'
G11_015	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.35527	121.4809	'DOLET HILLS - SOUTHWEST SHREVEPORT 345KV CKT 1'
G11_015	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.35519	120.6513	'FLINT CREEK - GRDA1 345KV CKT 1'
G11_015	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.35523	120.724	'FLINT CREEK - SUB 383 - MONETT 345KV CKT 1'
G11_015	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.35522	120.4317	'CHAMBER SPRINGS - CLARKSVILLE 345KV CKT 1'
G11_015	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.35556	120.7447	'CLARKSVILLE - MUSKOGEE 345KV CKT 1'
G11_015	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.35162	119.5155	'REDBUD - RIVERSIDE STATION 345KV CKT 1'
G11_015	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.35555	121.634	'NORTHEAST STATION - ONETA 345KV CKT 1'
G11_015	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.35479	120.8284	'CLEVELAND - TULSA NORTH 345KV CKT 1'
G11_015	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.35566	120.1823	'DELAWARE - NORTHEAST STATION 345KV CKT 1'
G11_015	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.35559	120.765	'DELAWARE - NEOSHO 345KV CKT 1'
G11_015	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.35247	119.8521	'PITTSBURG - VALLIANT 345KV CKT 1'
G11_015	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.3532	120.3595	'PITTSBURG - SEMINOLE 345KV CKT 1'
G11_015	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.35565	121.5804	'HINTON - WEATHERFORD JCT. 138KV CKT 1'
G11_015	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.35565	121.5712	'CAN_GAS4 138.00 - HINTON 138KV CKT 1'
G11_015	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.35601	121.6199	'CARNEGIE - HOBART JUNCTION 138KV CKT 1'
G11_015	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.35601	121.5886	'CARNEGIE - SOUTHWESTERN STATION 138KV CKT 1'

SOURCE	DIRECTION	MONTCOMMONNAME	RATEB	TDF	TC%LOADING	CONTNAME
G11_015	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.35652	122.1967	'CLINTON AIR FORCE BASE TAP - ELK CITY 138KV CKT 1'
G11_015	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.35652	122.1532	'CLINTON AIR FORCE BASE TAP - HOBART JUNCTION 138KV CKT 1'
G11_015	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.35948	131.8283	'LAWTON EASTSIDE - OKLAUNION 345KV CKT 1'
G11_015	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.35948	126.0396	'G08-14T 345.00 - OKLAUNION 345KV CKT 1'
G11_015	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.357	123.0053	'CLINTON JUNCTION - ELK CITY 138KV CKT 1'
G11_015	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.3574	122.3377	'ELK CITY - RHWIND4 138.00 138KV CKT 1'
G11_015	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.35653	121.9365	'LAWTON EASTSIDE - SUNNYSIDE 345KV CKT 1'
G11_015	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.35557	121.4907	'CLINTON JUNCTION - CLINTON NATURAL GAS TAP 138KV CKT 1'
G11_015	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.35565	121.709	'WEATHERFORD JCT. - WEATHERFORD SOUTHEAST 138KV CKT 1'
G11_015	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.35535	123.4069	'ELK CITY 230KV - SWEETWT6 230.00 230KV CKT 1'
G11_015	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.35557	121.558	'WEATHERFORD SOUTHEAST - WEATHERFORD TAP 138KV CKT 1'
G11_015	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.35557	121.4625	'CLINTON NATURAL GAS TAP - WEATHERFORD WIND FARM 138KV CKT 1'
G11_015	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.35557	121.6405	'WEATHERFORD TAP - WEATHERFORD WIND FARM 138KV CKT 1'
G11_015	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.35565	121.5342	'CAN_GAS4 138.00 - JENSEN ROAD 138KV CKT 1'
G11_015	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.35535	122.2561	'STLN-DEMARC6230.00 - SWEETWT6 230.00 230KV CKT 1'
G11_015	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.35571	121.4846	'CHILDRESS - LAKE PAULINE 138KV CKT 1'
G11_015	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.3556	121.5	'MCLEAN RURAL SUB - SHAMROCK 115KV CKT 1'
G11_015	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.35476	120.7162	'CLEVELAND - SOONER 345KV CKT 1'
G11_015	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.35749	121.9846	'WAUKOMIS - WAUKOMIS TAP 138KV CKT 1'
G11_015	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.35749	122.0177	'HENESSEY - WAUKOMIS 138KV CKT 1'
G11_015	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.3559	121.6267	'MARSHALL - WOODRING 138KV CKT 1'
G11_015	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.35675	123.1045	'G08-13T 345.00 - WOODRING 345KV CKT 1'
G11_015	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.35409	122.2674	'G11-007T 345.00 - WOODRING 345KV CKT 1'
G11_015	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.3564	121.7261	'KNOBHILL - SALINE 69KV CKT 1'
G11_015	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.3564	121.7021	'HELENAT2 69.000 - SALINE 69KV CKT 1'
G11_015	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.3564	121.6161	'GOLTRY - IMO 69KV CKT 1'
G11_015	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.3564	121.6333	'GOLTRY - HELENAT2 69.000 69KV CKT 1'
G11_015	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.35623	121.4866	'IMO TAP - SOUTH 4TH ST 138KV CKT 1'
G11_015	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.3559	121.618	'COTTONWOOD CREEK - MARSHALL 138KV CKT 1'
G11_015	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.35563	120.7461	'KILDARE4 - NEWKIRK4 138KV CKT 1'
G11_015	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.35563	120.6828	'NEWKIRK4 - PECKHMT4 138.00 138KV CKT 1'
G11_015	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.35561	120.7991	'KILDARE4 - WHITE EAGLE 138KV CKT 1'
G11_015	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.35749	122.0934	'DOVER SW - HENESSEY 138KV CKT 1'
G11_015	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.35976	124.1973	'CLEO CORNER - GLASS MOUNTAIN 138KV CKT 1'
G11_015	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.36072	124.3769	'CLEO CORNER - MEN TAP 138KV CKT 1'
G11_015	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.35657	121.5531	'FPL SWITCH - WOODWARD 138KV CKT 1'
G11_015	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.3577	121.8218	'DEWEY - IODINE 138KV CKT 1'
G11_015	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.36146	124.6821	'DEWEY - SOUTHARD 138KV CKT 1'
G11_015	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.35976	124.2704	'GLASS MOUNTAIN - MOORELAND 138KV CKT 1'
G11_015	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.36072	124.3545	'IMO TAP - MEN TAP 138KV CKT 1'
G11_015	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.35653	122.1565	'KNOBHILL - MOORELAND 138KV CKT 1'
G11_015	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.3577	121.8801	'IODINE - WWRDEHV4 138.00 138KV CKT 1'
G11_015	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.36146	127.3325	'EL RENO - ROMAN NOSE 138KV CKT 1'
G11_015	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.35609	121.6992	'CIMARRON - EL RENO 138KV CKT 1'
G11_015	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.36146	124.347	'ROMAN NOSE - SOUTHARD 138KV CKT 1'
G11_015	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.34171	116.6491	'CIMARRON - NORTHWEST 345KV CKT 1'
G11_015	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.34632	119.3687	'ARCADIA - NORTHWEST 345KV CKT 1'
G11_015	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.35366	120.3716	'CIMARRON - DRAPER LAKE 345KV CKT 1'
G11_015	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.35409	122.6901	'CIMARRON - G11-007T 345.00 345KV CKT 1'
G11_015	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.35403	120.5275	'ARCADIA - HORSESHOE LAKE 345KV CKT 1'
G11_015	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.35403	120.5278	'HORSESHOE LAKE - SEMINOLE 345KV CKT 1'
G11_015	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.3556	121.6439	'MORRISON - STILLWATER 138KV CKT 1'
G11_015	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.35553	121.4833	'KINZE - MCELROY 138KV CKT 1'
G11_015	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.35553	121.5266	'MCELROY - STILLWATER 138KV CKT 1'

SOURCE	DIRECTION	MONTCOMMONNAME	RATEB	TDF	TC%LOADING	CONTNAME
G11_015	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.3545	120.7171	'FT SMITH - MUSKOGEE 345KV CKT 1'
G11_015	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.3641	122.664	'BORDER 7345.00 - WWRDEHV7 345.00 345KV CKT 1'
G11_015	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.36172	121.7312	'MOORELAND 345.00 - WWRDEHV7 345.00 345KV CKT 1'
G11_015	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	1	124.6238	'G11-015T 345.00 - WWRDEHV7 345.00 345KV CKT 1'
G11_015	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.37475	129.0574	'MED-LDG5 345.00 - WWRDEHV7 345.00 345KV CKT 1'
G11_015	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.37475	129.0574	'MED-LDG5 345.00 - WWRDEHV7 345.00 345KV CKT 2'
G11_015	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.35563	120.6831	'CRESWELL - PECKHMT4 138.00 138KV CKT 1'
G11_015	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.35657	121.9504	'FPL SWITCH - MOORELAND 138KV CKT 1'
G11_015	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.35612	121.5773	'ARAPAHO - HAMON BUTLER 69KV CKT 1'
G11_015	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.35612	121.5759	'ARAPAHO - INDUSTRIAL PARK 69KV CKT 1'
G11_015	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.35603	121.4599	'CALUMET - WATONGA SW 69KV CKT 1'
G11_015	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.3559	121.5186	'CANTON - OKEENE 69KV CKT 1'
G11_015	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.3559	121.5455	'CANTON - TALOGA 69KV CKT 1'
G11_015	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.35875	123.5896	'CEDARDALE - MOORELAND 138KV CKT 1'
G11_015	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.35875	123.5574	'CEDARDALE - OKEENE 138KV CKT 1'
G11_015	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.35612	121.6136	'CLINTON - WEATHERFORD 138KV CKT 1'
G11_015	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.35612	121.6308	'CLINTON - G07-32T 138.00 138KV CKT 1'
G11_015	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.35612	121.5485	'CORDELL - INDUSTRIAL PARK 69KV CKT 1'
G11_015	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.35839	123.0464	'DOVER SW - OKEENE 138KV CKT 1'
G11_015	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.35612	121.578	'HAMON BUTLER - PUTNAM 69KV CKT 1'
G11_015	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.35948	123.3261	'MOORELAND - NINMILE 4 138.00 138KV CKT 1'
G11_015	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.3574	122.0903	'MOREWOOD SW - RHWIND4 138.00 138KV CKT 1'
G11_015	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.35948	123.316	'MOREWOOD SW - NINMILE 4 138.00 138KV CKT 1'
G11_015	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.35616	121.6302	'OKEENE - WATONGA SW 69KV CKT 1'
G11_015	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.35612	121.5968	'PUTNAM - TALOGA 69KV CKT 1'
G11_015	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.35832	121.5562	'Hitchland Interchange - STEVENSCO 345.00 345KV CKT 1'
G11_015	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.35654	121.4558	'G11-012T 230.00 - MOORE COUNTY INTERCHANGE 230KV CKT 1'
G11_015	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.35535	122.5267	'GRAPEVINE INTERCHANGE - STATELINE INTERCHANGE 230KV CKT 1'
G11_015	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.35544	122.4379	'GRAPEVINE INTERCHANGE - NICHOLS STATION 230KV CKT 1'
G11_015	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.36553	125.6713	'BORDER 7345.00 - TUCO INTERCHANGE 345KV CKT 1'
G11_015	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.35535	122.2561	'STATELINE INTERCHANGE - STLN-DEMARC6230.00 230KV CKT 1'
G11_015	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.3556	121.5861	'MCCLELLAN SUB - MCLEAN RURAL SUB 115KV CKT 1'
G11_015	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.3556	121.6069	'KIRBY SWITCHING STATION - MCCLELLAN SUB 115KV CKT 1'
G11_015	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.35832	122.3192	'FINNEY SWITCHING STATION - STEVENSCO 345.00 345KV CKT 1'
G11_015	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.35903	121.6877	'G05-17T 345.00 - POTTER COUNTY INTERCHANGE 345KV CKT 1'
G11_015	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.35575	121.5043	'AMARILLO SOUTH INTERCHANGE - G07-48T 230.00 230KV CKT 1'
G11_015	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.35587	121.575	'DEAF SMITH COUNTY INTERCHANGE - S-RANDLCO 230.00 230KV CKT 1'
G11_015	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.35575	121.7726	'G07-48T 230.00 - SWISHER COUNTY INTERCHANGE 230KV CKT 1'
G11_015	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.35948	125.2866	'G08-14T 345.00 - TUCO INTERCHANGE 345KV CKT 1'
G11_015	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.3558	121.7081	'KNOLL 230 - POSTROCK6 230.00 230KV CKT 1'
G11_015	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.35614	121.9482	'KNOLL 230 - SMOKYHL6 230.00 230KV CKT 1'
G11_015	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.3595	124.7039	'G10-16T 345.00 - POSTROCK7 345.00 345KV CKT 1'
G11_015	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.35853	123.1024	'AXTELL - POSTROCK7 345.00 345KV CKT 1'
G11_015	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.35614	122.3498	'SMOKYHL6 230.00 - SUMMIT 230KV CKT 1'
G11_015	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.35573	121.522	'ST JOHN - ST_JOHN 115KV CKT 1'
G11_015	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.35866	122.8911	'HOLCOMB - SETAB 345KV CKT 1'
G11_015	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.35957	123.9508	'MINGO - SETAB 345KV CKT 1'
G11_015	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.36017	124.0173	'MINGO - RED WILLOW 345KV CKT 1'
G11_015	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.35988	124.3165	'GRAY CO 345.00 - SPEARVILLE 345KV CKT 1'
G11_015	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.3595	123.9118	'G10-16T 345.00 - SPEARVILLE 345KV CKT 1'
G11_015	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.35591	122.0099	'HOYT - JEFFERY ENERGY CENTER 345KV CKT 1'
G11_015	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.35598	121.7112	'HOYT - STRANGER CREEK 345KV CKT 1'
G11_015	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.35613	121.4541	'EMPORIA ENERGY CENTER - SWISSVALE 345KV CKT 1'
G11_015	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.35657	121.6012	'EMPORIA ENERGY CENTER - WICHITA 345KV CKT 1'

SOURCE	DIRECTION	MONTCOMMONNAME	RATEB	TDF	TC%LOADING	CONTNAME
G11_015	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.35633	121.5801	'SWISSVALE - WEST GARDNER 345KV CKT 1'
G11_015	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.35799	122.0589	'BENTON - ROSE HILL 345KV CKT 1'
G11_015	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.36054	123.3928	'BENTON - WICHITA 345KV CKT 1'
G11_015	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.35536	122.5452	'LACYGNE - NEOSHO 345KV CKT 1'
G11_015	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.35713	122.1792	'G05-13T 345.00 - NEOSHO 345KV CKT 1'
G11_015	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.35713	121.747	'LATHAMS7 345.00 - ROSE HILL 345KV CKT 1'
G11_015	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.35578	120.6146	'G08-127T 345.00 - ROSE HILL 345KV CKT 1'
G11_015	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.36602	128.5095	'MED-LDG5 345.00 - WICHITA 345KV CKT 1'
G11_015	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.36602	128.5095	'MED-LDG5 345.00 - WICHITA 345KV CKT 2'
G11_015	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.35592	121.687	'ANDERSONCO 345.00 - WOLF CREEK 345KV CKT 1'
G11_015	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.35713	122.0095	'G05-13T 345.00 - LATHAMS7 345.00 345KV CKT 1'
G11_015	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.35624	122.2425	'CIRCLE - MULLERGREN 230KV CKT 1'
G11_015	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.35675	122.1234	'CLEARWATER - GILL ENERGY CENTER WEST 138KV CKT 1'
G11_015	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.35675	122.2148	'CLEARWATER - MILAN TAP 138KV CKT 1'
G11_015	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.35551	121.8083	'EVANS ENERGY CENTER NORTH - EVANS ENERGY CENTER SOUTH 138KV CKT 1'
G11_015	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.35675	122.4617	'FLATRDG3 - HARPER 138KV CKT 1'
G11_015	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.35675	122.1698	'FLATRDG3 - MEDICINE LODGE 138KV CKT 1'
G11_015	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.35675	122.324	'HARPER - MILAN TAP 138KV CKT 1'
G11_015	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.35604	121.5745	'MED-LDG5 345.00 345/138KV TRANSFORMER CKT 1'
G11_015	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.3564	122.2184	'MULLERGREN - SPEARVILLE 230KV CKT 1'
G11_015	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.35543	120.733	'LACYGNE - WEST GARDNER 345KV CKT 1'
G11_015	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.35535	120.709	'LACYGNE - STILWELL 345KV CKT 1'
G11_015	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.35592	121.7332	'ANDERSONCO 345.00 - LACYGNE 345KV CKT 1'
G11_015	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.35523	120.7248	'BROOKLINE - SUB 383 - MONETT 345KV CKT 1'
G11_015	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.35675	122.4106	'G08-13T 345.00 - SUMNERCO 345.00 345KV CKT 1'
G11_015	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.36262	122.9615	'2008-047T 345.00 - GRAY CO 345.00 345KV CKT 1'
G11_015	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.35644	122.0613	'AXTELL - PAULINE 345KV CKT 1'
G11_015	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.35748	121.9078	'GERALD GENTLEMAN STATION - RED WILLOW 345KV CKT 1'
G11_015	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.35563	121.6061	'GERALD GENTLEMAN STATION - SWEETWATER 345KV CKT 1'
G11_015	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.35558	121.4814	'GERALD GENTLEMAN STATION - SWEETWATER 345KV CKT 2'
G11_015	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.35585	121.4598	'MCCOOL - MOORE 345KV CKT 1'
G11_015	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.35585	121.5692	'GRAND ISLAND - MCCOOL 345KV CKT 1'
G11_015	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.35636	121.9557	'MOORE - PAULINE 345KV CKT 1'
G11_015	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.35633	122.4054	'GRAND ISLAND - SWEETWATER 345KV CKT 1'
G11_015	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.35547	120.7017	'5NORANDA 161.00 - NEW MADRID 161KV CKT 1'
G11_015	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.35546	120.8329	'BAXTER WILSON SES - PERRYVILLE 500KV CKT 1'
G11_015	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.35557	121.4794	'LAKEOVER - MCADAMS 500KV CKT 1'
G11_015	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.35563	121.475	'MCADAMS - WOLF CREEK 500KV CKT 1'
G11_015	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.35538	120.8598	'ARKANSAS NUCLEAR ONE - MABELVALE 500 500KV CKT 1'
G11_015	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.35539	120.7427	'ARKANSAS NUCLEAR ONE - PLEASANT HILL 500KV CKT 1'
G11_015	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.35554	120.4748	'KEO EHV - WEST MEMPHIS 500 500KV CKT 1'
G11_015	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.35552	120.5693	'DELL 500 - INDEPENDENCE 500KV CKT 1'
G11_015	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.35535	123.4065	'ELK CITY 230KV (ELKCTY-6) 230/138/13.8KV TRANSFORMER CKT 1'
G11_015	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.3556	121.5416	'SHAMROCK (SHAMRCK1) 115/69/14.4KV TRANSFORMER CKT 1'
G11_015	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.35653	122.1417	'KNOBHILL (KNOBHIL4) 138/69/13.2KV TRANSFORMER CKT 1'
G11_015	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.3547	120.1957	'NORTHWEST (NORTWST2) 345/138/13.8KV TRANSFORMER CKT 1'
G11_015	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.35476	120.3948	'NORTHWEST (NORTWST3) 345/138/13.8KV TRANSFORMER CKT 1'
G11_015	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.35552	121.5689	'SUNNYSIDE (SUNNYSD3) 345/138/13.8KV TRANSFORMER CKT 1'
G11_015	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.35455	121.7121	'ARKANSAS NUCLEAR ONE - FT SMITH 500KV CKT 1'
G11_015	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.35611	120.6881	'WWRDEHV7 345.00 (WWDEHV) 345/138/13.8KV TRANSFORMER CKT 1'
G11_015	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.3561	120.7851	'WWRDEHV7 345.00 (WWDEHV-T2) 345/138/13.8KV TRANSFORMER CKT 2'
G11_015	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.36172	121.7105	'MOORELAND 345.00 (MRLNDAUTO) 345/138/13.8KV TRANSFORMER CKT 1'
G11_015	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.35903	122.0748	'POTTER COUNTY INTERCHANGE (WAUK 90343-A) 345/230/13.2KV TRANSFORMER CKT 1'
G11_015	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.35576	121.5286	'7OVERTON 345.00 - SIBLEY 345KV CKT 1'

SOURCE	DIRECTION	MONTCOMMONNAME	RATEB	TDF	TC%LOADING	CONTNAME
G11_015	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.3555	121.4581	'CLINTON - MONTROSE 161KV CKT 1'
G11_015	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.35563	121.5024	'BROOKLINE - MORGAN 345KV CKT 1'
G11_015	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.35547	121.1971	'G08-19 345.00 345/34.5KV TRANSFORMER CKT 1'
G11_015	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.35547	121.1971	'G08-19 345.00 345/34.5KV TRANSFORMER CKT 2'
G11_015	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.35573	121.4613	'RED WILLOW (R.WIL T1) 345/115/13.8KV TRANSFORMER CKT 1'
G11_015	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.35551	121.596	'8DANIEL 500.00 - MCKNIGHT 500KV CKT 1'
G11_015	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.35552	120.6746	'8BHAM STEEL 500.00 - WEST MEMPHIS 500 500KV CKT 1'
G11_015	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.35564	121.6001	'NUNDRWD - WAYSIDE 230KV CKT 1'
G11_015	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.35557	121.482	'STEGALL - WAYSIDE 230KV CKT 1'
G11_015	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.35547	120.7934	'BURLINGTON NO1 + NO 2 + NO 3 161/20.0KV TRANSFORMER CKT 1'
G11_015	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.35769	122.0839	'OGE3TERM1'
G11_015	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.35562	121.6445	'OGE3TERM2'
G11_015	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.35564	120.7273	'OGE3TERM7'
G11_015	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.35585	121.5011	'OGE3TERM10'
G11_015	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.35521	120.8033	'OGE3TERM14'
G11_015	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.35535	122.2561	'SPP-SWPS-02'
G11_015	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.35535	121.8742	'SPP-SWPS-02A'
G11_015	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.3556	121.5376	'SPP-SWPS-T54'
G11_015	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.35675	122.2066	'SPP-MKEC-05'
G11_015	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.35675	122.4793	'SPP-MKEC-08'
G11_015	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.35564	120.6138	'SPP-WERE-07B'
G11_015	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.35675	122.2096	'SPP-WERE-34'
G11_015	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.35563	120.6815	'SPP-WERE-41B'
G11_015	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.35593	122.0551	'WRTOD400'
G11_015	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.35523	120.7244	AI12'
G11_015	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.35577	121.5011	'OVERTON-TRF'
G11_015	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.35551	121.6712	'FIELD NORTH - LKFLDXL3 345KV CKT 1'
G11_015	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.35544	119.2619	'BASE CASE'
G11_015	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.35547	118.942	'DOLET HILLS 345/230KV TRANSFORMER CKT 1'
G11_015	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.35525	119.5957	'DOLET HILLS - SOUTHWEST SHREVEPORT 345KV CKT 1'
G11_015	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.35517	118.7697	'FLINT CREEK - GRDA1 345KV CKT 1'
G11_015	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.3552	118.8431	'FLINT CREEK - SUB 383 - MONETT 345KV CKT 1'
G11_015	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.35519	118.5518	'CHAMBER SPRINGS - CLARKSVILLE 345KV CKT 1'
G11_015	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.35554	118.8626	'CLARKSVILLE - MUSKOGEE 345KV CKT 1'
G11_015	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.3516	117.6529	'REDBUD - RIVERSIDE STATION 345KV CKT 1'
G11_015	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.35552	119.7498	'NORTHEAST STATION - ONETA 345KV CKT 1'
G11_015	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.35476	118.9466	'CLEVELAND - TULSA NORTH 345KV CKT 1'
G11_015	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.35563	118.3009	'DELAWARE - NORTHEAST STATION 345KV CKT 1'
G11_015	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.35557	118.8864	'DELAWARE - NEOSHO 345KV CKT 1'
G11_015	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.35245	117.9834	'PITTSBURG - VALLIANT 345KV CKT 1'
G11_015	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.35317	118.4896	'PITTSBURG - SEMINOLE 345KV CKT 1'
G11_015	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.35563	119.6943	'HINTON - WEATHERFORD JCT. 138KV CKT 1'
G11_015	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.35563	119.685	'CAN_GAS4 138.00 - HINTON 138KV CKT 1'
G11_015	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.35598	119.7349	'CARNEGIE - HOBART JUNCTION 138KV CKT 1'
G11_015	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.35598	119.6958	'CARNEGIE - SOUTHWESTERN STATION 138KV CKT 1'
G11_015	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.3565	120.2947	'CLINTON AIR FORCE BASE TAP - ELK CITY 138KV CKT 1'
G11_015	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.3565	120.2516	'CLINTON AIR FORCE BASE TAP - HOBART JUNCTION 138KV CKT 1'
G11_015	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.35947	129.7928	'LAWTON EASTSIDE - OKLAUNION 345KV CKT 1'
G11_015	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.35947	124.0786	'G08-14T 345.00 - OKLAUNION 345KV CKT 1'
G11_015	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.35698	121.1001	'CLINTON JUNCTION - ELK CITY 138KV CKT 1'
G11_015	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.35738	120.431	'ELK CITY - RHWIND4 138.00 138KV CKT 1'
G11_015	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.3565	120.0418	'LAWTON EASTSIDE - SUNNYSIDE 345KV CKT 1'
G11_015	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.35555	119.6093	'CLINTON JUNCTION - CLINTON NATURAL GAS TAP 138KV CKT 1'
G11_015	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.35563	119.8224	'WEATHERFORD JCT. - WEATHERFORD SOUTHEAST 138KV CKT 1'

SOURCE	DIRECTION	MONTCOMMONNAME	RATEB	TDF	TC%LOADING	CONTNAME
G11_015	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.35532	121.4999	'ELK CITY 230KV - SWEETWT6 230.00 230KV CKT 1'
G11_015	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.35555	119.6717	'WEATHERFORD SOUTHEAST - WEATHERFORD TAP 138KV CKT 1'
G11_015	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.35555	119.5802	'CLINTON NATURAL GAS TAP - WEATHERFORD WIND FARM 138KV CKT 1'
G11_015	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.35555	119.7535	'WEATHERFORD TAP - WEATHERFORD WIND FARM 138KV CKT 1'
G11_015	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.35563	119.6484	'CAN_GAS4 138.00 - JENSEN ROAD 138KV CKT 1'
G11_015	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.35532	120.3561	'STLN-DEMARC6230.00 - SWEETWT6 230.00 230KV CKT 1'
G11_015	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.35569	119.5971	'CHILDRESS - LAKE PAULINE 138KV CKT 1'
G11_015	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.35557	119.6541	'MCLEAN RURAL SUB - SHAMROCK 115KV CKT 1'
G11_015	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.35474	118.8345	'CLEVELAND - SOONER 345KV CKT 1'
G11_015	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.35747	120.0807	'WAUKOMIS - WAUKOMIS TAP 138KV CKT 1'
G11_015	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.35747	120.1137	'HENESSEY - WAUKOMIS 138KV CKT 1'
G11_015	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.35588	119.7395	'MARSHALL - WOODRING 138KV CKT 1'
G11_015	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.35672	121.2198	'G08-13T 345.00 - WOODRING 345KV CKT 1'
G11_015	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.35407	120.3809	'G11-007T 345.00 - WOODRING 345KV CKT 1'
G11_015	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.35637	119.8323	'KNOBHILL - SALINE 69KV CKT 1'
G11_015	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.35637	119.8083	'HELENAT2 69.000 - SALINE 69KV CKT 1'
G11_015	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.35637	119.7224	'GOLTRY - IMO 69KV CKT 1'
G11_015	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.35637	119.7396	'GOLTRY - HELENAT2 69.000 69KV CKT 1'
G11_015	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.3562	119.5949	'IMO TAP - SOUTH 4TH ST 138KV CKT 1'
G11_015	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.35588	119.7309	'COTTONWOOD CREEK - MARSHALL 138KV CKT 1'
G11_015	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.35561	118.8617	'KILDARE4 - NEWKIRK4 138KV CKT 1'
G11_015	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.35561	118.7991	'NEWKIRK4 - PECKHMT4 138.00 138KV CKT 1'
G11_015	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.35558	118.9147	'KILDARE4 - WHITE EAGLE 138KV CKT 1'
G11_015	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.35747	120.1886	'DOVER SW - HENESSEY 138KV CKT 1'
G11_015	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.35974	122.2684	'CLEO CORNER - GLASS MOUNTAIN 138KV CKT 1'
G11_015	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.36069	122.4433	'CLEO CORNER - MEN TAP 138KV CKT 1'
G11_015	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.35654	119.6612	'FPL SWITCH - WOODWARD 138KV CKT 1'
G11_015	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.35768	119.9187	'DEWEY - IODINE 138KV CKT 1'
G11_015	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.36144	122.7381	'DEWEY - SOUTHARD 138KV CKT 1'
G11_015	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.35974	122.3409	'GLASS MOUNTAIN - MOORELAND 138KV CKT 1'
G11_015	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.36069	122.4211	'IMO TAP - MEN TAP 138KV CKT 1'
G11_015	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.3565	120.2553	'KNOBHILL - MOORELAND 138KV CKT 1'
G11_015	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.35768	119.9771	'IODINE - WWRDEHV4 138.00 138KV CKT 1'
G11_015	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.35318	119.7139	'CIMARRON - MINCO 7 345.00 345KV CKT 1'
G11_015	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.36144	125.3734	'EL RENO - ROMAN NOSE 138KV CKT 1'
G11_015	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.35607	119.8076	'CIMARRON - EL RENO 138KV CKT 1'
G11_015	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.35579	119.5542	'CIMARRON - JENSEN TAP 138KV CKT 1'
G11_015	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.36144	122.4053	'ROMAN NOSE - SOUTHARD 138KV CKT 1'
G11_015	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.34168	114.844	'CIMARRON - NORTHWEST 345KV CKT 1'
G11_015	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.3463	117.5101	'ARCADIA - NORTHWEST 345KV CKT 1'
G11_015	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.35364	118.493	'CIMARRON - DRAPER LAKE 345KV CKT 1'
G11_015	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.35407	120.8121	'CIMARRON - G11-007T 345.00 345KV CKT 1'
G11_015	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.35401	118.6404	'ARCADIA - HORSESHOE LAKE 345KV CKT 1'
G11_015	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.35401	118.6486	'HORSESHOE LAKE - SEMINOLE 345KV CKT 1'
G11_015	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.35557	119.7575	'MORRISON - STILLWATER 138KV CKT 1'
G11_015	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.35551	119.5975	'KINZE - MCELROY 138KV CKT 1'
G11_015	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.35551	119.6408	'MCELROY - STILLWATER 138KV CKT 1'
G11_015	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.35448	118.8368	'FT SMITH - MUSKOGEE 345KV CKT 1'
G11_015	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.36408	120.7141	'BORDER 7345.00 - WWRDEHV7 345.00 345KV CKT 1'
G11_015	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.3617	119.8082	'MOORELAND 345.00 - WWRDEHV7 345.00 345KV CKT 1'
G11_015	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	1	115.5924	'G11-015T 345.00 - WWRDEHV7 345.00 345KV CKT 1'
G11_015	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.37473	126.9844	'MED-LDG5 345.00 - WWRDEHV7 345.00 345KV CKT 1'
G11_015	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.37473	126.9844	'MED-LDG5 345.00 - WWRDEHV7 345.00 345KV CKT 2'
G11_015	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.35561	118.7994	'CRESWELL - PECKHMT4 138.00 138KV CKT 1'

SOURCE	DIRECTION	MONTCOMMONNAME	RATEB	TDF	TC%LOADING	CONTNAME
G11_015	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.35654	120.0526	'FPL SWITCH - MOORELAND 138KV CKT 1'
G11_015	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.3561	119.6831	'ARAPAHO - HAMON BUTLER 69KV CKT 1'
G11_015	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.3561	119.6817	'ARAPAHO - INDUSTRIAL PARK 69KV CKT 1'
G11_015	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.356	119.5684	'CALUMET - WATONGA SW 69KV CKT 1'
G11_015	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.35588	119.6246	'CANTON - OKEENE 69KV CKT 1'
G11_015	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.35588	119.6528	'CANTON - TALOGA 69KV CKT 1'
G11_015	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.35873	121.668	'CEDARDALE - MOORELAND 138KV CKT 1'
G11_015	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.35873	121.6361	'CEDARDALE - OKEENE 138KV CKT 1'
G11_015	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.3561	119.7195	'CLINTON - WEATHERFORD 138KV CKT 1'
G11_015	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.3561	119.736	'CLINTON - G07-32T 138.00 138KV CKT 1'
G11_015	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.3561	119.5624	'CORDELL - GOTEBO 69KV CKT 1'
G11_015	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.3561	119.6545	'CORDELL - INDUSTRIAL PARK 69KV CKT 1'
G11_015	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.35837	121.134	'DOVER SW - OKEENE 138KV CKT 1'
G11_015	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.3561	119.6837	'HAMON BUTLER - PUTNAM 69KV CKT 1'
G11_015	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.35945	121.3892	'MOORELAND - NINMILE 4 138.00 138KV CKT 1'
G11_015	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.35738	120.1853	'MOREWOOD SW - RHWIND4 138.00 138KV CKT 1'
G11_015	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.35945	121.3793	'MOREWOOD SW - NINMILE 4 138.00 138KV CKT 1'
G11_015	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.35613	119.736	'OKEENE - WATONGA SW 69KV CKT 1'
G11_015	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.3561	119.7023	'PUTNAM - TALOGA 69KV CKT 1'
G11_015	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.3583	119.6481	'Hitchland Interchange - STEVENSCO 345.00 345KV CKT 1'
G11_015	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.35652	119.5587	'G11-012T 230.00 - MOORE COUNTY INTERCHANGE 230KV CKT 1'
G11_015	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.35532	120.6248	'GRAPEVINE INTERCHANGE - STATELINE INTERCHANGE 230KV CKT 1'
G11_015	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.35542	120.5387	'GRAPEVINE INTERCHANGE - NICHOLS STATION 230KV CKT 1'
G11_015	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.3655	123.7118	'BORDER 7345.00 - TUCO INTERCHANGE 345KV CKT 1'
G11_015	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.35532	120.3561	'STATELINE INTERCHANGE - STLN-DEMARC6230.00 230KV CKT 1'
G11_015	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.35557	119.7039	'MCCLELLAN SUB - MCLEAN RURAL SUB 115KV CKT 1'
G11_015	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.35557	119.718	'KIRBY SWITCHING STATION - MCCLELLAN SUB 115KV CKT 1'
G11_015	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.3583	120.4023	'FINNEY SWITCHING STATION - STEVENSCO 345.00 345KV CKT 1'
G11_015	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.35901	119.7826	'G05-17T 345.00 - POTTER COUNTY INTERCHANGE 345KV CKT 1'
G11_015	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.35573	119.6133	'AMARILLO SOUTH INTERCHANGE - G07-48T 230.00 230KV CKT 1'
G11_015	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.35585	119.6847	'DEAF SMITH COUNTY INTERCHANGE - S-RANDLCO 230.00 230KV CKT 1'
G11_015	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.35573	119.8792	'G07-48T 230.00 - SWISHER COUNTY INTERCHANGE 230KV CKT 1'
G11_015	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.35947	123.3315	'G08-14T 345.00 - TUCO INTERCHANGE 345KV CKT 1'
G11_015	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.35578	119.8131	'KNOLL 230 - POSTROCK6 230.00 230KV CKT 1'
G11_015	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.35612	120.0469	'KNOLL 230 - SMOKYHL6 230.00 230KV CKT 1'
G11_015	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.35948	122.7669	'G10-16T 345.00 - POSTROCK7 345.00 345KV CKT 1'
G11_015	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.35851	121.1816	'AXTELL - POSTROCK7 345.00 345KV CKT 1'
G11_015	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.35612	120.4451	'SMOKYHL6 230.00 - SUMMIT 230KV CKT 1'
G11_015	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.3557	119.6314	'ST JOHN - ST_JOHN 115KV CKT 1'
G11_015	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.35864	120.9643	'HOLCOMB - SETAB 345KV CKT 1'
G11_015	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.35955	122.0123	'MINGO - SETAB 345KV CKT 1'
G11_015	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.36015	122.0729	'MINGO - RED WILLOW 345KV CKT 1'
G11_015	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.35986	122.3677	'GRAY CO 345.00 - SPEARVILLE 345KV CKT 1'
G11_015	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.35948	121.9721	'G10-16T 345.00 - SPEARVILLE 345KV CKT 1'
G11_015	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.35588	120.1217	'HOYT - JEFFERY ENERGY CENTER 345KV CKT 1'
G11_015	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.35595	119.8235	'HOYT - STRANGER CREEK 345KV CKT 1'
G11_015	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.3561	119.566	'EMPORIA ENERGY CENTER - SWISSVALE 345KV CKT 1'
G11_015	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.35655	119.6962	'EMPORIA ENERGY CENTER - WICHITA 345KV CKT 1'
G11_015	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.35631	119.6918	'SWISSVALE - WEST GARDNER 345KV CKT 1'
G11_015	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.35797	120.1602	'BENTON - ROSE HILL 345KV CKT 1'
G11_015	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.36052	121.4758	'BENTON - WICHITA 345KV CKT 1'
G11_015	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.35533	120.6618	'LACYGNE - NEOSHO 345KV CKT 1'
G11_015	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.35711	120.2854	'G05-13T 345.00 - NEOSHO 345KV CKT 1'
G11_015	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.35711	119.8531	'LATHAMS7 345.00 - ROSE HILL 345KV CKT 1'

SOURCE	DIRECTION	MONTCOMMONNAME	RATEB	TDF	TC%LOADING	CONTNAME
G11_015	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.35575	118.7296	'G08-127T 345.00 - ROSE HILL 345KV CKT 1'
G11_015	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.366	126.5147	'MED-LDG5 345.00 - WICHITA 345KV CKT 1'
G11_015	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.366	126.5147	'MED-LDG5 345.00 - WICHITA 345KV CKT 2'
G11_015	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.3559	119.7948	'ANDERSONCO 345.00 - WOLF CREEK 345KV CKT 1'
G11_015	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.35711	120.1156	'G05-13T 345.00 - LATHAMS7 345.00 345KV CKT 1'
G11_015	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.35622	120.3386	'CIRCLE - MULLERGREN 230KV CKT 1'
G11_015	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.35673	120.2268	'CLEARWATER - GILL ENERGY CENTER WEST 138KV CKT 1'
G11_015	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.35673	120.3147	'CLEARWATER - MILAN TAP 138KV CKT 1'
G11_015	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.35549	119.9124	'EVANS ENERGY CENTER NORTH - EVANS ENERGY CENTER SOUTH 138KV CKT 1'
G11_015	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.35673	120.5599	'FLATRDG3 - HARPER 138KV CKT 1'
G11_015	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.35673	120.2691	'FLATRDG3 - MEDICINE LODGE 138KV CKT 1'
G11_015	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.35673	120.4232	'HARPER - MILAN TAP 138KV CKT 1'
G11_015	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.35602	119.6825	'MED-LDG5 345.00 345/138KV TRANSFORMER CKT 1'
G11_015	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.35637	120.3137	'MULLERGREN - SPEARVILLE 230KV CKT 1'
G11_015	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.3554	118.85	'LACYGNE - WEST GARDNER 345KV CKT 1'
G11_015	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.35533	118.8272	'LACYGNE - STILWELL 345KV CKT 1'
G11_015	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.3559	119.8419	'ANDERSONCO 345.00 - LACYGNE 345KV CKT 1'
G11_015	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.3552	118.8436	'BROOKLINE - SUB 383 - MONETT 345KV CKT 1'
G11_015	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.35672	120.526	'G08-13T 345.00 - SUMNERCO 345.00 345KV CKT 1'
G11_015	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.3626	121.01	'2008-047T 345.00 - GRAY CO 345.00 345KV CKT 1'
G11_015	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.35642	120.1617	'AXTELL - PAULINE 345KV CKT 1'
G11_015	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.35745	119.9962	'GERALD GENTLEMAN STATION - RED WILLOW 345KV CKT 1'
G11_015	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.3556	119.7185	'GERALD GENTLEMAN STATION - SWEETWATER 345KV CKT 1'
G11_015	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.35556	119.5915	'GERALD GENTLEMAN STATION - SWEETWATER 345KV CKT 2'
G11_015	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.35583	119.5698	'MCCOOL - MOORE 345KV CKT 1'
G11_015	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.35583	119.6835	'GRAND ISLAND - MCCOOL 345KV CKT 1'
G11_015	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.35634	120.0575	'MOORE - PAULINE 345KV CKT 1'
G11_015	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.35631	120.5044	'GRAND ISLAND - SWEETWATER 345KV CKT 1'
G11_015	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.35544	118.8181	'5NORANDA 161.00 - NEW MADRID 161KV CKT 1'
G11_015	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.35544	118.9503	'BAXTER WILSON SES - PERRYVILLE 500KV CKT 1'
G11_015	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.35554	119.5937	'LAKEOVER - MCADAMS 500KV CKT 1'
G11_015	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.3556	119.5885	'MCADAMS - WOLF CREEK 500KV CKT 1'
G11_015	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.35537	118.8594	'ARKANSAS NUCLEAR ONE - PLEASANT HILL 500KV CKT 1'
G11_015	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.35551	118.5947	'KEO EHV - WEST MEMPHIS 500 500KV CKT 1'
G11_015	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.3555	118.688	'DELL 500 - INDEPENDENCE 500KV CKT 1'
G11_015	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.35532	121.4996	'ELK CITY 230KV (ELKCTY-6) 230/138/13.8KV TRANSFORMER CKT 1'
G11_015	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.35557	119.6528	'SHAMROCK (SHAMRCK1) 115/69/14.4KV TRANSFORMER CKT 1'
G11_015	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.3565	120.2409	'KNOBHILL (KNOBHIL4) 138/69/13.2KV TRANSFORMER CKT 1'
G11_015	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.35467	118.3187	'NORTHWEST (NORTWST2) 345/138/13.8KV TRANSFORMER CKT 1'
G11_015	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.35474	118.5161	'NORTHWEST (NORTWST3) 345/138/13.8KV TRANSFORMER CKT 1'
G11_015	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.3555	119.682	'SUNNYSIDE (SUNNYSD3) 345/138/13.8KV TRANSFORMER CKT 1'
G11_015	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.35452	119.8264	'ARKANSAS NUCLEAR ONE - FT SMITH 500KV CKT 1'
G11_015	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.35608	118.8104	'WWRDEHV7 345.00 (WWDEHV) 345/138/13.8KV TRANSFORMER CKT 1'
G11_015	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.35608	118.8982	'WWRDEHV7 345.00 (WWDEHV-T2) 345/138/13.8KV TRANSFORMER CKT 2'
G11_015	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.3617	119.7887	'MOORELAND 345.00 (MRLNDAUTO) 345/138/13.8KV TRANSFORMER CKT 1'
G11_015	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.35573	119.5715	'TALOGA (TALOGA) 138/69/13.8KV TRANSFORMER CKT 1'
G11_015	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.35901	120.1626	'POTTER COUNTY INTERCHANGE (WAUK 90343-A) 345/230/13.2KV TRANSFORMER CKT 1'
G11_015	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.35574	119.6376	'7OVERTON 345.00 - SIBLEY 345KV CKT 1'
G11_015	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.35547	119.573	'CLINTON - MONTROSE 161KV CKT 1'
G11_015	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.35561	119.6161	'BROOKLINE - MORGAN 345KV CKT 1'
G11_015	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.35544	119.3094	'G08-19 345.00 345/34.5KV TRANSFORMER CKT 1'
G11_015	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.35544	119.3094	'G08-19 345.00 345/34.5KV TRANSFORMER CKT 2'
G11_015	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.3557	119.563	'RED WILLOW (R.WIL T1) 345/115/13.8KV TRANSFORMER CKT 1'
G11_015	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.35549	119.71	'8DANIEL 500.00 - MCKNIGHT 500KV CKT 1'

SOURCE	DIRECTION	MONTCOMMONNAME	RATEB	TDF	TC%LOADING	CONTNAME
G11_015	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.3555	118.7934	'8BHAM STEEL 500.00 - WEST MEMPHIS 500 500KV CKT 1'
G11_015	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.35561	119.7099	'NUNDRWD - WAYSIDE 230KV CKT 1'
G11_015	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.35555	119.5959	'STEGALL - WAYSIDE 230KV CKT 1'
G11_015	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.35544	118.9105	'BURLINGTON NO1 + NO 2 + NO 3 161/20.0KV TRANSFORMER CKT 1'
G11_015	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.35766	120.1781	'OGE3TERM1'
G11_015	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.3556	119.7577	'OGE3TERM2'
G11_015	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.35561	118.8428	'OGE3TERM7'
G11_015	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.35582	119.615	'OGE3TERM10'
G11_015	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.35518	118.9217	'OGE3TERM14'
G11_015	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.35532	120.3561	'SPP-SWPS-02'
G11_015	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.35532	119.9757	'SPP-SWPS-02A'
G11_015	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.35557	119.6487	'SPP-SWPS-T54'
G11_015	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.35673	120.3071	'SPP-MKEC-05'
G11_015	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.35673	120.5766	'SPP-MKEC-08'
G11_015	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.35561	118.7295	'SPP-WERE-07B'
G11_015	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.35673	120.3101	'SPP-WERE-34'
G11_015	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.35561	118.7979	'SPP-WERE-41B'
G11_015	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.3559	120.1684	'WRTOD400'
G11_015	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.3552	118.8433	'AI12'
G11_015	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.35574	119.6173	'OVERTON-TRF'
G11_015	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.35549	119.7846	'FIELD NORTH - LKFLDXL3 345KV CKT 1'
G11_015	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.35359	111.8101	'LAWTON EASTSIDE - OKLAUNION 345KV CKT 1'
G11_015	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.35359	105.9974	'G08-14T 345.00 - OKLAUNION 345KV CKT 1'
G11_015	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.35687	100	'EL RENO - ROMAN NOSE 138KV CKT 1'
G11_015	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.37007	102.2155	'MED-LDG5 345.00 - WWRDEHV7 345.00 345KV CKT 1'
G11_015	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.37007	102.2155	'MED-LDG5 345.00 - WWRDEHV7 345.00 345KV CKT 2'
G11_015	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.35359	105.244	'G08-14T 345.00 - TUCO INTERCHANGE 345KV CKT 1'
G11_015	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.35519	100.8335	'GRAY CO 345.00 - SPEARVILLE 345KV CKT 1'
G11_015	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.36133	103.6121	'MED-LDG5 345.00 - WICHITA 345KV CKT 1'
G11_015	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.36133	103.6121	'MED-LDG5 345.00 - WICHITA 345KV CKT 2'
G11_015	'TO->FROM'	'CIMARRON - MATTHEWSON 345.00 345KV CKT 1'	956	0.31136	151.6951	'MATTHEWSON 345.00 - NORTHWEST 345KV CKT 1'
G11_015	'TO->FROM'	'CIMARRON - MATTHEWSON 345.00 345KV CKT 1'	956	0.37535	153.4363	'MATTHEWSON 345.00 - NORTHWEST 345KV CKT 1'
G11_015	'TO->FROM'	'CIMARRON - MATTHEWSON 345.00 345KV CKT 1'	956	0.31133	149.8055	'MATTHEWSON 345.00 - NORTHWEST 345KV CKT 1'
G11_015	'TO->FROM'	'CIMARRON - MATTHEWSON 345.00 345KV CKT 1'	956	0.3074	127.5919	'MATTHEWSON 345.00 - NORTHWEST 345KV CKT 1'
G11_015	'TO->FROM'	'CIMARRON - MATTHEWSON 345.00 345KV CKT 1'	956	0.30855	128.9848	'MATTHEWSON 345.00 - NORTHWEST 345KV CKT 1'
G11_015	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.44762	116.3511	'LAWTON EASTSIDE - OKLAUNION 345KV CKT 1'
G11_015	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.44762	109.3695	'G08-14T 345.00 - OKLAUNION 345KV CKT 1'
G11_015	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.44923	100.5551	'CLINTON JUNCTION - ELK CITY 138KV CKT 1'
G11_015	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.4471	102.4599	'ELK CITY 230KV - SWEETWT6 230.00 230KV CKT 1'
G11_015	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.4471	101.0983	'STLN-DEMARC6230.00 - SWEETWT6 230.00 230KV CKT 1'
G11_015	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.44708	101.7816	'SPP-SWPS-03'
G11_015	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.44486	100.718	'G08-13T 345.00 - WOODRING 345KV CKT 1'
G11_015	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.45239	100.9396	'CLEO CORNER - GLASS MOUNTAIN 138KV CKT 1'
G11_015	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.45329	101.0115	'CLEO CORNER - MEN TAP 138KV CKT 1'
G11_015	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.45369	101.9975	'DEWEY - SOUTHARD 138KV CKT 1'
G11_015	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.45239	101.0292	'GLASS MOUNTAIN - MOORELAND 138KV CKT 1'
G11_015	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.45329	100.9846	'IMO TAP - MEN TAP 138KV CKT 1'
G11_015	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.45369	102.3701	'EL RENO - ROMAN NOSE 138KV CKT 1'
G11_015	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.45369	101.6003	'ROMAN NOSE - SOUTHARD 138KV CKT 1'
G11_015	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.45443	100.5087	'MOORELAND 345.00 - WWRDEHV7 345.00 345KV CKT 1'
G11_015	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.46884	104.7633	'MED-LDG5 345.00 - WWRDEHV7 345.00 345KV CKT 1'
G11_015	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.46884	104.7633	'MED-LDG5 345.00 - WWRDEHV7 345.00 345KV CKT 2'
G11_015	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.45139	100.3798	'CEDARDALE - MOORELAND 138KV CKT 1'
G11_015	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.45139	100.3373	'CEDARDALE - OKEENE 138KV CKT 1'

SOURCE	DIRECTION	MONTCOMMONNAME	RATEB	TDF	TC%LOADING	CONTNAME
G11_015	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.4471	101.3779	'GRAPEVINE INTERCHANGE - STATELINE INTERCHANGE 230KV CKT 1'
G11_015	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.44763	100.6346	'GRAPEVINE INTERCHANGE - NICHOLS STATION 230KV CKT 1'
G11_015	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.46031	101.134	'BORDER 7345.00 - TUCO INTERCHANGE 345KV CKT 1'
G11_015	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.4471	101.0983	'STATELINE INTERCHANGE - STLN-DEMARC6230.00 230KV CKT 1'
G11_015	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.4513	101.9392	'FINNEY SWITCHING STATION - STEVENSCO 345.00 345KV CKT 1'
G11_015	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.44762	108.4536	'G08-14T 345.00 - TUCO INTERCHANGE 345KV CKT 1'
G11_015	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.45273	102.5419	'G10-16T 345.00 - POSTROCK7 345.00 345KV CKT 1'
G11_015	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.45174	100.2513	'AXTELL - POSTROCK7 345.00 345KV CKT 1'
G11_015	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.45178	100.7955	'HOLCOMB - SETAB 345KV CKT 1'
G11_015	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.45273	102.4111	'MINGO - SETAB 345KV CKT 1'
G11_015	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.4534	102.4204	'MINGO - RED WILLOW 345KV CKT 1'
G11_015	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.45261	104.2969	'GRAY CO 345.00 - SPEARVILLE 345KV CKT 1'
G11_015	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.45273	101.5518	'G10-16T 345.00 - SPEARVILLE 345KV CKT 1'
G11_015	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.45339	100.5296	'BENTON - WICHITA 345KV CKT 1'
G11_015	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.45907	106.7794	'MED-LDG5 345.00 - WICHITA 345KV CKT 1'
G11_015	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.45907	106.7794	'MED-LDG5 345.00 - WICHITA 345KV CKT 2'
G11_015	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.45604	100.5819	'2008-047T 345.00 - GRAY CO 345.00 345KV CKT 1'
G11_015	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.4471	102.4593	'ELK CITY 230KV (ELKCTY-6) 230/138/13.8KV TRANSFORMER CKT 1'
G11_015	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.45443	100.4878	'MOORELAND 345.00 (MRLNDAUTO) 345/138/13.8KV TRANSFORMER CKT 1'
G11_015	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.4471	101.0983	'SPP-SWPS-02'
G11_015	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.4471	100.6318	'SPP-SWPS-02A'
G11_015	'FROM->TO'	'MATTHEWSON 345.00 - NORTHWEST 345KV CKT 1'	1195	0.34634	134.0475	'CIMARRON - MATTHEWSON 345.00 345KV CKT 1'
G11_015	'FROM->TO'	'MATTHEWSON 345.00 - NORTHWEST 345KV CKT 1'	1195	0.42148	135.0651	'CIMARRON - MATTHEWSON 345.00 345KV CKT 1'
G11_015	'FROM->TO'	'MATTHEWSON 345.00 - NORTHWEST 345KV CKT 1'	1195	0.34629	132.3797	'CIMARRON - MATTHEWSON 345.00 345KV CKT 1'
G11_015	'FROM->TO'	'MATTHEWSON 345.00 - NORTHWEST 345KV CKT 1'	1195	0.34156	113.3461	'CIMARRON - MATTHEWSON 345.00 345KV CKT 1'
G11_015	'FROM->TO'	'MATTHEWSON 345.00 - NORTHWEST 345KV CKT 1'	1195	0.34311	113.064	'CIMARRON - MATTHEWSON 345.00 345KV CKT 1'
G11_015	'TO->FROM'	'MATTHEWSON 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.37428	126.3529	'MATTHEWSON 345.00 - TATONGA7 345.00 345KV CKT 2'
G11_015	'TO->FROM'	'MATTHEWSON 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.44084	137.5331	'MATTHEWSON 345.00 - TATONGA7 345.00 345KV CKT 2'
G11_015	'TO->FROM'	'MATTHEWSON 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.37426	124.3769	'MATTHEWSON 345.00 - TATONGA7 345.00 345KV CKT 2'
G11_015	'TO->FROM'	'MATTHEWSON 345.00 - TATONGA7 345.00 345KV CKT 2'	1195	0.37428	126.3529	'MATTHEWSON 345.00 - TATONGA7 345.00 345KV CKT 1'
G11_015	'TO->FROM'	'MATTHEWSON 345.00 - TATONGA7 345.00 345KV CKT 2'	1195	0.44084	137.5331	'MATTHEWSON 345.00 - TATONGA7 345.00 345KV CKT 1'
G11_015	'TO->FROM'	'MATTHEWSON 345.00 - TATONGA7 345.00 345KV CKT 2'	1195	0.37426	124.3769	'MATTHEWSON 345.00 - TATONGA7 345.00 345KV CKT 1'
G11_015	'TO->FROM'	'CIMARRON - MATTHEWSON 345.00 345KV CKT 1'	956	0.39669	142.5038	'MATTHEWSON 345.00 - NORTHWEST 345KV CKT 1'
G11_015	'FROM->TO'	'MATTHEWSON 345.00 - NORTHWEST 345KV CKT 1'	1195	0.44484	124.0373	'CIMARRON - MATTHEWSON 345.00 345KV CKT 1'
G11_015	'TO->FROM'	'CIMARRON - MATTHEWSON 345.00 345KV CKT 1'	956	0.36017	154.2912	'MATTHEWSON 345.00 - NORTHWEST 345KV CKT 1'
G11_015	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.54297	106.2909	'LAWTON EASTSIDE - OKLAUNION 345KV CKT 1'
G11_015	'FROM->TO'	'MATTHEWSON 345.00 - NORTHWEST 345KV CKT 1'	1195	0.40778	135.7368	'CIMARRON - MATTHEWSON 345.00 345KV CKT 1'
G11_015	'TO->FROM'	'MATTHEWSON 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.43436	103.4832	'MATTHEWSON 345.00 - TATONGA7 345.00 345KV CKT 2'
G11_015	'TO->FROM'	'MATTHEWSON 345.00 - TATONGA7 345.00 345KV CKT 2'	1195	0.43436	103.4832	'MATTHEWSON 345.00 - TATONGA7 345.00 345KV CKT 1'
G11_015	'TO->FROM'	'CIMARRON - MATTHEWSON 345.00 345KV CKT 1'	956	0.38148	135.1275	'MATTHEWSON 345.00 - NORTHWEST 345KV CKT 1'
G11_015	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.553	105.7054	'LAWTON EASTSIDE - OKLAUNION 345KV CKT 1'
G11_015	'FROM->TO'	'MATTHEWSON 345.00 - NORTHWEST 345KV CKT 1'	1195	0.42926	117.7769	'CIMARRON - MATTHEWSON 345.00 345KV CKT 1'
G11_015	'TO->FROM'	'MATTHEWSON 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.44157	100.7395	'MATTHEWSON 345.00 - TATONGA7 345.00 345KV CKT 2'
G11_015	'TO->FROM'	'MATTHEWSON 345.00 - TATONGA7 345.00 345KV CKT 2'	1195	0.44157	100.7395	'MATTHEWSON 345.00 - TATONGA7 345.00 345KV CKT 1'
G11_015	'TO->FROM'	'CIMARRON - MATTHEWSON 345.00 345KV CKT 1'	956	0.3754	137.1267	'MATTHEWSON 345.00 - NORTHWEST 345KV CKT 1'
G11_015	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.54996	113.9722	'LAWTON EASTSIDE - OKLAUNION 345KV CKT 1'
G11_015	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.54996	107.1703	'G08-14T 345.00 - OKLAUNION 345KV CKT 1'
G11_015	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.55295	100.0563	'MED-LDG5 345.00 - WWRDEHV7 345.00 345KV CKT 1'
G11_015	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.55295	100.0563	'MED-LDG5 345.00 - WWRDEHV7 345.00 345KV CKT 2'
G11_015	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.54996	106.7522	'G08-14T 345.00 - TUCO INTERCHANGE 345KV CKT 1'
G11_015	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.53671	100.8232	'G10-16T 345.00 - POSTROCK7 345.00 345KV CKT 1'
G11_015	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.54561	104.0022	'MED-LDG5 345.00 - WICHITA 345KV CKT 1'
G11_015	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.54561	104.0022	'MED-LDG5 345.00 - WICHITA 345KV CKT 2'
G11_015	'FROM->TO'	'MATTHEWSON 345.00 - NORTHWEST 345KV CKT 1'	1195	0.4206	122.9661	'CIMARRON - MATTHEWSON 345.00 345KV CKT 1'

SOURCE	DIRECTION	MONTCOMMONNAME	RATEB	TDF	TC%LOADING	CONTNAME
G11_015	'TO->FROM'	'MATTHEWSON 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.43902	106.7267	'MATTHEWSON 345.00 - TATONGA7 345.00 345KV CKT 2'
G11_015	'TO->FROM'	'MATTHEWSON 345.00 - TATONGA7 345.00 345KV CKT 2'	1195	0.43902	106.7267	'MATTHEWSON 345.00 - TATONGA7 345.00 345KV CKT 1'
G11_015	'TO->FROM'	'CIMARRON - MATTHEWSON 345.00 345KV CKT 1'	956	0.30548	126.9879	'MATTHEWSON 345.00 - NORTHWEST 345KV CKT 1'
G11_015	'FROM->TO'	'MATTHEWSON 345.00 - NORTHWEST 345KV CKT 1'	1195	0.33926	112.6244	'CIMARRON - MATTHEWSON 345.00 345KV CKT 1'
G11_016		Non Converged Contingency	0	0.39227	-	'DBL-SPRVL-CO'
G11_016		Non Converged Contingency	0	0.39227	-	'DBL-COM-MEDL'
G11_016		Non Converged Contingency	0	0.27142	-	'DBL-MEDLO-WI'
G11_016		Non Converged Contingency	0	0.3926	-	'DBL-COM-MEDL'
G11_016		Non Converged Contingency	0	0.27199	-	'DBL-MEDLO-WI'
G11_016		Non Converged Contingency	1328	0.30999	-	'GRAY CO 345.00 - SPEARVILLE 345KV CKT 1'
G11_016		Non Converged Contingency	0	0.39206	-	'DBL-SPRVL-CO'
G11_016		Non Converged Contingency	0	0.39206	-	'DBL-COM-MEDL'
G11_016		Non Converged Contingency	0	0.261	-	'DBL-MEDLO-WI'
G11_016		Non Converged Contingency	0	0.39236	-	'DBL-COM-MEDL'
G11_016		Non Converged Contingency	0	0.26152	-	'DBL-MEDLO-WI'
G11_016		Non Converged Contingency	0	0.24267	-	'DBL-MEDLO-WI'
G11_016		Non Converged Contingency	0	0.39217	-	'DBL-SPRVL-CO'
G11_016		Non Converged Contingency	0	0.39217	-	'DBL-COM-MEDL'
G11_016		Non Converged Contingency	0	0.2609	-	'DBL-MEDLO-WI'
G11_016		Non Converged Contingency	0	0.39248	-	'DBL-COM-MEDL'
G11_016		Non Converged Contingency	0	0.26143	-	'DBL-MEDLO-WI'
G11_017		Non Converged Contingency	0	0.31315	-	'DBL-COM-MEDL'
G11_017		Non Converged Contingency	0	0.20635	-	'DBL-MEDLO-WI'
G11_017		Non Converged Contingency	0	0.3131	-	'DBL-COM-MEDL'
G11_017		Non Converged Contingency	0	0.2064	-	'DBL-MEDLO-WI'
G11_017		Non Converged Contingency	0	0.31297	-	'DBL-COM-MEDL'
G11_017		Non Converged Contingency	0	0.31293	-	'DBL-COM-MEDL'
G11_017		Non Converged Contingency	0	0.19747	-	'DBL-MEDLO-WI'
G11_017		Non Converged Contingency	0	0.19752	-	'DBL-MEDLO-WI'
G11_017		Non Converged Contingency	0	0.31308	-	'DBL-COM-MEDL'
G11_017		Non Converged Contingency	0	0.31303	-	'DBL-COM-MEDL'
G11_017		Non Converged Contingency	0	0.19739	-	'DBL-MEDLO-WI'
G11_017		Non Converged Contingency	0	0.19744	-	'DBL-MEDLO-WI'
G11_018	'TO->FROM'	'BEATRICE - G10-47T 115.00 115KV CKT 1'	99	0.54712	101.8787	'BAILEYVILLE N.M. STATION (NEMAHA MARSHALL R - SOUTH SENECA 115KV CKT 1'
G11_018	'TO->FROM'	'BEATRICE - G10-47T 115.00 115KV CKT 1'	99	0.54712	102.4403	'BAILEYVILLE N.M. STATION (NEMAHA MARSHALL R - SMITTYVILLE N.M. COOP (NEMAHA MARSHALL R.E. 115KV CKT 1'
G11_018	'TO->FROM'	'BEATRICE - G10-47T 115.00 115KV CKT 1'	99	0.54712	102.7975	'G09-40T 115.00 - SMITTYVILLE N.M. COOP (NEMAHA MARSHALL R.E. 115KV CKT 1'
G11_018	'TO->FROM'	'BEATRICE - G10-47T 115.00 115KV CKT 1'	99	0.63078	105.9006	'FAIRBURY - HARBINE 115KV CKT 1'
G11_018	'TO->FROM'	'BEATRICE - G10-47T 115.00 115KV CKT 1'	99	0.63078	106.2615	LN-1175B'
G11_018	'FROM->TO'	'BEATRICE POWER STATION - CLATONIA 115KV CKT 1'	137	0.30364	111.6216	'BEATRICE POWER STATION - SHELDON 115KV CKT 1'
G11_018	'FROM->TO'	'CLATONIA - SHELDON 115KV CKT 1'	137	0.30364	108.3764	'BEATRICE POWER STATION - SHELDON 115KV CKT 1'
G11_019		Non Converged Contingency	0	0.24298	-	'DBL-MEDLO-WI'
G11_019		Non Converged Contingency	0	0.24163	-	'DBL-MEDLO-WI'
G11_019	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22542	124.5413	'BASE CASE'
G11_019	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22546	124.2102	'DOLET HILLS 345/230KV TRANSFORMER CKT 1'
G11_019	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22524	124.8648	'DOLET HILLS - SOUTHWEST SHREVEPORT 345KV CKT 1'
G11_019	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22519	124.0307	'FLINT CREEK - GRDA1 345KV CKT 1'
G11_019	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22532	124.0989	'FLINT CREEK - SUB 383 - MONETT 345KV CKT 1'
G11_019	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22525	123.812	'CHAMBER SPRINGS - CLARKSVILLE 345KV CKT 1'
G11_019	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22556	124.1279	'CLARKSVILLE - MUSKOGEE 345KV CKT 1'
G11_019	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22242	122.8349	'REDBUD - RIVERSIDE STATION 345KV CKT 1'
G11_019	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22561	125.0109	'NORTHEAST STATION - ONETA 345KV CKT 1'
G11_019	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22477	124.2005	'CLEVELAND - TULSA NORTH 345KV CKT 1'
G11_019	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22618	123.5669	'DELAWARE - NORTHEAST STATION 345KV CKT 1'
G11_019	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22608	124.1399	'DELAWARE - NEOSHO 345KV CKT 1'

SOURCE	DIRECTION	MONTCOMMONNAME	RATEB	TDF	TC%LOADING	CONTNAME
G11_019	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.2226	123.1792	'PITTSBURG - VALLIANT 345KV CKT 1'
G11_019	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22348	123.6936	'PITTSBURG - SEMINOLE 345KV CKT 1'
G11_019	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.2259	124.9764	'HINTON - WEATHERFORD JCT. 138KV CKT 1'
G11_019	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.2259	124.9671	'CAN_GAS4 138.00 - HINTON 138KV CKT 1'
G11_019	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22623	125.0269	'CARNEGIE - HOBART JUNCTION 138KV CKT 1'
G11_019	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22623	124.9868	'CARNEGIE - SOUTHWESTERN STATION 138KV CKT 1'
G11_019	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22693	125.6297	'CLINTON AIR FORCE BASE TAP - ELK CITY 138KV CKT 1'
G11_019	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22693	125.5853	'CLINTON AIR FORCE BASE TAP - HOBART JUNCTION 138KV CKT 1'
G11_019	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.23384	135.7378	'LAWTON EASTSIDE - OKLAUNION 345KV CKT 1'
G11_019	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.23384	129.7721	'G08-14T 345.00 - OKLAUNION 345KV CKT 1'
G11_019	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22788	126.4627	'CLINTON JUNCTION - ELK CITY 138KV CKT 1'
G11_019	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22785	125.7852	'ELK CITY - RHWIND4 138.00 138KV CKT 1'
G11_019	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.2266	125.3577	'LAWTON EASTSIDE - SUNNYSIDE 345KV CKT 1'
G11_019	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.2257	124.8819	'CLINTON JUNCTION - CLINTON NATURAL GAS TAP 138KV CKT 1'
G11_019	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.2259	125.1095	'WEATHERFORD JCT. - WEATHERFORD SOUTHEAST 138KV CKT 1'
G11_019	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22604	126.8884	'ELK CITY 230KV - SWEETWT6 230.00 230KV CKT 1'
G11_019	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.2257	124.9502	'WEATHERFORD SOUTHEAST - WEATHERFORD TAP 138KV CKT 1'
G11_019	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.2257	124.8535	'CLINTON NATURAL GAS TAP - WEATHERFORD WIND FARM 138KV CKT 1'
G11_019	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.2257	125.0342	'WEATHERFORD TAP - WEATHERFORD WIND FARM 138KV CKT 1'
G11_019	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.2259	124.9294	'CAN_GAS4 138.00 - JENSEN ROAD 138KV CKT 1'
G11_019	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22604	125.6925	'STLN-DEMARC6230.00 - SWEETWT6 230.00 230KV CKT 1'
G11_019	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22591	124.885	'CHILDRESS - LAKE PAULINE 138KV CKT 1'
G11_019	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22474	124.0866	'CLEVELAND - SOONER 345KV CKT 1'
G11_019	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22802	125.4361	'WAUKOMIS - WAUKOMIS TAP 138KV CKT 1'
G11_019	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22802	125.4689	'HENESSEY - WAUKOMIS 138KV CKT 1'
G11_019	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22619	125.0153	'MARSHALL - WOODRING 138KV CKT 1'
G11_019	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22955	126.5152	'G08-13T 345.00 - WOODRING 345KV CKT 1'
G11_019	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22644	125.6253	'G11-007T 345.00 - WOODRING 345KV CKT 1'
G11_019	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22664	125.1382	'KNOBHILL - SALINE 69KV CKT 1'
G11_019	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22664	125.1138	'HELENAT2 69.000 - SALINE 69KV CKT 1'
G11_019	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22664	125.0273	'GOLTRY - IMO 69KV CKT 1'
G11_019	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22664	125.0445	'GOLTRY - HELENAT2 69.000 69KV CKT 1'
G11_019	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22644	124.8979	'IMO TAP - SOUTH 4TH ST 138KV CKT 1'
G11_019	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22619	125.0065	'COTTONWOOD CREEK - MARSHALL 138KV CKT 1'
G11_019	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22582	124.1288	'KILDARE4 - NEWKIRK4 138KV CKT 1'
G11_019	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22582	124.0669	'NEWKIRK4 - PECKHMT4 138.00 138KV CKT 1'
G11_019	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.2257	124.1846	'KILDARE4 - WHITE EAGLE 138KV CKT 1'
G11_019	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22561	125.2497	'TRF-STEGALL'
G11_019	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22802	125.5452	'DOVER SW - HENESSEY 138KV CKT 1'
G11_019	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.23106	127.729	'CLEO CORNER - GLASS MOUNTAIN 138KV CKT 1'
G11_019	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.23231	127.9158	'CLEO CORNER - MEN TAP 138KV CKT 1'
G11_019	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22685	124.9678	'FPL SWITCH - WOODWARD 138KV CKT 1'
G11_019	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22844	125.2677	'DEWEY - IODINE 138KV CKT 1'
G11_019	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.23373	128.2958	'DEWEY - SOUTHARD 138KV CKT 1'
G11_019	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.23106	127.8066	'GLASS MOUNTAIN - MOORELAND 138KV CKT 1'
G11_019	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.23231	127.8926	'IMO TAP - MEN TAP 138KV CKT 1'
G11_019	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22682	125.6023	'KNOBHILL - MOORELAND 138KV CKT 1'
G11_019	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22844	125.3279	'IODINE - WWRDEHV4 138.00 138KV CKT 1'
G11_019	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22105	124.5828	'SOONER - SPRING CREEK 345KV CKT 1'
G11_019	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.23373	131.0703	'EL RENO - ROMAN NOSE 138KV CKT 1'
G11_019	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22636	125.1087	'CIMARRON - EL RENO 138KV CKT 1'
G11_019	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22598	124.8387	'CIMARRON - JENSEN TAP 138KV CKT 1'
G11_019	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.23373	127.9422	'ROMAN NOSE - SOUTHARD 138KV CKT 1'
G11_019	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22105	124.581	'NORTHWEST - SPRING CREEK 345KV CKT 1'

SOURCE	DIRECTION	MONTCOMMONNAME	RATEB	TDF	TC%LOADING	CONTNAME
G11_019	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.21826	119.9674	'CIMARRON - NORTHWEST 345KV CKT 1'
G11_019	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.2182	122.7252	'ARCADIA - NORTHWEST 345KV CKT 1'
G11_019	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22381	123.7511	'CIMARRON - DRAPER LAKE 345KV CKT 1'
G11_019	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22644	126.0448	'CIMARRON - G11-007T 345.00 345KV CKT 1'
G11_019	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22431	123.9115	'ARCADIA - HORSESHOE LAKE 345KV CKT 1'
G11_019	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22431	123.9117	'HORSESHOE LAKE - SEMINOLE 345KV CKT 1'
G11_019	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22562	125.0278	'MORRISON - STILLWATER 138KV CKT 1'
G11_019	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22555	124.8669	'KINZE - MCELROY 138KV CKT 1'
G11_019	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22555	124.9095	'MCELROY - STILLWATER 138KV CKT 1'
G11_019	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22458	124.0798	'FT SMITH - MUSKOGEE 345KV CKT 1'
G11_019	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.2354	126.3052	'BORDER 7345.00 - WWRDEHV7 345.00 345KV CKT 1'
G11_019	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.23355	125.2498	'MOORELAND 345.00 - WWRDEHV7 345.00 345KV CKT 1'
G11_019	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.24875	133.249	'MED-LDG5 345.00 - WWRDEHV7 345.00 345KV CKT 1'
G11_019	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.24875	133.249	'MED-LDG5 345.00 - WWRDEHV7 345.00 345KV CKT 2'
G11_019	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22582	124.0673	'CRESWELL - PECKHMT4 138.00 138KV CKT 1'
G11_019	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22685	125.3689	'FPL SWITCH - MOORELAND 138KV CKT 1'
G11_019	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22626	124.9891	'ARAPAHO - HAMON BUTLER 69KV CKT 1'
G11_019	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22626	124.9874	'ARAPAHO - INDUSTRIAL PARK 69KV CKT 1'
G11_019	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22619	124.8553	'CALUMET - WATONGA SW 69KV CKT 1'
G11_019	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.226	124.9234	'CANTON - OKEENE 69KV CKT 1'
G11_019	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.226	124.9542	'CANTON - TALOGA 69KV CKT 1'
G11_019	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22979	127.063	'CEDARDALE - MOORELAND 138KV CKT 1'
G11_019	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22979	127.0158	'CEDARDALE - OKEENE 138KV CKT 1'
G11_019	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22633	125.0206	'CLINTON - WEATHERFORD 138KV CKT 1'
G11_019	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22633	125.0377	'CLINTON - G07-32T 138.00 138KV CKT 1'
G11_019	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22626	124.9612	'CORDELL - INDUSTRIAL PARK 69KV CKT 1'
G11_019	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22929	126.5327	'DOVER SW - OKEENE 138KV CKT 1'
G11_019	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22626	124.9899	'HAMON BUTLER - PUTNAM 69KV CKT 1'
G11_019	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.23046	126.8654	'MOORELAND - NINMILE 4 138.00 138KV CKT 1'
G11_019	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22785	125.5383	'MOREWOOD SW - RHWIND4 138.00 138KV CKT 1'
G11_019	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.23046	126.8501	'MOREWOOD SW - NINMILE 4 138.00 138KV CKT 1'
G11_019	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22636	125.0326	'OKEENE - WATONGA SW 69KV CKT 1'
G11_019	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22626	125.0098	'PUTNAM - TALOGA 69KV CKT 1'
G11_019	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22884	125.0447	'Hitchland Interchange - STEVENSCO 345.00 345KV CKT 1'
G11_019	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22662	124.8671	'G11-012T 230.00 - MOORE COUNTY INTERCHANGE 230KV CKT 1'
G11_019	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22586	125.8411	'GRAPEVINE INTERCHANGE - NICHOLS STATION 230KV CKT 1'
G11_019	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.23714	129.3586	'BORDER 7345.00 - TUCO INTERCHANGE 345KV CKT 1'
G11_019	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22604	125.6925	'STATELINE INTERCHANGE - STLN-DEMARC6230.00 230KV CKT 1'
G11_019	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22568	124.9841	'MCCLELLAN SUB - MCLEAN RURAL SUB 115KV CKT 1'
G11_019	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22568	124.9948	'KIRBY SWITCHING STATION - MCCLELLAN SUB 115KV CKT 1'
G11_019	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22884	125.8393	'FINNEY SWITCHING STATION - STEVENSCO 345.00 345KV CKT 1'
G11_019	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.2294	125.1565	'G05-17T 345.00 - POTTER COUNTY INTERCHANGE 345KV CKT 1'
G11_019	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22577	124.9034	'AMARILLO SOUTH INTERCHANGE - G07-48T 230.00 230KV CKT 1'
G11_019	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22586	124.978	'DEAF SMITH COUNTY INTERCHANGE - S-RANDLCO 230.00 230KV CKT 1'
G11_019	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22577	125.1819	'G07-48T 230.00 - SWISHER COUNTY INTERCHANGE 230KV CKT 1'
G11_019	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.23384	128.9459	'G08-14T 345.00 - TUCO INTERCHANGE 345KV CKT 1'
G11_019	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22584	125.1267	'KNOLL 230 - POSTROCK6 230.00 230KV CKT 1'
G11_019	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22626	125.381	'KNOLL 230 - SMOKYHL6 230.00 230KV CKT 1'
G11_019	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.23011	128.3483	'G10-16T 345.00 - POSTROCK7 345.00 345KV CKT 1'
G11_019	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22889	126.6208	'AXTELL - POSTROCK7 345.00 345KV CKT 1'
G11_019	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22626	125.7956	'SMOKYHL6 230.00 - SUMMIT 230KV CKT 1'
G11_019	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22575	124.9228	'ST JOHN - ST_JOHN 115KV CKT 1'
G11_019	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22915	126.4373	'HOLCOMB - SETAB 345KV CKT 1'
G11_019	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.23022	127.5809	'MINGO - SETAB 345KV CKT 1'

SOURCE	DIRECTION	MONTCOMMONNAME	RATEB	TDF	TC%LOADING	CONTNAME
G11_019	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.23091	127.6747	'MINGO - RED WILLOW 345KV CKT 1'
G11_019	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.23094	127.9851	'GRAY CO 345.00 - SPEARVILLE 345KV CKT 1'
G11_019	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.23011	127.522	'G10-16T 345.00 - SPEARVILLE 345KV CKT 1'
G11_019	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22593	125.4084	'HOYT - JEFFERY ENERGY CENTER 345KV CKT 1'
G11_019	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.226	125.1059	'HOYT - STRANGER CREEK 345KV CKT 1'
G11_019	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22614	124.8483	'EMPORIA ENERGY CENTER - SWISSVALE 345KV CKT 1'
G11_019	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22659	125.0234	'EMPORIA ENERGY CENTER - WICHITA 345KV CKT 1'
G11_019	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22641	124.9756	'SWISSVALE - WEST GARDNER 345KV CKT 1'
G11_019	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22883	125.5095	'BENTON - ROSE HILL 345KV CKT 1'
G11_019	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.2318	126.893	'BENTON - WICHITA 345KV CKT 1'
G11_019	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22562	125.9326	'LACYGNE - NEOSHO 345KV CKT 1'
G11_019	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.2273	125.5851	'G05-13T 345.00 - NEOSHO 345KV CKT 1'
G11_019	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.2273	125.1613	'LATHAMS7 345.00 - ROSE HILL 345KV CKT 1'
G11_019	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22786	123.9843	'G08-127T 345.00 - ROSE HILL 345KV CKT 1'
G11_019	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.23856	132.4215	'MED-LDG5 345.00 - WICHITA 345KV CKT 1'
G11_019	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.23856	132.4215	'MED-LDG5 345.00 - WICHITA 345KV CKT 2'
G11_019	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22589	125.0826	'ANDERSONCO 345.00 - WOLF CREEK 345KV CKT 1'
G11_019	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.2273	125.4305	'G05-13T 345.00 - LATHAMS7 345.00 345KV CKT 1'
G11_019	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22641	125.675	'CIRCLE - MULLERGREN 230KV CKT 1'
G11_019	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22703	125.546	'CLEARWATER - GILL ENERGY CENTER WEST 138KV CKT 1'
G11_019	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22703	125.6309	'CLEARWATER - MILAN TAP 138KV CKT 1'
G11_019	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22549	125.1467	'EVANS ENERGY CENTER NORTH - EVANS ENERGY CENTER SOUTH 138KV CKT 1'
G11_019	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22703	125.9054	'FLATRDG3 - HARPER 138KV CKT 1'
G11_019	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22703	125.6048	'FLATRDG3 - MEDICINE LODGE 138KV CKT 1'
G11_019	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22703	125.7619	'HARPER - MILAN TAP 138KV CKT 1'
G11_019	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22614	124.9745	'MED-LDG5 345.00 345/138KV TRANSFORMER CKT 1'
G11_019	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22653	125.6621	'MULLERGREN - SPEARVILLE 230KV CKT 1'
G11_019	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22542	124.1276	'LACYGNE - WEST GARDNER 345KV CKT 1'
G11_019	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22533	124.0968	'LACYGNE - STILWELL 345KV CKT 1'
G11_019	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22589	125.1342	'ANDERSONCO 345.00 - LACYGNE 345KV CKT 1'
G11_019	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22532	124.1013	'BROOKLINE - SUB 383 - MONETT 345KV CKT 1'
G11_019	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22955	125.8283	'G08-13T 345.00 - SUMNERCO 345.00 345KV CKT 1'
G11_019	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.23395	126.6284	'2008-047T 345.00 - GRAY CO 345.00 345KV CKT 1'
G11_019	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22654	125.4949	'AXTELL - PAULINE 345KV CKT 1'
G11_019	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22776	125.387	'GERALD GENTLEMAN STATION - RED WILLOW 345KV CKT 1'
G11_019	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22561	125.0106	'GERALD GENTLEMAN STATION - SWEETWATER 345KV CKT 1'
G11_019	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22556	124.8742	'GERALD GENTLEMAN STATION - SWEETWATER 345KV CKT 2'
G11_019	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22587	124.8585	'MCCOOL - MOORE 345KV CKT 1'
G11_019	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22587	124.9714	'GRAND ISLAND - MCCOOL 345KV CKT 1'
G11_019	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22645	125.3811	'MOORE - PAULINE 345KV CKT 1'
G11_019	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22642	125.8242	'GRAND ISLAND - SWEETWATER 345KV CKT 1'
G11_019	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22542	124.0865	'5NORANDA 161.00 - NEW MADRID 161KV CKT 1'
G11_019	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22543	124.2148	'BAXTER WILSON SES - PERRYVILLE 500KV CKT 1'
G11_019	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22553	124.8655	'LAKEOVER - MCADAMS 500KV CKT 1'
G11_019	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22561	124.8628	'MCADAMS - WOLF CREEK 500KV CKT 1'
G11_019	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22535	124.2412	'ARKANSAS NUCLEAR ONE - MABELVALE 500 500KV CKT 1'
G11_019	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22536	124.1243	'ARKANSAS NUCLEAR ONE - PLEASANT HILL 500KV CKT 1'
G11_019	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22553	123.8558	'KEO EHV - WEST MEMPHIS 500 500KV CKT 1'
G11_019	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.2255	123.9542	'DELL 500 - INDEPENDENCE 500KV CKT 1'
G11_019	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22604	126.8881	'ELK CITY 230KV (ELKCTY-6) 230/138/13.8KV TRANSFORMER CKT 1'
G11_019	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22682	125.5811	'KNOBHILL (KNOBHIL4) 138/69/13.2KV TRANSFORMER CKT 1'
G11_019	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22493	123.5762	'NORTHWEST (NORTWST2) 345/138/13.8KV TRANSFORMER CKT 1'
G11_019	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22497	123.7759	'NORTHWEST (NORTWST3) 345/138/13.8KV TRANSFORMER CKT 1'
G11_019	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22552	124.9563	'SUNNYSIDE (SUNNYSD3) 345/138/13.8KV TRANSFORMER CKT 1'

SOURCE	DIRECTION	MONTCOMMONNAME	RATEB	TDF	TC%LOADING	CONTNAME
G11_019	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22466	125.0776	'ARKANSAS NUCLEAR ONE - FT SMITH 500KV CKT 1'
G11_019	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22626	124.0794	'WWRDEHV7 345.00 (WWDEHV) 345/138/13.8KV TRANSFORMER CKT 1'
G11_019	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22626	124.1911	'WWRDEHV7 345.00 (WWDEHV-T2) 345/138/13.8KV TRANSFORMER CKT 2'
G11_019	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.23355	125.2277	'MOORELAND 345.00 (MRLNDAUTO) 345/138/13.8KV TRANSFORMER CKT 1'
G11_019	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22579	124.8629	'TALOGA (TALOGA) 138/69/13.8KV TRANSFORMER CKT 1'
G11_019	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.2294	125.5609	'POTTER COUNTY INTERCHANGE (WAUK 90343-A) 345/230/13.2KV TRANSFORMER CKT 1'
G11_019	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22579	124.914	'7OVERTON 345.00 - SIBLEY 345KV CKT 1'
G11_019	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22547	124.8428	'CLINTON - MONTROSE 161KV CKT 1'
G11_019	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22565	124.8895	'BROOKLINE - MORGAN 345KV CKT 1'
G11_019	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22542	124.6011	'G08-19 345.00 345/34.5KV TRANSFORMER CKT 1'
G11_019	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22542	124.6011	'G08-19 345.00 345/34.5KV TRANSFORMER CKT 2'
G11_019	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22572	124.8643	'RED WILLOW (R.WIL T1) 345/115/13.8KV TRANSFORMER CKT 1'
G11_019	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22547	124.9814	'8DANIEL 500.00 - MCKNIGHT 500KV CKT 1'
G11_019	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22551	124.0558	'8BHAM STEEL 500.00 - WEST MEMPHIS 500 500KV CKT 1'
G11_019	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22562	124.9976	'NUNDRWD - WAYSIDE 230KV CKT 1'
G11_019	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22554	124.875	'STEGALL - WAYSIDE 230KV CKT 1'
G11_019	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22542	124.1757	'BURLINGTON NO1 + NO 2 + NO 3 161/20.0KV TRANSFORMER CKT 1'
G11_019	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22829	125.5432	'OGE3TERM1'
G11_019	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22565	125.0301	'OGE3TERM2'
G11_019	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22583	124.1114	'OGE3TERM7'
G11_019	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22622	124.9021	'OGE3TERM10'
G11_019	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22528	124.1861	'OGE3TERM14'
G11_019	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22604	125.6925	'SPP-SWPS-02'
G11_019	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22604	125.3387	'SPP-SWPS-02A'
G11_019	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22703	125.6393	'SPP-MKEC-05'
G11_019	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22703	125.9266	'SPP-MKEC-08'
G11_019	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22583	123.9993	'SPP-WERE-07B'
G11_019	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22703	125.643	'SPP-WERE-34'
G11_019	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22582	124.0656	'SPP-WERE-41B'
G11_019	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22595	125.455	'WRTOD400'
G11_019	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22532	124.101	'AI12'
G11_019	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.2258	124.8871	'OVERTON-TRF'
G11_019	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22548	125.0612	'FIELD NORTH - LKFLDXL3 345KV CKT 1'
G11_019	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22517	119.2619	'BASE CASE'
G11_019	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22521	118.942	'DOLET HILLS 345/230KV TRANSFORMER CKT 1'
G11_019	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22499	119.5957	'DOLET HILLS - SOUTHWEST SHREVEPORT 345KV CKT 1'
G11_019	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22494	118.7697	'FLINT CREEK - GRDA1 345KV CKT 1'
G11_019	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22507	118.8431	'FLINT CREEK - SUB 383 - MONETT 345KV CKT 1'
G11_019	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.225	118.5518	'CHAMBER SPRINGS - CLARKSVILLE 345KV CKT 1'
G11_019	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22531	118.8626	'CLARKSVILLE - MUSKOGEE 345KV CKT 1'
G11_019	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22215	117.6529	'REDBUD - RIVERSIDE STATION 345KV CKT 1'
G11_019	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22536	119.7498	'NORTHEAST STATION - ONETA 345KV CKT 1'
G11_019	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22452	118.9466	'CLEVELAND - TULSA NORTH 345KV CKT 1'
G11_019	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22591	118.3009	'DELAWARE - NORTHEAST STATION 345KV CKT 1'
G11_019	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22581	118.8864	'DELAWARE - NEOSHO 345KV CKT 1'
G11_019	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22234	117.9834	'PITTSBURG - VALLIANT 345KV CKT 1'
G11_019	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22322	118.4896	'PITTSBURG - SEMINOLE 345KV CKT 1'
G11_019	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22565	119.6943	'HINTON - WEATHERFORD JCT. 138KV CKT 1'
G11_019	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22565	119.685	'CAN_GAS4 138.00 - HINTON 138KV CKT 1'
G11_019	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22598	119.7349	'CARNEGIE - HOBART JUNCTION 138KV CKT 1'
G11_019	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22598	119.6958	'CARNEGIE - SOUTHWESTERN STATION 138KV CKT 1'
G11_019	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22668	120.2947	'CLINTON AIR FORCE BASE TAP - ELK CITY 138KV CKT 1'
G11_019	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22668	120.2516	'CLINTON AIR FORCE BASE TAP - HOBART JUNCTION 138KV CKT 1'
G11_019	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.23359	129.7928	'LAWTON EASTSIDE - OKLAUNION 345KV CKT 1'

SOURCE	DIRECTION	MONTCOMMONNAME	RATEB	TDF	TC%LOADING	CONTNAME
G11_019	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.23359	124.0786	'G08-14T 345.00 - OKLAUNION 345KV CKT 1'
G11_019	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22763	121.1001	'CLINTON JUNCTION - ELK CITY 138KV CKT 1'
G11_019	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.2276	120.431	'ELK CITY - RHWIND4 138.00 138KV CKT 1'
G11_019	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22635	120.0418	'LAWTON EASTSIDE - SUNNYSIDE 345KV CKT 1'
G11_019	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22545	119.6093	'CLINTON JUNCTION - CLINTON NATURAL GAS TAP 138KV CKT 1'
G11_019	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22565	119.8224	'WEATHERFORD JCT. - WEATHERFORD SOUTHEAST 138KV CKT 1'
G11_019	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22579	121.4999	'ELK CITY 230KV - SWEETWT6 230.00 230KV CKT 1'
G11_019	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22545	119.6717	'WEATHERFORD SOUTHEAST - WEATHERFORD TAP 138KV CKT 1'
G11_019	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22545	119.5802	'CLINTON NATURAL GAS TAP - WEATHERFORD WIND FARM 138KV CKT 1'
G11_019	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22545	119.7535	'WEATHERFORD TAP - WEATHERFORD WIND FARM 138KV CKT 1'
G11_019	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22565	119.6484	'CAN_GAS4 138.00 - JENSEN ROAD 138KV CKT 1'
G11_019	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22579	120.3561	'STLN-DEMARC6230.00 - SWEETWT6 230.00 230KV CKT 1'
G11_019	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22566	119.5971	'CHILDRESS - LAKE PAULINE 138KV CKT 1'
G11_019	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22543	119.6541	'MCLEAN RURAL SUB - SHAMROCK 115KV CKT 1'
G11_019	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22449	118.8345	'CLEVELAND - SOONER 345KV CKT 1'
G11_019	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22777	120.0807	'WAUKOMIS - WAUKOMIS TAP 138KV CKT 1'
G11_019	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22777	120.1137	'HENESSEY - WAUKOMIS 138KV CKT 1'
G11_019	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22594	119.7395	'MARSHALL - WOODRING 138KV CKT 1'
G11_019	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22925	121.2198	'G08-13T 345.00 - WOODRING 345KV CKT 1'
G11_019	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22616	120.3809	'G11-007T 345.00 - WOODRING 345KV CKT 1'
G11_019	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22639	119.8323	'KNOBHILL - SALINE 69KV CKT 1'
G11_019	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22639	119.8083	'HELENAT2 69.000 - SALINE 69KV CKT 1'
G11_019	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22639	119.7224	'GOLTRY - IMO 69KV CKT 1'
G11_019	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22639	119.7396	'GOLTRY - HELENAT2 69.000 69KV CKT 1'
G11_019	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22619	119.5949	'IMO TAP - SOUTH 4TH ST 138KV CKT 1'
G11_019	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22594	119.7309	'COTTONWOOD CREEK - MARSHALL 138KV CKT 1'
G11_019	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22556	118.8617	'KILDARE4 - NEWKIRK4 138KV CKT 1'
G11_019	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22556	118.7991	'NEWKIRK4 - PECKHMT4 138.00 138KV CKT 1'
G11_019	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22544	118.9147	'KILDARE4 - WHITE EAGLE 138KV CKT 1'
G11_019	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22777	120.1886	'DOVER SW - HENESSEY 138KV CKT 1'
G11_019	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.23081	122.2684	'CLEO CORNER - GLASS MOUNTAIN 138KV CKT 1'
G11_019	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.23205	122.4433	'CLEO CORNER - MEN TAP 138KV CKT 1'
G11_019	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.2266	119.6612	'FPL SWITCH - WOODWARD 138KV CKT 1'
G11_019	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22818	119.9187	'DEWEY - IODINE 138KV CKT 1'
G11_019	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.23347	122.7381	'DEWEY - SOUTHARD 138KV CKT 1'
G11_019	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.23081	122.3409	'GLASS MOUNTAIN - MOORELAND 138KV CKT 1'
G11_019	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.23205	122.4211	'IMO TAP - MEN TAP 138KV CKT 1'
G11_019	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22657	120.2553	'KNOBHILL - MOORELAND 138KV CKT 1'
G11_019	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22818	119.9771	'IODINE - WWRDEHV4 138.00 138KV CKT 1'
G11_019	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22456	119.7139	'CIMARRON - MINCO 7 345.00 345KV CKT 1'
G11_019	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.23347	125.3734	'EL RENO - ROMAN NOSE 138KV CKT 1'
G11_019	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22611	119.8076	'CIMARRON - EL RENO 138KV CKT 1'
G11_019	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22573	119.5542	'CIMARRON - JENSEN TAP 138KV CKT 1'
G11_019	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.23347	122.4053	'ROMAN NOSE - SOUTHARD 138KV CKT 1'
G11_019	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.21801	114.844	'CIMARRON - NORTHWEST 345KV CKT 1'
G11_019	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.21798	117.5101	'ARCADIA - NORTHWEST 345KV CKT 1'
G11_019	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22357	118.493	'CIMARRON - DRAPER LAKE 345KV CKT 1'
G11_019	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22616	120.8121	'CIMARRON - G11-007T 345.00 345KV CKT 1'
G11_019	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22407	118.6404	'ARCADIA - HORSESHOE LAKE 345KV CKT 1'
G11_019	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22407	118.6486	'HORSESHOE LAKE - SEMINOLE 345KV CKT 1'
G11_019	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22537	119.7575	'MORRISON - STILLWATER 138KV CKT 1'
G11_019	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.2253	119.5975	'KINZE - MCELROY 138KV CKT 1'
G11_019	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.2253	119.6408	'MCELROY - STILLWATER 138KV CKT 1'
G11_019	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22433	118.8368	'FT SMITH - MUSKOGEE 345KV CKT 1'

SOURCE	DIRECTION	MONTCOMMONNAME	RATEB	TDF	TC%LOADING	CONTNAME
G11_019	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.23515	120.7141	'BORDER 7345.00 - WWRDEHV7 345.00 345KV CKT 1'
G11_019	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.23329	119.8082	'MOORELAND 345.00 - WWRDEHV7 345.00 345KV CKT 1'
G11_019	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.24852	126.9844	'MED-LDG5 345.00 - WWRDEHV7 345.00 345KV CKT 1'
G11_019	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.24852	126.9844	'MED-LDG5 345.00 - WWRDEHV7 345.00 345KV CKT 2'
G11_019	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22556	118.7994	'CRESWELL - PECKHMT4 138.00 138KV CKT 1'
G11_019	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.2266	120.0526	'FPL SWITCH - MOORELAND 138KV CKT 1'
G11_019	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22601	119.6831	'ARAPAHO - HAMON BUTLER 69KV CKT 1'
G11_019	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22601	119.6817	'ARAPAHO - INDUSTRIAL PARK 69KV CKT 1'
G11_019	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22594	119.5684	'CALUMET - WATONGA SW 69KV CKT 1'
G11_019	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22575	119.6246	'CANTON - OKEENE 69KV CKT 1'
G11_019	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22575	119.6528	'CANTON - TALOGA 69KV CKT 1'
G11_019	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22954	121.668	'CEDARDALE - MOORELAND 138KV CKT 1'
G11_019	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22954	121.6361	'CEDARDALE - OKEENE 138KV CKT 1'
G11_019	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22608	119.7195	'CLINTON - WEATHERFORD 138KV CKT 1'
G11_019	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22608	119.736	'CLINTON - G07-32T 138.00 138KV CKT 1'
G11_019	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22601	119.5624	'CORDELL - GOTEBO 69KV CKT 1'
G11_019	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22601	119.6545	'CORDELL - INDUSTRIAL PARK 69KV CKT 1'
G11_019	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22903	121.134	'DOVER SW - OKEENE 138KV CKT 1'
G11_019	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22601	119.6837	'HAMON BUTLER - PUTNAM 69KV CKT 1'
G11_019	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.23021	121.3892	'MOORELAND - NINMILE 4 138.00 138KV CKT 1'
G11_019	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.2276	120.1853	'MOREWOOD SW - RHWIND4 138.00 138KV CKT 1'
G11_019	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.23021	121.3793	'MOREWOOD SW - NINMILE 4 138.00 138KV CKT 1'
G11_019	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22611	119.736	'OKEENE - WATONGA SW 69KV CKT 1'
G11_019	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22601	119.7023	'PUTNAM - TALOGA 69KV CKT 1'
G11_019	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22859	119.6481	'Hitchland Interchange - STEVENSCO 345.00 345KV CKT 1'
G11_019	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22637	119.5587	'G11-012T 230.00 - MOORE COUNTY INTERCHANGE 230KV CKT 1'
G11_019	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22579	120.6248	'GRAPEVINE INTERCHANGE - STATELINE INTERCHANGE 230KV CKT 1'
G11_019	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22561	120.5387	'GRAPEVINE INTERCHANGE - NICHOLS STATION 230KV CKT 1'
G11_019	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.23688	123.7118	'BORDER 7345.00 - TUCO INTERCHANGE 345KV CKT 1'
G11_019	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22579	120.3561	'STATELINE INTERCHANGE - STLN-DEMARC6230.00 230KV CKT 1'
G11_019	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22543	119.7039	'MCCLELLAN SUB - MCLEAN RURAL SUB 115KV CKT 1'
G11_019	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22543	119.718	'KIRBY SWITCHING STATION - MCCLELLAN SUB 115KV CKT 1'
G11_019	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22859	120.4023	'FINNEY SWITCHING STATION - STEVENSCO 345.00 345KV CKT 1'
G11_019	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22915	119.7826	'G05-17T 345.00 - POTTER COUNTY INTERCHANGE 345KV CKT 1'
G11_019	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22552	119.6133	'AMARILLO SOUTH INTERCHANGE - G07-48T 230.00 230KV CKT 1'
G11_019	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22561	119.6847	'DEAF SMITH COUNTY INTERCHANGE - S-RANDLCO 230.00 230KV CKT 1'
G11_019	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22552	119.8792	'G07-48T 230.00 - SWISHER COUNTY INTERCHANGE 230KV CKT 1'
G11_019	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.23359	123.3315	'G08-14T 345.00 - TUCO INTERCHANGE 345KV CKT 1'
G11_019	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22559	119.8131	'KNOLL 230 - POSTROCK6 230.00 230KV CKT 1'
G11_019	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22601	120.0469	'KNOLL 230 - SMOKYHL6 230.00 230KV CKT 1'
G11_019	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22988	122.7669	'G10-16T 345.00 - POSTROCK7 345.00 345KV CKT 1'
G11_019	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22866	121.1816	'AXTELL - POSTROCK7 345.00 345KV CKT 1'
G11_019	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22601	120.4451	'SMOKYHL6 230.00 - SUMMIT 230KV CKT 1'
G11_019	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.2255	119.6314	'ST JOHN - ST_JOHN 115KV CKT 1'
G11_019	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22892	120.9643	'HOLCOMB - SETAB 345KV CKT 1'
G11_019	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22999	122.0123	'MINGO - SETAB 345KV CKT 1'
G11_019	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.23068	122.0729	'MINGO - RED WILLOW 345KV CKT 1'
G11_019	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.2307	122.3677	'GRAY CO 345.00 - SPEARVILLE 345KV CKT 1'
G11_019	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22988	121.9721	'G10-16T 345.00 - SPEARVILLE 345KV CKT 1'
G11_019	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22567	120.1217	'HOYT - JEFFERY ENERGY CENTER 345KV CKT 1'
G11_019	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22575	119.8235	'HOYT - STRANGER CREEK 345KV CKT 1'
G11_019	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.2259	119.566	'EMPORIA ENERGY CENTER - SWISSVALE 345KV CKT 1'
G11_019	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22634	119.6962	'EMPORIA ENERGY CENTER - WICHITA 345KV CKT 1'
G11_019	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22616	119.6918	'SWISSVALE - WEST GARDNER 345KV CKT 1'

SOURCE	DIRECTION	MONTCOMMONNAME	RATEB	TDF	TC%LOADING	CONTNAME
G11_019	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22857	120.1602	'BENTON - ROSE HILL 345KV CKT 1'
G11_019	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.23154	121.4758	'BENTON - WICHITA 345KV CKT 1'
G11_019	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22536	120.6618	'LACYGNE - NEOSHO 345KV CKT 1'
G11_019	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22705	120.2854	'G05-13T 345.00 - NEOSHO 345KV CKT 1'
G11_019	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22705	119.8531	'LATHAMS7 345.00 - ROSE HILL 345KV CKT 1'
G11_019	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22757	118.7296	'G08-127T 345.00 - ROSE HILL 345KV CKT 1'
G11_019	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.23832	126.5147	'MED-LDG5 345.00 - WICHITA 345KV CKT 1'
G11_019	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.23832	126.5147	'MED-LDG5 345.00 - WICHITA 345KV CKT 2'
G11_019	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22564	119.7948	'ANDERSONCO 345.00 - WOLF CREEK 345KV CKT 1'
G11_019	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22705	120.1156	'G05-13T 345.00 - LATHAMS7 345.00 345KV CKT 1'
G11_019	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22616	120.3386	'CIRCLE - MULLERGREN 230KV CKT 1'
G11_019	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22678	120.2268	'CLEARWATER - GILL ENERGY CENTER WEST 138KV CKT 1'
G11_019	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22678	120.3147	'CLEARWATER - MILAN TAP 138KV CKT 1'
G11_019	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22524	119.9124	'EVANS ENERGY CENTER NORTH - EVANS ENERGY CENTER SOUTH 138KV CKT 1'
G11_019	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22678	120.5599	'FLATRDG3 - HARPER 138KV CKT 1'
G11_019	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22678	120.2691	'FLATRDG3 - MEDICINE LODGE 138KV CKT 1'
G11_019	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22678	120.4232	'HARPER - MILAN TAP 138KV CKT 1'
G11_019	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22589	119.6825	'MED-LDG5 345.00 345/138KV TRANSFORMER CKT 1'
G11_019	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22629	120.3137	'MULLERGREN - SPEARVILLE 230KV CKT 1'
G11_019	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22516	118.85	'LACYGNE - WEST GARDNER 345KV CKT 1'
G11_019	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22508	118.8272	'LACYGNE - STILWELL 345KV CKT 1'
G11_019	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22564	119.8419	'ANDERSONCO 345.00 - LACYGNE 345KV CKT 1'
G11_019	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22507	118.8436	'BROOKLINE - SUB 383 - MONETT 345KV CKT 1'
G11_019	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22925	120.526	'G08-13T 345.00 - SUMNERCO 345.00 345KV CKT 1'
G11_019	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.23371	121.01	'2008-047T 345.00 - GRAY CO 345.00 345KV CKT 1'
G11_019	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.2263	120.1617	'AXTELL - PAULINE 345KV CKT 1'
G11_019	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22752	119.9962	'GERALD GENTLEMAN STATION - RED WILLOW 345KV CKT 1'
G11_019	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22536	119.7185	'GERALD GENTLEMAN STATION - SWEETWATER 345KV CKT 1'
G11_019	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22531	119.5915	'GERALD GENTLEMAN STATION - SWEETWATER 345KV CKT 2'
G11_019	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22562	119.5698	'MCCOOL - MOORE 345KV CKT 1'
G11_019	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22562	119.6835	'GRAND ISLAND - MCCOOL 345KV CKT 1'
G11_019	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22621	120.0575	'MOORE - PAULINE 345KV CKT 1'
G11_019	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22618	120.5044	'GRAND ISLAND - SWEETWATER 345KV CKT 1'
G11_019	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22517	118.8181	'5NORANDA 161.00 - NEW MADRID 161KV CKT 1'
G11_019	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22518	118.9503	'BAXTER WILSON SES - PERRYVILLE 500KV CKT 1'
G11_019	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22528	119.5937	'LAKEOVER - MCADAMS 500KV CKT 1'
G11_019	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22536	119.5885	'MCADAMS - WOLF CREEK 500KV CKT 1'
G11_019	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22511	118.8594	'ARKANSAS NUCLEAR ONE - PLEASANT HILL 500KV CKT 1'
G11_019	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22528	118.5947	'KEO EHV - WEST MEMPHIS 500 500KV CKT 1'
G11_019	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22525	118.688	'DELL 500 - INDEPENDENCE 500KV CKT 1'
G11_019	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22579	121.4996	'ELK CITY 230KV (ELKCTY-6) 230/138/13.8KV TRANSFORMER CKT 1'
G11_019	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22543	119.6528	'SHAMROCK (SHAMRCK1) 115/69/14.4KV TRANSFORMER CKT 1'
G11_019	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22657	120.2409	'KNOBHILL (KNOBHIL4) 138/69/13.2KV TRANSFORMER CKT 1'
G11_019	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22468	118.3187	'NORTHWEST (NORTWST2) 345/138/13.8KV TRANSFORMER CKT 1'
G11_019	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22472	118.5161	'NORTHWEST (NORTWST3) 345/138/13.8KV TRANSFORMER CKT 1'
G11_019	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22527	119.682	'SUNNYSIDE (SUNNYSD3) 345/138/13.8KV TRANSFORMER CKT 1'
G11_019	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.2244	119.8264	'ARKANSAS NUCLEAR ONE - FT SMITH 500KV CKT 1'
G11_019	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22601	118.8104	'WWRDEHV7 345.00 (WWDEHV) 345/138/13.8KV TRANSFORMER CKT 1'
G11_019	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22601	118.8982	'WWRDEHV7 345.00 (WWDEHV-T2) 345/138/13.8KV TRANSFORMER CKT 2'
G11_019	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.23329	119.7887	'MOORELAND 345.00 (MRLNDAUTO) 345/138/13.8KV TRANSFORMER CKT 1'
G11_019	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22554	119.5715	'TALOGA (TALOGA) 138/69/13.8KV TRANSFORMER CKT 1'
G11_019	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22915	120.1626	'POTTER COUNTY INTERCHANGE (WAUK 90343-A) 345/230/13.2KV TRANSFORMER CKT 1'
G11_019	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22554	119.6376	'7OVERTON 345.00 - SIBLEY 345KV CKT 1'
G11_019	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22522	119.573	'CLINTON - MONTROSE 161KV CKT 1'

SOURCE	DIRECTION	MONTCOMMONNAME	RATEB	TDF	TC%LOADING	CONTNAME
G11_019	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.2254	119.6161	'BROOKLINE - MORGAN 345KV CKT 1'
G11_019	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22517	119.3094	'G08-19 345.00 345/34.5KV TRANSFORMER CKT 1'
G11_019	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22517	119.3094	'G08-19 345.00 345/34.5KV TRANSFORMER CKT 2'
G11_019	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22548	119.563	'RED WILLOW (R.WIL T1) 345/115/13.8KV TRANSFORMER CKT 1'
G11_019	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22522	119.71	'8DANIEL 500.00 - MCKNIGHT 500KV CKT 1'
G11_019	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22526	118.7934	'8BHAM STEEL 500.00 - WEST MEMPHIS 500 500KV CKT 1'
G11_019	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22538	119.7099	'NUNDRWD - WAYSIDE 230KV CKT 1'
G11_019	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.2253	119.5959	'STEGALL - WAYSIDE 230KV CKT 1'
G11_019	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22517	118.9105	'BURLINGTON NO1 + NO 2 + NO 3 161/20.0KV TRANSFORMER CKT 1'
G11_019	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22804	120.1781	'OGE3TERM1'
G11_019	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.2254	119.7577	'OGE3TERM2'
G11_019	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22557	118.8428	'OGE3TERM7'
G11_019	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22597	119.615	'OGE3TERM10'
G11_019	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22504	118.9217	'OGE3TERM14'
G11_019	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22579	120.3561	'SPP-SWPS-02'
G11_019	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22579	119.9757	'SPP-SWPS-02A'
G11_019	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22543	119.6487	'SPP-SWPS-T54'
G11_019	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22678	120.3071	'SPP-MKEC-05'
G11_019	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22678	120.5766	'SPP-MKEC-08'
G11_019	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22557	118.7295	'SPP-WERE-07B'
G11_019	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22678	120.3101	'SPP-WERE-34'
G11_019	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22556	118.7979	'SPP-WERE-41B'
G11_019	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.2257	120.1684	'WRTOD400'
G11_019	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22507	118.8433	'AI12'
G11_019	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22555	119.6173	'OVERTON-TRF'
G11_019	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22523	119.7846	'FIELD NORTH - LKFLDXL3 345KV CKT 1'
G11_019	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22772	111.8101	'LAWTON EASTSIDE - OKLAUNION 345KV CKT 1'
G11_019	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22772	105.9974	'G08-14T 345.00 - OKLAUNION 345KV CKT 1'
G11_019	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.2289	100	'EL RENO - ROMAN NOSE 138KV CKT 1'
G11_019	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.24386	102.2155	'MED-LDG5 345.00 - WWRDEHV7 345.00 345KV CKT 1'
G11_019	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.24386	102.2155	'MED-LDG5 345.00 - WWRDEHV7 345.00 345KV CKT 2'
G11_019	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22772	105.244	'G08-14T 345.00 - TUCO INTERCHANGE 345KV CKT 1'
G11_019	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22604	100.8335	'GRAY CO 345.00 - SPEARVILLE 345KV CKT 1'
G11_019	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.23365	103.6121	'MED-LDG5 345.00 - WICHITA 345KV CKT 1'
G11_019	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.23365	103.6121	'MED-LDG5 345.00 - WICHITA 345KV CKT 2'
G11_019		Non Converged Contingency	1195	0.21726	-	'G11-015T 345.00 - WWRDEHV7 345.00 345KV CKT 1'
G11_019	'TO->FROM'	'CIMARRON - MATTHEWSON 345.00 345KV CKT 1'	956	0.21353	154.8587	'MATTHEWSON 345.00 - NORTHWEST 345KV CKT 1'
G11_019	'TO->FROM'	'CIMARRON - MATTHEWSON 345.00 345KV CKT 1'	956	0.27226	153.4363	'MATTHEWSON 345.00 - NORTHWEST 345KV CKT 1'
G11_019	'TO->FROM'	'CIMARRON - MATTHEWSON 345.00 345KV CKT 1'	956	0.21305	149.8055	'MATTHEWSON 345.00 - NORTHWEST 345KV CKT 1'
G11_019	'TO->FROM'	'CIMARRON - MATTHEWSON 345.00 345KV CKT 1'	956	0.20913	127.5919	'MATTHEWSON 345.00 - NORTHWEST 345KV CKT 1'
G11_019	'TO->FROM'	'CIMARRON - MATTHEWSON 345.00 345KV CKT 1'	956	0.21027	128.9848	'MATTHEWSON 345.00 - NORTHWEST 345KV CKT 1'
G11_019	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.2863	116.3511	'LAWTON EASTSIDE - OKLAUNION 345KV CKT 1'
G11_019	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.2863	109.3695	'G08-14T 345.00 - OKLAUNION 345KV CKT 1'
G11_019	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.2823	100.5551	'CLINTON JUNCTION - ELK CITY 138KV CKT 1'
G11_019	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.27989	102.4599	'ELK CITY 230KV - SWEETWT6 230.00 230KV CKT 1'
G11_019	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.27989	101.0983	'STLN-DEMARC6230.00 - SWEETWT6 230.00 230KV CKT 1'
G11_019	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.27991	101.7816	'SPP-SWPS-03'
G11_019	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.28263	100.718	'G08-13T 345.00 - WOODRING 345KV CKT 1'
G11_019	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.28634	100.9396	'CLEO CORNER - GLASS MOUNTAIN 138KV CKT 1'
G11_019	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.28775	101.0115	'CLEO CORNER - MEN TAP 138KV CKT 1'
G11_019	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.28895	101.9975	'DEWEY - SOUTHARD 138KV CKT 1'
G11_019	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.28634	101.0292	'GLASS MOUNTAIN - MOORELAND 138KV CKT 1'
G11_019	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.28775	100.9846	'IMO TAP - MEN TAP 138KV CKT 1'
G11_019	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.28895	102.3701	'EL RENO - ROMAN NOSE 138KV CKT 1'

SOURCE	DIRECTION	MONTCOMMONNAME	RATEB	TDF	TC%LOADING	CONTNAME
G11_019	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.28895	101.6003	'ROMAN NOSE - SOUTHARD 138KV CKT 1'
G11_019	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.28916	100.5087	'MOORELAND 345.00 - WWRDEHV7 345.00 345KV CKT 1'
G11_019	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.30723	104.7633	'MED-LDG5 345.00 - WWRDEHV7 345.00 345KV CKT 1'
G11_019	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.30723	104.7633	'MED-LDG5 345.00 - WWRDEHV7 345.00 345KV CKT 2'
G11_019	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.28484	100.3798	'CEDARDALE - MOORELAND 138KV CKT 1'
G11_019	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.28484	100.3373	'CEDARDALE - OKEENE 138KV CKT 1'
G11_019	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.27989	101.3779	'GRAPEVINE INTERCHANGE - STATELINE INTERCHANGE 230KV CKT 1'
G11_019	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.27997	100.6346	'GRAPEVINE INTERCHANGE - NICHOLS STATION 230KV CKT 1'
G11_019	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.29458	101.134	'BORDER 7345.00 - TUCO INTERCHANGE 345KV CKT 1'
G11_019	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.27989	101.0983	'STATELINE INTERCHANGE - STLN-DEMARC6230.00 230KV CKT 1'
G11_019	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.28385	101.9392	'FINNEY SWITCHING STATION - STEVENSCO 345.00 345KV CKT 1'
G11_019	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.2863	108.4536	'G08-14T 345.00 - TUCO INTERCHANGE 345KV CKT 1'
G11_019	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.28543	102.5419	'G10-16T 345.00 - POSTROCK7 345.00 345KV CKT 1'
G11_019	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.284	100.2513	'AXTELL - POSTROCK7 345.00 345KV CKT 1'
G11_019	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.28428	100.7955	'HOLCOMB - SETAB 345KV CKT 1'
G11_019	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.28549	102.4111	'MINGO - SETAB 345KV CKT 1'
G11_019	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.28629	102.4204	'MINGO - RED WILLOW 345KV CKT 1'
G11_019	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.2861	104.2969	'GRAY CO 345.00 - SPEARVILLE 345KV CKT 1'
G11_019	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.28543	101.5518	'G10-16T 345.00 - SPEARVILLE 345KV CKT 1'
G11_019	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.28687	100.5296	'BENTON - WICHITA 345KV CKT 1'
G11_019	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.29508	106.7794	'MED-LDG5 345.00 - WICHITA 345KV CKT 1'
G11_019	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.29508	106.7794	'MED-LDG5 345.00 - WICHITA 345KV CKT 2'
G11_019	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.28995	100.5819	'2008-047T 345.00 - GRAY CO 345.00 345KV CKT 1'
G11_019	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.27989	102.4593	'ELK CITY 230KV (ELKCTY-6) 230/138/13.8KV TRANSFORMER CKT 1'
G11_019	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.28916	100.4878	'MOORELAND 345.00 (MRLNDAUTO) 345/138/13.8KV TRANSFORMER CKT 1'
G11_019	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.27989	101.0983	'SPP-SWPS-02'
G11_019	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.27989	100.6318	'SPP-SWPS-02A'
G11_019	'TO->FROM'	'G11-015T 345.00 - WWRDEHV7 345.00 345KV CKT 1'	1195	0.2863	111.4524	'LAWTON EASTSIDE - OKLAUNION 345KV CKT 1'
G11_019	'TO->FROM'	'G11-015T 345.00 - WWRDEHV7 345.00 345KV CKT 1'	1195	0.2863	104.4057	'G08-14T 345.00 - OKLAUNION 345KV CKT 1'
G11_019	'TO->FROM'	'G11-015T 345.00 - WWRDEHV7 345.00 345KV CKT 1'	1195	0.2863	103.4862	'G08-14T 345.00 - TUCO INTERCHANGE 345KV CKT 1'
G11_019	'TO->FROM'	'G11-015T 345.00 - WWRDEHV7 345.00 345KV CKT 1'	1195	0.29508	101.7039	'MED-LDG5 345.00 - WICHITA 345KV CKT 1'
G11_019	'TO->FROM'	'G11-015T 345.00 - WWRDEHV7 345.00 345KV CKT 1'	1195	0.29508	101.7039	'MED-LDG5 345.00 - WICHITA 345KV CKT 2'
G11_019	'FROM->TO'	'MATTHEWSON 345.00 - NORTHWEST 345KV CKT 1'	1195	0.23878	136.9233	'CIMARRON - MATTHEWSON 345.00 345KV CKT 1'
G11_019	'FROM->TO'	'MATTHEWSON 345.00 - NORTHWEST 345KV CKT 1'	1195	0.31101	135.0651	'CIMARRON - MATTHEWSON 345.00 345KV CKT 1'
G11_019	'FROM->TO'	'MATTHEWSON 345.00 - NORTHWEST 345KV CKT 1'	1195	0.23825	132.3797	'CIMARRON - MATTHEWSON 345.00 345KV CKT 1'
G11_019	'FROM->TO'	'MATTHEWSON 345.00 - NORTHWEST 345KV CKT 1'	1195	0.23352	113.3461	'CIMARRON - MATTHEWSON 345.00 345KV CKT 1'
G11_019	'FROM->TO'	'MATTHEWSON 345.00 - NORTHWEST 345KV CKT 1'	1195	0.23507	113.064	'CIMARRON - MATTHEWSON 345.00 345KV CKT 1'
G11_019	'TO->FROM'	'MATTHEWSON 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.23559	129.8688	'MATTHEWSON 345.00 - TATONGA7 345.00 345KV CKT 2'
G11_019	'TO->FROM'	'MATTHEWSON 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.30149	137.5331	'MATTHEWSON 345.00 - TATONGA7 345.00 345KV CKT 2'
G11_019	'TO->FROM'	'MATTHEWSON 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.23535	124.3769	'MATTHEWSON 345.00 - TATONGA7 345.00 345KV CKT 2'
G11_019	'TO->FROM'	'MATTHEWSON 345.00 - TATONGA7 345.00 345KV CKT 2'	1195	0.23559	129.8688	'MATTHEWSON 345.00 - TATONGA7 345.00 345KV CKT 1'
G11_019	'TO->FROM'	'MATTHEWSON 345.00 - TATONGA7 345.00 345KV CKT 2'	1195	0.30149	137.5331	'MATTHEWSON 345.00 - TATONGA7 345.00 345KV CKT 1'
G11_019	'TO->FROM'	'MATTHEWSON 345.00 - TATONGA7 345.00 345KV CKT 2'	1195	0.23535	124.3769	'MATTHEWSON 345.00 - TATONGA7 345.00 345KV CKT 1'
G11_019		Non Converged Contingency	0	0.21887	-	'DBL-MEDLO-WI'
G11_019	'TO->FROM'	'CIMARRON - MATTHEWSON 345.00 345KV CKT 1'	956	0.29654	142.5038	'MATTHEWSON 345.00 - NORTHWEST 345KV CKT 1'
G11_019	'FROM->TO'	'MATTHEWSON 345.00 - NORTHWEST 345KV CKT 1'	1195	0.33528	124.0373	'CIMARRON - MATTHEWSON 345.00 345KV CKT 1'
G11_019	'TO->FROM'	'CIMARRON - MATTHEWSON 345.00 345KV CKT 1'	956	0.26001	154.2912	'MATTHEWSON 345.00 - NORTHWEST 345KV CKT 1'
G11_019	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.38097	106.2909	'LAWTON EASTSIDE - OKLAUNION 345KV CKT 1'
G11_019	'FROM->TO'	'MATTHEWSON 345.00 - NORTHWEST 345KV CKT 1'	1195	0.29821	135.7368	'CIMARRON - MATTHEWSON 345.00 345KV CKT 1'
G11_019	'TO->FROM'	'MATTHEWSON 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.29512	103.4832	'MATTHEWSON 345.00 - TATONGA7 345.00 345KV CKT 2'
G11_019	'TO->FROM'	'MATTHEWSON 345.00 - TATONGA7 345.00 345KV CKT 2'	1195	0.29512	103.4832	'MATTHEWSON 345.00 - TATONGA7 345.00 345KV CKT 1'
G11_019	'TO->FROM'	'CIMARRON - MATTHEWSON 345.00 345KV CKT 1'	956	0.27739	135.1275	'MATTHEWSON 345.00 - NORTHWEST 345KV CKT 1'
G11_019	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.38989	105.7054	'LAWTON EASTSIDE - OKLAUNION 345KV CKT 1'
G11_019	'FROM->TO'	'MATTHEWSON 345.00 - NORTHWEST 345KV CKT 1'	1195	0.31744	117.7769	'CIMARRON - MATTHEWSON 345.00 345KV CKT 1'

SOURCE	DIRECTION	MONTCOMMONNAME	RATEB	TDF	TC%LOADING	CONTNAME
G11_019	'TO->FROM'	'MATTHEWSON 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.30166	100.7395	'MATTHEWSON 345.00 - TATONGA7 345.00 345KV CKT 2'
G11_019	'TO->FROM'	'MATTHEWSON 345.00 - TATONGA7 345.00 345KV CKT 2'	1195	0.30166	100.7395	'MATTHEWSON 345.00 - TATONGA7 345.00 345KV CKT 1'
G11_019	'TO->FROM'	'CIMARRON - MATTHEWSON 345.00 345KV CKT 1'	956	0.27131	137.1267	'MATTHEWSON 345.00 - NORTHWEST 345KV CKT 1'
G11_019	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.38685	113.9722	'LAWTON EASTSIDE - OKLAUNION 345KV CKT 1'
G11_019	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.38685	107.1703	'G08-14T 345.00 - OKLAUNION 345KV CKT 1'
G11_019	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.39	100.0563	'MED-LDG5 345.00 - WWRDEHV7 345.00 345KV CKT 1'
G11_019	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.39	100.0563	'MED-LDG5 345.00 - WWRDEHV7 345.00 345KV CKT 2'
G11_019	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.38685	106.7522	'G08-14T 345.00 - TUCO INTERCHANGE 345KV CKT 1'
G11_019	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.36795	100.8232	'G10-16T 345.00 - POSTROCK7 345.00 345KV CKT 1'
G11_019	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.38023	104.0022	'MED-LDG5 345.00 - WICHITA 345KV CKT 1'
G11_019	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.38023	104.0022	'MED-LDG5 345.00 - WICHITA 345KV CKT 2'
G11_019	'FROM->TO'	'MATTHEWSON 345.00 - NORTHWEST 345KV CKT 1'	1195	0.30878	122.9661	'CIMARRON - MATTHEWSON 345.00 345KV CKT 1'
G11_019	'TO->FROM'	'MATTHEWSON 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.2991	106.7267	'MATTHEWSON 345.00 - TATONGA7 345.00 345KV CKT 2'
G11_019	'TO->FROM'	'MATTHEWSON 345.00 - TATONGA7 345.00 345KV CKT 2'	1195	0.2991	106.7267	'MATTHEWSON 345.00 - TATONGA7 345.00 345KV CKT 1'
G11_019	'TO->FROM'	'CIMARRON - MATTHEWSON 345.00 345KV CKT 1'	956	0.20665	126.9879	'MATTHEWSON 345.00 - NORTHWEST 345KV CKT 1'
G11_019	'FROM->TO'	'MATTHEWSON 345.00 - NORTHWEST 345KV CKT 1'	1195	0.2305	112.6244	'CIMARRON - MATTHEWSON 345.00 345KV CKT 1'
G11_019		Non Converged Contingency	0	0.22318	-	'DBL-MEDLO-WI'
G11_019		Non Converged Contingency	0	0.21872	-	'DBL-MEDLO-WI'
G11_020		Non Converged Contingency	0	0.24298	-	'DBL-MEDLO-WI'
G11_020		Non Converged Contingency	0	0.24163	-	'DBL-MEDLO-WI'
G11_020	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22542	124.5413	'BASE CASE'
G11_020	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22546	124.2102	'DOLET HILLS 345/230KV TRANSFORMER CKT 1'
G11_020	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22524	124.8648	'DOLET HILLS - SOUTHWEST SHREVEPORT 345KV CKT 1'
G11_020	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22519	124.0307	'FLINT CREEK - GRDA1 345KV CKT 1'
G11_020	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22532	124.0989	'FLINT CREEK - SUB 383 - MONETT 345KV CKT 1'
G11_020	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22525	123.812	'CHAMBER SPRINGS - CLARKSVILLE 345KV CKT 1'
G11_020	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22556	124.1279	'CLARKSVILLE - MUSKOGEE 345KV CKT 1'
G11_020	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22242	122.8349	'REDBUD - RIVERSIDE STATION 345KV CKT 1'
G11_020	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22561	125.0109	'NORTHEAST STATION - ONETA 345KV CKT 1'
G11_020	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22477	124.2005	'CLEVELAND - TULSA NORTH 345KV CKT 1'
G11_020	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22618	123.5669	'DELAWARE - NORTHEAST STATION 345KV CKT 1'
G11_020	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22608	124.1399	'DELAWARE - NEOSHO 345KV CKT 1'
G11_020	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.2226	123.1792	'PITTSBURG - VALLIANT 345KV CKT 1'
G11_020	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22348	123.6936	'PITTSBURG - SEMINOLE 345KV CKT 1'
G11_020	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.2259	124.9764	'HINTON - WEATHERFORD JCT. 138KV CKT 1'
G11_020	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.2259	124.9671	'CAN_GAS4 138.00 - HINTON 138KV CKT 1'
G11_020	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22623	125.0269	'CARNEGIE - HOBART JUNCTION 138KV CKT 1'
G11_020	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22623	124.9868	'CARNEGIE - SOUTHWESTERN STATION 138KV CKT 1'
G11_020	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22693	125.6297	'CLINTON AIR FORCE BASE TAP - ELK CITY 138KV CKT 1'
G11_020	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22693	125.5853	'CLINTON AIR FORCE BASE TAP - HOBART JUNCTION 138KV CKT 1'
G11_020	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.23384	135.7378	'LAWTON EASTSIDE - OKLAUNION 345KV CKT 1'
G11_020	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.23384	129.7721	'G08-14T 345.00 - OKLAUNION 345KV CKT 1'
G11_020	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22788	126.4627	'CLINTON JUNCTION - ELK CITY 138KV CKT 1'
G11_020	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22785	125.7852	'ELK CITY - RHWIND4 138.00 138KV CKT 1'
G11_020	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.2266	125.3577	'LAWTON EASTSIDE - SUNNYSIDE 345KV CKT 1'
G11_020	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.2257	124.8819	'CLINTON JUNCTION - CLINTON NATURAL GAS TAP 138KV CKT 1'
G11_020	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.2259	125.1095	'WEATHERFORD JCT. - WEATHERFORD SOUTHEAST 138KV CKT 1'
G11_020	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22604	126.8884	'ELK CITY 230KV - SWEETWT6 230.00 230KV CKT 1'
G11_020	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.2257	124.9502	'WEATHERFORD SOUTHEAST - WEATHERFORD TAP 138KV CKT 1'
G11_020	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.2257	124.8535	'CLINTON NATURAL GAS TAP - WEATHERFORD WIND FARM 138KV CKT 1'
G11_020	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.2257	125.0342	'WEATHERFORD TAP - WEATHERFORD WIND FARM 138KV CKT 1'
G11_020	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.2259	124.9294	'CAN_GAS4 138.00 - JENSEN ROAD 138KV CKT 1'
G11_020	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22604	125.6925	'STLN-DEMARC6230.00 - SWEETWT6 230.00 230KV CKT 1'
G11_020	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22591	124.885	'CHILDRESS - LAKE PAULINE 138KV CKT 1'

SOURCE	DIRECTION	MONTCOMMONNAME	RATEB	TDF	TC%LOADING	CONTNAME
G11_020	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22474	124.0866	'CLEVELAND - SOONER 345KV CKT 1'
G11_020	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22802	125.4361	'WAUKOMIS - WAUKOMIS TAP 138KV CKT 1'
G11_020	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22802	125.4689	'HENESSEY - WAUKOMIS 138KV CKT 1'
G11_020	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22619	125.0153	'MARSHALL - WOODRING 138KV CKT 1'
G11_020	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22955	126.5152	'G08-13T 345.00 - WOODRING 345KV CKT 1'
G11_020	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22644	125.6253	'G11-007T 345.00 - WOODRING 345KV CKT 1'
G11_020	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22664	125.1382	'KNOBHILL - SALINE 69KV CKT 1'
G11_020	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22664	125.1138	'HELENAT2 69.000 - SALINE 69KV CKT 1'
G11_020	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22664	125.0273	'GOLTRY - IMO 69KV CKT 1'
G11_020	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22664	125.0445	'GOLTRY - HELENAT2 69.000 69KV CKT 1'
G11_020	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22644	124.8979	'IMO TAP - SOUTH 4TH ST 138KV CKT 1'
G11_020	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22619	125.0065	'COTTONWOOD CREEK - MARSHALL 138KV CKT 1'
G11_020	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22582	124.1288	'KILDARE4 - NEWKIRK4 138KV CKT 1'
G11_020	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22582	124.0669	'NEWKIRK4 - PECKHMT4 138.00 138KV CKT 1'
G11_020	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.2257	124.1846	'KILDARE4 - WHITE EAGLE 138KV CKT 1'
G11_020	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22561	125.2497	'TRF-STEGALL'
G11_020	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22802	125.5452	'DOVER SW - HENESSEY 138KV CKT 1'
G11_020	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.23106	127.729	'CLEO CORNER - GLASS MOUNTAIN 138KV CKT 1'
G11_020	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.23231	127.9158	'CLEO CORNER - MEN TAP 138KV CKT 1'
G11_020	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22685	124.9678	'FPL SWITCH - WOODWARD 138KV CKT 1'
G11_020	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22844	125.2677	'DEWEY - IODINE 138KV CKT 1'
G11_020	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.23373	128.2958	'DEWEY - SOUTHARD 138KV CKT 1'
G11_020	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.23106	127.8066	'GLASS MOUNTAIN - MOORELAND 138KV CKT 1'
G11_020	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.23231	127.8926	'IMO TAP - MEN TAP 138KV CKT 1'
G11_020	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22682	125.6023	'KNOBHILL - MOORELAND 138KV CKT 1'
G11_020	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22844	125.3279	'IODINE - WWRDEHV4 138.00 138KV CKT 1'
G11_020	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22105	124.5828	'SOONER - SPRING CREEK 345KV CKT 1'
G11_020	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.23373	131.0703	'EL RENO - ROMAN NOSE 138KV CKT 1'
G11_020	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22636	125.1087	'CIMARRON - EL RENO 138KV CKT 1'
G11_020	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22598	124.8387	'CIMARRON - JENSEN TAP 138KV CKT 1'
G11_020	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.23373	127.9422	'ROMAN NOSE - SOUTHARD 138KV CKT 1'
G11_020	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22105	124.581	'NORTHWEST - SPRING CREEK 345KV CKT 1'
G11_020	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.21826	119.9674	'CIMARRON - NORTHWEST 345KV CKT 1'
G11_020	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.2182	122.7252	'ARCADIA - NORTHWEST 345KV CKT 1'
G11_020	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22381	123.7511	'CIMARRON - DRAPER LAKE 345KV CKT 1'
G11_020	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22644	126.0448	'CIMARRON - G11-007T 345.00 345KV CKT 1'
G11_020	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22431	123.9115	'ARCADIA - HORSESHOE LAKE 345KV CKT 1'
G11_020	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22431	123.9117	'HORSESHOE LAKE - SEMINOLE 345KV CKT 1'
G11_020	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22562	125.0278	'MORRISON - STILLWATER 138KV CKT 1'
G11_020	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22555	124.8669	'KINZE - MCELROY 138KV CKT 1'
G11_020	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22555	124.9095	'MCELROY - STILLWATER 138KV CKT 1'
G11_020	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22458	124.0798	'FT SMITH - MUSKOGEE 345KV CKT 1'
G11_020	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.2354	126.3052	'BORDER 7345.00 - WWRDEHV7 345.00 345KV CKT 1'
G11_020	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.23355	125.2498	'MOORELAND 345.00 - WWRDEHV7 345.00 345KV CKT 1'
G11_020	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.24875	133.249	'MED-LDG5 345.00 - WWRDEHV7 345.00 345KV CKT 1'
G11_020	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.24875	133.249	'MED-LDG5 345.00 - WWRDEHV7 345.00 345KV CKT 2'
G11_020	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22582	124.0673	'CRESWELL - PECKHMT4 138.00 138KV CKT 1'
G11_020	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22685	125.3689	'FPL SWITCH - MOORELAND 138KV CKT 1'
G11_020	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22626	124.9891	'ARAPAHO - HAMON BUTLER 69KV CKT 1'
G11_020	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22626	124.9874	'ARAPAHO - INDUSTRIAL PARK 69KV CKT 1'
G11_020	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22619	124.8553	'CALUMET - WATONGA SW 69KV CKT 1'
G11_020	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.226	124.9234	'CANTON - OKEENE 69KV CKT 1'
G11_020	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.226	124.9542	'CANTON - TALOGA 69KV CKT 1'
G11_020	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22979	127.063	'CEDARDALE - MOORELAND 138KV CKT 1'

SOURCE	DIRECTION	MONTCOMMONNAME	RATEB	TDF	TC%LOADING	CONTNAME
G11_020	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22979	127.0158	'CEDARDALE - OKEENE 138KV CKT 1'
G11_020	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22633	125.0206	'CLINTON - WEATHERFORD 138KV CKT 1'
G11_020	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22633	125.0377	'CLINTON - G07-32T 138.00 138KV CKT 1'
G11_020	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22626	124.9612	'CORDELL - INDUSTRIAL PARK 69KV CKT 1'
G11_020	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22929	126.5327	'DOVER SW - OKEENE 138KV CKT 1'
G11_020	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22626	124.9899	'HAMON BUTLER - PUTNAM 69KV CKT 1'
G11_020	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.23046	126.8654	'MOORELAND - NINMILE 4 138.00 138KV CKT 1'
G11_020	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22785	125.5383	'MOREWOOD SW - RHWIND4 138.00 138KV CKT 1'
G11_020	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.23046	126.8501	'MOREWOOD SW - NINMILE 4 138.00 138KV CKT 1'
G11_020	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22636	125.0326	'OKEENE - WATONGA SW 69KV CKT 1'
G11_020	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22626	125.0098	'PUTNAM - TALOGA 69KV CKT 1'
G11_020	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22884	125.0447	'Hitchland Interchange - STEVENSCO 345.00 345KV CKT 1'
G11_020	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22662	124.8671	'G11-012T 230.00 - MOORE COUNTY INTERCHANGE 230KV CKT 1'
G11_020	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22586	125.8411	'GRAPEVINE INTERCHANGE - NICHOLS STATION 230KV CKT 1'
G11_020	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.23714	129.3586	'BORDER 7345.00 - TUCO INTERCHANGE 345KV CKT 1'
G11_020	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22604	125.6925	'STATELINE INTERCHANGE - STLN-DEMARC6230.00 230KV CKT 1'
G11_020	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22568	124.9841	'MCCLELLAN SUB - MCLEAN RURAL SUB 115KV CKT 1'
G11_020	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22568	124.9948	'KIRBY SWITCHING STATION - MCCLELLAN SUB 115KV CKT 1'
G11_020	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22884	125.8393	'FINNEY SWITCHING STATION - STEVENSCO 345.00 345KV CKT 1'
G11_020	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.2294	125.1565	'G05-17T 345.00 - POTTER COUNTY INTERCHANGE 345KV CKT 1'
G11_020	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22577	124.9034	'AMARILLO SOUTH INTERCHANGE - G07-48T 230.00 230KV CKT 1'
G11_020	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22586	124.978	'DEAF SMITH COUNTY INTERCHANGE - S-RANDLCO 230.00 230KV CKT 1'
G11_020	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22577	125.1819	'G07-48T 230.00 - SWISHER COUNTY INTERCHANGE 230KV CKT 1'
G11_020	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.23384	128.9459	'G08-14T 345.00 - TUCO INTERCHANGE 345KV CKT 1'
G11_020	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22584	125.1267	'KNOLL 230 - POSTROCK6 230.00 230KV CKT 1'
G11_020	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22626	125.381	'KNOLL 230 - SMOKYHL6 230.00 230KV CKT 1'
G11_020	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.23011	128.3483	'G10-16T 345.00 - POSTROCK7 345.00 345KV CKT 1'
G11_020	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22889	126.6208	'AXTELL - POSTROCK7 345.00 345KV CKT 1'
G11_020	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22626	125.7956	'SMOKYHL6 230.00 - SUMMIT 230KV CKT 1'
G11_020	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22575	124.9228	'ST JOHN - ST_JOHN 115KV CKT 1'
G11_020	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22915	126.4373	'HOLCOMB - SETAB 345KV CKT 1'
G11_020	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.23022	127.5809	'MINGO - SETAB 345KV CKT 1'
G11_020	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.23091	127.6747	'MINGO - RED WILLOW 345KV CKT 1'
G11_020	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.23094	127.9851	'GRAY CO 345.00 - SPEARVILLE 345KV CKT 1'
G11_020	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.23011	127.522	'G10-16T 345.00 - SPEARVILLE 345KV CKT 1'
G11_020	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22593	125.4084	'HOYT - JEFFERY ENERGY CENTER 345KV CKT 1'
G11_020	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.226	125.1059	'HOYT - STRANGER CREEK 345KV CKT 1'
G11_020	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22614	124.8483	'EMPORIA ENERGY CENTER - SWISSVALE 345KV CKT 1'
G11_020	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22659	125.0234	'EMPORIA ENERGY CENTER - WICHITA 345KV CKT 1'
G11_020	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22641	124.9756	'SWISSVALE - WEST GARDNER 345KV CKT 1'
G11_020	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22883	125.5095	'BENTON - ROSE HILL 345KV CKT 1'
G11_020	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.2318	126.893	'BENTON - WICHITA 345KV CKT 1'
G11_020	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22562	125.9326	'LACYGNE - NEOSHO 345KV CKT 1'
G11_020	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.2273	125.5851	'G05-13T 345.00 - NEOSHO 345KV CKT 1'
G11_020	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.2273	125.1613	'LATHAMS7 345.00 - ROSE HILL 345KV CKT 1'
G11_020	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22786	123.9843	'G08-127T 345.00 - ROSE HILL 345KV CKT 1'
G11_020	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.23856	132.4215	'MED-LDG5 345.00 - WICHITA 345KV CKT 1'
G11_020	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.23856	132.4215	'MED-LDG5 345.00 - WICHITA 345KV CKT 2'
G11_020	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22589	125.0826	'ANDERSONCO 345.00 - WOLF CREEK 345KV CKT 1'
G11_020	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.2273	125.4305	'G05-13T 345.00 - LATHAMS7 345.00 345KV CKT 1'
G11_020	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22641	125.675	'CIRCLE - MULLERGREN 230KV CKT 1'
G11_020	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22703	125.546	'CLEARWATER - GILL ENERGY CENTER WEST 138KV CKT 1'
G11_020	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22703	125.6309	'CLEARWATER - MILAN TAP 138KV CKT 1'
G11_020	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22549	125.1467	'EVANS ENERGY CENTER NORTH - EVANS ENERGY CENTER SOUTH 138KV CKT 1'

SOURCE	DIRECTION	MONTCOMMONNAME	RATEB	TDF	TC%LOADING	CONTNAME
G11_020	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22703	125.9054	'FLATRDG3 - HARPER 138KV CKT 1'
G11_020	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22703	125.6048	'FLATRDG3 - MEDICINE LODGE 138KV CKT 1'
G11_020	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22703	125.7619	'HARPER - MILAN TAP 138KV CKT 1'
G11_020	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22614	124.9745	'MED-LDG5 345.00 345/138KV TRANSFORMER CKT 1'
G11_020	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22653	125.6621	'MULLERGREN - SPEARVILLE 230KV CKT 1'
G11_020	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22542	124.1276	'LACYGNE - WEST GARDNER 345KV CKT 1'
G11_020	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22533	124.0968	'LACYGNE - STILWELL 345KV CKT 1'
G11_020	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22589	125.1342	'ANDERSONCO 345.00 - LACYGNE 345KV CKT 1'
G11_020	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22532	124.1013	'BROOKLINE - SUB 383 - MONETT 345KV CKT 1'
G11_020	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22955	125.8283	'G08-13T 345.00 - SUMNERCO 345.00 345KV CKT 1'
G11_020	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.23395	126.6284	'2008-047T 345.00 - GRAY CO 345.00 345KV CKT 1'
G11_020	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22654	125.4949	'AXTELL - PAULINE 345KV CKT 1'
G11_020	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22776	125.387	'GERALD GENTLEMAN STATION - RED WILLOW 345KV CKT 1'
G11_020	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22561	125.0106	'GERALD GENTLEMAN STATION - SWEETWATER 345KV CKT 1'
G11_020	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22556	124.8742	'GERALD GENTLEMAN STATION - SWEETWATER 345KV CKT 2'
G11_020	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22587	124.8585	'MCCOOL - MOORE 345KV CKT 1'
G11_020	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22587	124.9714	'GRAND ISLAND - MCCOOL 345KV CKT 1'
G11_020	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22645	125.3811	'MOORE - PAULINE 345KV CKT 1'
G11_020	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22642	125.8242	'GRAND ISLAND - SWEETWATER 345KV CKT 1'
G11_020	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22542	124.0865	'5NORANDA 161.00 - NEW MADRID 161KV CKT 1'
G11_020	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22543	124.2148	'BAXTER WILSON SES - PERRYVILLE 500KV CKT 1'
G11_020	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22553	124.8655	'LAKEOVER - MCADAMS 500KV CKT 1'
G11_020	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22561	124.8628	'MCADAMS - WOLF CREEK 500KV CKT 1'
G11_020	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22535	124.2412	'ARKANSAS NUCLEAR ONE - MABELVALE 500 500KV CKT 1'
G11_020	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22536	124.1243	'ARKANSAS NUCLEAR ONE - PLEASANT HILL 500KV CKT 1'
G11_020	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22553	123.8558	'KEO EHV - WEST MEMPHIS 500 500KV CKT 1'
G11_020	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.2255	123.9542	'DELL 500 - INDEPENDENCE 500KV CKT 1'
G11_020	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22604	126.8881	'ELK CITY 230KV (ELKCTY-6) 230/138/13.8KV TRANSFORMER CKT 1'
G11_020	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22682	125.5811	'KNOBHILL (KNOBHIL4) 138/69/13.2KV TRANSFORMER CKT 1'
G11_020	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22493	123.5762	'NORTHWEST (NORTWST2) 345/138/13.8KV TRANSFORMER CKT 1'
G11_020	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22497	123.7759	'NORTHWEST (NORTWST3) 345/138/13.8KV TRANSFORMER CKT 1'
G11_020	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22552	124.9563	'SUNNYSIDE (SUNNYSD3) 345/138/13.8KV TRANSFORMER CKT 1'
G11_020	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22466	125.0776	'ARKANSAS NUCLEAR ONE - FT SMITH 500KV CKT 1'
G11_020	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22626	124.0794	'WWRDEHV7 345.00 (WWDEHV) 345/138/13.8KV TRANSFORMER CKT 1'
G11_020	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22626	124.1911	'WWRDEHV7 345.00 (WWDEHV-T2) 345/138/13.8KV TRANSFORMER CKT 2'
G11_020	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.23355	125.2277	'MOORELAND 345.00 (MRLNDAUTO) 345/138/13.8KV TRANSFORMER CKT 1'
G11_020	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22579	124.8629	'TALOGA (TALOGA) 138/69/13.8KV TRANSFORMER CKT 1'
G11_020	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.2294	125.5609	'POTTER COUNTY INTERCHANGE (WAUK 90343-A) 345/230/13.2KV TRANSFORMER CKT 1'
G11_020	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22579	124.914	'7OVERTON 345.00 - SIBLEY 345KV CKT 1'
G11_020	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22547	124.8428	'CLINTON - MONTROSE 161KV CKT 1'
G11_020	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22565	124.8895	'BROOKLINE - MORGAN 345KV CKT 1'
G11_020	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22542	124.6011	'G08-19 345.00 345/34.5KV TRANSFORMER CKT 1'
G11_020	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22542	124.6011	'G08-19 345.00 345/34.5KV TRANSFORMER CKT 2'
G11_020	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22572	124.8643	'RED WILLOW (R.WIL T1) 345/115/13.8KV TRANSFORMER CKT 1'
G11_020	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22547	124.9814	'8DANIEL 500.00 - MCKNIGHT 500KV CKT 1'
G11_020	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22551	124.0558	'8BHAM STEEL 500.00 - WEST MEMPHIS 500 500KV CKT 1'
G11_020	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22562	124.9976	'NUNDRWD - WAYSIDE 230KV CKT 1'
G11_020	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22554	124.875	'STEGALL - WAYSIDE 230KV CKT 1'
G11_020	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22542	124.1757	'BURLINGTON NO1 + NO 2 + NO 3 161/20.0KV TRANSFORMER CKT 1'
G11_020	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22829	125.5432	'OGE3TERM1'
G11_020	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22565	125.0301	'OGE3TERM2'
G11_020	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22583	124.1114	'OGE3TERM7'
G11_020	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22622	124.9021	'OGE3TERM10'
G11_020	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22528	124.1861	'OGE3TERM14'

SOURCE	DIRECTION	MONTCOMMONNAME	RATEB	TDF	TC%LOADING	CONTNAME
G11_020	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22604	125.6925	'SPP-SWPS-02'
G11_020	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22604	125.3387	'SPP-SWPS-02A'
G11_020	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22703	125.6393	'SPP-MKEC-05'
G11_020	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22703	125.9266	'SPP-MKEC-08'
G11_020	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22583	123.9993	'SPP-WERE-07B'
G11_020	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22703	125.643	'SPP-WERE-34'
G11_020	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22582	124.0656	'SPP-WERE-41B'
G11_020	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22595	125.455	'WRTOD400'
G11_020	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22532	124.101	'AI12'
G11_020	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.2258	124.8871	'OVERTON-TRF'
G11_020	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22548	125.0612	'FIELD NORTH - LKFLDXL3 345KV CKT 1'
G11_020	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22517	119.2619	'BASE CASE'
G11_020	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22521	118.942	'DOLET HILLS 345/230KV TRANSFORMER CKT 1'
G11_020	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22499	119.5957	'DOLET HILLS - SOUTHWEST SHREVEPORT 345KV CKT 1'
G11_020	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22494	118.7697	'FLINT CREEK - GRDA1 345KV CKT 1'
G11_020	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22507	118.8431	'FLINT CREEK - SUB 383 - MONETT 345KV CKT 1'
G11_020	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.225	118.5518	'CHAMBER SPRINGS - CLARKSVILLE 345KV CKT 1'
G11_020	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22531	118.8626	'CLARKSVILLE - MUSKOGEE 345KV CKT 1'
G11_020	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22215	117.6529	'REDBUD - RIVERSIDE STATION 345KV CKT 1'
G11_020	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22536	119.7498	'NORTHEAST STATION - ONETA 345KV CKT 1'
G11_020	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22452	118.9466	'CLEVELAND - TULSA NORTH 345KV CKT 1'
G11_020	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22591	118.3009	'DELAWARE - NORTHEAST STATION 345KV CKT 1'
G11_020	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22581	118.8864	'DELAWARE - NEOSHO 345KV CKT 1'
G11_020	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22234	117.9834	'PITTSBURG - VALLIANT 345KV CKT 1'
G11_020	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22322	118.4896	'PITTSBURG - SEMINOLE 345KV CKT 1'
G11_020	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22565	119.6943	'HINTON - WEATHERFORD JCT. 138KV CKT 1'
G11_020	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22565	119.685	'CAN_GAS4 138.00 - HINTON 138KV CKT 1'
G11_020	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22598	119.7349	'CARNEGIE - HOBART JUNCTION 138KV CKT 1'
G11_020	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22598	119.6958	'CARNEGIE - SOUTHWESTERN STATION 138KV CKT 1'
G11_020	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22668	120.2947	'CLINTON AIR FORCE BASE TAP - ELK CITY 138KV CKT 1'
G11_020	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22668	120.2516	'CLINTON AIR FORCE BASE TAP - HOBART JUNCTION 138KV CKT 1'
G11_020	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.23359	129.7928	'LAWTON EASTSIDE - OKLAUNION 345KV CKT 1'
G11_020	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.23359	124.0786	'G08-14T 345.00 - OKLAUNION 345KV CKT 1'
G11_020	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22763	121.1001	'CLINTON JUNCTION - ELK CITY 138KV CKT 1'
G11_020	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.2276	120.431	'ELK CITY - RHWIND4 138.00 138KV CKT 1'
G11_020	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22635	120.0418	'LAWTON EASTSIDE - SUNNYSIDE 345KV CKT 1'
G11_020	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22545	119.6093	'CLINTON JUNCTION - CLINTON NATURAL GAS TAP 138KV CKT 1'
G11_020	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22565	119.8224	'WEATHERFORD JCT. - WEATHERFORD SOUTHEAST 138KV CKT 1'
G11_020	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22579	121.4999	'ELK CITY 230KV - SWEETWT6 230.00 230KV CKT 1'
G11_020	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22545	119.6717	'WEATHERFORD SOUTHEAST - WEATHERFORD TAP 138KV CKT 1'
G11_020	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22545	119.5802	'CLINTON NATURAL GAS TAP - WEATHERFORD WIND FARM 138KV CKT 1'
G11_020	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22545	119.7535	'WEATHERFORD TAP - WEATHERFORD WIND FARM 138KV CKT 1'
G11_020	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22565	119.6484	'CAN_GAS4 138.00 - JENSEN ROAD 138KV CKT 1'
G11_020	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22579	120.3561	'STLN-DEMARC6230.00 - SWEETWT6 230.00 230KV CKT 1'
G11_020	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22566	119.5971	'CHILDRESS - LAKE PAULINE 138KV CKT 1'
G11_020	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22543	119.6541	'MCLEAN RURAL SUB - SHAMROCK 115KV CKT 1'
G11_020	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22449	118.8345	'CLEVELAND - SOONER 345KV CKT 1'
G11_020	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22777	120.0807	'WAUKOMIS - WAUKOMIS TAP 138KV CKT 1'
G11_020	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22777	120.1137	'HENESSEY - WAUKOMIS 138KV CKT 1'
G11_020	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22594	119.7395	'MARSHALL - WOODRING 138KV CKT 1'
G11_020	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22925	121.2198	'G08-13T 345.00 - WOODRING 345KV CKT 1'
G11_020	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22616	120.3809	'G11-007T 345.00 - WOODRING 345KV CKT 1'
G11_020	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22639	119.8323	'KNOBHILL - SALINE 69KV CKT 1'
G11_020	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22639	119.8083	'HELENAT2 69.000 - SALINE 69KV CKT 1'

SOURCE	DIRECTION	MONTCOMMONNAME	RATEB	TDF	TC%LOADING	CONTNAME
G11_020	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22639	119.7224	'GOLTRY - IMO 69KV CKT 1'
G11_020	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22639	119.7396	'GOLTRY - HELENAT2 69.000 69KV CKT 1'
G11_020	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22619	119.5949	'IMO TAP - SOUTH 4TH ST 138KV CKT 1'
G11_020	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22594	119.7309	'COTTONWOOD CREEK - MARSHALL 138KV CKT 1'
G11_020	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22556	118.8617	'KILDARE4 - NEWKIRK4 138KV CKT 1'
G11_020	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22556	118.7991	'NEWKIRK4 - PECKHMT4 138.00 138KV CKT 1'
G11_020	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22544	118.9147	'KILDARE4 - WHITE EAGLE 138KV CKT 1'
G11_020	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22777	120.1886	'DOVER SW - HENESSEY 138KV CKT 1'
G11_020	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.23081	122.2684	'CLEO CORNER - GLASS MOUNTAIN 138KV CKT 1'
G11_020	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.23205	122.4433	'CLEO CORNER - MEN TAP 138KV CKT 1'
G11_020	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.2266	119.6612	'FPL SWITCH - WOODWARD 138KV CKT 1'
G11_020	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22818	119.9187	'DEWEY - IODINE 138KV CKT 1'
G11_020	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.23347	122.7381	'DEWEY - SOUTHARD 138KV CKT 1'
G11_020	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.23081	122.3409	'GLASS MOUNTAIN - MOORELAND 138KV CKT 1'
G11_020	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.23205	122.4211	'IMO TAP - MEN TAP 138KV CKT 1'
G11_020	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22657	120.2553	'KNOBHILL - MOORELAND 138KV CKT 1'
G11_020	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22818	119.9771	'IODINE - WWRDEHV4 138.00 138KV CKT 1'
G11_020	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22456	119.7139	'CIMARRON - MINCO 7 345.00 345KV CKT 1'
G11_020	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.23347	125.3734	'EL RENO - ROMAN NOSE 138KV CKT 1'
G11_020	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22611	119.8076	'CIMARRON - EL RENO 138KV CKT 1'
G11_020	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22573	119.5542	'CIMARRON - JENSEN TAP 138KV CKT 1'
G11_020	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.23347	122.4053	'ROMAN NOSE - SOUTHARD 138KV CKT 1'
G11_020	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.21801	114.844	'CIMARRON - NORTHWEST 345KV CKT 1'
G11_020	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.21798	117.5101	'ARCADIA - NORTHWEST 345KV CKT 1'
G11_020	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22357	118.493	'CIMARRON - DRAPER LAKE 345KV CKT 1'
G11_020	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22616	120.8121	'CIMARRON - G11-007T 345.00 345KV CKT 1'
G11_020	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22407	118.6404	'ARCADIA - HORSESHOE LAKE 345KV CKT 1'
G11_020	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22407	118.6486	'HORSESHOE LAKE - SEMINOLE 345KV CKT 1'
G11_020	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22537	119.7575	'MORRISON - STILLWATER 138KV CKT 1'
G11_020	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.2253	119.5975	'KINZE - MCELROY 138KV CKT 1'
G11_020	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.2253	119.6408	'MCELROY - STILLWATER 138KV CKT 1'
G11_020	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22433	118.8368	'FT SMITH - MUSKOGEE 345KV CKT 1'
G11_020	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.23515	120.7141	'BORDER 7345.00 - WWRDEHV7 345.00 345KV CKT 1'
G11_020	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.23329	119.8082	'MOORELAND 345.00 - WWRDEHV7 345.00 345KV CKT 1'
G11_020	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.24852	126.9844	'MED-LDG5 345.00 - WWRDEHV7 345.00 345KV CKT 1'
G11_020	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.24852	126.9844	'MED-LDG5 345.00 - WWRDEHV7 345.00 345KV CKT 2'
G11_020	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22556	118.7994	'CRESWELL - PECKHMT4 138.00 138KV CKT 1'
G11_020	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.2266	120.0526	'FPL SWITCH - MOORELAND 138KV CKT 1'
G11_020	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22601	119.6831	'ARAPAHO - HAMON BUTLER 69KV CKT 1'
G11_020	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22601	119.6817	'ARAPAHO - INDUSTRIAL PARK 69KV CKT 1'
G11_020	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22594	119.5684	'CALUMET - WATONGA SW 69KV CKT 1'
G11_020	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22575	119.6246	'CANTON - OKEENE 69KV CKT 1'
G11_020	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22575	119.6528	'CANTON - TALOGA 69KV CKT 1'
G11_020	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22954	121.668	'CEDARDALE - MOORELAND 138KV CKT 1'
G11_020	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22954	121.6361	'CEDARDALE - OKEENE 138KV CKT 1'
G11_020	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22608	119.7195	'CLINTON - WEATHERFORD 138KV CKT 1'
G11_020	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22608	119.736	'CLINTON - G07-32T 138.00 138KV CKT 1'
G11_020	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22601	119.5624	'CORDELL - GOTEBO 69KV CKT 1'
G11_020	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22601	119.6545	'CORDELL - INDUSTRIAL PARK 69KV CKT 1'
G11_020	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22903	121.134	'DOVER SW - OKEENE 138KV CKT 1'
G11_020	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22601	119.6837	'HAMON BUTLER - PUTNAM 69KV CKT 1'
G11_020	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.23021	121.3892	'MOORELAND - NINMILE 4 138.00 138KV CKT 1'
G11_020	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.2276	120.1853	'MOREWOOD SW - RHWIND4 138.00 138KV CKT 1'
G11_020	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.23021	121.3793	'MOREWOOD SW - NINMILE 4 138.00 138KV CKT 1'

SOURCE	DIRECTION	MONTCOMMONNAME	RATEB	TDF	TC%LOADING	CONTNAME
G11_020	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22611	119.736	'OKEENE - WATONGA SW 69KV CKT 1'
G11_020	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22601	119.7023	'PUTNAM - TALOGA 69KV CKT 1'
G11_020	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22859	119.6481	'Hitchland Interchange - STEVENSCO 345.00 345KV CKT 1'
G11_020	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22637	119.5587	'G11-012T 230.00 - MOORE COUNTY INTERCHANGE 230KV CKT 1'
G11_020	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22579	120.6248	'GRAPEVINE INTERCHANGE - STATELINE INTERCHANGE 230KV CKT 1'
G11_020	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22561	120.5387	'GRAPEVINE INTERCHANGE - NICHOLS STATION 230KV CKT 1'
G11_020	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.23688	123.7118	'BORDER 7345.00 - TUCO INTERCHANGE 345KV CKT 1'
G11_020	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22579	120.3561	'STATELINE INTERCHANGE - STLN-DEMARC6230.00 230KV CKT 1'
G11_020	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22543	119.7039	'MCCLELLAN SUB - MCLEAN RURAL SUB 115KV CKT 1'
G11_020	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22543	119.718	'KIRBY SWITCHING STATION - MCCLELLAN SUB 115KV CKT 1'
G11_020	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22859	120.4023	'FINNEY SWITCHING STATION - STEVENSCO 345.00 345KV CKT 1'
G11_020	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22915	119.7826	'G05-17T 345.00 - POTTER COUNTY INTERCHANGE 345KV CKT 1'
G11_020	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22552	119.6133	'AMARILLO SOUTH INTERCHANGE - G07-48T 230.00 230KV CKT 1'
G11_020	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22561	119.6847	'DEAF SMITH COUNTY INTERCHANGE - S-RANDLCO 230.00 230KV CKT 1'
G11_020	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22552	119.8792	'G07-48T 230.00 - SWISHER COUNTY INTERCHANGE 230KV CKT 1'
G11_020	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.23359	123.3315	'G08-14T 345.00 - TUCO INTERCHANGE 345KV CKT 1'
G11_020	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22559	119.8131	'KNOLL 230 - POSTROCK6 230.00 230KV CKT 1'
G11_020	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22601	120.0469	'KNOLL 230 - SMOKYHL6 230.00 230KV CKT 1'
G11_020	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22988	122.7669	'G10-16T 345.00 - POSTROCK7 345.00 345KV CKT 1'
G11_020	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22866	121.1816	'AXTELL - POSTROCK7 345.00 345KV CKT 1'
G11_020	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22601	120.4451	'SMOKYHL6 230.00 - SUMMIT 230KV CKT 1'
G11_020	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.2255	119.6314	'ST JOHN - ST_JOHN 115KV CKT 1'
G11_020	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22892	120.9643	'HOLCOMB - SETAB 345KV CKT 1'
G11_020	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22999	122.0123	'MINGO - SETAB 345KV CKT 1'
G11_020	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.23068	122.0729	'MINGO - RED WILLOW 345KV CKT 1'
G11_020	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.2307	122.3677	'GRAY CO 345.00 - SPEARVILLE 345KV CKT 1'
G11_020	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22988	121.9721	'G10-16T 345.00 - SPEARVILLE 345KV CKT 1'
G11_020	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22567	120.1217	'HOYT - JEFFERY ENERGY CENTER 345KV CKT 1'
G11_020	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22575	119.8235	'HOYT - STRANGER CREEK 345KV CKT 1'
G11_020	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.2259	119.566	'EMPORIA ENERGY CENTER - SWISSVALE 345KV CKT 1'
G11_020	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22634	119.6962	'EMPORIA ENERGY CENTER - WICHITA 345KV CKT 1'
G11_020	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22616	119.6918	'SWISSVALE - WEST GARDNER 345KV CKT 1'
G11_020	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22857	120.1602	'BENTON - ROSE HILL 345KV CKT 1'
G11_020	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.23154	121.4758	'BENTON - WICHITA 345KV CKT 1'
G11_020	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22536	120.6618	'LACYGNE - NEOSHO 345KV CKT 1'
G11_020	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22705	120.2854	'G05-13T 345.00 - NEOSHO 345KV CKT 1'
G11_020	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22705	119.8531	'LATHAMS7 345.00 - ROSE HILL 345KV CKT 1'
G11_020	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22757	118.7296	'G08-127T 345.00 - ROSE HILL 345KV CKT 1'
G11_020	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.23832	126.5147	'MED-LDG5 345.00 - WICHITA 345KV CKT 1'
G11_020	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.23832	126.5147	'MED-LDG5 345.00 - WICHITA 345KV CKT 2'
G11_020	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22564	119.7948	'ANDERSONCO 345.00 - WOLF CREEK 345KV CKT 1'
G11_020	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22705	120.1156	'G05-13T 345.00 - LATHAMS7 345.00 345KV CKT 1'
G11_020	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22616	120.3386	'CIRCLE - MULLERGREN 230KV CKT 1'
G11_020	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22678	120.2268	'CLEARWATER - GILL ENERGY CENTER WEST 138KV CKT 1'
G11_020	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22678	120.3147	'CLEARWATER - MILAN TAP 138KV CKT 1'
G11_020	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22524	119.9124	'EVANS ENERGY CENTER NORTH - EVANS ENERGY CENTER SOUTH 138KV CKT 1'
G11_020	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22678	120.5599	'FLATRDG3 - HARPER 138KV CKT 1'
G11_020	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22678	120.2691	'FLATRDG3 - MEDICINE LODGE 138KV CKT 1'
G11_020	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22678	120.4232	'HARPER - MILAN TAP 138KV CKT 1'
G11_020	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22589	119.6825	'MED-LDG5 345.00 345/138KV TRANSFORMER CKT 1'
G11_020	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22629	120.3137	'MULLERGREN - SPEARVILLE 230KV CKT 1'
G11_020	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22516	118.85	'LACYGNE - WEST GARDNER 345KV CKT 1'
G11_020	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22508	118.8272	'LACYGNE - STILWELL 345KV CKT 1'
G11_020	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22564	119.8419	'ANDERSONCO 345.00 - LACYGNE 345KV CKT 1'

SOURCE	DIRECTION	MONTCOMMONNAME	RATEB	TDF	TC%LOADING	CONTNAME
G11_020	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22507	118.8436	'BROOKLINE - SUB 383 - MONETT 345KV CKT 1'
G11_020	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22925	120.526	'G08-13T 345.00 - SUMNERCO 345.00 345KV CKT 1'
G11_020	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.23371	121.01	'2008-047T 345.00 - GRAY CO 345.00 345KV CKT 1'
G11_020	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.2263	120.1617	'AXTELL - PAULINE 345KV CKT 1'
G11_020	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22752	119.9962	'GERALD GENTLEMAN STATION - RED WILLOW 345KV CKT 1'
G11_020	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22536	119.7185	'GERALD GENTLEMAN STATION - SWEETWATER 345KV CKT 1'
G11_020	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22531	119.5915	'GERALD GENTLEMAN STATION - SWEETWATER 345KV CKT 2'
G11_020	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22562	119.5698	'MCCOOL - MOORE 345KV CKT 1'
G11_020	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22562	119.6835	'GRAND ISLAND - MCCOOL 345KV CKT 1'
G11_020	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22621	120.0575	'MOORE - PAULINE 345KV CKT 1'
G11_020	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22618	120.5044	'GRAND ISLAND - SWEETWATER 345KV CKT 1'
G11_020	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22517	118.8181	'5NORANDA 161.00 - NEW MADRID 161KV CKT 1'
G11_020	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22518	118.9503	'BAXTER WILSON SES - PERRYVILLE 500KV CKT 1'
G11_020	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22528	119.5937	'LAKEOVER - MCADAMS 500KV CKT 1'
G11_020	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22536	119.5885	'MCADAMS - WOLF CREEK 500KV CKT 1'
G11_020	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22511	118.8594	'ARKANSAS NUCLEAR ONE - PLEASANT HILL 500KV CKT 1'
G11_020	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22528	118.5947	'KEO EHV - WEST MEMPHIS 500 500KV CKT 1'
G11_020	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22525	118.688	'DELL 500 - INDEPENDENCE 500KV CKT 1'
G11_020	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22579	121.4996	'ELK CITY 230KV (ELKCTY-6) 230/138/13.8KV TRANSFORMER CKT 1'
G11_020	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22543	119.6528	'SHAMROCK (SHAMRCK1) 115/69/14.4KV TRANSFORMER CKT 1'
G11_020	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22657	120.2409	'KNOBHILL (KNOBHIL4) 138/69/13.2KV TRANSFORMER CKT 1'
G11_020	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22468	118.3187	'NORTHWEST (NORTWST2) 345/138/13.8KV TRANSFORMER CKT 1'
G11_020	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22472	118.5161	'NORTHWEST (NORTWST3) 345/138/13.8KV TRANSFORMER CKT 1'
G11_020	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22527	119.682	'SUNNYSIDE (SUNNYSD3) 345/138/13.8KV TRANSFORMER CKT 1'
G11_020	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.2244	119.8264	'ARKANSAS NUCLEAR ONE - FT SMITH 500KV CKT 1'
G11_020	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22601	118.8104	'WWRDEHV7 345.00 (WWDEHV) 345/138/13.8KV TRANSFORMER CKT 1'
G11_020	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22601	118.8982	'WWRDEHV7 345.00 (WWDEHV-T2) 345/138/13.8KV TRANSFORMER CKT 2'
G11_020	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.23329	119.7887	'MOORELAND 345.00 (MRLNDAUTO) 345/138/13.8KV TRANSFORMER CKT 1'
G11_020	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22554	119.5715	'TALOGA (TALOGA) 138/69/13.8KV TRANSFORMER CKT 1'
G11_020	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22915	120.1626	'POTTER COUNTY INTERCHANGE (WAUK 90343-A) 345/230/13.2KV TRANSFORMER CKT 1'
G11_020	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22554	119.6376	'7OVERTON 345.00 - SIBLEY 345KV CKT 1'
G11_020	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22522	119.573	'CLINTON - MONTROSE 161KV CKT 1'
G11_020	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.2254	119.6161	'BROOKLINE - MORGAN 345KV CKT 1'
G11_020	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22517	119.3094	'G08-19 345.00 345/34.5KV TRANSFORMER CKT 1'
G11_020	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22517	119.3094	'G08-19 345.00 345/34.5KV TRANSFORMER CKT 2'
G11_020	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22548	119.563	'RED WILLOW (R.WIL T1) 345/115/13.8KV TRANSFORMER CKT 1'
G11_020	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22522	119.71	'8DANIEL 500.00 - MCKNIGHT 500KV CKT 1'
G11_020	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22526	118.7934	'8BHAM STEEL 500.00 - WEST MEMPHIS 500 500KV CKT 1'
G11_020	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22538	119.7099	'NUNDRWD - WAYSIDE 230KV CKT 1'
G11_020	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.2253	119.5959	'STEGALL - WAYSIDE 230KV CKT 1'
G11_020	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22517	118.9105	'BURLINGTON NO1 + NO 2 + NO 3 161/20.0KV TRANSFORMER CKT 1'
G11_020	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22804	120.1781	'OGE3TERM1'
G11_020	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.2254	119.7577	'OGE3TERM2'
G11_020	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22557	118.8428	'OGE3TERM7'
G11_020	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22597	119.615	'OGE3TERM10'
G11_020	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22504	118.9217	'OGE3TERM14'
G11_020	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22579	120.3561	'SPP-SWPS-02'
G11_020	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22579	119.9757	'SPP-SWPS-02A'
G11_020	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22543	119.6487	'SPP-SWPS-T54'
G11_020	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22678	120.3071	'SPP-MKEC-05'
G11_020	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22678	120.5766	'SPP-MKEC-08'
G11_020	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22557	118.7295	'SPP-WERE-07B'
G11_020	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22678	120.3101	'SPP-WERE-34'
G11_020	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22556	118.7979	'SPP-WERE-41B'

SOURCE	DIRECTION	MONTCOMMONNAME	RATEB	TDF	TC%LOADING	CONTNAME
G11_020	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.2257	120.1684	'WRTOD400'
G11_020	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22507	118.8433	'AI12'
G11_020	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22555	119.6173	'OVERTON-TRF'
G11_020	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22523	119.7846	'FIELD NORTH - LKFLDXL3 345KV CKT 1'
G11_020	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22772	111.8101	'LAWTON EASTSIDE - OKLAUNION 345KV CKT 1'
G11_020	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22772	105.9974	'G08-14T 345.00 - OKLAUNION 345KV CKT 1'
G11_020	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.2289	100	'EL RENO - ROMAN NOSE 138KV CKT 1'
G11_020	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.24386	102.2155	'MED-LDG5 345.00 - WWRDEHV7 345.00 345KV CKT 1'
G11_020	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.24386	102.2155	'MED-LDG5 345.00 - WWRDEHV7 345.00 345KV CKT 2'
G11_020	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22772	105.244	'G08-14T 345.00 - TUCO INTERCHANGE 345KV CKT 1'
G11_020	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.22604	100.8335	'GRAY CO 345.00 - SPEARVILLE 345KV CKT 1'
G11_020	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.23365	103.6121	'MED-LDG5 345.00 - WICHITA 345KV CKT 1'
G11_020	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.23365	103.6121	'MED-LDG5 345.00 - WICHITA 345KV CKT 2'
G11_020		Non Converged Contingency	1195	0.21726	-	'G11-015T 345.00 - WWRDEHV7 345.00 345KV CKT 1'
G11_020	'TO->FROM'	'CIMARRON - MATTHEWSON 345.00 345KV CKT 1'	956	0.21353	154.8587	'MATTHEWSON 345.00 - NORTHWEST 345KV CKT 1'
G11_020	'TO->FROM'	'CIMARRON - MATTHEWSON 345.00 345KV CKT 1'	956	0.27226	153.4363	'MATTHEWSON 345.00 - NORTHWEST 345KV CKT 1'
G11_020	'TO->FROM'	'CIMARRON - MATTHEWSON 345.00 345KV CKT 1'	956	0.21305	149.8055	'MATTHEWSON 345.00 - NORTHWEST 345KV CKT 1'
G11_020	'TO->FROM'	'CIMARRON - MATTHEWSON 345.00 345KV CKT 1'	956	0.20913	127.5919	'MATTHEWSON 345.00 - NORTHWEST 345KV CKT 1'
G11_020	'TO->FROM'	'CIMARRON - MATTHEWSON 345.00 345KV CKT 1'	956	0.21027	128.9848	'MATTHEWSON 345.00 - NORTHWEST 345KV CKT 1'
G11_020	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.2863	116.3511	'LAWTON EASTSIDE - OKLAUNION 345KV CKT 1'
G11_020	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.2863	109.3695	'G08-14T 345.00 - OKLAUNION 345KV CKT 1'
G11_020	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.2823	100.5551	'CLINTON JUNCTION - ELK CITY 138KV CKT 1'
G11_020	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.27989	102.4599	'ELK CITY 230KV - SWEETWT6 230.00 230KV CKT 1'
G11_020	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.27989	101.0983	'STLN-DEMARC6230.00 - SWEETWT6 230.00 230KV CKT 1'
G11_020	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.27991	101.7816	'SPP-SWPS-03'
G11_020	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.28263	100.718	'G08-13T 345.00 - WOODRING 345KV CKT 1'
G11_020	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.28634	100.9396	'CLEO CORNER - GLASS MOUNTAIN 138KV CKT 1'
G11_020	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.28775	101.0115	'CLEO CORNER - MEN TAP 138KV CKT 1'
G11_020	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.28895	101.9975	'DEWEY - SOUTHARD 138KV CKT 1'
G11_020	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.28634	101.0292	'GLASS MOUNTAIN - MOORELAND 138KV CKT 1'
G11_020	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.28775	100.9846	'IMO TAP - MEN TAP 138KV CKT 1'
G11_020	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.28895	102.3701	'EL RENO - ROMAN NOSE 138KV CKT 1'
G11_020	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.28895	101.6003	'ROMAN NOSE - SOUTHARD 138KV CKT 1'
G11_020	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.28916	100.5087	'MOORELAND 345.00 - WWRDEHV7 345.00 345KV CKT 1'
G11_020	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.30723	104.7633	'MED-LDG5 345.00 - WWRDEHV7 345.00 345KV CKT 1'
G11_020	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.30723	104.7633	'MED-LDG5 345.00 - WWRDEHV7 345.00 345KV CKT 2'
G11_020	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.28484	100.3798	'CEDARDALE - MOORELAND 138KV CKT 1'
G11_020	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.28484	100.3373	'CEDARDALE - OKEENE 138KV CKT 1'
G11_020	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.27989	101.3779	'GRAPEVINE INTERCHANGE - STATELINE INTERCHANGE 230KV CKT 1'
G11_020	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.27997	100.6346	'GRAPEVINE INTERCHANGE - NICHOLS STATION 230KV CKT 1'
G11_020	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.29458	101.134	'BORDER 7345.00 - TUCO INTERCHANGE 345KV CKT 1'
G11_020	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.27989	101.0983	'STATELINE INTERCHANGE - STLN-DEMARC6230.00 230KV CKT 1'
G11_020	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.28385	101.9392	'FINNEY SWITCHING STATION - STEVENSCO 345.00 345KV CKT 1'
G11_020	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.2863	108.4536	'G08-14T 345.00 - TUCO INTERCHANGE 345KV CKT 1'
G11_020	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.28543	102.5419	'G10-16T 345.00 - POSTROCK7 345.00 345KV CKT 1'
G11_020	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.284	100.2513	'AXTELL - POSTROCK7 345.00 345KV CKT 1'
G11_020	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.28428	100.7955	'HOLCOMB - SETAB 345KV CKT 1'
G11_020	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.28549	102.4111	'MINGO - SETAB 345KV CKT 1'
G11_020	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.28629	102.4204	'MINGO - RED WILLOW 345KV CKT 1'
G11_020	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.2861	104.2969	'GRAY CO 345.00 - SPEARVILLE 345KV CKT 1'
G11_020	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.28543	101.5518	'G10-16T 345.00 - SPEARVILLE 345KV CKT 1'
G11_020	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.28687	100.5296	'BENTON - WICHITA 345KV CKT 1'
G11_020	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.29508	106.7794	'MED-LDG5 345.00 - WICHITA 345KV CKT 1'
G11_020	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.29508	106.7794	'MED-LDG5 345.00 - WICHITA 345KV CKT 2'

SOURCE	DIRECTION	MONTCOMMONNAME	RATEB	TDF	TC%LOADING	CONTNAME
G11_020	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.28995	100.5819	'2008-047T 345.00 - GRAY CO 345.00 345KV CKT 1'
G11_020	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.27989	102.4593	'ELK CITY 230KV (ELKCTY-6) 230/138/13.8KV TRANSFORMER CKT 1'
G11_020	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.28916	100.4878	'MOORELAND 345.00 (MRLNDAUTO) 345/138/13.8KV TRANSFORMER CKT 1'
G11_020	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.27989	101.0983	'SPP-SWPS-02'
G11_020	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.27989	100.6318	'SPP-SWPS-02A'
G11_020	'TO->FROM'	'G11-015T 345.00 - WWRDEHV7 345.00 345KV CKT 1'	1195	0.2863	111.4524	'LAWTON EASTSIDE - OKLAUNION 345KV CKT 1'
G11_020	'TO->FROM'	'G11-015T 345.00 - WWRDEHV7 345.00 345KV CKT 1'	1195	0.2863	104.4057	'G08-14T 345.00 - OKLAUNION 345KV CKT 1'
G11_020	'TO->FROM'	'G11-015T 345.00 - WWRDEHV7 345.00 345KV CKT 1'	1195	0.2863	103.4862	'G08-14T 345.00 - TUCO INTERCHANGE 345KV CKT 1'
G11_020	'TO->FROM'	'G11-015T 345.00 - WWRDEHV7 345.00 345KV CKT 1'	1195	0.29508	101.7039	'MED-LDG5 345.00 - WICHITA 345KV CKT 1'
G11_020	'TO->FROM'	'G11-015T 345.00 - WWRDEHV7 345.00 345KV CKT 1'	1195	0.29508	101.7039	'MED-LDG5 345.00 - WICHITA 345KV CKT 2'
G11_020	'FROM->TO'	'MATTHEWSON 345.00 - NORTHWEST 345KV CKT 1'	1195	0.23878	136.9233	'CIMARRON - MATTHEWSON 345.00 345KV CKT 1'
G11_020	'FROM->TO'	'MATTHEWSON 345.00 - NORTHWEST 345KV CKT 1'	1195	0.31101	135.0651	'CIMARRON - MATTHEWSON 345.00 345KV CKT 1'
G11_020	'FROM->TO'	'MATTHEWSON 345.00 - NORTHWEST 345KV CKT 1'	1195	0.23825	132.3797	'CIMARRON - MATTHEWSON 345.00 345KV CKT 1'
G11_020	'FROM->TO'	'MATTHEWSON 345.00 - NORTHWEST 345KV CKT 1'	1195	0.23352	113.3461	'CIMARRON - MATTHEWSON 345.00 345KV CKT 1'
G11_020	'FROM->TO'	'MATTHEWSON 345.00 - NORTHWEST 345KV CKT 1'	1195	0.23507	113.064	'CIMARRON - MATTHEWSON 345.00 345KV CKT 1'
G11_020	'TO->FROM'	'MATTHEWSON 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.23559	129.8688	'MATTHEWSON 345.00 - TATONGA7 345.00 345KV CKT 2'
G11_020	'TO->FROM'	'MATTHEWSON 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.30149	137.5331	'MATTHEWSON 345.00 - TATONGA7 345.00 345KV CKT 2'
G11_020	'TO->FROM'	'MATTHEWSON 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.23535	124.3769	'MATTHEWSON 345.00 - TATONGA7 345.00 345KV CKT 2'
G11_020	'TO->FROM'	'MATTHEWSON 345.00 - TATONGA7 345.00 345KV CKT 2'	1195	0.23559	129.8688	'MATTHEWSON 345.00 - TATONGA7 345.00 345KV CKT 1'
G11_020	'TO->FROM'	'MATTHEWSON 345.00 - TATONGA7 345.00 345KV CKT 2'	1195	0.30149	137.5331	'MATTHEWSON 345.00 - TATONGA7 345.00 345KV CKT 1'
G11_020	'TO->FROM'	'MATTHEWSON 345.00 - TATONGA7 345.00 345KV CKT 2'	1195	0.23535	124.3769	'MATTHEWSON 345.00 - TATONGA7 345.00 345KV CKT 1'
G11_020		Non Converged Contingency	0	0.21887	-	'DBL-MEDLO-WI'
G11_020	'TO->FROM'	'CIMARRON - MATTHEWSON 345.00 345KV CKT 1'	956	0.29654	142.5038	'MATTHEWSON 345.00 - NORTHWEST 345KV CKT 1'
G11_020	'FROM->TO'	'MATTHEWSON 345.00 - NORTHWEST 345KV CKT 1'	1195	0.33528	124.0373	'CIMARRON - MATTHEWSON 345.00 345KV CKT 1'
G11_020	'TO->FROM'	'CIMARRON - MATTHEWSON 345.00 345KV CKT 1'	956	0.26001	154.2912	'MATTHEWSON 345.00 - NORTHWEST 345KV CKT 1'
G11_020	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.38097	106.2909	'LAWTON EASTSIDE - OKLAUNION 345KV CKT 1'
G11_020	'FROM->TO'	'MATTHEWSON 345.00 - NORTHWEST 345KV CKT 1'	1195	0.29821	135.7368	'CIMARRON - MATTHEWSON 345.00 345KV CKT 1'
G11_020	'TO->FROM'	'MATTHEWSON 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.29512	103.4832	'MATTHEWSON 345.00 - TATONGA7 345.00 345KV CKT 2'
G11_020	'TO->FROM'	'MATTHEWSON 345.00 - TATONGA7 345.00 345KV CKT 2'	1195	0.29512	103.4832	'MATTHEWSON 345.00 - TATONGA7 345.00 345KV CKT 1'
G11_020	'TO->FROM'	'CIMARRON - MATTHEWSON 345.00 345KV CKT 1'	956	0.27739	135.1275	'MATTHEWSON 345.00 - NORTHWEST 345KV CKT 1'
G11_020	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.38989	105.7054	'LAWTON EASTSIDE - OKLAUNION 345KV CKT 1'
G11_020	'FROM->TO'	'MATTHEWSON 345.00 - NORTHWEST 345KV CKT 1'	1195	0.31744	117.7769	'CIMARRON - MATTHEWSON 345.00 345KV CKT 1'
G11_020	'TO->FROM'	'MATTHEWSON 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.30166	100.7395	'MATTHEWSON 345.00 - TATONGA7 345.00 345KV CKT 2'
G11_020	'TO->FROM'	'MATTHEWSON 345.00 - TATONGA7 345.00 345KV CKT 2'	1195	0.30166	100.7395	'MATTHEWSON 345.00 - TATONGA7 345.00 345KV CKT 1'
G11_020	'TO->FROM'	'CIMARRON - MATTHEWSON 345.00 345KV CKT 1'	956	0.27131	137.1267	'MATTHEWSON 345.00 - NORTHWEST 345KV CKT 1'
G11_020	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.38685	113.9722	'LAWTON EASTSIDE - OKLAUNION 345KV CKT 1'
G11_020	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.38685	107.1703	'G08-14T 345.00 - OKLAUNION 345KV CKT 1'
G11_020	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.39	100.0563	'MED-LDG5 345.00 - WWRDEHV7 345.00 345KV CKT 1'
G11_020	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.39	100.0563	'MED-LDG5 345.00 - WWRDEHV7 345.00 345KV CKT 2'
G11_020	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.38685	106.7522	'G08-14T 345.00 - TUCO INTERCHANGE 345KV CKT 1'
G11_020	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.36795	100.8232	'G10-16T 345.00 - POSTROCK7 345.00 345KV CKT 1'
G11_020	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.38023	104.0022	'MED-LDG5 345.00 - WICHITA 345KV CKT 1'
G11_020	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.38023	104.0022	'MED-LDG5 345.00 - WICHITA 345KV CKT 2'
G11_020	'FROM->TO'	'MATTHEWSON 345.00 - NORTHWEST 345KV CKT 1'	1195	0.30878	122.9661	'CIMARRON - MATTHEWSON 345.00 345KV CKT 1'
G11_020	'TO->FROM'	'MATTHEWSON 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.2991	106.7267	'MATTHEWSON 345.00 - TATONGA7 345.00 345KV CKT 2'
G11_020	'TO->FROM'	'MATTHEWSON 345.00 - TATONGA7 345.00 345KV CKT 2'	1195	0.2991	106.7267	'MATTHEWSON 345.00 - TATONGA7 345.00 345KV CKT 1'
G11_020	'TO->FROM'	'CIMARRON - MATTHEWSON 345.00 345KV CKT 1'	956	0.20665	126.9879	'MATTHEWSON 345.00 - NORTHWEST 345KV CKT 1'
G11_020	'FROM->TO'	'MATTHEWSON 345.00 - NORTHWEST 345KV CKT 1'	1195	0.2305	112.6244	'CIMARRON - MATTHEWSON 345.00 345KV CKT 1'
G11_020		Non Converged Contingency	0	0.22318	-	'DBL-MEDLO-WI'
G11_020		Non Converged Contingency	0	0.21872	-	'DBL-MEDLO-WI'
G11_021		Non Converged Contingency	0	0.23063	-	'DBL-MEDLO-WI'
G11_021	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.20072	129.7928	'LAWTON EASTSIDE - OKLAUNION 345KV CKT 1'
G11_021	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.20072	124.0786	'G08-14T 345.00 - OKLAUNION 345KV CKT 1'
G11_021	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.20271	126.9844	'MED-LDG5 345.00 - WWRDEHV7 345.00 345KV CKT 1'

SOURCE	DIRECTION	MONTCOMMONNAME	RATEB	TDF	TC%LOADING	CONTNAME
G11_021	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.20271	126.9844	'MED-LDG5 345.00 - WWRDEHV7 345.00 345KV CKT 2'
G11_021	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.20072	123.3315	'G08-14T 345.00 - TUCO INTERCHANGE 345KV CKT 1'
G11_021	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.20061	122.3677	'GRAY CO 345.00 - SPEARVILLE 345KV CKT 1'
G11_021	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.19963	126.5147	'MED-LDG5 345.00 - WICHITA 345KV CKT 1'
G11_021	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.19963	126.5147	'MED-LDG5 345.00 - WICHITA 345KV CKT 2'
G11_021	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.20444	121.01	'2008-047T 345.00 - GRAY CO 345.00 345KV CKT 1'
G11_021	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.19839	123.7118	'BORDER 7345.00 - TUCO INTERCHANGE 345KV CKT 1'
G11_021	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.19538	112.283	'LAWTON EASTSIDE - OKLAUNION 345KV CKT 1'
G11_021	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.19538	106.4873	'G08-14T 345.00 - OKLAUNION 345KV CKT 1'
G11_021	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.19851	102.8318	'MED-LDG5 345.00 - WWRDEHV7 345.00 345KV CKT 1'
G11_021	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.19851	102.8318	'MED-LDG5 345.00 - WWRDEHV7 345.00 345KV CKT 2'
G11_021	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.19538	105.6796	'G08-14T 345.00 - TUCO INTERCHANGE 345KV CKT 1'
G11_021	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.19642	101.3871	'GRAY CO 345.00 - SPEARVILLE 345KV CKT 1'
G11_021	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.19546	104.1151	'MED-LDG5 345.00 - WICHITA 345KV CKT 1'
G11_021	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.19546	104.1151	'MED-LDG5 345.00 - WICHITA 345KV CKT 2'
G11_021	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.19806	102.2155	'MED-LDG5 345.00 - WWRDEHV7 345.00 345KV CKT 1'
G11_021	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.19806	102.2155	'MED-LDG5 345.00 - WWRDEHV7 345.00 345KV CKT 2'
G11_021	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.19595	100.8335	'GRAY CO 345.00 - SPEARVILLE 345KV CKT 1'
G11_021	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.24502	117.0119	'LAWTON EASTSIDE - OKLAUNION 345KV CKT 1'
G11_021	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.24502	109.9733	'G08-14T 345.00 - OKLAUNION 345KV CKT 1'
G11_021	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.23472	101.2013	'CLINTON JUNCTION - ELK CITY 138KV CKT 1'
G11_021	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.23439	103.1663	'ELK CITY 230KV - SWEETWT6 230.00 230KV CKT 1'
G11_021	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.23439	101.7528	'STLN-DEMARC6230.00 - SWEETWT6 230.00 230KV CKT 1'
G11_021	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.23595	101.3108	'G08-13T 345.00 - WOODRING 345KV CKT 1'
G11_021	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.23686	101.5989	'CLEO CORNER - GLASS MOUNTAIN 138KV CKT 1'
G11_021	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.23805	101.6728	'CLEO CORNER - MEN TAP 138KV CKT 1'
G11_021	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.239	102.6632	'DEWEY - SOUTHARD 138KV CKT 1'
G11_021	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.23686	101.6887	'GLASS MOUNTAIN - MOORELAND 138KV CKT 1'
G11_021	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.23805	101.6458	'IMO TAP - MEN TAP 138KV CKT 1'
G11_021	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.239	103.0308	'EL RENO - ROMAN NOSE 138KV CKT 1'
G11_021	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.239	102.2655	'ROMAN NOSE - SOUTHARD 138KV CKT 1'
G11_021	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.23878	101.1786	'MOORELAND 345.00 - WWRDEHV7 345.00 345KV CKT 1'
G11_021	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.24933	105.561	'MED-LDG5 345.00 - WWRDEHV7 345.00 345KV CKT 1'
G11_021	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.24933	105.561	'MED-LDG5 345.00 - WWRDEHV7 345.00 345KV CKT 2'
G11_021	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.2356	101.036	'CEDARDALE - MOORELAND 138KV CKT 1'
G11_021	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.2356	100.9934	'CEDARDALE - OKEENE 138KV CKT 1'
G11_021	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.23518	100.3817	'DOVER SW - OKEENE 138KV CKT 1'
G11_021	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.23439	102.077	'GRAPEVINE INTERCHANGE - STATELINE INTERCHANGE 230KV CKT 1'
G11_021	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.23329	101.2792	'GRAPEVINE INTERCHANGE - NICHOLS STATION 230KV CKT 1'
G11_021	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.24583	101.9359	'BORDER 7345.00 - TUCO INTERCHANGE 345KV CKT 1'
G11_021	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.23439	101.7528	'STATELINE INTERCHANGE - STLN-DEMARC6230.00 230KV CKT 1'
G11_021	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.23838	102.7474	'FINNEY SWITCHING STATION - STEVENSCO 345.00 345KV CKT 1'
G11_021	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.24502	109.0361	'G08-14T 345.00 - TUCO INTERCHANGE 345KV CKT 1'
G11_021	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.23821	103.1792	'G10-16T 345.00 - POSTROCK7 345.00 345KV CKT 1'
G11_021	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.23603	100.8982	'AXTELL - POSTROCK7 345.00 345KV CKT 1'
G11_021	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.23294	100	'SMOKYHL6 230.00 - SUMMIT 230KV CKT 1'
G11_021	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.23788	101.4593	'HOLCOMB - SETAB 345KV CKT 1'
G11_021	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.23957	103.0341	'MINGO - SETAB 345KV CKT 1'
G11_021	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.24046	103.0264	'MINGO - RED WILLOW 345KV CKT 1'
G11_021	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.24825	105.0515	'GRAY CO 345.00 - SPEARVILLE 345KV CKT 1'
G11_021	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.23821	102.173	'G10-16T 345.00 - SPEARVILLE 345KV CKT 1'
G11_021	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.23861	101.1616	'BENTON - WICHITA 345KV CKT 1'
G11_021	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.23179	100.1366	'LACYGNE - NEOSHO 345KV CKT 1'
G11_021	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.24624	107.4511	'MED-LDG5 345.00 - WICHITA 345KV CKT 1'

SOURCE	DIRECTION	MONTCOMMONNAME	RATEB	TDF	TC%LOADING	CONTNAME
G11_021	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.24624	107.4511	'MED-LDG5 345.00 - WICHITA 345KV CKT 2'
G11_021	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.23322	100	'CIRCLE - MULLERGREN 230KV CKT 1'
G11_021	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.23332	100.0391	'FLATRDG3 - HARPER 138KV CKT 1'
G11_021	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.23595	100.3574	'G08-13T 345.00 - SUMNERCO 345.00 345KV CKT 1'
G11_021	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.25302	101.4788	'2008-047T 345.00 - GRAY CO 345.00 345KV CKT 1'
G11_021	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.233	100	'GRAND ISLAND - SWEETWATER 345KV CKT 1'
G11_021	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.23439	103.1657	'ELK CITY 230KV (ELKCTY-6) 230/138/13.8KV TRANSFORMER CKT 1'
G11_021	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.23878	101.1573	'MOORELAND 345.00 (MRLNDAUTO) 345/138/13.8KV TRANSFORMER CKT 1'
G11_021	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.23439	101.7528	'SPP-SWPS-02'
G11_021	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.23439	101.3043	'SPP-SWPS-02A'
G11_021	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.23449	102.4854	'SPP-SWPS-03'
G11_021	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.23332	100.1151	'SPP-MKEC-08'
G11_021	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.24438	116.3511	'LAWTON EASTSIDE - OKLAUNION 345KV CKT 1'
G11_021	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.24438	109.3695	'G08-14T 345.00 - OKLAUNION 345KV CKT 1'
G11_021	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.23414	100.5551	'CLINTON JUNCTION - ELK CITY 138KV CKT 1'
G11_021	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.23381	102.4599	'ELK CITY 230KV - SWEETWT6 230.00 230KV CKT 1'
G11_021	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.23381	101.0983	'STLN-DEMARC6230.00 - SWEETWT6 230.00 230KV CKT 1'
G11_021	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.23391	101.7816	'SPP-SWPS-03'
G11_021	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.23534	100.718	'G08-13T 345.00 - WOODRING 345KV CKT 1'
G11_021	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.23628	100.9396	'CLEO CORNER - GLASS MOUNTAIN 138KV CKT 1'
G11_021	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.23746	101.0115	'CLEO CORNER - MEN TAP 138KV CKT 1'
G11_021	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.23841	101.9975	'DEWEY - SOUTHARD 138KV CKT 1'
G11_021	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.23628	101.0292	'GLASS MOUNTAIN - MOORELAND 138KV CKT 1'
G11_021	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.23746	100.9846	'IMO TAP - MEN TAP 138KV CKT 1'
G11_021	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.23841	102.3701	'EL RENO - ROMAN NOSE 138KV CKT 1'
G11_021	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.23841	101.6003	'ROMAN NOSE - SOUTHARD 138KV CKT 1'
G11_021	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.2382	100.5087	'MOORELAND 345.00 - WWRDEHV7 345.00 345KV CKT 1'
G11_021	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.24878	104.7633	'MED-LDG5 345.00 - WWRDEHV7 345.00 345KV CKT 1'
G11_021	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.24878	104.7633	'MED-LDG5 345.00 - WWRDEHV7 345.00 345KV CKT 2'
G11_021	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.23502	100.3798	'CEDARDALE - MOORELAND 138KV CKT 1'
G11_021	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.23502	100.3373	'CEDARDALE - OKEENE 138KV CKT 1'
G11_021	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.23381	101.3779	'GRAPEVINE INTERCHANGE - STATELINE INTERCHANGE 230KV CKT 1'
G11_021	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.23272	100.6346	'GRAPEVINE INTERCHANGE - NICHOLS STATION 230KV CKT 1'
G11_021	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.24526	101.134	'BORDER 7345.00 - TUCO INTERCHANGE 345KV CKT 1'
G11_021	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.23381	101.0983	'STATELINE INTERCHANGE - STLN-DEMARC6230.00 230KV CKT 1'
G11_021	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.23785	101.9392	'FINNEY SWITCHING STATION - STEVENSCO 345.00 345KV CKT 1'
G11_021	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.24438	108.4536	'G08-14T 345.00 - TUCO INTERCHANGE 345KV CKT 1'
G11_021	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.23761	102.5419	'G10-16T 345.00 - POSTROCK7 345.00 345KV CKT 1'
G11_021	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.23544	100.2513	'AXTELL - POSTROCK7 345.00 345KV CKT 1'
G11_021	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.23729	100.7955	'HOLCOMB - SETAB 345KV CKT 1'
G11_021	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.23896	102.4111	'MINGO - SETAB 345KV CKT 1'
G11_021	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.23985	102.4204	'MINGO - RED WILLOW 345KV CKT 1'
G11_021	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.24766	104.2969	'GRAY CO 345.00 - SPEARVILLE 345KV CKT 1'
G11_021	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.23761	101.5518	'G10-16T 345.00 - SPEARVILLE 345KV CKT 1'
G11_021	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.23801	100.5296	'BENTON - WICHITA 345KV CKT 1'
G11_021	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.24562	106.7794	'MED-LDG5 345.00 - WICHITA 345KV CKT 1'
G11_021	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.24562	106.7794	'MED-LDG5 345.00 - WICHITA 345KV CKT 2'
G11_021	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.2525	100.5819	'2008-047T 345.00 - GRAY CO 345.00 345KV CKT 1'
G11_021	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.23381	102.4593	'ELK CITY 230KV (ELKCTY-6) 230/138/13.8KV TRANSFORMER CKT 1'
G11_021	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.2382	100.4878	'MOORELAND 345.00 (MRLNDAUTO) 345/138/13.8KV TRANSFORMER CKT 1'
G11_021	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.23381	101.0983	'SPP-SWPS-02'
G11_021	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.23381	100.6318	'SPP-SWPS-02A'
G11_021	'TO->FROM'	'G11-015T 345.00 - WWRDEHV7 345.00 345KV CKT 1'	1195	0.24502	112.1311	'LAWTON EASTSIDE - OKLAUNION 345KV CKT 1'
G11_021	'TO->FROM'	'G11-015T 345.00 - WWRDEHV7 345.00 345KV CKT 1'	1195	0.24502	105.0358	'G08-14T 345.00 - OKLAUNION 345KV CKT 1'

SOURCE	DIRECTION	MONTCOMMONNAME	RATEB	TDF	TC%LOADING	CONTNAME
G11_021	'TO->FROM'	'G11-015T 345.00 - WWRDEHV7 345.00 345KV CKT 1'	1195	0.24933	100.554	'MED-LDG5 345.00 - WWRDEHV7 345.00 345KV CKT 1'
G11_021	'TO->FROM'	'G11-015T 345.00 - WWRDEHV7 345.00 345KV CKT 1'	1195	0.24933	100.554	'MED-LDG5 345.00 - WWRDEHV7 345.00 345KV CKT 2'
G11_021	'TO->FROM'	'G11-015T 345.00 - WWRDEHV7 345.00 345KV CKT 1'	1195	0.24502	104.0947	'G08-14T 345.00 - TUCO INTERCHANGE 345KV CKT 1'
G11_021	'TO->FROM'	'G11-015T 345.00 - WWRDEHV7 345.00 345KV CKT 1'	1195	0.24825	100.3398	'GRAY CO 345.00 - SPEARVILLE 345KV CKT 1'
G11_021	'TO->FROM'	'G11-015T 345.00 - WWRDEHV7 345.00 345KV CKT 1'	1195	0.24624	102.3923	'MED-LDG5 345.00 - WICHITA 345KV CKT 1'
G11_021	'TO->FROM'	'G11-015T 345.00 - WWRDEHV7 345.00 345KV CKT 1'	1195	0.24624	102.3923	'MED-LDG5 345.00 - WICHITA 345KV CKT 2'
G11_021	'TO->FROM'	'G11-015T 345.00 - WWRDEHV7 345.00 345KV CKT 1'	1195	0.24438	111.4524	'LAWTON EASTSIDE - OKLAUNION 345KV CKT 1'
G11_021	'TO->FROM'	'G11-015T 345.00 - WWRDEHV7 345.00 345KV CKT 1'	1195	0.24438	104.4057	'G08-14T 345.00 - OKLAUNION 345KV CKT 1'
G11_021	'TO->FROM'	'G11-015T 345.00 - WWRDEHV7 345.00 345KV CKT 1'	1195	0.24438	103.4862	'G08-14T 345.00 - TUCO INTERCHANGE 345KV CKT 1'
G11_021	'TO->FROM'	'G11-015T 345.00 - WWRDEHV7 345.00 345KV CKT 1'	1195	0.24562	101.7039	'MED-LDG5 345.00 - WICHITA 345KV CKT 1'
G11_021	'TO->FROM'	'G11-015T 345.00 - WWRDEHV7 345.00 345KV CKT 1'	1195	0.24562	101.7039	'MED-LDG5 345.00 - WICHITA 345KV CKT 2'
G11_021	'FROM->TO'	'MATTHEWSON 345.00 - NORTHWEST 345KV CKT 1'	1195	0.2018	132.3797	'CIMARRON - MATTHEWSON 345.00 345KV CKT 1'
G11_021	'FROM->TO'	'MATTHEWSON 345.00 - NORTHWEST 345KV CKT 1'	1195	0.19764	113.663	'CIMARRON - MATTHEWSON 345.00 345KV CKT 1'
G11_021	'FROM->TO'	'MATTHEWSON 345.00 - NORTHWEST 345KV CKT 1'	1195	0.19707	113.3461	'CIMARRON - MATTHEWSON 345.00 345KV CKT 1'
G11_021	'FROM->TO'	'MATTHEWSON 345.00 - NORTHWEST 345KV CKT 1'	1195	0.19861	113.064	'CIMARRON - MATTHEWSON 345.00 345KV CKT 1'
G11_021		Non Converged Contingency	0	0.21206	-	'DBL-MEDLO-WI'
G11_021		Non Converged Contingency	1195	0.22097	-	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'
G11_021		Non Converged Contingency	0	0.22741	-	'DBL-MEDLO-WI'
G11_021		Non Converged Contingency	0	0.21195	-	'DBL-MEDLO-WI'
G11_021		Non Converged Contingency	0	0.47885	-	'DBL-G0847-WO'
G11_022		Non Converged Contingency	0	0.21667	-	'DBL-MEDLO-WI'
G11_022		Non Converged Contingency	0	0.22048	-	'DBL-MEDLO-WI'
G11_022	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.21372	105.8013	'BASE CASE'
G11_022	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.21377	105.4478	'DOLET HILLS 345/230KV TRANSFORMER CKT 1'
G11_022	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.21349	106.1825	'DOLET HILLS - SOUTHWEST SHREVEPORT 345KV CKT 1'
G11_022	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.21345	105.2569	'FLINT CREEK - GRDA1 345KV CKT 1'
G11_022	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.21362	105.3947	'FLINT CREEK - SUB 383 - MONETT 345KV CKT 1'
G11_022	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.21351	105.0712	'CHAMBER SPRINGS - CLARKSVILLE 345KV CKT 1'
G11_022	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.21385	105.3999	'CLARKSVILLE - MUSKOGEE 345KV CKT 1'
G11_022	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.21107	104.4081	'REDBUD - RIVERSIDE STATION 345KV CKT 1'
G11_022	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.2139	106.3354	'NORTHEAST STATION - ONETA 345KV CKT 1'
G11_022	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.21342	106.0967	'NORTHEAST STATION - TULSA NORTH 345KV CKT 1'
G11_022	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.21261	105.2047	'CLEVELAND - TULSA NORTH 345KV CKT 1'
G11_022	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.21454	104.9254	'DELAWARE - NORTHEAST STATION 345KV CKT 1'
G11_022	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.21027	104.3292	'PITTSBURG - VALLIANT 345KV CKT 1'
G11_022	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.21161	105.0555	'PITTSBURG - SEMINOLE 345KV CKT 1'
G11_022	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.21471	106.5725	'HINTON - WEATHERFORD JCT. 138KV CKT 1'
G11_022	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.21471	106.5607	'CAN_GAS4 138.00 - HINTON 138KV CKT 1'
G11_022	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.21502	106.5896	'CARNEGIE - HOBART JUNCTION 138KV CKT 1'
G11_022	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.21502	106.5435	'CARNEGIE - SOUTHWESTERN STATION 138KV CKT 1'
G11_022	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.21587	107.3934	'CLINTON AIR FORCE BASE TAP - ELK CITY 138KV CKT 1'
G11_022	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.21587	107.341	'CLINTON AIR FORCE BASE TAP - HOBART JUNCTION 138KV CKT 1'
G11_022	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.23319	126.1913	'LAWTON EASTSIDE - OKLAUNION 345KV CKT 1'
G11_022	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.23319	118.6912	'G08-14T 345.00 - OKLAUNION 345KV CKT 1'
G11_022	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.21771	108.756	'CLINTON JUNCTION - ELK CITY 138KV CKT 1'
G11_022	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.21425	106.27	'RED WILLOW (R.WIL T1) 345/115/13.8KV TRANSFORMER CKT 1'
G11_022	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.21378	106.3154	'8DANIEL 500.00 - MCKNIGHT 500KV CKT 1'
G11_022	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.21383	105.2874	'8BHAM STEEL 500.00 - WEST MEMPHIS 500 500KV CKT 1'
G11_022	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.21404	106.394	'NUNDRWD - WAYSIDE 230KV CKT 1'
G11_022	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.21391	106.2326	'STEGALL - WAYSIDE 230KV CKT 1'
G11_022	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.21402	106.6881	'STEGALL - STEGALL TRANSFORMER 230KV CKT 1'
G11_022	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.21402	106.6873	'STEGALL TY 345/230KV TRANSFORMER CKT 1'
G11_022	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.21372	105.4109	'BURLINGTON NO1 + NO 2 + NO 3 161/20.0KV TRANSFORMER CKT 1'
G11_022	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.21372	105.4099	'CENTER GEN TRANS 4 - SQUARE BUTTE 230KV CKT 1'

SOURCE	DIRECTION	MONTCOMMONNAME	RATEB	TDF	TC%LOADING	CONTNAME
G11_022	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.21382	106.1411	'KCPL-OPGD01A'
G11_022	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.21382	106.1472	'KCPL-OPGD06A'
G11_022	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.21415	106.1124	'MIDW-CATB05'
G11_022	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.21402	106.6873	'TRF-STEGALL'
G11_022	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.21642	106.7547	'OGE3TERM1'
G11_022	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.21389	106.1957	'OGE3TERM2'
G11_022	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.21418	105.3868	'OGE3TERM7'
G11_022	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.21488	106.3909	'OGE3TERM10'
G11_022	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.21882	109.4364	'SPP-SWPS-02'
G11_022	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.21882	108.9959	'SPP-SWPS-02A'
G11_022	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.21898	110.209	'SPP-SWPS-03'
G11_022	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.2145	106.5124	'SPP-SWPS-T54'
G11_022	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.21545	107.1896	'SPP-MKEC-05'
G11_022	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.21545	107.5757	'SPP-MKEC-08'
G11_022	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.21418	105.2653	'SPP-WERE-07B'
G11_022	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.21545	107.1932	'SPP-WERE-34'
G11_022	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.21417	105.3309	'SPP-WERE-41B'
G11_022	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.21434	106.1886	'WRTOD1104'
G11_022	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.21429	106.853	'WRTOD400'
G11_022	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.21362	105.3973	'AI12'
G11_022	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.21416	106.2132	'OVERTON-TRF'
G11_022	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.2138	106.4101	'FIELD NORTH - LKFLDXL3 345KV CKT 1'
G11_022	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.21487	106.6061	'ELK CITY - RHWIND4 138.00 138KV CKT 1'
G11_022	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.21518	106.727	'LAWTON EASTSIDE - SUNNYSIDE 345KV CKT 1'
G11_022	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.21449	106.6071	'GRACMNT7 345.00 - LAWTON EASTSIDE 345KV CKT 1'
G11_022	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.21429	106.3617	'CLINTON JUNCTION - CLINTON NATURAL GAS TAP 138KV CKT 1'
G11_022	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.21503	106.2893	'CLINTON JUNCTION - G07-32T 138.00 138KV CKT 1'
G11_022	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.21471	106.7097	'WEATHERFORD JCT. - WEATHERFORD SOUTHEAST 138KV CKT 1'
G11_022	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.21882	110.9234	'ELK CITY 230KV - SWEETWT6 230.00 230KV CKT 1'
G11_022	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.21429	106.4239	'WEATHERFORD SOUTHEAST - WEATHERFORD TAP 138KV CKT 1'
G11_022	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.21429	106.3318	'CLINTON NATURAL GAS TAP - WEATHERFORD WIND FARM 138KV CKT 1'
G11_022	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.21429	106.517	'WEATHERFORD TAP - WEATHERFORD WIND FARM 138KV CKT 1'
G11_022	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.21471	106.5208	'CAN_GAS4 138.00 - JENSEN ROAD 138KV CKT 1'
G11_022	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.21882	109.4364	'STLN-DEMARC6230.00 - SWEETWT6 230.00 230KV CKT 1'
G11_022	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.21396	106.1976	'JERICHO - KIRBY SWITCHING STATION 115KV CKT 1'
G11_022	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.21396	106.1926	'CLARENDON - JERICHO 69KV CKT 1'
G11_022	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.21396	106.1517	'CLARENDON - CLARENDON REC 69KV CKT 1'
G11_022	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.2145	106.2878	'CHILDRESS - HOLLIS TAP 138KV CKT 1'
G11_022	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.21516	106.7257	'CHILDRESS - LAKE PAULINE 138KV CKT 1'
G11_022	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.2145	106.2987	'HOLLIS TAP - WELLINGTON 138KV CKT 1'
G11_022	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.2145	106.397	'SHAMROCK - WELLINGTON 138KV CKT 1'
G11_022	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.2145	106.5163	'MCLEAN RURAL SUB - SHAMROCK 115KV CKT 1'
G11_022	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.21436	106.2316	'LAKE PAULINE - RUSSELL 138KV CKT 1'
G11_022	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.21239	104.8484	'CLEVELAND - SOONER 345KV CKT 1'
G11_022	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.21618	106.6609	'WAUKOMIS - WAUKOMIS TAP 138KV CKT 1'
G11_022	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.21618	106.7042	'HENESSEY - WAUKOMIS 138KV CKT 1'
G11_022	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.21428	106.2381	'MARSHALL - WOODRING 138KV CKT 1'
G11_022	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.21208	105.4421	'SOONER - WOODRING 345KV CKT 1'
G11_022	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.21789	108.688	'G08-13T 345.00 - WOODRING 345KV CKT 1'
G11_022	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.20985	105.3	'MATTHEWSON 345.00 - WOODRING 345KV CKT 1'
G11_022	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.21481	106.4228	'KNOBHILL - SALINE 69KV CKT 1'
G11_022	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.21481	106.3946	'HELENAT2 69.000 - SALINE 69KV CKT 1'
G11_022	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.21481	106.2911	'GOLTRY - IMO 69KV CKT 1'
G11_022	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.21481	106.3123	'GOLTRY - HELENAT2 69.000 69KV CKT 1'

SOURCE	DIRECTION	MONTCOMMONNAME	RATEB	TDF	TC%LOADING	CONTNAME
G11_022	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.21463	106.1552	'IMO TAP - SOUTH 4TH ST 138KV CKT 1'
G11_022	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.21428	106.2311	'COTTONWOOD CREEK - MARSHALL 138KV CKT 1'
G11_022	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.21417	105.4134	'KILDARE4 - NEWKIRK4 138KV CKT 1'
G11_022	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.21417	105.3328	'NEWKIRK4 - PECKHMT4 138.00 138KV CKT 1'
G11_022	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.21402	105.4261	'KILDARE4 - WHITE EAGLE 138KV CKT 1'
G11_022	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.21618	106.8033	'DOVER SW - HENESSEY 138KV CKT 1'
G11_022	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.21875	109.1737	'CLEO CORNER - GLASS MOUNTAIN 138KV CKT 1'
G11_022	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.21987	109.2835	'CLEO CORNER - MEN TAP 138KV CKT 1'
G11_022	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.21484	106.3156	'FPL SWITCH - WOODWARD 138KV CKT 1'
G11_022	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.21617	107.2277	'DEWEY - IODINE 138KV CKT 1'
G11_022	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.22062	110.3295	'DEWEY - SOUTHARD 138KV CKT 1'
G11_022	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.21875	109.2667	'GLASS MOUNTAIN - MOORELAND 138KV CKT 1'
G11_022	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.21987	109.2561	'IMO TAP - MEN TAP 138KV CKT 1'
G11_022	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.21496	106.9927	'KNOBHILL - MOORELAND 138KV CKT 1'
G11_022	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.21617	107.3024	'IODINE - WWRDEHV4 138.00 138KV CKT 1'
G11_022	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.21491	107.3641	'CIMARRON - MINCO 7 345.00 345KV CKT 1'
G11_022	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.21491	106.7835	'GRACMNT7 345.00 - MINCO 7 345.00 345KV CKT 1'
G11_022	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.22062	110.7068	'EL RENO - ROMAN NOSE 138KV CKT 1'
G11_022	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.21459	106.2468	'CIMARRON - EL RENO 138KV CKT 1'
G11_022	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.21463	106.2819	'JENSEN ROAD - JENSEN TAP 138KV CKT 1'
G11_022	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.21432	106.0985	'CIMARRON - JENSEN TAP 138KV CKT 1'
G11_022	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.22062	109.9256	'ROMAN NOSE - SOUTHARD 138KV CKT 1'
G11_022	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.20901	104.325	'ARCADIA - NORTHWEST 345KV CKT 1'
G11_022	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.21046	103.9394	'CIMARRON - DRAPER LAKE 345KV CKT 1'
G11_022	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.20875	102.115	'CIMARRON - MATTHEWSON 345.00 345KV CKT 1'
G11_022	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.21316	105.4617	'ARCADIA - HORSESHOE LAKE 345KV CKT 1'
G11_022	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.21316	105.4656	'HORSESHOE LAKE - SEMINOLE 345KV CKT 1'
G11_022	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.21388	106.1946	'MORRISON - STILLWATER 138KV CKT 1'
G11_022	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.21382	106.1065	'MCELROY - STILLWATER 138KV CKT 1'
G11_022	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.21275	105.4031	'FT SMITH - MUSKOGEE 345KV CKT 1'
G11_022	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.19955	100.9184	'BORDER 7345.00 - WWRDEHV7 345.00 345KV CKT 1'
G11_022	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.22011	108.7567	'MOORELAND 345.00 - WWRDEHV7 345.00 345KV CKT 1'
G11_022	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.20118	100.2678	'2008-047T 345.00 - WWRDEHV7 345.00 345KV CKT 1'
G11_022	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.20118	100.2678	'2008-047T 345.00 - WWRDEHV7 345.00 345KV CKT 2'
G11_022	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.22983	113.6516	'MED-LDG5 345.00 - WWRDEHV7 345.00 345KV CKT 1'
G11_022	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.22983	113.6516	'MED-LDG5 345.00 - WWRDEHV7 345.00 345KV CKT 2'
G11_022	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.21417	105.3333	'CRESWELL - PECKHMT4 138.00 138KV CKT 1'
G11_022	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.21484	106.478	'FPL SWITCH - MOORELAND 138KV CKT 1'
G11_022	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.21428	106.1513	'ARAPAHO - HAMON BUTLER 69KV CKT 1'
G11_022	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.21428	106.1496	'ARAPAHO - INDUSTRIAL PARK 69KV CKT 1'
G11_022	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.2143	106.1081	'CALUMET - WATONGA SW 69KV CKT 1'
G11_022	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.21424	106.1891	'CANTON - OKEENE 69KV CKT 1'
G11_022	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.21424	106.2154	'CANTON - TALOGA 69KV CKT 1'
G11_022	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.21754	108.5503	'CEDARDALE - MOORELAND 138KV CKT 1'
G11_022	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.21754	108.5057	'CEDARDALE - OKEENE 138KV CKT 1'
G11_022	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.21503	106.5226	'CLINTON - WEATHERFORD 138KV CKT 1'
G11_022	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.21503	106.5423	'CLINTON - G07-32T 138.00 138KV CKT 1'
G11_022	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.21428	106.1163	'CORDELL - INDUSTRIAL PARK 69KV CKT 1'
G11_022	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.21718	107.8746	'DOVER SW - OKEENE 138KV CKT 1'
G11_022	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.21426	106.1255	'GOTEBO - MOUNTAIN VIEW 69KV CKT 1'
G11_022	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.21428	106.1521	'HAMON BUTLER - PUTNAM 69KV CKT 1'
G11_022	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.2144	106.2797	'MOORELAND - TALOGA 138KV CKT 1'
G11_022	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.2161	107.0603	'MOORELAND - NINMILE 4 138.00 138KV CKT 1'
G11_022	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.21487	106.3019	'MOREWOOD SW - RHWIND4 138.00 138KV CKT 1'

SOURCE	DIRECTION	MONTCOMMONNAME	RATEB	TDF	TC%LOADING	CONTNAME
G11_022	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.2161	107.0448	'MOREWOOD SW - NINMILE 4 138.00 138KV CKT 1'
G11_022	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.21426	106.0901	'MOUNTAIN VIEW - PINE RIDGE 69KV CKT 1'
G11_022	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.21449	106.3073	'OKEENE - WATONGA SW 69KV CKT 1'
G11_022	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.21428	106.175	'PUTNAM - TALOGA 69KV CKT 1'
G11_022	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.21216	105.384	'BORDER 7345.00 - Hitchland Interchange 345KV CKT 1'
G11_022	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.21216	105.384	'BORDER 7345.00 - Hitchland Interchange 345KV CKT 2'
G11_022	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.22695	107.0023	'Hitchland Interchange - STEVENSCO 345.00 345KV CKT 1'
G11_022	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.22217	104.5689	'G05-17T 345.00 - Hitchland Interchange 345KV CKT 1'
G11_022	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.20269	103.7555	'G11-021T 345.00 - Hitchland Interchange 345KV CKT 1'
G11_022	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.21016	105.1855	'2008-047T 345.00 - Hitchland Interchange 345KV CKT 2'
G11_022	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.21882	109.7743	'GRAPEVINE INTERCHANGE - STATELINE INTERCHANGE 230KV CKT 1'
G11_022	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.21682	108.8978	'GRAPEVINE INTERCHANGE - NICHOLS STATION 230KV CKT 1'
G11_022	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.22834	109.4804	'BORDER 7345.00 - TUCO INTERCHANGE 345KV CKT 1'
G11_022	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.21882	109.4364	'STATELINE INTERCHANGE - STLN-DEMARC6230.00 230KV CKT 1'
G11_022	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.2145	106.593	'MCCLELLAN SUB - MCLEAN RURAL SUB 115KV CKT 1'
G11_022	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.2145	106.6326	'KIRBY SWITCHING STATION - MCCLELLAN SUB 115KV CKT 1'
G11_022	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.22695	110.6592	'FINNEY SWITCHING STATION - STEVENSCO 345.00 345KV CKT 1'
G11_022	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.22217	106.2712	'G05-17T 345.00 - POTTER COUNTY INTERCHANGE 345KV CKT 1'
G11_022	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.21473	106.4497	'AMARILLO SOUTH INTERCHANGE - G07-48T 230.00 230KV CKT 1'
G11_022	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.2146	106.3351	'DEAF SMITH COUNTY INTERCHANGE - S-RANDLCO 230.00 230KV CKT 1'
G11_022	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.21431	106.3194	'SWISHER COUNTY INTERCHANGE - TUCO INTERCHANGE 230KV CKT 1'
G11_022	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.21473	106.7716	'G07-48T 230.00 - SWISHER COUNTY INTERCHANGE 230KV CKT 1'
G11_022	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.21346	106.4038	'TOLK STATION EAST - TUCO INTERCHANGE 230KV CKT 1'
G11_022	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.23319	117.6914	'G08-14T 345.00 - TUCO INTERCHANGE 345KV CKT 1'
G11_022	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.21438	106.6527	'KNOLL 230 - POSTROCK6 230.00 230KV CKT 1'
G11_022	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.21516	107.0872	'KNOLL 230 - SMOKYHL6 230.00 230KV CKT 1'
G11_022	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.22012	111.1473	'G10-16T 345.00 - POSTROCK7 345.00 345KV CKT 1'
G11_022	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.218	108.5593	'AXTELL - POSTROCK7 345.00 345KV CKT 1'
G11_022	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.21516	107.5696	'SMOKYHL6 230.00 - SUMMIT 230KV CKT 1'
G11_022	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.21415	106.1082	'HUNTSVILLE - ST_JOHN 115KV CKT 1'
G11_022	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.21415	106.0971	'HUNTSVILLE - HUTCHINSON ENERGY CENTER 115KV CKT 1'
G11_022	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.21415	106.3187	'ST JOHN - ST_JOHN 115KV CKT 1'
G11_022	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.2207	109.2182	'HOLCOMB - SETAB 345KV CKT 1'
G11_022	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.2135	105.6267	'G08-18 345.00 - HOLCOMB 345KV CKT 1'
G11_022	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.22248	111.0008	'MINGO - SETAB 345KV CKT 1'
G11_022	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.22334	111.1764	'MINGO - RED WILLOW 345KV CKT 1'
G11_022	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.23051	113.2567	'GRAY CO 345.00 - SPEARVILLE 345KV CKT 1'
G11_022	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.22012	110.0746	'G10-16T 345.00 - SPEARVILLE 345KV CKT 1'
G11_022	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.21426	106.7997	'HOYT - JEFFERY ENERGY CENTER 345KV CKT 1'
G11_022	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.21435	106.4617	'HOYT - STRANGER CREEK 345KV CKT 1'
G11_022	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.21448	106.1641	'EMPORIA ENERGY CENTER - SWISSVALE 345KV CKT 1'
G11_022	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.21481	106.3199	'EMPORIA ENERGY CENTER - WICHITA 345KV CKT 1'
G11_022	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.21376	106.1555	'CRAIG - STRANGER CREEK 345KV CKT 1'
G11_022	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.21481	106.3339	'SWISSVALE - WEST GARDNER 345KV CKT 1'
G11_022	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.2174	107.0962	'BENTON - ROSE HILL 345KV CKT 1'
G11_022	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.22055	108.7294	'BENTON - WICHITA 345KV CKT 1'
G11_022	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.214	107.4942	'LACYGNE - NEOSHO 345KV CKT 1'
G11_022	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.21567	106.9632	'G05-13T 345.00 - NEOSHO 345KV CKT 1'
G11_022	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.21567	106.5095	'LATHAMS7 345.00 - ROSE HILL 345KV CKT 1'
G11_022	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.22775	115.6262	'MED-LDG5 345.00 - WICHITA 345KV CKT 1'
G11_022	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.22775	115.6262	'MED-LDG5 345.00 - WICHITA 345KV CKT 2'
G11_022	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.21412	106.339	'ANDERSONCO 345.00 - WOLF CREEK 345KV CKT 1'
G11_022	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.21567	106.7929	'G05-13T 345.00 - LATHAMS7 345.00 345KV CKT 1'
G11_022	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.21544	107.4485	'CIRCLE - MULLERGREN 230KV CKT 1'

SOURCE	DIRECTION	MONTCOMMONNAME	RATEB	TDF	TC%LOADING	CONTNAME
G11_022	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.21545	107.0381	'CLEARWATER - GILL ENERGY CENTER WEST 138KV CKT 1'
G11_022	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.21545	107.1569	'CLEARWATER - MILAN TAP 138KV CKT 1'
G11_022	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.21379	106.5443	'EVANS ENERGY CENTER NORTH - EVANS ENERGY CENTER SOUTH 138KV CKT 1'
G11_022	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.21395	106.0893	'EVANS ENERGY CENTER NORTH - MAIZE 4 138.00 138KV CKT 1'
G11_022	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.21545	107.4815	'FLATRDG3 - HARPER 138KV CKT 1'
G11_022	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.21545	107.1166	'FLATRDG3 - MEDICINE LODGE 138KV CKT 1'
G11_022	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.21402	106.1443	'NINNESC3 115.00 - PRATT 115KV CKT 1'
G11_022	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.21402	106.1196	'NINNESC3 115.00 - ST JOHN 115KV CKT 1'
G11_022	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.21402	106.1018	'MEDICINE LODGE - SAWYER 3 115.00 115KV CKT 1'
G11_022	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.21402	106.0968	'PRATT - SAWYER 3 115.00 115KV CKT 1'
G11_022	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.21545	107.313	'HARPER - MILAN TAP 138KV CKT 1'
G11_022	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.21446	106.3425	'MED-LDG5 345.00 345/138KV TRANSFORMER CKT 1'
G11_022	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.21537	107.3674	'MULLERGREN - SPEARVILLE 230KV CKT 1'
G11_022	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.21374	105.3524	'LACYGNE - WEST GARDNER 345KV CKT 1'
G11_022	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.21363	105.2991	'LACYGNE - STILWELL 345KV CKT 1'
G11_022	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.21381	106.1194	'HAWTHORN - NASHUA 345KV CKT 1'
G11_022	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.21412	106.3885	'ANDERSONCO 345.00 - LACYGNE 345KV CKT 1'
G11_022	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.21362	105.3977	'BROOKLINE - SUB 383 - MONETT 345KV CKT 1'
G11_022	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.21789	107.7454	'G08-13T 345.00 - SUMNERCO 345.00 345KV CKT 1'
G11_022	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.2135	105.624	'G08-18 345.00 - GRAY CO 345.00 345KV CKT 1'
G11_022	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.22765	109.393	'2008-047T 345.00 - GRAY CO 345.00 345KV CKT 1'
G11_022	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.20269	103.0069	'2008-047T 345.00 - G11-021T 345.00 345KV CKT 1'
G11_022	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.21532	107.0657	'AXTELL - PAULINE 345KV CKT 1'
G11_022	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.21386	106.1149	'CROOKED CREEK - NORTH PLATTE 230KV CKT 1'
G11_022	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.21399	106.1114	'COLUMWEST - GRAND ISLAND 230KV CKT 1'
G11_022	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.21784	107.4333	'GERALD GENTLEMAN STATION - RED WILLOW 345KV CKT 1'
G11_022	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.21408	106.4455	'GERALD GENTLEMAN STATION - SWEETWATER 345KV CKT 1'
G11_022	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.21398	106.2638	'GERALD GENTLEMAN STATION - SWEETWATER 345KV CKT 2'
G11_022	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.21441	106.2663	'MCCOOL - MOORE 345KV CKT 1'
G11_022	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.21442	106.4042	'GRAND ISLAND - MCCOOL 345KV CKT 1'
G11_022	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.21522	106.9257	'MOORE - PAULINE 345KV CKT 1'
G11_022	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.21524	107.5021	'GRAND ISLAND - SWEETWATER 345KV CKT 1'
G11_022	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.21372	105.3184	'SNORANDA 161.00 - NEW MADRID 161KV CKT 1'
G11_022	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.21373	105.4193	'BAXTER WILSON SES - PERRYVILLE 500KV CKT 1'
G11_022	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.21386	106.1894	'LAKEOVER - MCADAMS 500KV CKT 1'
G11_022	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.21395	106.1739	'MCADAMS - WOLF CREEK 500KV CKT 1'
G11_022	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.21364	105.5045	'ARKANSAS NUCLEAR ONE - MABELVALE 500 500KV CKT 1'
G11_022	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.21365	105.3729	'ARKANSAS NUCLEAR ONE - PLEASANT HILL 500KV CKT 1'
G11_022	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.21385	105.0654	'KEO EHV - WEST MEMPHIS 500 500KV CKT 1'
G11_022	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.21382	105.1707	'DELL 500 - INDEPENDENCE 500KV CKT 1'
G11_022	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.21389	106.1097	'ELK CITY (ELKCTY-4) 138/69/13.8KV TRANSFORMER CKT 1'
G11_022	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.21882	110.9228	'ELK CITY 230KV (ELKCTY-6) 230/138/13.8KV TRANSFORMER CKT 1'
G11_022	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.21396	106.1901	'JERICHO (JERIC2WT) 115/69/14.4KV TRANSFORMER CKT 1'
G11_022	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.2145	106.3895	'SHAMROCK (SHAMRCK2) 138/69/14.4KV TRANSFORMER CKT 1'
G11_022	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.2145	106.5137	'SHAMROCK (SHAMRCK1) 115/69/14.4KV TRANSFORMER CKT 1'
G11_022	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.21482	105.4095	'WOODRING (WOODRNG2) 345/138/13.8KV TRANSFORMER CKT 1'
G11_022	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.21496	106.9711	'KNOBHILL (KNOBHIL4) 138/69/13.2KV TRANSFORMER CKT 1'
G11_022	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.2135	105.264	'NORTHWEST (NORTWST2) 345/138/13.8KV TRANSFORMER CKT 1'
G11_022	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.21352	105.3732	'NORTHWEST (NORTWST3) 345/138/13.8KV TRANSFORMER CKT 1'
G11_022	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.2136	105.3029	'CIMARRON (CIMARON1) 345/138/13.8KV TRANSFORMER CKT 1'
G11_022	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.2136	105.3196	'CIMARRON (CIMARON2) 345/138/13.8KV TRANSFORMER CKT 1'
G11_022	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.21388	106.2461	'SUNNYSIDE (SUNNYSD3) 345/138/13.8KV TRANSFORMER CKT 1'
G11_022	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.21283	106.5702	'ARKANSAS NUCLEAR ONE - FT SMITH 500KV CKT 1'
G11_022	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.22011	108.734	'MOORELAND 345.00 (MRLNDAUTO) 345/138/13.8KV TRANSFORMER CKT 1'

SOURCE	DIRECTION	MONTCOMMONNAME	RATEB	TDF	TC%LOADING	CONTNAME
G11_022	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.21401	106.0954	'TALOGA (TALOGA) 138/69/13.8KV TRANSFORMER CKT 1'
G11_022	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.21461	105.5091	'HITCHLAND INTERCHANGE (H TP80148301) 230/115/13.2KV TRANSFORMER CKT 1'
G11_022	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.22217	106.7042	'POTTER COUNTY INTERCHANGE (WAUK 90343-A) 345/230/13.2KV TRANSFORMER CKT 1'
G11_022	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.21382	106.1116	'WICHITA (WICHT12X) 345/138/13.8KV TRANSFORMER CKT 1'
G11_022	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.21415	106.2421	'7OVERTON 345.00 - SIBLEY 345KV CKT 1'
G11_022	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.21377	106.1591	'CLINTON - MONTROSE 161KV CKT 1'
G11_022	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.21398	106.2246	'BROOKLINE - MORGAN 345KV CKT 1'
G11_022	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.23332	116.3511	'LAWTON EASTSIDE - OKLAUNION 345KV CKT 1'
G11_022	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.23332	109.3695	'G08-14T 345.00 - OKLAUNION 345KV CKT 1'
G11_022	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.2177	100.5551	'CLINTON JUNCTION - ELK CITY 138KV CKT 1'
G11_022	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.21883	102.4599	'ELK CITY 230KV - SWEETWT6 230.00 230KV CKT 1'
G11_022	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.21883	101.0983	'STLN-DEMARC6230.00 - SWEETWT6 230.00 230KV CKT 1'
G11_022	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.21899	101.7816	'SPP-SWPS-03'
G11_022	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.21778	100.718	'G08-13T 345.00 - WOODRING 345KV CKT 1'
G11_022	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.21873	100.9396	'CLEO CORNER - GLASS MOUNTAIN 138KV CKT 1'
G11_022	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.21985	101.0115	'CLEO CORNER - MEN TAP 138KV CKT 1'
G11_022	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.22059	101.9975	'DEWEY - SOUTHARD 138KV CKT 1'
G11_022	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.21873	101.0292	'GLASS MOUNTAIN - MOORELAND 138KV CKT 1'
G11_022	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.21985	100.9846	'IMO TAP - MEN TAP 138KV CKT 1'
G11_022	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.22059	102.3701	'EL RENO - ROMAN NOSE 138KV CKT 1'
G11_022	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.22059	101.6003	'ROMAN NOSE - SOUTHARD 138KV CKT 1'
G11_022	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.22007	100.5087	'MOORELAND 345.00 - WWRDEHV7 345.00 345KV CKT 1'
G11_022	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.22989	104.7633	'MED-LDG5 345.00 - WWRDEHV7 345.00 345KV CKT 1'
G11_022	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.22989	104.7633	'MED-LDG5 345.00 - WWRDEHV7 345.00 345KV CKT 2'
G11_022	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.21751	100.3798	'CEDARDALE - MOORELAND 138KV CKT 1'
G11_022	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.21751	100.3373	'CEDARDALE - OKEENE 138KV CKT 1'
G11_022	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.21883	101.3779	'GRAPEVINE INTERCHANGE - STATELINE INTERCHANGE 230KV CKT 1'
G11_022	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.21682	100.6346	'GRAPEVINE INTERCHANGE - NICHOLS STATION 230KV CKT 1'
G11_022	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.2282	101.134	'BORDER 7345.00 - TUCO INTERCHANGE 345KV CKT 1'
G11_022	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.21883	101.0983	'STATELINE INTERCHANGE - STLN-DEMARC6230.00 230KV CKT 1'
G11_022	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.22698	101.9392	'FINNEY SWITCHING STATION - STEVENSCO 345.00 345KV CKT 1'
G11_022	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.23332	108.4536	'G08-14T 345.00 - TUCO INTERCHANGE 345KV CKT 1'
G11_022	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.22012	102.5419	'G10-16T 345.00 - POSTROCK7 345.00 345KV CKT 1'
G11_022	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.21799	100.2513	'AXTELL - POSTROCK7 345.00 345KV CKT 1'
G11_022	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.2207	100.7955	'HOLCOMB - SETAB 345KV CKT 1'
G11_022	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.22249	102.4111	'MINGO - SETAB 345KV CKT 1'
G11_022	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.22336	102.4204	'MINGO - RED WILLOW 345KV CKT 1'
G11_022	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.23054	104.2969	'GRAY CO 345.00 - SPEARVILLE 345KV CKT 1'
G11_022	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.22012	101.5518	'G10-16T 345.00 - SPEARVILLE 345KV CKT 1'
G11_022	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.22052	100.5296	'BENTON - WICHITA 345KV CKT 1'
G11_022	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.22776	106.7794	'MED-LDG5 345.00 - WICHITA 345KV CKT 1'
G11_022	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.22776	106.7794	'MED-LDG5 345.00 - WICHITA 345KV CKT 2'
G11_022	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.2277	100.5819	'2008-047T 345.00 - GRAY CO 345.00 345KV CKT 1'
G11_022	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.21883	102.4593	'ELK CITY 230KV (ELKCTY-6) 230/138/13.8KV TRANSFORMER CKT 1'
G11_022	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.22007	100.4878	'MOORELAND 345.00 (MRLNDAUTO) 345/138/13.8KV TRANSFORMER CKT 1'
G11_022	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.21883	101.0983	'SPP-SWPS-02'
G11_022	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.21883	100.6318	'SPP-SWPS-02A'
G11_022	'TO->FROM'	'G11-015T 345.00 - WWRDEHV7 345.00 345KV CKT 1'	1195	0.21372	100.9167	'BASE CASE'
G11_022	'TO->FROM'	'G11-015T 345.00 - WWRDEHV7 345.00 345KV CKT 1'	1195	0.21377	100.5676	'DOLET HILLS 345/230KV TRANSFORMER CKT 1'
G11_022	'TO->FROM'	'G11-015T 345.00 - WWRDEHV7 345.00 345KV CKT 1'	1195	0.21349	101.2938	'DOLET HILLS - SOUTHWEST SHREVEPORT 345KV CKT 1'
G11_022	'TO->FROM'	'G11-015T 345.00 - WWRDEHV7 345.00 345KV CKT 1'	1195	0.21345	100.3765	'FLINT CREEK - GRDA1 345KV CKT 1'
G11_022	'TO->FROM'	'G11-015T 345.00 - WWRDEHV7 345.00 345KV CKT 1'	1195	0.21362	100.5143	'FLINT CREEK - SUB 383 - MONETT 345KV CKT 1'
G11_022	'TO->FROM'	'G11-015T 345.00 - WWRDEHV7 345.00 345KV CKT 1'	1195	0.21351	100.1959	'CHAMBER SPRINGS - CLARKSVILLE 345KV CKT 1'
G11_022	'TO->FROM'	'G11-015T 345.00 - WWRDEHV7 345.00 345KV CKT 1'	1195	0.21385	100.5231	'CLARKSVILLE - MUSKOGEE 345KV CKT 1'

SOURCE	DIRECTION	MONTCOMMONNAME	RATEB	TDF	TC%LOADING	CONTNAME
G11_022	'TO->FROM'	'G11-015T 345.00 - WWRDEHV7 345.00 345KV CKT 1'	1195	0.2139	101.442	'NORTHEAST STATION - ONETA 345KV CKT 1'
G11_022	'TO->FROM'	'G11-015T 345.00 - WWRDEHV7 345.00 345KV CKT 1'	1195	0.21342	101.209	'NORTHEAST STATION - TULSA NORTH 345KV CKT 1'
G11_022	'TO->FROM'	'G11-015T 345.00 - WWRDEHV7 345.00 345KV CKT 1'	1195	0.21261	100.3144	'CLEVELAND - TULSA NORTH 345KV CKT 1'
G11_022	'TO->FROM'	'G11-015T 345.00 - WWRDEHV7 345.00 345KV CKT 1'	1195	0.21454	100.0523	'DELAWARE - NORTHEAST STATION 345KV CKT 1'
G11_022	'TO->FROM'	'G11-015T 345.00 - WWRDEHV7 345.00 345KV CKT 1'	1195	0.21161	100.1769	'PITTSBURG - SEMINOLE 345KV CKT 1'
G11_022	'TO->FROM'	'G11-015T 345.00 - WWRDEHV7 345.00 345KV CKT 1'	1195	0.21471	101.689	'HINTON - WEATHERFORD JCT. 138KV CKT 1'
G11_022	'TO->FROM'	'G11-015T 345.00 - WWRDEHV7 345.00 345KV CKT 1'	1195	0.21471	101.6769	'CAN_GAS4 138.00 - HINTON 138KV CKT 1'
G11_022	'TO->FROM'	'G11-015T 345.00 - WWRDEHV7 345.00 345KV CKT 1'	1195	0.21449	101.2052	'CACHE - SNYDER 138KV CKT 1'
G11_022	'TO->FROM'	'G11-015T 345.00 - WWRDEHV7 345.00 345KV CKT 1'	1195	0.21502	101.7065	'CARNEGIE - HOBART JUNCTION 138KV CKT 1'
G11_022	'TO->FROM'	'G11-015T 345.00 - WWRDEHV7 345.00 345KV CKT 1'	1195	0.21502	101.6604	'CARNEGIE - SOUTHWESTERN STATION 138KV CKT 1'
G11_022	'TO->FROM'	'G11-015T 345.00 - WWRDEHV7 345.00 345KV CKT 1'	1195	0.21587	102.5125	'CLINTON AIR FORCE BASE TAP - ELK CITY 138KV CKT 1'
G11_022	'TO->FROM'	'G11-015T 345.00 - WWRDEHV7 345.00 345KV CKT 1'	1195	0.21587	102.46	'CLINTON AIR FORCE BASE TAP - HOBART JUNCTION 138KV CKT 1'
G11_022	'TO->FROM'	'G11-015T 345.00 - WWRDEHV7 345.00 345KV CKT 1'	1195	0.23319	121.3157	'LAWTON EASTSIDE - OKLAUNION 345KV CKT 1'
G11_022	'TO->FROM'	'G11-015T 345.00 - WWRDEHV7 345.00 345KV CKT 1'	1195	0.23319	113.8364	'G08-14T 345.00 - OKLAUNION 345KV CKT 1'
G11_022	'TO->FROM'	'G11-015T 345.00 - WWRDEHV7 345.00 345KV CKT 1'	1195	0.21771	103.8792	'CLINTON JUNCTION - ELK CITY 138KV CKT 1'
G11_022	'TO->FROM'	'G11-015T 345.00 - WWRDEHV7 345.00 345KV CKT 1'	1195	0.21425	101.3914	'RED WILLOW (R.WIL T1) 345/115/13.8KV TRANSFORMER CKT 1'
G11_022	'TO->FROM'	'G11-015T 345.00 - WWRDEHV7 345.00 345KV CKT 1'	1195	0.21378	101.4264	'8DANIEL 500.00 - MCKNIGHT 500KV CKT 1'
G11_022	'TO->FROM'	'G11-015T 345.00 - WWRDEHV7 345.00 345KV CKT 1'	1195	0.21383	100.4072	'8BHAM STEEL 500.00 - WEST MEMPHIS 500 500KV CKT 1'
G11_022	'TO->FROM'	'G11-015T 345.00 - WWRDEHV7 345.00 345KV CKT 1'	1195	0.21404	101.5146	'NUNDRWD - WAYSIDE 230KV CKT 1'
G11_022	'TO->FROM'	'G11-015T 345.00 - WWRDEHV7 345.00 345KV CKT 1'	1195	0.21391	101.3515	'STEGALL - WAYSIDE 230KV CKT 1'
G11_022	'TO->FROM'	'G11-015T 345.00 - WWRDEHV7 345.00 345KV CKT 1'	1195	0.21402	101.8113	'STEGALL - STEGALL TRANSFORMER 230KV CKT 1'
G11_022	'TO->FROM'	'G11-015T 345.00 - WWRDEHV7 345.00 345KV CKT 1'	1195	0.21402	101.8106	'STEGALL TY 345/230KV TRANSFORMER CKT 1'
G11_022	'TO->FROM'	'G11-015T 345.00 - WWRDEHV7 345.00 345KV CKT 1'	1195	0.21372	100.5291	'BURLINGTON NO1 + NO 2 + NO 3 161/20.0KV TRANSFORMER CKT 1'
G11_022	'TO->FROM'	'G11-015T 345.00 - WWRDEHV7 345.00 345KV CKT 1'	1195	0.21372	100.5249	'CENTER GEN TRANS 4 - SQUARE BUTTE 230KV CKT 1'
G11_022	'TO->FROM'	'G11-015T 345.00 - WWRDEHV7 345.00 345KV CKT 1'	1195	0.21382	101.2563	'KCPL-OPGD01A'
G11_022	'TO->FROM'	'G11-015T 345.00 - WWRDEHV7 345.00 345KV CKT 1'	1195	0.21382	101.2625	'KCPL-OPGD06A'
G11_022	'TO->FROM'	'G11-015T 345.00 - WWRDEHV7 345.00 345KV CKT 1'	1195	0.21415	101.228	'MIDW-CATB05'
G11_022	'TO->FROM'	'G11-015T 345.00 - WWRDEHV7 345.00 345KV CKT 1'	1195	0.21402	101.8105	'TRF-STEGALL'
G11_022	'TO->FROM'	'G11-015T 345.00 - WWRDEHV7 345.00 345KV CKT 1'	1195	0.21642	101.8649	'OGE3TERM1'
G11_022	'TO->FROM'	'G11-015T 345.00 - WWRDEHV7 345.00 345KV CKT 1'	1195	0.21389	101.299	'OGE3TERM2'
G11_022	'TO->FROM'	'G11-015T 345.00 - WWRDEHV7 345.00 345KV CKT 1'	1195	0.21418	100.5082	'OGE3TERM7'
G11_022	'TO->FROM'	'G11-015T 345.00 - WWRDEHV7 345.00 345KV CKT 1'	1195	0.21488	101.5075	'OGE3TERM10'
G11_022	'TO->FROM'	'G11-015T 345.00 - WWRDEHV7 345.00 345KV CKT 1'	1195	0.21882	104.6523	'SPP-SWPS-02'
G11_022	'TO->FROM'	'G11-015T 345.00 - WWRDEHV7 345.00 345KV CKT 1'	1195	0.21882	104.222	'SPP-SWPS-02A'
G11_022	'TO->FROM'	'G11-015T 345.00 - WWRDEHV7 345.00 345KV CKT 1'	1195	0.21898	105.4488	'SPP-SWPS-03'
G11_022	'TO->FROM'	'G11-015T 345.00 - WWRDEHV7 345.00 345KV CKT 1'	1195	0.2145	101.6391	'SPP-SWPS-T54'
G11_022	'TO->FROM'	'G11-015T 345.00 - WWRDEHV7 345.00 345KV CKT 1'	1195	0.21545	102.297	'SPP-MKEC-05'
G11_022	'TO->FROM'	'G11-015T 345.00 - WWRDEHV7 345.00 345KV CKT 1'	1195	0.21545	102.6976	'SPP-MKEC-08'
G11_022	'TO->FROM'	'G11-015T 345.00 - WWRDEHV7 345.00 345KV CKT 1'	1195	0.21418	100.3894	'SPP-WERE-07B'
G11_022	'TO->FROM'	'G11-015T 345.00 - WWRDEHV7 345.00 345KV CKT 1'	1195	0.21545	102.3003	'SPP-WERE-34'
G11_022	'TO->FROM'	'G11-015T 345.00 - WWRDEHV7 345.00 345KV CKT 1'	1195	0.21417	100.4532	'SPP-WERE-41B'
G11_022	'TO->FROM'	'G11-015T 345.00 - WWRDEHV7 345.00 345KV CKT 1'	1195	0.21434	101.299	'WRTOD1104'
G11_022	'TO->FROM'	'G11-015T 345.00 - WWRDEHV7 345.00 345KV CKT 1'	1195	0.21429	101.952	'WRTOD400'
G11_022	'TO->FROM'	'G11-015T 345.00 - WWRDEHV7 345.00 345KV CKT 1'	1195	0.21362	100.5167	'AI12'
G11_022	'TO->FROM'	'G11-015T 345.00 - WWRDEHV7 345.00 345KV CKT 1'	1195	0.21388	101.1965	'AI43'
G11_022	'TO->FROM'	'G11-015T 345.00 - WWRDEHV7 345.00 345KV CKT 1'	1195	0.21416	101.324	'OVERTON-TRF'
G11_022	'TO->FROM'	'G11-015T 345.00 - WWRDEHV7 345.00 345KV CKT 1'	1195	0.2138	101.5241	'FIELD NORTH - LKFLDXL3 345KV CKT 1'
G11_022	'TO->FROM'	'G11-015T 345.00 - WWRDEHV7 345.00 345KV CKT 1'	1195	0.21487	101.7084	'ELK CITY - RHWIND4 138.00 138KV CKT 1'
G11_022	'TO->FROM'	'G11-015T 345.00 - WWRDEHV7 345.00 345KV CKT 1'	1195	0.21518	101.8487	'LAWTON EASTSIDE - SUNNYSIDE 345KV CKT 1'
G11_022	'TO->FROM'	'G11-015T 345.00 - WWRDEHV7 345.00 345KV CKT 1'	1195	0.21449	101.7225	'GRACMNT7 345.00 - LAWTON EASTSIDE 345KV CKT 1'
G11_022	'TO->FROM'	'G11-015T 345.00 - WWRDEHV7 345.00 345KV CKT 1'	1195	0.21429	101.4784	'CLINTON JUNCTION - CLINTON NATURAL GAS TAP 138KV CKT 1'
G11_022	'TO->FROM'	'G11-015T 345.00 - WWRDEHV7 345.00 345KV CKT 1'	1195	0.21503	101.4041	'CLINTON JUNCTION - G07-32T 138.00 138KV CKT 1'
G11_022	'TO->FROM'	'G11-015T 345.00 - WWRDEHV7 345.00 345KV CKT 1'	1195	0.21471	101.8263	'WEATHERFORD JCT. - WEATHERFORD SOUTHEAST 138KV CKT 1'
G11_022	'TO->FROM'	'G11-015T 345.00 - WWRDEHV7 345.00 345KV CKT 1'	1195	0.21882	106.2001	'ELK CITY 230KV - SWEETWT6 230.00 230KV CKT 1'

SOURCE	DIRECTION	MONTCOMMONNAME	RATEB	TDF	TC%LOADING	CONTNAME
G11_022	'TO->FROM'	'G11-015T 345.00 - WWRDEHV7 345.00 345KV CKT 1'	1195	0.21429	101.5393	'WEATHERFORD SOUTHEAST - WEATHERFORD TAP 138KV CKT 1'
G11_022	'TO->FROM'	'G11-015T 345.00 - WWRDEHV7 345.00 345KV CKT 1'	1195	0.21429	101.4487	'CLINTON NATURAL GAS TAP - WEATHERFORD WIND FARM 138KV CKT 1'
G11_022	'TO->FROM'	'G11-015T 345.00 - WWRDEHV7 345.00 345KV CKT 1'	1195	0.21429	101.6321	'WEATHERFORD TAP - WEATHERFORD WIND FARM 138KV CKT 1'
G11_022	'TO->FROM'	'G11-015T 345.00 - WWRDEHV7 345.00 345KV CKT 1'	1195	0.21471	101.6373	'CAN_GAS4 138.00 - JENSEN ROAD 138KV CKT 1'
G11_022	'TO->FROM'	'G11-015T 345.00 - WWRDEHV7 345.00 345KV CKT 1'	1195	0.21882	104.6523	'STLN-DEMARC6230.00 - SWEETWT6 230.00 230KV CKT 1'
G11_022	'TO->FROM'	'G11-015T 345.00 - WWRDEHV7 345.00 345KV CKT 1'	1195	0.21396	101.3184	'JERICHO - KIRBY SWITCHING STATION 115KV CKT 1'
G11_022	'TO->FROM'	'G11-015T 345.00 - WWRDEHV7 345.00 345KV CKT 1'	1195	0.21396	101.3131	'CLARENDON - JERICHO 69KV CKT 1'
G11_022	'TO->FROM'	'G11-015T 345.00 - WWRDEHV7 345.00 345KV CKT 1'	1195	0.21396	101.2712	'CLARENDON - CLARENDON REC 69KV CKT 1'
G11_022	'TO->FROM'	'G11-015T 345.00 - WWRDEHV7 345.00 345KV CKT 1'	1195	0.2145	101.4105	'CHILDRESS - HOLLIS TAP 138KV CKT 1'
G11_022	'TO->FROM'	'G11-015T 345.00 - WWRDEHV7 345.00 345KV CKT 1'	1195	0.21516	101.856	'CHILDRESS - LAKE PAULINE 138KV CKT 1'
G11_022	'TO->FROM'	'G11-015T 345.00 - WWRDEHV7 345.00 345KV CKT 1'	1195	0.2145	101.4217	'HOLLIS TAP - WELLINGTON 138KV CKT 1'
G11_022	'TO->FROM'	'G11-015T 345.00 - WWRDEHV7 345.00 345KV CKT 1'	1195	0.2145	101.5222	'SHAMROCK - WELLINGTON 138KV CKT 1'
G11_022	'TO->FROM'	'G11-015T 345.00 - WWRDEHV7 345.00 345KV CKT 1'	1195	0.2145	101.6431	'MCLEAN RURAL SUB - SHAMROCK 115KV CKT 1'
G11_022	'TO->FROM'	'G11-015T 345.00 - WWRDEHV7 345.00 345KV CKT 1'	1195	0.21436	101.3529	'LAKE PAULINE - RUSSELL 138KV CKT 1'
G11_022	'TO->FROM'	'G11-015T 345.00 - WWRDEHV7 345.00 345KV CKT 1'	1195	0.21618	101.7708	'WAUKOMIS - WAUKOMIS TAP 138KV CKT 1'
G11_022	'TO->FROM'	'G11-015T 345.00 - WWRDEHV7 345.00 345KV CKT 1'	1195	0.21618	101.813	'HENESSEY - WAUKOMIS 138KV CKT 1'
G11_022	'TO->FROM'	'G11-015T 345.00 - WWRDEHV7 345.00 345KV CKT 1'	1195	0.21428	101.3461	'MARSHALL - WOODRING 138KV CKT 1'
G11_022	'TO->FROM'	'G11-015T 345.00 - WWRDEHV7 345.00 345KV CKT 1'	1195	0.21208	100.5408	'SOONER - WOODRING 345KV CKT 1'
G11_022	'TO->FROM'	'G11-015T 345.00 - WWRDEHV7 345.00 345KV CKT 1'	1195	0.21789	103.7692	'G08-13T 345.00 - WOODRING 345KV CKT 1'
G11_022	'TO->FROM'	'G11-015T 345.00 - WWRDEHV7 345.00 345KV CKT 1'	1195	0.20985	100.3675	'MATTHEWSON 345.00 - WOODRING 345KV CKT 1'
G11_022	'TO->FROM'	'G11-015T 345.00 - WWRDEHV7 345.00 345KV CKT 1'	1195	0.21481	101.5309	'KNOBHILL - SALINE 69KV CKT 1'
G11_022	'TO->FROM'	'G11-015T 345.00 - WWRDEHV7 345.00 345KV CKT 1'	1195	0.21481	101.5036	'HELENAT2 69.000 - SALINE 69KV CKT 1'
G11_022	'TO->FROM'	'G11-015T 345.00 - WWRDEHV7 345.00 345KV CKT 1'	1195	0.21481	101.4034	'GOLTRY - IMO 69KV CKT 1'
G11_022	'TO->FROM'	'G11-015T 345.00 - WWRDEHV7 345.00 345KV CKT 1'	1195	0.21481	101.424	'GOLTRY - HELENAT2 69.000 69KV CKT 1'
G11_022	'TO->FROM'	'G11-015T 345.00 - WWRDEHV7 345.00 345KV CKT 1'	1195	0.21463	101.2719	'IMO TAP - SOUTH 4TH ST 138KV CKT 1'
G11_022	'TO->FROM'	'G11-015T 345.00 - WWRDEHV7 345.00 345KV CKT 1'	1195	0.21428	101.3391	'COTTONWOOD CREEK - MARSHALL 138KV CKT 1'
G11_022	'TO->FROM'	'G11-015T 345.00 - WWRDEHV7 345.00 345KV CKT 1'	1195	0.21417	100.5344	'KILDARE4 - NEWKIRK4 138KV CKT 1'
G11_022	'TO->FROM'	'G11-015T 345.00 - WWRDEHV7 345.00 345KV CKT 1'	1195	0.21417	100.4552	'NEWKIRK4 - PECKHMT4 138.00 138KV CKT 1'
G11_022	'TO->FROM'	'G11-015T 345.00 - WWRDEHV7 345.00 345KV CKT 1'	1195	0.21402	100.5467	'KILDARE4 - WHITE EAGLE 138KV CKT 1'
G11_022	'TO->FROM'	'G11-015T 345.00 - WWRDEHV7 345.00 345KV CKT 1'	1195	0.21618	101.91	'DOVER SW - HENESSEY 138KV CKT 1'
G11_022	'TO->FROM'	'G11-015T 345.00 - WWRDEHV7 345.00 345KV CKT 1'	1195	0.21875	104.2673	'CLEO CORNER - GLASS MOUNTAIN 138KV CKT 1'
G11_022	'TO->FROM'	'G11-015T 345.00 - WWRDEHV7 345.00 345KV CKT 1'	1195	0.21987	104.3704	'CLEO CORNER - MEN TAP 138KV CKT 1'
G11_022	'TO->FROM'	'G11-015T 345.00 - WWRDEHV7 345.00 345KV CKT 1'	1195	0.21484	101.4488	'FPL SWITCH - WOODWARD 138KV CKT 1'
G11_022	'TO->FROM'	'G11-015T 345.00 - WWRDEHV7 345.00 345KV CKT 1'	1195	0.21617	102.3525	'DEWEY - IODINE 138KV CKT 1'
G11_022	'TO->FROM'	'G11-015T 345.00 - WWRDEHV7 345.00 345KV CKT 1'	1195	0.22062	105.4197	'DEWEY - SOUTHARD 138KV CKT 1'
G11_022	'TO->FROM'	'G11-015T 345.00 - WWRDEHV7 345.00 345KV CKT 1'	1195	0.21875	104.361	'GLASS MOUNTAIN - MOORELAND 138KV CKT 1'
G11_022	'TO->FROM'	'G11-015T 345.00 - WWRDEHV7 345.00 345KV CKT 1'	1195	0.21987	104.3426	'IMO TAP - MEN TAP 138KV CKT 1'
G11_022	'TO->FROM'	'G11-015T 345.00 - WWRDEHV7 345.00 345KV CKT 1'	1195	0.21496	102.1081	'KNOBHILL - MOORELAND 138KV CKT 1'
G11_022	'TO->FROM'	'G11-015T 345.00 - WWRDEHV7 345.00 345KV CKT 1'	1195	0.21617	102.4252	'IODINE - WWRDEHV4 138.00 138KV CKT 1'
G11_022	'TO->FROM'	'G11-015T 345.00 - WWRDEHV7 345.00 345KV CKT 1'	1195	0.21491	102.457	'CIMARRON - MINCO 7 345.00 345KV CKT 1'
G11_022	'TO->FROM'	'G11-015T 345.00 - WWRDEHV7 345.00 345KV CKT 1'	1195	0.21491	101.8897	'GRACMNT7 345.00 - MINCO 7 345.00 345KV CKT 1'
G11_022	'TO->FROM'	'G11-015T 345.00 - WWRDEHV7 345.00 345KV CKT 1'	1195	0.21105	101.2194	'SOONER - SPRING CREEK 345KV CKT 1'
G11_022	'TO->FROM'	'G11-015T 345.00 - WWRDEHV7 345.00 345KV CKT 1'	1195	0.22062	105.797	'EL RENO - ROMAN NOSE 138KV CKT 1'
G11_022	'TO->FROM'	'G11-015T 345.00 - WWRDEHV7 345.00 345KV CKT 1'	1195	0.21459	101.361	'CIMARRON - EL RENO 138KV CKT 1'
G11_022	'TO->FROM'	'G11-015T 345.00 - WWRDEHV7 345.00 345KV CKT 1'	1195	0.21463	101.3987	'JENSEN ROAD - JENSEN TAP 138KV CKT 1'
G11_022	'TO->FROM'	'G11-015T 345.00 - WWRDEHV7 345.00 345KV CKT 1'	1195	0.21432	101.2141	'CIMARRON - JENSEN TAP 138KV CKT 1'
G11_022	'TO->FROM'	'G11-015T 345.00 - WWRDEHV7 345.00 345KV CKT 1'	1195	0.22062	105.0204	'ROMAN NOSE - SOUTHARD 138KV CKT 1'
G11_022	'TO->FROM'	'G11-015T 345.00 - WWRDEHV7 345.00 345KV CKT 1'	1195	0.21316	100.5769	'ARCADIA - HORSESHOE LAKE 345KV CKT 1'
G11_022	'TO->FROM'	'G11-015T 345.00 - WWRDEHV7 345.00 345KV CKT 1'	1195	0.21316	100.5811	'HORSESHOE LAKE - SEMINOLE 345KV CKT 1'
G11_022	'TO->FROM'	'G11-015T 345.00 - WWRDEHV7 345.00 345KV CKT 1'	1195	0.21388	101.2981	'MORRISON - STILLWATER 138KV CKT 1'
G11_022	'TO->FROM'	'G11-015T 345.00 - WWRDEHV7 345.00 345KV CKT 1'	1195	0.21382	101.1787	'KINZE - MCELROY 138KV CKT 1'
G11_022	'TO->FROM'	'G11-015T 345.00 - WWRDEHV7 345.00 345KV CKT 1'	1195	0.21382	101.2131	'MCELROY - STILLWATER 138KV CKT 1'
G11_022	'TO->FROM'	'G11-015T 345.00 - WWRDEHV7 345.00 345KV CKT 1'	1195	0.21275	100.5219	'FT SMITH - MUSKOGEE 345KV CKT 1'
G11_022	'TO->FROM'	'G11-015T 345.00 - WWRDEHV7 345.00 345KV CKT 1'	1195	0.22011	103.9153	'MOORELAND 345.00 - WWRDEHV7 345.00 345KV CKT 1'

SOURCE	DIRECTION	MONTCOMMONNAME	RATEB	TDF	TC%LOADING	CONTNAME
G11_022	'TO->FROM'	'G11-015T 345.00 - WWRDEHV7 345.00 345KV CKT 1'	1195	0.22983	108.7553	'MED-LDG5 345.00 - WWRDEHV7 345.00 345KV CKT 1'
G11_022	'TO->FROM'	'G11-015T 345.00 - WWRDEHV7 345.00 345KV CKT 1'	1195	0.22983	108.7553	'MED-LDG5 345.00 - WWRDEHV7 345.00 345KV CKT 2'
G11_022	'TO->FROM'	'G11-015T 345.00 - WWRDEHV7 345.00 345KV CKT 1'	1195	0.21417	100.4556	'CRESWELL - PECKHMT4 138.00 138KV CKT 1'
G11_022	'TO->FROM'	'G11-015T 345.00 - WWRDEHV7 345.00 345KV CKT 1'	1195	0.21484	101.6062	'FPL SWITCH - MOORELAND 138KV CKT 1'
G11_022	'TO->FROM'	'G11-015T 345.00 - WWRDEHV7 345.00 345KV CKT 1'	1195	0.21388	101.2095	'ANADARKO - POCASSETT 138KV CKT 1'
G11_022	'TO->FROM'	'G11-015T 345.00 - WWRDEHV7 345.00 345KV CKT 1'	1195	0.21428	101.2632	'ARAPAHO - HAMON BUTLER 69KV CKT 1'
G11_022	'TO->FROM'	'G11-015T 345.00 - WWRDEHV7 345.00 345KV CKT 1'	1195	0.21428	101.2613	'ARAPAHO - INDUSTRIAL PARK 69KV CKT 1'
G11_022	'TO->FROM'	'G11-015T 345.00 - WWRDEHV7 345.00 345KV CKT 1'	1195	0.2143	101.2191	'CALUMET - WATONGA SW 69KV CKT 1'
G11_022	'TO->FROM'	'G11-015T 345.00 - WWRDEHV7 345.00 345KV CKT 1'	1195	0.21424	101.3037	'CANTON - OKEENE 69KV CKT 1'
G11_022	'TO->FROM'	'G11-015T 345.00 - WWRDEHV7 345.00 345KV CKT 1'	1195	0.21424	101.3298	'CANTON - TALOGA 69KV CKT 1'
G11_022	'TO->FROM'	'G11-015T 345.00 - WWRDEHV7 345.00 345KV CKT 1'	1195	0.21754	103.6481	'CEDARDALE - MOORELAND 138KV CKT 1'
G11_022	'TO->FROM'	'G11-015T 345.00 - WWRDEHV7 345.00 345KV CKT 1'	1195	0.21754	103.602	'CEDARDALE - OKEENE 138KV CKT 1'
G11_022	'TO->FROM'	'G11-015T 345.00 - WWRDEHV7 345.00 345KV CKT 1'	1195	0.21503	101.6368	'CLINTON - WEATHERFORD 138KV CKT 1'
G11_022	'TO->FROM'	'G11-015T 345.00 - WWRDEHV7 345.00 345KV CKT 1'	1195	0.21503	101.6565	'CLINTON - G07-32T 138.00 138KV CKT 1'
G11_022	'TO->FROM'	'G11-015T 345.00 - WWRDEHV7 345.00 345KV CKT 1'	1195	0.21428	101.2286	'CORDELL - INDUSTRIAL PARK 69KV CKT 1'
G11_022	'TO->FROM'	'G11-015T 345.00 - WWRDEHV7 345.00 345KV CKT 1'	1195	0.21718	102.9672	'DOVER SW - OKEENE 138KV CKT 1'
G11_022	'TO->FROM'	'G11-015T 345.00 - WWRDEHV7 345.00 345KV CKT 1'	1195	0.21426	101.2391	'GOTEBO - MOUNTAIN VIEW 69KV CKT 1'
G11_022	'TO->FROM'	'G11-015T 345.00 - WWRDEHV7 345.00 345KV CKT 1'	1195	0.21428	101.2641	'HAMON BUTLER - PUTNAM 69KV CKT 1'
G11_022	'TO->FROM'	'G11-015T 345.00 - WWRDEHV7 345.00 345KV CKT 1'	1195	0.2144	101.3979	'MOORELAND - TALOGA 138KV CKT 1'
G11_022	'TO->FROM'	'G11-015T 345.00 - WWRDEHV7 345.00 345KV CKT 1'	1195	0.2161	102.1668	'MOORELAND - NINMILE 4 138.00 138KV CKT 1'
G11_022	'TO->FROM'	'G11-015T 345.00 - WWRDEHV7 345.00 345KV CKT 1'	1195	0.21487	101.4116	'MOREWOOD SW - RHWIND4 138.00 138KV CKT 1'
G11_022	'TO->FROM'	'G11-015T 345.00 - WWRDEHV7 345.00 345KV CKT 1'	1195	0.2161	102.1485	'MOREWOOD SW - NINMILE 4 138.00 138KV CKT 1'
G11_022	'TO->FROM'	'G11-015T 345.00 - WWRDEHV7 345.00 345KV CKT 1'	1195	0.21426	101.2039	'MOUNTAIN VIEW - PINE RIDGE 69KV CKT 1'
G11_022	'TO->FROM'	'G11-015T 345.00 - WWRDEHV7 345.00 345KV CKT 1'	1195	0.21449	101.4164	'OKEENE - WATONGA SW 69KV CKT 1'
G11_022	'TO->FROM'	'G11-015T 345.00 - WWRDEHV7 345.00 345KV CKT 1'	1195	0.21428	101.2867	'PUTNAM - TALOGA 69KV CKT 1'
G11_022	'TO->FROM'	'G11-015T 345.00 - WWRDEHV7 345.00 345KV CKT 1'	1195	0.21216	100.5746	'BORDER 7345.00 - Hitchland Interchange 345KV CKT 1'
G11_022	'TO->FROM'	'G11-015T 345.00 - WWRDEHV7 345.00 345KV CKT 1'	1195	0.21216	100.5746	'BORDER 7345.00 - Hitchland Interchange 345KV CKT 2'
G11_022	'TO->FROM'	'G11-015T 345.00 - WWRDEHV7 345.00 345KV CKT 1'	1195	0.22695	102.1838	'Hitchland Interchange - STEVENSCO 345.00 345KV CKT 1'
G11_022	'TO->FROM'	'G11-015T 345.00 - WWRDEHV7 345.00 345KV CKT 1'	1195	0.21016	100.3353	'2008-047T 345.00 - Hitchland Interchange 345KV CKT 2'
G11_022	'TO->FROM'	'G11-015T 345.00 - WWRDEHV7 345.00 345KV CKT 1'	1195	0.21882	105.0026	'GRAPEVINE INTERCHANGE - STATELINE INTERCHANGE 230KV CKT 1'
G11_022	'TO->FROM'	'G11-015T 345.00 - WWRDEHV7 345.00 345KV CKT 1'	1195	0.21682	104.0919	'GRAPEVINE INTERCHANGE - NICHOLS STATION 230KV CKT 1'
G11_022	'TO->FROM'	'G11-015T 345.00 - WWRDEHV7 345.00 345KV CKT 1'	1195	0.22834	104.6272	'BORDER 7345.00 - TUCO INTERCHANGE 345KV CKT 1'
G11_022	'TO->FROM'	'G11-015T 345.00 - WWRDEHV7 345.00 345KV CKT 1'	1195	0.21882	104.6523	'STATELINE INTERCHANGE - STLN-DEMARC6230.00 230KV CKT 1'
G11_022	'TO->FROM'	'G11-015T 345.00 - WWRDEHV7 345.00 345KV CKT 1'	1195	0.2145	101.7209	'MCCLELLAN SUB - MCLEAN RURAL SUB 115KV CKT 1'
G11_022	'TO->FROM'	'G11-015T 345.00 - WWRDEHV7 345.00 345KV CKT 1'	1195	0.2145	101.7614	'KIRBY SWITCHING STATION - MCCLELLAN SUB 115KV CKT 1'
G11_022	'TO->FROM'	'G11-015T 345.00 - WWRDEHV7 345.00 345KV CKT 1'	1195	0.22695	106.0885	'FINNEY SWITCHING STATION - STEVENSCO 345.00 345KV CKT 1'
G11_022	'TO->FROM'	'G11-015T 345.00 - WWRDEHV7 345.00 345KV CKT 1'	1195	0.22217	101.4033	'G05-17T 345.00 - POTTER COUNTY INTERCHANGE 345KV CKT 1'
G11_022	'TO->FROM'	'G11-015T 345.00 - WWRDEHV7 345.00 345KV CKT 1'	1195	0.21473	101.5891	'AMARILLO SOUTH INTERCHANGE - G07-48T 230.00 230KV CKT 1'
G11_022	'TO->FROM'	'G11-015T 345.00 - WWRDEHV7 345.00 345KV CKT 1'	1195	0.2146	101.4698	'DEAF SMITH COUNTY INTERCHANGE - S-RANDLCO 230.00 230KV CKT 1'
G11_022	'TO->FROM'	'G11-015T 345.00 - WWRDEHV7 345.00 345KV CKT 1'	1195	0.21431	101.4538	'SWISHER COUNTY INTERCHANGE - TUCO INTERCHANGE 230KV CKT 1'
G11_022	'TO->FROM'	'G11-015T 345.00 - WWRDEHV7 345.00 345KV CKT 1'	1195	0.21473	101.9249	'G07-48T 230.00 - SWISHER COUNTY INTERCHANGE 230KV CKT 1'
G11_022	'TO->FROM'	'G11-015T 345.00 - WWRDEHV7 345.00 345KV CKT 1'	1195	0.21346	101.5409	'TOLK STATION EAST - TUCO INTERCHANGE 230KV CKT 1'
G11_022	'TO->FROM'	'G11-015T 345.00 - WWRDEHV7 345.00 345KV CKT 1'	1195	0.23319	112.84	'G08-14T 345.00 - TUCO INTERCHANGE 345KV CKT 1'
G11_022	'TO->FROM'	'G11-015T 345.00 - WWRDEHV7 345.00 345KV CKT 1'	1195	0.21438	101.7795	'KNOLL 230 - POSTROCK6 230.00 230KV CKT 1'
G11_022	'TO->FROM'	'G11-015T 345.00 - WWRDEHV7 345.00 345KV CKT 1'	1195	0.21516	102.2215	'KNOLL 230 - SMOKYHL6 230.00 230KV CKT 1'
G11_022	'TO->FROM'	'G11-015T 345.00 - WWRDEHV7 345.00 345KV CKT 1'	1195	0.22012	106.3089	'G10-16T 345.00 - POSTROCK7 345.00 345KV CKT 1'
G11_022	'TO->FROM'	'G11-015T 345.00 - WWRDEHV7 345.00 345KV CKT 1'	1195	0.218	103.6777	'AXTELL - POSTROCK7 345.00 345KV CKT 1'
G11_022	'TO->FROM'	'G11-015T 345.00 - WWRDEHV7 345.00 345KV CKT 1'	1195	0.21516	102.7107	'SMOKYHL6 230.00 - SUMMIT 230KV CKT 1'
G11_022	'TO->FROM'	'G11-015T 345.00 - WWRDEHV7 345.00 345KV CKT 1'	1195	0.21415	101.2237	'HUNTSVILLE - ST_JOHN 115KV CKT 1'
G11_022	'TO->FROM'	'G11-015T 345.00 - WWRDEHV7 345.00 345KV CKT 1'	1195	0.21415	101.2125	'HUNTSVILLE - HUTCHINSON ENERGY CENTER 115KV CKT 1'
G11_022	'TO->FROM'	'G11-015T 345.00 - WWRDEHV7 345.00 345KV CKT 1'	1195	0.21415	101.4342	'ST JOHN - ST_JOHN 115KV CKT 1'
G11_022	'TO->FROM'	'G11-015T 345.00 - WWRDEHV7 345.00 345KV CKT 1'	1195	0.2207	104.407	'HOLCOMB - SETAB 345KV CKT 1'
G11_022	'TO->FROM'	'G11-015T 345.00 - WWRDEHV7 345.00 345KV CKT 1'	1195	0.2135	100.7881	'G08-18 345.00 - HOLCOMB 345KV CKT 1'
G11_022	'TO->FROM'	'G11-015T 345.00 - WWRDEHV7 345.00 345KV CKT 1'	1195	0.22248	106.2164	'MINGO - SETAB 345KV CKT 1'

SOURCE	DIRECTION	MONTCOMMONNAME	RATEB	TDF	TC%LOADING	CONTNAME
G11_022	'TO->FROM'	'G11-015T 345.00 - WWRDEHV7 345.00 345KV CKT 1'	1195	0.22334	106.384	'MINGO - RED WILLOW 345KV CKT 1'
G11_022	'TO->FROM'	'G11-015T 345.00 - WWRDEHV7 345.00 345KV CKT 1'	1195	0.23051	108.6876	'GRAY CO 345.00 - SPEARVILLE 345KV CKT 1'
G11_022	'TO->FROM'	'G11-015T 345.00 - WWRDEHV7 345.00 345KV CKT 1'	1195	0.22012	105.2281	'G10-16T 345.00 - SPEARVILLE 345KV CKT 1'
G11_022	'TO->FROM'	'G11-015T 345.00 - WWRDEHV7 345.00 345KV CKT 1'	1195	0.21426	101.8994	'HOYT - JEFFERY ENERGY CENTER 345KV CKT 1'
G11_022	'TO->FROM'	'G11-015T 345.00 - WWRDEHV7 345.00 345KV CKT 1'	1195	0.21435	101.5659	'HOYT - STRANGER CREEK 345KV CKT 1'
G11_022	'TO->FROM'	'G11-015T 345.00 - WWRDEHV7 345.00 345KV CKT 1'	1195	0.21448	101.2691	'EMPORIA ENERGY CENTER - SWISSVALE 345KV CKT 1'
G11_022	'TO->FROM'	'G11-015T 345.00 - WWRDEHV7 345.00 345KV CKT 1'	1195	0.21481	101.4276	'EMPORIA ENERGY CENTER - WICHITA 345KV CKT 1'
G11_022	'TO->FROM'	'G11-015T 345.00 - WWRDEHV7 345.00 345KV CKT 1'	1195	0.21376	101.2715	'CRAIG - STRANGER CREEK 345KV CKT 1'
G11_022	'TO->FROM'	'G11-015T 345.00 - WWRDEHV7 345.00 345KV CKT 1'	1195	0.21481	101.4381	'SWISSVALE - WEST GARDNER 345KV CKT 1'
G11_022	'TO->FROM'	'G11-015T 345.00 - WWRDEHV7 345.00 345KV CKT 1'	1195	0.2174	102.1971	'BENTON - ROSE HILL 345KV CKT 1'
G11_022	'TO->FROM'	'G11-015T 345.00 - WWRDEHV7 345.00 345KV CKT 1'	1195	0.22055	103.8048	'BENTON - WICHITA 345KV CKT 1'
G11_022	'TO->FROM'	'G11-015T 345.00 - WWRDEHV7 345.00 345KV CKT 1'	1195	0.214	102.5966	'LACYGNE - NEOSHO 345KV CKT 1'
G11_022	'TO->FROM'	'G11-015T 345.00 - WWRDEHV7 345.00 345KV CKT 1'	1195	0.21567	102.0528	'G05-13T 345.00 - NEOSHO 345KV CKT 1'
G11_022	'TO->FROM'	'G11-015T 345.00 - WWRDEHV7 345.00 345KV CKT 1'	1195	0.21567	101.612	'LATHAMS7 345.00 - ROSE HILL 345KV CKT 1'
G11_022	'TO->FROM'	'G11-015T 345.00 - WWRDEHV7 345.00 345KV CKT 1'	1195	0.22775	110.6685	'MED-LDG5 345.00 - WICHITA 345KV CKT 1'
G11_022	'TO->FROM'	'G11-015T 345.00 - WWRDEHV7 345.00 345KV CKT 1'	1195	0.22775	110.6685	'MED-LDG5 345.00 - WICHITA 345KV CKT 2'
G11_022	'TO->FROM'	'G11-015T 345.00 - WWRDEHV7 345.00 345KV CKT 1'	1195	0.21412	101.4302	'ANDERSONCO 345.00 - WOLF CREEK 345KV CKT 1'
G11_022	'TO->FROM'	'G11-015T 345.00 - WWRDEHV7 345.00 345KV CKT 1'	1195	0.21567	101.8876	'G05-13T 345.00 - LATHAMS7 345.00 345KV CKT 1'
G11_022	'TO->FROM'	'G11-015T 345.00 - WWRDEHV7 345.00 345KV CKT 1'	1195	0.21544	102.5874	'CIRCLE - MULLERGREN 230KV CKT 1'
G11_022	'TO->FROM'	'G11-015T 345.00 - WWRDEHV7 345.00 345KV CKT 1'	1195	0.21395	101.1902	'CHISHOLM - MAIZE 4 138.00 138KV CKT 1'
G11_022	'TO->FROM'	'G11-015T 345.00 - WWRDEHV7 345.00 345KV CKT 1'	1195	0.21545	102.1405	'CLEARWATER - GILL ENERGY CENTER WEST 138KV CKT 1'
G11_022	'TO->FROM'	'G11-015T 345.00 - WWRDEHV7 345.00 345KV CKT 1'	1195	0.21545	102.2639	'CLEARWATER - MILAN TAP 138KV CKT 1'
G11_022	'TO->FROM'	'G11-015T 345.00 - WWRDEHV7 345.00 345KV CKT 1'	1195	0.21379	101.6642	'EVANS ENERGY CENTER NORTH - EVANS ENERGY CENTER SOUTH 138KV CKT 1'
G11_022	'TO->FROM'	'G11-015T 345.00 - WWRDEHV7 345.00 345KV CKT 1'	1195	0.21395	101.2013	'EVANS ENERGY CENTER NORTH - MAIZE 4 138.00 138KV CKT 1'
G11_022	'TO->FROM'	'G11-015T 345.00 - WWRDEHV7 345.00 345KV CKT 1'	1195	0.21545	102.592	'FLATRDG3 - HARPER 138KV CKT 1'
G11_022	'TO->FROM'	'G11-015T 345.00 - WWRDEHV7 345.00 345KV CKT 1'	1195	0.21545	102.2321	'FLATRDG3 - MEDICINE LODGE 138KV CKT 1'
G11_022	'TO->FROM'	'G11-015T 345.00 - WWRDEHV7 345.00 345KV CKT 1'	1195	0.21402	101.2538	'NINNESC3 115.00 - PRATT 115KV CKT 1'
G11_022	'TO->FROM'	'G11-015T 345.00 - WWRDEHV7 345.00 345KV CKT 1'	1195	0.21402	101.2296	'NINNESC3 115.00 - ST JOHN 115KV CKT 1'
G11_022	'TO->FROM'	'G11-015T 345.00 - WWRDEHV7 345.00 345KV CKT 1'	1195	0.21402	101.217	'MEDICINE LODGE - SAWYER 3 115.00 115KV CKT 1'
G11_022	'TO->FROM'	'G11-015T 345.00 - WWRDEHV7 345.00 345KV CKT 1'	1195	0.21402	101.2114	'PRATT - SAWYER 3 115.00 115KV CKT 1'
G11_022	'TO->FROM'	'G11-015T 345.00 - WWRDEHV7 345.00 345KV CKT 1'	1195	0.21545	102.4222	'HARPER - MILAN TAP 138KV CKT 1'
G11_022	'TO->FROM'	'G11-015T 345.00 - WWRDEHV7 345.00 345KV CKT 1'	1195	0.21446	101.4623	'MED-LDG5 345.00 345/138KV TRANSFORMER CKT 1'
G11_022	'TO->FROM'	'G11-015T 345.00 - WWRDEHV7 345.00 345KV CKT 1'	1195	0.21537	102.5028	'MULLERGREN - SPEARVILLE 230KV CKT 1'
G11_022	'TO->FROM'	'G11-015T 345.00 - WWRDEHV7 345.00 345KV CKT 1'	1195	0.21374	100.469	'LACYGNE - WEST GARDNER 345KV CKT 1'
G11_022	'TO->FROM'	'G11-015T 345.00 - WWRDEHV7 345.00 345KV CKT 1'	1195	0.21363	100.4107	'LACYGNE - STILWELL 345KV CKT 1'
G11_022	'TO->FROM'	'G11-015T 345.00 - WWRDEHV7 345.00 345KV CKT 1'	1195	0.21381	101.2343	'HAWTHORN - NASHUA 345KV CKT 1'
G11_022	'TO->FROM'	'G11-015T 345.00 - WWRDEHV7 345.00 345KV CKT 1'	1195	0.21412	101.4779	'ANDERSONCO 345.00 - LACYGNE 345KV CKT 1'
G11_022	'TO->FROM'	'G11-015T 345.00 - WWRDEHV7 345.00 345KV CKT 1'	1195	0.21362	100.5171	'BROOKLINE - SUB 383 - MONETT 345KV CKT 1'
G11_022	'TO->FROM'	'G11-015T 345.00 - WWRDEHV7 345.00 345KV CKT 1'	1195	0.21789	102.8423	'G08-13T 345.00 - SUMNERCO 345.00 345KV CKT 1'
G11_022	'TO->FROM'	'G11-015T 345.00 - WWRDEHV7 345.00 345KV CKT 1'	1195	0.2135	100.8089	'G08-18 345.00 - GRAY CO 345.00 345KV CKT 1'
G11_022	'TO->FROM'	'G11-015T 345.00 - WWRDEHV7 345.00 345KV CKT 1'	1195	0.22765	104.6712	'2008-047T 345.00 - GRAY CO 345.00 345KV CKT 1'
G11_022	'TO->FROM'	'G11-015T 345.00 - WWRDEHV7 345.00 345KV CKT 1'	1195	0.21532	102.1887	'AXTELL - PAULINE 345KV CKT 1'
G11_022	'TO->FROM'	'G11-015T 345.00 - WWRDEHV7 345.00 345KV CKT 1'	1195	0.21386	101.2347	'CROOKED CREEK - NORTH PLATTE 230KV CKT 1'
G11_022	'TO->FROM'	'G11-015T 345.00 - WWRDEHV7 345.00 345KV CKT 1'	1195	0.21399	101.229	'COLUMWEST - GRAND ISLAND 230KV CKT 1'
G11_022	'TO->FROM'	'G11-015T 345.00 - WWRDEHV7 345.00 345KV CKT 1'	1195	0.21784	102.5755	'GERALD GENTLEMAN STATION - RED WILLOW 345KV CKT 1'
G11_022	'TO->FROM'	'G11-015T 345.00 - WWRDEHV7 345.00 345KV CKT 1'	1195	0.21408	101.5716	'GERALD GENTLEMAN STATION - SWEETWATER 345KV CKT 1'
G11_022	'TO->FROM'	'G11-015T 345.00 - WWRDEHV7 345.00 345KV CKT 1'	1195	0.21398	101.3871	'GERALD GENTLEMAN STATION - SWEETWATER 345KV CKT 2'
G11_022	'TO->FROM'	'G11-015T 345.00 - WWRDEHV7 345.00 345KV CKT 1'	1195	0.21441	101.3863	'MCCOOL - MOORE 345KV CKT 1'
G11_022	'TO->FROM'	'G11-015T 345.00 - WWRDEHV7 345.00 345KV CKT 1'	1195	0.21442	101.5255	'GRAND ISLAND - MCCOOL 345KV CKT 1'
G11_022	'TO->FROM'	'G11-015T 345.00 - WWRDEHV7 345.00 345KV CKT 1'	1195	0.21522	102.0487	'MOORE - PAULINE 345KV CKT 1'
G11_022	'TO->FROM'	'G11-015T 345.00 - WWRDEHV7 345.00 345KV CKT 1'	1195	0.21524	102.6318	'GRAND ISLAND - SWEETWATER 345KV CKT 1'
G11_022	'TO->FROM'	'G11-015T 345.00 - WWRDEHV7 345.00 345KV CKT 1'	1195	0.21372	100.4403	'SNORANDA 161.00 - NEW MADRID 161KV CKT 1'
G11_022	'TO->FROM'	'G11-015T 345.00 - WWRDEHV7 345.00 345KV CKT 1'	1195	0.21374	100.6374	'BAXTER WILSON SES - RAY BRASWELL SES 500KV CKT 1'
G11_022	'TO->FROM'	'G11-015T 345.00 - WWRDEHV7 345.00 345KV CKT 1'	1195	0.21373	100.5381	'BAXTER WILSON SES - PERRYVILLE 500KV CKT 1'

SOURCE	DIRECTION	MONTCOMMONNAME	RATEB	TDF	TC%LOADING	CONTNAME
G11_022	'TO->FROM'	'G11-015T 345.00 - WWRDEHV7 345.00 345KV CKT 1'	1195	0.21386	101.3015	'LAKEOVER - MCADAMS 500KV CKT 1'
G11_022	'TO->FROM'	'G11-015T 345.00 - WWRDEHV7 345.00 345KV CKT 1'	1195	0.21395	101.286	'MCADAMS - WOLF CREEK 500KV CKT 1'
G11_022	'TO->FROM'	'G11-015T 345.00 - WWRDEHV7 345.00 345KV CKT 1'	1195	0.21364	100.6219	'ARKANSAS NUCLEAR ONE - MABELVALE 500 500KV CKT 1'
G11_022	'TO->FROM'	'G11-015T 345.00 - WWRDEHV7 345.00 345KV CKT 1'	1195	0.21365	100.4915	'ARKANSAS NUCLEAR ONE - PLEASANT HILL 500KV CKT 1'
G11_022	'TO->FROM'	'G11-015T 345.00 - WWRDEHV7 345.00 345KV CKT 1'	1195	0.21385	100.1872	'KEO EHV - WEST MEMPHIS 500 500KV CKT 1'
G11_022	'TO->FROM'	'G11-015T 345.00 - WWRDEHV7 345.00 345KV CKT 1'	1195	0.21382	100.2917	'DELL 500 - INDEPENDENCE 500KV CKT 1'
G11_022	'TO->FROM'	'G11-015T 345.00 - WWRDEHV7 345.00 345KV CKT 1'	1195	0.21387	101.1972	'7LUTESVIL 345.00 - 7ST FRANC 345.00 345KV CKT 1'
G11_022	'TO->FROM'	'G11-015T 345.00 - WWRDEHV7 345.00 345KV CKT 1'	1195	0.21389	101.2278	'ELK CITY (ELKCTY-4) 138/69/13.8KV TRANSFORMER CKT 1'
G11_022	'TO->FROM'	'G11-015T 345.00 - WWRDEHV7 345.00 345KV CKT 1'	1195	0.21882	106.1994	'ELK CITY 230KV (ELKCTY-6) 230/138/13.8KV TRANSFORMER CKT 1'
G11_022	'TO->FROM'	'G11-015T 345.00 - WWRDEHV7 345.00 345KV CKT 1'	1195	0.21396	101.3106	'JERICHO (JERIC2WT) 115/69/14.4KV TRANSFORMER CKT 1'
G11_022	'TO->FROM'	'G11-015T 345.00 - WWRDEHV7 345.00 345KV CKT 1'	1195	0.2145	101.5147	'SHAMROCK (SHAMRCK2) 138/69/14.4KV TRANSFORMER CKT 1'
G11_022	'TO->FROM'	'G11-015T 345.00 - WWRDEHV7 345.00 345KV CKT 1'	1195	0.2145	101.6404	'SHAMROCK (SHAMRCK1) 115/69/14.4KV TRANSFORMER CKT 1'
G11_022	'TO->FROM'	'G11-015T 345.00 - WWRDEHV7 345.00 345KV CKT 1'	1195	0.21482	100.5416	'WOODRING (WOODRNG2) 345/138/13.8KV TRANSFORMER CKT 1'
G11_022	'TO->FROM'	'G11-015T 345.00 - WWRDEHV7 345.00 345KV CKT 1'	1195	0.21403	101.2285	'WOODWARD (WOODWRD2) 138/69/13.2KV TRANSFORMER CKT 1'
G11_022	'TO->FROM'	'G11-015T 345.00 - WWRDEHV7 345.00 345KV CKT 1'	1195	0.21496	102.0828	'KNOBHILL (KNOBHIL4) 138/69/13.2KV TRANSFORMER CKT 1'
G11_022	'TO->FROM'	'G11-015T 345.00 - WWRDEHV7 345.00 345KV CKT 1'	1195	0.2135	100.3901	'NORTHWEST (NORTWST2) 345/138/13.8KV TRANSFORMER CKT 1'
G11_022	'TO->FROM'	'G11-015T 345.00 - WWRDEHV7 345.00 345KV CKT 1'	1195	0.21352	100.4962	'NORTHWEST (NORTWST3) 345/138/13.8KV TRANSFORMER CKT 1'
G11_022	'TO->FROM'	'G11-015T 345.00 - WWRDEHV7 345.00 345KV CKT 1'	1195	0.2136	100.4252	'CIMARRON (CIMARON1) 345/138/13.8KV TRANSFORMER CKT 1'
G11_022	'TO->FROM'	'G11-015T 345.00 - WWRDEHV7 345.00 345KV CKT 1'	1195	0.2136	100.4417	'CIMARRON (CIMARON2) 345/138/13.8KV TRANSFORMER CKT 1'
G11_022	'TO->FROM'	'G11-015T 345.00 - WWRDEHV7 345.00 345KV CKT 1'	1195	0.21388	101.3598	'SUNNYSIDE (SUNNYSD3) 345/138/13.8KV TRANSFORMER CKT 1'
G11_022	'TO->FROM'	'G11-015T 345.00 - WWRDEHV7 345.00 345KV CKT 1'	1195	0.21283	101.6801	'ARKANSAS NUCLEAR ONE - FT SMITH 500KV CKT 1'
G11_022	'TO->FROM'	'G11-015T 345.00 - WWRDEHV7 345.00 345KV CKT 1'	1195	0.22011	103.8795	'MOORELAND 345.00 (MRLNDAUTO) 345/138/13.8KV TRANSFORMER CKT 1'
G11_022	'TO->FROM'	'G11-015T 345.00 - WWRDEHV7 345.00 345KV CKT 1'	1195	0.21401	101.2093	'TALOGA (TALOGA) 138/69/13.8KV TRANSFORMER CKT 1'
G11_022	'TO->FROM'	'G11-015T 345.00 - WWRDEHV7 345.00 345KV CKT 1'	1195	0.21461	100.6304	'HITCHLAND INTERCHANGE (H TP80148301) 230/115/13.2KV TRANSFORMER CKT 1'
G11_022	'TO->FROM'	'G11-015T 345.00 - WWRDEHV7 345.00 345KV CKT 1'	1195	0.22217	101.851	'POTTER COUNTY INTERCHANGE (WAUK 90343-A) 345/230/13.2KV TRANSFORMER CKT 1'
G11_022	'TO->FROM'	'G11-015T 345.00 - WWRDEHV7 345.00 345KV CKT 1'	1195	0.21382	101.2232	'WICHITA (WICHT12X) 345/138/13.8KV TRANSFORMER CKT 1'
G11_022	'TO->FROM'	'G11-015T 345.00 - WWRDEHV7 345.00 345KV CKT 1'	1195	0.21415	101.3524	'7OVERTON 345.00 - SIBLEY 345KV CKT 1'
G11_022	'TO->FROM'	'G11-015T 345.00 - WWRDEHV7 345.00 345KV CKT 1'	1195	0.21377	101.2701	'CLINTON - MONTROSE 161KV CKT 1'
G11_022	'TO->FROM'	'G11-015T 345.00 - WWRDEHV7 345.00 345KV CKT 1'	1195	0.21398	101.3352	'BROOKLINE - MORGAN 345KV CKT 1'
G11_022	'TO->FROM'	'G11-015T 345.00 - WWRDEHV7 345.00 345KV CKT 1'	1195	0.23332	111.4524	'LAWTON EASTSIDE - OKLAUNION 345KV CKT 1'
G11_022	'TO->FROM'	'G11-015T 345.00 - WWRDEHV7 345.00 345KV CKT 1'	1195	0.23332	104.4057	'G08-14T 345.00 - OKLAUNION 345KV CKT 1'
G11_022	'TO->FROM'	'G11-015T 345.00 - WWRDEHV7 345.00 345KV CKT 1'	1195	0.23332	103.4862	'G08-14T 345.00 - TUCO INTERCHANGE 345KV CKT 1'
G11_022	'TO->FROM'	'G11-015T 345.00 - WWRDEHV7 345.00 345KV CKT 1'	1195	0.22776	101.7039	'MED-LDG5 345.00 - WICHITA 345KV CKT 1'
G11_022	'TO->FROM'	'G11-015T 345.00 - WWRDEHV7 345.00 345KV CKT 1'	1195	0.22776	101.7039	'MED-LDG5 345.00 - WICHITA 345KV CKT 2'
G11_022		Non Converged Contingency	0	0.20336	-	'DBL-MEDLO-WI'
G11_022	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.22345	104.8946	'LAWTON EASTSIDE - OKLAUNION 345KV CKT 1'
G11_022	'TO->FROM'	'G11-015T 345.00 - WWRDEHV7 345.00 345KV CKT 1'	1195	0.22345	102.5126	'LAWTON EASTSIDE - OKLAUNION 345KV CKT 1'
G11_022	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.22098	115.0066	'LAWTON EASTSIDE - OKLAUNION 345KV CKT 1'
G11_022	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.22098	107.8631	'G08-14T 345.00 - OKLAUNION 345KV CKT 1'
G11_022	'FROM->TO'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.22098	107.399	'G08-14T 345.00 - TUCO INTERCHANGE 345KV CKT 1'
G11_022	'TO->FROM'	'G11-015T 345.00 - WWRDEHV7 345.00 345KV CKT 1'	1195	0.22098	112.9799	'LAWTON EASTSIDE - OKLAUNION 345KV CKT 1'
G11_022	'TO->FROM'	'G11-015T 345.00 - WWRDEHV7 345.00 345KV CKT 1'	1195	0.22098	105.6611	'G08-14T 345.00 - OKLAUNION 345KV CKT 1'
G11_022	'TO->FROM'	'G11-015T 345.00 - WWRDEHV7 345.00 345KV CKT 1'	1195	0.22098	105.1945	'G08-14T 345.00 - TUCO INTERCHANGE 345KV CKT 1'
G11_022		Non Converged Contingency	0	0.21365	-	'DBL-MEDLO-WI'
G11_022		Non Converged Contingency	0	0.21423	-	'DBL-MEDLO-WI'
G11_022		Non Converged Contingency	0	0.20327	-	'DBL-MEDLO-WI'
G11_022		Non Converged Contingency	0	0.33889	-	'DBL-G0847-WO'
G11_023		Non Converged Contingency	0	0.4574	-	'DBL-COM-MEDL'
G11_023		Non Converged Contingency	0	0.29928	-	'DBL-MEDLO-WI'
G11_023		Non Converged Contingency	0	0.4573	-	'DBL-COM-MEDL'
G11_023		Non Converged Contingency	0	0.29924	-	'DBL-MEDLO-WI'
G11_023		Non Converged Contingency	0	0.45718	-	'DBL-COM-MEDL'
G11_023		Non Converged Contingency	0	0.2889	-	'DBL-MEDLO-WI'
G11_023		Non Converged Contingency	0	0.45707	-	'DBL-COM-MEDL'

SOURCE	DIRECTION	MONTCOMMONNAME	RATEB	TDF	TC%LOADING	CONTNAME
G11_023		Non Converged Contingency	0	0.28886	-	'DBL-MEDLO-WI'
G11_023		Non Converged Contingency	0	0.26616	-	'DBL-MEDLO-WI'
G11_023		Non Converged Contingency	0	0.45728	-	'DBL-COM-MEDL'
G11_023		Non Converged Contingency	0	0.2888	-	'DBL-MEDLO-WI'
G11_023		Non Converged Contingency	0	0.45718	-	'DBL-COM-MEDL'
G11_023		Non Converged Contingency	0	0.28876	-	'DBL-MEDLO-WI'
G11_024	'FROM->TO'	'G11-015T 345.00 - WWRDEHV7 345.00 345KV CKT 1'	1195	1	113.4438	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'
G11_024		Non Converged Contingency	1195	0.48595	-	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'
G11_024		Non Converged Contingency	1195	0.51405	-	'G11-015T 345.00 - WWRDEHV7 345.00 345KV CKT 1'
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.48595	131.3978	'BASE CASE'
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.48563	130.8698	'FLINT CREEK - GRDA1 345KV CKT 1'
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.48558	130.9367	'FLINT CREEK - SUB 383 - MONETT 345KV CKT 1'
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.48563	130.6381	'CHAMBER SPRINGS - CLARKSVILLE 345KV CKT 1'
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.48601	130.9676	'CLARKSVILLE - MUSKOGEE 345KV CKT 1'
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.4813	129.5919	'REDBUD - RIVERSIDE STATION 345KV CKT 1'
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.48593	131.8865	'NORTHEAST STATION - ONETA 345KV CKT 1'
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.48525	131.0506	'CLEVELAND - TULSA NORTH 345KV CKT 1'
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.48561	130.3568	'DELAWARE - NORTHEAST STATION 345KV CKT 1'
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.48558	130.9686	'DELAWARE - NEOSHO 345KV CKT 1'
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.48281	129.9756	'PITTSBURG - VALLIANT 345KV CKT 1'
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.48337	130.5069	'PITTSBURG - SEMINOLE 345KV CKT 1'
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.48585	131.8474	'HINTON - WEATHERFORD JCT. 138KV CKT 1'
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.48585	131.8378	'CAN_GAS4 138.00 - HINTON 138KV CKT 1'
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.48622	131.8972	'CARNEGIE - HOBART JUNCTION 138KV CKT 1'
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.48622	131.8555	'CARNEGIE - SOUTHWESTERN STATION 138KV CKT 1'
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.48656	132.5186	'CLINTON AIR FORCE BASE TAP - ELK CITY 138KV CKT 1'
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.48656	132.4644	'CLINTON AIR FORCE BASE TAP - HOBART JUNCTION 138KV CKT 1'
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.48559	143.1192	'LAWTON EASTSIDE - OKLAUNION 345KV CKT 1'
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.48559	136.7069	'G08-14T 345.00 - OKLAUNION 345KV CKT 1'
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.48657	133.3666	'CLINTON JUNCTION - ELK CITY 138KV CKT 1'
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.48739	132.6804	'ELK CITY - RHWIND4 138.00 138KV CKT 1'
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.4869	132.2556	'LAWTON EASTSIDE - SUNNYSIDE 345KV CKT 1'
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.48589	131.75	'CLINTON JUNCTION - CLINTON NATURAL GAS TAP 138KV CKT 1'
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.48585	131.9898	'WEATHERFORD JCT. - WEATHERFORD SOUTHEAST 138KV CKT 1'
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.4851	133.8285	'ELK CITY 230KV - SWEETWT6 230.00 230KV CKT 1'
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.48589	131.8227	'WEATHERFORD SOUTHEAST - WEATHERFORD TAP 138KV CKT 1'
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.48589	131.9149	'WEATHERFORD TAP - WEATHERFORD WIND FARM 138KV CKT 1'
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.48585	131.7986	'CAN_GAS4 138.00 - JENSEN ROAD 138KV CKT 1'
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.4851	132.5611	'STLN-DEMARC6230.00 - SWEETWT6 230.00 230KV CKT 1'
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.48522	130.9415	'CLEVELAND - SOONER 345KV CKT 1'
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.48741	132.3112	'WAUKOMIS - WAUKOMIS TAP 138KV CKT 1'
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.48741	132.3458	'HENESSEY - WAUKOMIS 138KV CKT 1'
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.48606	131.8835	'MARSHALL - WOODRING 138KV CKT 1'
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.48448	133.3494	'G08-13T 345.00 - WOODRING 345KV CKT 1'
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.48225	132.4626	'G11-007T 345.00 - WOODRING 345KV CKT 1'
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.48659	132.0151	'KNOBHILL - SALINE 69KV CKT 1'
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.48659	131.9895	'HELENAT2 69.000 - SALINE 69KV CKT 1'
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.48659	131.898	'GOLTRY - IMO 69KV CKT 1'
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.48659	131.9173	'GOLTRY - HELENAT2 69.000 69KV CKT 1'
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.48646	131.759	'IMO TAP - SOUTH 4TH ST 138KV CKT 1'
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.48606	131.8773	'COTTONWOOD CREEK - MARSHALL 138KV CKT 1'
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.48589	130.9699	'KILDARE4 - NEWKIRK4 138KV CKT 1'
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.48589	130.9034	'NEWKIRK4 - PECKHMT4 138.00 138KV CKT 1'
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.48596	131.0285	'KILDARE4 - WHITE EAGLE 138KV CKT 1'

SOURCE	DIRECTION	MONTCOMMONNAME	RATEB	TDF	TC%LOADING	CONTNAME
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.48741	132.425	'DOVER SW - HENESSEY 138KV CKT 1'
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.48608	132.1282	'TRF-STEGALL'
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.48891	134.7072	'CLEO CORNER - GLASS MOUNTAIN 138KV CKT 1'
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.48957	134.9093	'CLEO CORNER - MEN TAP 138KV CKT 1'
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.48742	132.1428	'DEWEY - IODINE 138KV CKT 1'
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.48965	135.2814	'DEWEY - SOUTHARD 138KV CKT 1'
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.48891	134.7665	'GLASS MOUNTAIN - MOORELAND 138KV CKT 1'
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.48957	134.8846	'IMO TAP - MEN TAP 138KV CKT 1'
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.48668	132.4929	'KNOBHILL - MOORELAND 138KV CKT 1'
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.48742	132.2036	'IODINE - WWRDEHV4 138.00 138KV CKT 1'
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.47414	131.3917	'SOONER - SPRING CREEK 345KV CKT 1'
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.48965	138.2138	'EL RENO - ROMAN NOSE 138KV CKT 1'
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.48627	131.9782	'CIMARRON - EL RENO 138KV CKT 1'
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.48965	134.9144	'ROMAN NOSE - SOUTHARD 138KV CKT 1'
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.47414	131.3921	'NORTHWEST - SPRING CREEK 345KV CKT 1'
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.46557	126.5177	'CIMARRON - NORTHWEST 345KV CKT 1'
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.47485	129.5758	'ARCADIA - NORTHWEST 345KV CKT 1'
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.48394	130.5932	'CIMARRON - DRAPER LAKE 345KV CKT 1'
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.48225	132.9042	'CIMARRON - G11-007T 345.00 345KV CKT 1'
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.48418	130.7305	'ARCADIA - HORSESHOE LAKE 345KV CKT 1'
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.48418	130.7301	'HORSESHOE LAKE - SEMINOLE 345KV CKT 1'
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.48601	131.9098	'MORRISON - STILLWATER 138KV CKT 1'
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.48596	131.7869	'MCELROY - STILLWATER 138KV CKT 1'
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.48487	130.9113	'FT SMITH - MUSKOGEE 345KV CKT 1'
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.49324	133.2695	'BORDER 7345.00 - WWRDEHV7 345.00 345KV CKT 1'
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.49035	132.1059	'MOORELAND 345.00 - WWRDEHV7 345.00 345KV CKT 1'
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.50115	140.5308	'MED-LDG5 345.00 - WWRDEHV7 345.00 345KV CKT 1'
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.50115	140.5308	'MED-LDG5 345.00 - WWRDEHV7 345.00 345KV CKT 2'
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.48589	130.9038	'CRESWELL - PECKHMT4 138.00 138KV CKT 1'
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.48673	132.2875	'FPL SWITCH - MOORELAND 138KV CKT 1'
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.48642	131.8598	'ARAPAHO - HAMON BUTLER 69KV CKT 1'
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.48642	131.8574	'ARAPAHO - INDUSTRIAL PARK 69KV CKT 1'
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.48625	131.7899	'CANTON - OKEENE 69KV CKT 1'
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.48625	131.8255	'CANTON - TALOGA 69KV CKT 1'
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.48816	134.0357	'CEDARDALE - MOORELAND 138KV CKT 1'
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.48816	133.9857	'CEDARDALE - OKEENE 138KV CKT 1'
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.48636	131.893	'CLINTON - WEATHERFORD 138KV CKT 1'
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.48636	131.9138	'CLINTON - G07-32T 138.00 138KV CKT 1'
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.48642	131.8284	'CORDELL - INDUSTRIAL PARK 69KV CKT 1'
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.48795	133.4422	'DOVER SW - OKEENE 138KV CKT 1'
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.48642	131.8606	'HAMON BUTLER - PUTNAM 69KV CKT 1'
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.48894	133.7994	'MOORELAND - NINMILE 4 138.00 138KV CKT 1'
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.48739	132.4211	'MOREWOOD SW - RHWIND4 138.00 138KV CKT 1'
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.48894	133.7812	'MOREWOOD SW - NINMILE 4 138.00 138KV CKT 1'
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.4864	131.9065	'OKEENE - WATONGA SW 69KV CKT 1'
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.48642	131.8808	'PUTNAM - TALOGA 69KV CKT 1'
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.48823	131.906	'Hitchland Interchange - STEVENSCO 345.00 345KV CKT 1'
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.4851	132.8637	'GRAPEVINE INTERCHANGE - STATELINE INTERCHANGE 230KV CKT 1'
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.48547	132.7292	'GRAPEVINE INTERCHANGE - NICHOLS STATION 230KV CKT 1'
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.49438	136.3582	'BORDER 7345.00 - TUCO INTERCHANGE 345KV CKT 1'
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.4851	132.5611	'STATELINE INTERCHANGE - STLN-DEMARC6230.00 230KV CKT 1'
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.48596	131.8561	'MCCLELLAN SUB - MCLEAN RURAL SUB 115KV CKT 1'
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.48596	131.8766	'KIRBY SWITCHING STATION - MCCLELLAN SUB 115KV CKT 1'
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.48823	132.7424	'FINNEY SWITCHING STATION - STEVENSCO 345.00 345KV CKT 1'

SOURCE	DIRECTION	MONTCOMMONNAME	RATEB	TDF	TC%LOADING	CONTNAME
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.48911	132.0247	'G05-17T 345.00 - POTTER COUNTY INTERCHANGE 345KV CKT 1'
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.48633	131.8574	'DEAF SMITH COUNTY INTERCHANGE - S-RANDLCO 230.00 230KV CKT 1'
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.48618	132.0689	'G07-48T 230.00 - SWISHER COUNTY INTERCHANGE 230KV CKT 1'
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.48559	135.8289	'G08-14T 345.00 - TUCO INTERCHANGE 345KV CKT 1'
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.48621	132.0022	'KNOLL 230 - POSTROCK6 230.00 230KV CKT 1'
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.48645	132.2743	'KNOLL 230 - SMOKYHL6 230.00 230KV CKT 1'
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.48929	135.3736	'G10-16T 345.00 - POSTROCK7 345.00 345KV CKT 1'
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.48859	133.5383	'AXTELL - POSTROCK7 345.00 345KV CKT 1'
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.48645	132.6852	'SMOKYHL6 230.00 - SUMMIT 230KV CKT 1'
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.48615	131.7944	'ST JOHN - ST_JOHN 115KV CKT 1'
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.48858	133.3436	'HOLCOMB - SETAB 345KV CKT 1'
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.48932	134.5473	'MINGO - SETAB 345KV CKT 1'
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.48984	134.6429	'MINGO - RED WILLOW 345KV CKT 1'
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.48924	135.0245	'GRAY CO 345.00 - SPEARVILLE 345KV CKT 1'
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.48929	134.4705	'G10-16T 345.00 - SPEARVILLE 345KV CKT 1'
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.48633	132.2928	'HOYT - JEFFERY ENERGY CENTER 345KV CKT 1'
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.4864	131.9795	'HOYT - STRANGER CREEK 345KV CKT 1'
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.48698	131.8996	'EMPORIA ENERGY CENTER - WICHITA 345KV CKT 1'
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.48669	131.8443	'SWISSVALE - WEST GARDNER 345KV CKT 1'
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.4876	132.3684	'BENTON - ROSE HILL 345KV CKT 1'
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.48973	133.8207	'BENTON - WICHITA 345KV CKT 1'
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.48556	132.8283	'LACYGNE - NEOSHO 345KV CKT 1'
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.48741	132.4812	'G05-13T 345.00 - NEOSHO 345KV CKT 1'
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.48741	132.044	'LATHAMS7 345.00 - ROSE HILL 345KV CKT 1'
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.48422	130.7766	'G08-127T 345.00 - ROSE HILL 345KV CKT 1'
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.4939	139.5183	'MED-LDG5 345.00 - WICHITA 345KV CKT 1'
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.4939	139.5183	'MED-LDG5 345.00 - WICHITA 345KV CKT 2'
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.48639	131.9691	'ANDERSONCO 345.00 - WOLF CREEK 345KV CKT 1'
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.48741	132.3157	'G05-13T 345.00 - LATHAMS7 345.00 345KV CKT 1'
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.48651	132.5656	'CIRCLE - MULLERGREN 230KV CKT 1'
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.48691	132.4312	'CLEARWATER - GILL ENERGY CENTER WEST 138KV CKT 1'
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.48691	132.514	'CLEARWATER - MILAN TAP 138KV CKT 1'
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.48598	132.0239	'EVANS ENERGY CENTER NORTH - EVANS ENERGY CENTER SOUTH 138KV CKT 1'
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.48691	132.799	'FLATRDG3 - HARPER 138KV CKT 1'
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.48691	132.4916	'FLATRDG3 - MEDICINE LODGE 138KV CKT 1'
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.48691	132.6507	'HARPER - MILAN TAP 138KV CKT 1'
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.48639	131.8487	'MED-LDG5 345.00 345/138KV TRANSFORMER CKT 1'
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.4867	132.5474	'MULLERGREN - SPEARVILLE 230KV CKT 1'
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.48588	130.959	'LACYGNE - WEST GARDNER 345KV CKT 1'
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.48582	130.9357	'LACYGNE - STILWELL 345KV CKT 1'
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.48639	132.0234	'ANDERSONCO 345.00 - LACYGNE 345KV CKT 1'
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.48558	130.9377	'BROOKLINE - SUB 383 - MONETT 345KV CKT 1'
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.48448	132.6343	'G08-13T 345.00 - SUMNERCO 345.00 345KV CKT 1'
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.49172	133.5524	'2008-047T 345.00 - GRAY CO 345.00 345KV CKT 1'
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.48678	132.3807	'AXTELL - PAULINE 345KV CKT 1'
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.48761	132.2608	'GERALD GENTLEMAN STATION - RED WILLOW 345KV CKT 1'
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.48608	131.8856	'GERALD GENTLEMAN STATION - SWEETWATER 345KV CKT 1'
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.48627	131.844	'GRAND ISLAND - MCCOOL 345KV CKT 1'
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.48671	132.2619	'MOORE - PAULINE 345KV CKT 1'
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.48668	132.7462	'GRAND ISLAND - SWEETWATER 345KV CKT 1'
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.48595	130.9253	'SNORANDA 161.00 - NEW MADRID 161KV CKT 1'
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.48586	130.9638	'ARKANSAS NUCLEAR ONE - PLEASANT HILL 500KV CKT 1'
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.48599	130.6867	'KEO EHV - WEST MEMPHIS 500 500KV CKT 1'
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.48599	130.79	'DELL 500 - INDEPENDENCE 500KV CKT 1'

SOURCE	DIRECTION	MONTCOMMONNAME	RATEB	TDF	TC%LOADING	CONTNAME
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.4851	133.8282	'ELK CITY 230KV (ELKCTY-6) 230/138/13.8KV TRANSFORMER CKT 1'
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.48668	132.4687	'KNOBHILL (KNOBHIL4) 138/69/13.2KV TRANSFORMER CKT 1'
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.4849	130.377	'NORTHWEST (NORTWST2) 345/138/13.8KV TRANSFORMER CKT 1'
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.48499	130.5907	'NORTHWEST (NORTWST3) 345/138/13.8KV TRANSFORMER CKT 1'
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.48593	131.1539	'ARCADIA (ARCADIA2) 345/138/13.8KV TRANSFORMER CKT 1'
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.48597	131.8374	'SUNNYSIDE (SUNNYSD3) 345/138/13.8KV TRANSFORMER CKT 1'
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.48489	131.9466	'ARKANSAS NUCLEAR ONE - FT SMITH 500KV CKT 1'
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.48639	130.8879	'WWRDEHV7 345.00 (WWDEHV) 345/138/13.8KV TRANSFORMER CKT 1'
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.48639	131.0298	'WWRDEHV7 345.00 (WWDEHV-T2) 345/138/13.8KV TRANSFORMER CKT 2'
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.49035	132.0726	'MOORELAND 345.00 (MRLNDAUTO) 345/138/13.8KV TRANSFORMER CKT 1'
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.48911	132.4413	'POTTER COUNTY INTERCHANGE (WAUK 90343-A) 345/230/13.2KV TRANSFORMER CKT 1'
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.48618	131.7854	'7OVERTON 345.00 - SIBLEY 345KV CKT 1'
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.48606	131.7595	'BROOKLINE - MORGAN 345KV CKT 1'
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.48595	132.0489	'G08-19 345.00 345/34.5KV TRANSFORMER CKT 1'
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.48595	132.0489	'G08-19 345.00 345/34.5KV TRANSFORMER CKT 2'
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.48599	131.8577	'8DANIEL 500.00 - MCKNIGHT 500KV CKT 1'
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.48598	130.8994	'8BHAM STEEL 500.00 - WEST MEMPHIS 500 500KV CKT 1'
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.48609	131.8747	'NUNDRWD - WAYSIDE 230KV CKT 1'
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.48595	131.019	'BURLINGTON NO1 + NO 2 + NO 3 161/20.0KV TRANSFORMER CKT 1'
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.48752	132.4212	'OGE3TERM1'
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.48603	131.911	'OGE3TERM2'
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.4859	130.9513	'OGE3TERM7'
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.48592	131.7655	'OGE3TERM10'
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.48557	131.022	'OGE3TERM14'
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.4851	132.5611	'SPP-SWPS-02'
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.4851	132.1931	'SPP-SWPS-02A'
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.48691	132.5243	'SPP-MKEC-05'
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.48691	132.823	'SPP-MKEC-08'
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.4859	130.8323	'SPP-WERE-07B'
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.48691	132.5276	'SPP-WERE-34'
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.48589	130.9021	'SPP-WERE-41B'
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.48635	132.3403	'WRTOD400'
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.48558	130.9373	'AI12'
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.48618	131.7574	'OVERTON-TRF'
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.48598	131.9396	'FIELD NORTH - LKFLDXL3 345KV CKT 1'
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.48571	119.2619	'BASE CASE'
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.48573	118.942	'DOLET HILLS 345/230KV TRANSFORMER CKT 1'
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.4855	119.5957	'DOLET HILLS - SOUTHWEST SHREVEPORT 345KV CKT 1'
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.48539	118.7697	'FLINT CREEK - GRDA1 345KV CKT 1'
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.48534	118.8431	'FLINT CREEK - SUB 383 - MONETT 345KV CKT 1'
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.48539	118.5518	'CHAMBER SPRINGS - CLARKSVILLE 345KV CKT 1'
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.48577	118.8626	'CLARKSVILLE - MUSKOGEE 345KV CKT 1'
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.48104	117.6529	'REDBUD - RIVERSIDE STATION 345KV CKT 1'
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.48568	119.7498	'NORTHEAST STATION - ONETA 345KV CKT 1'
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.485	118.9466	'CLEVELAND - TULSA NORTH 345KV CKT 1'
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.48535	118.3009	'DELAWARE - NORTHEAST STATION 345KV CKT 1'
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.48532	118.8864	'DELAWARE - NEOSHO 345KV CKT 1'
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.48256	117.9834	'PITTSBURG - VALLIANT 345KV CKT 1'
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.48312	118.4896	'PITTSBURG - SEMINOLE 345KV CKT 1'
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.48561	119.6943	'HINTON - WEATHERFORD JCT. 138KV CKT 1'
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.48561	119.685	'CAN_GAS4 138.00 - HINTON 138KV CKT 1'
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.48598	119.7349	'CARNEGIE - HOBART JUNCTION 138KV CKT 1'
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.48598	119.6958	'CARNEGIE - SOUTHWESTERN STATION 138KV CKT 1'
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.48632	120.2947	'CLINTON AIR FORCE BASE TAP - ELK CITY 138KV CKT 1'

SOURCE	DIRECTION	MONTCOMMONNAME	RATEB	TDF	TC%LOADING	CONTNAME
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.48632	120.2516	'CLINTON AIR FORCE BASE TAP - HOBART JUNCTION 138KV CKT 1'
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.48534	129.7928	'LAWTON EASTSIDE - OKLAUNION 345KV CKT 1'
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.48534	124.0786	'G08-14T 345.00 - OKLAUNION 345KV CKT 1'
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.48632	121.1001	'CLINTON JUNCTION - ELK CITY 138KV CKT 1'
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.48715	120.431	'ELK CITY - RHWIND4 138.00 138KV CKT 1'
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.48666	120.0418	'LAWTON EASTSIDE - SUNNYSIDE 345KV CKT 1'
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.48565	119.6093	'CLINTON JUNCTION - CLINTON NATURAL GAS TAP 138KV CKT 1'
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.48561	119.8224	'WEATHERFORD JCT. - WEATHERFORD SOUTHEAST 138KV CKT 1'
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.48486	121.4999	'ELK CITY 230KV - SWEETWT6 230.00 230KV CKT 1'
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.48565	119.6717	'WEATHERFORD SOUTHEAST - WEATHERFORD TAP 138KV CKT 1'
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.48565	119.5802	'CLINTON NATURAL GAS TAP - WEATHERFORD WIND FARM 138KV CKT 1'
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.48565	119.7535	'WEATHERFORD TAP - WEATHERFORD WIND FARM 138KV CKT 1'
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.48561	119.6484	'CAN_GAS4 138.00 - JENSEN ROAD 138KV CKT 1'
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.48486	120.3561	'STLN-DEMARC6230.00 - SWEETWT6 230.00 230KV CKT 1'
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.48572	119.5971	'CHILDRESS - LAKE PAULINE 138KV CKT 1'
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.48572	119.6541	'MCLEAN RURAL SUB - SHAMROCK 115KV CKT 1'
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.48498	118.8345	'CLEVELAND - SOONER 345KV CKT 1'
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.48717	120.0807	'WAUKOMIS - WAUKOMIS TAP 138KV CKT 1'
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.48717	120.1137	'HENESSEY - WAUKOMIS 138KV CKT 1'
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.48582	119.7395	'MARSHALL - WOODRING 138KV CKT 1'
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.48419	121.2198	'G08-13T 345.00 - WOODRING 345KV CKT 1'
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.48198	120.3809	'G11-007T 345.00 - WOODRING 345KV CKT 1'
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.48635	119.8323	'KNOBHILL - SALINE 69KV CKT 1'
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.48635	119.8083	'HELENAT2 69.000 - SALINE 69KV CKT 1'
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.48635	119.7224	'GOLTRY - IMO 69KV CKT 1'
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.48635	119.7396	'GOLTRY - HELENAT2 69.000 69KV CKT 1'
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.48621	119.5949	'IMO TAP - SOUTH 4TH ST 138KV CKT 1'
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.48582	119.7309	'COTTONWOOD CREEK - MARSHALL 138KV CKT 1'
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.48565	118.8617	'KILDARE4 - NEWKIRK4 138KV CKT 1'
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.48565	118.7991	'NEWKIRK4 - PECKHMT4 138.00 138KV CKT 1'
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.48572	118.9147	'KILDARE4 - WHITE EAGLE 138KV CKT 1'
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.48717	120.1886	'DOVER SW - HENESSEY 138KV CKT 1'
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.48867	122.2684	'CLEO CORNER - GLASS MOUNTAIN 138KV CKT 1'
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.48933	122.4433	'CLEO CORNER - MEN TAP 138KV CKT 1'
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.48649	119.6612	'FPL SWITCH - WOODWARD 138KV CKT 1'
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.48718	119.9187	'DEWEY - IODINE 138KV CKT 1'
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.4894	122.7381	'DEWEY - SOUTHARD 138KV CKT 1'
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.48867	122.3409	'GLASS MOUNTAIN - MOORELAND 138KV CKT 1'
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.48933	122.4211	'IMO TAP - MEN TAP 138KV CKT 1'
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.48644	120.2553	'KNOBHILL - MOORELAND 138KV CKT 1'
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.48718	119.9771	'IODINE - WWRDEHV4 138.00 138KV CKT 1'
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.48181	119.7139	'CIMARRON - MINCO 7 345.00 345KV CKT 1'
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.4894	125.3734	'EL RENO - ROMAN NOSE 138KV CKT 1'
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.48603	119.8076	'CIMARRON - EL RENO 138KV CKT 1'
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.48585	119.5542	'CIMARRON - JENSEN TAP 138KV CKT 1'
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.4894	122.4053	'ROMAN NOSE - SOUTHARD 138KV CKT 1'
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.46534	114.844	'CIMARRON - NORTHWEST 345KV CKT 1'
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.47463	117.5101	'ARCADIA - NORTHWEST 345KV CKT 1'
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.48371	118.493	'CIMARRON - DRAPER LAKE 345KV CKT 1'
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.48198	120.8121	'CIMARRON - G11-007T 345.00 345KV CKT 1'
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.48395	118.6404	'ARCADIA - HORSESHOE LAKE 345KV CKT 1'
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.48395	118.6486	'HORSESHOE LAKE - SEMINOLE 345KV CKT 1'
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.48577	119.7575	'MORRISON - STILLWATER 138KV CKT 1'
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.48572	119.5975	'KINZE - MCELROY 138KV CKT 1'

SOURCE	DIRECTION	MONTCOMMONNAME	RATEB	TDF	TC%LOADING	CONTNAME
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.48572	119.6408	'MCELROY - STILLWATER 138KV CKT 1'
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.48463	118.8368	'FT SMITH - MUSKOGEE 345KV CKT 1'
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.493	120.7141	'BORDER 7345.00 - WWRDEHV7 345.00 345KV CKT 1'
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.4901	119.8082	'MOORELAND 345.00 - WWRDEHV7 345.00 345KV CKT 1'
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	1	115.5924	'G11-015T 345.00 - WWRDEHV7 345.00 345KV CKT 1'
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.50093	126.9844	'MED-LDG5 345.00 - WWRDEHV7 345.00 345KV CKT 1'
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.50093	126.9844	'MED-LDG5 345.00 - WWRDEHV7 345.00 345KV CKT 2'
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.48565	118.7994	'CRESWELL - PECKHMT4 138.00 138KV CKT 1'
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.48649	120.0526	'FPL SWITCH - MOORELAND 138KV CKT 1'
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.48618	119.6831	'ARAPAHO - HAMON BUTLER 69KV CKT 1'
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.48618	119.6817	'ARAPAHO - INDUSTRIAL PARK 69KV CKT 1'
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.48606	119.5684	'CALUMET - WATONGA SW 69KV CKT 1'
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.48601	119.6246	'CANTON - OKEENE 69KV CKT 1'
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.48601	119.6528	'CANTON - TALOGA 69KV CKT 1'
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.48792	121.668	'CEDARDALE - MOORELAND 138KV CKT 1'
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.48792	121.6361	'CEDARDALE - OKEENE 138KV CKT 1'
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.48612	119.7195	'CLINTON - WEATHERFORD 138KV CKT 1'
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.48612	119.736	'CLINTON - G07-32T 138.00 138KV CKT 1'
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.48618	119.5624	'CORDELL - GOTEBO 69KV CKT 1'
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.48618	119.6545	'CORDELL - INDUSTRIAL PARK 69KV CKT 1'
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.4877	121.134	'DOVER SW - OKEENE 138KV CKT 1'
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.48618	119.6837	'HAMON BUTLER - PUTNAM 69KV CKT 1'
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.4887	121.3892	'MOORELAND - NINMILE 4 138.00 138KV CKT 1'
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.48715	120.1853	'MOREWOOD SW - RHWIND4 138.00 138KV CKT 1'
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.4887	121.3793	'MOREWOOD SW - NINMILE 4 138.00 138KV CKT 1'
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.48616	119.736	'OKEENE - WATONGA SW 69KV CKT 1'
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.48618	119.7023	'PUTNAM - TALOGA 69KV CKT 1'
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.488	119.6481	'Hitchland Interchange - STEVENSCO 345.00 345KV CKT 1'
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.48666	119.5587	'G11-012T 230.00 - MOORE COUNTY INTERCHANGE 230KV CKT 1'
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.48486	120.6248	'GRAPEVINE INTERCHANGE - STATELINE INTERCHANGE 230KV CKT 1'
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.48523	120.5387	'GRAPEVINE INTERCHANGE - NICHOLS STATION 230KV CKT 1'
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.49413	123.7118	'BORDER 7345.00 - TUCO INTERCHANGE 345KV CKT 1'
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.48486	120.3561	'STATELINE INTERCHANGE - STLN-DEMARC6230.00 230KV CKT 1'
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.48572	119.7039	'MCCLELLAN SUB - MCLEAN RURAL SUB 115KV CKT 1'
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.48572	119.718	'KIRBY SWITCHING STATION - MCCLELLAN SUB 115KV CKT 1'
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.488	120.4023	'FINNEY SWITCHING STATION - STEVENSCO 345.00 345KV CKT 1'
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.48887	119.7826	'G05-17T 345.00 - POTTER COUNTY INTERCHANGE 345KV CKT 1'
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.48594	119.6133	'AMARILLO SOUTH INTERCHANGE - G07-48T 230.00 230KV CKT 1'
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.48609	119.6847	'DEAF SMITH COUNTY INTERCHANGE - S-RANDLCO 230.00 230KV CKT 1'
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.48594	119.8792	'G07-48T 230.00 - SWISHER COUNTY INTERCHANGE 230KV CKT 1'
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.48534	123.3315	'G08-14T 345.00 - TUCO INTERCHANGE 345KV CKT 1'
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.48597	119.8131	'KNOLL 230 - POSTROCK6 230.00 230KV CKT 1'
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.48622	120.0469	'KNOLL 230 - SMOKYHL6 230.00 230KV CKT 1'
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.48907	122.7669	'G10-16T 345.00 - POSTROCK7 345.00 345KV CKT 1'
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.48836	121.1816	'AXTELL - POSTROCK7 345.00 345KV CKT 1'
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.48622	120.4451	'SMOKYHL6 230.00 - SUMMIT 230KV CKT 1'
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.48591	119.6314	'ST JOHN - ST_JOHN 115KV CKT 1'
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.48836	120.9643	'HOLCOMB - SETAB 345KV CKT 1'
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.4891	122.0123	'MINGO - SETAB 345KV CKT 1'
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.48963	122.0729	'MINGO - RED WILLOW 345KV CKT 1'
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.48901	122.3677	'GRAY CO 345.00 - SPEARVILLE 345KV CKT 1'
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.48907	121.9721	'G10-16T 345.00 - SPEARVILLE 345KV CKT 1'
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.48609	120.1217	'HOYT - JEFFERY ENERGY CENTER 345KV CKT 1'
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.48615	119.8235	'HOYT - STRANGER CREEK 345KV CKT 1'

SOURCE	DIRECTION	MONTCOMMONNAME	RATEB	TDF	TC%LOADING	CONTNAME
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.48631	119.566	'EMPORIA ENERGY CENTER - SWISSVALE 345KV CKT 1'
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.48675	119.6962	'EMPORIA ENERGY CENTER - WICHITA 345KV CKT 1'
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.48645	119.6918	'SWISSVALE - WEST GARDNER 345KV CKT 1'
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.48736	120.1602	'BENTON - ROSE HILL 345KV CKT 1'
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.48949	121.4758	'BENTON - WICHITA 345KV CKT 1'
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.4853	120.6618	'LACYGNE - NEOSHO 345KV CKT 1'
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.48717	120.2854	'G05-13T 345.00 - NEOSHO 345KV CKT 1'
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.48717	119.8531	'LATHAMS7 345.00 - ROSE HILL 345KV CKT 1'
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.48394	118.7296	'G08-127T 345.00 - ROSE HILL 345KV CKT 1'
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.49367	126.5147	'MED-LDG5 345.00 - WICHITA 345KV CKT 1'
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.49367	126.5147	'MED-LDG5 345.00 - WICHITA 345KV CKT 2'
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.48615	119.7948	'ANDERSONCO 345.00 - WOLF CREEK 345KV CKT 1'
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.48717	120.1156	'G05-13T 345.00 - LATHAMS7 345.00 345KV CKT 1'
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.48627	120.3386	'CIRCLE - MULLERGREN 230KV CKT 1'
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.48667	120.2268	'CLEARWATER - GILL ENERGY CENTER WEST 138KV CKT 1'
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.48667	120.3147	'CLEARWATER - MILAN TAP 138KV CKT 1'
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.48574	119.9124	'EVANS ENERGY CENTER NORTH - EVANS ENERGY CENTER SOUTH 138KV CKT 1'
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.48667	120.5599	'FLATRDG3 - HARPER 138KV CKT 1'
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.48667	120.2691	'FLATRDG3 - MEDICINE LODGE 138KV CKT 1'
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.48667	120.4232	'HARPER - MILAN TAP 138KV CKT 1'
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.48615	119.6825	'MED-LDG5 345.00 345/138KV TRANSFORMER CKT 1'
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.48646	120.3137	'MULLERGREN - SPEARVILLE 230KV CKT 1'
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.48564	118.85	'LACYGNE - WEST GARDNER 345KV CKT 1'
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.48558	118.8272	'LACYGNE - STILWELL 345KV CKT 1'
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.48615	119.8419	'ANDERSONCO 345.00 - LACYGNE 345KV CKT 1'
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.48534	118.8436	'BROOKLINE - SUB 383 - MONETT 345KV CKT 1'
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.48419	120.526	'G08-13T 345.00 - SUMNERCO 345.00 345KV CKT 1'
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.49149	121.01	'2008-047T 345.00 - GRAY CO 345.00 345KV CKT 1'
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.48654	120.1617	'AXTELL - PAULINE 345KV CKT 1'
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.48738	119.9962	'GERALD GENTLEMAN STATION - RED WILLOW 345KV CKT 1'
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.48584	119.7185	'GERALD GENTLEMAN STATION - SWEETWATER 345KV CKT 1'
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.48581	119.5915	'GERALD GENTLEMAN STATION - SWEETWATER 345KV CKT 2'
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.48604	119.5698	'MCCOOL - MOORE 345KV CKT 1'
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.48604	119.6835	'GRAND ISLAND - MCCOOL 345KV CKT 1'
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.48647	120.0575	'MOORE - PAULINE 345KV CKT 1'
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.48644	120.5044	'GRAND ISLAND - SWEETWATER 345KV CKT 1'
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.48571	118.8181	'5NORANDA 161.00 - NEW MADRID 161KV CKT 1'
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.48569	118.9503	'BAXTER WILSON SES - PERRYVILLE 500KV CKT 1'
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.4858	119.5937	'LAKEOVER - MCADAMS 500KV CKT 1'
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.48585	119.5885	'MCADAMS - WOLF CREEK 500KV CKT 1'
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.48562	118.8594	'ARKANSAS NUCLEAR ONE - PLEASANT HILL 500KV CKT 1'
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.48575	118.5947	'KEO EHV - WEST MEMPHIS 500 500KV CKT 1'
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.48575	118.688	'DELL 500 - INDEPENDENCE 500KV CKT 1'
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.48486	121.4996	'ELK CITY 230KV (ELKCTY-6) 230/138/13.8KV TRANSFORMER CKT 1'
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.48572	119.6528	'SHAMROCK (SHAMRCK1) 115/69/14.4KV TRANSFORMER CKT 1'
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.48644	120.2409	'KNOBHILL (KNOBHIL4) 138/69/13.2KV TRANSFORMER CKT 1'
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.48466	118.3187	'NORTHWEST (NORTWST2) 345/138/13.8KV TRANSFORMER CKT 1'
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.48475	118.5161	'NORTHWEST (NORTWST3) 345/138/13.8KV TRANSFORMER CKT 1'
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.48573	119.682	'SUNNYSIDE (SUNNYSD3) 345/138/13.8KV TRANSFORMER CKT 1'
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.48464	119.8264	'ARKANSAS NUCLEAR ONE - FT SMITH 500KV CKT 1'
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.48615	118.8104	'WWRDEHV7 345.00 (WWDEHV) 345/138/13.8KV TRANSFORMER CKT 1'
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.48615	118.8982	'WWRDEHV7 345.00 (WWDEHV-T2) 345/138/13.8KV TRANSFORMER CKT 2'
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.4901	119.7887	'MOORELAND 345.00 (MRLNDAUTO) 345/138/13.8KV TRANSFORMER CKT 1'
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.48592	119.5715	'TALOGA (TALOGA) 138/69/13.8KV TRANSFORMER CKT 1'

SOURCE	DIRECTION	MONTCOMMONNAME	RATEB	TDF	TC%LOADING	CONTNAME
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.48887	120.1626	'POTTER COUNTY INTERCHANGE (WAUK 90343-A) 345/230/13.2KV TRANSFORMER CKT 1'
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.48593	119.6376	'7OVERTON 345.00 - SIBLEY 345KV CKT 1'
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.48572	119.573	'CLINTON - MONTROSE 161KV CKT 1'
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.48582	119.6161	'BROOKLINE - MORGAN 345KV CKT 1'
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.48571	119.3094	'G08-19 345.00 345/34.5KV TRANSFORMER CKT 1'
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.48571	119.3094	'G08-19 345.00 345/34.5KV TRANSFORMER CKT 2'
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.48593	119.563	'RED WILLOW (R.WIL T1) 345/115/13.8KV TRANSFORMER CKT 1'
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.48575	119.71	'8DANIEL 500.00 - MCKNIGHT 500KV CKT 1'
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.48574	118.7934	'8BHAM STEEL 500.00 - WEST MEMPHIS 500 500KV CKT 1'
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.48585	119.7099	'NUNDRWD - WAYSIDE 230KV CKT 1'
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.4858	119.5959	'STEGALL - WAYSIDE 230KV CKT 1'
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.48571	118.9105	'BURLINGTON NO1 + NO 2 + NO 3 161/20.0KV TRANSFORMER CKT 1'
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.48728	120.1781	'OGE3TERM1'
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.48579	119.7577	'OGE3TERM2'
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.48566	118.8428	'OGE3TERM7'
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.48568	119.615	'OGE3TERM10'
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.48533	118.9217	'OGE3TERM14'
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.48486	120.3561	'SPP-SWPS-02'
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.48486	119.9757	'SPP-SWPS-02A'
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.48572	119.6487	'SPP-SWPS-T54'
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.48667	120.3071	'SPP-MKEC-05'
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.48667	120.5766	'SPP-MKEC-08'
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.48566	118.7295	'SPP-WERE-07B'
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.48667	120.3101	'SPP-WERE-34'
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.48565	118.7979	'SPP-WERE-41B'
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.48611	120.1684	'WRTOD400'
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.48534	118.8433	'AI12'
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.48594	119.6173	'OVERTON-TRF'
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.48574	119.7846	'FIELD NORTH - LKFLDXL3 345KV CKT 1'
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.47947	111.8101	'LAWTON EASTSIDE - OKLAUNION 345KV CKT 1'
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.47947	105.9974	'G08-14T 345.00 - OKLAUNION 345KV CKT 1'
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.48484	100	'EL RENO - ROMAN NOSE 138KV CKT 1'
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.49628	102.2155	'MED-LDG5 345.00 - WWRDEHV7 345.00 345KV CKT 1'
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.49628	102.2155	'MED-LDG5 345.00 - WWRDEHV7 345.00 345KV CKT 2'
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.47947	105.244	'G08-14T 345.00 - TUCO INTERCHANGE 345KV CKT 1'
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.48435	100.8335	'GRAY CO 345.00 - SPEARVILLE 345KV CKT 1'
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.489	103.6121	'MED-LDG5 345.00 - WICHITA 345KV CKT 1'
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.489	103.6121	'MED-LDG5 345.00 - WICHITA 345KV CKT 2'
G11_024	'TO->FROM'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	1	114.1348	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'
G11_024	'FROM->TO'	'G11-015T 345.00 - WWRDEHV7 345.00 345KV CKT 1'	1195	1	115.5849	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'
G11_024		Non Converged Contingency	1195	0.51807	-	'G11-015T 345.00 - WWRDEHV7 345.00 345KV CKT 1'
G11_024		Non Converged Contingency	1195	0.51807	-	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'
G11_024	'TO->FROM'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	1	114.4095	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'
G11_024	'FROM->TO'	'G11-015T 345.00 - WWRDEHV7 345.00 345KV CKT 1'	1195	1	116.176	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'
G11_024		Non Converged Contingency	1195	0.5207	-	'G11-015T 345.00 - WWRDEHV7 345.00 345KV CKT 1'
G11_024		Non Converged Contingency	1195	0.5207	-	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.47807	104.9669	'LAWTON EASTSIDE - OKLAUNION 345KV CKT 1'
G11_024	'TO->FROM'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	1	114.437	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'
G11_024	'FROM->TO'	'G11-015T 345.00 - WWRDEHV7 345.00 345KV CKT 1'	1195	1	116.203	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'
G11_024		Non Converged Contingency	1195	0.51898	-	'G11-015T 345.00 - WWRDEHV7 345.00 345KV CKT 1'
G11_024		Non Converged Contingency	1195	0.51898	-	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.47966	106.3434	'LAWTON EASTSIDE - OKLAUNION 345KV CKT 1'
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.47966	100.9816	'G08-14T 345.00 - OKLAUNION 345KV CKT 1'
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.47966	100.6245	'G08-14T 345.00 - TUCO INTERCHANGE 345KV CKT 1'

SOURCE	DIRECTION	MONTCOMMONNAME	RATEB	TDF	TC%LOADING	CONTNAME
G11_024	'TO->FROM'	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	1	114.5853	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'
G11_024	'FROM->TO'	'G11-015T 345.00 - WWRDEHV7 345.00 345KV CKT 1'	1195	1	116.3496	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'
G11_024		Non Converged Contingency	1195	0.52125	-	'G11-015T 345.00 - WWRDEHV7 345.00 345KV CKT 1'
G11_024		Non Converged Contingency	1195	0.52125	-	'G11-015T 345.00 - TATONGA7 345.00 345KV CKT 1'
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.47645	113.202	'LAWTON EASTSIDE - OKLAUNION 345KV CKT 1'
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.47645	107.834	'G08-14T 345.00 - OKLAUNION 345KV CKT 1'
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.47751	101.0104	'ELK CITY 230KV - SWEETWT6 230.00 230KV CKT 1'
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.47751	100.4	'STATELINE INTERCHANGE - SWEETWT6 230.00 230KV CKT &1'
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.48149	100.2954	'CLEO CORNER - GLASS MOUNTAIN 138KV CKT 1'
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.48209	100.2982	'CLEO CORNER - MEN TAP 138KV CKT 1'
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.4821	100.8554	'DEWEY - SOUTHARD 138KV CKT 1'
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.48149	100.3585	'GLASS MOUNTAIN - MOORELAND 138KV CKT 1'
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.48209	100.2622	'IMO TAP - MEN TAP 138KV CKT 1'
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.4821	100.6298	'EL RENO - ROMAN NOSE 138KV CKT 1'
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.4821	100.5013	'ROMAN NOSE - SOUTHARD 138KV CKT 1'
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.49362	103.2436	'MED-LDG5 345.00 - WWRDEHV7 345.00 345KV CKT 1'
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.49362	103.2436	'MED-LDG5 345.00 - WWRDEHV7 345.00 345KV CKT 2'
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.48109	100.1295	'CEDARDALE - MOORELAND 138KV CKT 1'
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.48109	100.0942	'CEDARDALE - OKEENE 138KV CKT 1'
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.47751	100.7198	'GRAPEVINE INTERCHANGE - STATELINE INTERCHANGE 230KV CKT 1'
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.47645	107.4701	'G08-14T 345.00 - TUCO INTERCHANGE 345KV CKT 1'
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.48227	100.2148	'G10-16T 345.00 - POSTROCK7 345.00 345KV CKT 1'
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.48166	100.638	'GRAY CO 345.00 - SPEARVILLE 345KV CKT 1'
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.4863	102.4561	'MED-LDG5 345.00 - WICHITA 345KV CKT 1'
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.4863	102.4561	'MED-LDG5 345.00 - WICHITA 345KV CKT 2'
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.47751	101.0102	'ELK CITY 230KV (ELKCTY-6) 230/138/13.8KV TRANSFORMER CKT 1'
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.47751	101.0104	'SPP-SWPS-02A'
G11_024	'TO->FROM'	'NORTHWEST - TATONGA7 345.00 345KV CKT 1'	1195	0.47748	100.7916	'SPP-SWPS-03'
G11_024	'TO->FROM'	'CIMARRON - MATTHEWSON 345.00 345KV CKT 1'	956	0.41004	160.7095	'MATTHEWSON 345.00 - NORTHWEST 345KV CKT 1'
G11_024	'TO->FROM'	'CIMARRON - MATTHEWSON 345.00 345KV CKT 1'	956	0.47843	153.4363	'MATTHEWSON 345.00 - NORTHWEST 345KV CKT 1'
G11_024	'TO->FROM'	'CIMARRON - MATTHEWSON 345.00 345KV CKT 1'	956	0.40961	149.8055	'MATTHEWSON 345.00 - NORTHWEST 345KV CKT 1'
G11_024	'TO->FROM'	'CIMARRON - MATTHEWSON 345.00 345KV CKT 1'	956	0.40568	127.5919	'MATTHEWSON 345.00 - NORTHWEST 345KV CKT 1'
G11_024	'TO->FROM'	'CIMARRON - MATTHEWSON 345.00 345KV CKT 1'	956	0.40682	128.9848	'MATTHEWSON 345.00 - NORTHWEST 345KV CKT 1'
G11_024	'FROM->TO'	'MATTHEWSON 345.00 - NORTHWEST 345KV CKT 1'	1195	0.45481	142.1306	'CIMARRON - MATTHEWSON 345.00 345KV CKT 1'
G11_024	'FROM->TO'	'MATTHEWSON 345.00 - NORTHWEST 345KV CKT 1'	1195	0.53194	135.0651	'CIMARRON - MATTHEWSON 345.00 345KV CKT 1'
G11_024	'FROM->TO'	'MATTHEWSON 345.00 - NORTHWEST 345KV CKT 1'	1195	0.45433	132.3797	'CIMARRON - MATTHEWSON 345.00 345KV CKT 1'
G11_024	'FROM->TO'	'MATTHEWSON 345.00 - NORTHWEST 345KV CKT 1'	1195	0.4496	113.3461	'CIMARRON - MATTHEWSON 345.00 345KV CKT 1'
G11_024	'FROM->TO'	'MATTHEWSON 345.00 - NORTHWEST 345KV CKT 1'	1195	0.45115	113.064	'CIMARRON - MATTHEWSON 345.00 345KV CKT 1'
G11_024	'TO->FROM'	'MATTHEWSON 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.51338	136.9817	'MATTHEWSON 345.00 - TATONGA7 345.00 345KV CKT 2'
G11_024	'TO->FROM'	'MATTHEWSON 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.58018	137.5331	'MATTHEWSON 345.00 - TATONGA7 345.00 345KV CKT 2'
G11_024	'TO->FROM'	'MATTHEWSON 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.51317	124.3769	'MATTHEWSON 345.00 - TATONGA7 345.00 345KV CKT 2'
G11_024	'TO->FROM'	'MATTHEWSON 345.00 - TATONGA7 345.00 345KV CKT 2'	1195	0.51338	136.9817	'MATTHEWSON 345.00 - TATONGA7 345.00 345KV CKT 1'
G11_024	'TO->FROM'	'MATTHEWSON 345.00 - TATONGA7 345.00 345KV CKT 2'	1195	0.58018	137.5331	'MATTHEWSON 345.00 - TATONGA7 345.00 345KV CKT 1'
G11_024	'TO->FROM'	'MATTHEWSON 345.00 - TATONGA7 345.00 345KV CKT 2'	1195	0.51317	124.3769	'MATTHEWSON 345.00 - TATONGA7 345.00 345KV CKT 1'
G11_024	'TO->FROM'	'CIMARRON - MATTHEWSON 345.00 345KV CKT 1'	956	0.40777	112.3241	'MATTHEWSON 345.00 - NORTHWEST 345KV CKT 1'
G11_024	'TO->FROM'	'CIMARRON - MATTHEWSON 345.00 345KV CKT 1'	956	0.49684	142.5038	'MATTHEWSON 345.00 - NORTHWEST 345KV CKT 1'
G11_024	'FROM->TO'	'MATTHEWSON 345.00 - NORTHWEST 345KV CKT 1'	1195	0.5544	124.0373	'CIMARRON - MATTHEWSON 345.00 345KV CKT 1'
G11_024	'TO->FROM'	'CIMARRON - MATTHEWSON 345.00 345KV CKT 1'	956	0.40442	123.0889	'MATTHEWSON 345.00 - NORTHWEST 345KV CKT 1'
G11_024	'TO->FROM'	'CIMARRON - MATTHEWSON 345.00 345KV CKT 1'	956	0.46032	154.2912	'MATTHEWSON 345.00 - NORTHWEST 345KV CKT 1'
G11_024	'FROM->TO'	'MATTHEWSON 345.00 - NORTHWEST 345KV CKT 1'	1195	0.44576	106.5795	'CIMARRON - MATTHEWSON 345.00 345KV CKT 1'
G11_024	'FROM->TO'	'MATTHEWSON 345.00 - NORTHWEST 345KV CKT 1'	1195	0.51734	135.7368	'CIMARRON - MATTHEWSON 345.00 345KV CKT 1'
G11_024	'TO->FROM'	'MATTHEWSON 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.57361	103.4832	'MATTHEWSON 345.00 - TATONGA7 345.00 345KV CKT 2'
G11_024	'TO->FROM'	'MATTHEWSON 345.00 - TATONGA7 345.00 345KV CKT 2'	1195	0.57361	103.4832	'MATTHEWSON 345.00 - TATONGA7 345.00 345KV CKT 1'
G11_024	'TO->FROM'	'CIMARRON - MATTHEWSON 345.00 345KV CKT 1'	956	0.48557	135.1275	'MATTHEWSON 345.00 - NORTHWEST 345KV CKT 1'

SOURCE	DIRECTION	MONTCOMMONNAME	RATEB	TDF	TC%LOADING	CONTNAME
G11_024	'FROM->TO'	'MATTHEWSON 345.00 - NORTHWEST 345KV CKT 1'	1195	0.54108	117.7769	'CIMARRON - MATTHEWSON 345.00 345KV CKT 1'
G11_024	'TO->FROM'	'MATTHEWSON 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.58149	100.7395	'MATTHEWSON 345.00 - TATONGA7 345.00 345KV CKT 2'
G11_024	'TO->FROM'	'MATTHEWSON 345.00 - TATONGA7 345.00 345KV CKT 2'	1195	0.58149	100.7395	'MATTHEWSON 345.00 - TATONGA7 345.00 345KV CKT 1'
G11_024	'TO->FROM'	'CIMARRON - MATTHEWSON 345.00 345KV CKT 1'	956	0.40379	119.1468	'MATTHEWSON 345.00 - NORTHWEST 345KV CKT 1'
G11_024	'TO->FROM'	'CIMARRON - MATTHEWSON 345.00 345KV CKT 1'	956	0.47949	137.1267	'MATTHEWSON 345.00 - NORTHWEST 345KV CKT 1'
G11_024	'FROM->TO'	'MATTHEWSON 345.00 - NORTHWEST 345KV CKT 1'	1195	0.44749	105.7762	'CIMARRON - MATTHEWSON 345.00 345KV CKT 1'
G11_024	'FROM->TO'	'MATTHEWSON 345.00 - NORTHWEST 345KV CKT 1'	1195	0.53242	122.9661	'CIMARRON - MATTHEWSON 345.00 345KV CKT 1'
G11_024	'TO->FROM'	'MATTHEWSON 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.50638	101.9845	'MATTHEWSON 345.00 - TATONGA7 345.00 345KV CKT 2'
G11_024	'TO->FROM'	'MATTHEWSON 345.00 - TATONGA7 345.00 345KV CKT 1'	1195	0.57893	106.7267	'MATTHEWSON 345.00 - TATONGA7 345.00 345KV CKT 2'
G11_024	'TO->FROM'	'MATTHEWSON 345.00 - TATONGA7 345.00 345KV CKT 2'	1195	0.50638	101.9845	'MATTHEWSON 345.00 - TATONGA7 345.00 345KV CKT 1'
G11_024	'TO->FROM'	'MATTHEWSON 345.00 - TATONGA7 345.00 345KV CKT 2'	1195	0.57893	106.7267	'MATTHEWSON 345.00 - TATONGA7 345.00 345KV CKT 1'
G11_024	'TO->FROM'	'CIMARRON - MATTHEWSON 345.00 345KV CKT 1'	956	0.40431	126.9879	'MATTHEWSON 345.00 - NORTHWEST 345KV CKT 1'

H: Powerflow Analysis (Constraints Between 3% and 20% TDF)

****The results will be available by request****

I: Stability Study for Group 1

Final Report

For

Southwest Power Pool

From

S&C Electric Company

DEFINITIVE IMPACT STUDY
DISIS-2011-001 (Group 1)

S&C Project No. 5538

July 26, 2011

S&C Electric Company

S&C Electric Company, Chicago, IL 60626-3997, Phone: (773) 338-1000
Power Systems Services Division Fax: (773) 338-4254

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Report Revision History:

Date of Report	Issue	Comments
July 13, 2011	Rev. A	Preliminary report issued for review and approval
July 26, 2011	Rev. 0	Final report issued

Prepared by:	Reviewed by:
_____ Saeed Kamalinia Project Engineer Power System Services S&C Electric Company	_____ George S. Tsai Li Senior Engineer Power System Services S&C Electric Company
	Approved by: _____ Terrance A. Bellei Power Systems Technical Director Power System Services S&C Electric Company

EXECUTIVE SUMMARY

S&C Electric Company has performed an interconnection impact study for the Definitive Impact Study DISIS-2011-001 (Group 1) in response to a request through the Southwest Power Pool (SPP) Tariff studies. Group 1 includes four interconnection wind-farm projects.

Group 1 and prior queued projects in the Oklahoma Gas and Electric (OKGE) area were studied at 100% output power using 2010/2011 summer and winter peak loading cases 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. The power factor requirements are for N-1 (or N-2 contingencies if applicable) contingencies specified by SPP. Power Factor analysis for the study projects revealed that the generating facilities must meet the following requirements.

- GEN-2011-015 is required to maintain a power factor of 97% lagging (supplying reactive power) to 99% leading (absorbing reactive power) at the POI.
- GEN-2011-019 is required to maintain a power factor of 95% lagging to 95% leading at the POI.
- GEN-2011-020 is required to maintain a power factor of 95% lagging to 95% leading at the POI.
- GEN-2011-024 is required to maintain a power factor of 95% lagging to 95% leading at the POI.

Transient stability analysis indicates that Group 1 will ride-through each fault contingency specified by SPP and the nearby areas will retain angular, frequency and voltage stability. Group 1 can successfully interconnect into the transmission system at the desired location without reduction in output power.

1. INTRODUCTION

S&C Electric Company has performed an interconnection impact study for the Definitive Impact Study DISIS-2011-001 (Group 1) in response to a request through the Southwest Power Pool (SPP) Tariff studies. Group 1 includes projects as follows.

Table 1.1: Study Projects in Group 1

Project	Size (MW)	Wind Turbine Model	Point of Interconnection
GEN-2011-015	300.6	Vestas 1.8MW	Tap on the Woodward - Tatonga 345kV line
GEN-2011-019	299	Siemens 2.3MW	Woodward 345kV Bus
GEN-2011-020	299	Siemens 2.3MW	Woodward 345kV Bus
GEN-2011-024	299	Siemens 2.3MW	Tatonga 345kV Bus

Group 1 and prior queued projects in the Oklahoma Gas and Electric (OKGE) area were studied at 100% output power using 2010/2011 summer and winter peak loading cases provided by SPP.

2 TRANSMISSION SYSTEM AND STUDY AREA

The wind generation projects in Group 1 will interconnect into OKGE. In addition to the OKGE area, the following areas were monitored:

AEP West (AEPW)

Sunflower Electric Power Company (SUNC)

Western Farmers Electric Cooperative (WFEC)

Southwestern Public Service (SPS)

Midwest Energy, Inc. (MIDW)

Westar Energy, Inc (WERE)

3. POWER FLOW BASE CASES

The following power flow base cases were provided by SPP:

MDWG_2010_2011SP_DISIS-2010-001-G1.sav – Summer peak 2010/2011, which includes aggregate representation of wind turbine generators for Definitive Impact Study DISIS-2011-001 (Group 1) and prior queued projects at 100% output power.

MDWG_2010_2011WP_DISIS-2010-001-G1.sav – Winter peak 2010/2011, which includes aggregate representation of generation interconnect projects for Definitive Impact Study DISIS-2011-001 (Group 1) and prior queued projects at 100% output power.

4 POWER FLOW MODEL

Definitive Impact Study DISIS-2011-001 (Group 1) and prior queued projects were modeled as aggregates of wind turbine generators. The aggregate models were part of the base case supplied by SPP. Single-line diagrams and other information corresponding to the Group 1 project can be found in Appendix A.

4.1 Vestas V90 VCS 1.8 MW / 60 Hz Wind Turbine Generator

The Vestas V90-1.8 MW wind turbine is a pitch regulated upwind turbine with active yaw and a three-blade rotor. The generator is a 3-phase asynchronous generator with wound rotor. The Vestas V90-1.8 MW turbine has a rotor diameter of 90 m with a generator rated at 1.8 MW.

4.2 Siemens SWT 2.3 MW / 60 Hz Wind Turbine Generator

The SWT WTG consists of a rotor, gearbox, induction generator, machine bridge, DC link, and network bridge. The machine bridge and network bridge decouple the generator from the power system and allows the WTG to operate at a definite power factor setpoint. The power factor range of operation in steady-state and dynamically is variable and is a function of the voltage at the generator terminals and the active power output of the generator. At rated output power and at nominal terminal voltage, the output power factor range varies from 90% leading (inductive) to 90% lagging (capacitive) power factor. The lagging power factor range is reduced if the terminal

voltage is higher than nominal. The leading power factor range is reduced if the terminal voltage is less than nominal and increased if the terminal voltage is greater than nominal.

5. POWER FACTOR REQUIREMENTS AT THE POINT OF INTERCONNECTION

SPP has specific voltage requirements for interconnecting wind farm requests. Such projects are required to meet a voltage schedule at the POI consistent with the voltage in the SPP base case or nominal voltage, whichever is higher, for single (or N-2, if applicable) transmission facility outage contingencies specified by SPP.

5.1 Facility Outage Contingencies

Single transmission facility outage contingencies specified by SPP are listed in Table 5.1.

The base case voltages at the point of interconnection for summer and winter are listed in Table 5.2.

Table 5.2: Base Case Voltage at the Point of Interconnection

Point of Interconnection	Summer Peak 2010/2011 (pu)	Winter Peak 2010/2011 (pu)
Tap on the Woodward - Tatonga 345kV line (582215)	0.984	0.990
Woodward 345kV (515375)	1.002	1.002
Tatonga 345kV (515407)	0.970	0.973

Table 5.1: List of Power Flow Contingencies

Cont. No.	Description
0	System Intact
1	Outage of the Woodward (515375) to Border (525835) 345kV line
2	Outage of the Woodward (515375) to Mooreland (560304) 345kV line
3	Outage of the Woodward (515375) to GEN-2008-047 Tap (580500)
4	Outage of the double ckts of the Woodward (515375) to Medicine Lodge (765342) 345kV lines
5	Outage of the Woodward 345kV (515375) to 138kV (515376) transformer
6	Outage of the GEN-2011-015 Tap (582215) to Woodward (515375) 345kV line
7	Outage of the GEN-2011-015 Tap (582215) to Tatonga (515407) 345kV line
8	Outage of the double ckts of the Tatonga (515407) to Mathewson Northwest (560368) 345kV line
9	Outage of the Northwest (514880) to Spring Creek (514881) 345kV line
10	Outage of the Northwest (514880) to Cimarron (514901) 345kV line
11	Outage of the Northwest 345kV (514880) to 138kV (514879) transformer T2
12	Outage of the Arcadia (514908) to Northwest (514880) 345kV line
13	Outage of the Woodward EHV (515376) to Iodine (514796) 138kV line
14	Outage of the Mathewson (560368) to Woodring (514715) 345kV line
15	Outage of the Mathewson (560368) to Cimarron (514901) 345kV line
16	Outage of the Mooreland (520999) to Windfarm (515785) 138kV line
17	Outage of the Mooreland (520999) to Cedardale (520848) 138kV line
18	Outage of the Mooreland (520999) to Iodine (520957) 138kV line
19	Outage of the Mooreland (520999) to Taloga (521065) 138kV line
20	Outage of the Taloga (521065) to Dewey (514787) 138kV line
21	Outage of the Dewey (514787) to Southard (514822) 138kV line
22	Outage of the double ckts of the GEN-2008-047 Tap (580500) to Hitchland (523097) 345kV line
23	Outage of the Hitchland (523095) 230kV to Hitchland (523097) 345kV transformer
24	Outage of the Ninmile (521128) to Mooreland (520999) 138kV line
25	Outage of the Mathewson (560368) to Northwest (514880) 345kV line
26	Outage of the double ckts of Medcine Lodge (765342) to GEN-2007-025 Tap (532796) 345kV line
27	Outage of the Medcine Lodge (765342) to GEN-2007-025 Tap (532796) 345kV line
28	Outage of the double ckts of Matthewson (560368) – Cimarron (514901) 345kV line

Table 5.3: Power Factor Requirements at the POI for Power Flow Contingencies in Table 5.1 for GEN-2011-015

Cont. No.	Summer				Winter			
	P (MW)	Q (MVAR)	Power Factor		P (MW)	Q (MVAR)	Power Factor	
0	-147.1	-14.0	99.55%	lagging	-147.1	-21.3	98.97%	lagging
1	-147.1	-15.3	99.46%	lagging	-147.1	-16.0	99.41%	lagging
2	-147.1	-9.7	99.78%	lagging	-147.1	-21.8	98.92%	lagging
3	-147.1	-14.7	99.50%	lagging	-147.2	-36.5	97.06%	lagging
4	-147.2	-27.4	98.31%	lagging	-147.1	-20.5	99.04%	lagging
5	-147.1	-13.3	99.59%	lagging	-147.1	-20.5	99.04%	lagging
6	-147.0	10.7	99.74%	leading	-147.0	10.7	99.74%	leading
7	-146.9	18.6	99.21%	leading	-146.9	18.6	99.21%	leading
8	-146.9	16.7	99.36%	leading	-147.0	14.0	99.55%	leading
9	-147.1	-13.5	99.58%	lagging	-147.1	-19.6	99.12%	lagging
10	-147.1	-14.0	99.55%	lagging	-147.1	-21.2	98.98%	lagging
11	-147.1	-13.3	99.59%	lagging	-147.1	-20.7	99.02%	lagging
12	-147.1	-12.2	99.66%	lagging	-147.1	-18.2	99.24%	lagging
13	-147.1	-14.9	99.49%	lagging	-147.1	-22.1	98.89%	lagging
14	-147.1	-9.7	99.78%	lagging	-147.1	-16.9	99.35%	lagging
15	-147.1	-12.2	99.66%	lagging	-147.1	-19.3	99.15%	lagging
16	-147.1	-14.9	99.49%	lagging	-147.1	-22.2	98.88%	lagging
17	-147.1	-19.3	99.15%	lagging	-147.2	-26.4	98.43%	lagging
18	-147.1	-13.9	99.56%	lagging	-147.1	-21.1	98.99%	lagging
19	-147.1	-14.4	99.52%	lagging	-147.1	-21.6	98.94%	lagging
20	-147.1	-13.9	99.56%	lagging	-147.1	-21.1	98.99%	lagging
21	-147.1	-19.3	99.15%	lagging	-147.2	-27.0	98.36%	lagging
22	-147.1	-14.1	99.54%	lagging	-147.1	-21.1	98.99%	lagging
23	-147.1	-15.4	99.46%	lagging	-147.1	-21.9	98.91%	lagging
24	-147.1	-17.3	99.32%	lagging	-147.2	-24.5	98.64%	lagging
25	-147.1	-8.5	99.83%	lagging	-147.1	-14.8	99.50%	lagging
26	-147.1	-14.0	99.55%	lagging	-147.1	-21.3	98.97%	lagging
27	-147.1	-14.0	99.55%	lagging	-147.1	-21.3	98.97%	lagging
28	-147.1	-12.2	99.66%	lagging	-147.1	-19.3	99.15%	lagging

Table 5.4: Power Factor Requirements at the POI for Power Flow Contingencies in Table 5.1 for GEN-2011-019

Cont. No.	Summer				Winter			
	P (MW)	Q (MVAR)	Power Factor		P (MW)	Q (MVAR)	Power Factor	
0	-291.9	91.2	95.45%	leading	-292.4	74.5	96.90%	leading
1	-292.6	66.7	97.50%	leading	-293.1	33.9	99.34%	leading
2	-292.9	53.3	98.38%	leading	-293.0	45.4	98.82%	leading
3	-292.7	61.3	97.88%	leading	-293.1	39.6	99.10%	leading
4	-292.9	49.0	98.63%	leading	-292.5	69.4	97.30%	leading
5	-292.0	87.7	95.77%	leading	-292.5	69.4	97.30%	leading
6	-293.1	1.2	100.00%	leading	-292.7	-28.7	99.52%	lagging
7	-292.2	-64.7	97.64%	lagging	-292.3	-98.6	94.75%	lagging
8	-293.1	34.1	99.33%	leading	-293.2	16.1	99.85%	leading
9	-291.9	89.9	95.57%	leading	-292.5	70.2	97.24%	leading
10	-291.9	90.9	95.48%	leading	-292.4	74.0	96.94%	leading
11	-291.9	90.8	95.49%	leading	-292.4	74.5	96.90%	leading
12	-291.9	88.6	95.69%	leading	-292.5	68.8	97.34%	leading
13	-292.0	87.8	95.76%	leading	-292.5	70.4	97.22%	leading
14	-292.1	84.4	96.07%	leading	-292.6	67.4	97.45%	leading
15	-291.9	90.0	95.56%	leading	-292.4	73.7	96.97%	leading
16	-292.4	75.4	96.83%	leading	-292.8	59.6	97.99%	leading
17	-292.4	75.3	96.84%	leading	-292.8	57.6	98.12%	leading
18	-291.9	89.4	95.62%	leading	-292.4	73.1	97.01%	leading
19	-291.9	89.4	95.62%	leading	-292.4	72.6	97.05%	leading
20	-291.9	90.7	95.50%	leading	-292.4	74.1	96.94%	leading
21	-292.5	69.6	97.28%	leading	-292.9	50.5	98.55%	leading
22	-292.1	84.1	96.10%	leading	-292.6	66.5	97.51%	leading
23	-292.0	87.8	95.76%	leading	-292.5	70.5	97.22%	leading
24	-292.4	74.8	96.88%	leading	-292.8	58.1	98.09%	leading
25	-292.1	85.3	95.99%	leading	-292.6	66.4	97.52%	leading
26	-291.9	91.2	95.45%	leading	-292.4	74.0	96.94%	leading
27	-291.9	91.2	95.45%	leading	-292.4	74.5	96.90%	leading
28	-291.9	90.2	95.54%	leading	-292.4	73.7	96.97%	leading

Table 5.5: Power Factor Requirements at the POI for Power Flow Contingencies in Table 5.1 for GEN-2011-020

Cont. No.	Summer				Winter			
	P (MW)	Q (MVAR)	Power Factor		P (MW)	Q (MVAR)	Power Factor	
0	-292.0	92.6	95.32%	leading	-292.5	74.5	96.91%	leading
1	-292.7	66.7	97.50%	leading	-293.2	33.9	99.34%	leading
2	-292.9	53.3	98.38%	leading	-293.1	45.4	98.82%	leading
3	-292.8	61.3	97.88%	leading	-293.1	39.6	99.10%	leading
4	-293.0	49.0	98.63%	leading	-292.6	69.4	97.30%	leading
5	-292.0	87.7	95.77%	leading	-292.6	69.4	97.30%	leading
6	-293.2	1.3	100.00%	leading	-292.7	-28.6	99.53%	lagging
7	-292.2	-63.3	97.73%	lagging	-292.4	-97.2	94.89%	lagging
8	-293.2	34.2	99.33%	leading	-293.3	16.2	99.85%	leading
9	-292.0	91.4	95.43%	leading	-292.6	70.2	97.24%	leading
10	-292.0	92.4	95.34%	leading	-292.5	74.0	96.95%	leading
11	-292.0	92.3	95.35%	leading	-292.5	74.5	96.91%	leading
12	-292.0	89.2	95.64%	leading	-292.6	68.8	97.35%	leading
13	-292.0	87.8	95.76%	leading	-292.6	70.4	97.23%	leading
14	-292.2	84.4	96.07%	leading	-292.6	67.4	97.45%	leading
15	-292.0	91.7	95.41%	leading	-292.5	73.6	96.98%	leading
16	-292.4	75.3	96.84%	leading	-292.8	59.6	97.99%	leading
17	-292.4	75.3	96.84%	leading	-292.9	57.6	98.12%	leading
18	-292.0	90.9	95.48%	leading	-292.5	73.0	97.02%	leading
19	-292.0	90.9	95.48%	leading	-292.5	72.6	97.06%	leading
20	-292.0	92.2	95.36%	leading	-292.5	74.1	96.94%	leading
21	-292.6	69.6	97.29%	leading	-293.0	50.5	98.55%	leading
22	-292.2	84.1	96.10%	leading	-292.7	66.5	97.51%	leading
23	-292.0	87.8	95.76%	leading	-292.6	70.5	97.22%	leading
24	-292.4	74.8	96.88%	leading	-292.9	58.0	98.10%	leading
25	-292.1	85.2	96.00%	leading	-292.7	66.0	97.55%	leading
26	-292.0	92.6	95.32%	leading	-292.5	74.5	96.91%	leading
27	-292.0	92.6	95.32%	leading	-292.5	74.5	96.91%	leading
28	-292.0	91.7	95.41%	leading	-292.5	73.6	96.98%	leading

Table 5.6: Power Factor Requirements at the POI for Power Flow Contingencies in Table 5.1 for GEN-2011-024

Cont. No.	Summer				Winter			
	P (MW)	Q (MVAR)	Power Factor		P (MW)	Q (MVAR)	Power Factor	
0	-293.0	-423.8	56.87%	lagging	-292.6	-473.3	52.58%	lagging
1	-292.9	-431.5	56.16%	lagging	-292.8	-447.0	54.79%	lagging
2	-293.1	-402.0	58.91%	lagging	-292.6	-476.7	52.31%	lagging
3	-292.9	-427.9	56.48%	lagging	-291.9	-566.6	45.80%	lagging
4	-292.4	-508.1	49.88%	lagging	-292.7	-469.5	52.90%	lagging
5	-293.0	-420.2	57.20%	lagging	-292.7	-469.5	52.90%	lagging
6	-293.8	-120.7	92.50%	lagging	-293.8	-130.6	91.38%	lagging
7	-293.7	-43.4	98.93%	leading	-289.6	-38.9	99.11%	lagging
8	-292.0	-554.4	46.60%	lagging	-291.5	-614.5	42.86%	lagging
9	-292.7	-462.8	53.45%	lagging	-292.5	-490.0	51.26%	lagging
10	-292.9	-426.6	56.60%	lagging	-292.6	-475.9	52.38%	lagging
11	-293.0	-417.9	57.41%	lagging	-292.7	-464.7	53.30%	lagging
12	-292.8	-451.0	54.45%	lagging	-292.4	-508.1	49.88%	lagging
13	292.9	-428.2	56.46%	lagging	-292.6	-477.1	52.28%	lagging
14	-292.9	-438.6	55.54%	lagging	-292.5	-495.5	50.83%	lagging
15	-292.9	-427.6	56.51%	lagging	-292.6	-478.7	52.15%	lagging
16	-292.9	-428.2	56.46%	lagging	-292.6	-477.0	52.29%	lagging
17	-292.8	-456.9	53.96%	lagging	-292.4	-502.0	50.33%	lagging
18	-293.0	-423.1	56.93%	lagging	-292.6	-472.1	52.68%	lagging
19	-292.9	-425.5	56.70%	lagging	-292.6	-474.8	52.46%	lagging
20	-293.0	-423.5	56.90%	lagging	-292.6	-473.0	52.61%	lagging
21	-292.8	-451.0	54.45%	lagging	-292.4	-499.9	50.49%	lagging
22	-293.0	-424.1	56.84%	lagging	-292.6	-472.4	52.66%	lagging
23	-292.9	-431.8	56.14%	lagging	-292.6	-476.6	52.32%	lagging
24	-292.8	-445.5	54.92%	lagging	-292.5	-493.8	50.96%	lagging
25	-292.9	-431.7	56.14%	lagging	-292.6	-478.8	52.15%	lagging
26	-293.0	-423.8	56.87%	lagging	-292.6	-473.3	52.58%	lagging
27	-293.0	-423.8	56.87%	lagging	292.6	-473.3	52.58%	lagging
28	-292.9	-427.6	56.51%	lagging	-292.6	-478.7	52.15%	lagging

To deliver additional capacitive reactive power in order to meet the schedule at the POI of 1.0 per unit voltage, external sources of reactive power such as capacitor banks will be needed. Wind farms are not required by FERC 661-A to operate at the POI beyond a power factor range of ±95% for voltages from 95 to 105% of nominal; therefore, capacitors were considered to meet the FERC 661-A power factor requirements in the cases that voltage at the POI were below 1.0 pu.

The power factor required to maintain a voltage schedule at the POI of 1.0 per unit voltage in accordance with SPP requirements for each of the power flow contingencies in Table 5.1 is listed in Tables 5.3 through 5.6. Note that the contingencies that the 95% power factor requirement is exceeded highlighted in the tables. The 95% power factor requirement was slightly exceeded when outage of the GEN-2011-015 Tap to Tatonga 345kV line (i.e., contingency no.7) occurs. In the case of GEN-2011-024 project, the power factor requirements for the summer and winter cases would exceed 95% lagging power factor. The major reason is that the voltage at the POI was less than 1.0 pu (i.e. 0.976 pu in the base case of) in the pre-project case which would enforce significant amount of reactive power support to reach 1.0 pu. With the power factor set to 95% lagging at the POI the voltage would elevate slightly to 0.978 pu.

Power Factor analysis for the study projects revealed that the generating facilities must meet the following requirements.

- GEN-2011-015 is required to maintain a power factor of 97% lagging (supplying reactive power) to 99% leading (absorbing reactive power) at the POI.
- GEN-2011-019 is required to maintain a power factor of 95% lagging to 95% leading at the POI.
- GEN-2011-020 is required to maintain a power factor of 95% lagging to 95% leading at the POI.
- GEN-2011-024 is required to maintain a power factor of 95% lagging to 95% leading at the POI.

6. TRANSIENT STABILITY ANALYSIS

Transient stability analysis was performed for the fault contingencies in Table 6.1, which were specified by SPP. For the purpose of the transient stability analysis, each of the interconnection request projects were studied with 95% power factor at the POIs.

Table 6.1: SPP fault contingencies

Cont. No.	Cont. Name	Description
1	FLT01-3PH	3-phase fault on the Woodward (515375) to Border (525835) 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.
2	FLT02-1PH	*Single phase fault and sequence like previous*
3	FLT03-3PH	3-phase fault on the Woodward (515375) to Mooreland (560304) 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.
4	FLT04-1PH	*Single phase fault and sequence like previous*
5	FLT05-3PH	3-phase fault on one of the Woodward (515375) to GEN-2008-047 Tap (580500) 345kV lines, 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.
6	FLT06-1PH	*Single phase fault and sequence like previous*
7	FLT07-3PH	3-phase fault double circuit on the Woodward (515375) to Medicine Lodge (765342) 345kV lines, near Woodward. a. Apply double circuit 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.
8	FLT08-1PH	*Single phase fault and sequence like previous*
9	FLT09-3PH	3-phase fault on one of the Woodward 345kV (515375) to 138kV (515376) transformer, near the 345 kV bus. 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.

Cont. No.	Cont. Name	Description
10	FLT10-3PH	3-phase fault on the GEN-2011-015 Tap (582215) to Woodward (515375) 345kV line, near GEN-2011-015 Tap. a. Apply fault at the GEN-2011-015 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.
11	FLT11-1PH	*Single phase fault and sequence like previous*
12	FLT12-3PH	3-phase fault on the GEN-2011-015 Tap (582215) to Tatonga (515407) 345kV line, near GEN-2011-015 Tap. a. Apply fault at the GEN-2011-015 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.
13	FLT13-1PH	*Single phase fault and sequence like previous*
14	FLT14-3PH	3-phase fault double circuit on the Tatonga (515407) to Mathewson (560368) 345kV line, near Tatonga. a. Apply double circuit fault at the Tatonga 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.
15	FLT15-1PH	*Single phase fault and sequence like previous*
16	FLT16-3PH	3-phase fault on the Northwest (514880) to Spring Creek (514881) 345kV line, near Northwest. a. Apply fault at the Northwest 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.
17	FLT17-1PH	*Single phase fault and sequence like previous*
18	FLT18-3PH	3-phase fault on the Northwest (514880) to Cimarron (514901) 345kV line, near Northwest. a. Apply fault at the Northwest 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.
19	FLT19-1PH	*Single phase fault and sequence like previous*
20	FLT20-3PH	3-phase fault on Northwest 345kV (514880) to 138kV (514879) transformer T2, near the 345 kV bus. a. Apply fault at the Northwest 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.
21	FLT21-3PH	3-phase fault on the Arcadia (514908) to Northwest (514880) 345kV line, near Arcadia. a. Apply fault at the Arcadia 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.
22	FLT22-1PH	*Single phase fault and sequence like previous*

Cont. No.	Cont. Name	Description
23	FLT23-3PH	3-phase fault on the Woodward EHV (515376) to Iodine (514796) 138kV line, near Woodward EHV. a. Apply fault at the Woodward EHV 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	*Single phase fault and sequence like previous*
25	FLT25-3PH	3-phase fault on the Mathewson (560368) to Woodring (514715)345kV line, near Woodring. a. Apply fault at the Woodring 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.
26	FLT26-1PH	*Single phase fault and sequence like previous*
27	FLT27-3PH	3-phase fault on the Mathewson (560368) to Cimarron (514901) 345kV line, near Cimarron. a. Apply fault at the Cimarron 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	FLT28-1PH	*Single phase fault and sequence like previous*
29	FLT29-3PH	3-phase fault on the Mooreland (520999) to Windfarm (515785) 138kV line, near Mooreland. a. Apply fault at the Mooreland 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	*Single phase fault and sequence like previous*
31	FLT31-3PH	3-phase fault on the Mooreland (520999) to Cedardale (520848) 138kV line, near Cedardale. a. Apply fault at Cedardale 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.
32	FLT32-1PH	*Single phase fault and sequence like previous*
33	FLT33-3PH	3-phase fault on the Mooreland (520999) to Iodine (520957) 138kV line, near Iodine. a. Apply fault at Iodine 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	FLT34-1PH	*Single phase fault and sequence like previous*
35	FLT35-3PH	3-phase fault on the Mooreland (520999) to Taloga (521065) 138kV line, near Taloga. a. Apply fault at Taloga 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	FLT36-1PH	*Single phase fault and sequence like previous*

Cont. No.	Cont. Name	Description
37	FLT37-3PH	3-phase fault on the Taloga (521065) to Dewey (514787) 138kV line, near Taloga. a. Apply fault at the Taloga 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.
38	FLT38-1PH	*Single phase fault and sequence like previous*
39	FLT39-3PH	3-phase fault on the Dewey (514787) to Southard (514822) 138kV line, near Dewey. a. Apply fault at the Dewey 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.
40	FLT40-1PH	*Single phase fault and sequence like previous*
41	FLT41-3PH	3-phase double circuit fault on the GEN-2008-047 Tap (580500) to Hitchland (523097) 345kV lines, near GEN-2008-047 Tap. a. Apply double circuit fault at the GEN-2008-047 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.
42	FLT42-1PH	*Single phase fault and sequence like previous*
43	FLT43-3PH	3-phase fault on the Hitchland (523095) 230kV to Hitchland (523097) 345kV transformer, 230 kV bus. a. Apply fault at the Hitchland 230kV bus. b. Clear fault after 5 cycles by tripping the faulted transformer.
44	FLT44-3PH	3-phase fault on the Ninmile (521128) to Mooreland (520999) 138kV line, near Ninmile. a. Apply fault at Ninmile 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.
45	FLT45-1PH	*Single phase fault and sequence like previous*
46	FLT46-3PH	3-phase fault on the Mathewson (560368) to Northwest (514880) 345kV lines, near Northwest. a. Apply fault at the Northwest 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.
47	FLT47-1PH	*Single phase fault and sequence like previous*
48	FLT48-3PH	3-phase fault on the Medcine Lodge (765342) to GEN-2007-025 Tap (532796) 345kV line, near Medicine Lodge, Ckt 1 and 2. a. Apply fault at Medicine Lodge 345kV Ckt 1 and 2. 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.

Cont. No.	Cont. Name	Description
49	FLT49-3PH	3-phase fault on the Medcine Lodge (765342) to GEN-2007-025 Tap (532796) 345kV line, near Medicine Lodge, Ckt 1. a. Apply fault at Medicine Lodge 345kV Ckt 3. 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	FLT50-3PH	3-phase fault on one of the Matthewson (560368) – Cimarron (514901) 345kV line, near the Matthewson 345 kV bus. a. Apply fault at the Matthewson 345kV bus. b. Clear fault after 5 cycles by tripping the faulted transformer.

Single line to ground faults were simulated in a manner consistent with currently accepted practices, that is to assume that a single line to ground will cause a voltage drop at the fault location of 60% of nominal.

The prior queued projects monitored are listed in Table 6.2.

Table 6.2: Prior queued wind farm projects monitored

Request	Size (MW)	Wind Turbine Model	Point of Interconnection
GEN-2001-014	94.5	Suzlon 2.1MW	Fort Supply 138kV (520920)
GEN-2001-037	102	GE 1.5MW	Woodward-Mooreland 138kV (515785)
GEN-2005-005	18.4	SMK 223	Moorland – Woodward 138kV (515785)
GEN-2005-008	120	GE 1.5MW	Woodward 138kV (514785)
GEN-2006-024S	18.9	Suzlon 2.1MW	Buffalo Bear 69kV (521120)
GEN-2006-046	132	Mitsubishi 2.4MW	Dewey 138kV (514787)
GEN-2007-006	161.7	Suzlon 2.1MW	Roman Nose 138kV (514823)
GEN-2007-021	200	GE 1.6MW	Tatonga 345kV (515407)
GEN-2007-044	299.2	GE 1.6MW	Tatonga 345kV (515407)
GEN-2007-050	175.2	Siemens 2.3MW	Woodward 138kV (515376)
GEN-2007-051	199.5	GE 1.5MW	Mooreland 138kV (520999)
GEN-2007-062	765	GE 1.5MW	Woodward 345kV (515375)
GEN-2008-003	101.2	Siemens 2.3MW	Woodward 138kV (515376)
GEN-2008-019	300	Mitsubishi 2.4MW	Tatonga 345kV (515407)
GEN-2008-029	250.5	GE 1.5MW	Woodward 138kV (515376)
GEN-2008-044	197.8	Siemens SWT 2.3MW	Tatonga 345kV (515407)
GEN-2010-008	64.4	Vestas V90 1.8MW	Fargo Jct 69kV (521196)
GEN-2010-011	29.7	Siemens SWT 2.3MW	Addition to Gen-2008-044 34.5kV bus (576503)
GEN-2010-043	320	GENROU	Mooreland 345kV (560304)

Table 6.3 through Table 6.5 listed voltage and frequency relay settings were used to evaluate fault ride-through capability of WTGs in transient stability analysis.

Table 6.3: Vestas V90, 1.8 MW Protection Settings (based on Vestas Generic Model Dynamic Data Template for PSS/E Model revision 7.2)

Relay Type	Trip Setting (unit)	Time Delay (sec)
Undervoltage	0.90 (pu)	60
Undervoltage	0.85 (pu)	0.4
Undervoltage	0.75 (pu)	0.0001
Overvoltage	1.10 (pu)	60
Overvoltage	1.35 (pu)	0.2
Overvoltage	1.20 (pu)	0.12
Underfrequency	56.4 (Hz)	0.2
Overfrequency	63.0 (Hz)	0.2

Table 6.4: Siemens SWT 2.3 MW Protection Settings (PSS/E Model Version 1.3)

Relay Type	Trip Setting	Time Setting (sec)
Undervoltage	0.85 (pu)	3.0
Undervoltage	0.40 (pu)	1.6
Undervoltage	0.15 (pu)	0.85
Overvoltage	1.2 (pu)	0.15
Overvoltage	1.10 (pu)	1.0
Underfrequency	57.0 (Hz)	10
Underfrequency	56.4 (Hz)	0.1
Overfrequency	62.4 (Hz)	0.1

Table 6.5: GE 1.6xle Protection Settings

Relay Type	Trip Setting	Time Delay (sec)
Undervoltage	0.75 (pu)	1.9
Undervoltage	0.50 (pu)	1.2
Undervoltage	0.30 (pu)	0.7
Undervoltage	0.15 (pu)	0.2
Overvoltage	1.15 (pu)	0.1
Overvoltage	1.10 (pu)	1.0

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 reasonable operating level. Frequencies should settle to the nominal 60 Hz power frequency.

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.

The simulation does not converge in fault #7 and #14 in the winter peak case. There are also instability issues in contingencies #8 and #15, which include the same sequence of events as in contingencies #7 and #14 with the phase-to-ground fault. These contingencies include double-circuit fault and enforce drastic changes to the network. The simulation would only converge in fault #7 by reducing acceleration factor to 0.1 in the summer peak case, but this would not help solving the issues in the winter case and in fault #14. Furthermore, WTGs tripped in prior queued project GEN-2007-006 in faults #14 and #15. There are also oscillation issues in prior queued project in contingencies #8 and #15. These issues have been discussed with SPP previously and the decision is not to take any further action due to very-low possibility of the double-circuit contingencies for lines on separate towers to occur in the case of fault #14 and #15.

Group 1 will survive each fault disturbance in Table 6.1. Voltage, frequency and angular stability will be retained. Transient stability plots of the undisturbed runs and #1 through #50 fault contingencies for summer and winter can be found in the Appendix section of this report. As the results showed none of the interconnection request projects required additional reactive power to retain stability and that 95% power factor should be sufficient requirement for each project.

Table 6.6: Summary of Transient Stability Results

Cont. No.	Cont. Name	Summer Peak 2010/2011	Winter Peak 2010/2011
1	FLT01-3PH	STABLE	STABLE
2	FLT02-1PH	STABLE	STABLE
3	FLT03-3PH	STABLE	STABLE
4	FLT04-1PH	STABLE	STABLE
5	FLT05-3PH	STABLE	STABLE
6	FLT06-1PH	STABLE	STABLE
7	FLT07-3PH	STABLE	Not Converged*
8	FLT08-1PH	STABLE	Not Converged*
9	FLT09-3PH	STABLE	STABLE
10	FLT10-3PH	STABLE	STABLE
11	FLT11-1PH	STABLE	STABLE
12	FLT12-3PH	STABLE	STABLE
13	FLT13-1PH	STABLE	STABLE
14	FLT14-3PH	STABLE (GEN-2007-006 tripped)	Not Converged
15	FLT15-1PH	STABLE (GEN-2007-006 tripped)	STABLE (GEN-2007-006 tripped)
16	FLT16-3PH	STABLE	STABLE
17	FLT17-1PH	STABLE	STABLE
18	FLT18-3PH	STABLE	STABLE
19	FLT19-1PH	STABLE	STABLE
20	FLT20-3PH	STABLE	STABLE
21	FLT21-3PH	STABLE	STABLE
22	FLT22-1PH	STABLE	STABLE
23	FLT23-3PH	STABLE	STABLE
24	FLT24-1PH	STABLE	STABLE
25	FLT25-3PH	STABLE	STABLE
26	FLT26-1PH	STABLE	STABLE
27	FLT27-3PH	STABLE	STABLE
28	FLT28-1PH	STABLE	STABLE
29	FLT29-3PH	STABLE	STABLE
30	FLT30-1PH	STABLE	STABLE
31	FLT31-3PH	STABLE	STABLE
32	FLT32-1PH	STABLE	STABLE
33	FLT33-3PH	STABLE	STABLE
34	FLT34-1PH	STABLE	STABLE
35	FLT35-3PH	STABLE	STABLE

Cont. No.	Cont. Name	Summer Peak 2010/2011	Winter Peak 2010/2011
36	FLT36-1PH	STABLE	STABLE
37	FLT37-3PH	STABLE	STABLE
38	FLT38-1PH	STABLE	STABLE
39	FLT39-3PH	STABLE	STABLE
40	FLT40-1PH	STABLE	STABLE
41	FLT41-3PH	STABLE	STABLE
42	FLT42-1PH	STABLE	STABLE
43	FLT43-3PH	STABLE	STABLE
44	FLT44-3PH	STABLE	STABLE
45	FLT45-1PH	STABLE	STABLE
46	FLT46-3PH	STABLE	STABLE
47	FLT47-1PH	STABLE	STABLE
48	FLT48-3PH	STABLE	STABLE
49	FLT49-3PH	STABLE	STABLE
50	FLT50-3PH	STABLE	STABLE

*ADJUSTMENT OF PSS/E PARMETERS ALLOWED CONVERGENCE

7. CONCLUSIONS AND RECOMMENDATIONS

The results of power factor analysis indicated that GEN-2011-015 is required to maintain a power factor of 97% lagging to 99% leading at the POI, while other study projects (i.e., GEN-2011-019, GEN-2011-020 and GEN-2011-024) are required to maintain 95% lagging to 95% leading at their POIs.

Transient analysis results indicate that definitive Impact Study DISIS-2011-001 (Group 1) can successfully interconnect into the transmission system at 100% output power and at the desired location. Transient stability analysis indicated that Group 1 will ride-through each fault contingency specified by SPP and the nearby areas will retain angular, frequency and voltage stability.

J: Stability Study for Group 2

SPP DISIS-2011-001 Group 2
Definitive Impact Study

Final Report for

Southwest Power Pool

Prepared by:
Excel Engineering, Inc.

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Principal Contributor:

Shu Liu, P.E.
William Quaintance, P.E.

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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** and **Texas**.

William Quaintance
Oklahoma License Number: 24320
Texas License Number: 104268

Excel Field Services, Inc.
Oklahoma Firm License Number: 5844

Minnesota Excel Engineering, Inc.
Texas Firm License Number: 7970

1. Background and Scope

The DISIS-2011-001 Group 2 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 2011.

Table 1-1. Interconnection Requests Evaluated in this Study

Request	Size (MW)	Wind Turbine Model	Point of Interconnection	POI Bus	Gen Buses
GEN-2011-012	104.5	GE 2.75MW	Tap on Moore County - Hitchland 230kV line	581116	581120
GEN-2011-014	201	Siemens 3.0MW	Tap on Hitchland to Woodward 345kV line	580500	581115
GEN-2011-021	299	Siemens 2.3MW	Tap on Hitchland to GEN-2008-047 Tap 345kV line	580507	581146 581147
GEN-2011-022	299	Siemens 2.3MW	Hitchland 345kV	523097	581153 581154
ASGI-2011-002	10	DeWind D8.2 2.0MW	Herring 115kV	523359	580123

The prior-queued requests shown in Table 1-2 were included in this study and dispatched at 100% of rated capacity.

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 disabled. A power factor analysis was performed for the wind farms in Table 1-1.

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.

Table 1-2. Nearby Interconnection Requests Already in the Queue

Request	Size	Wind Turbine Model	Point of Interconnection	POI Bus	Gen Buses
GEN-2002-008	240	GE 1.5MW	Hitchland 345kV	523097	579077 579078 579079
GEN-2002-009	79.8	Suzlon 2.1MW	Hansford 115kV	523195	579084
GEN-2003-013	198	GE 1.5 MW	Tap on Hitchland – Finney 345kV line	560029	579091
GEN-2003-020	159	GE 1.5 MW	Martin 115kV	523928	560845 560846
GEN-2005-017	339	GE 1.5 MW	Tap on Hitchland – Potter 345kV line	579118	579119 579120 579121
GEN-2006-020	20	D8.2 2.0MW	Tap on Hitchland – Sherman Tap 115kV line	523160	579138
GEN-2006-044	370	DeWind D9.2 2.0MW	Hitchland 345kV	523097	579367 579368 579369 579370
GEN-2006-049	399	GE 1.5 MW	Tap on Hitchland – Finney 345kV line	560029	560946 560947
GEN-2007-046	199.5	GE 1.5MW	Hitchland 115kV	523093	1050
GEN-2007-057	34.5	GE 1.5MW	Moore Co. East 115kV	523308	523313
GEN-2008-047	300	GE 1.5MW	Tap on Hitchland to Woodward 345kV line	580500	573506 573510
GEN-2008-110	299.2	GE 1.6MW	Hitchland 345kV	523097	575083
GEN-2010-001	300	Suzlon 2.1MW	Tap on Hitchland to Woodward 345kV line	580500	578545 578548
GEN-2010-007	73.8	Vestas V100 1.8MW	Tap on Riverside – Pringle 115kV line	575090	575094
GEN-2010-014	358.8	Siemens SWT 2.3MW	Hitchland 345kV	523097	576400 576410

2. Executive Summary

The DISIS-2011-001 Group 2 Definitive Impact Study evaluated the impacts of interconnecting the Table 1-1 study projects to the SPP transmission system.

Steady-state stability problems were found during the power factor analysis for the following outages:

- Fault 24 – 3 phase fault on the Conestoga to Finney 345kV line, near Conestoga.
- Fault 47 – 3 phase fault on the GEN-2011-015 Tap to Woodward 345kV line, near Woodward 345kV bus.
- Fault 59 – 3 phase fault on both of the Gen-2008-047 Tap to Woodward 345kV lines, near Gen-2008-047 Tap.
- Fault 60 – 3 phase fault on both of the Gen-2008-047 Tap to Hitchland 345kV line and the GEN-2008-047 Tap to GEN-2011-021 Tap, near Gen-2008-047 Tap.
- Fault 62 – 3 phase fault on both of the Gen-2011-021 Tap to Gen-2008-047 Tap 345kV line and the Gen-2008-047 Tap to Hitchland 345kV line, near Gen-2011-021 Tap.

To fix these problems, the following system adjustments and upgrades are included:

- Adjust Group 2 local voltage
- Upgrades at O.K.U. local area
- Add GEN-2008-047 to Comanche 345kV line

With these system adjustments and upgrades, all steady-state and dynamic analyses were stable.

In Faults 60 and 62, the following buses voltage show slow recovery following fault clearing in WP cases:

- GEN-2011-021 POI (580507)
- Hitchland 345kV (523097)
- GEN-2003-013 POI (560029)

In order to improve the voltage profile to an acceptable level, 100 Mvar switched shunts were added at GEN-2011-021 POI for Scenario 1 WP case and 200 Mvar switched shunts were added at GEN-2011-021 POI for Scenario 2 WP case.

Final power factor and capacitor requirements for the Group 2 projects are listed in Table 4-2.

With the assumptions and upgrades described in this report, DISIS-2011-001 Group 2 should be able to connect without causing any stability problems on the SPP transmission grid.

Any change in system or wind farm 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 30.3.3 was used in this study.

3.2 Models Used

SPP provided its latest stability database cases for both summer and winter peak seasons for the following two scenarios:

- **Scenario 1:** Midland Combined Cycle generation (GEN-2010-059 and GEN-2010-060) dispatched at 250 MW
- **Scenario 2:** Midland Combined Cycle generation (GEN-2010-059 and GEN-2010-060) dispatched at 750 MW

The model included the study and prior-queued projects.

Power flow one-line diagrams of the study projects in scenario 1 summer peak conditions are shown in Figure 3-1 through Figure 3-5. As the figures show, each wind farm model includes explicit representation of the radial transmission line, if any; the substation transformer(s) from transmission voltage to 34.5kV; and the substation reactive power device(s), if any. The remainder of each wind farm is represented by one or more lumped equivalents including a generator, a step-up transformer, and a collector system impedance, if any.

Steady-state and dynamic model data for the study plants are given in Appendix F.

A one-line diagram of the SPP 345 kV system in the Group 2 area is shown in Appendix G.

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

3.3 Monitored Facilities

All generators and transmission buses in Areas 520, 524, 525, 526, 531, 534, and 536 were monitored.

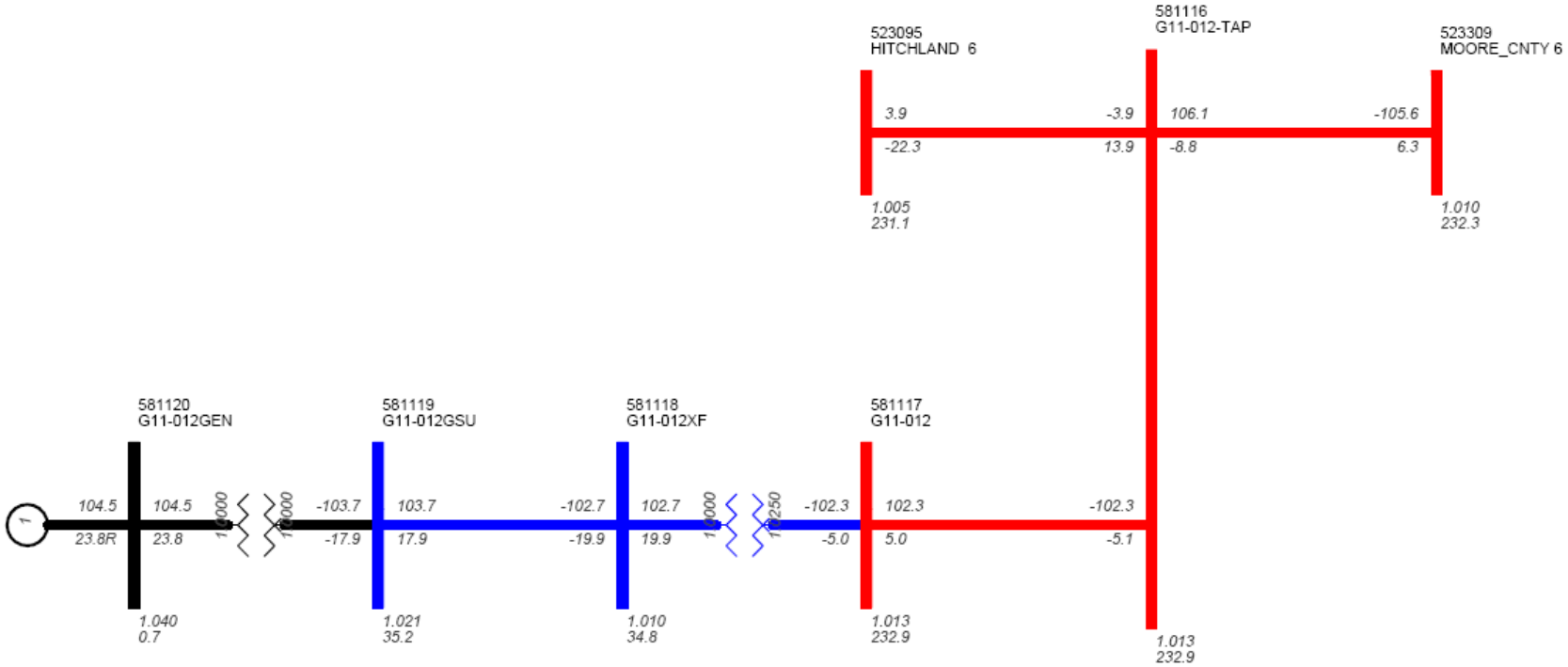

Figure 3-1. Power Flow One-line for GEN-2011-012 and adjacent equipment (Scenario 1 – SP)

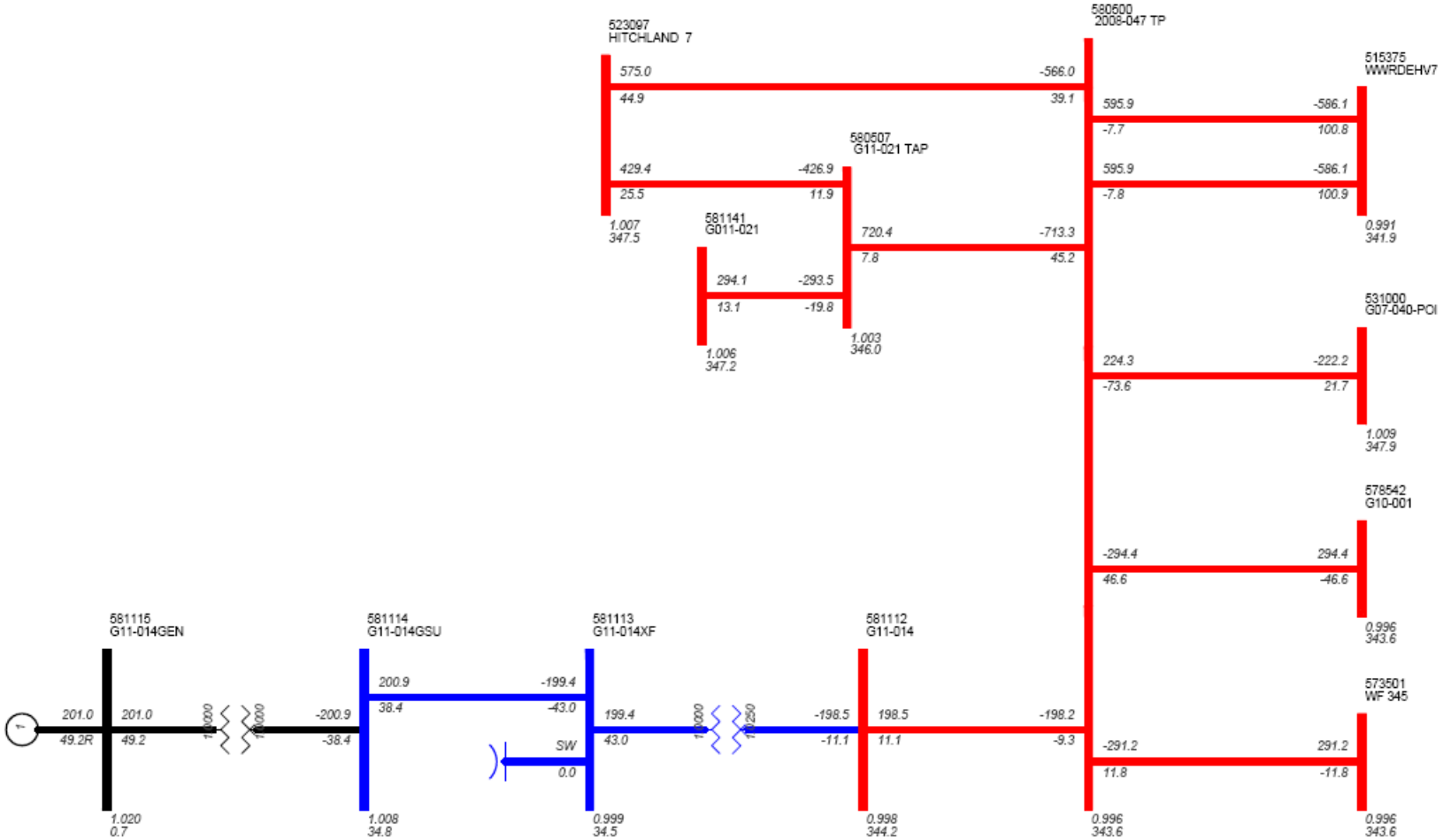

Figure 3-2. Power Flow One-line for GEN-2011-014 and adjacent equipment (Scenario 1 – SP)

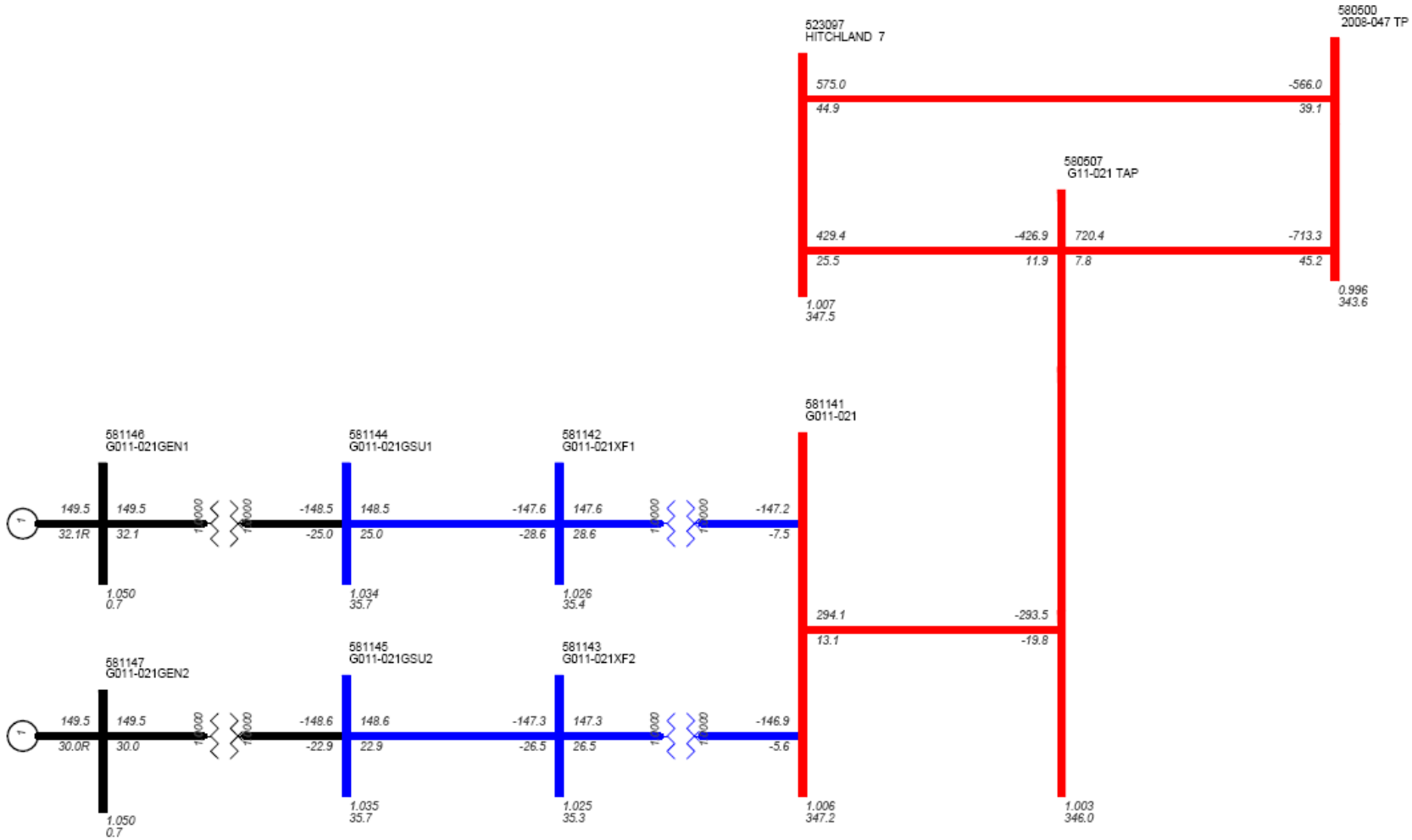

Figure 3-3. Power Flow One-line for GEN-2011-021 and adjacent equipment (Scenario 1 – SP)

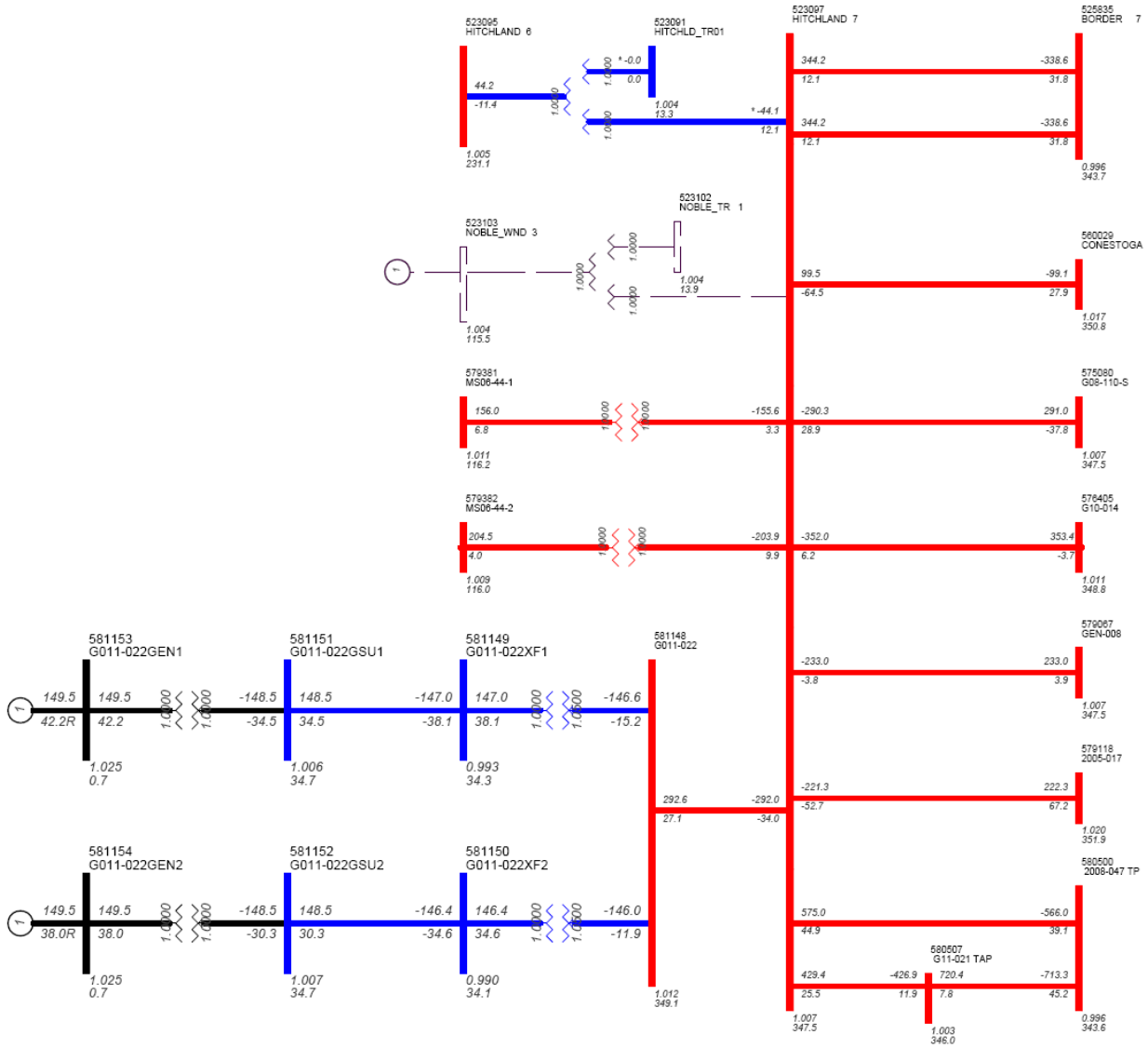

Figure 3-4. Power Flow One-line for GEN-2011-022 and adjacent equipment (Scenario 1 – SP)

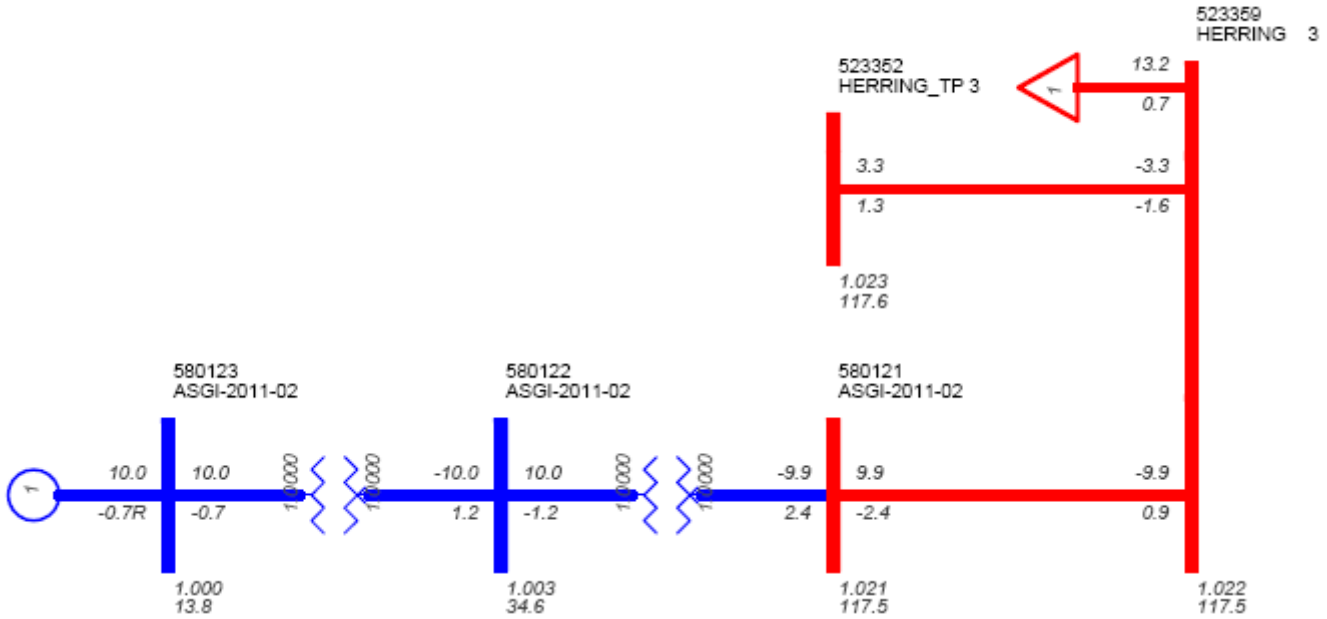

Figure 3-5. Power Flow One-line for ASGI-2011-002 and adjacent equipment (Scenario 1 – SP)

3.4 Performance Criteria

Any 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 for the stability analysis. 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 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-2011-001 Group 2

Cont. No.	Cont. Name	Description
1	FLT01-3PH	3 phase fault on one of the Hitchland (523097) to Border (525835) 345 kV lines, at Hitchland (523097). a. Apply fault at the Hitchland 345kV bus. b. Clear fault after 5 cycles by tripping the faulted line.
2	FLT02-1PH	Single phase fault on the line in previous a. Apply fault at the Hitchland 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.
3	FLT03-3PH	3 phase fault on the Hitchland (523097) to Conestoga (560029) 345kV line, near Hitchland. a. Apply fault at the Hitchland 345kV bus. b. Clear fault after 5 cycles by tripping the faulted line.
4	FLT04-1PH	Single phase fault on the line in previous a. Apply fault at the Hitchland 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.
5	FLT05-3PH	3 phase fault on the Hitchland (523097) to GEN-2005-017 Tap (579118) 345kV line, near Hitchland. a. Apply fault at the Hitchland 345kV bus. b. Clear fault after 5 cycles by tripping the faulted line.
6	FLT06-1PH	Single phase fault on the line in previous a. Apply fault at the Hitchland 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.
7	FLT07-3PH	3 phase fault on one of the Gen-2008-047 Tap (580500) to Hitchland (523097) 345kV lines, near Gen-2008-047 Tap. a. Apply fault at the Gen-2008-047 Tap 345kV bus. b. Clear fault after 5 cycles by tripping the faulted line.
8	FLT08-1PH	Single phase fault on the line in previous a. Apply fault at the Gen-2008-047 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.
9	FLT09-3PH	3 phase fault on the Hitchland 230kV (523095) to 345kV (523097) transformer, near the 230kV bus. a. Apply fault at the Hitchland 230kV bus. b. Clear fault after 5 cycles by tripping the faulted transformer.
10	FLT10-3PH	3 phase fault on the GEN-2011-012 Tap (581116) to Hitchland (523095) 230kV near GEN-2011-012 Tap. a. Apply fault at the GEN-2011-012 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.
11	FLT11-1PH	*Single phase fault and sequence like previous*

Cont. No.	Cont. Name	Description
12	FLT12-3PH	3 phase fault on the GEN-2011-012 Tap (581116) to Moore Co (523309) 230kV near GEN-2011-012 Tap. a. Apply fault at the GEN-2011-012 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.
13	FLT13-1PH	*Single phase fault and sequence like previous*
14	FLT14-3PH	3 phase fault on one of the Gen-2008-047 Tap (580500) to Woodward (515375) 345kV lines, near Gen-2008-047 Tap. a. Apply fault at the Gen-2008-047 Tap 345kV bus. b. Clear fault after 5 cycles by tripping the faulted line.
15	FLT15-1PH	Single phase fault on the line in previous a. Apply fault at the Gen-2008-047 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.
16	FLT16-3PH	3 phase fault on the Gen-2008-047 Tap (580500) to GEN-2007-040 Tap (531000) 345kV line, near Gen-2008-047 Tap. a. Apply fault at the Gen-2008-047 Tap 345kV bus. b. Clear fault after 5 cycles by tripping the faulted line.
17	FLT17-1PH	Single phase fault on the line in previous a. Apply fault at the Gen-2008-047 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.
18	FLT18-3PH	3 phase fault on the GEN-2005-017 Tap (579118) to Potter Co. (523961) 345kV line, near GEN-2005-017 Tap. a. Apply fault at the GEN-2005-017 Tap 345kV bus. b. Clear fault after 5 cycles by tripping the faulted line.
19	FLT19-1PH	Single phase fault on the line in previous a. Apply fault at the GEN-2005-017 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.
20	FLT20-3PH	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.
21	FLT21-1PH	*Single phase fault and sequence like previous*
22	FLT22-3PH	3 phase fault on the Pringle (523267) to Harrington (523979) 230kV line, near Pringle. a. Apply fault at the Pringle 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.
23	FLT23-1PH	*Single phase fault and sequence like previous*
24	FLT24-3PH	3 phase fault on the Conestoga (560029) to Finney (523853) 345kV line, near Conestoga. a. Apply fault at the Conestoga 345kV bus. b. Clear fault after 5 cycles by tripping the faulted line

Cont. No.	Cont. Name	Description
25	FLT25-1PH	Single phase fault on the line in previous a. Apply fault at the Conestoga 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.
26	FLT26-3PH	3 phase fault on the 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.
27	FLT27-1PH	*Single phase fault and sequence like previous*
28	FLT28-3PH	3 phase fault on the Holcomb (531449) to GEN-2008-018 Tap (531010) 345kV line, near Holcomb. a. Apply fault at the Holcomb 345kV bus. b. Clear fault after 5 cycles by tripping the faulted line.
29	FLT29-1PH	Single phase fault on the line in previous 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.
30	FLT30-3PH	3 phase fault on the DWS Frisco (523160) to Lasley (523175) 115kV line, near DWS Frisco. a. Apply fault at the DWS Frisco 115kV bus. b. Clear fault after 5 cycles by tripping the faulted line (all segments listed above). 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.
31	FLT31-1PH	*Single phase fault and sequence like previous*
32	FLT32-3PH	3 phase fault on the Hitchland 115kV (523093) to 230kV (523095) transformer, near the 115 kV bus. a. Apply fault at the Hitchland 115kV bus. b. Clear fault after 5 cycles by tripping the faulted transformer.
33	FLT33-3PH	3 phase fault on the Pringle (523266) to Spearman (523186) 115kV line #1, near Pringle. a. Apply fault at the Pringle 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.
34	FLT34-1PH	*Single phase fault and sequence like previous*
35	FLT35-3PH	3 phase fault on the Moore Co. East 115kV (523308) to 230kV (523309) transformer, near the 115 kV bus. a. Apply fault at the Moore Co. East 115kV bus. b. Clear fault after 5 cycles by tripping the faulted transformer.
36	FLT36-3PH	3 phase fault on the Spearman (523186) to Spearman Sub (523203) 115kV line, near Spearman. a. Apply fault at the Spearman 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.
37	FLT37-1PH	*Single phase fault and sequence like previous*
38	FLT38-3PH	3 phase fault on the Texas Co. 115kV phase shifting transformer (523090 to 523106), near the main 115 kV bus. a. Apply fault at the main Texas Co. 115kV bus. b. Clear fault after 5 cycles by tripping the faulted transformer.

Cont. No.	Cont. Name	Description
39	FLT39-3PH	3 phase fault on the Pringle 115kV (523266) to Pringle 230kV (523267) transformer near the 115 kV bus. a. Apply fault at the Pringle 115kV bus. b. Clear fault after 5 cycles by tripping the faulted transformer.
40	FLT40-3PH	3 phase fault on the Riverview (523377) to Herring Tap (523352) 115kV line, near Riverview. a. Apply fault at the Riverview 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.
41	FLT41-1PH	*Single phase fault and sequence like previous*
42	FLT42-3PH	3 phase fault on the Hutchison 115kV (523546) to the Hutchison 230kV (523551) transformer near the 115 kV bus. a. Apply fault at the Hutchison 115kV bus. b. Clear fault after 5 cycles by tripping the faulted transformer.
43	FLT43-3PH	3 phase fault on the Border (525835) to Woodward (515375) 345 kV line, at Border (525835). a Apply fault at Border 345kV bus. b. Clear fault after 5 cycles by tripping the faulted line.
44	FLT44-1PH	Single phase fault on the line in previous 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.
45	FLT45-3PH	3 phase fault on one of the Finney (523853) to Holcomb (531449) 345kV lines, near Finney. a. Apply fault at the Finney 345kV bus. b. Clear fault after 5 cycles by tripping the faulted line.
46	FLT46-1PH	Single phase fault on the line in previous a. Apply fault at the Finney 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.
47	FLT47-3PH	3 phase fault on the GEN-2011-015 Tap (582215) to Woodward (515375) 345kV line, near Woodward 345kV bus. 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.
48	FLT48-3PH	3 phase fault on the Herring Tap (523352) to Riverview (523377) 115kV line, near Herring Tap 115kV bus. a. Apply fault at the Herring Tap 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.
49	FLT49-1PH	*Single phase fault and sequence like previous*
50	FLT50-3PH	3 phase fault on the Herring Tap (523352) to RB-Sneed (523366) 115kV line, near Herring Tap 115kV bus. a. Apply fault at the Herring Tap 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.
51	FLT51-1PH	*Single phase fault and sequence like previous*

Cont. No.	Cont. Name	Description
52	FLT52-3PH	3 phase fault on the Gen-2011-021 Tap (580507) to Hitchland (523097) 345kV line, near Gen-2011-021 Tap. a. Apply fault at the Gen-2011-021 Tap 345kV bus. b. Clear fault after 5 cycles by tripping the faulted line.
53	FLT53-1PH	Single phase fault on the Gen-2011-021 Tap (580507) to Hitchland (523097) 345kV line, near Gen-2011-021 Tap. a. Apply fault at the Gen-2011-021 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.
54	FLT54-3PH	3 phase fault on the Gen-2011-021 Tap (580507) to Gen-2008-047 Tap (580500) 345kV line, near Gen-2011-021 Tap. a. Apply fault at the Gen-2011-021 Tap 345kV bus. b. Clear fault after 5 cycles by tripping the faulted line.
55	FLT55-1PH	Single phase fault on the Gen-2011-021 Tap (580507) to Gen-2008-047 Tap (580500) 345kV line, near Gen-2011-021 Tap. a. Apply fault at the Gen-2011-021 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	FLT56-3PH	3 phase fault on the Gen-2008-047 Tap (580500) to Gen-2011-021 Tap (580507) 345kV line, near Gen-2008-047 Tap. a. Apply fault at the Gen-2008-047 Tap 345kV bus. b. Clear fault after 5 cycles by tripping the faulted line.
57	FLT57-1PH	Single phase fault on the Gen-2008-047 Tap (580500) to Gen-2011-021 Tap (580507) 345kV line, near Gen-2008-047 Tap. a. Apply fault at the Gen-2008-047 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.
58	FLT58-3PH	3 phase fault on both of the Hitchland (523097) to Border (525835) 345 kV lines, at Hitchland (523097). a. Apply fault at the Hitchland 345kV bus. b. Clear fault after 5 cycles by tripping the faulted lines.
59	FLT59-3PH	3 phase fault on both of the Gen-2008-047 Tap (580500) to Woodward (515375) 345kV lines, near Gen-2008-047 Tap. a. Apply fault at the Gen-2008-047 Tap 345kV bus. b. Clear fault after 5 cycles by tripping the faulted lines.
60	FLT60-3PH	3 phase fault on both of the Gen-2008-047 Tap (580500) to Hitchland (523097) 345kV line and the GEN-2008-047 Tap (580500) to GEN-2011-021 Tap (580507), near Gen-2008-047 Tap. a. Apply fault at the Gen-2008-047 Tap 345kV bus. b. Clear fault after 5 cycles by tripping the faulted lines.
61	FLT61-3PH	3 phase fault on both of the Gen-2011-021 Tap (580507) to Hitchland (523097) 345kV line and the Gen-2008-047 Tap (580500) to Hitchland (523097) 345kV line, near Gen-2011-021 Tap. a. Apply fault at the Gen-2011-021 Tap 345kV bus. b. Clear fault after 5 cycles by tripping the faulted lines.
62	FLT62-3PH	3 phase fault on both of the Gen-2011-021 Tap (580507) to Gen-2008-047 Tap (580500) 345kV line and the Gen-2008-047 Tap (580500) to Hitchland (523097) 345kV line, near Gen-2011-021 Tap. a. Apply fault at the Gen-2011-021 Tap 345kV bus. b. Clear fault after 5 cycles by tripping the faulted lines.

4. Results and Observations

4.1 Stability Analysis Results

Table 4-1 summarizes the results. Figure 4-1 through Figure 4-10 show representative scenario 1 summer peak season plots for faults at the POI's of the study projects. Complete sets of plots for both summer and winter peak seasons of both of the two scenarios for each fault and each project are included in Appendices A, B, C and D.

In the initial power factor analysis of the Scenario 1 Winter Peak case, some of the contingencies, listed below, would not solve in power flow, even with required reactive power compensation added to the study projects:

- Fault 24 – 3 phase fault on the Conestoga to Finney 345kV line, near Conestoga.
- Fault 47 – 3 phase fault on the GEN-2011-015 Tap to Woodward 345kV line, near Woodward 345kV bus.
- Fault 59 – 3 phase fault on both of the Gen-2008-047 Tap to Woodward 345kV lines, near Gen-2008-047 Tap.
- Fault 60 – 3 phase fault on both of the Gen-2008-047 Tap to Hitchland 345kV line and the GEN-2008-047 Tap to GEN-2011-021 Tap, near Gen-2008-047 Tap.
- Fault 62 – 3 phase fault on both of the Gen-2011-021 Tap to Gen-2008-047 Tap 345kV line and the Gen-2008-047 Tap to Hitchland 345kV line, near Gen-2011-021 Tap.

These faults are considered to be steady-state unstable. The Winter Peak case is more severe because, with less load and the same wind generation, more power has to be exported from west to east, increasing the flows on the transmission system.

To fix these problems, the following system adjustments and upgrades are included:

- Adjust Group 2 local voltage
- Upgrades at O.K.U. local area
- Add GEN-2008-047 to Comanche 345kV line

With these system adjustments and upgrades, all steady-state and dynamic analyses were stable. However, the following behaviors were noted:

In Faults 60 and 62, the following buses voltage show slow recovery following fault clearing in WP cases:

- GEN-2011-021 POI (580507)
- Hitchland 345kV (523097)
- GEN-2003-013 POI (560029)

In order to improve the voltage profile to an acceptable level, 100 Mvar switched shunts were added at GEN-2011-021 POI for Scenario 1 WP case and 200 Mvar switched

shunts were added at GEN-2011-021 POI for Scenario 2 WP case. Figure 4-11 and Figure 4-22 show the voltage response following Faults 60 and 62.
In Fault 24, the GEN-2003-013 plant tripped due to low voltage during the fault. This wind plant has a sensitive under-voltage trip setting (<30% voltage for >20ms). The pre-fault voltage is fine at around 1.045, but the 83ms fault takes the voltage below 30%. When the fault was rerun with tripping disabled, everything was fine.

In Faults 32 and 38, the ASGI-011 plant tripped due to low voltage during the fault. This wind plant has a sensitive under-voltage trip setting (<30% voltage for >20ms). The pre-fault voltage is fine at around 1.00, but the 83ms faults take the voltage below 30%. When the fault was rerun with tripping disabled, everything was fine.

Table 4-1. Summary of Stability Results

Cont. No.	Cont. Name	Description	Scenario 1		Scenario 2	
			Summer Peak Results	Winter Peak Results	Summer Peak Results	Winter Peak Results
1	FLT01-3PH	3 phase fault on one of the Hitchland (523097) to Border (525835) 345 kV lines, at Hitchland (523097).	OK	OK	OK	OK
2	FLT02-1PH	Single phase fault on the line in previous	OK	OK	OK	OK
3	FLT03-3PH	3 phase fault on the Hitchland (523097) to Conestoga (560029) 345kV line, near Hitchland.	OK	OK	OK	OK
4	FLT04-1PH	Single phase fault on the line in previous	OK	OK	OK	OK
5	FLT05-3PH	3 phase fault on the Hitchland (523097) to GEN-2005-017 Tap (579118) 345kV line, near Hitchland.	OK	OK	OK	OK
6	FLT06-1PH	Single phase fault on the line in previous	OK	OK	OK	OK
7	FLT07-3PH	3 phase fault on one of the Gen-2008-047 Tap (580500) to Hitchland (523097) 345kV lines, near Gen-2008-047 Tap.	OK	OK	OK	OK
8	FLT08-1PH	Single phase fault on the line in previous	OK	OK	OK	OK
9	FLT09-3PH	3 phase fault on the Hitchland 230kV (523095) to 345kV (523097) transformer, near the 230kV bus.	OK	OK	OK	OK
10	FLT10-3PH	3 phase fault on the GEN-2011-012 Tap (581116) to Hitchland (523095) 230kV near GEN-2011-012 Tap.	OK	OK	OK	OK
11	FLT11-1PH	*Single phase fault and sequence like previous*	OK	OK	OK	OK
12	FLT12-3PH	3 phase fault on the GEN-2011-012 Tap (581116) to Moore Co (523309) 230kV near GEN-2011-012 Tap.	OK	OK	OK	OK
13	FLT13-1PH	*Single phase fault and sequence like previous*	OK	OK	OK	OK
14	FLT14-3PH	3 phase fault on one of the Gen-2008-047 Tap (580500) to Woodward (515375) 345kV lines, near Gen-2008-047 Tap.	OK	OK	OK	OK
15	FLT15-1PH	Single phase fault on the line in previous	OK	OK	OK	OK
16	FLT16-3PH	3 phase fault on the Gen-2008-047 Tap (580500) to GEN-2007-040 Tap (531000) 345kV line, near Gen-2008-047 Tap.	OK	OK	OK	OK
17	FLT17-1PH	Single phase fault on the line in previous	OK	OK	OK	OK

Cont. No.	Cont. Name	Description	Scenario 1		Scenario 2	
			Summer Peak Results	Winter Peak Results	Summer Peak Results	Winter Peak Results
18	FLT18-3PH	3 phase fault on the GEN-2005-017 Tap (579118) to Potter Co. (523961) 345kV line, near GEN-2005-017 Tap.	OK	OK	OK	OK
19	FLT19-1PH	Single phase fault on the line in previous	OK	OK	OK	OK
20	FLT20-3PH	3 phase fault on the Potter Co (523959) to Moore Co. (523309) 230kV line, near Potter Co.	OK	OK	OK	OK
21	FLT21-1PH	*Single phase fault and sequence like previous*	OK	OK	OK	OK
22	FLT22-3PH	3 phase fault on the Pringle (523267) to Harrington (523979) 230kV line, near Pringle.	OK	OK	OK	OK
23	FLT23-1PH	*Single phase fault and sequence like previous*	OK	OK	OK	OK
24	FLT24-3PH	3 phase fault on the Conestoga (560029) to Finney (523853) 345kV line, near Conestoga.	OK G03-13 tripped	OK	OK G03-13 tripped	OK
	FLT24-3PH_NT	3 phase fault on the Conestoga (560029) to Finney (523853) 345kV line, near Conestoga.	OK		OK	
25	FLT25-1PH	Single phase fault on the line in previous	OK	OK	OK	OK
26	FLT26-3PH	3 phase fault on the Holcomb (531449) to Setab (531465) 345kV line, near Holcomb.	OK	OK	OK	OK
27	FLT27-1PH	*Single phase fault and sequence like previous*	OK	OK	OK	OK
28	FLT28-3PH	3 phase fault on the Holcomb (531449) to GEN-2008-018 Tap (531010) 345kV line, near Holcomb.	OK	OK	OK	OK
29	FLT29-1PH	Single phase fault on the line in previous	OK	OK	OK	OK
30	FLT30-3PH	3 phase fault on the DWS Frisco (523160) to Lasley (523175) 115kV line, near DWS Frisco.	OK	OK	OK	OK
31	FLT31-1PH	*Single phase fault and sequence like previous*	OK	OK	OK	OK
32	FLT32-3PH	3 phase fault on the Hitchland 115kV (523093) to 230kV (523095) transformer, near the 115 kV bus.	OK ASGI-11 tripped	OK ASGI-11 tripped	OK ASGI-11 tripped	OK ASGI-11 tripped

Cont. No.	Cont. Name	Description	Scenario 1		Scenario 2	
			Summer Peak Results	Winter Peak Results	Summer Peak Results	Winter Peak Results
	FLT32-3PH_NT	3 phase fault on the Hitchland 115kV (523093) to 230kV (523095) transformer, near the 115 kV bus.	OK	OK	OK	OK
33	FLT33-3PH	3 phase fault on the Pringle (523266) to Spearman (523186) 115kV line #1, near Pringle.	OK	OK	OK	OK
34	FLT34-1PH	*Single phase fault and sequence like previous*	OK	OK	OK	OK
35	FLT35-3PH	3 phase fault on the Moore Co. East 115kV (523308) to 230kV (523309) transformer, near the 115 kV bus.	OK	OK	OK	OK
36	FLT36-3PH	3 phase fault on the Spearman (523186) to Spearman Sub (523203) 115kV line, near Spearman.	OK	OK	OK	OK
37	FLT37-1PH	*Single phase fault and sequence like previous*	OK	OK	OK	OK
38	FLT38-3PH	3 phase fault on the Texas Co. 115kV phase shifting transformer (523090 to 523106), near the main 115 kV bus.	OK ASGI-11 tripped	OK ASGI-11 tripped	OK ASGI-11 tripped	OK ASGI-11 tripped
	FLT38-3PH_NT	3 phase fault on the Texas Co. 115kV phase shifting transformer (523090 to 523106), near the main 115 kV bus.	OK	OK	OK	OK
39	FLT39-3PH	3 phase fault on the Pringle 115kV (523266) to Pringle 230kV (523267) transformer near the 115 kV bus.	OK	OK	OK	OK
40	FLT40-3PH	3 phase fault on the Riverview (523377) to Herring Tap (523352) 115kV line, near Riverview.	OK	OK	OK	OK
41	FLT41-1PH	*Single phase fault and sequence like previous*	OK	OK	OK	OK
42	FLT42-3PH	3 phase fault on the Hutchison 115kV (523546) to the Hutchison 230kV (523551) transformer near the 115 kV bus.	OK	OK	OK	OK
43	FLT43-3PH	3 phase fault on the Border (525835) to Woodward (515375) 345 kV line, at Border (525835).	OK	OK	OK	OK
		a Apply fault at Border 345kV bus.	OK	OK	OK	OK
44	FLT44-1PH	Single phase fault on the line in previous	OK	OK	OK	OK
45	FLT45-3PH	3 phase fault on one of the Finney (523853) to Holcomb (531449) 345kV lines, near Finney.	OK	OK	OK	OK
46	FLT46-1PH	Single phase fault on the line in previous	OK	OK	OK	OK

Cont. No.	Cont. Name	Description	Scenario 1		Scenario 2	
			Summer Peak Results	Winter Peak Results	Summer Peak Results	Winter Peak Results
47	FLT47-3PH	3 phase fault on the GEN-2011-015 Tap (582215) to Woodward (515375) 345kV line, near Woodward 345kV bus.	OK	OK	OK	OK
48	FLT48-3PH	3 phase fault on the Herring Tap (523352) to Riverview (523377) 115kV line, near Herring Tap 115kV bus.	OK	OK	OK	OK
49	FLT49-1PH	*Single phase fault and sequence like previous*	OK	OK	OK	OK
50	FLT50-3PH	3 phase fault on the Herring Tap (523352) to RB-Sneed (523366) 115kV line, near Herring Tap 115kV bus.	OK	OK	OK	OK
51	FLT51-1PH	*Single phase fault and sequence like previous*	OK	OK	OK	OK
52	FLT52-3PH	3 phase fault on the Gen-2011-021 Tap (580507) to Hitchland (523097) 345kV line, near Gen-2011-021 Tap.	OK	OK	OK	OK
53	FLT53-1PH	Single phase fault on the Gen-2011-021 Tap (580507) to Hitchland (523097) 345kV line, near Gen-2011-021 Tap.	OK	OK	OK	OK
54	FLT54-3PH	3 phase fault on the Gen-2011-021 Tap (580507) to Gen-2008-047 Tap (580500) 345kV line, near Gen-2011-021 Tap.	OK	OK	OK	OK
55	FLT55-1PH	Single phase fault on the Gen-2011-021 Tap (580507) to Gen-2008-047 Tap (580500) 345kV line, near Gen-2011-021 Tap.	OK	OK	OK	OK
56	FLT56-3PH	3 phase fault on the Gen-2008-047 Tap (580500) to Gen-2011-021 Tap (580507) 345kV line, near Gen-2008-047 Tap.	OK	OK	OK	OK
57	FLT57-1PH	Single phase fault on the Gen-2008-047 Tap (580500) to Gen-2011-021 Tap (580507) 345kV line, near Gen-2008-047 Tap.	OK	OK	OK	OK
58	FLT58-3PH	3 phase fault on both of the Hitchland (523097) to Border (525835) 345 kV lines, at Hitchland (523097).	OK	OK	OK	OK
59	FLT59-3PH	3 phase fault on both of the Gen-2008-047 Tap (580500) to Woodward (515375) 345kV lines, near Gen-2008-047 Tap.	OK	OK	OK	OK

Cont. No.	Cont. Name	Description	Scenario 1		Scenario 2	
			Summer Peak Results	Winter Peak Results	Summer Peak Results	Winter Peak Results
60	FLT60-3PH	3 phase fault on both of the Gen-2008-047 Tap (580500) to Hitchland (523097) 345kV line and the GEN-2008-047 Tap (580500) to GEN-2011-021 Tap (580507), near Gen-2008-047 Tap.	OK	GEN-2011-021 POI Voltage Slow Recovery	OK	GEN-2011-021 POI Voltage Slow Recovery
	FLT60-3PH_SW-100Mvar	3 phase fault on both of the Gen-2008-047 Tap (580500) to Hitchland (523097) 345kV line and the GEN-2008-047 Tap (580500) to GEN-2011-021 Tap (580507), near Gen-2008-047 Tap.		OK		
	FLT60-3PH_SW-200Mvar	3 phase fault on both of the Gen-2008-047 Tap (580500) to Hitchland (523097) 345kV line and the GEN-2008-047 Tap (580500) to GEN-2011-021 Tap (580507), near Gen-2008-047 Tap.				OK
61	FLT61-3PH	3 phase fault on both of the Gen-2011-021 Tap (580507) to Hitchland (523097) 345kV line and the Gen-2008-047 Tap (580500) to Hitchland (523097) 345kV line, near Gen-2011-021 Tap.	OK	OK	OK	OK
62	FLT62-3PH	3 phase fault on both of the Gen-2011-021 Tap (580507) to Gen-2008-047 Tap (580500) 345kV line and the Gen-2008-047 Tap (580500) to Hitchland (523097) 345kV line, near Gen-2011-021 Tap.	OK	OK	OK	OK
62	FLT62-3PH	3 phase fault on both of the Gen-2011-021 Tap (580507) to Gen-2008-047 Tap (580500) 345kV line and the Gen-2008-047 Tap (580500) to Hitchland (523097) 345kV line, near Gen-2011-021 Tap.	OK	GEN-2011-021 POI Voltage Slow Recovery	OK	GEN-2011-021 POI Voltage Slow Recovery

Cont. No.	Cont. Name	Description	Scenario 1		Scenario 2	
			Summer Peak Results	Winter Peak Results	Summer Peak Results	Winter Peak Results
	FLT62-3PH_SW-100Mvar	3 phase fault on both of the Gen-2011-021 Tap (580507) to Gen-2008-047 Tap (580500) 345kV line and the Gen-2008-047 Tap (580500) to Hitchland (523097) 345kV line, near Gen-2011-021 Tap.		OK		
	FLT62-3PH_SW-200Mvar	3 phase fault on both of the Gen-2011-021 Tap (580507) to Gen-2008-047 Tap (580500) 345kV line and the Gen-2008-047 Tap (580500) to Hitchland (523097) 345kV line, near Gen-2011-021 Tap.				OK

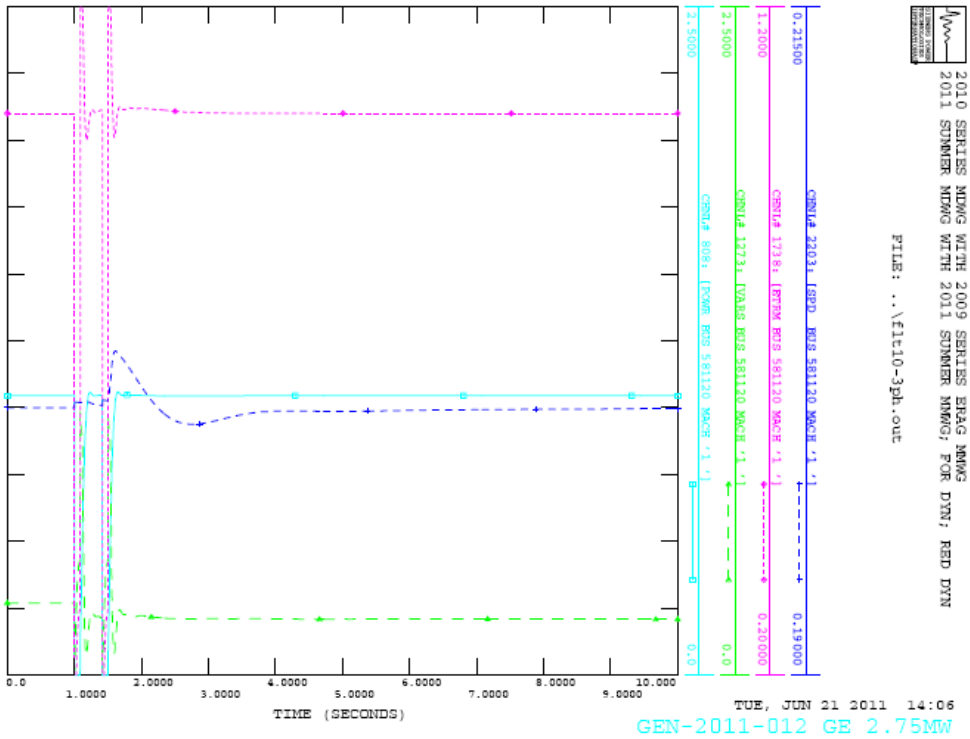

Figure 4-1. GEN-2011-012 Plot for Fault 10 – 3-Phase fault on the GEN-2011-012 Tap (581116) to Hitchland (523095) 230kV line, near GEN-2011-012 Tap

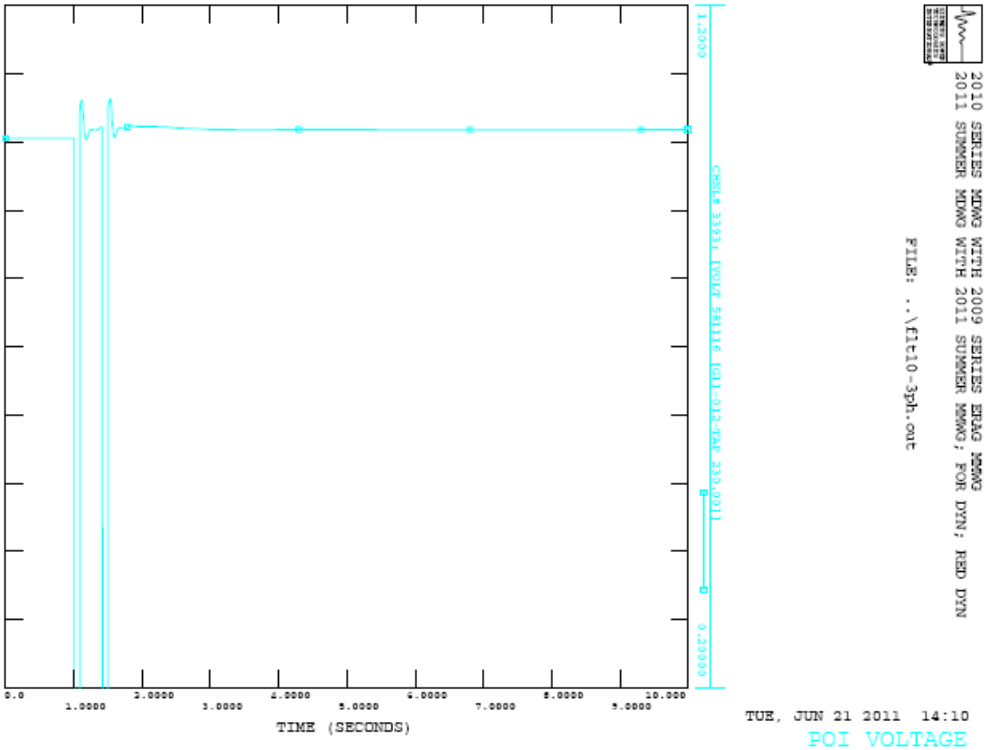

Figure 4-2. POI Voltages for Fault 10 – 3-Phase fault on the GEN-2011-012 Tap (581116) to Hitchland (523095) 230kV line, near GEN-2011-012 Tap

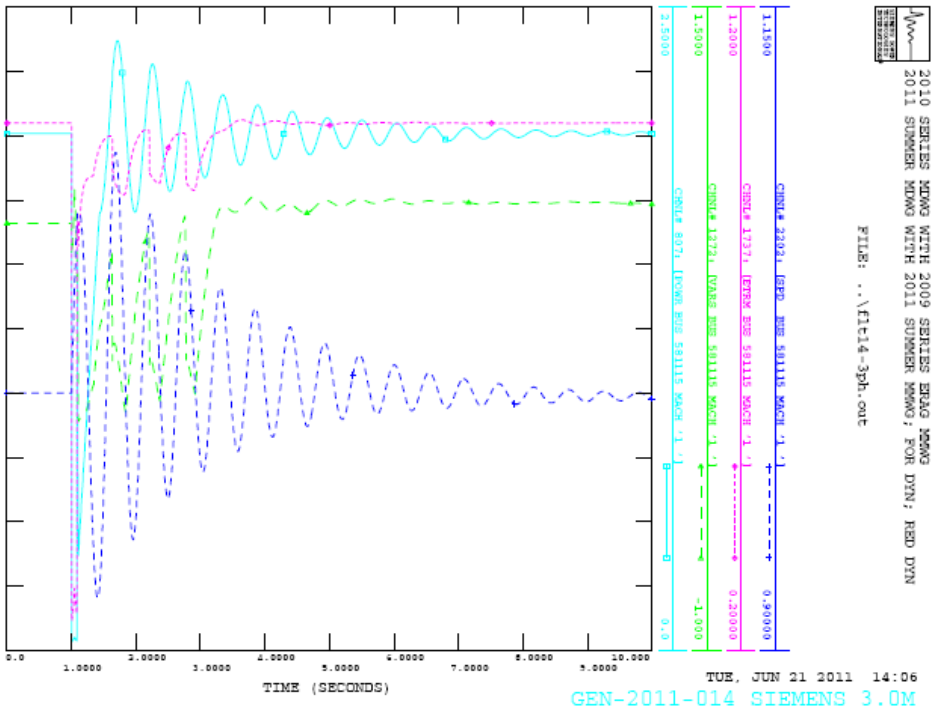

Figure 4-3. GEN-2011-014 Plot for Fault 14 – 3-Phase fault on one of the Gen-2008-047 Tap (580500) to Woodward (515375) 345kV lines, near Gen-2008-047 Tap

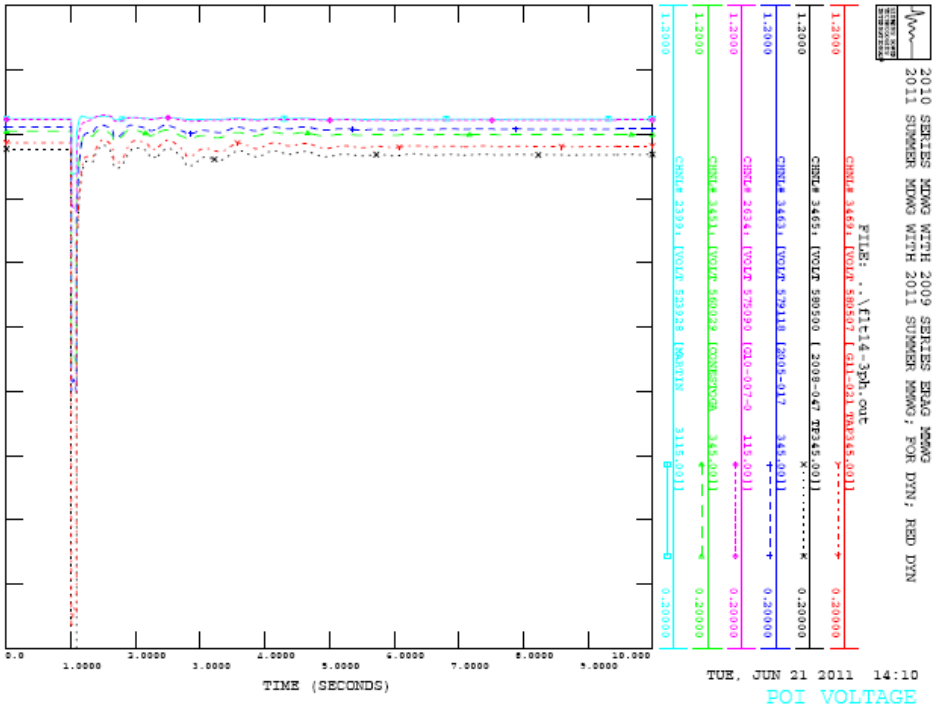

Figure 4-4. POI Voltages for Fault 14 – 3-Phase fault on one of the Gen-2008-047 Tap (580500) to Woodward (515375) 345kV lines, near Gen-2008-047 Tap

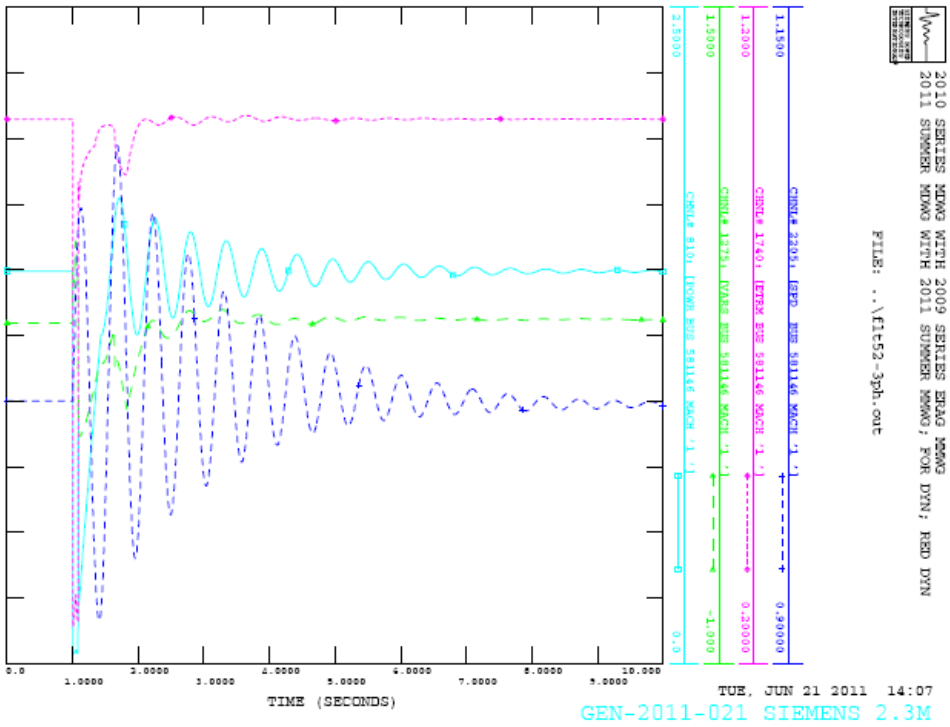

Figure 4-5. GEN-2011-021 Plot for Fault 52 – 3-Phase fault on the Gen-2011-021 Tap (580507) to Hitchland (523097) 345kV line, near Gen-2011-021 Tap

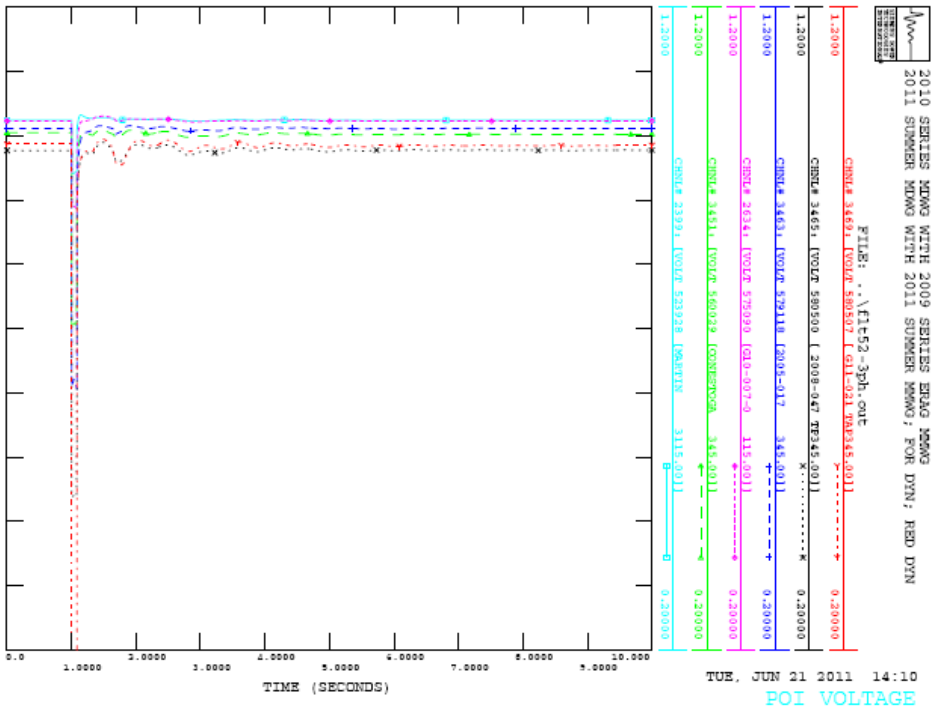

Figure 4-6. POI Voltages for Fault 52 – 3-Phase fault on the Gen-2011-021 Tap (580507) to Hitchland (523097) 345kV line, near Gen-2011-021 Tap

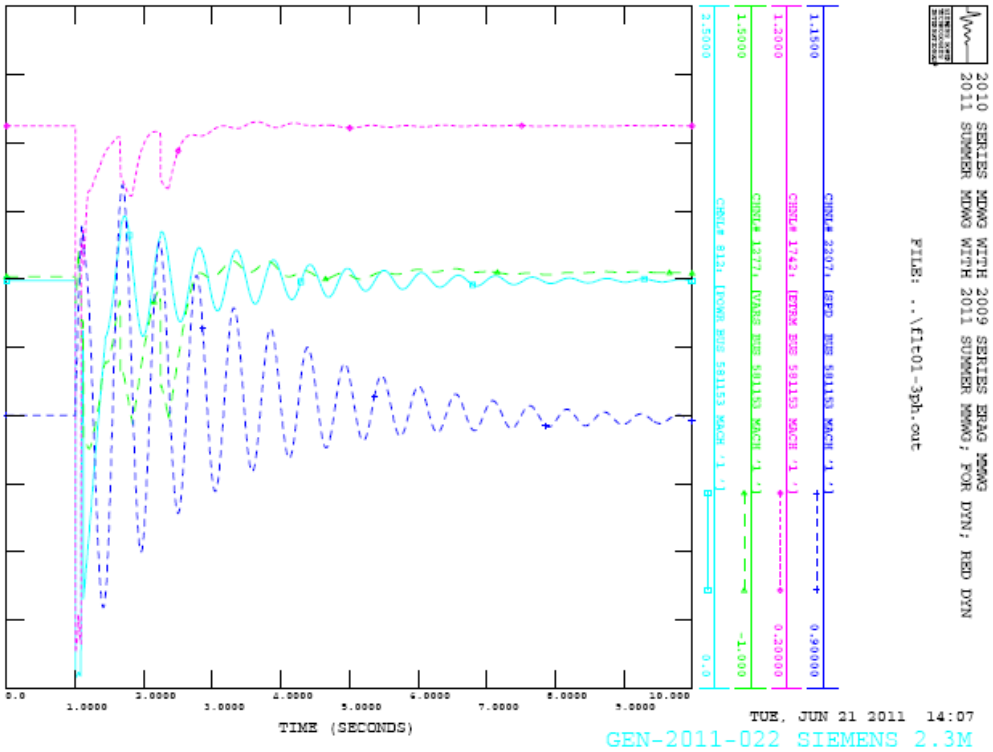

Figure 4-7. GEN-2011-022 Plot for Fault 1 – 3-Phase fault on one of the Hitchland (523097) to Border (525835) 345 kV lines, near Hitchland

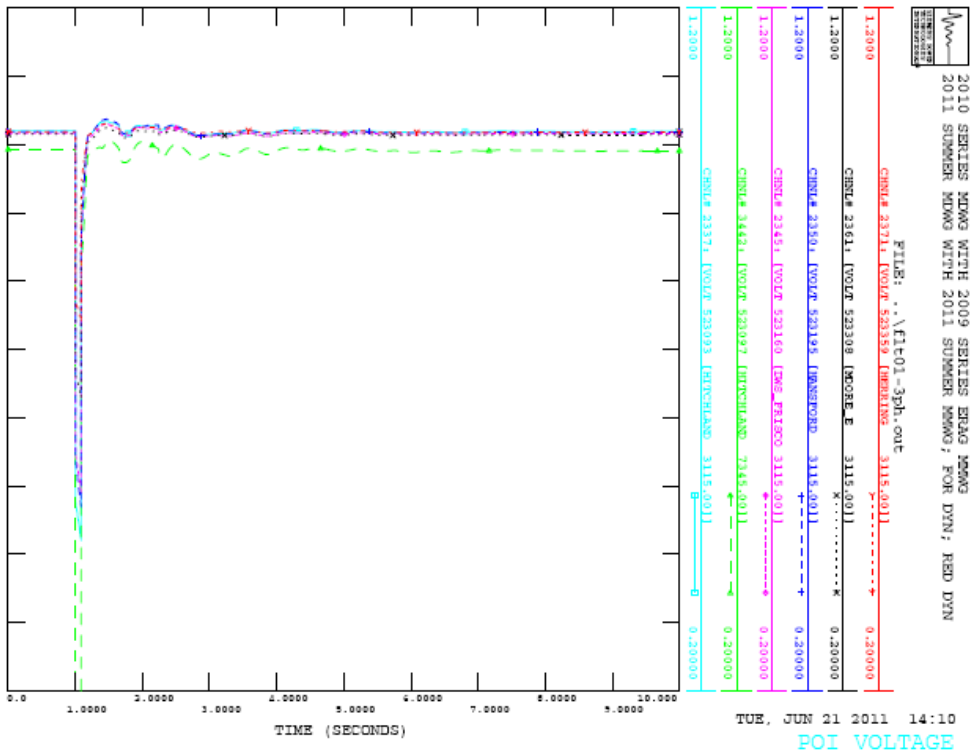

Figure 4-8. POI Voltages for Fault 1 – 3-Phase fault on one of the Hitchland (523097) to Border (525835) 345 kV lines, near Hitchland

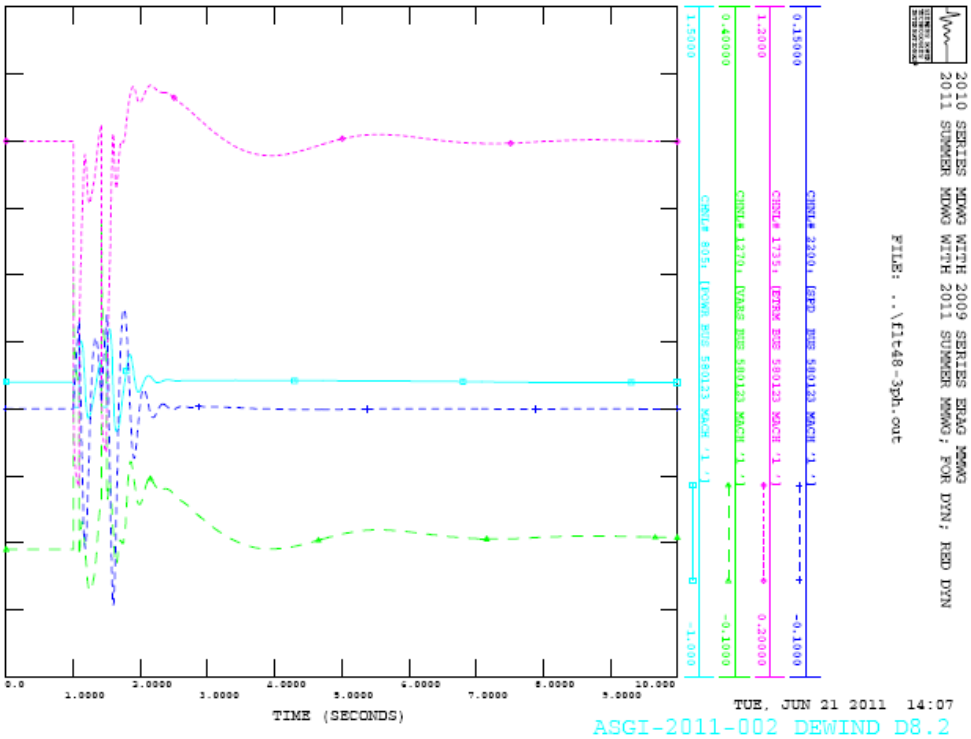

Figure 4-9. ASGI-2011-002 Plot for Fault 48 – 3-Phase fault on the Herring Tap (523352) to Riverview (523377) 115kV line, near Herring Tap 115kV

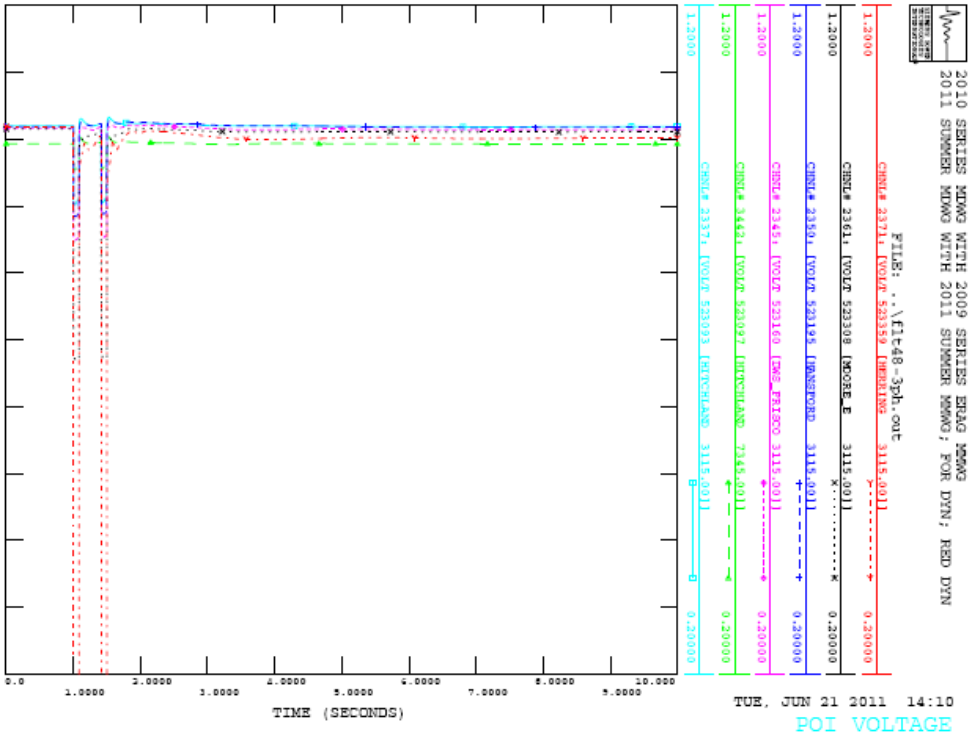

Figure 4-10. POI Voltages for Fault 48 – 3-Phase fault on the Herring Tap (523352) to Riverview (523377) 115kV line, near Herring Tap 115kV

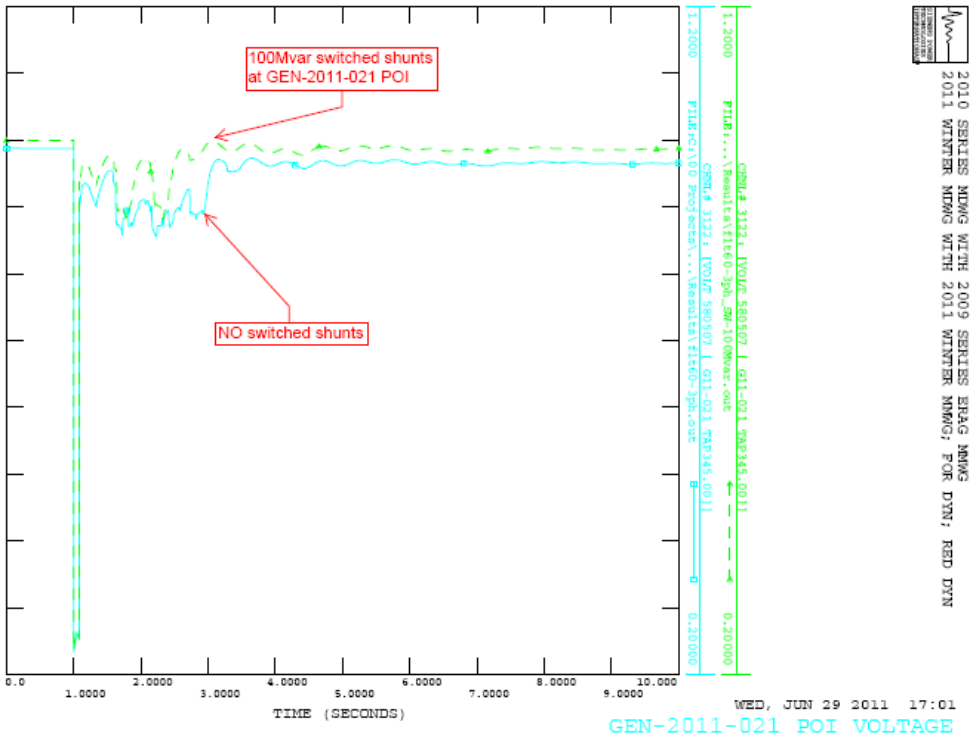

Figure 4-11. GEN-2011-021 POI Voltage for Fault 60 – Scenario 1 WP Case with and without 100Mvar Switched Shunts

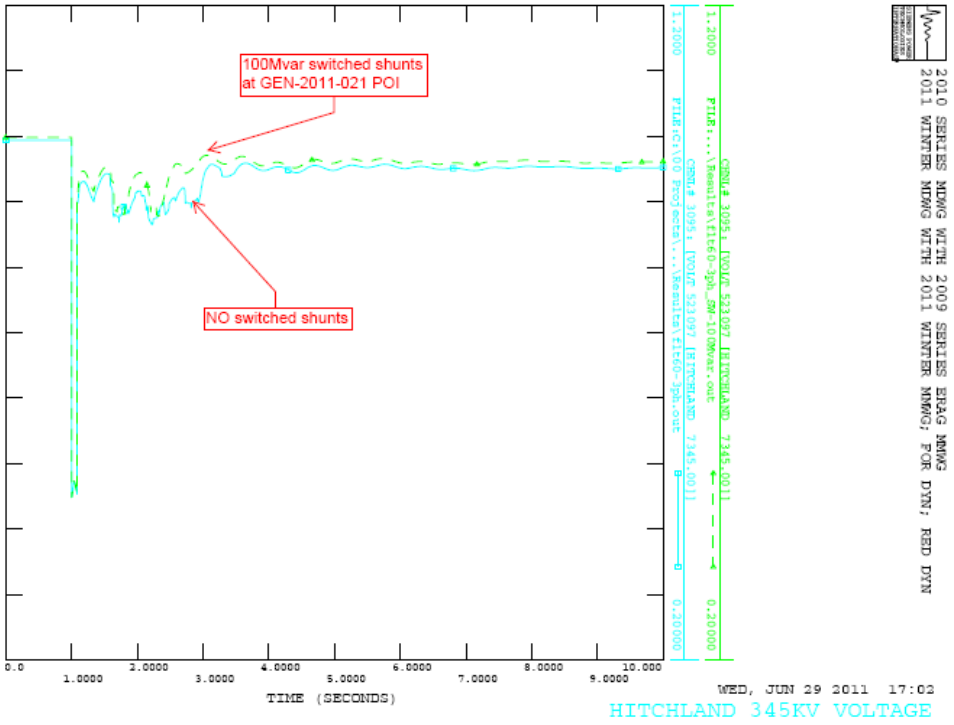

Figure 4-12. Hitchland 345kV Bus Voltage for Fault 60 – Scenario 1 WP Case with and without 100Mvar Switched Shunts

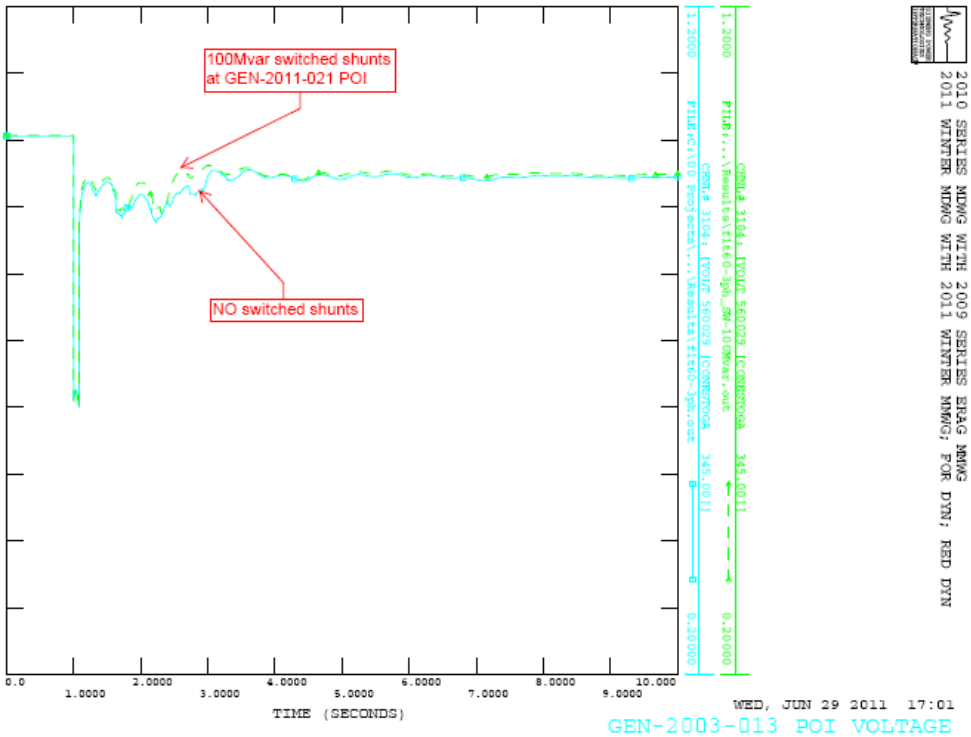

Figure 4-13. GEN-2003-013 POI Voltage for Fault 60 – Scenario 1 WP Case with and without 100Mvar Switched Shunts

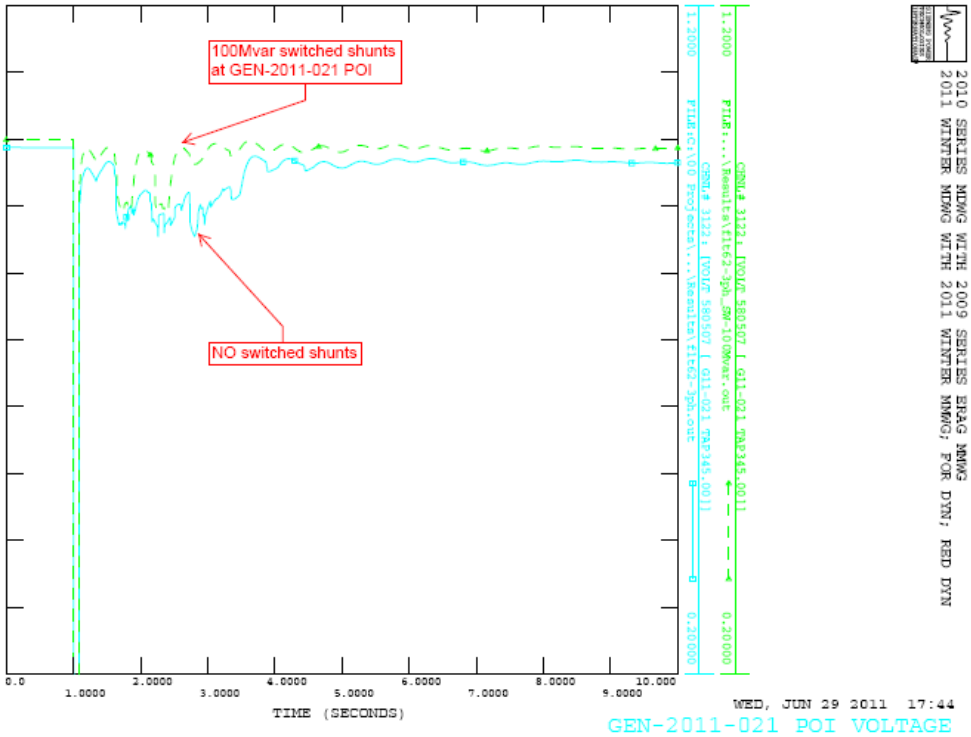

Figure 4-14. GEN-2011-021 POI Voltage for Fault 62 – Scenario 1 WP Case with and without 100Mvar Switched Shunts

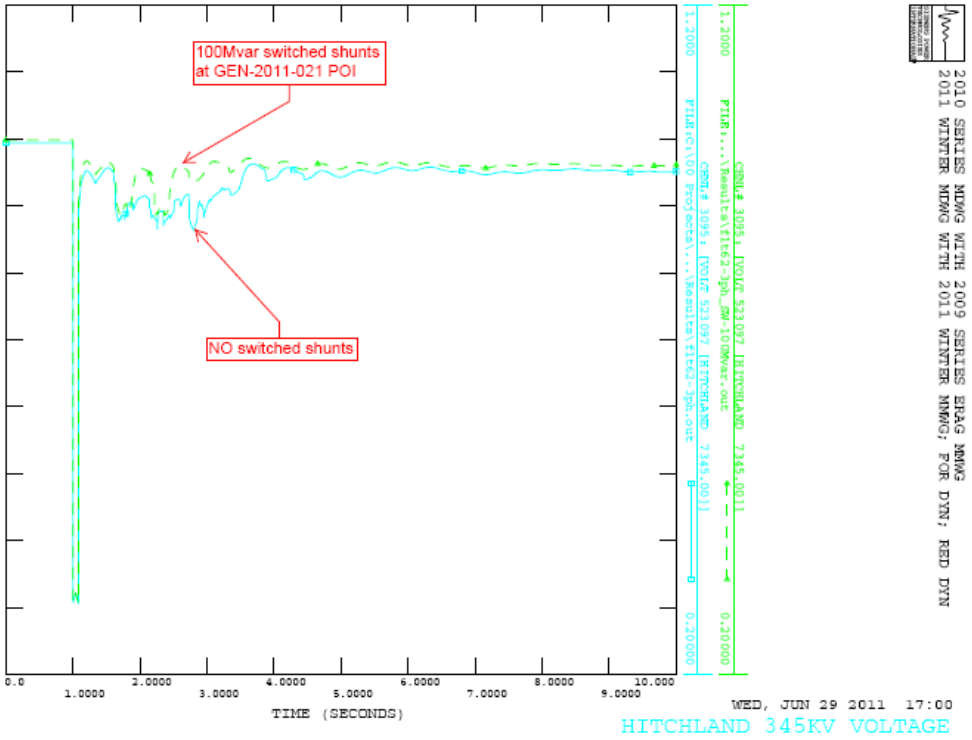

Figure 4-15. Hitchland 345kV Bus Voltage for Fault 62 – Scenario 1 WP Case with and without 100Mvar Switched Shunts

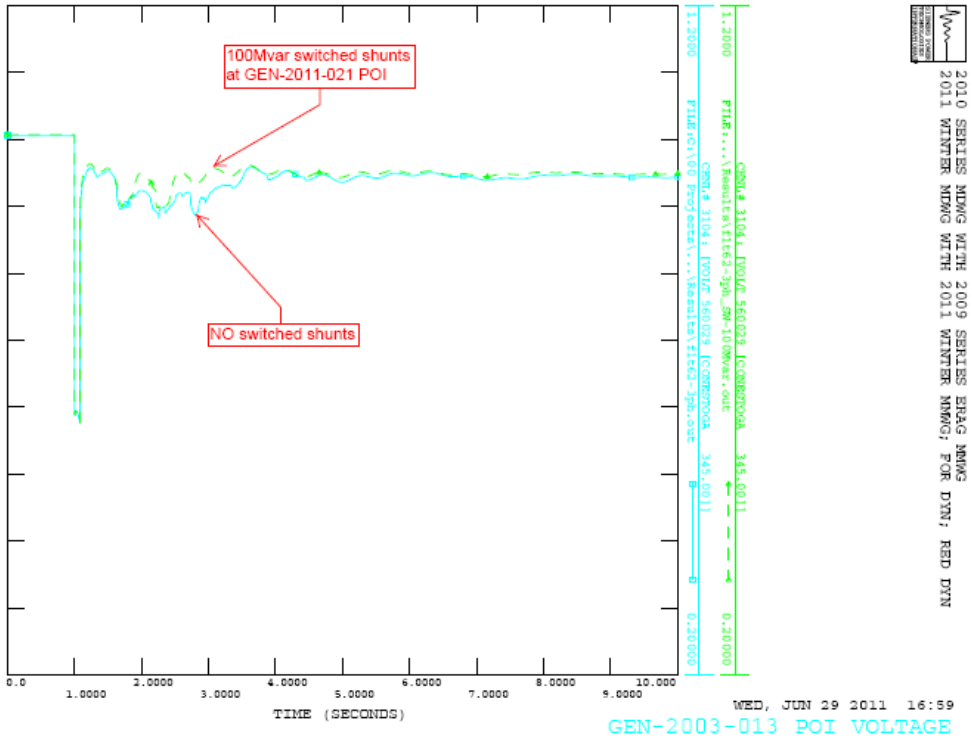

Figure 4-16. GEN-2003-013 POI Voltage for Fault 62 – Scenario 1 WP Case with and without 100Mvar Switched Shunts

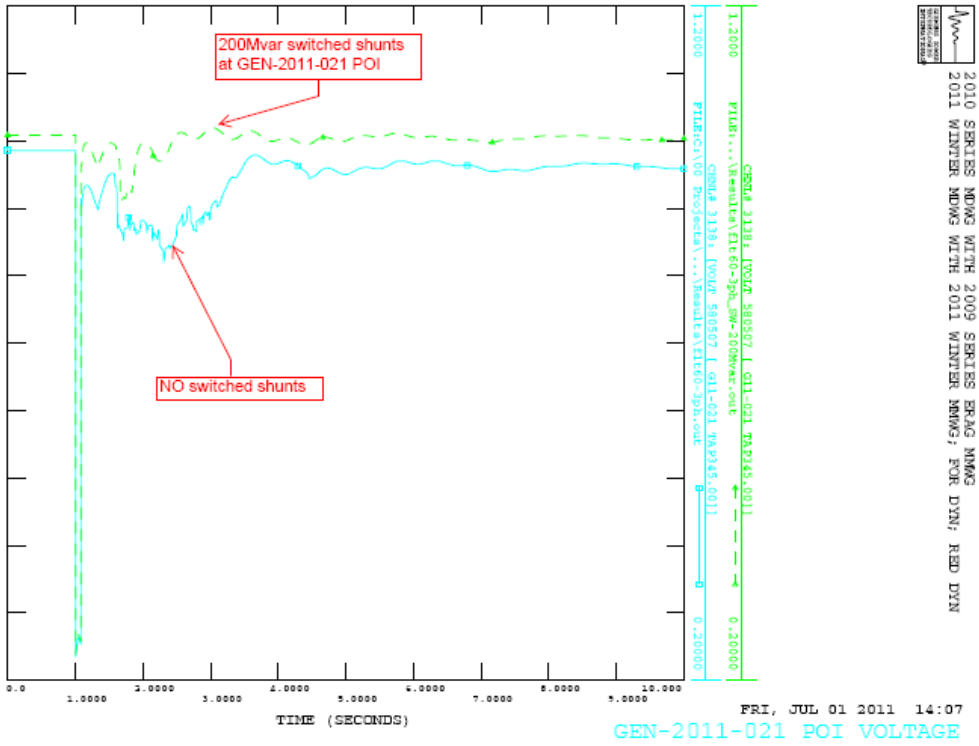

Figure 4-17. GEN-2011-021 POI Voltage for Fault 60 – Scenario 2 WP Case with and without 200Mvar Switched Shunts

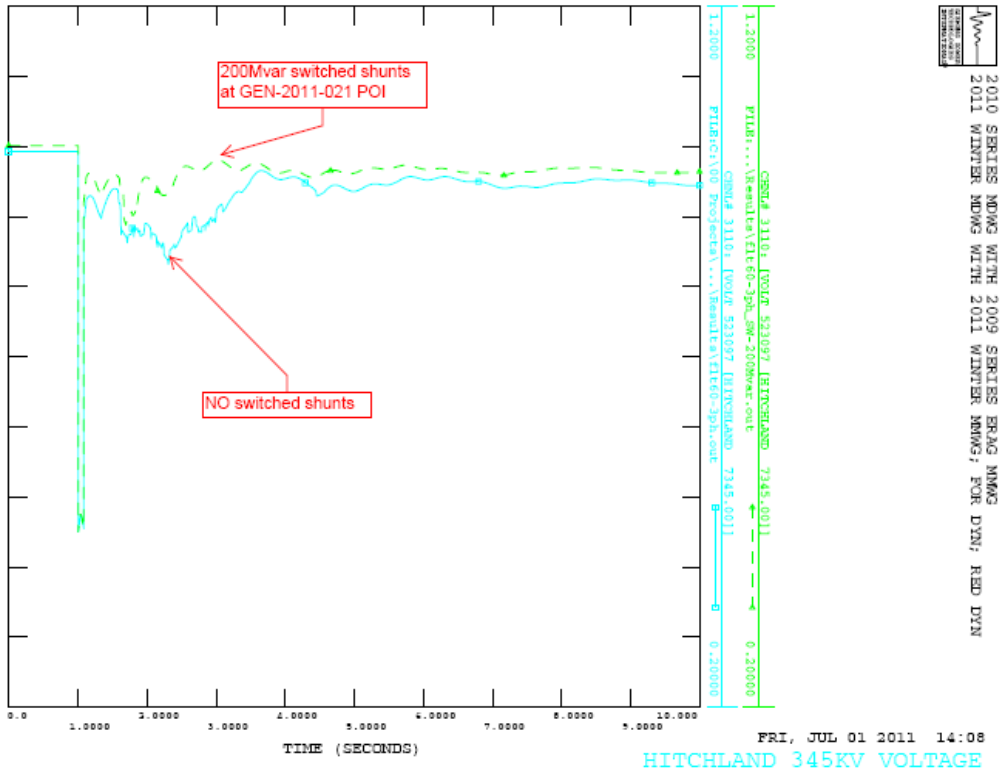

Figure 4-18. Hitchland 345kV Bus Voltage for Fault 60 – Scenario 2 WP Case with and without 200Mvar Switched Shunts

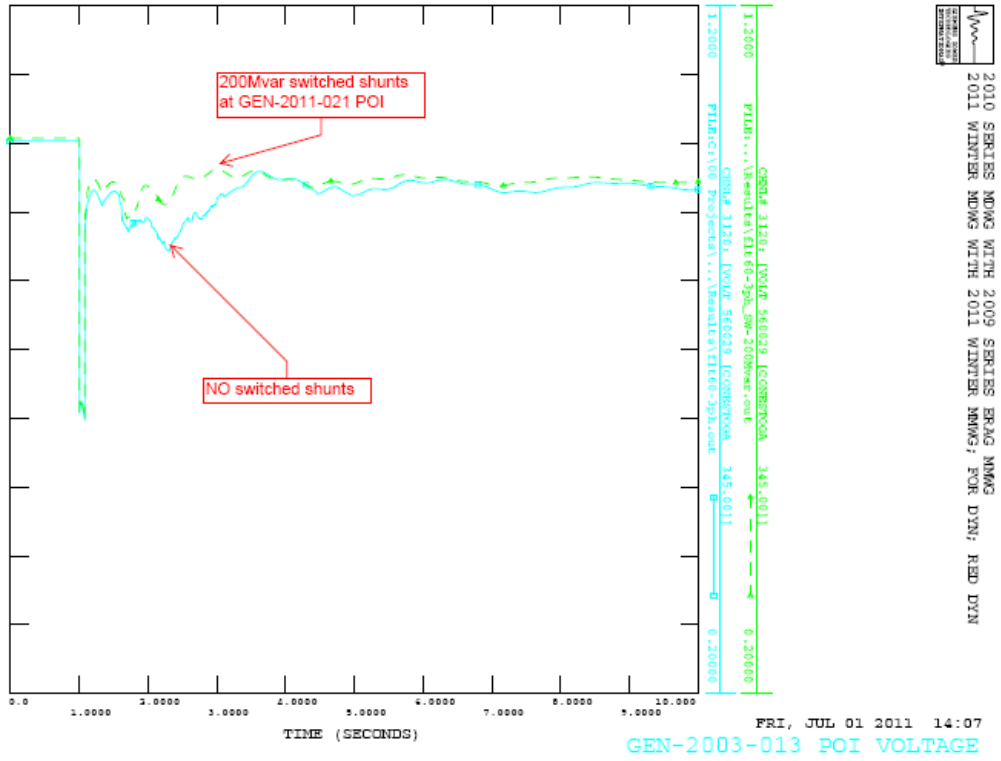

Figure 4-19. GEN-2003-013 POI Voltage for Fault 60 – Scenario 2 WP Case with and without 200Mvar Switched Shunts

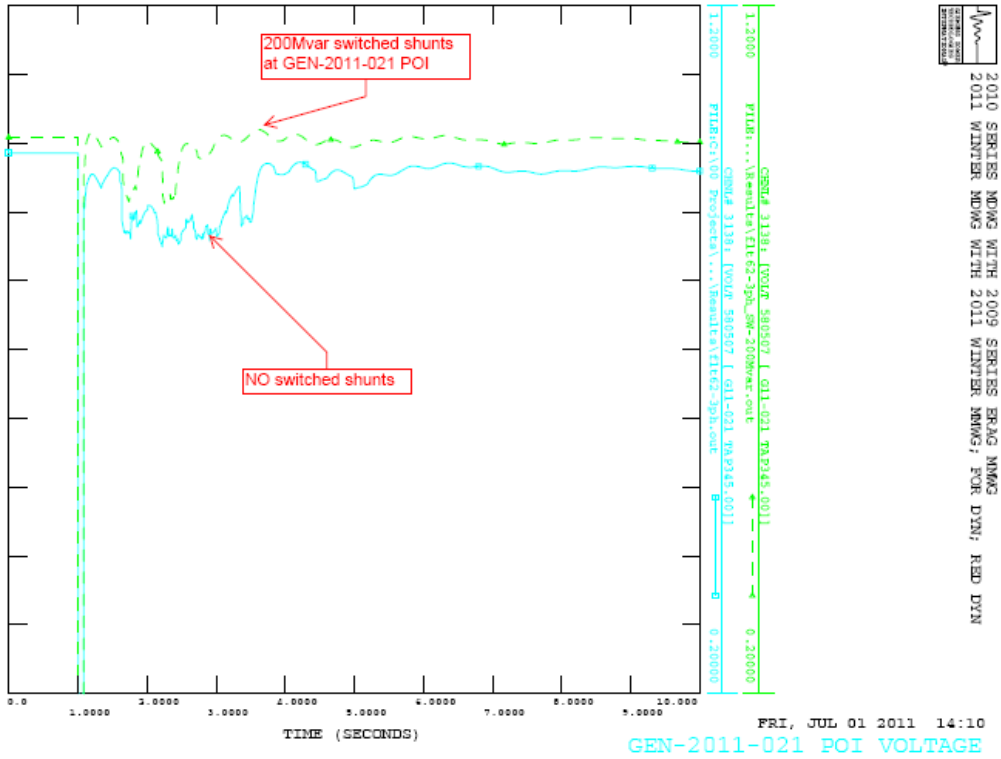

Figure 4-20. GEN-2011-021 POI Voltage for Fault 62 – Scenario 2 WP Case with and without 200Mvar Switched Shunts

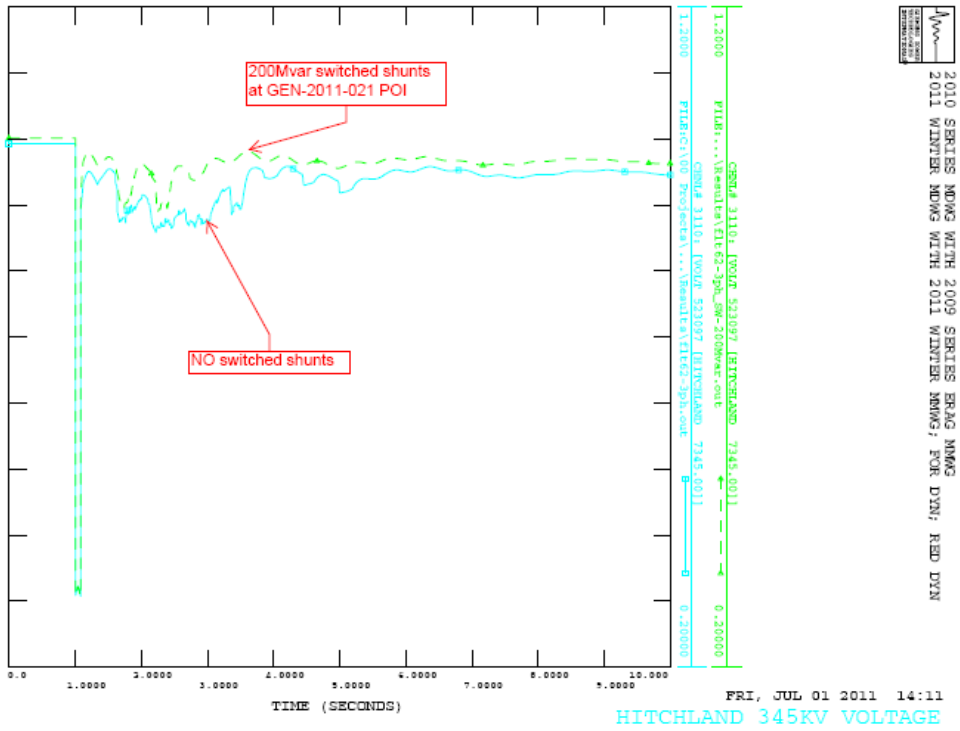

Figure 4-21. Hitchland 345kV Bus Voltage for Fault 62 – Scenario 2 WP Case with and without 200Mvar Switched Shunts

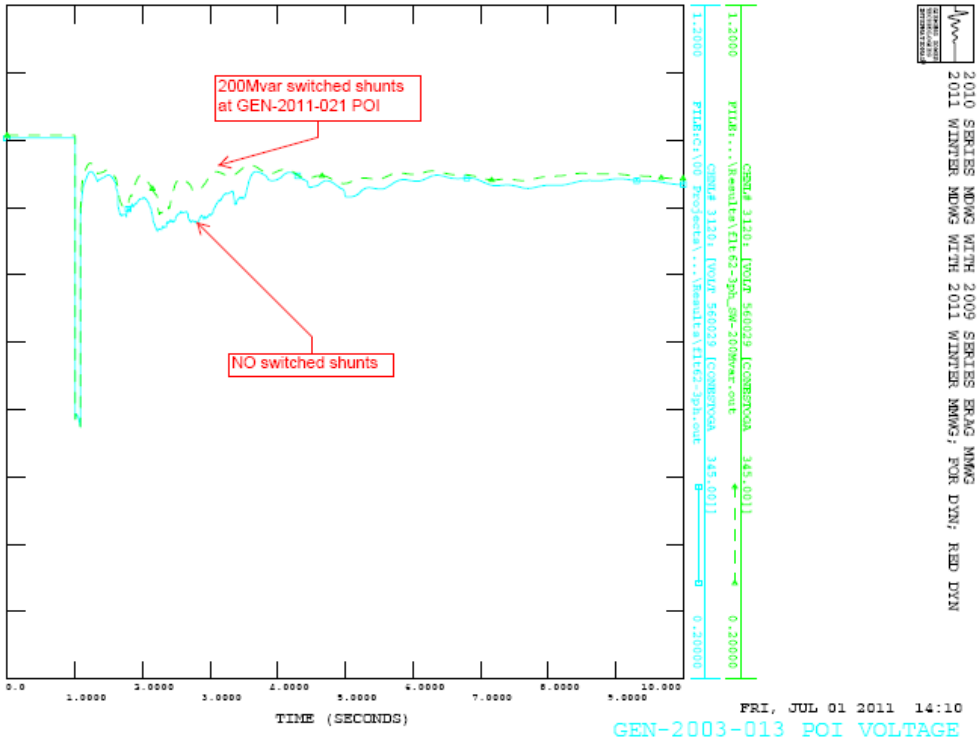

Figure 4-22. GEN-2003-013 POI Voltage for Fault 62 – Scenario 2 WP Case with and without 200Mvar Switched Shunts

4.2 Power Factor Requirements

All stability faults were tested as power flow contingencies to determine the power factor requirements for the wind 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. Estimates were made of the capacitor additions needed to meet the lagging power factor requirement.

Power factor analysis of the original winter cases had some non-solvable contingencies, as described in the previous section. The final power factor analysis was performed after including the following system adjustments and upgrades:

- Adjust Group 2 local voltage
- Upgrades at O.K.U. local area
- Add GEN-2008-047 to Comanche 345kV line

The final power factor requirements are shown in Table 4-2 below. These are only the minimum power factor ranges based on steady-state analysis. A project developer may install more capability than this if desired.

The full details for each contingency in summer and winter peak cases are given in Appendix E.

Table 4-2. Power Factor Requirements [1]

Request	Size (MW)	Generator Model	Point of Interconnection	Final PF Requirement		Estimated Capacitor Requirements[5]
				Lagging[2]	Leading[3]	(Mvar)
GEN-2011-012	104.5	GE 2.75MW	Tap on Moore County - Hitchland 230kV line	0.966	0.970	0
GEN-2011-014	201	Siemens 3.0MW	Tap on Hitchland to Woodward 345kV line	0.950	1.000	13
GEN-2011-021	299	Siemens 2.3MW	Tap on Hitchland to GEN-2008-047 Tap 345kV line	0.950	0.980	0(200)[4]
GEN-2011-022	299	Siemens 2.3MW	Hitchland 345kV	0.950	1.000	6
ASGI-2011-002	10	DeWind D8.2 2.0MW	Herring 115kV	0.950	0.950	0

Notes:
1. 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.
2. 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.
3. 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.
4. Stability Analysis showed that 200MVars of capacitors are required at the point of interconnection for GEN-2011-021.
5. Capacitors shown are estimates for calculated power factor requirements. Unless otherwise noted, Interconnection Customer will be required to estimate the amount of capacitors necessary to maintain +/- 95% power factor.

Conclusions

The DISIS-2011-001 Group 2 Definitive Impact Study evaluated the impacts of interconnecting the projects shown below.

Table 0-1. Interconnection Requests Evaluated in this Study

Request	Size (MW)	Wind Turbine Model	Point of Interconnection	POI Bus	Gen Buses
GEN-2011-012	104.5	GE 2.75MW	Tap on Moore County - Hitchland 230kV line	581116	581120
GEN-2011-014	201	Siemens 3.0MW	Tap on Hitchland to Woodward 345kV line	580500	581115
GEN-2011-021	299	Siemens 2.3MW	Tap on Hitchland to GEN-2008-047 Tap 345kV line	580507	581146 581147
GEN-2011-022	299	Siemens 2.3MW	Hitchland 345kV	523097	581153 581154
ASGI-2011-002	10	DeWind D8.2 2.0MW	Herring 115kV	523359	580123

Steady-state stability problems were found during the power factor analysis for the following outages:

- Fault 24 – 3 phase fault on the Conestoga to Finney 345kV line, near Conestoga.
- Fault 47 – 3 phase fault on the GEN-2011-015 Tap to Woodward 345kV line, near Woodward 345kV bus.
- Fault 59 – 3 phase fault on both of the Gen-2008-047 Tap to Woodward 345kV lines, near Gen-2008-047 Tap.
- Fault 60 – 3 phase fault on both of the Gen-2008-047 Tap to Hitchland 345kV line and the GEN-2008-047 Tap to GEN-2011-021 Tap, near Gen-2008-047 Tap.
- Fault 62 – 3 phase fault on both of the Gen-2011-021 Tap to Gen-2008-047 Tap 345kV line and the Gen-2008-047 Tap to Hitchland 345kV line, near Gen-2011-021 Tap.

To fix these problems, the following system adjustments and upgrades are included:

- Adjust Group 2 local voltage
- Upgrades at O.K.U. local area
- Add GEN-2008-047 to Comanche 345kV line

With these system adjustments and upgrades, all steady-state and dynamic analyses were stable.

In Faults 60 and 62, the following buses voltage show slow recovery following fault clearing in WP cases:

- GEN-2011-021 POI (580507)
- Hitchland 345kV (523097)

- GEN-2003-013 POI (560029)

In order to improve the voltage profile to an acceptable level, 100 Mvar switched shunts were added at GEN-2011-021 POI for Scenario 1 WP case and 200 Mvar switched shunts were added at GEN-2011-021 POI for Scenario 2 WP case.

Final power factor and capacitor requirements for the Group 2 projects are listed in Table 4-2. .

With the assumptions and upgrades described in this report, DISIS-2011-001 Group 2 should be able to connect without causing any stability problems on the SPP transmission grid.

Any change in system or wind farm models or assumptions could change these results.

Appendix A – Scenario 1 Summer Peak Plots

See attachments.

Appendix B – Scenario 1 Winter Peak Plots

See attachments.

Appendix C – Scenario 2 Summer Peak Plots

See attachments.

Appendix D – Scenario 2 Winter Peak Plots

See attachments.

Appendix E – Power Factor Details

See attachment.

Appendix F – Project Model Data

See attachment.

Appendix G – One-line Diagrams

See attachment.

K: Stability Study for Group 3

Final Report

For

Southwest Power Pool

From

S&C Electric Company

DEFINITIVE IMPACT STUDY
DISIS-2011-001 (Group 3)

S&C Project No. 5539

July 26, 2011

S&C Electric Company

S&C Electric Company, Chicago, IL 60626-3997, Phone: (773) 338-1000
Power Systems Services Division Fax: (773) 338-4254

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Report Revision History:

Date of Report	Issue	Comments
July 13, 2011	Rev. A	Preliminary report issued for review and approval
July 26, 2011	Rev. 0	Final report issued

Prepared by:	Reviewed by:
_____ Saeed Kamalinia Project Engineer Power System Services S&C Electric Company	_____ George S. Tsai Li Senior Engineer Power System Services S&C Electric Company
	Approved by: _____ Terrance A. Bellei Power Systems Technical Director Power System Services S&C Electric Company

EXECUTIVE SUMMARY

S&C Electric Company has performed an interconnection impact study for the Definitive Impact Study DISIS-2011-001 (Group 3) in response to a request through the Southwest Power Pool (SPP) Tariff studies. The interconnection request for Group 3 consists of five wind generation projects.

The interconnection request projects and prior queued projects in the Sunflower Electric Power Company (SUNC) area were studied at 100% output power using 2010/2011 summer and winter peak loading cases 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. The power factor requirements are for N-1 (or N-2 contingencies if applicable) contingencies specified by SPP. Power Factor analysis for the study projects revealed that the generating facilities must meet the following requirements.

- GEN-2010-029 is required to maintain a power factor of 96% lagging (supplying reactive power) to unity at the POI.
- GEN-2011-016 is required to maintain a power factor of 95% lagging to 99% leading at the POI.
- GEN-2011-008 is required to maintain a power factor of 95% lagging to 95% leading (absorbing reactive power) at the POI.
- GEN-2011-017 is required to maintain a power factor of 95% lagging to 95% leading at the POI.
- GEN-2011-023 is required to maintain a power factor of 99% lagging to 99% leading at the POI.

Transient stability analysis indicates that Group 3 will ride-through each fault contingency specified by SPP and the nearby areas will retain angular, frequency and voltage stability. Interconnection request projects in Group 3 can successfully interconnect into the transmission system at the desired location without reduction in output power. SPP's power factor requirement at the POI consists of maintaining a voltage schedule equal to nominal voltage or pre-contingency voltage (base case voltage), whichever is higher.

1. INTRODUCTION

S&C Electric Company has performed an interconnection impact study for the Definitive Impact Study DISIS-2011-001 (Group 3) in response to a request through the Southwest Power Pool (SPP) Tariff studies. The interconnection request projects in Group 3 are listed in Table 1.1.

Table 1.1: Study Projects in Group 3

Project	Size (MW)	Wind Turbine Model	Point of Interconnection
GEN-2010-029	450	Vestas V90 1.8MW	Spearville 345kV (531469)
GEN-2011-008	600	GE 1.6MW	Comanche 345kV (765341)
GEN-2011-016	200.1	Siemens 2.3MW	Spearville 345kV (531469)
GEN-2011-017	299	Siemens 2.3MW	Tap on Spearville – Post Rock 345kV line (576704)
GEN-2011-023	299	Siemens 2.3MW	Tap on Comanche - Spearville 345kV (582023)

Group 3 and prior queued projects in the Sunflower Electric Power Company (SUNC) area were studied at 100% output power using 2010/2011 summer and winter peak loading cases provided by SPP.

2 TRANSMISSION SYSTEM AND STUDY AREA

The wind generation projects in Group 3 will interconnect into SUNC. In addition to the SUNC area, the following areas were monitored:

AEP West (AEPW)

Oklahoma Gas and Electric (OKGE)

Western Farmers Electric Cooperative (WFEC)

Southwestern Public Service (SPS)

Midwest Energy, Inc. (MIDW)

Westar Energy, Inc (WERE)

Nebraska Public Power District (NPPD)

Omaha Public Power District (NPPD)

Lincoln Electric System (LES)

Western Area Power Administration (WAPA)

3. POWER FLOW BASE CASES

The following power flow base cases were provided by SPP:

MDWG_2010_2011SP_DISIS-2010-001-G3.sav – Summer peak 2010/2011, which includes aggregate representation of wind turbine generators for Definitive Impact Study DISIS-2011-001 (Group 3) and prior queued projects at 100% output power.

MDWG_2010_2011WP_DISIS-2010-001-G3.sav – Winter peak 2010/2011, which includes aggregate representation of generation interconnect projects for Definitive Impact Study DISIS-2011-001 (Group 3) and prior queued projects at 100% output power.

4 POWER FLOW MODEL

Definitive Impact Study DISIS-2011-001 (Group 3) and prior queued projects were modeled as aggregates of wind turbine generators. The aggregate models were part of the base case supplied by SPP. Single-line diagrams and other information corresponding to the Group 1 project can be found in Appendix A.

4.1 Vestas V90 VCS 1.8 MW / 60 Hz Wind Turbine Generator

The Vestas V90-1.8 MW wind turbine is a pitch regulated upwind turbine with active yaw and a three-blade rotor. The generator is a 3-phase asynchronous generator with wound rotor. The Vestas V90-1.8 MW turbine has a rotor diameter of 90 m with a generator rated at 1.8 MW.

4.2 Siemens SWT 2.3 MW / 60 Hz Wind Turbine Generator

The SWT WTG consists of a rotor, gearbox, induction generator, machine bridge, DC link, and network bridge. The machine bridge and network bridge decouple the generator from the power system and allows the WTG to operate at a definite power

factor setpoint. The power factor range of operation in steady-state and dynamically is variable and is a function of the voltage at the generator terminals and the active power output of the generator. At rated output power and at nominal terminal voltage, the output power factor range varies from 90% leading (inductive) to 90% lagging (capacitive) power factor. The lagging power factor range is reduced if the terminal voltage is higher than nominal. The leading power factor range is reduced if the terminal voltage is less than nominal and increased if the terminal voltage is greater than nominal.

4.3 GE 1.6xle / 60 Hz Wind Turbine Generator

The GE 1.6xle WTG consists of a single rotor branch (single cage) doubly-fed (wound rotor) induction generator machine. In the model the MVAR generation will be calculated by either one of the operating modes: voltage control mode, or power factor control mode. This turbine has a rotor diameter of 82.5 m.

5. POWER FACTOR REQUIREMENTS AT THE POINT OF INTERCONNECTION

SPP has specific voltage requirements for interconnecting wind farm requests. Such projects are required to meet a voltage schedule at the POI consistent with the voltage in the SPP base case or nominal voltage, whichever is higher, for transmission facility outage contingencies specified by SPP.

5.1 Facility Outage Contingencies

Single transmission facility outage contingencies specified by SPP are listed in Table 5.1.

Table 5.1: List of Power Flow Contingencies

Cont. No.	Description
0	System Intact
1	Outage of the Spearville (531469) to GEN-2007-040 Tap (531000) 345kV line
2	Outage of the GEN-2010-016 Tap (576704) to Spearville (531469) 345kV line
3	Outage of the Spearville (531469) to Comanche (765341) 345kV lines Ckt 2
4	Outage of the Spearville 345kV (531469) to 230kV (539695) transformer
5	Outage of the Spearville 230kV (539695) to 115kV (539694) transformer
6	Outage of the Spearville 345kV (531469) to 115kV (539694) transformer
7	Outage of the Spearville (539695) to Mullergren (539679) 230kV line
8	Outage of the Comanche (765341) to Medicine Lodge (765342) 345kV line Ckt 1
9	Outage of the GEN-2010-016 Tap (576704) to Post Rock (531469) 345kV line
10	Outage of the Finney (523853) to Conestoga (560029) 345kV line
11	Outage of the Finney (523853) to Holcomb (531449) 345kV lines
12	Outage of the Holcomb (531449) to Setab (531465) 345kV line, near Holcomb
13	Outage of the GEN-2008-018 Tap (531010) to Holcomb (531449) 345kV line
14	Outage of the Holcomb 345kV (531449) to 115kV (531448) transformer
15	Outage of the Finney (523853) to Lamar (599950) 345kV line
16	Outage of the Mullergren (539679) to South Hays (530582) 230kV line
17	Outage of the Mullergren (539679) to Circle (532871) 230kV line
18	Outage of the Conestoga (560029) to Hitchland (523097) 345kV line
19	Outage of the Woodward (515375) to GEN-2008-047 (580500) Tap 345kV lines Ckt 1 & 2
20	Outage of the Knoll (530558) to Post Rock (530584) 230kV line
21	Outage of the Post Rock (530583) to Axtell (640065) 345kV line
22	Outage of the Post Rock 345kV (530583) to 230kV (530584) transformer
23	Outage of the GEN-2001-039A Tap (579025) to Fort Dodge (539671) 115kV line
24	Outage of the GEN-2008-079 Tap (573029) to Cudahy (539659) 115kV line
25	Outage of the Kismet (539646) to CMRIVTP (539652) 115kV line
26	Outage of the CMRIVTP (539652) to E-Liber (539672) 115kV line
27	System Intact Hugoton (531481) to GrantTP (531483)115kV line
28	Outage of the Pratt (539687) to Ninnescah (539648) 115kV line
29	Outage of the Pratt (539687) to Sawyer (539649) 115kV line
30	Outage of the Medicine Lodge (539673) to Sun City (539697) 115kV line

Cont. No.	Description
31	Outage of the GEN-2008-047 (580500) to GEN-2007-040 Tap (531000) 345kV line
32	Outage of the Spearville (531469) to Mullergren (1003) 345kV lines Ckt 1 & 2
33	Outage of the Medicine Lodge (765342) to GEN-2007-025 Tap (532781) 345kV lines Ckt 1 & 2
34	Outage of the Medicine Lodge (765342) to GEN-2007-025 Tap (532796) 345kV lines Ckt 1
35	Outage of the GEN-2011-023 (582023) to Comanche (765341) 345kV line
36	Outage of the GEN-2011-023 (582023) to Spearville (531469) 345kV line
37	Outage of the Mingo (531451) to Redwillow (640325) 345kV line
38	Outage of the GEN-2011-023 (582023) to Comanche (765341) 345kV line
39	Outage of the GEN-2011-023 (582023) to Spearville (531469) 345kV line

The base case voltages at the point of interconnection for summer and winter are listed in Table 5.2.

Table 5.2: Base Case Voltage at the Point of Interconnection

Point of Interconnection	Summer Peak 2010/2011 (pu)	Winter Peak 2010/2011 (pu)
Spearville 345kV (531469)	0.992	0.981
Comanche 345kV (765341)	0.982	0.972
Tap on Spearville – Post Rock 345kV line (576704)	0.988	0.975
Tap on Comanche - Spearville 345kV (582023)	0.990	0.980

The power factor requirements for each of the outage contingencies in Table 5.1 are listed in Tables 5.3 through 5.7 for each of the interconnection request projects. Note that the contingencies for which the 95% power factor requirement is exceeded are highlighted in the tables.

Table 5.3: Power Factor Requirements at the POI for Power Flow Contingencies in Table 5.1 for GEN-2010-029

Cont. No.	Summer				Winter			
	P (MW)	Q (MVAR)	Power Factor		P (MW)	Q (MVAR)	Power Factor	
0	-426.4	-6.9	99.99%	Lagging	-426.9	-39.1	99.58%	lagging
1	-426.5	-38.9	99.59%	Lagging	-426.8	-66.3	98.81%	lagging
2	-426.5	-65.8	98.83%	Lagging	-426.8	-100.2	97.35%	lagging
3	-426.5	-23.1	99.85%	Lagging	-426.8	-53.8	99.21%	lagging
4	-426.4	-3.8	100.00%	lagging	-426.9	-37.7	99.61%	lagging
5	-426.4	-6.9	99.99%	lagging	-426.9	-39.1	99.58%	lagging
6	-426.4	-6.9	99.99%	lagging	-426.9	-38.6	99.59%	lagging
7	-426.5	-17.9	99.91%	lagging	-426.8	-51.9	99.27%	lagging
8	-426.5	-66.7	98.80%	lagging	-426.8	-99.5	97.39%	lagging
9	-426.5	-65.8	98.83%	lagging	-426.8	-100.2	97.35%	lagging
10	-426.5	-31.3	99.73%	lagging	-426.8	-56.3	99.14%	lagging
11	-426.4	-7	99.99%	lagging	-426.9	-39.2	99.58%	lagging
12	-426.5	-43.8	99.48%	lagging	-426.8	-76.1	98.45%	lagging
13	-426.5	-33.9	99.69%	lagging	-426.8	-68.1	98.75%	lagging
14	-426.4	-2.6	100.00%	lagging	-426.9	-35.1	99.66%	lagging
15	-426.4	-6.9	99.99%	lagging	-426.9	-39.1	99.58%	lagging
16	-426.5	-15.3	99.94%	lagging	-426.8	-45.9	99.43%	lagging
17	-426.5	-17	99.92%	lagging	-426.8	-49.6	99.33%	lagging
18	-426.5	-40.2	99.56%	lagging	-426.8	-64	98.89%	lagging
19	-426.4	-14.7	99.94%	lagging	-426.8	-47.8	99.38%	lagging
20	-426.5	-15.3	99.94%	lagging	-426.8	-46.5	99.41%	lagging
21	-426.6	-68.9	98.72%	lagging	-426.7	-115.6	96.52%	lagging
22	-426.4	-7.7	99.98%	lagging	-426.9	-39.1	99.58%	lagging
23	-426.4	-6.4	99.99%	lagging	-426.9	-37.6	99.61%	lagging
24	-426.4	-13.1	99.95%	lagging	-426.8	-46.2	99.42%	lagging
25	-426.4	-12	99.96%	lagging	-426.8	-45.1	99.45%	lagging
26	-426.4	-7.3	99.99%	lagging	-426.9	-39.5	99.57%	lagging
27	-426.4	-7.3	99.99%	lagging	-426.9	-39.7	99.57%	lagging
28	-426.5	-17.7	99.91%	lagging	-426.8	-47.8	99.38%	lagging

Cont. No.	Summer				Winter			
	P (MW)	Q (MVAR)	Power Factor		P (MW)	Q (MVAR)	Power Factor	
29	-426.4	-6.7	99.99%	lagging	-426.9	-38.7	99.59%	lagging
30	-426.5	-16.3	99.93%	lagging	-426.8	-48.2	99.37%	lagging
31	-426.5	-55.8	99.15%	lagging	-426.8	-82.3	98.19%	lagging
32	-426.5	-26.7	99.80%	lagging	-426.8	-53	99.24%	lagging
33	-426.4	-6.9	99.99%	lagging	-426.7	-116.4	96.47%	lagging
34	-426.4	-6.9	99.99%	lagging	-426.7	-116.4	96.47%	lagging
35	-426.5	-36	99.65%	lagging	-426.8	-65.4	98.85%	lagging
36	-426.5	-17.5	99.92%	lagging	-426.8	-48.5	99.36%	lagging
37	-426.5	-62.3	98.95%	lagging	-426.8	-102.9	97.21%	lagging
38	-426.5	-36	99.65%	lagging	-426.8	-65.4	98.85%	lagging
39	-426.5	-17.5	99.92%	lagging	-426.8	-48.5	99.36%	lagging

Table 5.4: Power Factor Requirements at the POI for Power Flow Contingencies in Table 5.1 for GEN-2011-016

Cont. No.	Summer				Winter			
	P (MW)	Q (MVAR)	Power Factor		P (MW)	Q (MVAR)	Power Factor	
0	-194.8	18.2	99.57%	leading	-194.9	7.6	99.92%	leading
1	-195.1	-14.9	99.71%	lagging	-195.2	-24.2	99.24%	lagging
2	-195.2	-40.8	97.88%	lagging	-195.2	-60.6	95.50%	lagging
3	-195	1.1	100.00%	leading	-195.1	-9.9	99.87%	lagging
4	-194.8	21.6	99.39%	leading	-194.9	9.3	99.89%	leading
5	-194.8	18.3	99.56%	leading	-194.9	7.6	99.92%	leading
6	-194.8	18.2	99.57%	leading	-194.9	8.2	99.91%	leading
7	-195	6.4	99.95%	leading	-195.1	-7.7	99.92%	lagging
8	-195.2	-41.7	97.79%	lagging	-195.2	-59.9	95.60%	lagging
9	-195.2	-40.8	97.88%	lagging	-195.2	-60.6	95.50%	lagging
10	-195.1	-7.3	99.93%	lagging	-195.1	-12.9	99.78%	lagging
11	-194.8	18.1	99.57%	leading	-194.9	7.5	99.93%	leading
12	-195.1	-19.7	99.49%	lagging	-195.2	-35	98.43%	lagging
13	-195.1	-9.9	99.87%	lagging	-195.2	-26.2	99.11%	lagging
14	-194.8	22.9	99.32%	leading	-194.9	12.5	99.79%	leading

Cont. No.	Summer				Winter			
	P (MW)	Q (MVAR)	Power Factor		P (MW)	Q (MVAR)	Power Factor	
15	-194.8	18.2	99.57%	leading	-194.9	7.6	99.92%	leading
16	-194.9	9.3	99.89%	leading	-195	-0.7	100.00%	lagging
17	-194.9	7.5	99.93%	leading	-195	-5	99.97%	lagging
18	-195.1	-16.2	99.66%	lagging	-195.1	-21.6	99.39%	lagging
19	-194.9	9.8	99.87%	leading	-195	-2.8	99.99%	lagging
20	-194.9	9.3	99.89%	leading	-195	-1.3	100.00%	lagging
21	-195.2	-43.6	97.60%	lagging	-195.2	-76.2	93.15%	lagging
22	-194.9	17.3	99.61%	leading	-194.9	7.5	99.93%	leading
23	-194.8	18.8	99.54%	leading	-194.9	9.4	99.88%	leading
24	-194.9	11.6	99.82%	leading	-195	-1	100.00%	lagging
25	-194.9	12.7	99.79%	leading	-195	0.3	100.00%	leading
26	-194.8	17.7	99.59%	leading	-194.9	7.1	99.93%	leading
27	-194.8	17.7	99.59%	leading	-194.9	6.9	99.94%	leading
28	-194.9	6.7	99.94%	leading	-195	-2.8	99.99%	lagging
29	-194.8	18.4	99.56%	leading	-194.9	8	99.92%	leading
30	-194.9	8.2	99.91%	leading	-195	-3.3	99.99%	lagging
31	-195.2	-31.4	98.73%	lagging	-195.2	-41.8	97.78%	lagging
32	-195	-2.6	99.99%	lagging	-195.1	-8.9	99.90%	lagging
33	-194.8	18.2	99.57%	leading	-195.2	-77	93.02%	lagging
34	-194.8	18.2	99.57%	leading	-195.2	-77	93.02%	lagging
35	-195.1	-12	99.81%	leading	-195.1	-23.1	99.31%	lagging
36	-194.9	6.9	99.94%	leading	-195	-3.7	99.98%	lagging
37	-195.2	-37.5	98.20%	lagging	-195.2	-63.4	95.11%	lagging
38	-195.1	-12	99.81%	lagging	-195.1	-23.1	99.31%	lagging
39	-194.9	6.9	99.94%	leading	-195	-3.7	99.98%	lagging

Table 5.5: Power Factor Requirements at the POI for Power Flow Contingencies in Table 5.1 for GEN-2011-008

Cont. No.	Summer				Winter			
	P (MW)	Q (MVAR)	Power Factor		P (MW)	Q (MVAR)	Power Factor	
0	-572.5	-189.6	94.93%	lagging	-571.5	-252	91.50%	lagging
1	-573.2	-140.7	97.12%	lagging	-572.4	-199.3	94.44%	lagging
2	-571.3	-258.5	91.11%	lagging	-569.7	-328.8	86.61%	lagging
3	-572.7	-176.1	95.58%	lagging	-571.7	-239.4	92.24%	lagging
4	-572.5	-190.5	94.88%	lagging	-571.5	-252.5	91.47%	lagging
5	-572.5	-189	94.96%	lagging	-571.5	-252.2	91.49%	lagging
6	-572.5	-189.6	94.93%	lagging	-571.5	-251	91.56%	lagging
7	-571.8	-235.3	92.48%	lagging	-570.5	-296	88.76%	lagging
8	-572.3	-203.2	94.24%	lagging	-571.6	-244.6	91.94%	lagging
9	-571.3	-258	91.14%	lagging	-569.7	-328.8	86.61%	lagging
10	-572.2	-212.9	93.72%	lagging	-571.1	-268.1	90.52%	lagging
11	-572.5	-189.6	94.93%	lagging	-571.5	-252	91.50%	lagging
12	-572.1	-219.8	93.35%	lagging	-570.8	-285.6	89.43%	lagging
13	-572.1	-217	93.50%	lagging	-570.8	-283.9	89.54%	lagging
14	-572.6	-188	95.01%	lagging	-571.5	-250.6	91.58%	lagging
15	-572.5	-189.6	94.93%	lagging	-571.5	-252	91.50%	lagging
16	-572.5	-192.7	94.78%	lagging	-571.4	-254.5	91.35%	lagging
17	-572.2	-209.4	93.91%	lagging	-571	-274.8	90.11%	lagging
18	-571.9	-227	92.95%	lagging	-570.8	-281.9	89.66%	lagging
19	-572.2	-213.9	93.67%	lagging	-570.9	-279.1	89.84%	lagging
20	-572.3	-203.1	94.24%	lagging	-571.2	-265.1	90.71%	lagging
21	-570.1	-312.3	87.70%	lagging	-567.4	-407.9	81.20%	lagging
22	-572.5	-190.7	94.87%	lagging	-571.5	-252.6	91.46%	lagging
23	-572.5	-189.6	94.93%	lagging	-571.4	-252.8	91.45%	lagging
24	-572.5	-194.4	94.69%	lagging	-571.4	-257.2	91.19%	lagging
25	-572.5	-193.3	94.75%	lagging	-571.4	-256.4	91.24%	lagging
26	-572.5	-190	94.91%	lagging	-571.5	-252.4	91.48%	lagging
27	-572.5	-189.6	94.93%	lagging	-571.5	-252.2	91.49%	lagging
28	-572.3	-203.9	94.20%	lagging	-571.1	-268	90.53%	lagging

Cont. No.	Summer				Winter			
	P (MW)	Q (MVAR)	Power Factor		P (MW)	Q (MVAR)	Power Factor	
29	-572.5	-194.8	94.67%	lagging	-571.3	-257.8	91.15%	lagging
30	-572.4	-198	94.51%	lagging	-571.3	-260.8	90.97%	lagging
31	-571.3	-260.4	90.99%	lagging	-570	-316.5	87.43%	lagging
32	-571.3	-257.7	91.16%	lagging	-569.7	-327.1	86.72%	lagging
33	-572.5	-189.6	94.93%	lagging	-572.4	-198.8	94.46%	lagging
34	-572.5	-189.6	94.93%	lagging	-572.4	-198.8	94.46%	lagging
35	-572.7	-176	95.59%	lagging	-571.9	-227.3	92.93%	lagging
36	-572.7	-176	95.59%	lagging	-571.7	-239.3	92.25%	lagging
37	-571.4	-253.6	91.40%	lagging	-569.6	-332.4	86.37%	lagging
38	-572.9	-164.9	96.10%	lagging	-571.9	-227.3	92.93%	lagging
39	-572.7	-176	95.59%	lagging	-571.7	-239.3	92.25%	lagging

Table 5.6: Power Factor Requirements at the POI for Power Flow Contingencies in Table 5.1 for GEN-2011-017

Cont. No.	Summer				Winter			
	P (MW)	Q (MVAR)	Power Factor		P (MW)	Q (MVAR)	Power Factor	
0	-291.6	-152.8	88.58%	lagging	-291.7	-140.5	90.09%	lagging
1	-291.8	-123.8	92.06%	lagging	-291.8	-106.9	93.90%	lagging
2	-292	-28.7	99.52%	lagging	-291.9	0.5	100.00%	leading
3	-291.6	-161.5	87.48%	lagging	-291.7	-149.1	89.04%	lagging
4	-291.6	-153.8	88.45%	lagging	-291.7	-141	90.03%	lagging
5	-291.6	-152.8	88.58%	lagging	-291.7	-140.5	90.09%	lagging
6	-291.6	-152.8	88.58%	lagging	-291.7	-139.7	90.19%	lagging
7	-291.3	-201.1	82.29%	lagging	-291.4	-186.1	84.28%	lagging
8	-291.3	-202	82.18%	lagging	-291.4	-194.4	83.19%	lagging
9	-292	-28.7	99.52%	lagging	-291.9	0.5	100.00%	leading
10	-291.6	-159.4	87.75%	lagging	-291.7	-145.9	89.44%	lagging
11	-291.6	-152.8	88.58%	lagging	-291.7	-140.5	90.09%	lagging
12	-291.3	-208.1	81.37%	lagging	-291.4	-198	82.71%	lagging
13	-291.5	-173.3	85.96%	lagging	-291.6	-165.2	87.01%	lagging
14	-291.6	-151.8	88.70%	lagging	-291.7	-139.5	90.21%	lagging

Cont. No.	Summer				Winter			
	P (MW)	Q (MVAR)	Power Factor		P (MW)	Q (MVAR)	Power Factor	
15	-291.6	-152.8	88.58%	lagging	-291.7	-140.5	90.09%	lagging
16	-291.7	-142.8	89.82%	lagging	-291.7	-128.5	91.51%	lagging
17	-291.6	-155.9	88.19%	lagging	-291.7	-142.8	89.82%	lagging
18	-291.6	-162.3	87.38%	lagging	-291.7	-149.2	89.03%	lagging
19	-291.6	-158.9	87.81%	lagging	-291.7	-147.7	89.22%	lagging
20	-291.7	-142	89.91%	lagging	-291.7	-128.6	91.50%	lagging
21	-291.9	-49.4	98.60%	lagging	-291.9	-1.1	100.00%	lagging
22	-291.6	-153.1	88.54%	lagging	-291.7	-143.4	89.74%	lagging
23	-291.6	-152.1	88.66%	lagging	-291.7	-139.6	90.20%	lagging
24	-291.6	-155.3	88.26%	lagging	-291.7	-143.3	89.75%	lagging
25	-291.6	-154.7	88.34%	lagging	-291.7	-142.8	89.82%	lagging
26	-291.6	-152.9	88.56%	lagging	-291.7	-140.6	90.08%	lagging
27	-291.6	-153	88.55%	lagging	-291.7	-140.7	90.07%	lagging
28	-291.6	-160.8	87.57%	lagging	-291.7	-146.2	89.40%	lagging
29	-291.6	-152.5	88.61%	lagging	-291.7	-140	90.15%	lagging
30	-291.6	-156.2	88.15%	lagging	-291.7	-144.2	89.64%	lagging
31	-291.5	-179	85.22%	lagging	-291.6	-166.8	86.80%	lagging
32	-291.4	-190.2	83.74%	lagging	-291.5	-182.6	84.75%	lagging
33	-291.6	-152.8	88.58%	lagging	-291.3	-200.7	82.35%	lagging
34	-291.6	-152.8	88.58%	lagging	-291.3	-200.7	82.35%	lagging
35	-291.6	-166.1	86.89%	lagging	-291.6	-153.9	88.44%	lagging
36	-291.6	-156.8	88.07%	lagging	-291.7	-144.3	89.63%	lagging
37	-290.8	-268.5	73.47%	lagging	-290.7	-280.1	72.01%	lagging
38	-291.6	-166.1	86.89%	lagging	-291.6	-153.9	88.44%	lagging
39	-291.6	-156.8	88.07%	lagging	-291.7	-144.3	89.63%	lagging

Table 5.7: Power Factor Requirements at the POI for Power Flow Contingencies in Table 5.1 for GEN-2011-023

Cont. No.	Summer				Winter			
	P (MW)	Q (MVAR)	Power Factor		P (MW)	Q (MVAR)	Power Factor	
0	-292.3	33.3	99.36%	leading	-292.7	33.8	99.34%	leading
1	-292.3	35.9	99.25%	leading	-292.7	36.5	99.23%	leading
2	-292.3	30.7	99.45%	leading	-292.7	31.1	99.44%	leading
3	-292.4	19.1	99.79%	leading	-292.7	20.5	99.76%	leading
4	-292.3	33.2	99.36%	leading	-292.7	33.8	99.34%	leading
5	-292.3	33.3	99.36%	leading	-292.7	33.8	99.34%	leading
6	-292.3	33.3	99.36%	leading	-292.7	33.9	99.34%	leading
7	-292.3	31.4	99.43%	leading	-292.7	32	99.41%	leading
8	-292.3	39.4	99.10%	leading	-292.7	39.6	99.10%	leading
9	-292	-28.7	99.52%	lagging	-292.7	31.1	99.44%	leading
10	-292.3	31.8	99.41%	leading	-292.7	32.7	99.38%	leading
11	-292.3	33.3	99.36%	leading	-292.7	33.8	99.34%	leading
12	-292.3	32.8	99.38%	leading	-292.7	33.3	99.36%	leading
13	292.3	32	99.41%	leading	-292.7	32.4	99.39%	leading
14	-292.3	33.3	99.36%	leading	-292.7	33.8	99.34%	leading
15	-292.3	33.3	99.36%	leading	-292.7	33.7	99.34%	leading
16	-292.3	33.2	99.36%	leading	-292.7	33.7	99.34%	leading
17	-292.3	32.6	99.38%	leading	-292.7	33.1	99.37%	leading
18	-292.3	31	99.44%	leading	-292.7	32	99.41%	leading
19	-292.3	32	99.41%	leading	-292.7	32.4	99.39%	leading
20	-292.3	32.8	99.38%	leading	-292.7	33.3	99.36%	leading
21	-292.3	29.4	99.50%	leading	-292.7	29.5	99.50%	leading
22	-292.3	33.2	99.36%	leading	-292.7	33.7	99.34%	leading
23	-292.3	33.5	99.35%	leading	-292.7	34	99.33%	leading
24	-292.3	33.1	99.36%	leading	-292.7	33.6	99.35%	leading
25	-292.3	33.1	99.36%	leading	-292.7	33.6	99.35%	leading
26	-292.3	33.3	99.36%	leading	-292.7	33.8	99.34%	leading
27	-292.3	33.3	99.36%	leading	-292.7	33.8	99.34%	leading
28	-292.3	34.1	99.33%	leading	-292.7	34.6	99.31%	leading

Cont. No.	Summer				Winter			
	P (MW)	Q (MVAR)	Power Factor		P (MW)	Q (MVAR)	Power Factor	
29	-292.3	33.1	99.36%	leading	-292.7	33.5	99.35%	leading
30	-292.3	32.4	99.39%	leading	-292.7	32.9	99.37%	leading
31	-292.3	28.8	99.52%	leading	-292.7	29.9	99.48%	leading
32	-292.3	30.5	99.46%	leading	-292.7	30.9	99.45%	leading
33	-292.3	33.3	99.36%	leading	-292.7	37.9	99.17%	leading
34	-292.3	33.3	99.36%	leading	-292.7	37.9	99.17%	leading
35	-292.3	30.3	99.47%	leading	-292.7	30.3	99.47%	leading
36	-292.3	30.3	99.47%	leading	-292.7	30.3	99.47%	leading
37	-292.3	32.1	99.40%	leading	-292.7	32.6	99.39%	leading
38	-292.3	30.3	99.47%	leading	-292.7	30.3	99.47%	leading
39	-292.3	30.3	99.47%	leading	-292.7	30.3	99.47%	leading

For GEN-2011-016, GEN-2011-017, and GEN-2011-008 projects the contingencies in which the power factor requirements exceed 95% lagging (capacitive) power factor are highlighted in Table 5.4 through Table 5.6 respectively. The major reason is that the voltage at the POI for these projects is less than 1.0 pu in the pre-project case which would require significant amount of reactive power support to reach 1.0 pu. The projects studied with setting 95% lagging power factor at the interconnection projects POIs for the worst outage contingency case (i.e., contingency no. 37 and winter case) and the voltages at the POIs are listed in Table 5.8.

Table 5.8: Base Case Voltage at the Point of Interconnection

Point of Interconnection	Worst Case Contingency and Winter Peak 2010/2011 (pu)
Spearville 345kV (531469)	0.993
Comanche 345kV (765341)	0.991
Tap on Spearville – Post Rock 345kV line (576704)	0.971
Tap on Comanche - Spearville 345kV (582023)	0.998

Wind farms are not required by FERC 661-A to operate at the POI beyond a power factor range of ±95% for voltages from 95% to 105% of nominal unless additional reactive power is

necessary to prevent voltage collapse or operation of the voltage ride through protection in wind turbine generators.

Based on the above results, the study projects are required to meet power factor requirements as follows.

- GEN-2010-029 is required to maintain a power factor of 96% lagging (supplying reactive power) to unity at the POI.
- GEN-2011-016 is required to maintain a power factor of 95% lagging to 99% leading at the POI.
- GEN-2011-008 is required to maintain a power factor of 95% lagging to 95% leading (absorbing reactive power) at the POI.
- GEN-2011-017 is required to maintain a power factor of 95% lagging to 95% leading at the POI.
- GEN-2011-023 is required to maintain a power factor of 99% lagging to 99% leading at the POI.

6. TRANSIENT STABILITY ANALYSIS

Transient stability analysis was performed for the fault contingencies in Table 6.1, which were specified by SPP. For the purpose of the transient stability analysis, each of the interconnection request projects were studied with 95% power factor at the POIs.

Table 6.1: SPP fault contingencies

Cont. No.	Cont. Name	Description
1	FLT01-3PH	3 phase fault on the Spearville (531469) to GEN-2007-040 Tap (531000) 345kV line, near Spearville. a. Apply fault at the Spearville 345kV bus. b. Clear fault after 5 cycles by tripping the faulted line.
2	FLT02-1PH	Single phase fault on the line in previous a. Apply single phase 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.
3	FLT03-3PH	3 phase fault on the GEN-2010-016 Tap (576704) to Spearville (531469) 345kV line, near GEN-2010-016 Tap. a. Apply fault at GEN-2010-016 Tap 345kV bus. b. Clear fault after 5 cycles by tripping the faulted line.
4	FLT04-1PH	Single phase fault on the line in previous a. Apply single phase fault at GEN-2010-016 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.
5	FLT05-3PH	3 phase fault on one of the Spearville (531469) to Comanche (765341) 345kV line Ckt 2, near Spearville. a. Apply fault at the Spearville 345kV bus. b. Clear fault after 5 cycles by tripping the faulted line.
6	FLT06-1PH	Single phase fault on the line in previous a. Apply single phase 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.
7	FLT07-3PH	3 phase fault on the Spearville 345kV (531469) to 230kV (539695) transformer, near the 345kV bus. a. Apply fault at the Spearville 345kV bus. b. Clear fault after 5 cycles by tripping the faulted transformer.
8	FLT08-3PH	3 phase fault on the Spearville 230kV (539695) to 115kV (539694) transformer , near the 230kV bus. a. Apply fault at the Spearville 230kV bus. b. Clear fault after 5 cycles by tripping the faulted transformer.
9	FLT09-3PH	3 phase fault on the Spearville 345kV (531469) to 115kV (539694) transformer, near the 345kV bus. a. Apply fault at the Spearville 345kV bus. b. Clear fault after 5 cycles by tripping the faulted transformer.

Cont. No.	Cont. Name	Description
10	FLT10-3PH	3 phase fault on the Spearville (539695) to Mullergren (539679) 230kV line, near Spearville. a. Apply fault at the Spearville 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.
11	FLT11-1PH	Single phase fault and sequence like previous
12	FLT12-3PH	3 phase fault on the Comanche (765341) to Medicine Lodge (765342) 345kV line Ckt1, near Comanche. a. Apply fault at the Comanche 345kV bus. b. Clear fault after 5 cycles by tripping the faulted line.
13	FLT13-1PH	Single phase fault on the line in previous a. Apply single phase fault at the Comanche 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	FLT14-3PH	3 phase fault on the GEN-2010-016 Tap (576704) to Post Rock (531469) 345kV line, near GEN-2010-016 Tap. a. Apply fault at GEN-2010-016 Tap 345kV bus. b. Clear fault after 5 cycles by tripping the faulted line.
15	FLT15-1PH	Single phase fault on the line in previous a. Apply single phase fault at GEN-2010-016 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.
16	FLT16-3PH	3 phase fault on the Finney (523853) to Conestoga (560029) 345kV line, near Finney. a. Apply fault at the Finney 345kV bus. b. Clear fault after 5 cycles by tripping the faulted line.
17	FLT17-1PH	Single phase fault on the line in previous a. Apply single phase fault at the Finney 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	FLT18-3PH	3 phase fault on one of the Finney (523853) to Holcomb (531449) 345kV lines, near Finney. a. Apply fault at the Finney 345kV bus. b. Clear fault after 5 cycles by tripping the faulted line.
19	FLT19-1H	Single phase fault on the line in previous a. Apply single phase fault at the Finney 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	FLT20-3PH	3 phase fault on the 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.
21	FLT21-1PH	Single phase fault on the line in previous a. Apply single phase 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.

Cont. No.	Cont. Name	Description
22	FLT22-3PH	3 phase fault on the GEN-2008-018 Tap (531010) to Holcomb (531449) 345kV line, near GEN-2008-018 Tap. a. Apply fault at the GEN-2008-018 Tap 345kV bus. b. Clear fault after 5 cycles by tripping the faulted line.
23	FLT23-1PH	Single phase fault on the line in previous a. Apply single phase fault at the GEN-2008-018 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.
24	FLT24-3PH	3 phase fault on the Holcomb 345kV (531449) to 115kV (531448) transformer, near the 345 kV bus. a. Apply fault at the Holcomb 345kV bus. b. Clear fault after 5 cycles by tripping the faulted transformer.
25	FLT25-3PH	3 phase fault on the Finney (523853) to Lamar (599950) 345kV line, near Finney. a. Apply fault at Finney 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.
26	FLT26-1PH	Single phase fault and sequence like previous
27	FLT27-3PH	3 phase fault on the Mullergren (539679) to South Hays (530582) 230kV line, near Mullergren. a. Apply fault at the Mullergren 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.
28	FLT28-1PH	Single phase fault and sequence like previous
29	FLT29-3PH	3 phase fault on the Mullergren (539679) to Circle (532871) 230kV line, near Mullergren. a. Apply fault at the Mullergren 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.
30	FLT30-1PH	Single phase fault and sequence like previous
31	FLT31-3PH	3 phase fault on the Conestoga (560029) to Hitchland (523097) 345kV line, near GEN-2003-013. a. Apply fault at the Conestoga 345kV bus. b. Clear fault after 5 cycles by tripping the faulted line.
32	FLT32-1PH	Single phase fault on the line in previous a. Apply single phase fault at the Conestoga 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.
33	FLT33-3PH	3 phase fault on the Woodward (515375) to GEN-2008-047 (580500) Tap 345kV lines Ckt 1 & 2, near Woodward. a. Apply fault at the Woodward 345kV bus. b. Clear fault after 5 cycles by tripping the faulted line.
34	FLT34-1PH	Single phase fault on the line in previous a. Apply single phase fault. 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.

Cont. No.	Cont. Name	Description
35	FLT35-3PH	3 phase fault on the Knoll (530558) to Post Rock (530584) 230kV line, near Knoll. a. Apply fault at the Knoll 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	FLT36-1PH	Single phase fault and sequence like previous
37	FLT37-3PH	3 phase fault on the 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.
38	FLT38-1PH	Single phase fault on the line in previous a. Apply single phase 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.
39	FLT39-3PH	3 phase fault on the Post Rock 345kV (530583) to 230kV (530584) transformer, near the 345 kV bus. a. Apply fault at the Post Rock 345kV bus. b. Clear fault after 5 cycles by tripping the faulted transformer.
40	FLT40-3PH	3 phase fault on the GEN-2001-039A Tap (579025) to Fort Dodge (539671) 115kV line, near GEN-2001-039A Tap. a. Apply fault at the GEN-2001-039A Tap 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.
41	FLT41-1PH	Single phase fault and sequence like previous
42	FLT42-3PH	3 phase fault on the GEN-2008-079 Tap (573029) to Cudahy (539659) 115kV line, near GEN-2008-079 Tap. a. Apply fault at the GEN-2008-079 Tap 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.
43	FLT43-1PH	Single phase fault and sequence like previous
44	FLT44-3PH	3 phase fault on the Kismet (539646) to CMRIVTP (539652) 115kV line, near Kismet. a. Apply fault at the Kismet 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.
45	FLT45-1PH	Single phase fault and sequence like previous
46	FLT46-3PH	3 phase fault on the CMRIVTP (539652) to E-Liber (539672) 115kV line, near Kismet. a. Apply fault at the CMRIVTP115kV 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.
47	FLT47-1PH	Single phase fault and sequence like previous
48	FLT48-3PH	3 phase fault on the Hugoton (531481) to GrantTP (531483)115kV line, near Hugoton. a. Apply fault at the Hugoton 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.
49	FLT49-1PH	Single phase fault and sequence like previous

Cont. No.	Cont. Name	Description
50	FLT50-3PH	3 phase fault on the Pratt (539687) to Ninnescah (539648) 115kV line, near Pratt. a. Apply fault at the Pratt 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.
51	FLT51-1PH	Single phase fault and sequence like previous
52	FLT52-3PH	3 phase fault on the Pratt (539687) to Sawyer (539649) 115kV line, near Pratt. a. Apply fault at the Pratt 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.
53	FLT53-1PH	Single phase fault and sequence like previous
54	FLT54-3PH	3 phase fault on the Medicine Lodge (539673) to Sun City (539697) 115kV line, near Medicine Lodge. a. Apply fault at the Medicine Lodge 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.
55	FLT55-1PH	Single phase fault and sequence like previous
56	FLT56-3PH	3 phase fault on the GEN-2008-047 (580500) to GEN-2007-040 Tap (531000) 345kV line, near GEN-2007-040 Tap. a. Apply fault at the GEN-2007-040 Tap 345kV bus. b. Clear fault after 5 cycles by tripping the faulted line.
57	FLT57-1PH	Single phase fault and sequence like previous
58	FLT-58-3PH	3 phase fault on the Spearville (531469) to Mullergren (100321) 345kV lines ckt 1 & 2, near Spearville. a. Apply fault at the Spearville 345kV bus. b. Clear fault after 5 cycles by tripping the faulted line.
59	FLT-59-3PH	3 phase fault on the Medicine Lodge (765342) to GEN-2007-025 Tap (532796) 345kV lines ckt 1 & 2, near Medicine Lodge. a. Apply fault at the Medicine Lodge 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.
60	FLT-60-3PH	3 phase fault on the Medicine Lodge (765342) to GEN-2007-025 Tap (532796) 345kV lines ckt 1, near Medicine Lodge. a. Apply fault at the Medicine Lodge 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-61-3PH	3 phase fault on one of the GEN-2011-023 (582023) to Comanche (765341) 345kV line, near GEN-2011-023. a. Apply fault at the GEN-2011-023 345kV bus. b. Clear fault after 5 cycles by tripping the faulted line.
62	FLT-62-3PH	Single phase fault and sequence like previous
63	FLT-63-3PH	3 phase fault on one of the GEN-2011-023 (582023) to Spearville (531469) 345kV line, near GEN-2011-023. a. Apply fault at the GEN-2011-023 345kV bus. b. Clear fault after 5 cycles by tripping the faulted line.
64	FLT-64-3PH	*Single phase fault and sequence like previous*

Cont. No.	Cont. Name	Description
65	FLT-65-3PH	3 phase fault on one of Mingo (531451) to Redwillow (640325) 345kV line, near Mingo. a. Apply fault at the Medicine Lodge 115kV bus. b. Clear fault after 5 cycles by tripping the faulted line.
66	FLT-66-3PH	3 phase fault on one of the GEN-2011-023 (582023) to Comanche (765341) 345kV line, near GEN-2011-023. a. Apply fault at the GEN-2011-023 345kV bus. b. Clear fault after 5 cycles by tripping the faulted line. 3 phase fault on one of the GEN-2011-023 (582023) to Spearville (531469) 345kV line, near GEN-2011-023. a. Apply fault at the GEN-2011-023 345kV bus. b. Clear fault after 5 cycles by tripping the faulted line and Comanche (765341)-Spearville (531469) 345kV.
67	FLT-67-3PH	3 phase fault on one of theGEN-2011-023 (582023) to Spearville (531469) 345kV line, near GEN-2011-023. a. Apply fault at the GEN-2011-023 345kV bus. b. Clear fault after 5 cycles by tripping the faulted line. 3 phase fault on one of the GEN-2011-023 (582023) to Spearville (531469) 345kV line, near GEN-2011-023. a. Apply fault at the GEN-2011-023 345kV bus. b. Clear fault after 5 cycles by tripping the faulted line and Comanche (765341)-Spearville (531469) 345kV.

Single line to ground faults were simulated in a manner consistent with currently accepted practices, that is to assume that a single line to ground will cause a voltage drop at the fault location of 60% of nominal.

The prior queued projects monitored are listed in Table 6.2.

Table 6.2: Prior queued wind farm projects monitored

Request	Size (MW)	Wind Turbine Model	Point of Interconnection
GEN-2001-039A	105	Clipper 2.5MW	Tap on Judson Large – Greensburg 115kV line (579025)
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	Tap on Harper – Medicine Lodge 138kV line (539638)
GEN-2006-022	150	Clipper 2.5MW	Pratt 115kV (539687)
GEN-2007-038	200	Clipper 2.5MW	Spearville 345kV (531469)
GEN-2008-018	405	GE 1.5 MW	Finney 345kV (523853)
GEN-2007-040	200.1	Siemens 2.3MW	Tap on Holcomb – Spearville 345kV line (531000)
GEN-2008-079	99.5	G.E. 1.5 MW & 1.6MW	Tap on Cudahy – Judson Large 115kV line (573029)
GEN-2008-124	200.1	Siemens 2.3MW	Spearville 345kV (531469)
GEN-2009-062	129	Genrou	Hugoton 115kV (531481)
GEN-2010-009	165.6	Siemens SWT 2.3MW	Tap on Holcomb – Spearville 345kV line (531000)
GEN-2010-015	200.1	Siemens SWT 2.3MW	Spearville 345kV (531469)
GEN-2010-016	199.8	Vestas V90 1.8MW	Tap on Spearville – Post Rock 345kV line (576704)
GEN-2010-045	197.8	Siemens 2.3MW	Tap on Holcomb – Spearville 345kV line (531000)
GEN-2010-049	49.6	GE 1.6MW	Pratt 115kV (539687)
GEN-2010-052	301.3	Siemens 2.3MW	Finney 345kV (523853)
GEN-2010-053	199.8	Vestas V90 1.8MW	Comanche 345kV (765341)

Table 6.3 through Table 6.5 listed voltage and frequency relay settings were used to evaluate fault ride-through capability of WTGs in transient stability analysis.

Table 6.3: Vestas V90, 1.8 MW Protection Settings (based on Vestas Generic Model Dynamic Data Template for PSS/E Model revision 7.2).

Relay Type	Trip Setting (unit)	Time Delay (sec)
Undervoltage	0.90 (pu)	60
Undervoltage	0.85 (pu)	0.4
Undervoltage	0.75 (pu)	0.0001
Overvoltage	1.10 (pu)	60
Overvoltage	1.35 (pu)	0.2
Overvoltage	1.20 (pu)	0.12
Underfrequency	56.4 (Hz)	0.2
Overfrequency	63.0 (Hz)	0.2

Table 6.4: Siemens SWT 2.3 MW Protection Settings (PSS/E Model Version 1.3)

Relay Type	Trip Setting	Time Setting (sec)
Undervoltage	0.85 (pu)	3.0
Undervoltage	0.40 (pu)	1.6
Undervoltage	0.15 (pu)	0.85
Overvoltage	1.2 (pu)	0.15
Overvoltage	1.10 (pu)	1.0
Underfrequency	57.0 (Hz)	10
Underfrequency	56.4 (Hz)	0.1
Overfrequency	62.4 (Hz)	0.1

Table 6.5: GE 1.6xle Protection Settings

Relay Type	Trip Setting	Time Delay (sec)
Undervoltage	0.75 (pu)	1.9
Undervoltage	0.50 (pu)	1.2
Undervoltage	0.30 (pu)	0.7
Undervoltage	0.15 (pu)	0.2
Overvoltage	1.15 (pu)	0.1
Overvoltage	1.10 (pu)	1.0

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 reasonable operating level. Frequencies should settle to the nominal 60 Hz power frequency.

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.

Initial transient stability results showed instability issues due to undervoltage problem in Post Rock 345 kV area in the most of the contingencies in the summer peak loading case. The issue has been discussed with SPP and as a result, changes including switching off the reactors in Post Rock 345 kV area were applied in the study. After applying these modifications, Group 3 will survive each fault disturbance in Table 6.1. Voltage, frequency and angular stability will be retained. Transient stability plots of the undisturbed runs and #1 through #67 fault contingencies for summer and winter can be found in the Appendix section of this report. As the results showed none of the interconnection request projects required additional reactive power to retain stability and that 95% power factor should be sufficient requirement for each project.

Table 6.6: Summary of Transient Stability Results

Cont. No.	Cont. Name	Summer Peak 2010/2011	Winter Peak 2010/2011
1	FLT01-3PH	STABLE	STABLE
2	FLT02-1PH	STABLE	STABLE
3	FLT03-3PH	STABLE	STABLE
4	FLT04-1PH	STABLE	STABLE
5	FLT05-3PH	STABLE	STABLE
6	FLT06-1PH	STABLE	STABLE
7	FLT07-3PH	STABLE	STABLE
8	FLT08-1PH	STABLE	STABLE
9	FLT09-3PH	STABLE	STABLE
10	FLT10-3PH	STABLE	STABLE
11	FLT11-1PH	STABLE	STABLE
12	FLT12-3PH	STABLE	STABLE
13	FLT13-1PH	STABLE	STABLE
14	FLT14-3PH	STABLE	STABLE
15	FLT15-1PH	STABLE	STABLE
16	FLT16-3PH	STABLE	STABLE
17	FLT17-1PH	STABLE	STABLE
18	FLT18-3PH	STABLE	STABLE
19	FLT19-1PH	STABLE	STABLE
20	FLT20-3PH	STABLE	STABLE
21	FLT21-3PH	STABLE	STABLE
22	FLT22-1PH	STABLE	STABLE
23	FLT23-3PH	STABLE	STABLE
24	FLT24-1PH	STABLE	STABLE
25	FLT25-3PH	STABLE	STABLE
26	FLT26-1PH	STABLE	STABLE
27	FLT27-3PH	STABLE	STABLE
28	FLT28-1PH	STABLE	STABLE
29	FLT29-3PH	STABLE	STABLE
30	FLT30-1PH	STABLE	STABLE
31	FLT31-3PH	STABLE	STABLE

Cont. No.	Cont. Name	Summer Peak 2010/2011	Winter Peak 2010/2011
32	FLT32-1PH	STABLE	STABLE
33	FLT33-3PH	STABLE	STABLE
34	FLT34-1PH	STABLE	STABLE
35	FLT35-3PH	STABLE	STABLE
36	FLT36-1PH	STABLE	STABLE
37	FLT37-3PH	STABLE	STABLE
38	FLT38-1PH	STABLE	STABLE
39	FLT39-3PH	STABLE	STABLE
40	FLT40-1PH	STABLE	STABLE
41	FLT41-3PH	STABLE	STABLE
42	FLT42-1PH	STABLE	STABLE
43	FLT43-3PH	STABLE	STABLE
44	FLT44-3PH	STABLE	STABLE
45	FLT45-1PH	STABLE	STABLE
46	FLT46-3PH	STABLE	STABLE
47	FLT47-1PH	STABLE	STABLE
48	FLT48-3PH	STABLE	STABLE
49	FLT49-3PH	STABLE	STABLE
50	FLT50-3PH	STABLE	STABLE
51	FLT51-1PH	STABLE	STABLE
52	FLT52-3PH	STABLE	STABLE
53	FLT53-1PH	STABLE	STABLE
54	FLT54-3PH	STABLE	STABLE
55	FLT55-1PH	STABLE	STABLE
56	FLT56-3PH	STABLE	STABLE
57	FLT57-1PH	STABLE	STABLE
58	FLT58-3PH	STABLE	STABLE
59	FLT59-3PH	STABLE	STABLE
60	FLT60-3PH	STABLE	STABLE
61	FLT61-3PH	STABLE	STABLE
62	FLT62-1PH	STABLE	STABLE
63	FLT63-3PH	STABLE	STABLE
64	FLT64-1PH	STABLE	STABLE

Cont. No.	Cont. Name	Summer Peak 2010/2011	Winter Peak 2010/2011
65	FLT65-3PH	STABLE	STABLE
66	FLT66-3PH	STABLE	STABLE
67	FLT67-3PH	STABLE	STABLE

7. CONCLUSIONS AND RECOMMENDATIONS

Power Factor analysis for the study projects revealed that the generating facilities must meet the following requirements.

- GEN-2010-029 is required to maintain a power factor of 96% lagging (supplying reactive power) to unity at the POI.
- GEN-2011-016 is required to maintain a power factor of 95% lagging to 99% leading at the POI.
- GEN-2011-008 is required to maintain a power factor of 95% lagging to 95% leading (absorbing reactive power) at the POI.
- GEN-2011-017 is required to maintain a power factor of 95% lagging to 95% leading at the POI.
- GEN-2011-023 is required to maintain a power factor of 99% lagging to 99% leading at the POI.

Transient analysis results indicate that definitive Impact Study DISIS-2011-001 (Group 3) can successfully interconnect into the transmission system at 100% output power and at the desired location. Transient stability analysis indicated that Group 3 will ride-through each fault contingency specified by SPP and the nearby areas will retain angular, frequency and voltage stability.

L: Stability Study for Group 4

- No requests were located in the cluster group

M: Stability Study for Group 5

- No requests were located in the cluster group

N: Stability Study for Group 6

SPP DISIS-2011-001 Group 6
Definitive Impact Study

Draft Report for

Southwest Power Pool

Prepared by:
Excel Engineering, Inc.

July 19, 2011

Principal Contributor:

William Quaintance, P.E.

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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 **New Mexico and Texas**.

William Quaintance
New Mexico License Number 19505
Texas License Number 104268

Minnesota Excel Engineering
Texas Firm License Number 7970

1. Background and Scope

The DISIS-2011-001 Group 6 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 2011 unless otherwise noted.

Table 1-1. Interconnection Requests Evaluated in this Study

Request	Size	Generator Type	Point of Interconnection	POI Bus	Gen Buses
GEN-2010-020	20.8	Emerson Inverter (solar)	Roswell 69kV (527563)	527563	581003
GEN-2010-058	20.8	Emerson Inverter (solar)	Chaves County 69kV (527481)	527481	581158
GEN-2010-059	516 Winter 480 Summer	GE Combined Cycle (gas)	Midland 345kV (527916)	527916	581159 thru 581164
GEN-2010-060	992 Winter 960 Summer	GE Combined Cycle (gas)	Midland 345kV (527916)	527916	581165 thru 581170
GEN-2011-025	80	GE 1.6MW (wind)	Tap on Floyd County - Crosby County 115kV line (581137)	581137	581140
ASGI-2011-001	28.8	Vestas 1.8MW (wind)	Lovington 115kV (528334)	528334	575161
ASGI-2011-003	10	Sany 2.0MW (wind)	Hendricks 69kV (525943)	525943	582600

The prior-queued requests shown in Table 1-2 were included in this study and dispatched at 100% of rated capacity.

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.

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.

Table 1-2. Nearby Interconnection Requests Already in the Queue

Request	Size	Generator Type	Point of Interconnection	POI Bus	Gen Buses
GEN-2001-033	180.8	Mitsubishi 1000	San Juan Mesa 230kV (524885)	524885	579007 thru 579021
GEN-2001-036	80	CIMTR	Tap on Curry – Tucumcari 115kV line (524502)	524502	524485
GEN-2008-008	60	GE 1.5MW	Graham 69kV (526693)	526693	1081
GEN-2008-009	60	GE 1.5MW	San Juan Mesa 230kV (524885)	524885	1091 1092
GEN-2008-014	149.4	Vestas V90	Tap on Tuco – Oklaunion 345kV line (560813)	560813	1141
GEN-2008-016	248.4	Siemens 2.3MW	Grassland 345kV (580502)	580502	1161 1162
GEN-2008-022	300	GE 2.5MW	Tap on Eddy County – Tolk 345kV line (577104)	577104	577100 577110 577120
GEN-2009-017	102.5	W93 2.05MW	Tap on Pembrook – Stiles 138 kV line (570917)	570917	574053
GEN-2009-067S	20	STCNPG	Seven Rivers 69kV (528093)	528093	575153
GEN-2010-006	205W 180S	GENROU	Jones_bus2 230kV(526338)	526338	577300
ASGI-2010-010	42	GENROU	Lovington 115kV (528334)	528334	575160
ASGI-2010-020	50	Nordex	Top on Tatum-Crossroads 69 kV line (580084)	580084	580088
GEN-2010-046	56	GENSAL	Tuco 230kV (525830)	525830	580043

2. Executive Summary

The DISIS-2011-001 Group 6 Definitive Impact Study evaluated the impacts of interconnecting the Table 1-1 study projects to the SPP transmission system. Two scenarios were studied – one with 250 MW of generation at Midland and one with 1500 MW.

The ASGI-2011-003 WT3 model parameters had to be replaced with typical values to achieve correct operation.

Tripping was seen for prior-queued projects GEN-2001-033 and GE-2008-014 following a few faults. When tripping was disabled, no stability problems were found.

Instability of GEN-2010-059 for a prior outage of the Midland-Borden 345 kV line confirmed the necessity of this line with GEN-2010-059 dispatched at 250 MW.

With Midland dispatched at 1500 MW, reclosing into three phase faults caused significant stability problems were seen for 345 kV faults near Midland. Adding a second 345 kV line from Midland to Yoakum is one solution option. A more viable option is to disable fast reclosing from the Midland end of the 345 kV lines. With fast reclosing disabled, no stability problems were seen.

Final power factor and capacitor requirements for the Group 6 projects are listed in Table 4-2. GEN-2010-020, GEN-2010-058, ASGI-2011-001, and ASGI-2011-003 will need to add some capacitors to meet the 95% lagging power factor requirement.

With the assumptions and upgrades described in this report, DISIS-2011-001 Group 6 should be able to connect without causing any stability problems on the SPP transmission grid.

Any change in system or wind farm 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 30.3.3 was used in this study.

3.2 Models Used

SPP provided its latest stability database cases for both summer and winter peak seasons. The model included the study and prior-queued projects. Power flow one-line diagrams of the study projects are shown in Figure 3-1 through Figure 3-6.

Transmission lines and substation transformers are modeled explicitly in the power flow cases. The wind and solar collector systems and generators are modeled as a single equivalent for each substation transformer. Steady-state and dynamic model data for the study plants are given in Appendix D.

One-line diagrams of the SPP 345 kV system in the Group 6 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 520, 524, 525, 526, 531, 534, and 536 were monitored.

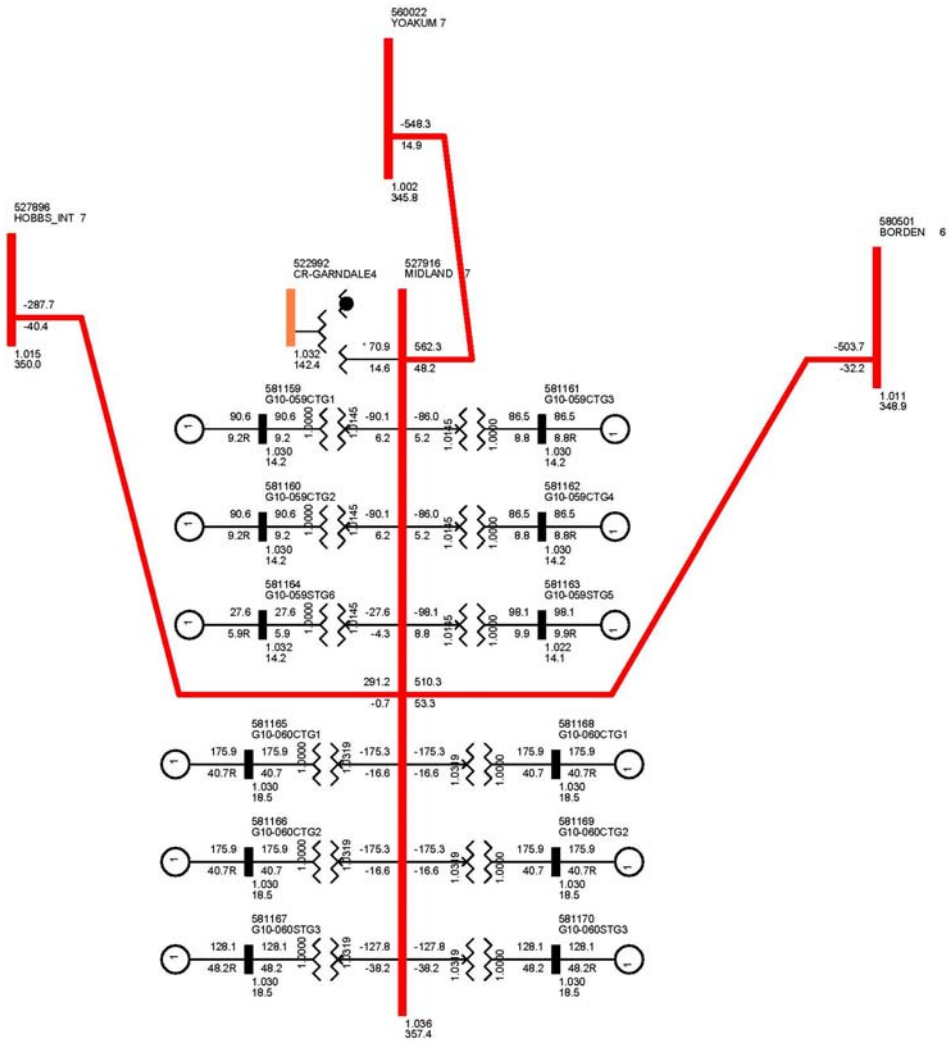


Figure 3-1. Power Flow One-line for GEN-2010-059 and GEN-2010-060

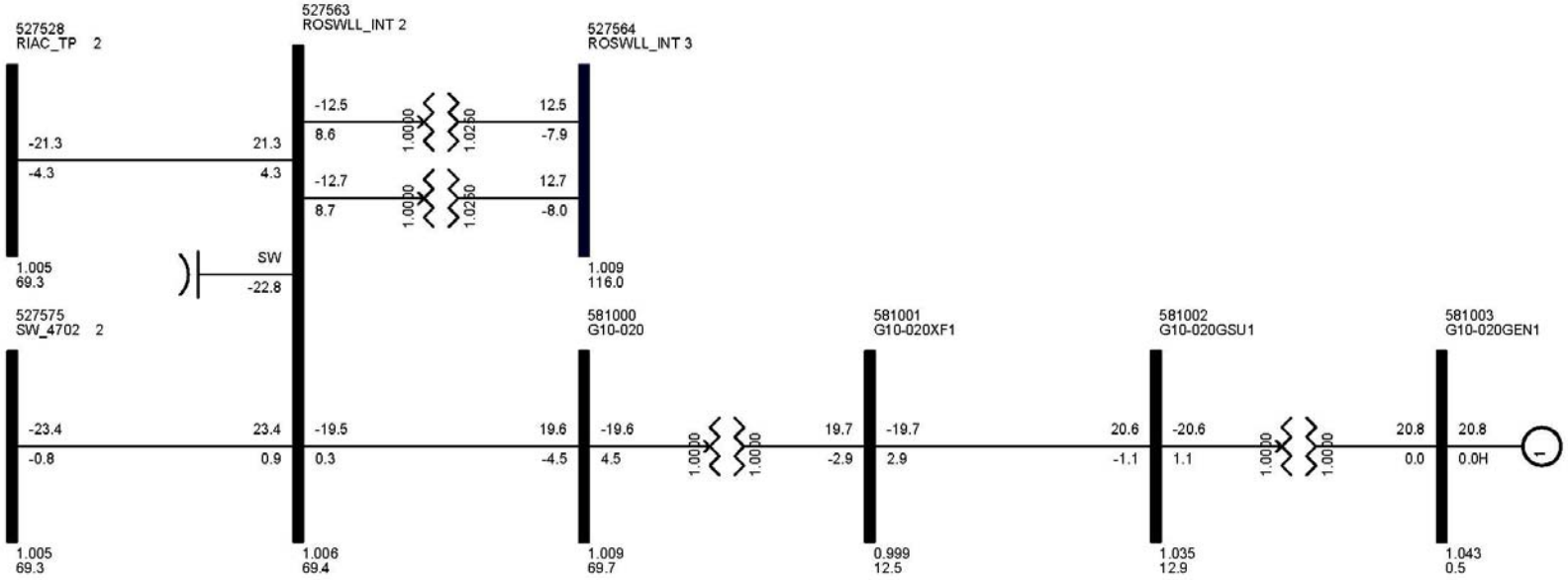


Figure 3-2. Power Flow One-line for GEN-2010-020

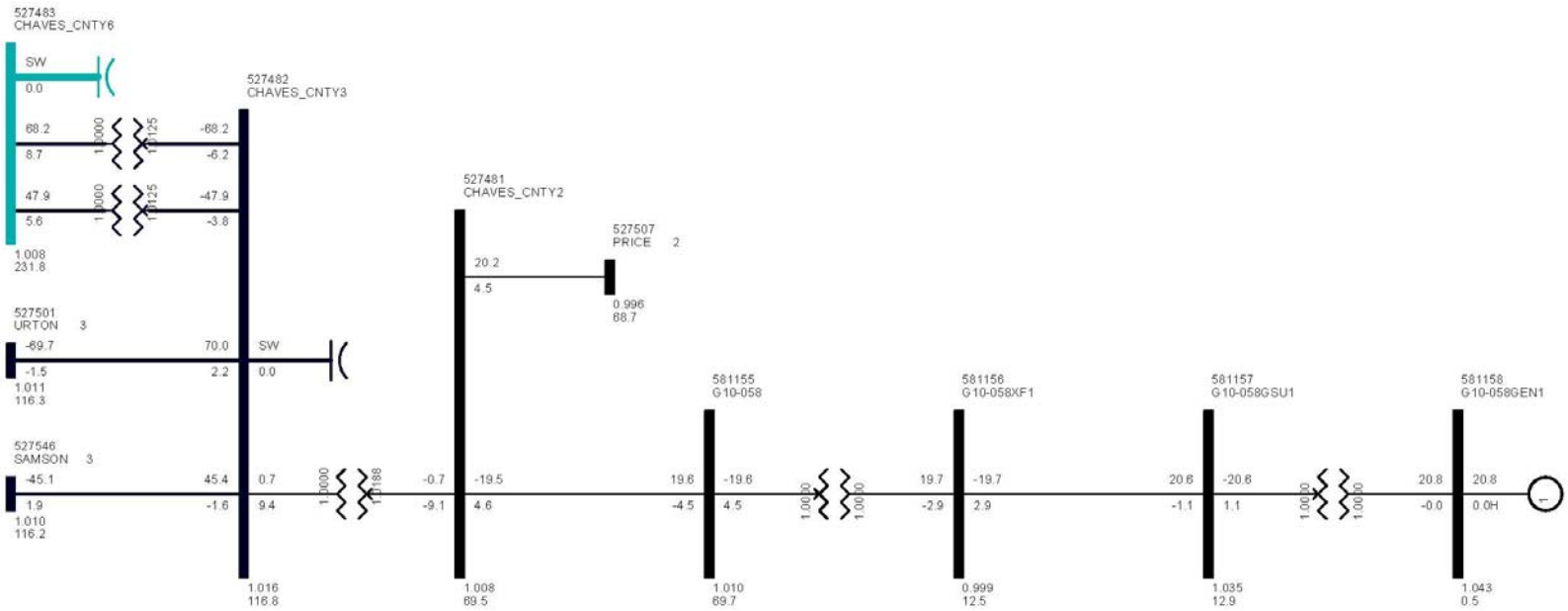


Figure 3-3. Power Flow One-line for GEN-2010-058

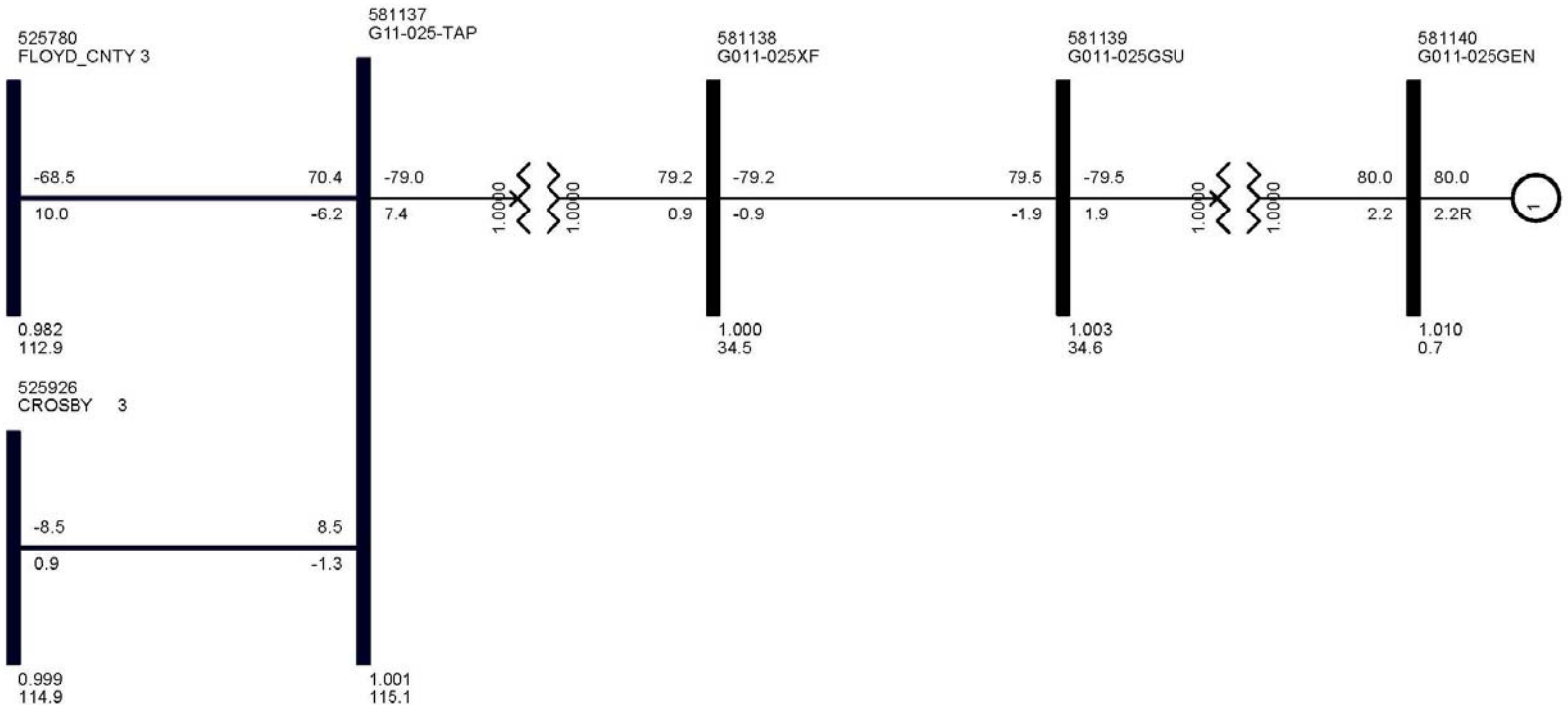


Figure 3-4. Power Flow One-line for GEN-2011-025

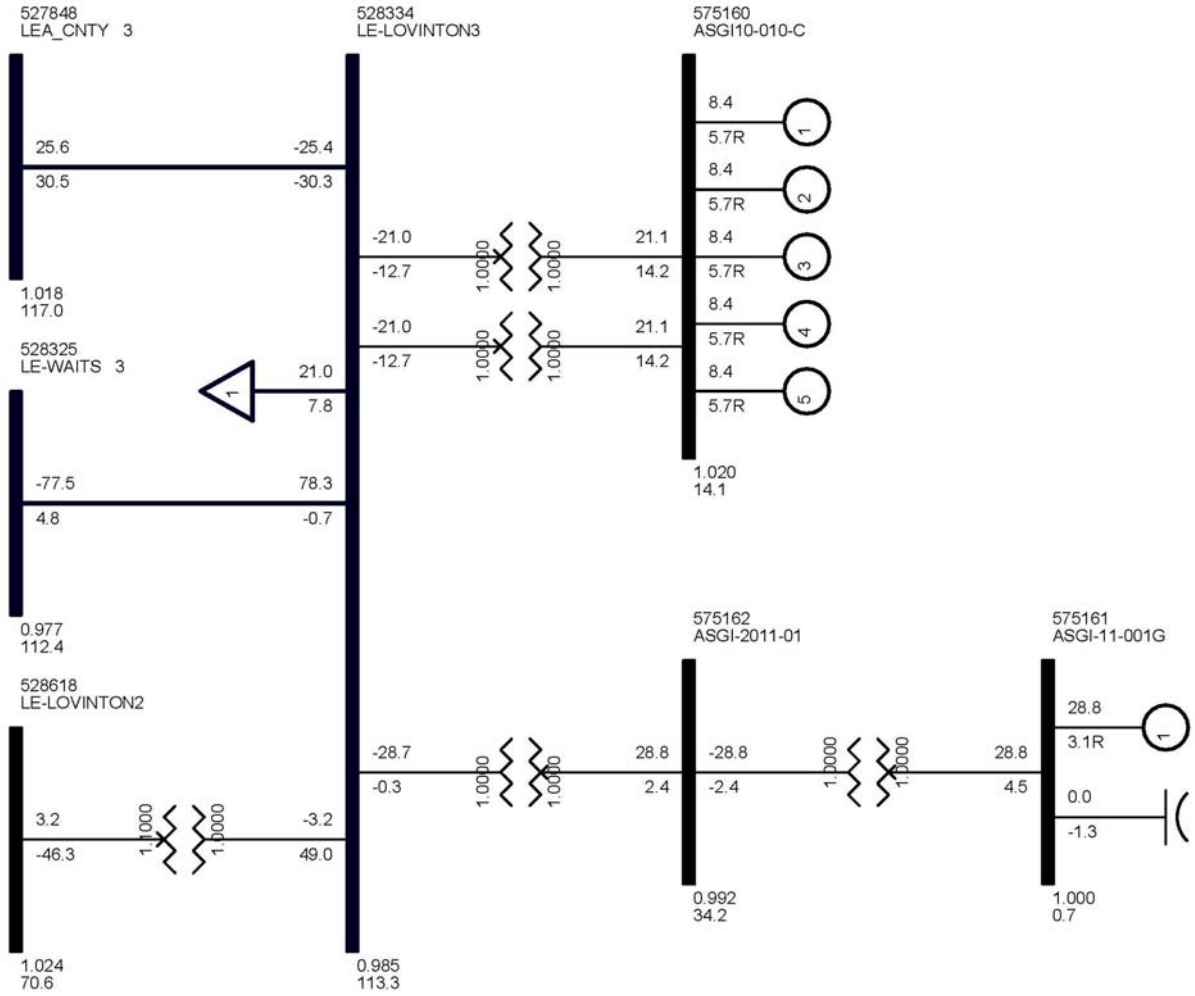


Figure 3-5. Power Flow One-line for ASGI-2011-001

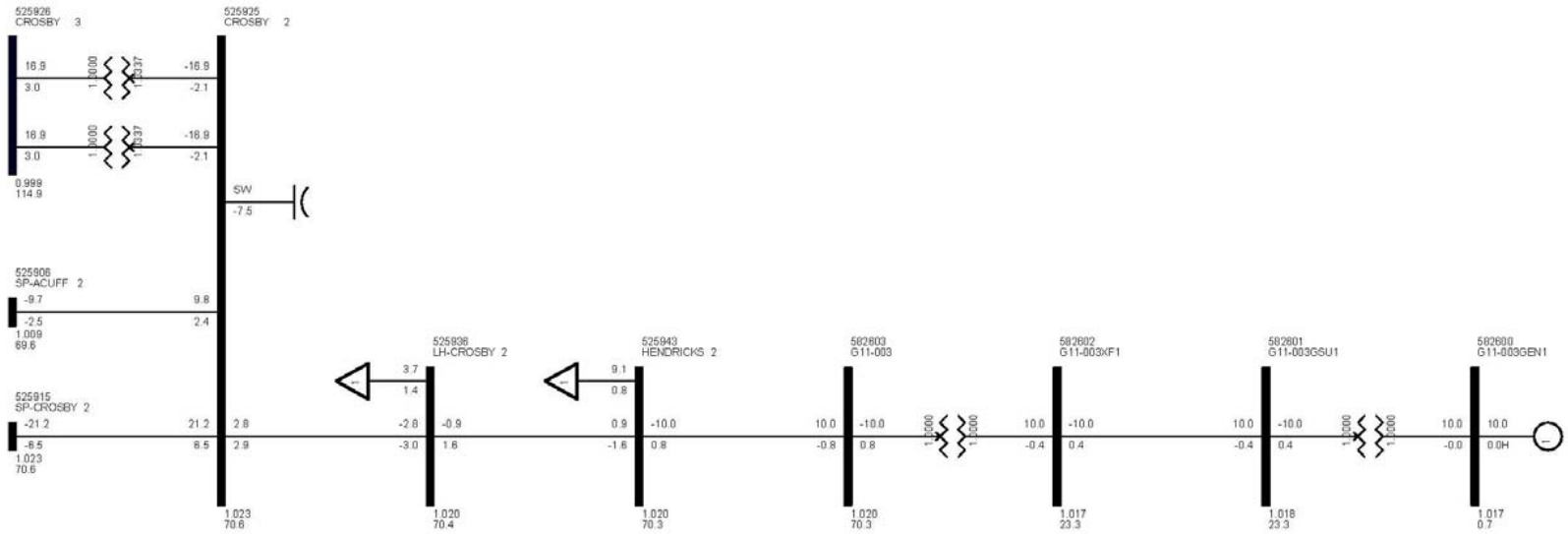


Figure 3-6. Power Flow One-line for ASGI-2011-003

3.4 Performance Criteria

Any 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 for the stability analysis. 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 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-2011-001 Group 6

Cont. No.	Contingency Name	Contingency Description
1	FLT01-3PH	3 phase fault on the Roswell (527563) to Riac Tap (527528) 69kV line, near Roswell. a. Apply fault at the Roswell 69kV 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	*Single phase fault and sequence like previous*
3	FLT03-3PH	3 phase fault on the Roswell (527563) to SW_4702 (527575) 69kV line, near Roswell. a. Apply fault at the Roswell 69kV 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	*Single phase fault and sequence like previous*
5	FLT05-3PH	3 phase fault on Roswell 69kV (527563) to 115kV (527564) transformer #2, near the 69kV bus. a. Apply fault at the Roswell 69kV bus. b. Clear fault after 5 cycles by tripping the faulted line.
6	FLT06-3PH	3 phase fault on the Roswell (527564) to Samson (527546) 115kV line, near Roswell. a. Apply fault at the Roswell 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.
7	FLT07-1PH	*Single phase fault and sequence like previous*
8	FLT08-3PH	3 phase fault on Chaves County 115kV (527482) to 230 kV (527483) transformer #1, near the 115kV bus. a. Apply fault at the Chaves County 115kV bus. b. Clear fault after 5 cycles by tripping the faulted line.
9	FLT09-3PH	3 phase fault on the Chaves County (527482) to Urton (527501) 115kV line, near Chaves County. a. Apply fault at the Chaves County 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.
10	FLT10-1PH	*Single phase fault and sequence like previous*
11	FLT11-3PH	3 phase fault on the Chaves County (527482) to Samson (527546) 115kV line, near Chaves County. a. Apply fault at the Chaves County 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.
12	FLT12-1PH	*Single phase fault and sequence like previous*
13	FLT13-3PH	3 phase fault on the Chaves County (527483) to Eddy County (527800) 230kV line, near Chaves County. a. Apply fault at the Chaves County 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.

Cont. No.	Contingency Name	Contingency Description
14	FLT14-1PH	*Single phase fault and sequence like previous*
15	FLT15-3PH	3 phase fault on the Tolk 345kV (525549) to 230kV (525543) transformer, near the 345kV bus. a. Apply fault at the Tolk 345kV bus. b. Clear fault after 5 cycles by tripping the faulted transformer.
16	FLT16-3PH	3 phase fault on the Tolk Tap (525543) to Tolk East (525524) 230kV line, near Tolk Tap. 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.
17	FLT17-1PH	*Single phase fault and sequence like previous*
18	FLT18-3PH	3 phase fault on the Roosevelt South (524911) to Tolk East (525524) 230kV line, near Roosevelt South. a. Apply fault at the Roosevelt South 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.
19	FLT19-1PH	*Single phase fault and sequence like previous*
20	FLT20-3PH	3 phase fault on the Tolk East (525524) to Plant X (525481) 230kV line #2, near Tolk East. 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.
21	FLT21-1PH	*Single phase fault and sequence like previous*
22	FLT22-3PH	3 phase fault on the Tolk East (525524) to Tuco (525830) 230kV line, near Tolk East. 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.
23	FLT23-1PH	*Single phase fault and sequence like previous*
24	FLT24-3PH	3 phase fault on the Tolk Tap (525543) to Tolk West (525531) 230kV line, near Tolk Tap. 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.
25	FLT25-1PH	*Single phase fault and sequence like previous*
26	FLT26-3PH	3 phase fault on the Lamb County (525637) to Tolk West (525531) 230kV line, near Lamb County. a. Apply fault at the Lamb County 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.
27	FLT27-1PH	*Single phase fault and sequence like previous*
28	FLT28-3PH	3 phase fault on the Yoakum (526935) to Tolk West (525531) 230kV line, near Yoakum. a. Apply fault at the Yoakum 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.
29	FLT29-1PH	*Single phase fault and sequence like previous*

Cont. No.	Contingency Name	Contingency Description
30	FLT30-3PH	3 phase fault on the Deaf Smith (524623) to Plant X (525481) 230kV line, near Deaf Smith. a. Apply fault at the Deaf Smith 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.
31	FLT31-1PH	*Single phase fault and sequence like previous*
32	FLT32-3PH	3 phase fault on the Sundown (526435) to Plant X (525481) 230kV line, near Sundown. a. Apply fault at the Sundown 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.
33	FLT33-1PH	*Single phase fault and sequence like previous*
34	FLT34-3PH	3 phase fault on the Plant X (525481) to GEN-2006-039 Tap (560009) 230kV line, near Plant X. a. Apply fault at the Plant X 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.
35	FLT35-1PH	*Single phase fault and sequence like previous*
36	FLT36-3PH	3 phase fault on the Tuco (525830) to Swisher (525213) 230kV line, near Tuco. 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.
37	FLT37-1PH	*Single phase fault and sequence like previous*
38	FLT38-3PH	3 phase fault on the Tuco (525830) to Jones Bus1 (526337) 230kV line, near Tuco. 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.
39	FLT39-1PH	*Single phase fault and sequence like previous*
40	FLT40-3PH	3 phase fault on Tuco 230kV (525830) to 345kV (525832) transformer #1, near the 230kV bus. a. Apply fault at the Tuco 230kV bus. b. Clear fault after 5 cycles by tripping the faulted transformer.
41	FLT41-3PH	3 phase fault on the Tuco (525832) to Border (525835) 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.
42	FLT42-1PH	*Single phase fault and sequence like previous*
43	FLT43-3PH	3 phase fault on the GEN-2008-014 Tap (560813) to Tuco (525832) 345kV line, near GEN-2008-014 Tap. a. Apply fault at the GEN-2008-014 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.
44	FLT44-1PH	*Single phase fault and sequence like previous*

Cont. No.	Contingency Name	Contingency Description
45	FLT45-3PH	3 phase fault on the Jones (580504) to Grassland (580502) 345kV line, near Jones. a. Apply fault at the Jones 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.
46	FLT46-1PH	*Single phase fault and sequence like previous*
47	FLT47-3PH	3 phase fault on the Borden (580501) to Grassland (580502) 345kV line, near Borden. a. Apply fault at the Borden 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.
48	FLT48-1PH	*Single phase fault and sequence like previous*
49	FLT49-3PH	3 phase fault on the Grassland 230kV (526677) to 115kV (526676) transformer, near the 230kV bus. a. Apply fault at the Grassland 230kV bus. b. Clear fault after 5 cycles by tripping the faulted transformer.
50	FLT50-3PH	3 phase fault on the Borden 345kV (580501) to Vealmoor 115kV (522896) transformer, near the Borden 345kV bus. a. Apply fault at the Borden 345kV bus. b. Clear fault after 5 cycles by tripping the faulted transformer.
51	FLT51-3PH	3 phase fault on the Midland 345kV(527916) to Garndale 138kV (522992) transformer, near the 345kV bus. a. Apply fault at the Midland 345kV bus. b. Clear fault after 5 cycles by tripping the faulted transformer.
52	FLT52-3PH	3 phase fault on the Midland (527916) to Hobbs (527896) 345kV line, near Midland. a. Apply fault at the Midland 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.
53	FLT53-1PH	*Single phase fault and sequence like previous*
54	FLT54-3PH	3 phase fault on the GEN-2011-025 Tap (581137) to Floyd County (525780) 115kV line, near GEN-2011-025 Tap. a. Apply fault at the GEN-2011-025 Tap 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.
55	FLT55-1PH	*Single phase fault and sequence like previous*
56	FLT56-3PH	3 phase fault on the GEN-2011-025 Tap (581137) to Crosby County (525926) 115kV line, near GEN-2011-025 Tap. a. Apply fault at the GEN-2011-025 Tap 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.
57	FLT57-1PH	*Single phase fault and sequence like previous*
58	FLT58-3PH	3 phase fault on one of the Crosby County 69kV (525925) to 115kV (525926) transformers, near the 69kV bus a. Apply fault at the Crosby County 69kV bus. b. Clear fault after 5 cycles by tripping the faulted transformer.

Cont. No.	Contingency Name	Contingency Description
59	FLT59-3PH	3 phase fault on the Crosby County (525926) to Lubbock East (526298) 115kV line, near Crosby County. a. Apply fault at the Crosby County 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.
60	FLT60-1PH	*Single phase fault and sequence like previous*
61	FLT61-3PH	3 phase fault on the Lubbock East (526299) to Jones Bus2 (526338) 230kV line, near Lubbock East. a. Apply fault at the Lubbock 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.
62	FLT62-1PH	*Single phase fault and sequence like previous*
63	FLT63-3PH	3 phase fault on the Floyd County (525780) to Cox (525326) 115kV line, near Floyd County. a. Apply fault at the Floyd County 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.
64	FLT64-1PH	*Single phase fault and sequence like previous*
65	FLT65-3PH	3 phase fault on one of the Floyd County 115kV (525780) to 69 kV (525779) transformers, near the 115kV bus a. Apply fault at the Floyd County 115kV bus. b. Clear fault after 5 cycles by tripping the faulted transformer.
66	FLT66-3PH	3 phase fault on the Floyd County (525780) to Tuco (525828) 115kV line, near Floyd County. a. Apply fault at the Floyd County 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.
67	FLT67-1PH	*Single phase fault and sequence like previous*
68	FLT68-3PH	3 phase fault on the Potter (523961) to GEN-2005-017 (579118) 345kV line, near Potter a. Apply fault at the Potter 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	FLT69-1PH	*Single phase fault and sequence like previous*
70	FLT70-3PH	3 phase fault on the Eddy Co 345kV (527802) to 230kV (527800) transformer, near the 345kV bus. a. Apply fault at the Eddy Co 345kV bus. b. Clear fault after 5 cycles by tripping the faulted transformer.
71	FLT71-3PH	3 phase fault on the Tuco (525832) to Jones (580504) 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.
72	FLT72-1PH	*Single phase fault and sequence like previous*

Cont. No.	Contingency Name	Contingency Description
73	FLT73-3PH	3 phase fault on the Midland (527916) to Borden (580501) 345kV line #2, near Midland. a. Apply fault at the Midland 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.
74	FLT74-1PH	*Single phase fault and sequence like previous*
75	FLT75-3PH	3 phase fault on the LE-Lovington (528334) to Lea County (527848) 115kV line, near LE Lovington a. Apply fault at the Lovington 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.
76	FLT76-1PH	*Single phase fault and sequence like previous*
77	FLT77-3PH	3 phase fault on the LE-Lovington (528334) to LE Waits (528325) 115kV line, near LE Lovington a. Apply fault at the Lovington 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.
78	FLT78-1PH	*Single phase fault and sequence like previous*
79	FLT79-3PH	**Prior Outage of Midland (527916) to Borden (580501) 345kV.** 3 phase fault on the Midland (527916) to Hobbs (527896) 345kV line, near Midland. a. Apply fault at the Midland 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.
80	FLT80-3PH	3 phase fault on the Midland (527916) to Yoakum (560022) 345kV line, near Midland. a. Apply fault at the Midland 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.
81	FLT81-1PH	*Single phase fault and sequence like previous*
82	FLT82-3PH	3 phase fault on the Yoakum (560022) to Tuco (525832) 345kV line, near Yoakum. a. Apply fault at the Yoakum 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.
83	FLT83-1PH	*Single phase fault and sequence like previous*
84	FLT84-3PH	3 phase fault on the Finney (523853) to Conestoga (560029) 345kV line, near Finney. a. Apply fault at the Finney 345kV bus. b. Clear fault after 5 cycles by tripping the faulted line.

4. Results and Observations

4.1 Stability Analysis Results

Table 4-1 summarizes the final results. Figure 4-1 through Figure 4-13 show representative summer peak season plots for faults at the POI's of the study projects. Complete sets of plots for both summer and winter peak seasons for each fault and each project are included in Appendices A and B.

In the initial simulations, ASGI-2011-003 performed very poorly. The power output dropped to almost zero and did not recover following every fault, and the generator tripped for many faults. A review of the provided WT3G/WT3E parameters found many erroneous values. All WT3G/WT3E parameters were replaced with typical values, and then the ASGI-2011-003 model performed well for all faults.

With 250 MW at Midland (GEN-2010-059), some of the GEN-2001-033 turbines tripped on under-voltage following the Tolk-Tuco 230 kV fault in summer and the Plant X to GEN-2006-039 230 kV fault in winter. When tripping was subsequently disabled, everything remained stable.

With 250 MW at Midland, the Midland generators go unstable for fault 79. The problem confirms the necessity of the Midland-Borden 345 kV line. No other problems were found with 250 MW at Midland.

With 1500 MW at Midland, GEN-2008-014 tripped on over-voltage following the GEN-2008-014 to Tuco 345 kV faults in summer and winter. When tripping was subsequently disabled, everything remained stable. Additionally, there are capacitors installed for GEN-2008-014, which could be switched off to alleviate any high voltage conditions.

With 1500 MW at Midland, the Midland generators go unstable following three-phase faults with high-speed reclosing on the 345 kV lines at Midland. To maintain stability and continue to use reclosing would require the addition of multiple new 345 kV transmission lines. If high-speed reclosing is disallowed at the Midland 345kV bus, then only the Jones-Tuco 345 kV addition is needed. This line is already required due to steady-state power flow issues.

Table 4-1. Summary of Stability Results

Cont. No.	Contingency Name	Contingency Description	Scenario 1		Scenario 2	
			Summer Peak Results	Winter Peak Results	Summer Peak Results	Winter Peak Results
1	FLT01-3PH	3 phase fault on the Roswell (527563) to Riac Tap (527528) 69kV line, near Roswell.	OK	OK	OK	OK
2	FLT02-1PH	*Single phase fault and sequence like previous*	OK	OK	OK	OK
3	FLT03-3PH	3 phase fault on the Roswell (527563) to SW_4702 (527575) 69kV line, near Roswell.	OK	OK	OK	OK
4	FLT04-1PH	*Single phase fault and sequence like previous*	OK	OK	OK	OK
5	FLT05-3PH	3 phase fault on Roswell 69kV (527563) to 115kV (527564) transformer #2, near the 69kV bus.	OK	OK	OK	OK
6	FLT06-3PH	3 phase fault on the Roswell (527564) to Samson (527546) 115kV line, near Roswell.	OK	OK	OK	OK
7	FLT07-1PH	*Single phase fault and sequence like previous*	OK	OK	OK	OK
8	FLT08-3PH	3 phase fault on Chaves County 115kV (527482) to 230 kV (527483) transformer #1, near the 115kV bus.	OK	OK	OK	OK
9	FLT09-3PH	3 phase fault on the Chaves County (527482) to Urton (527501) 115kV line, near Chaves County.	OK	OK	OK	OK
10	FLT10-1PH	*Single phase fault and sequence like previous*	OK	OK	OK	OK
11	FLT11-3PH	3 phase fault on the Chaves County (527482) to Samson (527546) 115kV line, near Chaves County.	OK	OK	OK	OK
12	FLT12-1PH	*Single phase fault and sequence like previous*	OK	OK	OK	OK
13	FLT13-3PH	3 phase fault on the Chaves County (527483) to Eddy County (527800) 230kV line, near Chaves County.	OK	OK	OK	OK
14	FLT14-1PH	*Single phase fault and sequence like previous*	OK	OK	OK	OK
15	FLT15-3PH	3 phase fault on the Tolk 345kV (525549) to 230kV (525543) transformer, near the 345kV bus.	OK	OK	OK	OK
16	FLT16-3PH	3 phase fault on the Tolk Tap (525543) to Tolk East (525524) 230kV line, near Tolk Tap.	OK	OK	OK	OK

Cont. No.	Contingency Name	Contingency Description	Scenario 1		Scenario 2	
			Summer Peak Results	Winter Peak Results	Summer Peak Results	Winter Peak Results
17	FLT17-1PH	*Single phase fault and sequence like previous*	OK	OK	OK	OK
18	FLT18-3PH	3 phase fault on the Roosevelt South (524911) to Tolk East (525524) 230kV line, near Roosevelt South.	OK	OK	OK	OK
19	FLT19-1PH	*Single phase fault and sequence like previous*	OK	OK	OK	OK
20	FLT20-3PH	3 phase fault on the Tolk East (525524) to Plant X (525481) 230kV line #2, near Tolk East.	OK	OK	OK	OK
21	FLT21-1PH	*Single phase fault and sequence like previous*	OK	OK	OK	OK
22	FLT22-3PH	3 phase fault on the Tolk East (525524) to Tuco (525830) 230kV line, near Tolk East.	G01-33 trips	OK	OK	OK
22-nt	FLT22-3PH-nt	3 phase fault on the Tolk East (525524) to Tuco (525830) 230kV line, near Tolk East. Tripping disabled.	OK			
23	FLT23-1PH	*Single phase fault and sequence like previous*	OK	OK	OK	OK
24	FLT24-3PH	3 phase fault on the Tolk Tap (525543) to Tolk West (525531) 230kV line, near Tolk Tap.	OK	OK	OK	OK
25	FLT25-1PH	*Single phase fault and sequence like previous*	OK	OK	OK	OK
26	FLT26-3PH	3 phase fault on the Lamb County (525637) to Tolk West (525531) 230kV line, near Lamb County.	OK	OK	OK	OK
27	FLT27-1PH	*Single phase fault and sequence like previous*	OK	OK	OK	OK
28	FLT28-3PH	3 phase fault on the Yoakum (526935) to Tolk West (525531) 230kV line, near Yoakum.	OK	OK	OK	OK
29	FLT29-1PH	*Single phase fault and sequence like previous*	OK	OK	OK	OK
30	FLT30-3PH	3 phase fault on the Deaf Smith (524623) to Plant X (525481) 230kV line, near Deaf Smith.	OK	OK	OK	OK
31	FLT31-1PH	*Single phase fault and sequence like previous*	OK	OK	OK	OK
32	FLT32-3PH	3 phase fault on the Sundown (526435) to Plant X (525481) 230kV line, near Sundown.	OK	OK	OK	OK
33	FLT33-1PH	*Single phase fault and sequence like previous*	OK	OK	OK	OK

Cont. No.	Contingency Name	Contingency Description	Scenario 1		Scenario 2	
			Summer Peak Results	Winter Peak Results	Summer Peak Results	Winter Peak Results
34	FLT34-3PH	3 phase fault on the Plant X (525481) to GEN-2006-039 Tap (560009) 230kV line, near Plant X.	OK	G01-33 trips	OK	OK
34-nt	FLT34-3PH-nt	3 phase fault on the Plant X (525481) to GEN-2006-039 Tap (560009) 230kV line, near Plant X. Tripping disabled.		OK		
35	FLT35-1PH	*Single phase fault and sequence like previous*	OK	OK	OK	OK
36	FLT36-3PH	3 phase fault on the Tuco (525830) to Swisher (525213) 230kV line, near Tuco.	OK	OK	OK	OK
37	FLT37-1PH	*Single phase fault and sequence like previous*	OK	OK	OK	OK
38	FLT38-3PH	3 phase fault on the Tuco (525830) to Jones Bus1 (526337) 230kV line, near Tuco.	OK	OK	OK	OK
39	FLT39-1PH	*Single phase fault and sequence like previous*	OK	OK	OK	OK
40	FLT40-3PH	3 phase fault on Tuco 230kV (525830) to 345kV (525832) transformer #1, near the 230kV bus.	OK	OK	OK	OK
41	FLT41-3PH	3 phase fault on the Tuco (525832) to Border (525835) 345kV line, near Tuco.	OK	OK	OK	OK
42	FLT42-1PH	*Single phase fault and sequence like previous*	OK	OK	OK	OK
43	FLT43-3PH	3 phase fault on the GEN-2008-014 Tap (560813) to Tuco (525832) 345kV line, near GEN-2008-014 Tap.	OK	OK	G08-14 trips	G08-14 trips
43-nt	FLT43-3PH-nt	3 phase fault on the GEN-2008-014 Tap (560813) to Tuco (525832) 345kV line, near GEN-2008-014 Tap. Tripping disabled.			OK	OK
44	FLT44-1PH	*Single phase fault and sequence like previous*	OK	OK	G08-14 trips	G08-14 trips
44-nt	FLT44-1PH-nt	*Single phase fault and sequence like previous. Tripping disabled.*			OK	OK
45	FLT45-3PH	3 phase fault on the Jones (580504) to Grassland (580502) 345kV line, near Jones.	OK	OK	OK	OK
46	FLT46-1PH	*Single phase fault and sequence like previous*	OK	OK	OK	OK

Cont. No.	Contingency Name	Contingency Description	Scenario 1		Scenario 2	
			Summer Peak Results	Winter Peak Results	Summer Peak Results	Winter Peak Results
47	FLT47-3PH	3 phase fault on the Borden (580501) to Grassland (580502) 345kV line, near Borden.	OK	OK	OK	OK
48	FLT48-1PH	*Single phase fault and sequence like previous*	OK	OK	OK	OK
49	FLT49-3PH	3 phase fault on the Grassland 230kV (526677) to 115kV (526676) transformer, near the 230kV bus.	OK	OK	OK	OK
50	FLT50-3PH	3 phase fault on the Borden 345kV (580501) to Vealmoor 115kV (522896) transformer, near the Borden 345kV bus.	OK	OK	OK	OK
51	FLT51-3PH	3 phase fault on the Midland 345kV(527916) to Garndale 138kV (522992) transformer, near the 345kV bus.	OK	OK	OK	OK
52	FLT52-3PH	3 phase fault on the Midland (527916) to Hobbs (527896) 345kV line, near Midland.	OK	OK	OK	OK
53	FLT53-1PH	*Single phase fault and sequence like previous*	OK	OK	OK	OK
54	FLT54-3PH	3 phase fault on the GEN-2011-025 Tap (581137) to Floyd County (525780) 115kV line, near GEN-2011-025 Tap.	OK	OK	OK	OK
55	FLT55-1PH	*Single phase fault and sequence like previous*	OK	OK	OK	OK
56	FLT56-3PH	3 phase fault on the GEN-2011-025 Tap (581137) to Crosby County (525926) 115kV line, near GEN-2011-025 Tap.	OK	OK	OK	OK
57	FLT57-1PH	*Single phase fault and sequence like previous*	OK	OK	OK	OK
58	FLT58-3PH	3 phase fault on one of the Crosby County 69kV (525925) to 115kV (525926) transformers, near the 69kV bus	OK	OK	OK	OK
59	FLT59-3PH	3 phase fault on the Crosby County (525926) to Lubbock East (526298) 115kV line, near Crosby County.	OK	OK	OK	OK
60	FLT60-1PH	*Single phase fault and sequence like previous*	OK	OK	OK	OK
61	FLT61-3PH	3 phase fault on the Lubbock East (526299) to Jones Bus2 (526338) 230kV line, near Lubbock East.	OK	OK	OK	OK
62	FLT62-1PH	*Single phase fault and sequence like previous*	OK	OK	OK	OK
63	FLT63-3PH	3 phase fault on the Floyd County (525780) to Cox (525326) 115kV line, near Floyd County.	OK	OK	OK	OK

Cont. No.	Contingency Name	Contingency Description	Scenario 1		Scenario 2	
			Summer Peak Results	Winter Peak Results	Summer Peak Results	Winter Peak Results
64	FLT64-1PH	*Single phase fault and sequence like previous*	OK	OK	OK	OK
65	FLT65-3PH	3 phase fault on one of the Floyd County 115kV (525780) to 69 kV (525779) transformers, near the 115kV bus	OK	OK	OK	OK
66	FLT66-3PH	3 phase fault on the Floyd County (525780) to Tuco (525828) 115kV line, near Floyd County.	OK	OK	OK	OK
67	FLT67-1PH	*Single phase fault and sequence like previous*	OK	OK	OK	OK
68	FLT68-3PH	3 phase fault on the Potter (523961) to GEN-2005-017 (579118) 345kV line, near Potter	OK	OK	OK	OK
69	FLT69-1PH	*Single phase fault and sequence like previous*	OK	OK	OK	OK
70	FLT70-3PH	3 phase fault on the Eddy Co 345kV (527802) to 230kV (527800) transformer, near the 345kV bus.	OK	OK	OK	OK
71	FLT71-3PH	3 phase fault on the Tuco (525832) to Jones (580504) 345kV line, near Tuco.			OK	OK
72	FLT72-1PH	*Single phase fault and sequence like previous*			OK	OK
73	FLT73-3PH	3 phase fault on the Midland (527916) to Borden (580501) 345kV line #2, near Midland.	OK	OK	OK	OK
74	FLT74-1PH	*Single phase fault and sequence like previous*	OK	OK	OK	OK
75	FLT75-3PH	3 phase fault on the LE-Lovington (528334) to Lea County (527848) 115kV line, near LE Lovington	OK	OK	OK	OK
76	FLT76-1PH	*Single phase fault and sequence like previous*	OK	OK	OK	OK
77	FLT77-3PH	3 phase fault on the LE-Lovington (528334) to LE Waits (528325) 115kV line, near LE Lovington	OK	OK	OK	OK
78	FLT78-1PH	*Single phase fault and sequence like previous*	OK	OK	OK	OK
79	FLT79-3PH	**Prior Outage of Midland (527916) to Borden (580501) 345kV.** 3 phase fault on the Midland (527916) to Hobbs (527896) 345kV line, near Midland.	G10-59, G08-16 unstable	G10-59, G08-16 unstable		
80	FLT80-3PH	3 phase fault on the Midland (527916) to Yoakum (560022) 345kV line, near Midland.			OK	OK

Cont. No.	Contingency Name	Contingency Description	Scenario 1		Scenario 2	
			Summer Peak Results	Winter Peak Results	Summer Peak Results	Winter Peak Results
81	FLT81-1PH	*Single phase fault and sequence like previous*			OK	OK
82	FLT82-3PH	3 phase fault on the Yoakum (560022) to Tuco (525832) 345kV line, near Yoakum.			OK	OK
83	FLT83-1PH	*Single phase fault and sequence like previous*			OK	OK
84	FLT84-3PH	3 phase fault on the Finney (523853) to Conestoga (560029) 345kV line, near Finney.	OK	OK	OK	OK

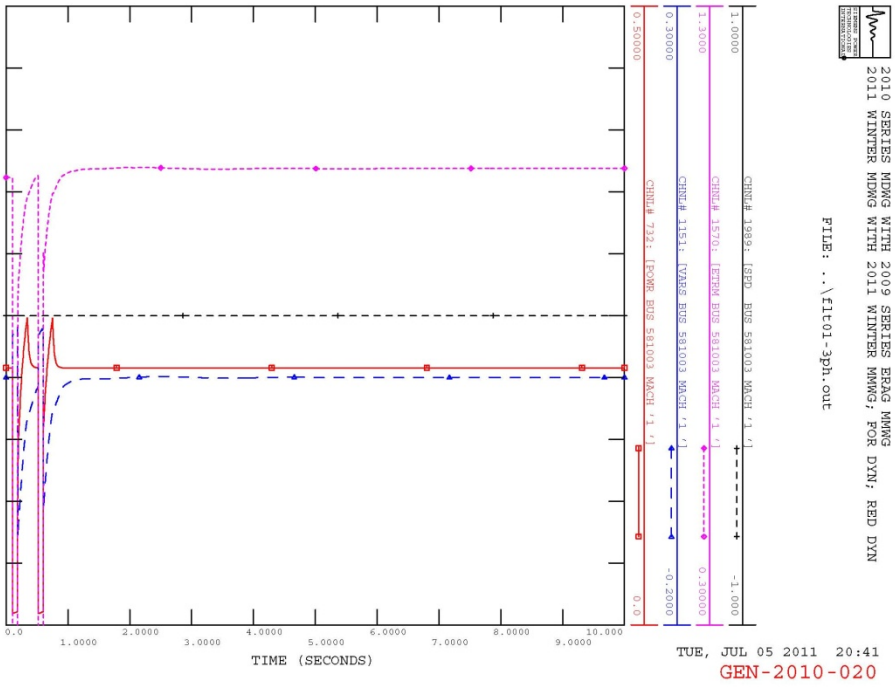


Figure 4-1. GEN-2010-020 Plot for Fault 1 – 3-Phase Fault on the Roswell (527563) to Riac Tap (527528) 69kV line, near Roswell

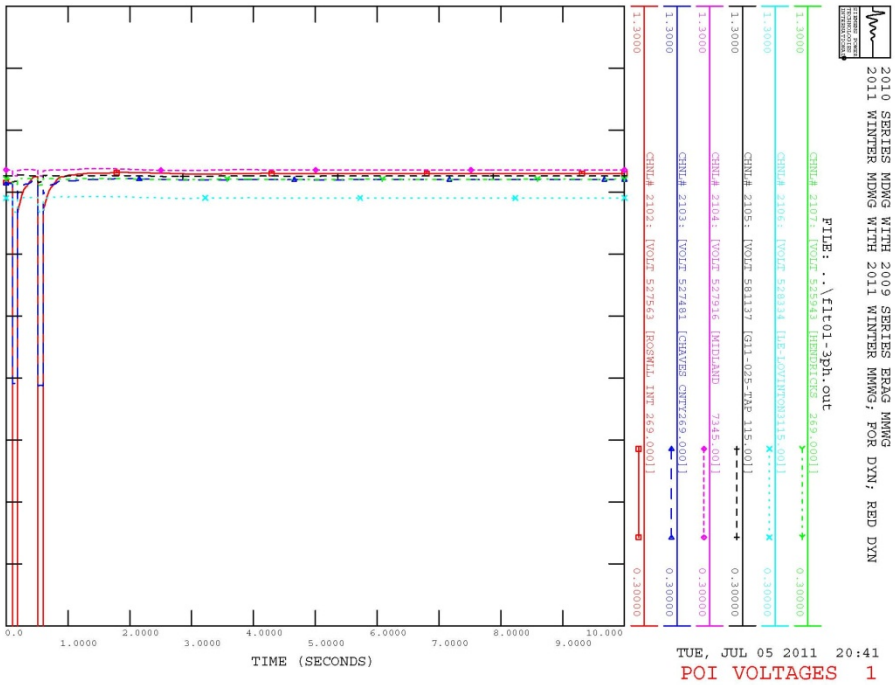


Figure 4-2. POI Voltages for Fault 1 – 3-Phase Fault on the Roswell (527563) to Riac Tap (527528) 69kV line, near Roswell

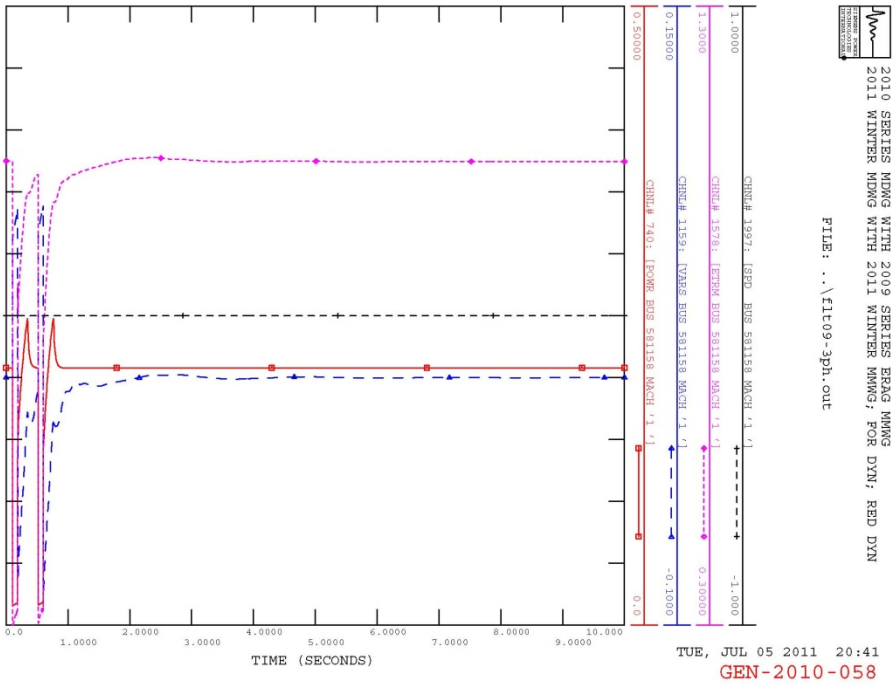


Figure 4-3. GEN-2010-058 Plot for Fault 9 – 3-Phase Fault on the Chaves County (527482) to Urton (527501) 115kV line, near Chaves County

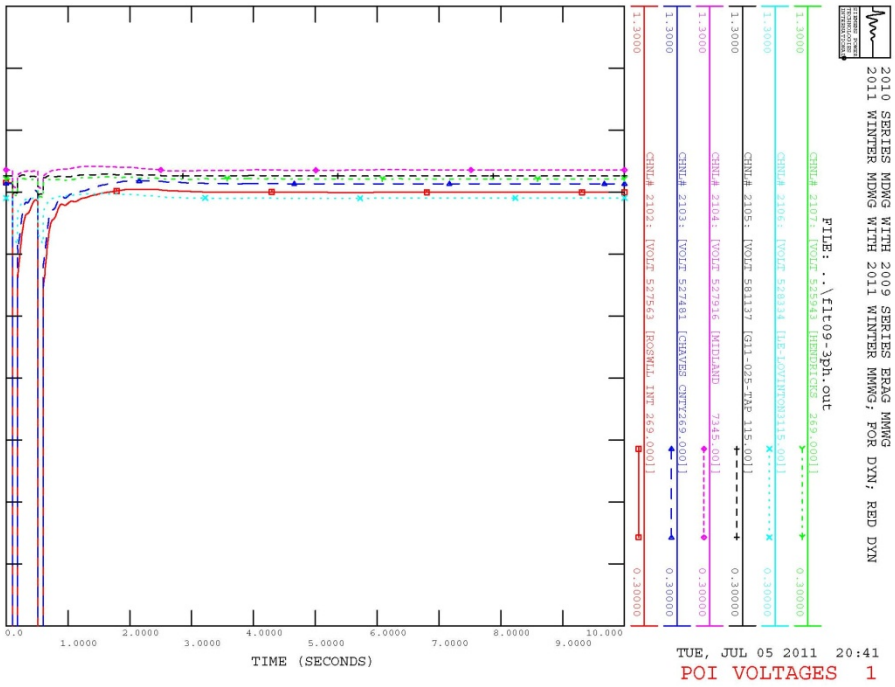


Figure 4-4. POI Voltages for Fault 9 – 3-Phase Fault on the Chaves County (527482) to Urton (527501) 115kV line, near Chaves County

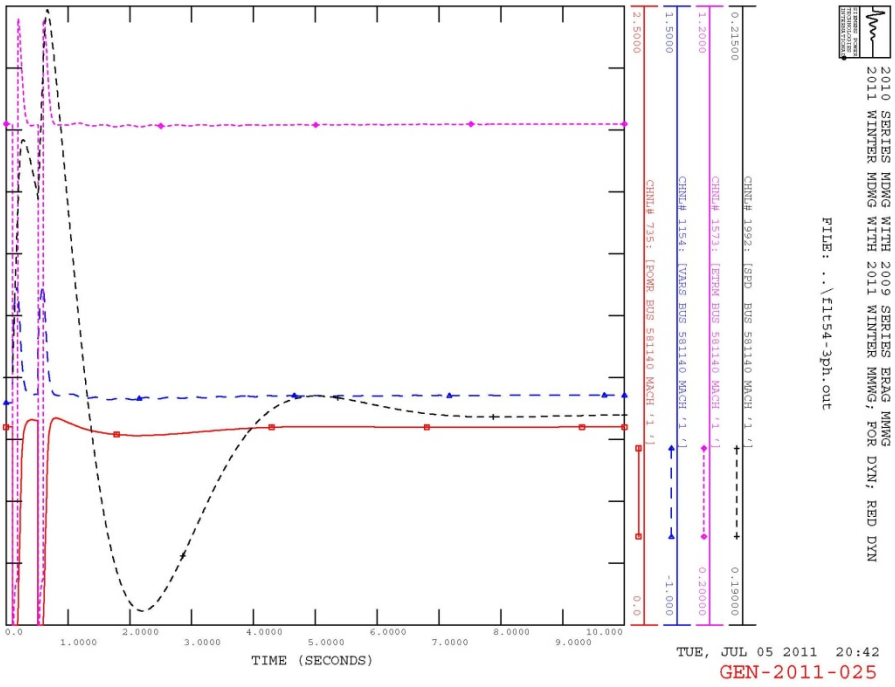


Figure 4-5. GEN-2011-025 Plot for Fault 54 – 3-Phase Fault on the GEN-2011-025 Tap (581137) to Floyd County (525780) 115kV line, near GEN-2011-025 Tap

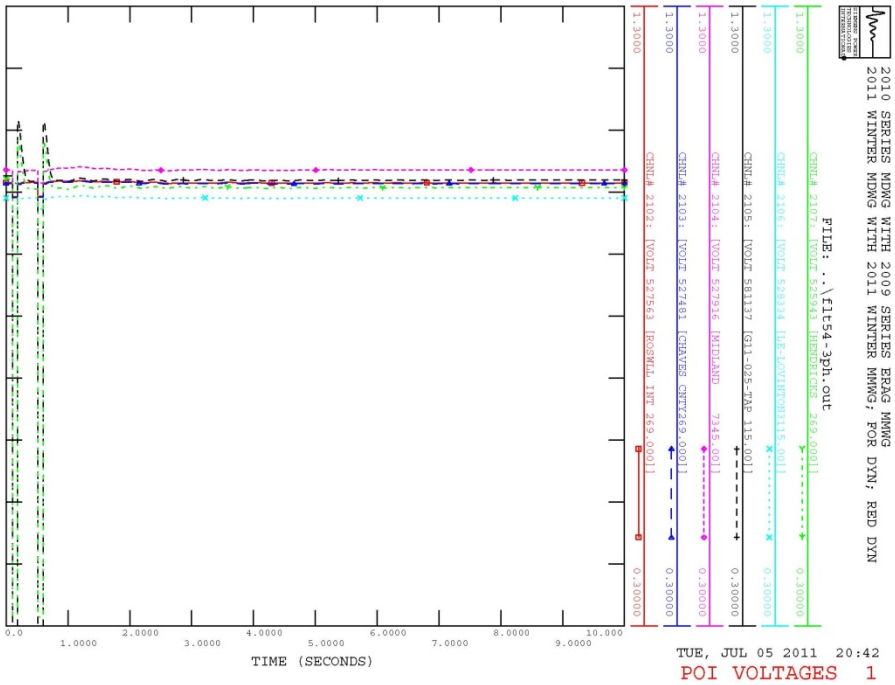


Figure 4-6. POI Voltages for Fault 54 – 3-Phase Fault on the GEN-2011-025 Tap (581137) to Floyd County (525780) 115kV line, near GEN-2011-025 Tap

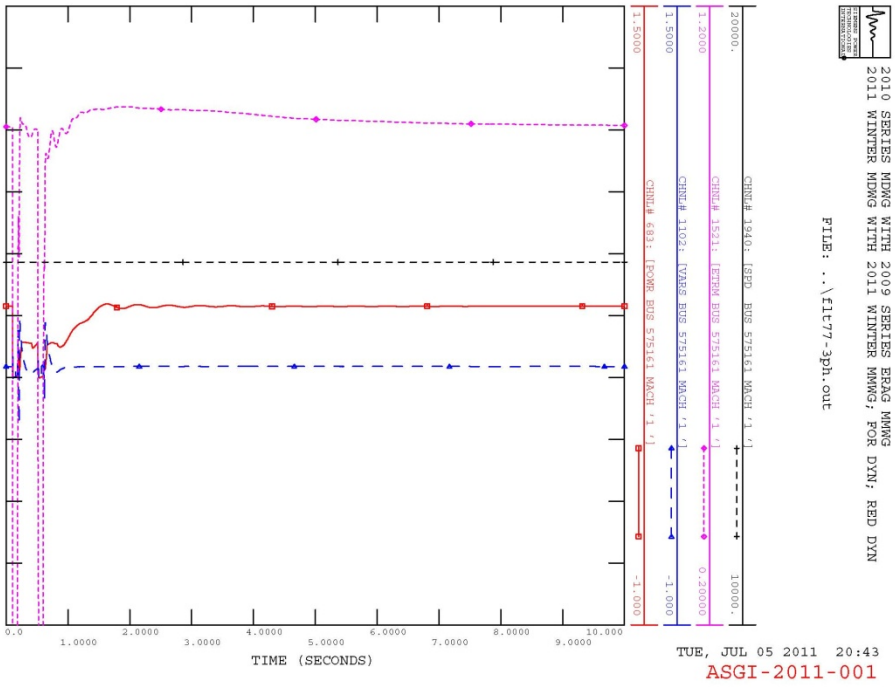


Figure 4-7. ASGI-2011-001 Plot for Fault 77 – 3-Phase Fault on the LE-Lovington (528334) to LE Waits (528325) 115kV line, near LE Lovington

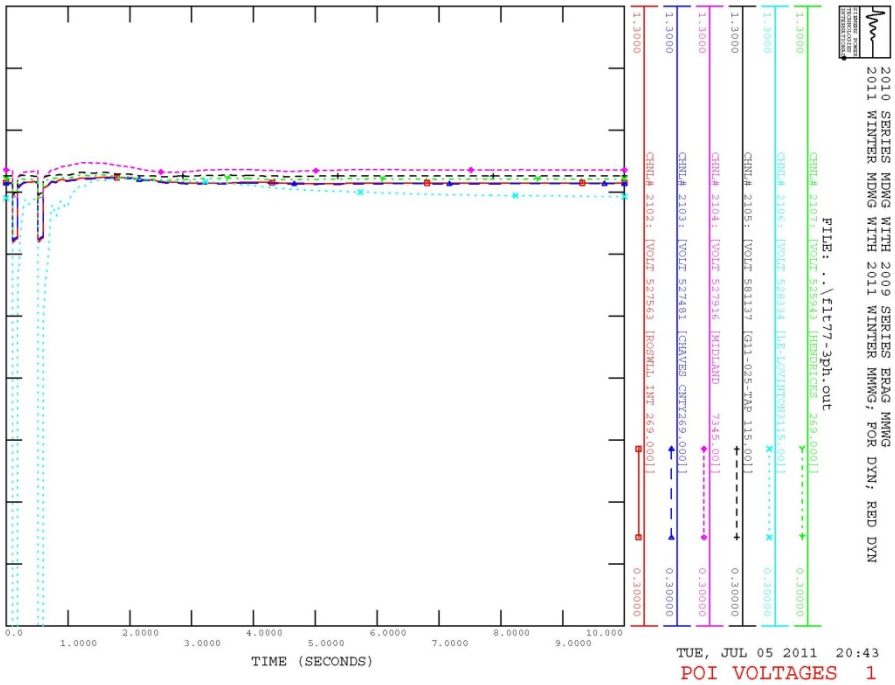


Figure 4-8. POI Voltages for Fault 77 – 3-Phase Fault on the LE-Lovington (528334) to LE Waits (528325) 115kV line, near LE Lovington

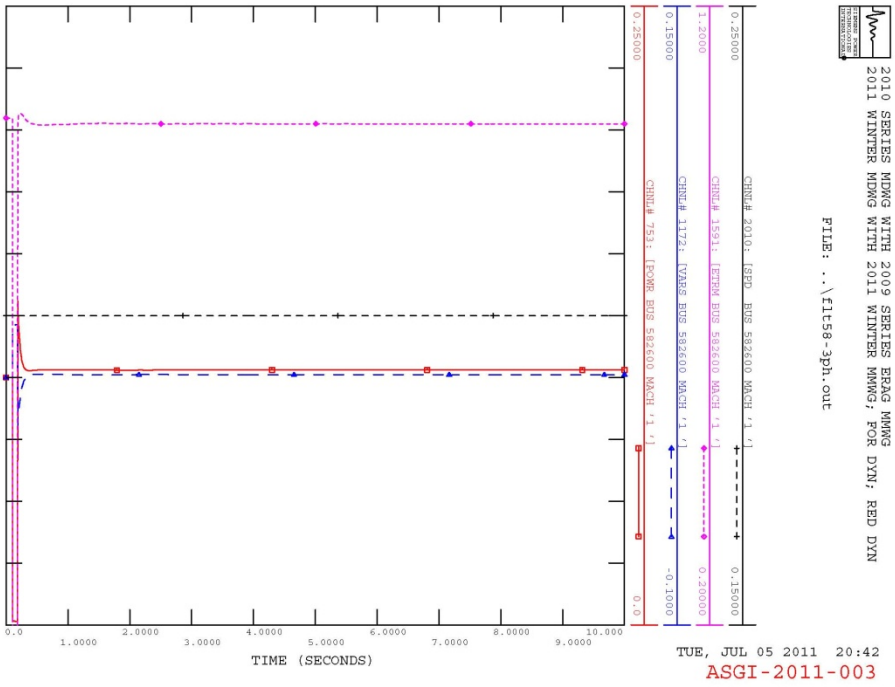


Figure 4-9. ASGI-2011-003 Plot for Fault 58 – 3-Phase Fault on one of the Crosby County 69kV (525925) to 115kV (525926) transformers, near the 69kV bus

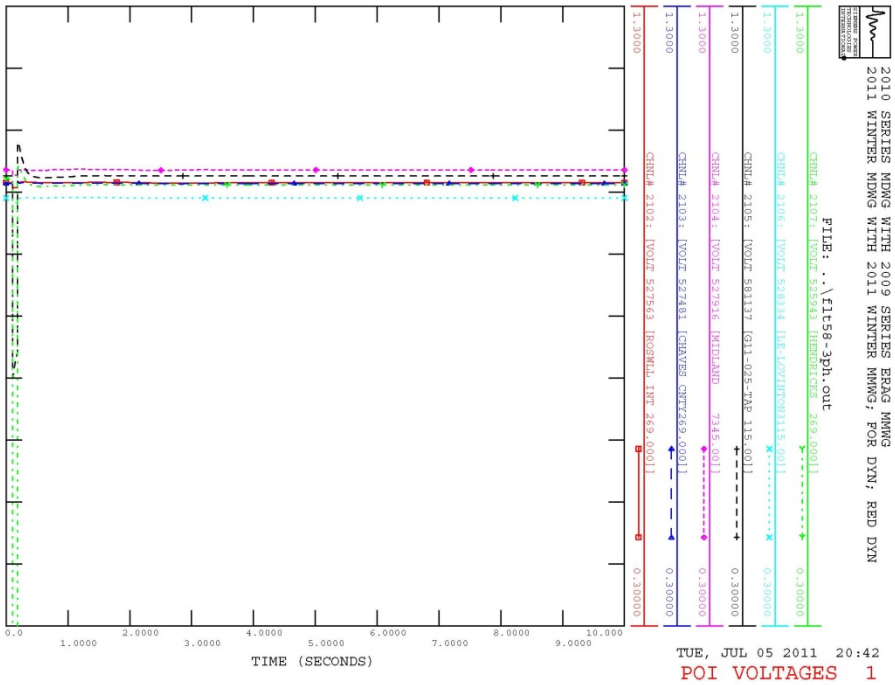


Figure 4-10. POI Voltages for Fault 58 – 3-Phase Fault on one of the Crosby County 69kV (525925) to 115kV (525926) transformers, near the 69kV bus

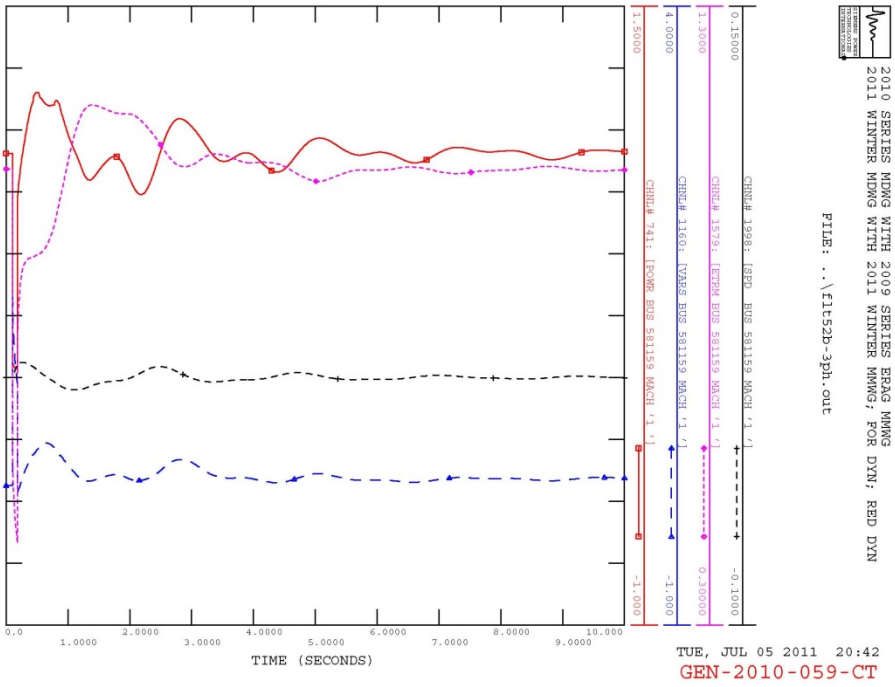


Figure 4-11. GEN-2010-059 Plot for Fault 52 – 3-Phase Fault on the Midland (527916) to Hobbs (527896) 345kV line, near Midland

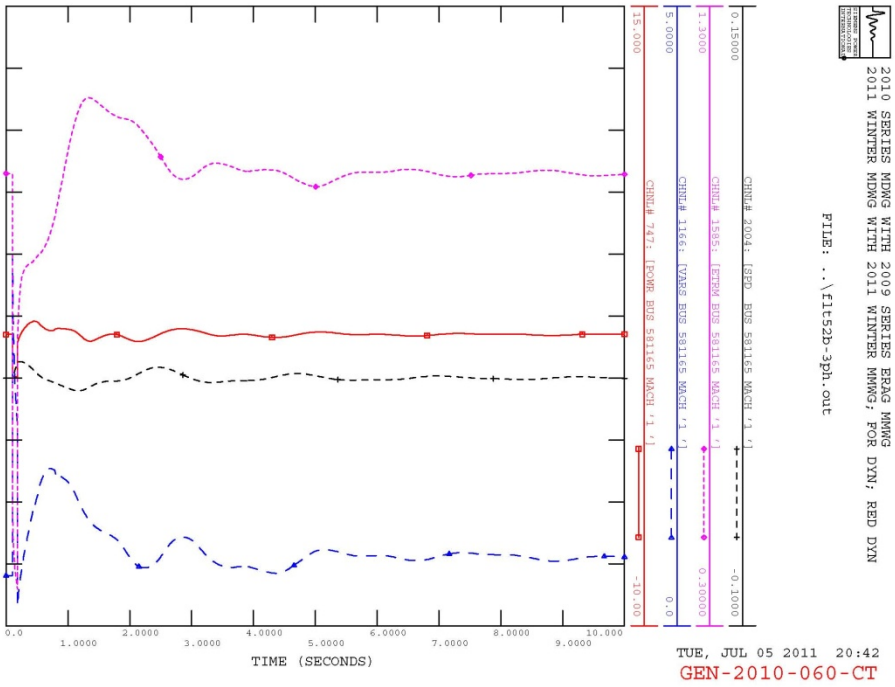


Figure 4-12. GEN-2010-060 Plot for Fault 52 – 3-Phase Fault on the Midland (527916) to Hobbs (527896) 345kV line, near Midland

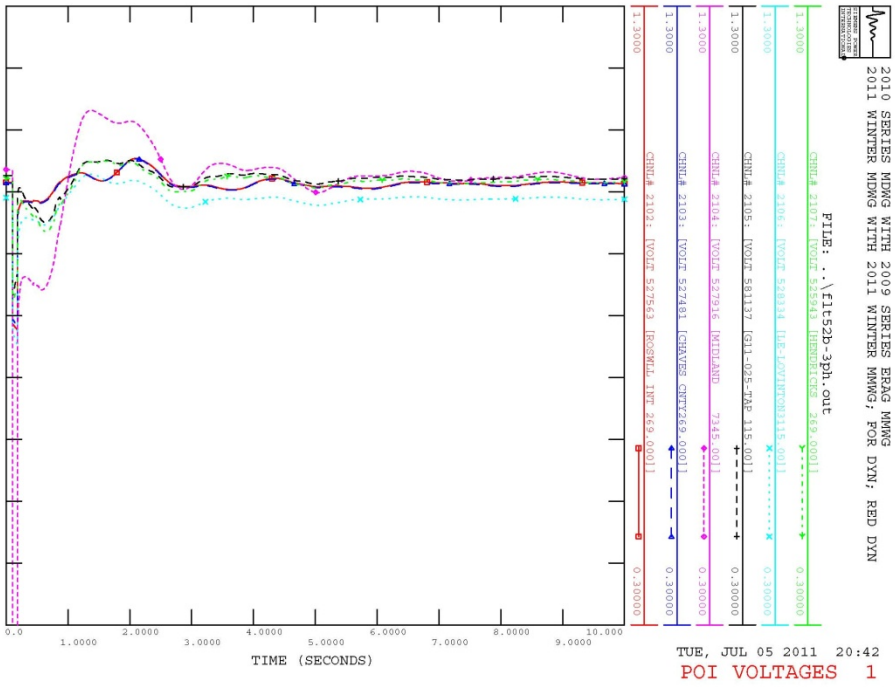


Figure 4-13. POI Voltages for Fault 52 – 3-Phase Fault on the Midland (527916) to Hobbs (527896) 345kV line, near Midland

4.2 Power Factor Requirements

All stability faults were tested as power flow contingencies to determine the power factor requirements for the wind 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. Estimates were made of the capacitor additions needed to meet the lagging power factor requirement based on the provided wind turbine model and wind farm impedances.

The final power factor requirements are shown in Table 4-2 below. These are only the minimum power factor ranges based on steady-state analysis. A project developer may install more capability than this if desired.

The full details for each contingency in summer and winter peak cases are given in Appendix C.

Table 4-2. Power Factor Requirements [1]

Request	Size (MW)	Generator Model	Point of Interconnection	Final PF Requirement		Estimated Capacitor Requirement (Mvar)[4]
				Lagging [2]	Leading [3]	
GEN-2010-020	20.8	Emerson Inverter (solar)	Roswell 69kV (527563)	0.95	0.95	5
GEN-2010-058	20.8	Emerson Inverter (solar)	Chaves County 69kV (527481)	0.988	0.987	7.2
GEN-2011-025	80	GE 1.6MW (wind)	Tap on Floyd County - Crosby County 115kV line (581137)	0.978	0.95	0
ASGI-2011-001	28.8	Mitsubishi 2.4MW (wind)	Lovington 115kV (528334)	0.95	1.0	9
ASGI-2011-003	10	Sany 2.0MW (wind)	Hendricks 69kV (525943)	0.95	0.95	3.5

Notes:

1. 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.
2. 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.
3. 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.
4. Capacitors shown are estimates for calculated power factor requirements. Unless otherwise noted, Interconnection Customer will be required to estimate the amount of capacitors necessary to maintain +/- 95% power factor

5. Conclusions

The DISIS-2011-001 Group 6 Definitive Impact Study evaluated the impacts of interconnecting the projects shown below. Two scenarios were studied – one with 250 MW of generation at Midland and one with 1500 MW.

Table 5-1. Interconnection Requests Evaluated in this Study

Request	Size	Generator Type	Point of Interconnection	POI Bus	Gen Buses
GEN-2010-020	20.8	Emerson Inverter (solar)	Roswell 69kV (527563)	527563	581003
GEN-2010-058	20.8	Emerson Inverter (solar)	Chaves County 69kV (527481)	527481	581158
GEN-2010-059	516 Winter 480 Summer	GE Combined Cycle (gas)	Midland 345kV (527916)	527916	581159 thru 581164
GEN-2010-060	992 Winter 960 Summer	GE Combined Cycle (gas)	Midland 345kV (527916)	527916	581165 thru 581170
GEN-2011-025	80	GE 1.6MW (wind)	Tap on Floyd County - Crosby County 115kV line (581137)	581137	581140
ASGI-2011-001	28.8	Vestas 1.8MW (wind)	Lovington 115kV (528334)	528334	575161
ASGI-2011-003	10	Sany 2.0MW (wind)	Hendricks 69kV (525943)	525943	582600

The ASGI-2011-003 WT3 model parameters had to be replaced with typical values to achieve correct operation.

Tripping was seen for prior-queued projects GEN-2001-033 and GE-2008-014 following a few faults. When tripping was disabled, no stability problems were found.

Instability of GEN-2010-059 with the Midland-Borden 345 kV line in a prior outage confirmed the necessity of this line with GEN-2010-059 dispatched at 250 MW.

With Midland dispatched at 1500 MW, significant stability problems were seen for 345 kV faults near Midland. Adding a second 345 kV line from Midland to Yoakum is one solution option. A cheaper option is to disable fast reclosing on the 345 kV lines at Midland. With fast reclosing disabled, no stability problems were seen.

Final power factor and capacitor requirements for the Group 6 projects are listed in Table 4-2. GEN-2010-020, GEN-2010-058, ASGI-2011-001, and ASGI-2011-003 will need to add some capacitors to meet the 95% lagging power factor requirement.

With the assumptions and upgrades described in this report, DISIS-2011-001 Group 6 should be able to connect without causing any stability problems on the SPP transmission grid.

Any change in system or wind farm models or assumptions could change these results.

Appendix A – Summer Peak Plots

A.1 Scenario 1

A.2 Scenario 2

See attachments.

Appendix B – Winter Peak Plots

B.1 Scenario 1

B.2 Scenario 2

See attachments.

Appendix C – Power Factor Details

See attachment.

Appendix D – Project Model Data

See attachment.

Appendix E – One-line Diagrams

See attachment.

SPP Southwest Power Pool

Definitive Interconnection System Impact Study

DISIS-2011-00-Group6

SPP Generation Interconnection Studies

(DISIS-2011-001)

July 2011

Executive Summary

A transient stability study has been performed by Southwest Power Pool (SPP) to evaluate the interconnection requests in the Definitive Impact Study Interconnection Study (DISIS-2011-001) for Group 6 in the South Panhandle/New Mexico area.

The DISIS-2011-001 study has seven (7) Interconnection Requests in the South Panhandle/New Mexico area. The interconnection requests include GEN-2010-020, GEN-2010-058, GEN-2010-059, GEN-2010-060, GEN-2011-025, ASGI-2011-003 and ASGI-2011-001. The interconnection requests in DISIS-2011-001 Group 6 are dispatching 908.8MW. The total dispatch for GEN-2010-059 and GEN-2010-060 are 1508MW (winter) and 1440 (summer). The GEN-2010-059 and GEN-2010-060 interconnection requests are being installed in stages and this analysis represents the 750MW study stage assumed to be in service 2016.

Upgrades identified in the powerflow analysis were added to the base models. After adjusting load to simulate 2016 summer and winter conditions, low voltage at Oklaunion 345 kV substation (around 0.85 pu) was observed. Because of these conditions the model was not able to initialize properly. The solution found was to add a new 345 kV line between Oklaunion and Lawton Eastside substations and a 100 MVAr capacitor bank at Oklaunion 345 kV substation.

The results of a stability analysis determined that for the addition of the DISIS-2011-001 interconnection requests, the transmission system was found to remain stable for both summer and winter peak conditions with all required network upgrades in service including the new 345kV line from Lawton Eastside – Oklaunion.. Additionally, the projects that were wind farms were found to stay connected during the contingencies that were studied, meeting the Low Voltage Ride Through (LVRT) requirements of FERC Order #661A.

The power factor analysis indicated that all DISIS-2011-001 interconnection requests will be required to maintain 95% lagging (producing vars) and 95% leading (absorbing vars) power factor at the point of interconnection.

Should any previously queued projects that were included in this study withdraw from the queue, then this System Impact Study may have to be revised to determine the impacts of this Interconnection Customer's project on transmission facilities.

1.0 Introduction

A transient stability study has been performed by Southwest Power Pool (SPP) to evaluate the interconnection requests in the Definitive Impact Study Interconnection Study (DISIS-2011-001) for Group 6 in the South Panhandle/New Mexico area.

The DISIS-2011-001 study has seven (7) Interconnection Requests in the South Panhandle/New Mexico area. The interconnection requests include GEN-2010-020, GEN-2010-058, GEN-2010-059, GEN-2010-060, GEN-2011-025, ASGI-2011-003 and ASGI-2011-001. The interconnection requests in DISIS-2011-001 Group 6 are dispatching 908.8MW. The total dispatch for GEN-2010-059 and GEN-2010-060 are 1508MW (winter) and 1440 (summer). This analysis simulated the 2016 conditions in which 750MW were requested to be on line in 2016.

Two seasonal base cases were used in the study to analyze the stability impacts of the proposed generation facility. A modifed 2011 summer peak case and a 2011 winter peak case which were both modified to include the prior queued projects shown in Table 1 and to include projected 2016 load conditions.

In this study SPP monitored the generators and transmission lines in Areas 520, 524, 525, 526, 531, 534 and 536.

2.0 Purpose

The purpose of this Definitive Impact Study Interconnection Study (DISIS), is to evaluate the impact of the proposed interconnection on the reliability of the Transmission System. Table 1 below lists the requests that were analyzed in this study.

Request	Size (MW)	Generator Model	Point of Interconnection
GEN-2010-020	20	Emmerson Inverter	Roswell 69kV (527563)
GEN-2010-058	20	Emmerson Inverter	Chaves County 69kV (527481)
GEN-2010-059	516 Winter 480 Summer	GE7EA, GE Steam Turbine	Midland 345kV (527916)
GEN-2010-060	992 Winter 960 Summer	GE7EA, GE Steam Turbine	Midland 345kV (527916)
GEN-2011-025	80	GE 1.6MW	Tap on Floyd County - Crosby County 115kV line (581137)
ASGI-2011-003	10	Sany 2.0MW	Hendricks 69kV (525943)
ASGI-2011-001	28.8	Mitsubishi 2.4MW	Lovington 115kV (528334)

Table 1: DISIS-2011-001 Interconnection Request Table

Should any previously queued projects that were included in this study withdraw, listed in Table 2, then this System Impact Study may require a re-study of this request at the expense of the customer.

Request	Size (MW)	Generator Model	Point of Interconnection
GEN-2001-033	180	Mitsubishi 1000	San Juan Mesa 230kV (524885)
GEN-2001-036	80	CIMTR	Tap on Curry – Tucumcari 115kV line (524502)
GEN-2008-008	60	GE 1.5MW	Graham 69kV (526693)

GEN-2008-009	60	GE 1.5MW	San Juan Mesa 230kV (524885)
GEN-2008-014	149.4	Vestas V90	Tap on Tuco – Oklaunion 345kV line (560813)
GEN-2008-016	248.4	Siemens 2.3MW	Grassland 345kV (526677)
GEN-2008-022	300	GE 2.5MW	Tap on Eddy County – Tolk 345kV line (577104)
GEN-2009-067S	20	STCNPG	Seven Rivers 69kV (528093)
GEN-2010-006	205W / 180S	GENROU	Jones_bus2 230kV(526338)
ASGI-2010-010	42	GENROU	Lovington 115kV (528334)
GEN-2010-046	56	GENSAL	Tuco 230kV (525830)

Table 2: DISIS-2011-001 Prior Queued Request Table

3.0 Facilities

3.1 Interconnection Facility

GEN-2010-020

The generating facility was studied with the assumption that it would be using solar inverters. The point of interconnection (POI) will be at the SPS Roswell 69kV Interchange. Figure 1 shows the POI one-line diagram. Interconnection facilities will include a 69kV single bus configuration.

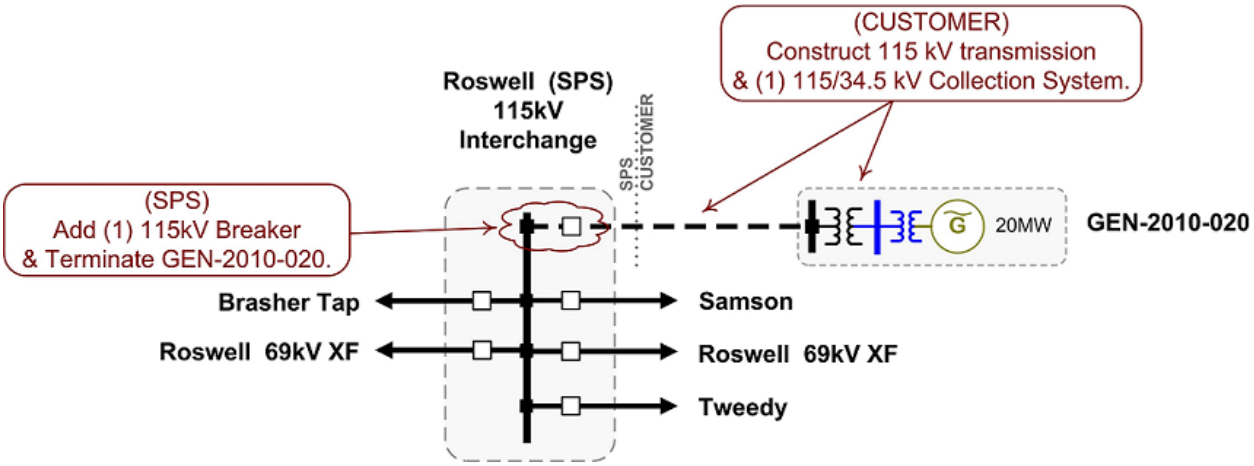


Figure 1: GEN-2010-020 POI One-line Diagram

Figure 2 shows a detailed one-line diagram of the GEN-2010-020 facility.

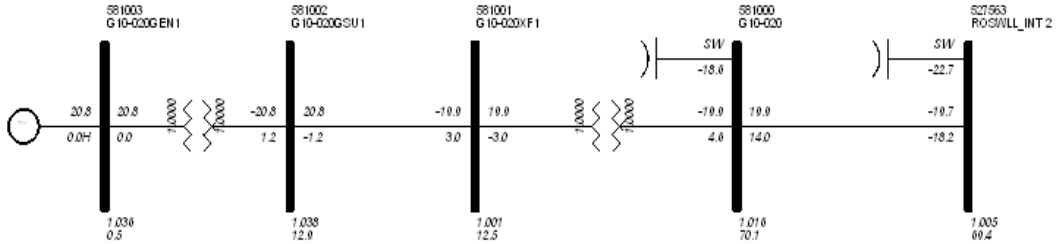


Figure 2: GEN-2010-020 Facility One-line Diagram

GEN-2010-058

The generating facility was studied with the assumption that it would be using solar inverters. The point of interconnection (POI) will be at the SPS Chaves County 69kV Interchange. Figure 3 below shows a simplified POI one-line diagram. Interconnection facilities will include a 69kV single bus configuration.

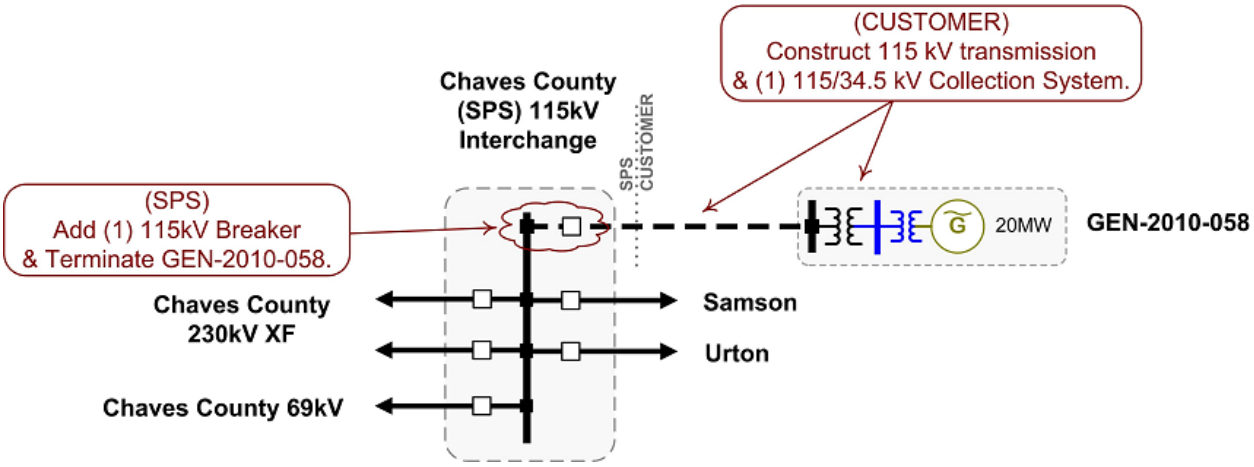


Figure 3: GEN-2010-058 POI One-line Diagram

Figure 4 shows a detailed one-line diagram of the GEN-2010-058 facility.

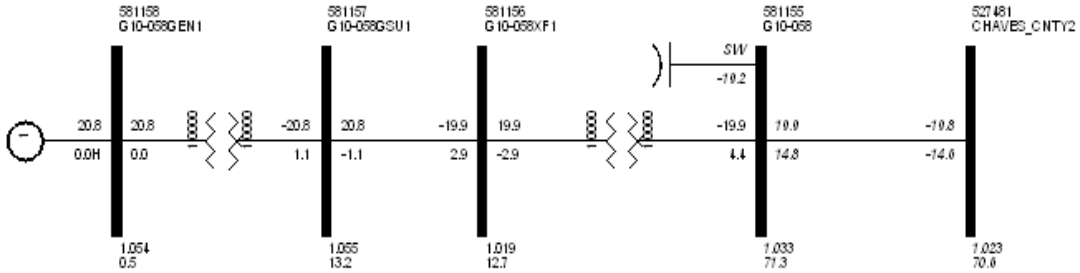


Figure 4: GEN-2010-058 Facility One-line Diagram

GEN-2010-059

The generating facility was studied with the assumption that it would be using the two steam turbines and four combustion turbines. The point of interconnection (POI) will be at the SPS Midland 345kV Switching Station. Figure 5 below shows a simplified POI one-line diagram. Interconnection facilities will include a 345kV breaker and half bus configuration.

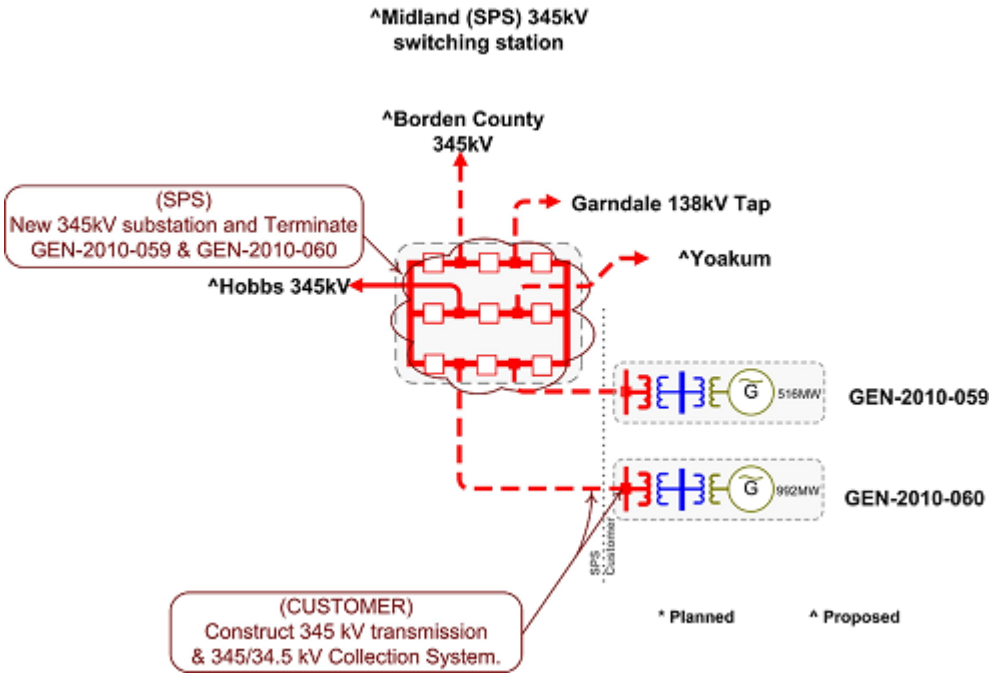


Figure 5: GEN-2010-059 POI One-line Diagram

Figure 6 shows a detailed one-line diagram of the GEN-2010-059 facility. In this study we are dispatching the GEN-2010-059 partially, combining 2010-059 and 2010-060 we are dispatching around 750MW.

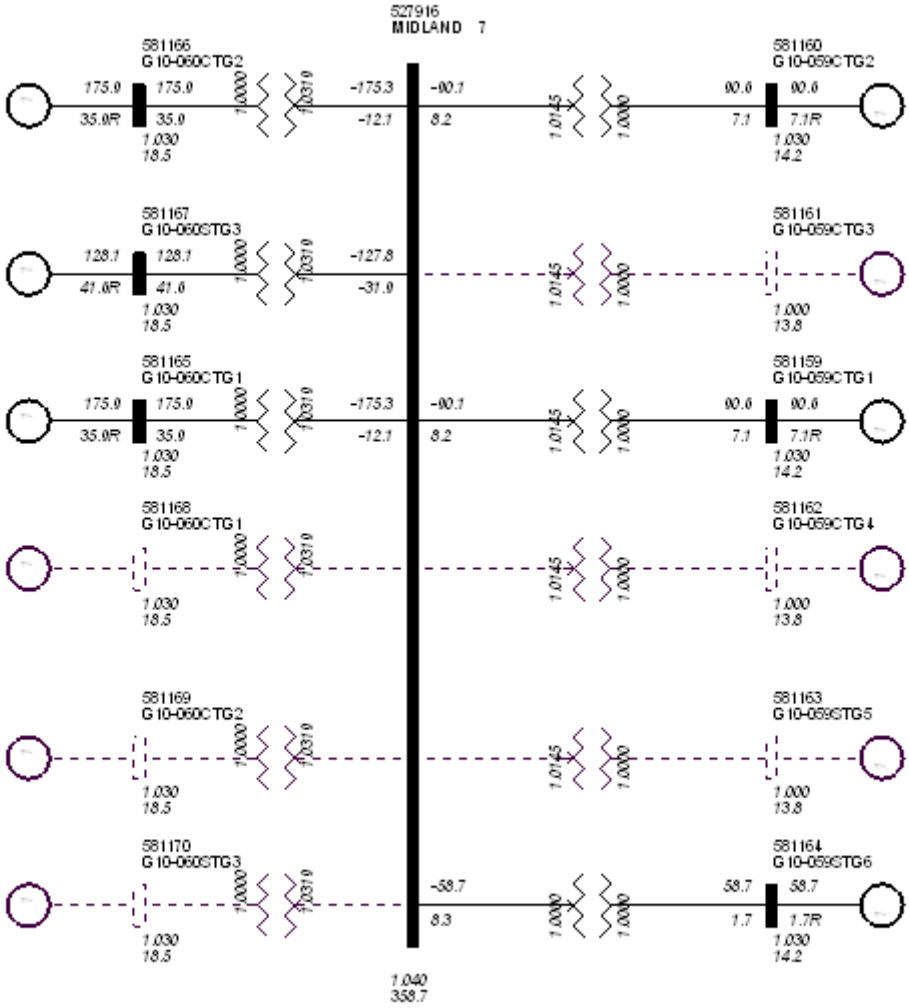


Figure 6: GEN-2010-059 Facility One-line Diagram

GEN-2010-060

The generating facility was studied with the assumption that it would be using the two steam turbines and four combustion cycle turbines. The point of interconnection (POI) will be at the SPS Midland 345kV Switching Station. Figure 7 below shows a simplified POI one-line diagram. Interconnection facilities will include a 345kV breaker and half bus configuration configuration.

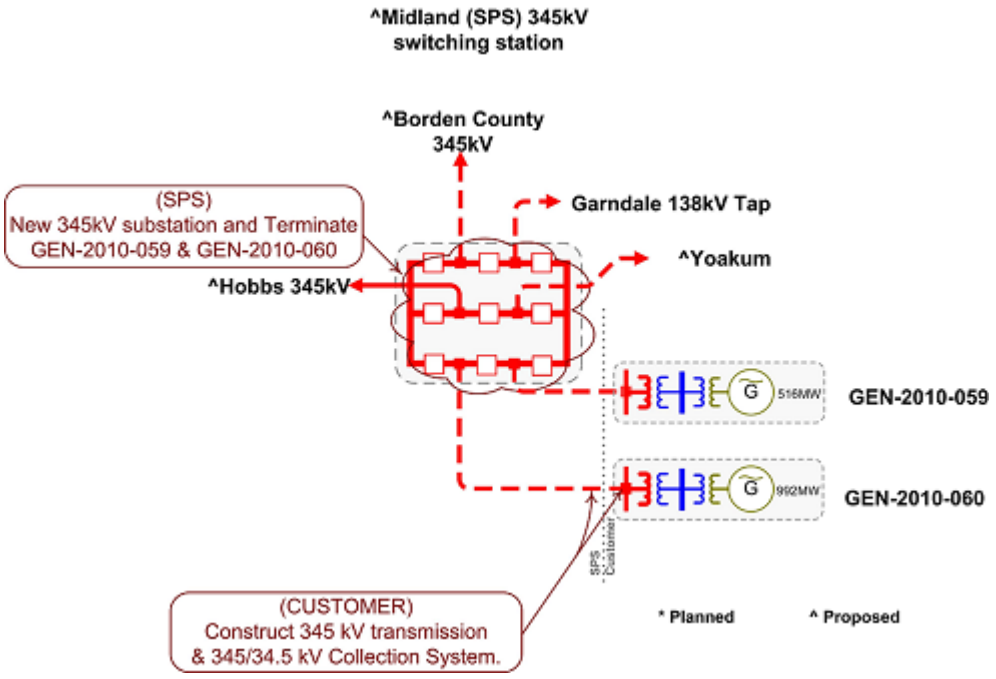


Figure 7: GEN-2010-060 One-line Diagram

Figure 8 shows a detailed one-line diagram of the GEN-2010-060 facility. In this study we are dispatching the GEN-2010-060 partially, combining 2010-059 and 2010-060 we are dispatching around 750MW.

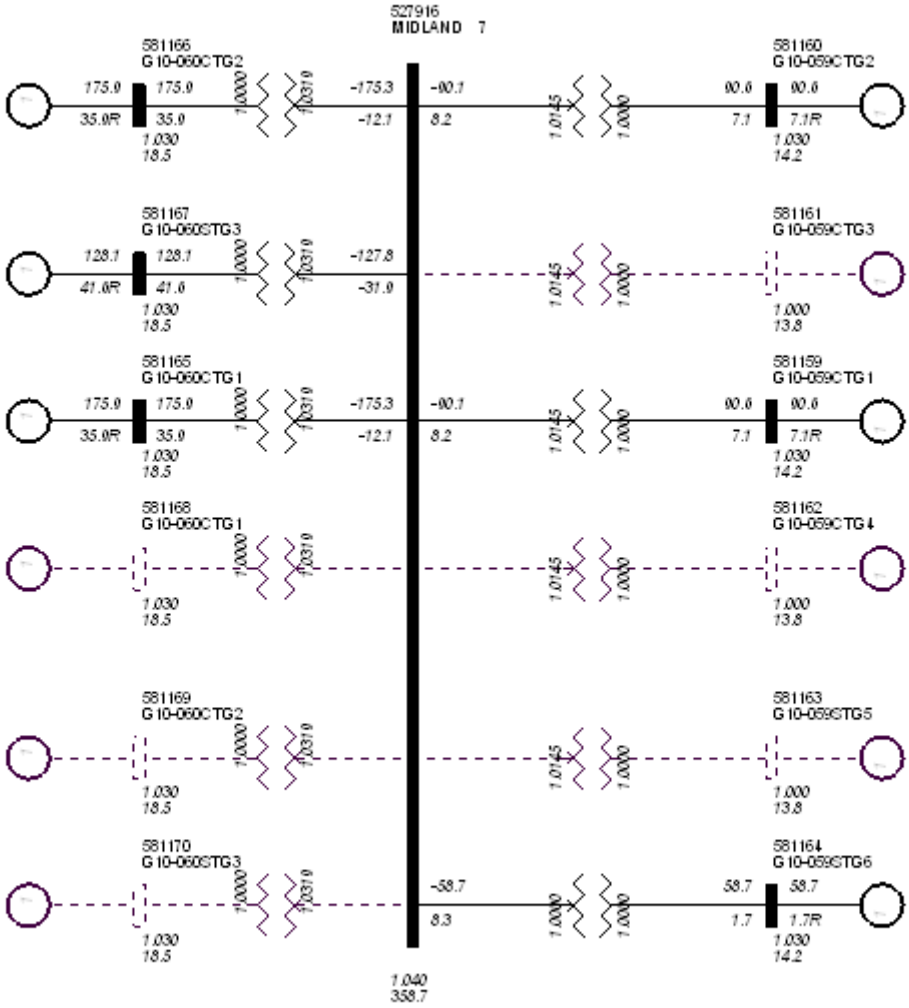


Figure 8: GEN-2010-059 Facility One-line Diagram

GEN-2011-025

The generating facility was studied with the assumption that it would be using the GE 1.6MW wind turbines. The nameplate rating of each turbine is 1.6MW (1600kW) with a machine base of 1780kVA. Each wind turbine has a 34.5kV/0.69kV 1750kVA transformer. The Customer's interconnection facilities will include one (1) 115/34.5kV 60.3/80.4/100.5MVA transformer. The point of interconnection (POI) is a tap in the 115kV line between Floyd County and Crosby County. Figure 9 below shows a POI one-line of the customer's facility.

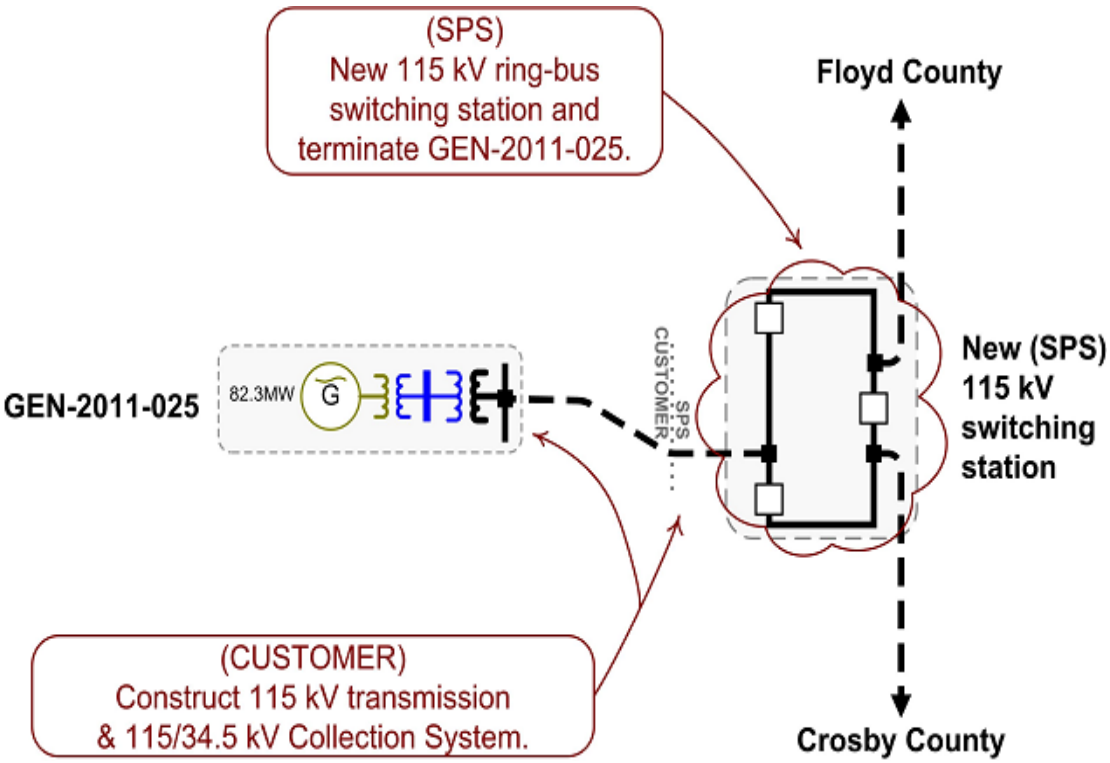


Figure 9: GEN-2011-025 POI One-line Diagram

Figure 10 shows a detailed one-line diagram of the GEN-2011-025 facility.

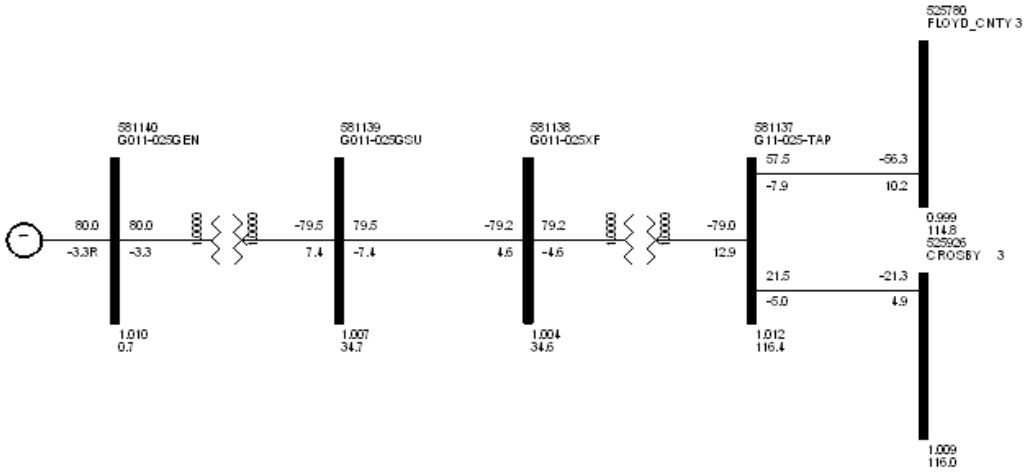


Figure 10: GEN-2011-025 Facility One-line Diagram

ASGI-2011-003

The generating facility was studied with the assumption that it would be using the Sany 2.0MW wind turbines. The nameplate rating of each turbine is 2057kW at 720 rpm at power factor equal 1. Each wind turbine has a 22.9kV/0.69kV 2500kVA pad mounted transformer. The Customer's

interconnection facilities will include one (1) 69/22.9kV 10/13.33 MVA transformer. The point of interconnection (POI) is SPS Hendricks 69 kV Substation. Interconnection facilities will include a 69kV single bus configuration. Figure 11 below shows a POI one-line of the customer's facility.

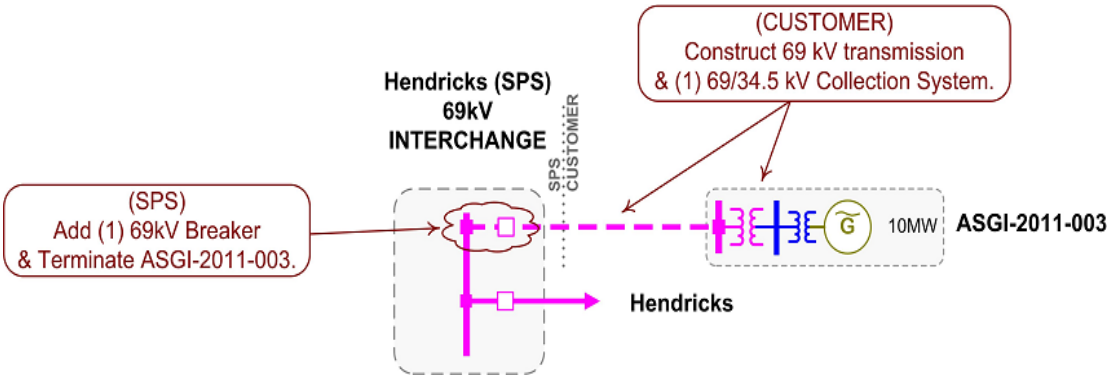


Figure 11: ASGI-2011-003 POI One-line Diagram

Figure 12 shows a detailed one-line diagram of the ASGI-2011-003 facility.

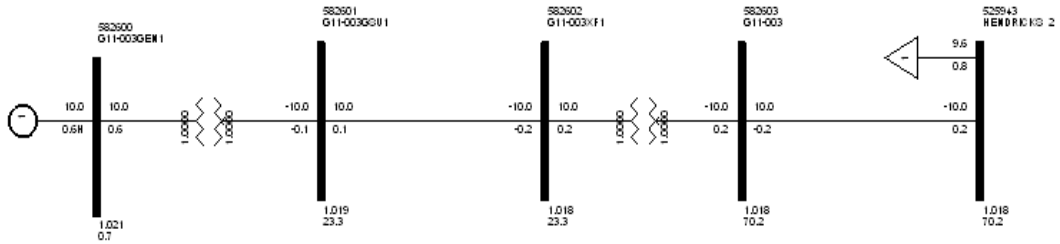


Figure 12: ASGI-2011-003 Facility One-line Diagram

ASGI-2011-001

The generating facility was studied with the assumption that it would be using the Mitsubishi 2.4MW wind turbines. The nameplate rating of each turbine is 2.4MW (2400kW) with a machine base of 2520kVA. Each wind turbine has a 34.5kV/0.69kV 2700kVA transformer. The Customer's interconnection facilities will include one (1) 115/34.5kV 12/16/20MVA transformer. Figure 13 below shows a simplified one-line of the customer's facility. The point of interconnection (POI) is SPS Lovington 115 kV Substation. Interconnection facilities will include a 69kV single bus configuration.

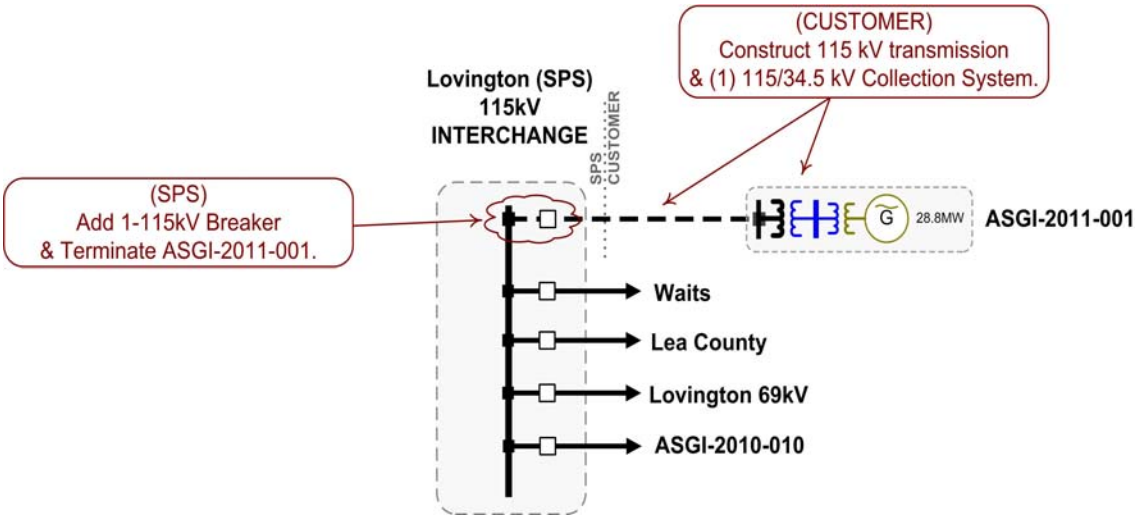


Figure 13: ASGI-2011-001 POI One-line Diagram

Figure 14 shows a detailed one-line diagram of the ASGI-2011-001 facility.

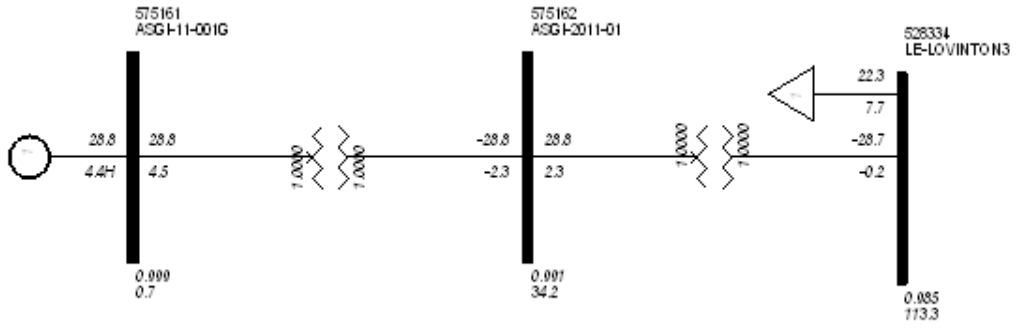


Figure 14: ASGI-2011-001 Facility One-line Diagram

4.0 Stability Study Criteria

FERC Order 661A Low Voltage Ride-Through Provisions (LVRT), which went into effect January 1, 2006, requires that wind generating plants remain in-service during 3-phase faults at the point of interconnection. This order may require a Static VAr Compensator (SVC) or STATCOM device be specified at the Customer facility to keep the wind generator on-line for the fault. Dynamic Stability studies performed as part of the System Impact Study will provide additional guidance as to whether the reactive compensation can be static or a portion must be dynamic (such as a SVC or STATCOM).

5.0 Stability Study Analysis

For group six 83 (eight three) contingencies were considered for the transient stability simulations. These contingencies included three phase faults and single phase line faults at locations defined by SPP. Single-phase line faults were simulated by applying a 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.
The faults that were defined and simulated are listed in Table 2 below. The faults were simulated on a summer peak and a winter peak model.

#	Cont. Name	Contingency
1	FLT01-3PH	3 phase fault on the Roswell (527563) to Riac Tap (527528) 69kV line, near Roswell. a. Apply fault at the Roswell 69kV 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	*Single phase fault and sequence like previous*
3	FLT03-3PH	3 phase fault on the Roswell (527563) to SW_4702 (527575) 69kV line, near Roswell. a. Apply fault at the Roswell 69kV 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	*Single phase fault and sequence like previous*
5	FLT05-3PH	3 phase fault on one of the Roswell 69kV (527563) to 115kV (527564) transformers, near the 69kV bus. a. Apply fault at the Roswell 69kV bus. b. Clear fault after 5 cycles by tripping the faulted line.
6	FLT06-3PH	3 phase fault on the Roswell (527564) to Samson (527546) 115kV line, near Roswell. a. Apply fault at the Roswell 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.
7	FLT07-1PH	*Single phase fault and sequence like previous*
8	FLT08-3PH	3 phase fault on one of the Chaves County 115kV (527482) to 230 kV (527483) transformers, near the 115kV bus. a. Apply fault at the Chaves County 115kV bus. b. Clear fault after 5 cycles by tripping the faulted line.
9	FLT09-3PH	3 phase fault on the Chaves County (527482) to Urton (527501) 115kV line, near Chaves County. a. Apply fault at the Chaves County 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.
10	FLT10-1PH	*Single phase fault and sequence like previous*
11	FLT11-3PH	3 phase fault on the Chaves County (527482) to Samson (527546) 115kV line, near Chaves County. a. Apply fault at the Chaves County 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.
12	FLT12-1PH	*Single phase fault and sequence like previous*
13	FLT13-3PH	3 phase fault on the Chaves County (527483) to Eddy County (527800) 230kV line, near Chaves County. a. Apply fault at the Chaves County 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	FLT14-1PH	*Single phase fault and sequence like previous*
15	FLT15-3PH	3 phase fault on the Tolk 345kV (525549) to 230kV (525543) transformer, near the 345kV bus. a. Apply fault at the Tolk 345kV bus. b. Clear fault after 5 cycles by tripping the faulted transformer.
16	FLT16-3PH	3 phase fault on the Tolk Tap (525543) to Tolk East (525524) 230kV line, near Tolk Tap. 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.
17	FLT17-1PH	*Single phase fault and sequence like previous*
18	FLT18-3PH	3 phase fault on the Roosevelt South (524911) to Tolk East (525524) 230kV line, near Roosevelt South. a. Apply fault at the Roosevelt South 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.
19	FLT19-1PH	*Single phase fault and sequence like previous*
20	FLT20-3PH	3 phase fault on the Tolk East (525524) to Plant X (525481) 230kV line, near Tolk East. 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.
21	FLT21-1PH	*Single phase fault and sequence like previous*
22	FLT22-3PH	3 phase fault on the Tolk East (525524) to Tuco (525830) 230kV line, near Tolk East. a. Apply fault at the Tolk East 230kV bus. b. Clear fault after 5 cycles by tripping the faulted line.
23	FLT23-1PH	*Single phase fault and sequence like previous*
24	FLT24-3PH	3 phase fault on the Tolk Tap (525543) to Tolk West (525531) 230kV line, near Tolk Tap. 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.
25	FLT25-1PH	*Single phase fault and sequence like previous*
26	FLT26-3PH	3 phase fault on the Tolk West (525531) to Lamb County (525637) 230kV line, near Lamb County. a. Apply fault at the Lamb County 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.
27	FLT27-1PH	*Single phase fault and sequence like previous*
28	FLT28-3PH	3 phase fault on the Tolk West (525531) to Yoakum (526935) 230kV line, near Yoakum. a. Apply fault at the Yoakum 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.
29	FLT29-1PH	*Single phase fault and sequence like previous*
30	FLT30-3PH	3 phase fault on the Deaf Smith (524623) to Plant X (525481) 230kV line, near

		Deaf Smith. a. Apply fault at the Deaf Smith 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.
31	FLT31-1PH	*Single phase fault and sequence like previous*
32	FLT32-3PH	3 phase fault on the Sundown (526435) to Plant X (525481) 230kV line, near Sundown. a. Apply fault at the Sundown 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.
33	FLT33-1PH	*Single phase fault and sequence like previous*
34	FLT34-3PH	3 phase fault on the Plant X (525481) to GEN-2006-039 Tap (560009) 230kV line, near Plant X. a. Apply fault at the Plant X 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.
35	FLT35-1PH	*Single phase fault and sequence like previous*
36	FLT36-3PH	3 phase fault on the Tuco (525830) to Swisher (525213) 230kV line, near Tuco. 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.
37	FLT37-1PH	*Single phase fault and sequence like previous*
38	FLT38-3PH	3 phase fault on the Tuco (525830) to Jones Bus1 (526337) 230kV line, near Tuco. 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.
39	FLT39-1PH	*Single phase fault and sequence like previous*
40	FLT40-3PH	3 phase fault on one of the Tuco 230kV (525830) to 345kV (525832) transformers, near the 230kV bus. a. Apply fault at the Tuco 230kV bus. b. Clear fault after 5 cycles by tripping the faulted transformer.
41	FLT41-3PH	3 phase fault on the Tuco (525832) to Border (525835) 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.
42	FLT42-1PH	*Single phase fault and sequence like previous*
43	FLT43-3PH	3 phase fault on the GEN-2008-014 Tap (560813) to Tuco (525832) 345kV line, near GEN-2008-014 Tap. a. Apply fault at the GEN-2008-014 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.
44	FLT44-1PH	*Single phase fault and sequence like previous*
45	FLT45-3PH	3 phase fault on the Jones (580504) to Grassland (580501) 345kV line, near Jones . a. Apply fault at the Jones 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.
46	FLT46-1PH	*Single phase fault and sequence like previous*
47	FLT47-3PH	3 phase fault on the Grassland (580502) to Borden (580501) 345kV line, near Borden. a. Apply fault at the Borden 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.
48	FLT48-1PH	*Single phase fault and sequence like previous*
49	FLT49-3PH	3 phase fault on one of the Grassland 230kV (526677) to 115kV (526676) transformers, near the 345kV bus. a. Apply fault at the Grassland 345kV bus. b. Clear fault after 5 cycles by tripping the faulted transformer.
50	FLT50-3PH	3 phase fault on the Borden 345kV (580501) to Vealmoor 115kV (522896) transformer, near the Borden 230kV bus. a. Apply fault at the Borden 230kV bus. b. Clear fault after 5 cycles by tripping the faulted transformer.
51	FLT51-3PH	3 phase fault on the Midland 345kV(527916) to Garndale 138kV (522992) transformer, near the 345kV bus. a. Apply fault at the Midland 345kV bus. b. Clear fault after 5 cycles by tripping the faulted transformer.
52	FLT52-3PH	3 phase fault on the Midland (527916) to Hobbs (527894) 345kV line, near Midland. a. Apply fault at the Midland 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.
53	FLT53-1PH	*Single phase fault and sequence like previous*
54	FLT54-3PH	3 phase fault on the GEN-2011-025 Tap (581137) to Floyd County (525780) 115kV line, near GEN-2011-025 Tap. a. Apply fault at the GEN-2011-025 Tap 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.
55	FLT55-1PH	*Single phase fault and sequence like previous*
56	FLT56-3PH	3 phase fault on the GEN-2011-025 Tap (581137) to Crosby County (525926) 115kV line, near GEN-2011-025 Tap. a. Apply fault at the GEN-2011-025 Tap 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.
57	FLT57-1PH	*Single phase fault and sequence like previous*
58	FLT58-3PH	3 phase fault on one of the Crosby County 69kV (525925) to 115kV (525926) transformers, near the 69kV bus a. Apply fault at the Crosby County 69kV bus. b. Clear fault after 5 cycles by tripping the faulted transformer.
59	FLT59-3PH	3 phase fault on the Crosby County (525926) to Lubbock East (526298) 115kV line, near Crosby County. a. Apply fault at the Crosby County 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.
60	FLT60-1PH	*Single phase fault and sequence like previous*
61	FLT61-3PH	3 phase fault on the Lubbock East (526299) to Jones Bus2 (526338) 230kV line, near Lubbock East.

		a. Apply fault at the Lubbock 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.
62	FLT62-1PH	*Single phase fault and sequence like previous*
63	FLT63-3PH	3 phase fault on the Floyd County (525780) to Cox (525326) 115kV line, near Floyd County. a. Apply fault at the Floyd County 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.
64	FLT64-1PH	*Single phase fault and sequence like previous*
65	FLT65-3PH	3 phase fault on one of the Floyd County 115kV (525780) to 69 kV (525779) transformers, near the 115kV bus a. Apply fault at the Floyd County 115kV bus. b. Clear fault after 5 cycles by tripping the faulted transformer.
66	FLT66-3PH	3 phase fault on the Floyd County (525780) to Tuco (525828) 115kV line, near Floyd County. a. Apply fault at the Floyd County 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.
67	FLT67-1PH	*Single phase fault and sequence like previous*
68	FLT68-3PH	3 phase fault on the Potter (523961) to GEN-2005-017 (579118) 345kV line, near Potter a. Apply fault at the Potter 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	FLT69-1PH	*Single phase fault and sequence like previous*
70	FLT70-3PH	3 phase fault on the Eddy Co 230kV (527800) to 345kV (527802) transformer, near the 345kV bus. a. Apply fault at the Eddy Co 345kV bus. b. Clear fault after 5 cycles by tripping the faulted transformer.
71	FLT71	3 phase fault on the Tuco (525832) to Jones (580504) 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.
72	FLT72	*Single phase fault and sequence like previous*
73	FLT73	3 phase fault on the Midland (527916) to Borden (580501) 345kV line, near Midland. a. Apply fault at the Midland 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.
74	FLT74	*Single phase fault and sequence like previous*
75	FLT75	3 phase fault on the LE-Lovington (528334) to LEA County (527848) 115kV line, near LE Lovington a. Apply fault at the Lovington 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.
76	FLT76	*Single phase fault and sequence like previous*
77	FLT77	3 phase fault on the LE-Lovington (528334) to LEA Waits (528325) 115kV line,

		near LE Lovington a. Apply fault at the Lovington 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.
78	FLT78	*Single phase fault and sequence like previous*
79	FLT79	3 phase fault on the Midland (527916) to Yoakum (560022) 345kV line, near Midland. a. Apply fault at the Midland 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.
80	FLT80	*Single phase fault and sequence like previous*
81	FLT81	3 phase fault on the Tuco (525832) to Yoakum (560022) 345kV line, near Yoakum. a. Apply fault at the Yoakum 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.
82	FLT82	*Single phase fault and sequence like previous*
83	FLT83	3 phase fault on the Conestoga (560029) to Finney (523853) 345kV line, near Finney. a. Apply fault at the Finney 345kV bus. b. Clear fault after 5 cycles by tripping the faulted line.

Table 3: Contingency List for Group 6

6.0 Simulation Results

All faults were run for both summer and winter cases, no tripping occurred in this study.

Table 4 summarizes the results for all faults. Complete sets of plots for summer and winter cases are available on request.

Request ASGI-2011-003 had problems in almost all contingencies. Basically, the main issues detected were the power dropping to almost zero and not recovering and generator tripping. All WT3G/WT3E were replaced with typical values, this action solved the problems and the model's response was fine for all contingencies.

With the addition of 750MW at Midland the GEN-2010-059 and GEN-2010-060 were unstable for Fault 73, because of this we added the line Midland – Yoakum – Tuco 345 kV line to make the system stable under the cited contingency. The system is stable without re-closing the Midland – Border 345kV fault, and re-closing is a problem applying the fault at Midland, when the fault occurs at Border the system is stable even with re-closing.

Also, we noticed a low voltage at Oklaunion 345 kV substation and GEN-2008-014 POI, around 0.85 pu in summer and winter cases in the pre-contingency analysis. Because of these conditions the model was not able to initialize properly. The solution found was to add a new 345 kV line between Oklaunion and Lawton Eastside substations and a 100 MVAr capacitor bank at Oklaunion 345 kV substation.

Based on the dynamic results, with all network upgrades in service, all the requests in Group 6 did not cause any stability problems and remained stable for all faults studied, with the addition the proposed upgrades.

Cont. Number	Cont. Name	Description	Summer	Winter
1	FLT01-3PH	3 phase fault on the Roswell (527563) to Riac Tap (527528) 69kV line, near Roswell.	OK	OK
2	FLT02-1PH	*Single phase fault and sequence like previous*	OK	OK
3	FLT03-3PH	3 phase fault on the Roswell (527563) to SW_4702 (527575) 69kV line, near Roswell.	OK	OK
4	FLT04-1PH	*Single phase fault and sequence like previous*	OK	OK
5	FLT05-3PH	3 phase fault on one of the Roswell 69kV (527563) to 115kV (527564) transformers, near the 69kV bus.	OK	OK
6	FLT06-3PH	3 phase fault on the Roswell (527564) to Samson (527546) 115kV line, near Roswell.	OK	OK
7	FLT07-1PH	*Single phase fault and sequence like previous*	OK	OK
8	FLT08-3PH	3 phase fault on one of the Chaves County 115kV (527482) to 230 kV (527483) transformers, near the 115kV bus.	OK	OK
9	FLT09-3PH	3 phase fault on the Chaves County (527482) to Urton (527501) 115kV line, near Chaves County.	OK	OK
10	FLT10-1PH	*Single phase fault and sequence like previous*	OK	OK
11	FLT11-3PH	3 phase fault on the Chaves County (527482) to Samson (527546) 115kV line, near Chaves County.	OK	OK
12	FLT12-1PH	*Single phase fault and sequence like previous*	OK	OK
13	FLT13-3PH	3 phase fault on the Chaves County (527483) to Eddy County (527800) 230kV line, near Chaves County.	OK	OK
14	FLT14-1PH	*Single phase fault and sequence like previous*	OK	OK
15	FLT15-3PH	3 phase fault on the Tolk 345kV (525549) to 230kV (525543) transformer, near the 345kV bus.	OK	OK
16	FLT16-3PH	3 phase fault on the Tolk Tap (525543) to Tolk East (525524) 230kV line, near Tolk Tap.	OK	OK
17	FLT17-1PH	*Single phase fault and sequence like previous*	OK	OK
18	FLT18-3PH	3 phase fault on the Roosevelt South (524911) to Tolk East (525524) 230kV line, near Roosevelt South.	OK	OK
19	FLT19-1PH	*Single phase fault and sequence like previous*	OK	OK
20	FLT20-3PH	3 phase fault on the Tolk East (525524) to Plant X (525481) 230kV line, near Tolk East.	OK	OK
21	FLT21-1PH	*Single phase fault and sequence like previous*	OK	OK
22	FLT22-3PH	3 phase fault on the Tolk East (525524) to Tuco (525830) 230kV line, near Tolk East.	OK	OK
23	FLT23-1PH	*Single phase fault and sequence like previous*	OK	OK
24	FLT24-3PH	3 phase fault on the Tolk Tap (525543) to Tolk West (525531) 230kV line, near Tolk Tap.	OK	OK
25	FLT25-1PH	*Single phase fault and sequence like previous*	OK	OK
26	FLT26-3PH	3 phase fault on the Tolk West (525531) to Lamb County (525637) 230kV line, near Lamb County.	OK	OK
27	FLT27-1PH	*Single phase fault and sequence like previous*	OK	OK
28	FLT28-3PH	3 phase fault on the Tolk West (525531) to Yoakum (526935) 230kV line, near Yoakum.	OK	OK
29	FLT29-1PH	*Single phase fault and sequence like previous*	OK	OK
30	FLT30-3PH	3 phase fault on the Deaf Smith (524623) to Plant X (525481) 230kV line, near Deaf Smith.	OK	OK
31	FLT31-1PH	*Single phase fault and sequence like previous*	OK	OK
32	FLT32-3PH	3 phase fault on the Sundown (526435) to Plant X (525481) 230kV line, near Sundown.	OK	OK
33	FLT33-1PH	*Single phase fault and sequence like previous*	OK	OK
34	FLT34-3PH	3 phase fault on the Plant X (525481) to GEN-2006-039 Tap	OK	OK

		(560009) 230kV line, near Plant X.		
35	FLT35-1PH	*Single phase fault and sequence like previous*	OK	OK
36	FLT36-3PH	3 phase fault on the Tuco (525830) to Swisher (525213) 230kV line, near Tuco.	OK	OK
37	FLT37-1PH	*Single phase fault and sequence like previous*	OK	OK
38	FLT38-3PH	3 phase fault on the Tuco (525830) to Jones Bus1 (526337) 230kV line, near Tuco.	OK	OK
39	FLT39-1PH	*Single phase fault and sequence like previous*	OK	OK
40	FLT40-3PH	3 phase fault on one of the Tuco 230kV (525830) to 345kV (525832) transformers, near the 230kV bus.	OK	OK
41	FLT41-3PH	3 phase fault on the Tuco (525832) to Border (525835) 345kV line, near Tuco.	OK	OK
42	FLT42-1PH	*Single phase fault and sequence like previous*	OK	OK
43	FLT43-3PH	3 phase fault on the GEN-2008-014 Tap (560813) to Tuco (525832) 345kV line, near GEN-2008-014 Tap.	OK	OK
44	FLT44-1PH	*Single phase fault and sequence like previous*	OK	OK
45	FLT45-3PH	3 phase fault on the Jones (580504) to Grassland (580501) 345kV line, near Jones	OK	OK
46	FLT46-1PH	*Single phase fault and sequence like previous*	OK	OK
47	FLT47-3PH	3 phase fault on the Grassland (580502) to Borden (580501) 345kV line, near Borden.	OK	OK
48	FLT48-1PH	*Single phase fault and sequence like previous*	OK	OK
49	FLT49-3PH	3 phase fault on one of the Grassland 230kV (526677) to 115kV (526676) transformers, near the 345kV bus.	OK	OK
50	FLT50-3PH	3 phase fault on the Borden 345kV (580501) to Vealmoor 115kV (522896) transformer, near the Borden 230kV bus.	OK	OK
51	FLT51-3PH	3 phase fault on the Midland 345kV(527916) to Garndale 138kV (522992) transformer, near the 345kV bus.	OK	OK
52	FLT52-3PH	3 phase fault on the Midland (527916) to Hobbs (527894) 345kV line, near Midland.	OK	OK
53	FLT53-1PH	*Single phase fault and sequence like previous*	OK	OK
54	FLT54-3PH	3 phase fault on the GEN-2011-025 Tap (581137) to Floyd County (525780) 115kV line, near GEN-2011-025 Tap.	OK	OK
55	FLT55-1PH	*Single phase fault and sequence like previous*	OK	OK
56	FLT56-3PH	3 phase fault on the GEN-2011-025 Tap (581137) to Crosby County (525926) 115kV line, near GEN-2011-025 Tap.	OK	OK
57	FLT57-1PH	*Single phase fault and sequence like previous*	OK	OK
58	FLT58-3PH	3 phase fault on one of the Crosby County 69kV (525925) to 115kV (525926) transformers, near the 69kV bus	OK	OK
59	FLT59-3PH	3 phase fault on the Crosby County (525926) to Lubbock East (526298) 115kV line, near Crosby County.	OK	OK
60	FLT60-1PH	*Single phase fault and sequence like previous*	OK	OK
61	FLT61-3PH	3 phase fault on the Lubbock East (526299) to Jones Bus2 (526338) 230kV line, near Lubbock East.	OK	OK
62	FLT62-1PH	*Single phase fault and sequence like previous*	OK	OK
63	FLT63-3PH	3 phase fault on the Floyd County (525780) to Cox (525326) 115kV line, near Floyd County.	OK	OK
64	FLT64-1PH	*Single phase fault and sequence like previous*	OK	OK
65	FLT65-3PH	3 phase fault on one of the Floyd County 115kV (525780) to 69 kV (525779) transformers, near the 115kV bus	OK	OK
66	FLT66-3PH	3 phase fault on the Floyd County (525780) to Tuco (525828) 115kV line, near Floyd County.	OK	OK
67	FLT67-1PH	*Single phase fault and sequence like previous*	OK	OK
68	FLT68-3PH	3 phase fault on the Potter (523961) to GEN-2005-017 (579118)	OK	OK

		345kV line, near Potter		
69	FLT69-1PH	*Single phase fault and sequence like previous*	OK	OK
70	FLT70-3PH	3 phase fault on the Eddy Co 230kV (527800) to 345kV (527802) transformer, near the 345kV bus.	OK	OK
71	FLT71-3PH	3 phase fault on the Tuco (525832) to Jones (580504) 345kV line, near Tuco.	OK	OK
72	FLT72-1PH	*Single phase fault and sequence like previous*	OK	OK
73	FLT73-3PH	3 phase fault on the Midland (527916) to Borden (580501) 345kV line, near Midland.	OK	OK
74	FLT74-1PH	*Single phase fault and sequence like previous*	OK	OK
75	FLT75-3PH	3 phase fault on the LE-Lovington (528334) to LEA County (527848) 115kV line, near LE Lovington	OK	OK
76	FLT76-1PH	*Single phase fault and sequence like previous*	OK	OK
77	FLT77-3PH	3 phase fault on the LE-Lovington (528334) to LEA Waits (528325) 115kV line, near LE Lovington	OK	OK
78	FLT78-1PH	*Single phase fault and sequence like previous*	OK	OK
79	FLT79-3PH	3 phase fault on the Midland (527916) to Yoakum (560022) 345kV line, near Midland.	OK	OK
80	FLT80-1PH	*Single phase fault and sequence like previous*	OK	OK
81	FLT81-3PH	3 phase fault on the Tuco (525832) to Yoakum (560022) 345kV line, near Yoakum.	OK	OK
82	FLT82-1PH	*Single phase fault and sequence like previous*	OK	OK
83	FLT83-3PH	3 phase fault on the Conestoga (560029) to Finney (523853) 345kV line, near Finney.	OK	OK

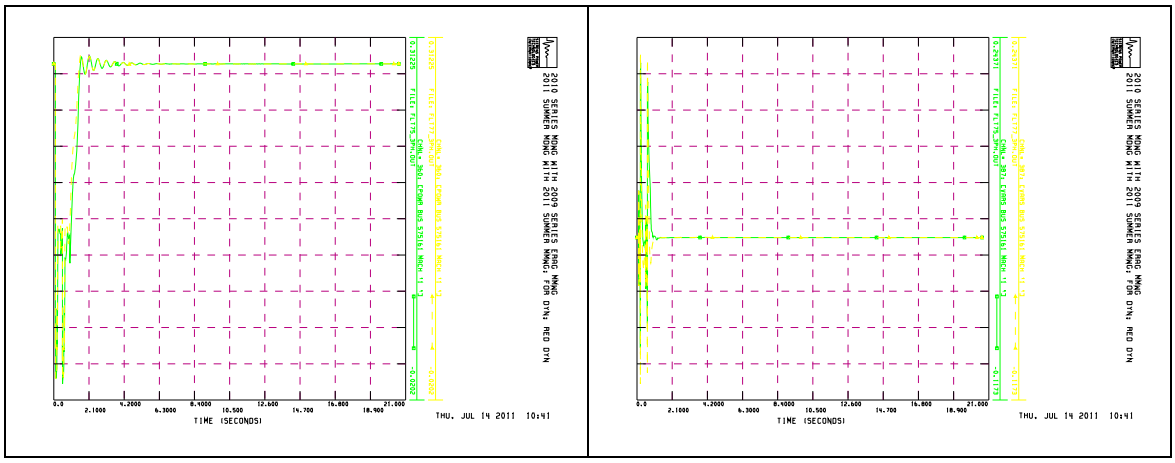
Table 4: Contingency List Simulation Results for Group 6

7.0 Generator Performance

ASGI-2011-001

The transmission system and the study generators were found to remain stable during the dynamic analysis.

Figure 15 and 16 shows the output power for ASGI-2011-001, summer and winter cases respectively, under contingencies FLT75-3PH and FLT77-3PH. The contingencies are in the point of interconnection of the generator. The equivalent model is represented by one equivalent generator.



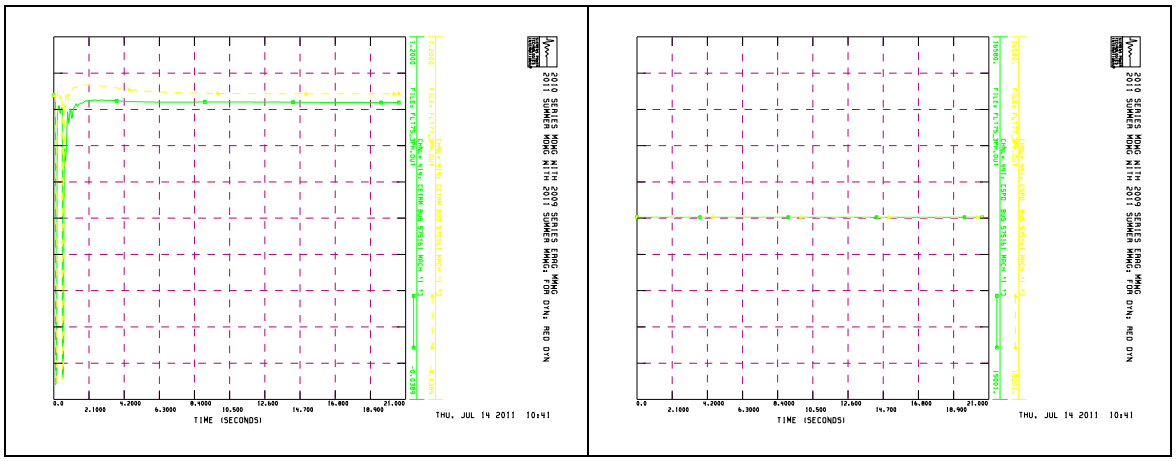


Figure 15: ASGI-2011-001 output power, reactive power, terminal voltage and speed for faults FLT75-3PH and FLT77-3PH summer case

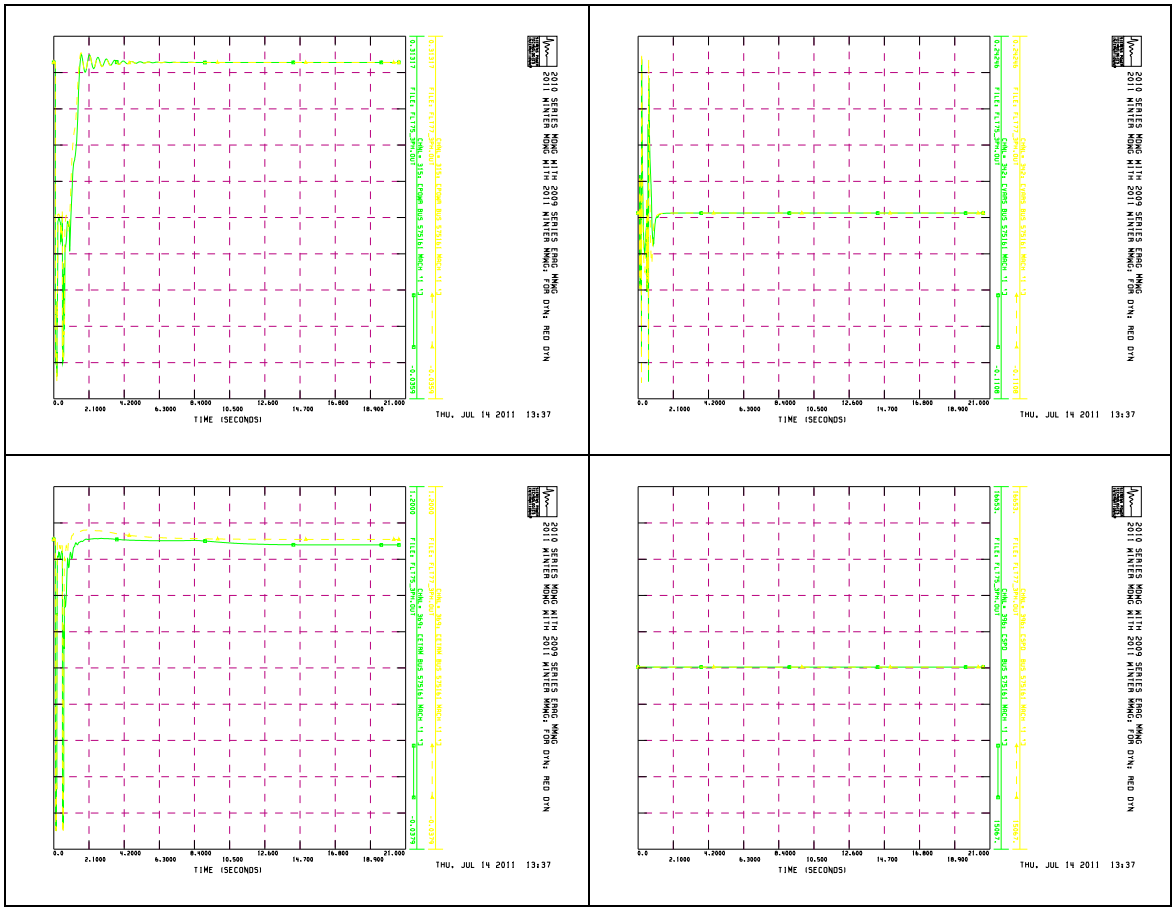


Figure 16: ASGI-2011-001 output power, reactive power, terminal voltage and speed for faults FLT75-3PH and FLT77-3PH winter case

ASGI-2011-003

The transmission system and the study generators were found to remain stable during the dynamic analysis.

Figure 17 and 18 shows the output power for ASGI-2011-003, summer and winter cases respectively, under contingencies FLT58-3PH and FLT59-3PH. The contingencies are in the point of interconnection of the generator. The equivalent model is represented by one equivalent generator.

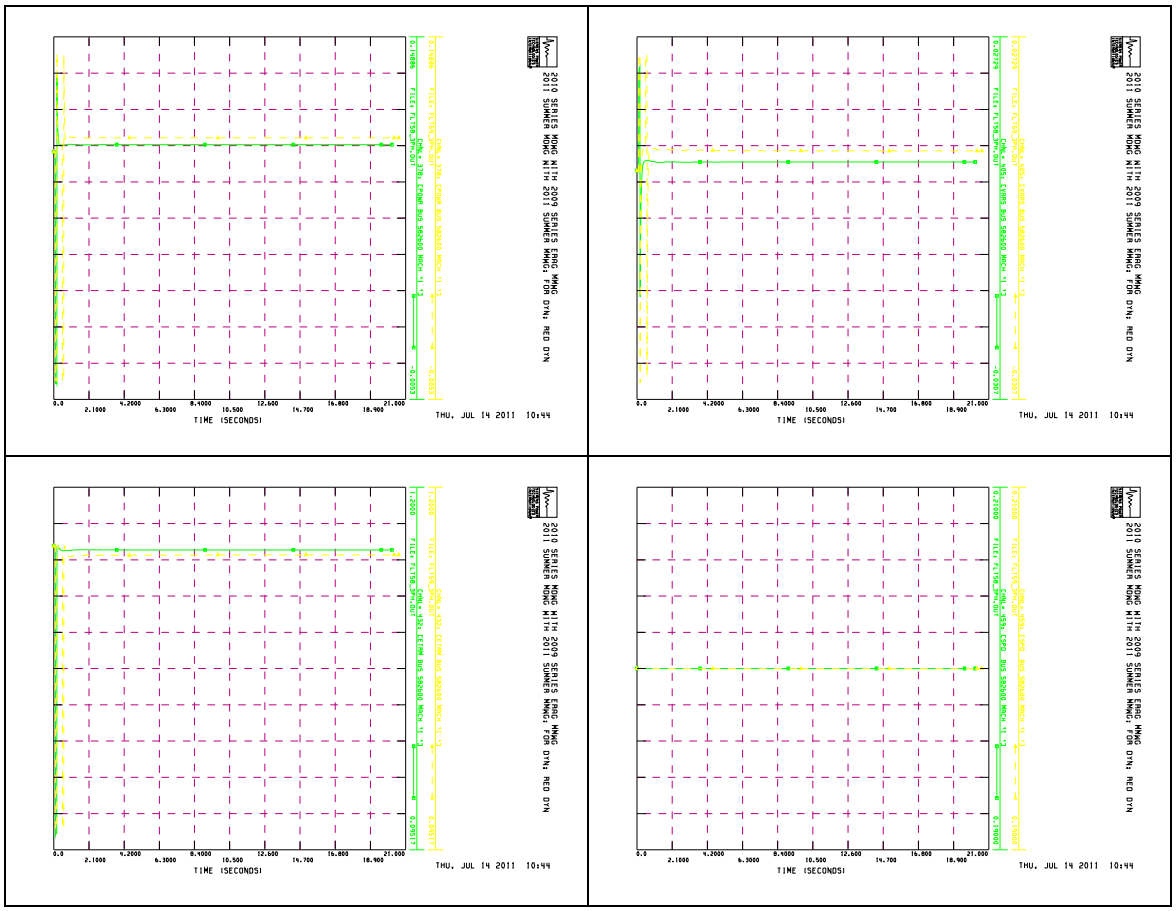
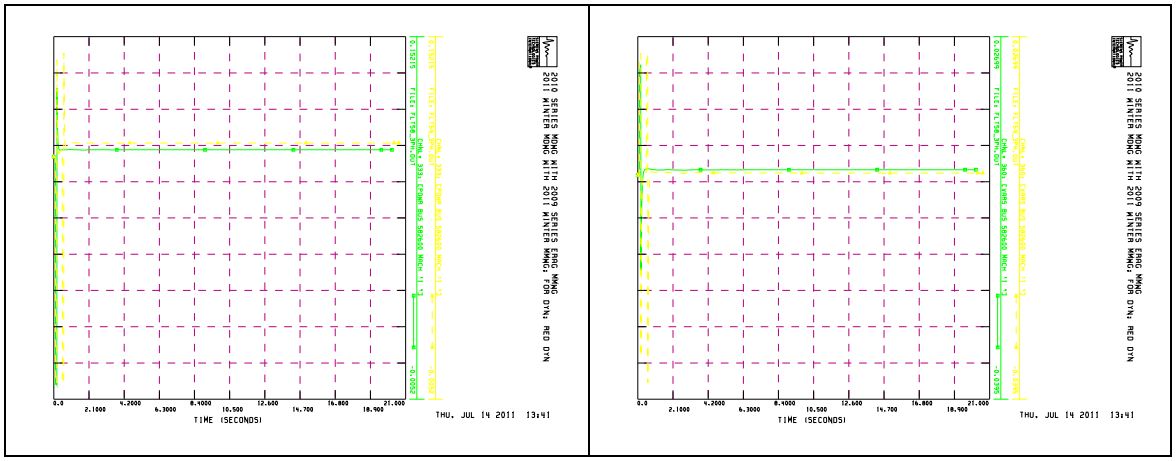


Figure 17: ASGI-2011-003 output power, reactive power, terminal voltage and speed for faults FLT58-3PH and FLT59-3PH summer case



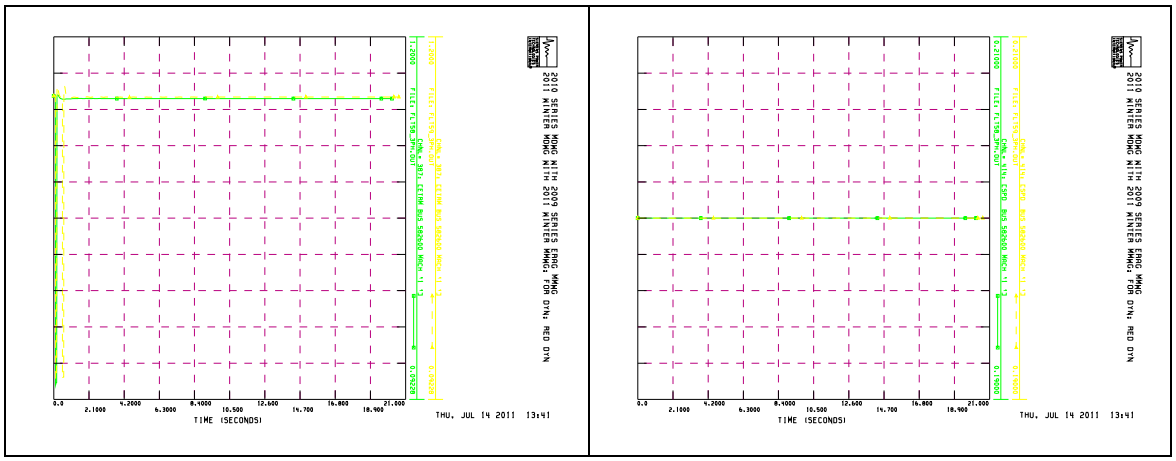
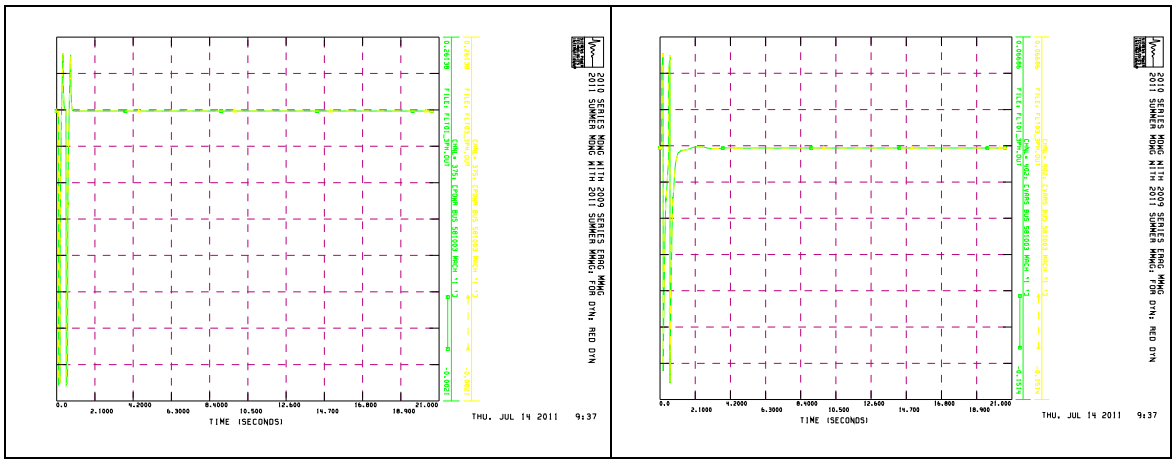


Figure 18: ASGI-2011-003 output power, reactive power, terminal voltage and speed for faults FLT58-3PH and FLT59-3PH winter case

GEN-2010-020

The transmission system and the study generators were found to remain stable during the dynamic analysis.

Figure 19 and 20 shows the output power for GEN-2010-020, summer and winter cases respectively, under contingencies FLT01-3PH and FLT03-3PH. The contingencies are in the point of interconnection of the generator. The equivalent model is represented by one equivalent generator.



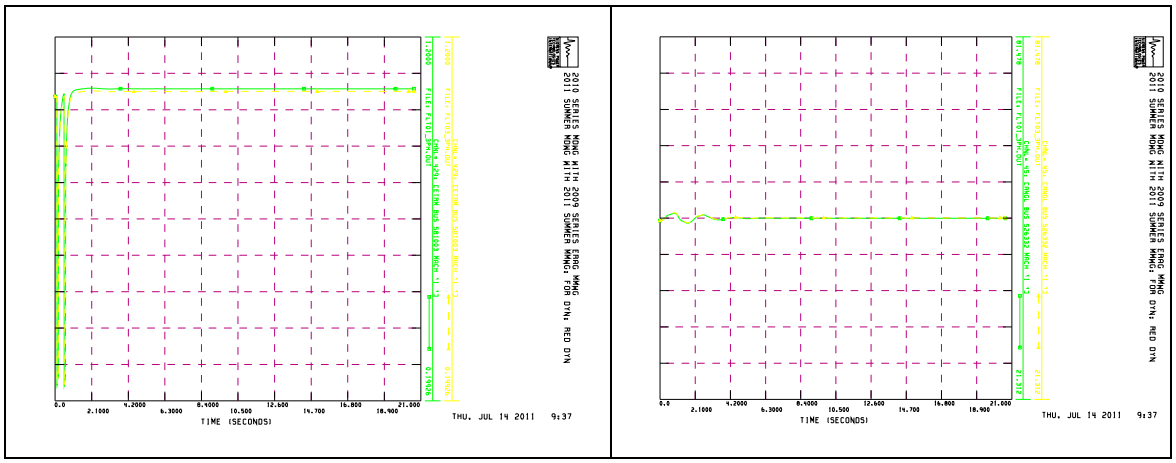


Figure 18: GEN-2010-020 output power, reactive power, terminal voltage and speed for faults FLT01-3PH and FLT03-3PH summer case

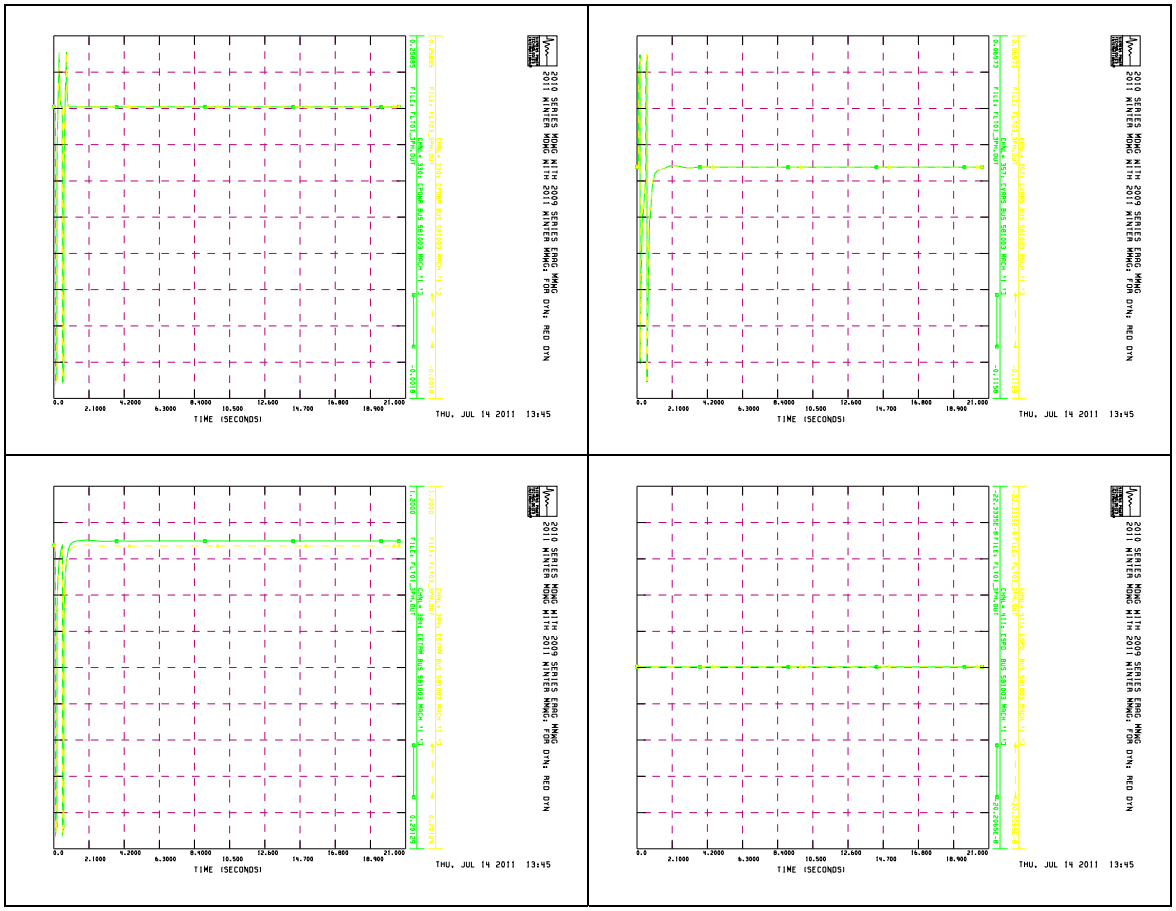


Figure 20: GEN-2010-020 output power, reactive power, terminal voltage and speed for faults FLT01-3PH and FLT03-3PH winter case

GEN-2010-058

The transmission system and the study generators were found to remain stable during the dynamic analysis.

Figure 21 and 22 shows the output power for GEN-2010-058, summer and winter cases respectively, under contingencies FLT08-3PH and FLT09-3PH. The contingencies are in the point of interconnection of the generator. The equivalent model is represented by one equivalent generator.

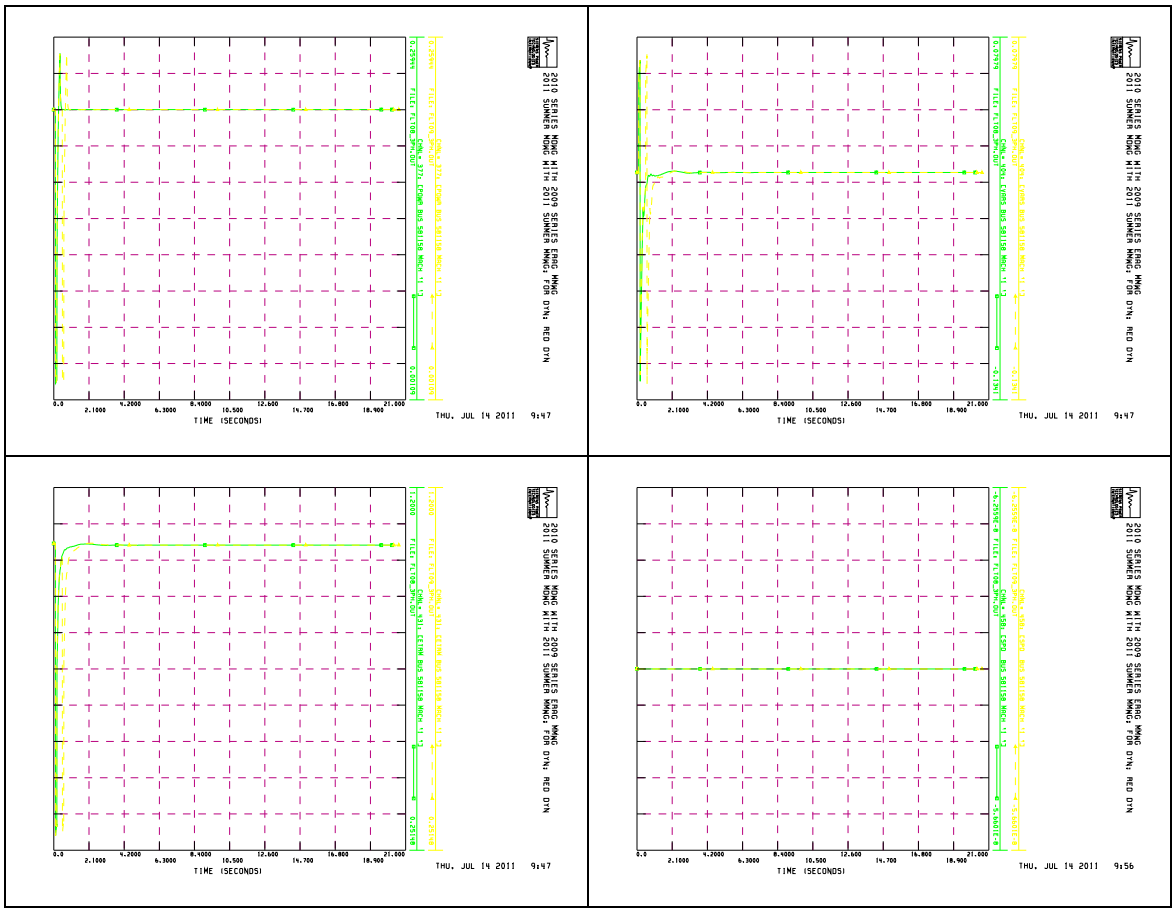
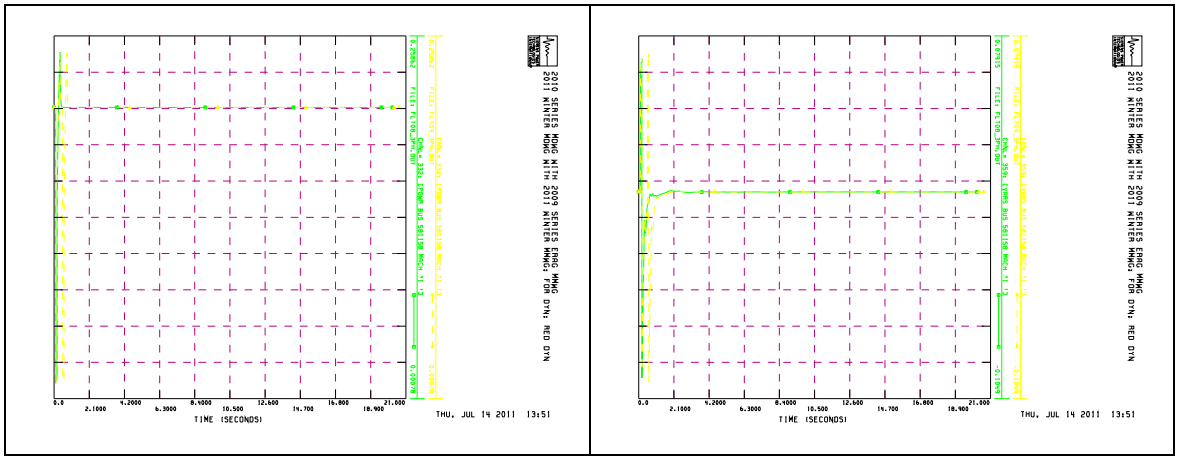


Figure 21: GEN-2010-058 output power, reactive power, terminal voltage and speed for faults FLT08-3PH and FLT09-3PH summer case



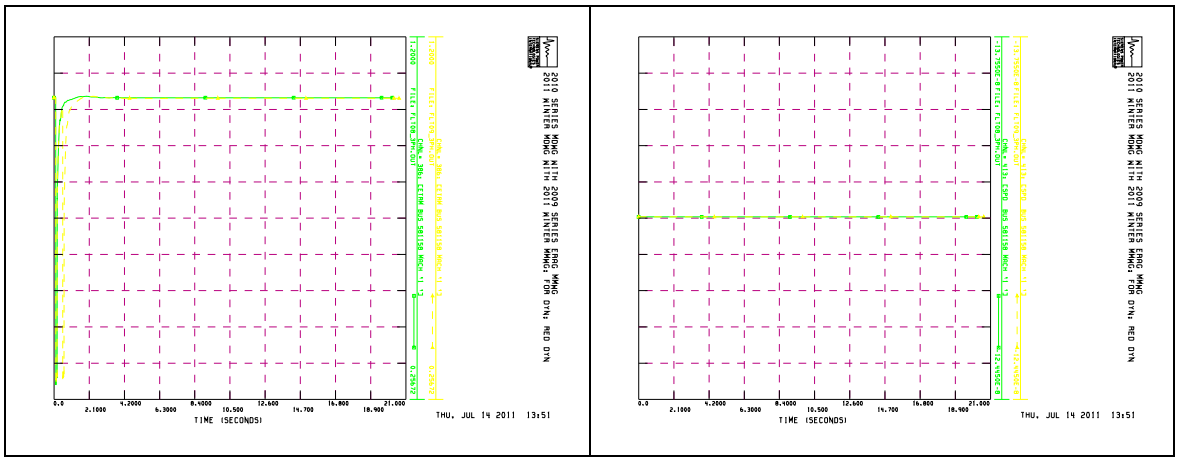
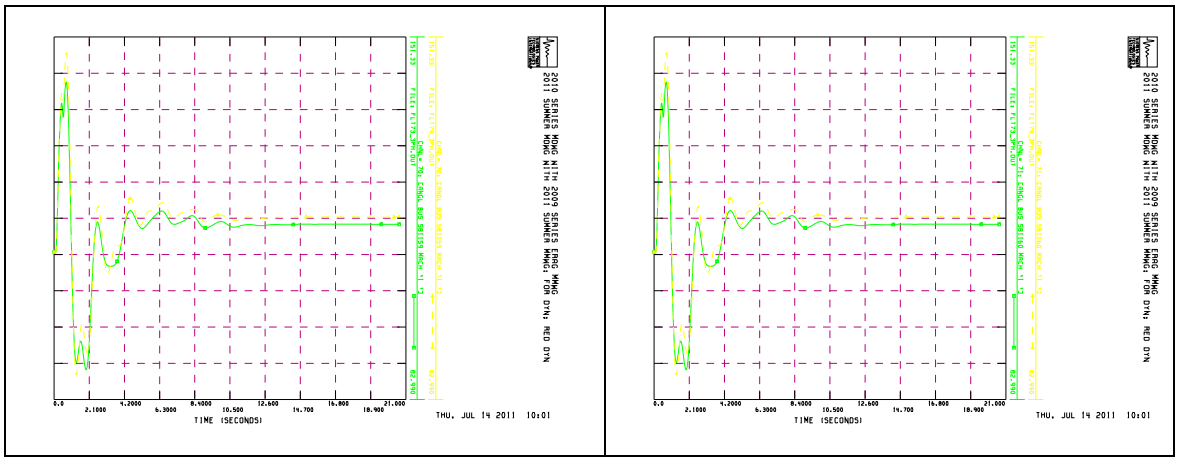


Figure 22: GEN-2010-058 output power, reactive power, terminal voltage and speed for faults FLT08-3PH and FLT09-3PH winter case

GEN-2010-059

The transmission system and the study generators were found to remain stable during the dynamic analysis.

Figures 23 to 32 shows the output power for GEN-2010-059, summer and winter cases, under contingencies FLT73-3PH and FLT79-3PH. The contingencies are in the point of interconnection of the generator. The equivalent model is represented by six equivalent generators, however in this study we are dispatching only three.



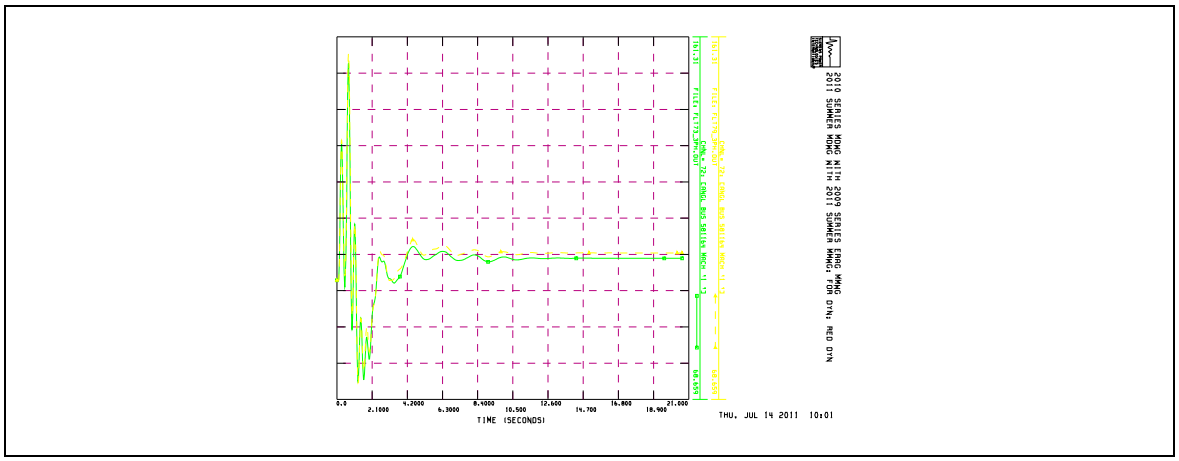


Figure 23: GEN-2010-059 angle for faults FLT73-3PH and FLT79-3PH summer case, machines 581159, 581160 and 581164

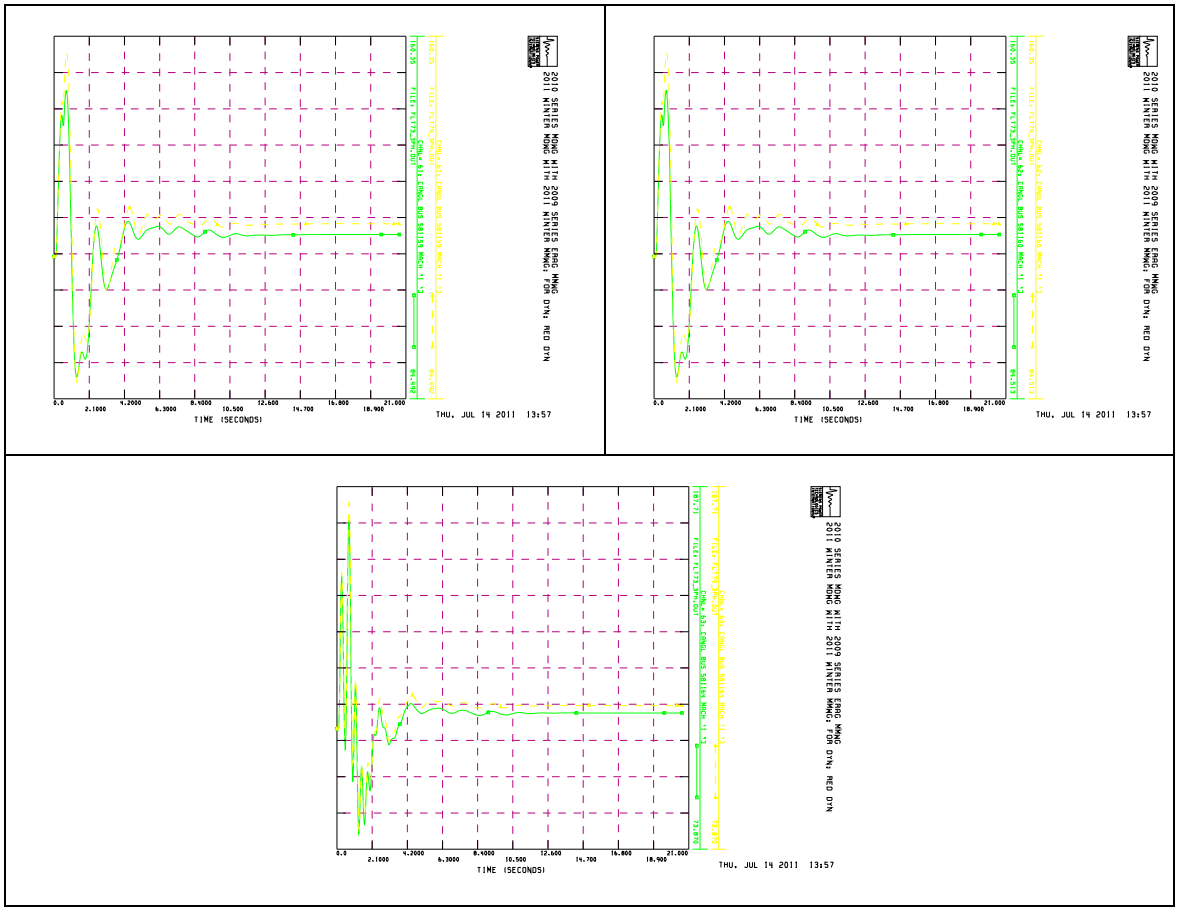


Figure 24: GEN-2010-059 angle for faults FLT73-3PH and FLT79-3PH winter case, machines 581159, 581160 and 581164

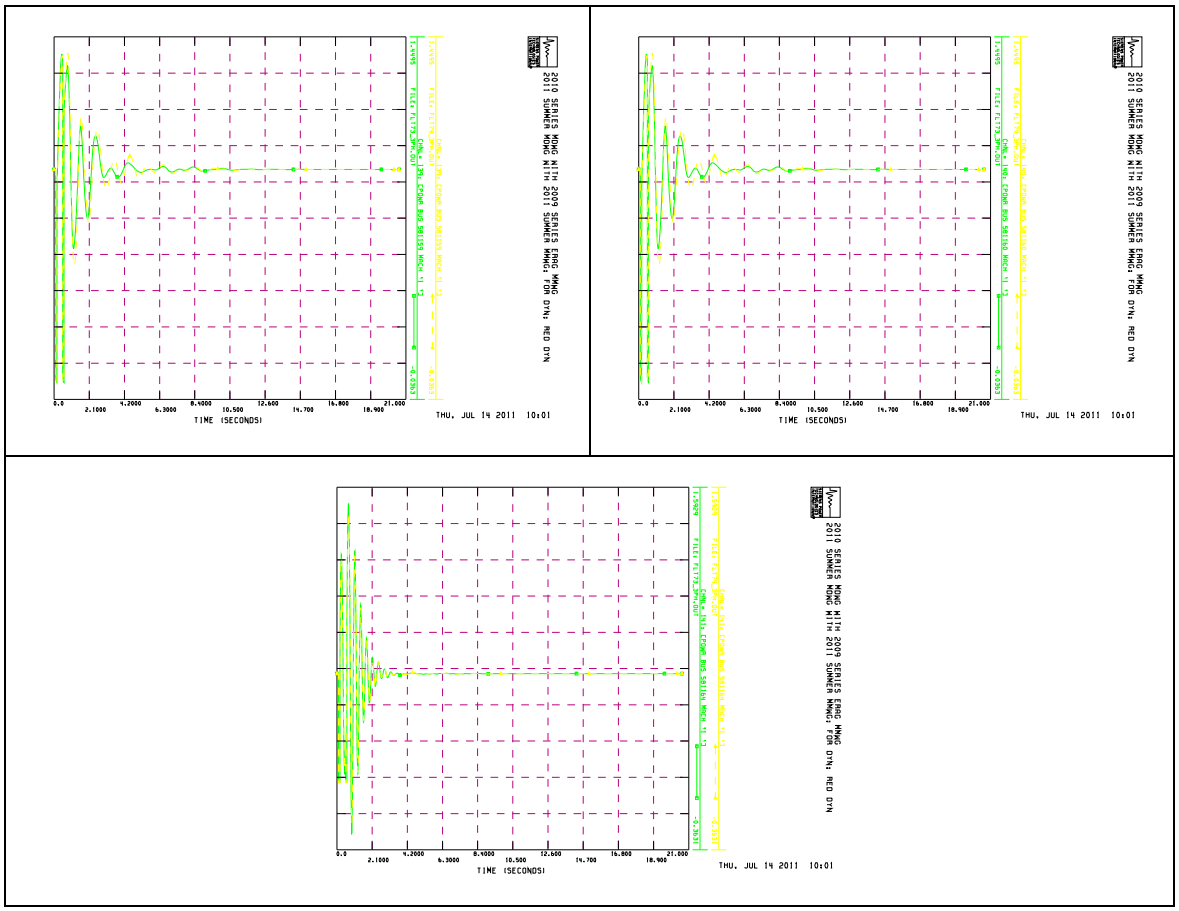
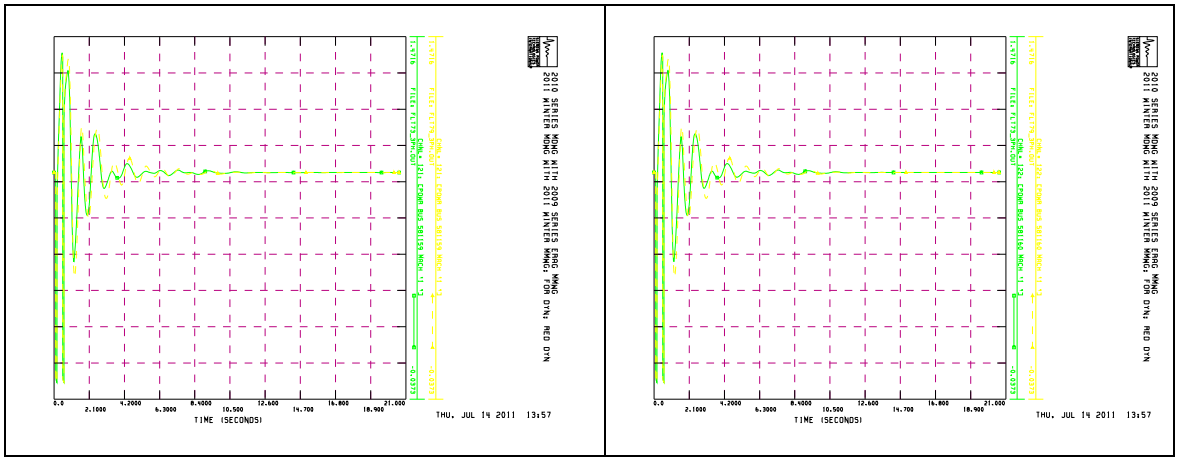


Figure 25: GEN-2010-059 output power for faults FLT73-3PH and FLT79-3PH summer case, machines 581159, 581160 and 581164



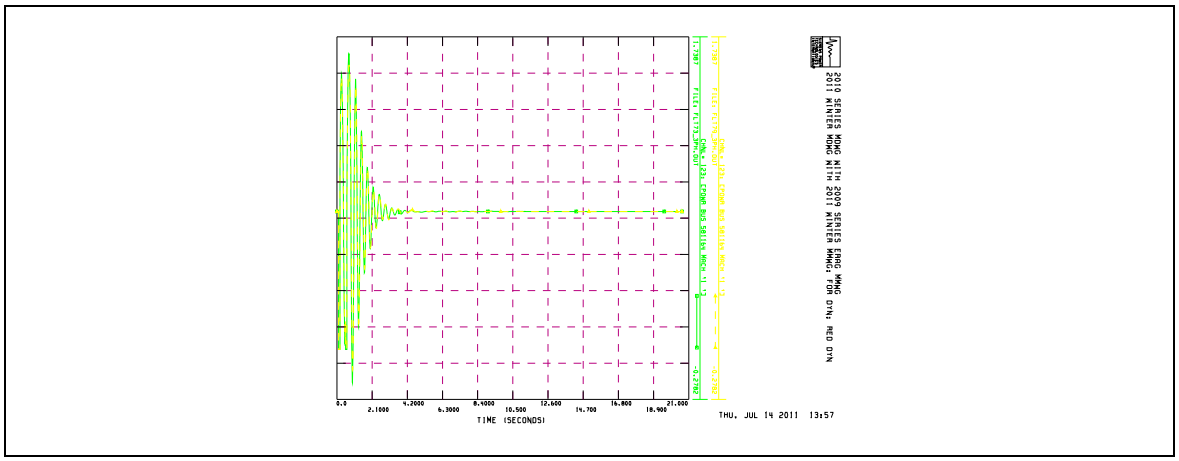


Figure 26: GEN-2010-059 output power for faults FLT73-3PH and FLT79-3PH winter case, machines 581159, 581160 and 581164

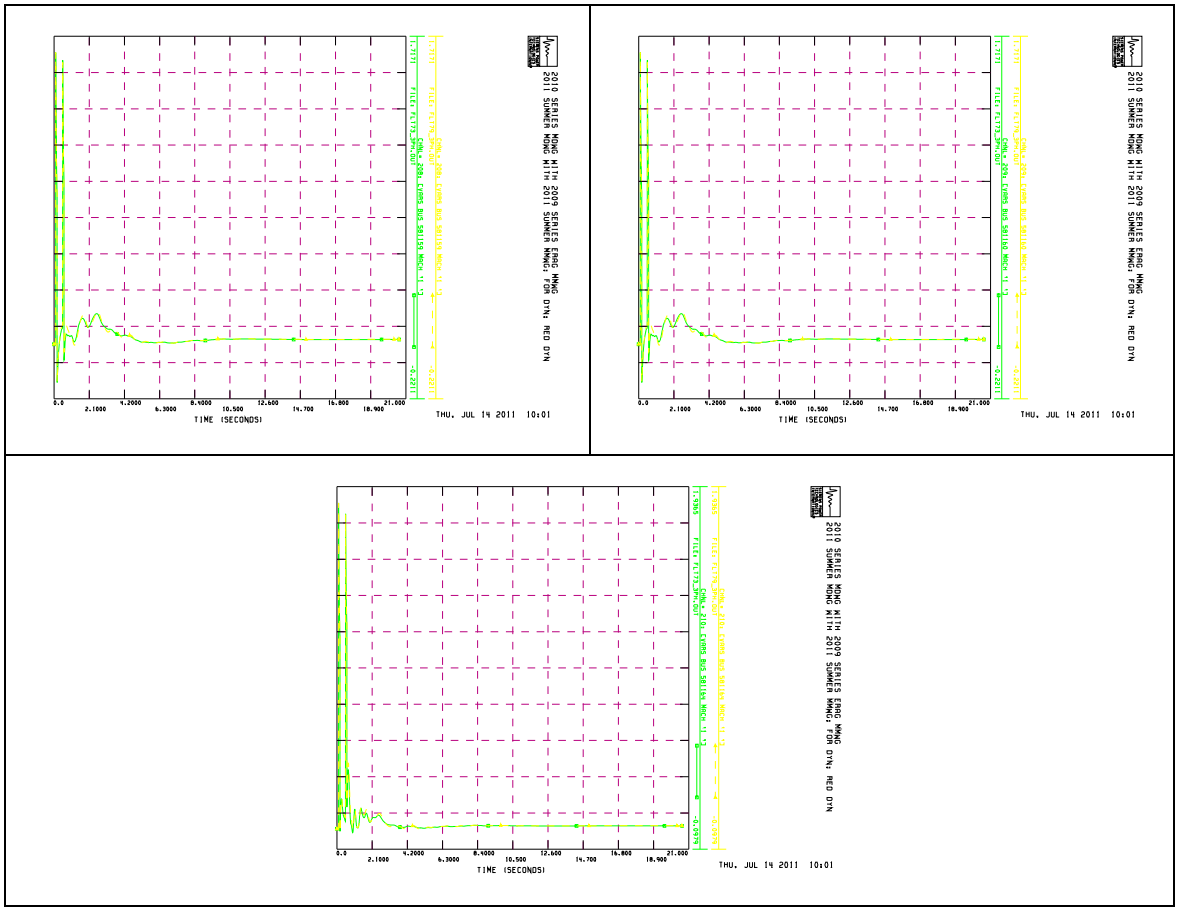


Figure 27: GEN-2010-059 reactive for power faults FLT73-3PH and FLT79-3PH summer case, machines 581159, 581160 and 581164

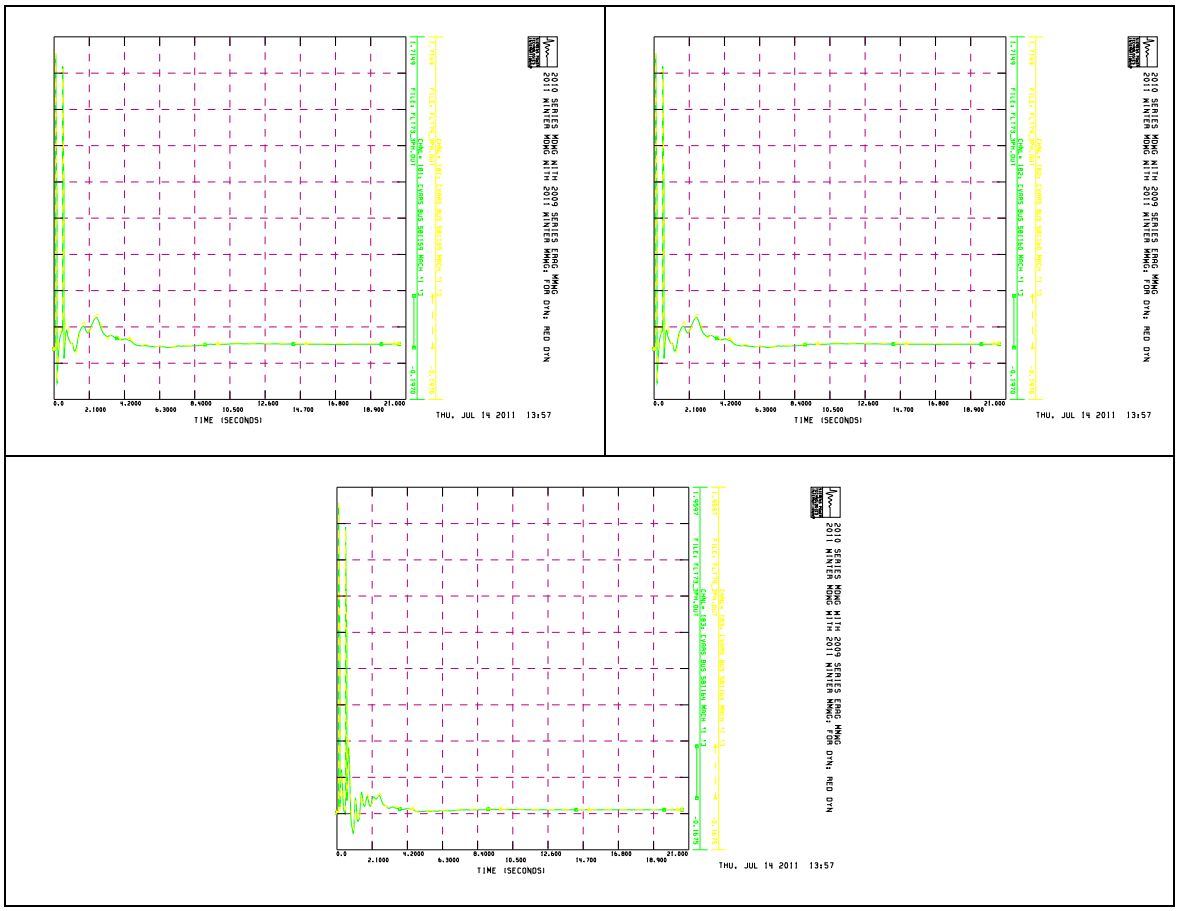
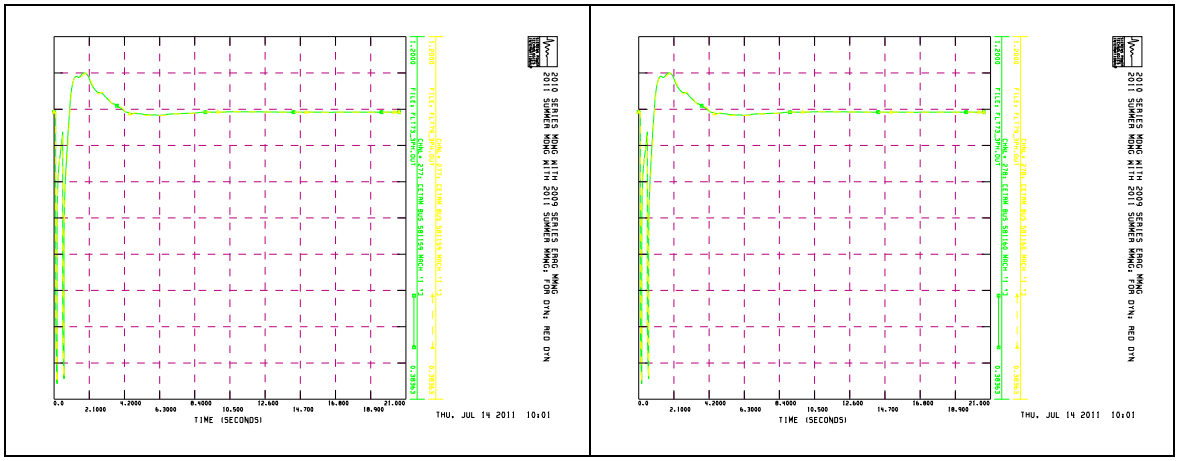


Figure 28: GEN-2010-059 reactive power for faults FLT73-3PH and FLT79-3PH winter case, machines 581159, 581160 and 581164



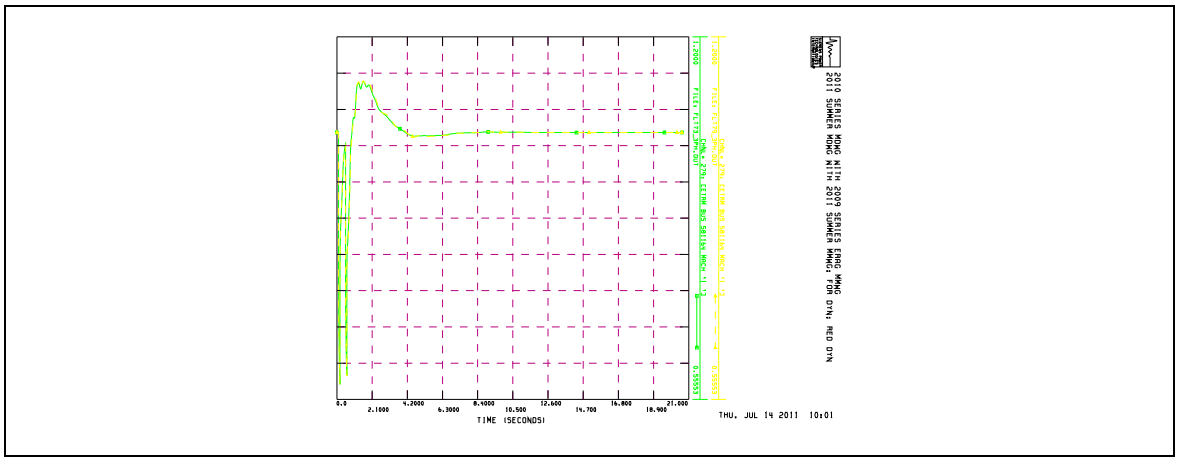


Figure 29: GEN-2010-059 terminal voltage for faults FLT73-3PH and FLT79-3PH summer case, machines 581159, 581160 and 581164

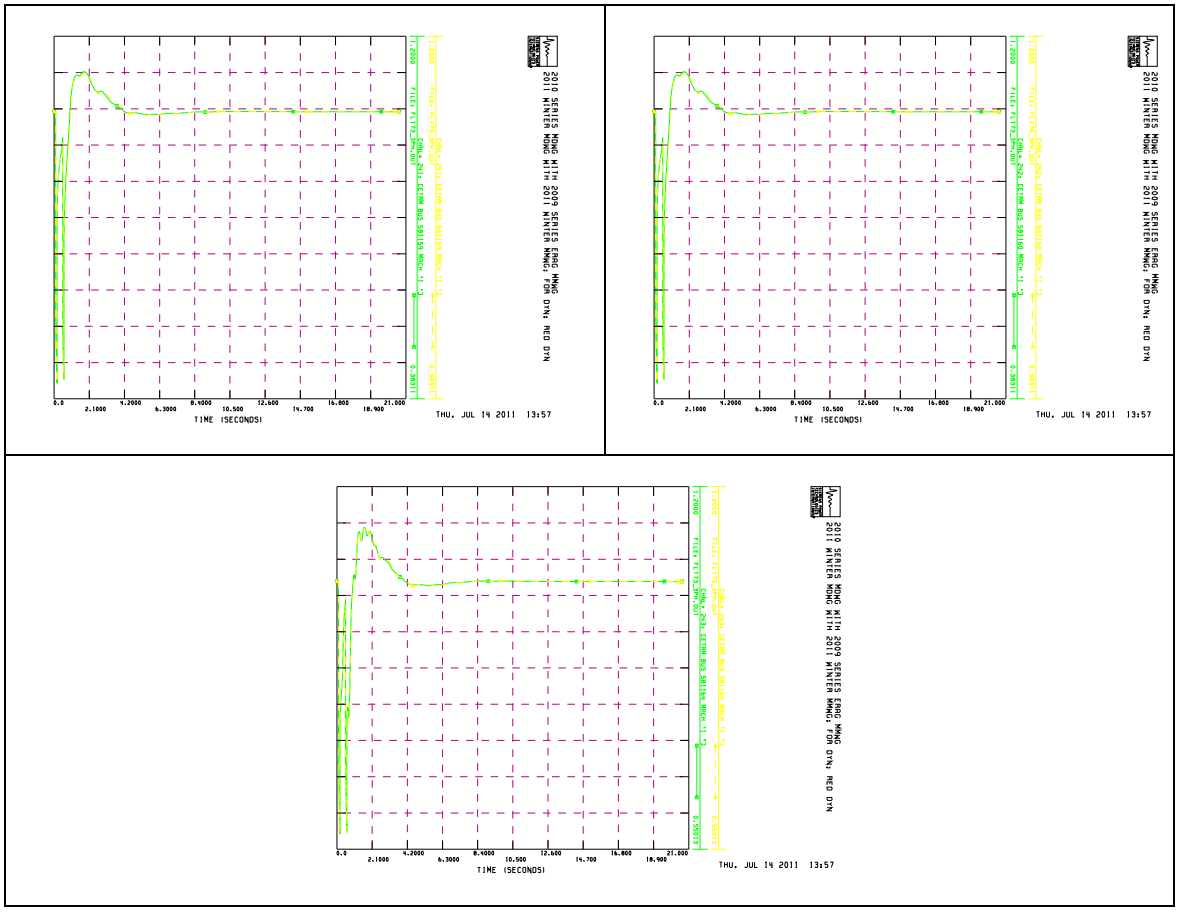


Figure 30: GEN-2010-059 terminal voltage for faults FLT73-3PH and FLT79-3PH winter case, machines 581159, 581160 and 581164

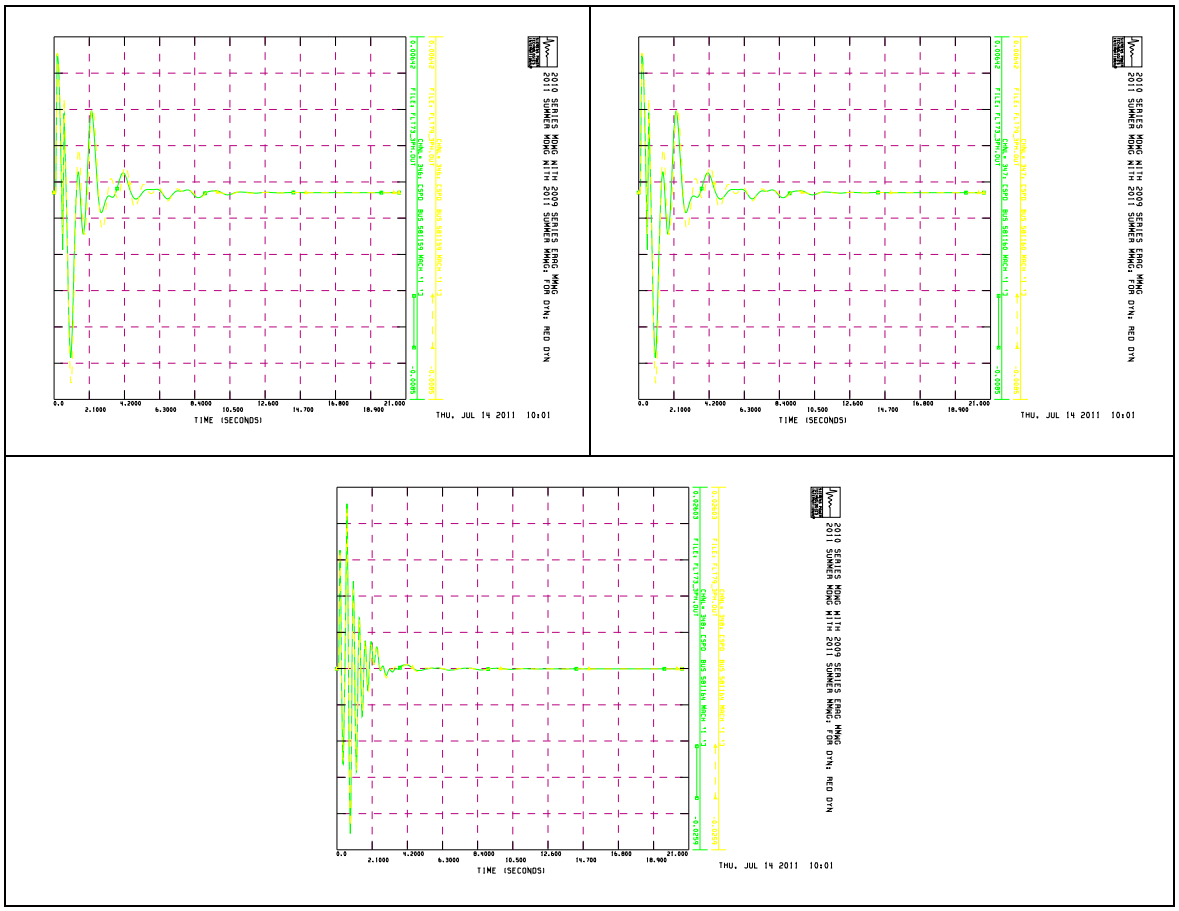
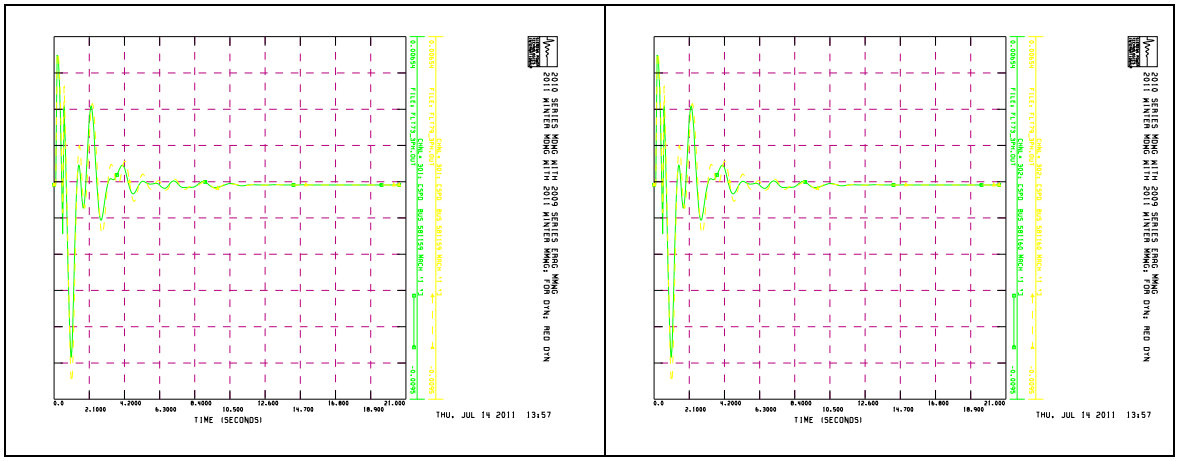


Figure 31: GEN-2010-059 speed for faults FLT73-3PH and FLT79-3PH summer case, machines 581159, 581160 and 581164



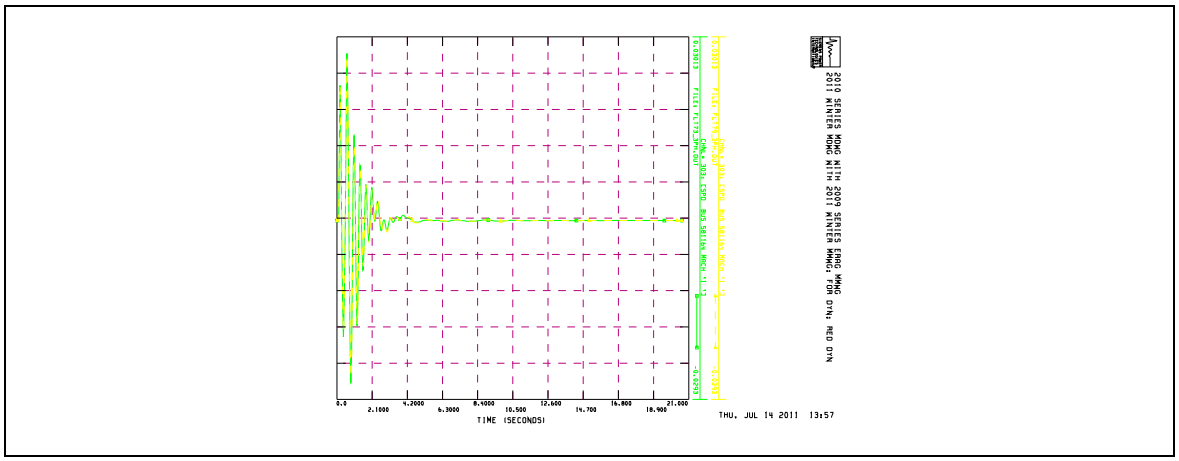
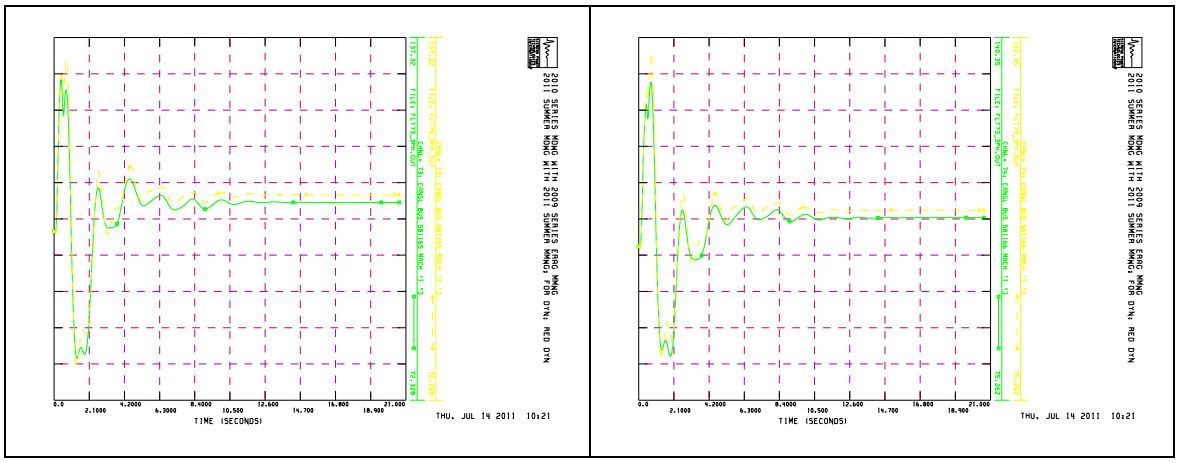


Figure 32: GEN-2010-059 speed for faults FLT73-3PH and FLT79-3PH winter case, machines 581159, 581160 and 581164

GEN-2010-060

The transmission system and the study generators were found to remain stable during the dynamic analysis.

Figures 33 to 42 shows the output power for GEN-2010-060, summer and winter cases, under contingencies FLT73-3PH and FLT79-3PH. The contingencies are in the point of interconnection of the generator. The equivalent model is represented by six equivalent generators, however in this study we are dispatching only three.



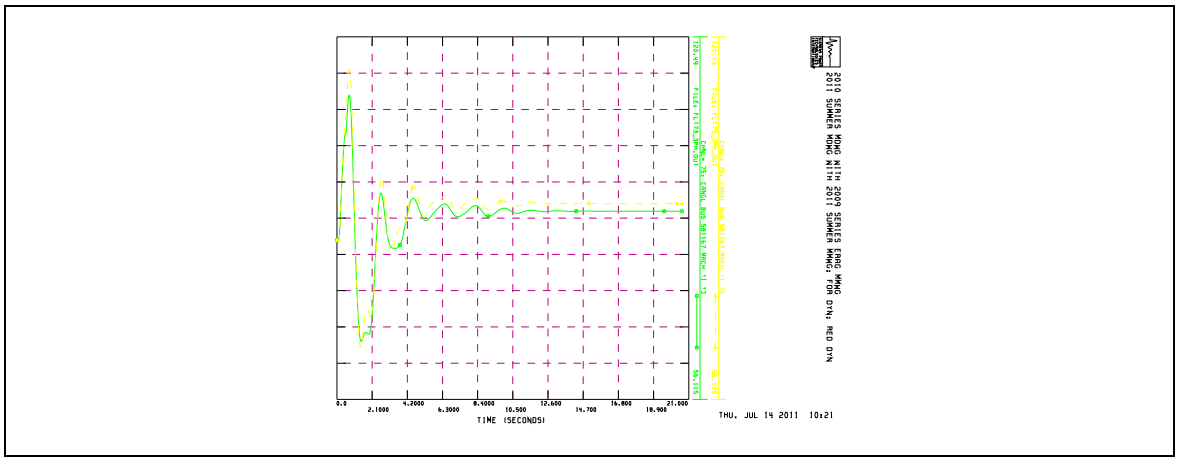


Figure 33: GEN-2010-060 angle for faults FLT73-3PH and FLT79-3PH summer case, machines 581165, 581166 and 581167

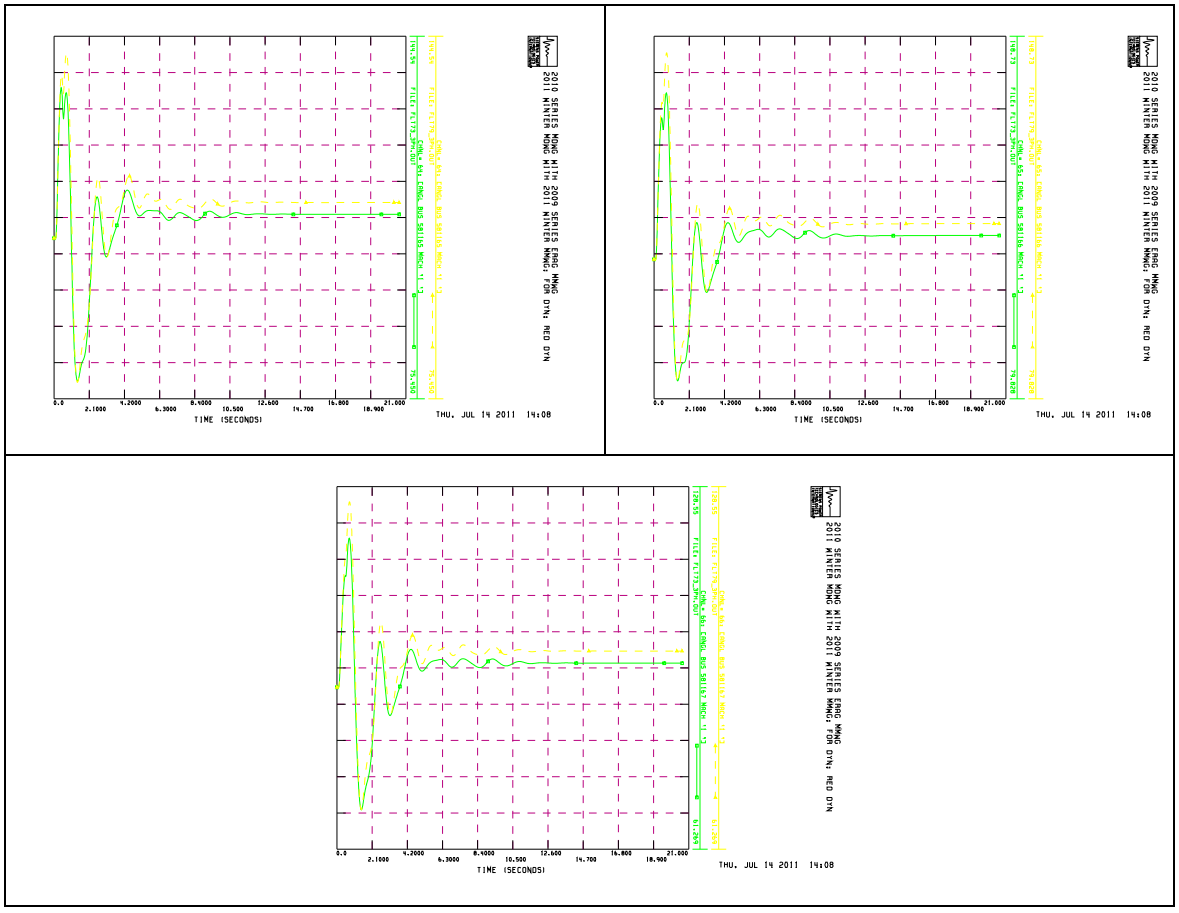


Figure 34: GEN-2010-060 angle for faults FLT73-3PH and FLT79-3PH winter case, machines 581165, 581166 and 581167

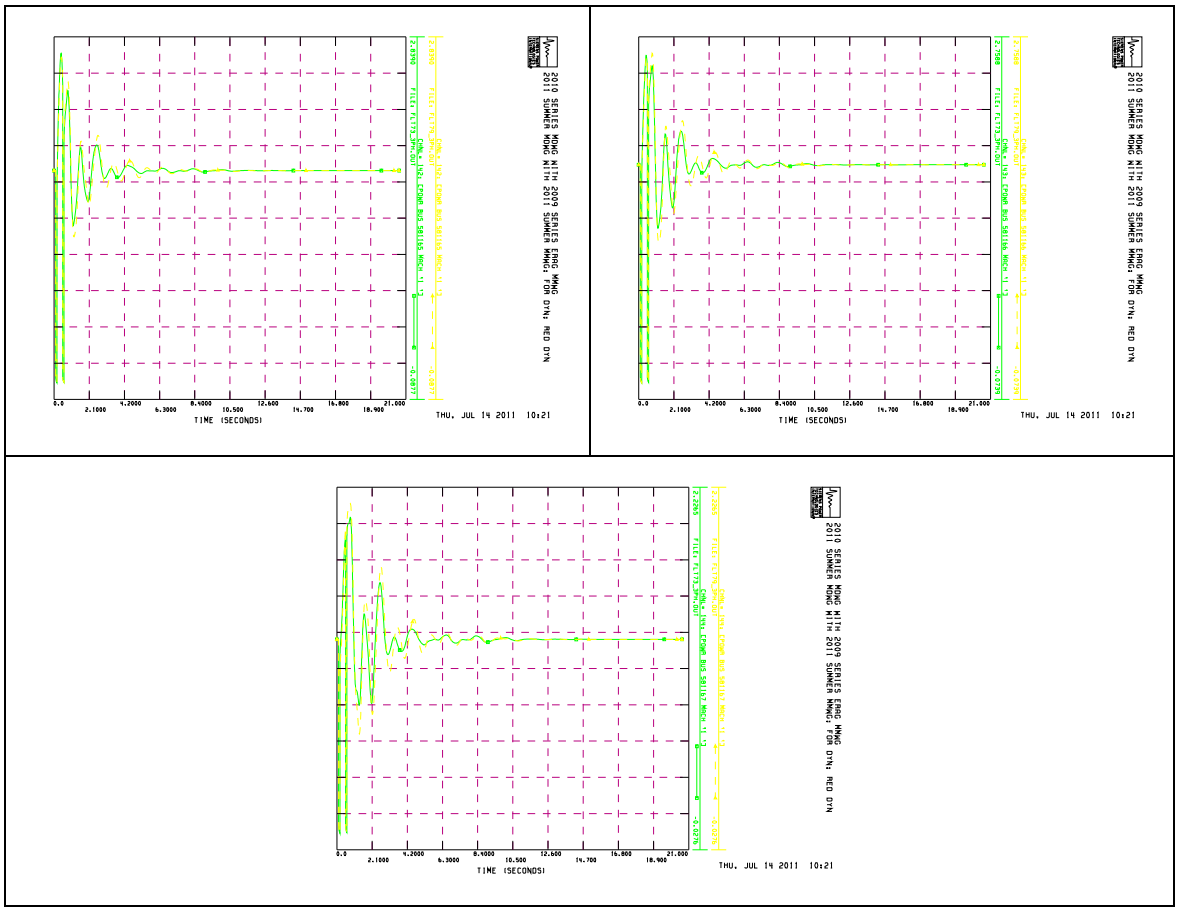
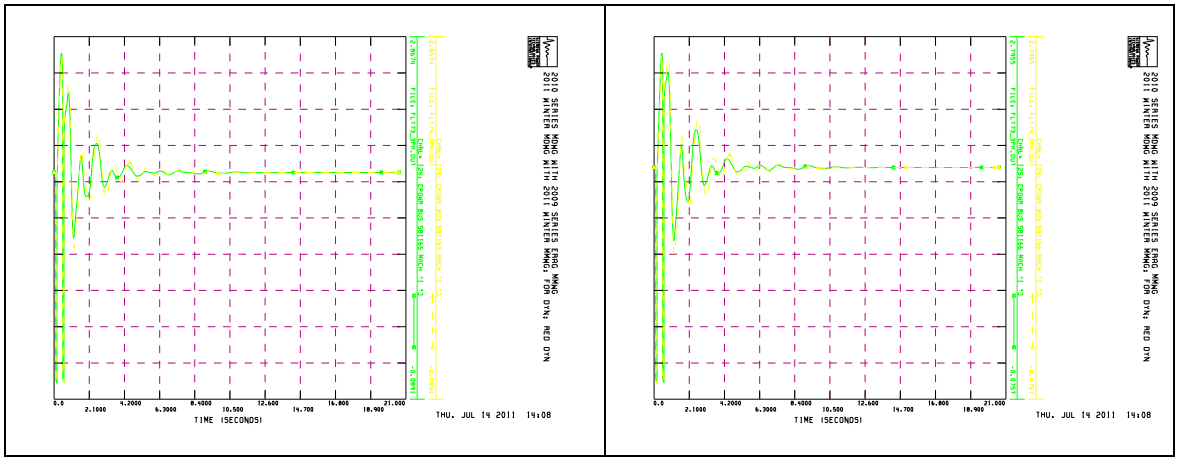


Figure 35: GEN-2010-060 output power for faults FLT73-3PH and FLT79-3PH summer case, machines 581165, 581166 and 581167



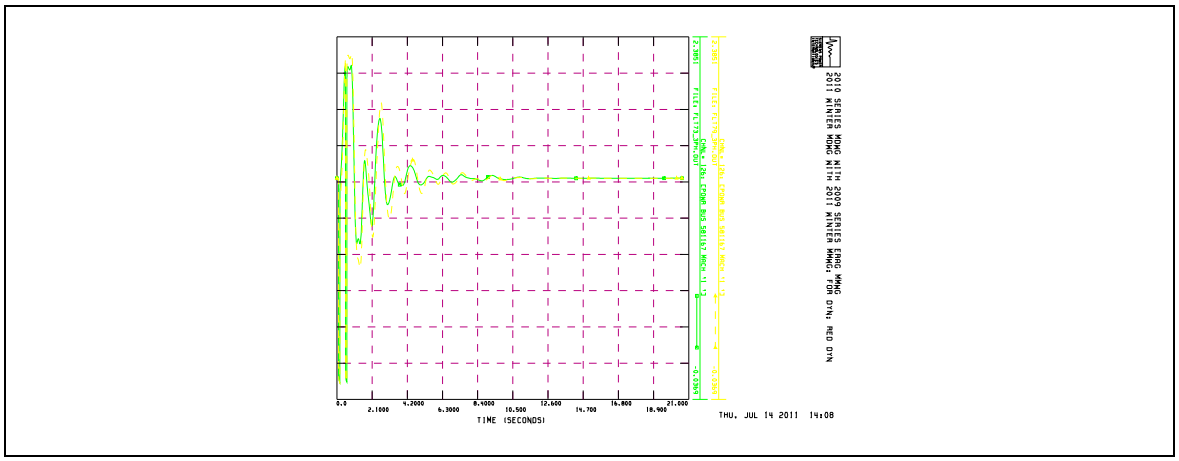


Figure 36: GEN-2010-060 output power for faults FLT73-3PH and FLT79-3PH winter case, machines 581165, 581166 and 581167

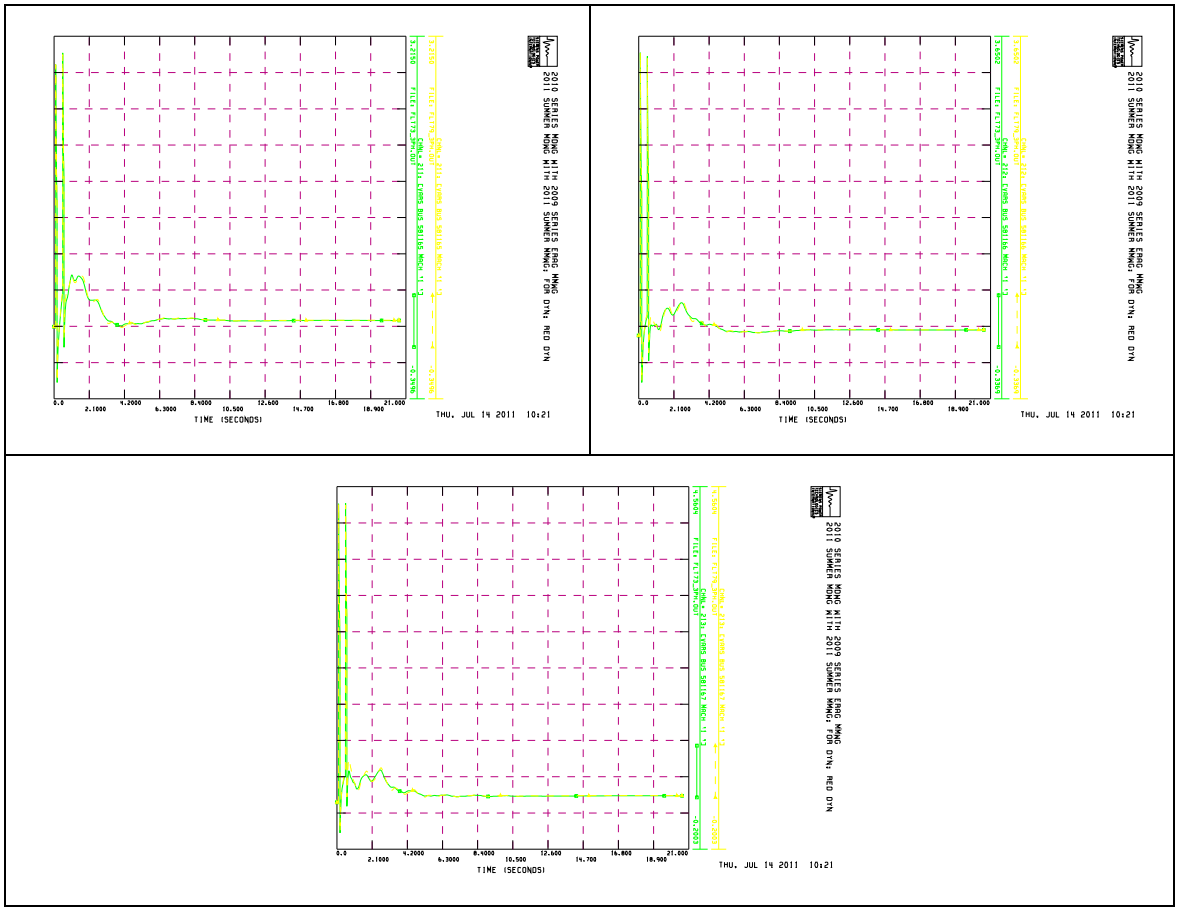


Figure 37: GEN-2010-060 reactive power for faults FLT73-3PH and FLT79-3PH summer case, machines 581165, 581166 and 581167

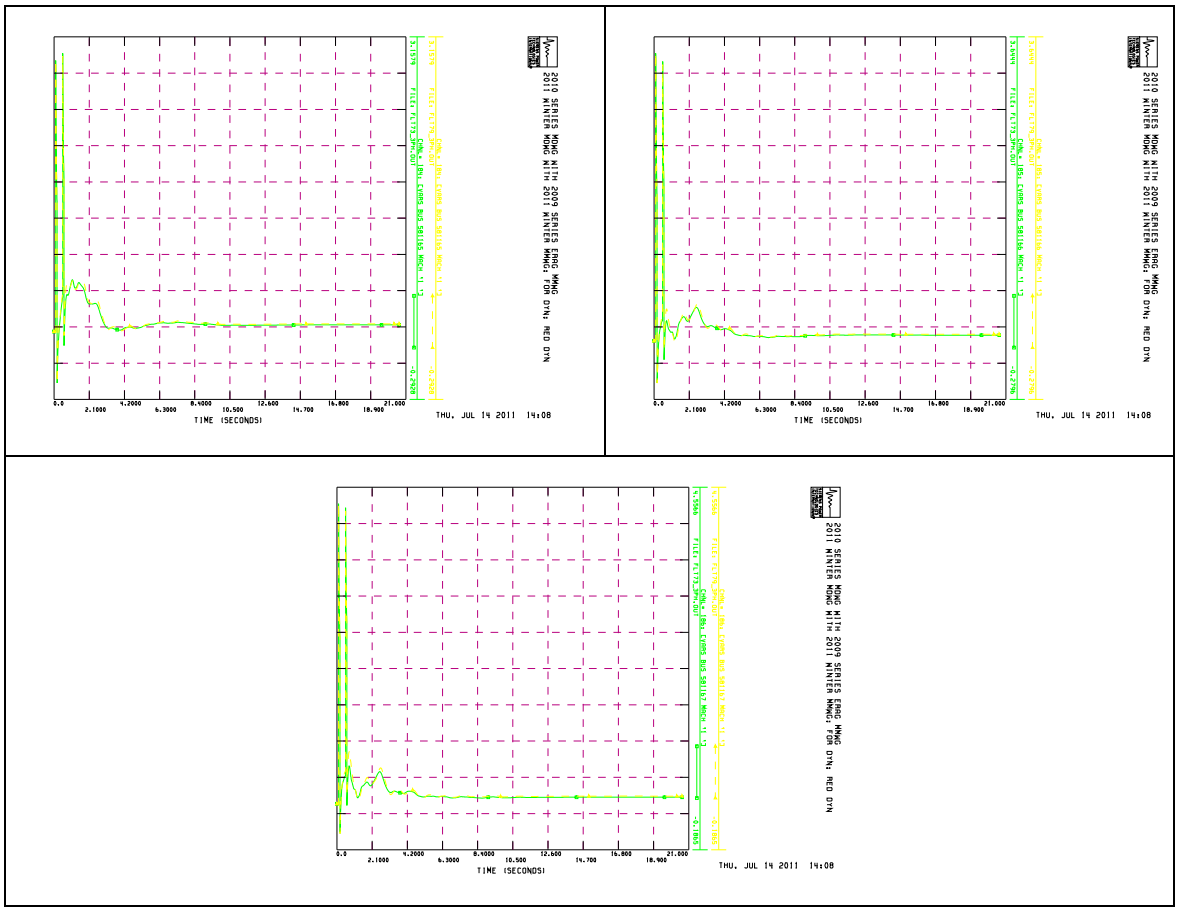
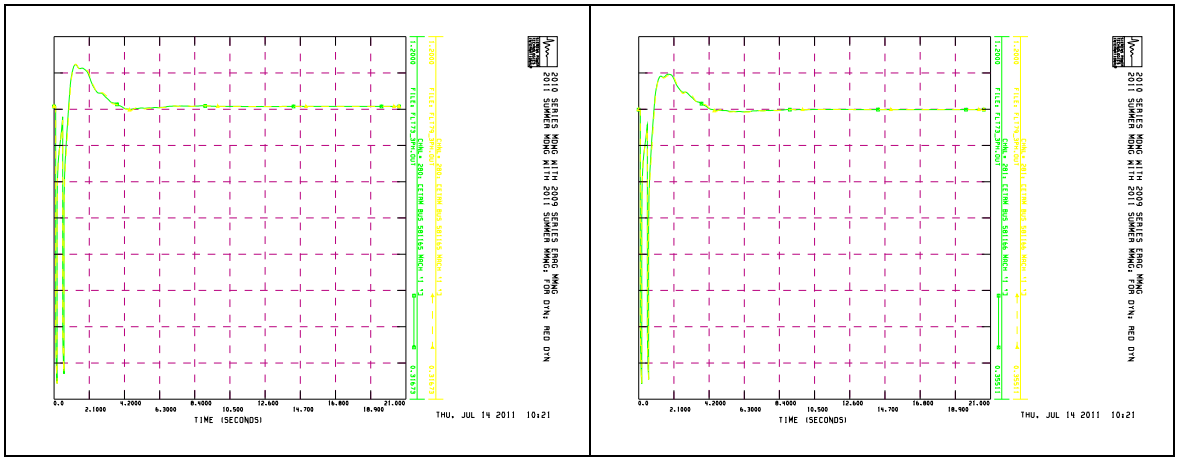


Figure 38: GEN-2010-060 reactive power for faults FLT73-3PH and FLT79-3PH winter case, machines 581165, 581166 and 581167



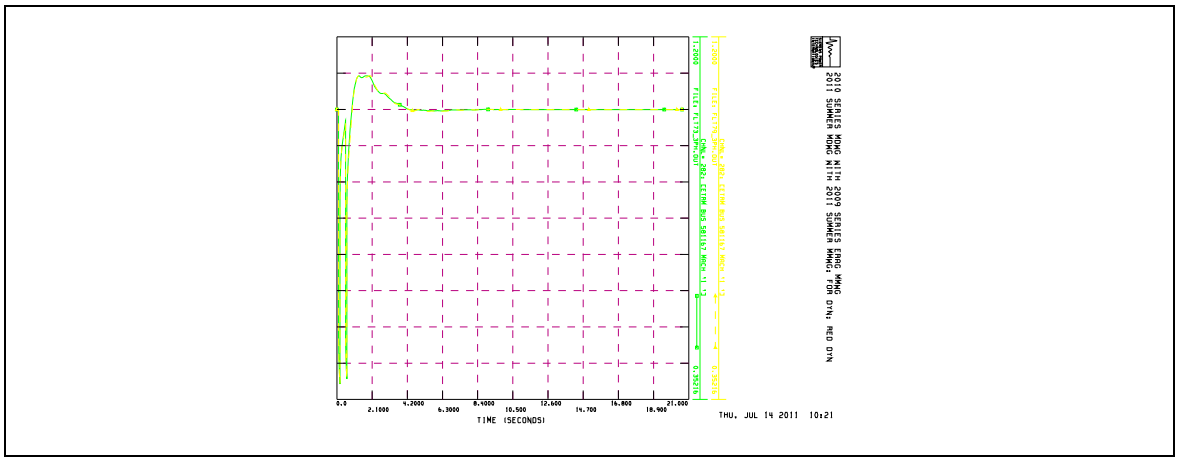


Figure 39: GEN-2010-060 terminal voltage for faults FLT73-3PH and FLT79-3PH summer case, machines 581165, 581166 and 581167

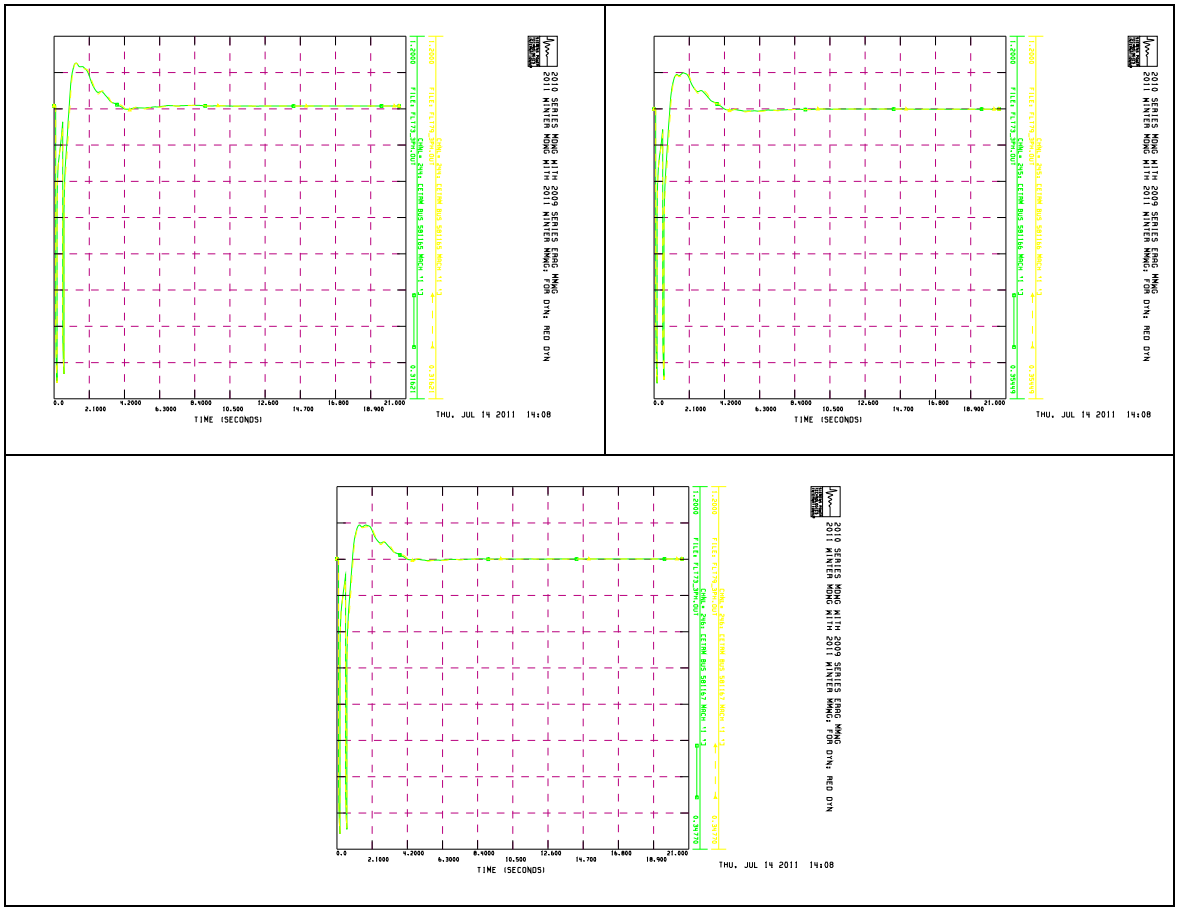


Figure 40: GEN-2010-060 terminal voltage for faults FLT73-3PH and FLT79-3PH winter case, machines 581165, 581166 and 581167

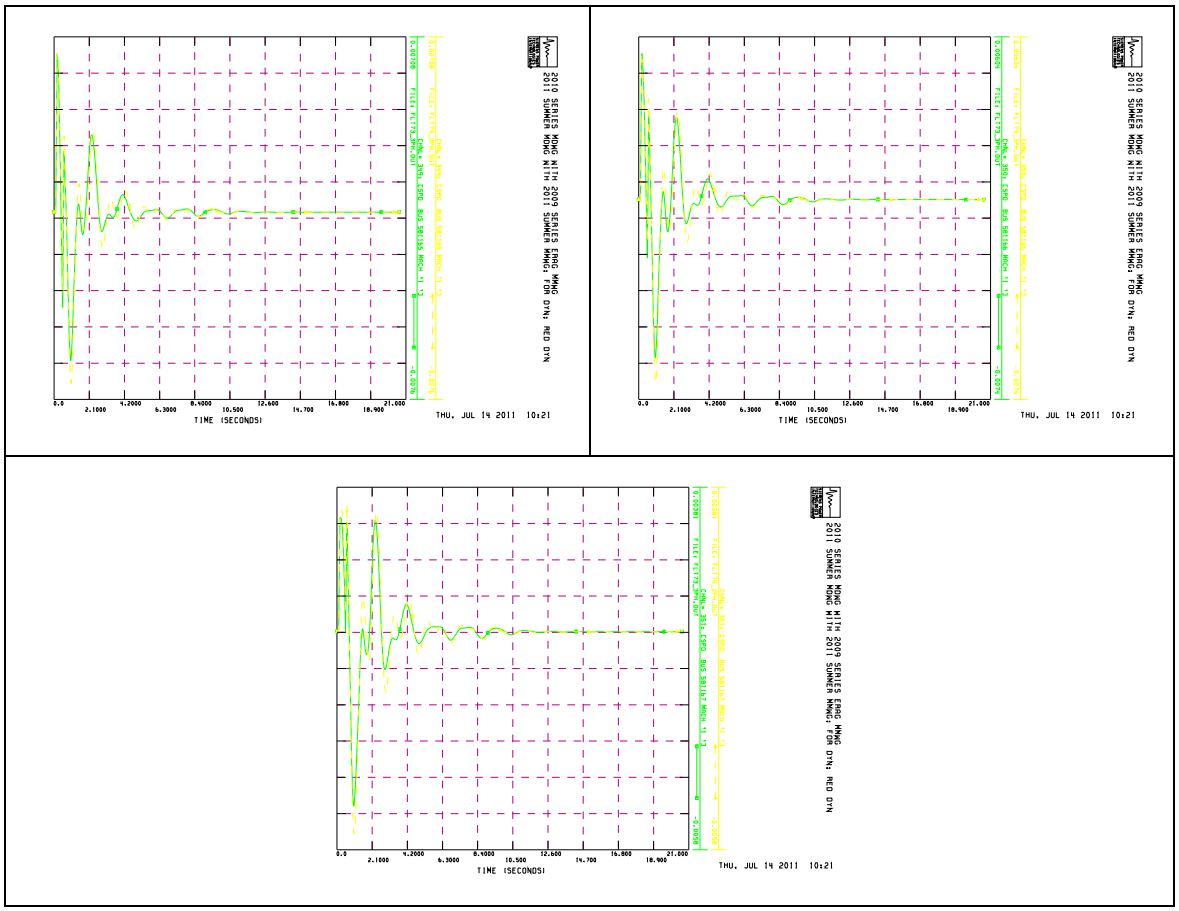
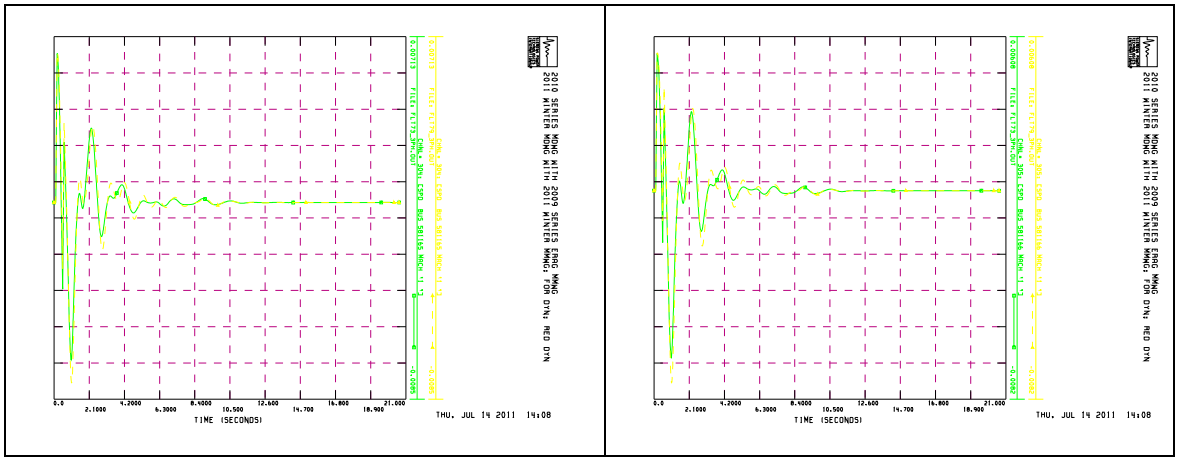


Figure 41: GEN-2010-060 speed for faults FLT73-3PH and FLT79-3PH summer case, machines 581165, 581166 and 581167



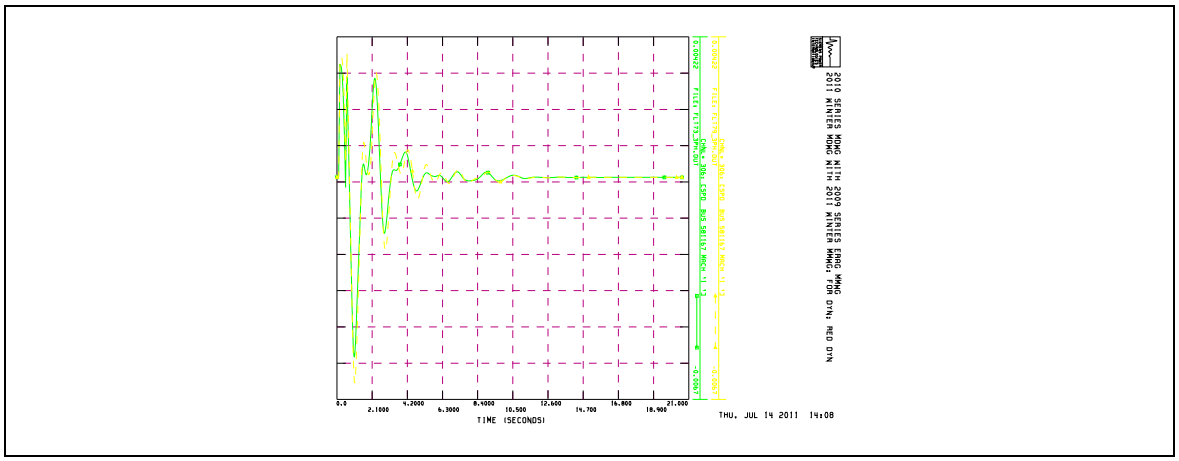
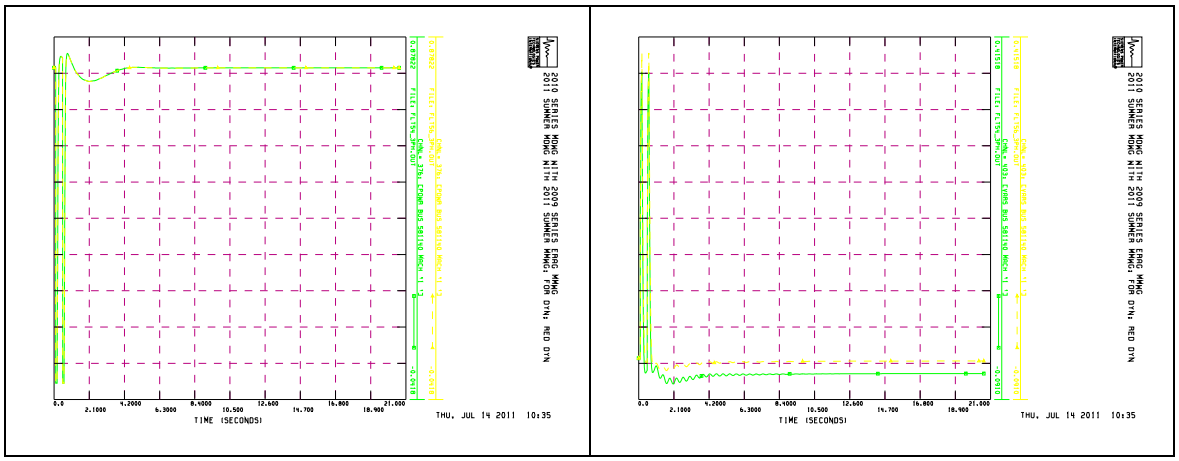


Figure 42: GEN-2010-060 speed for faults FLT73-3PH and FLT79-3PH winter case, machines 581165, 581166 and 581167

GEN-2011-025

The transmission system and the study generators were found to remain stable during the dynamic analysis.

Figure 43 and 44 shows the output power for GEN-2011-025, summer and winter cases respectively, under contingencies FLT54-3PH and FLT56-3PH. The contingencies are in the point of interconnection of the generator. The equivalent model is represented by one equivalent generator.



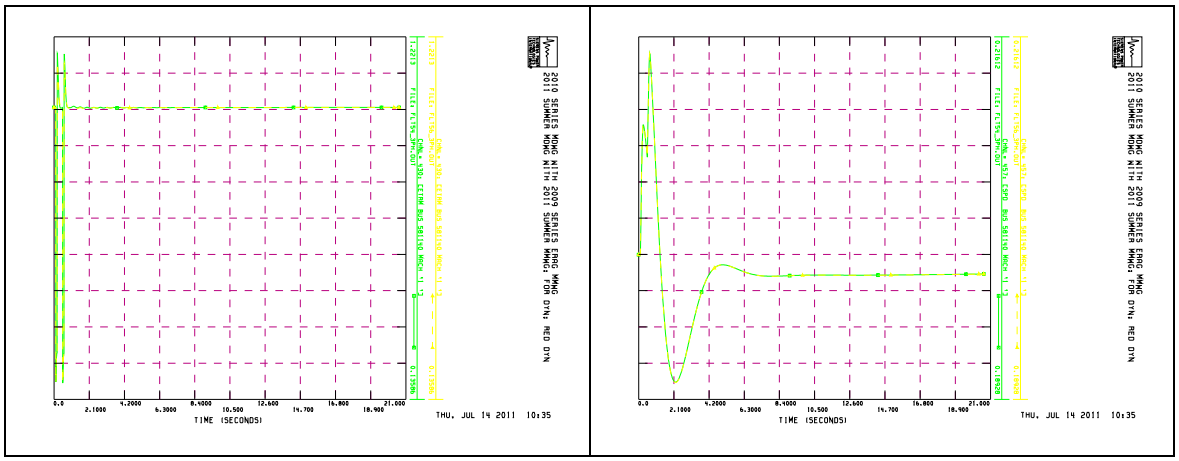


Figure 43: GEN-2011-025 output power, reactive power, terminal voltage and speed for faults FLT54-3PH and FLT56-3PH summer case

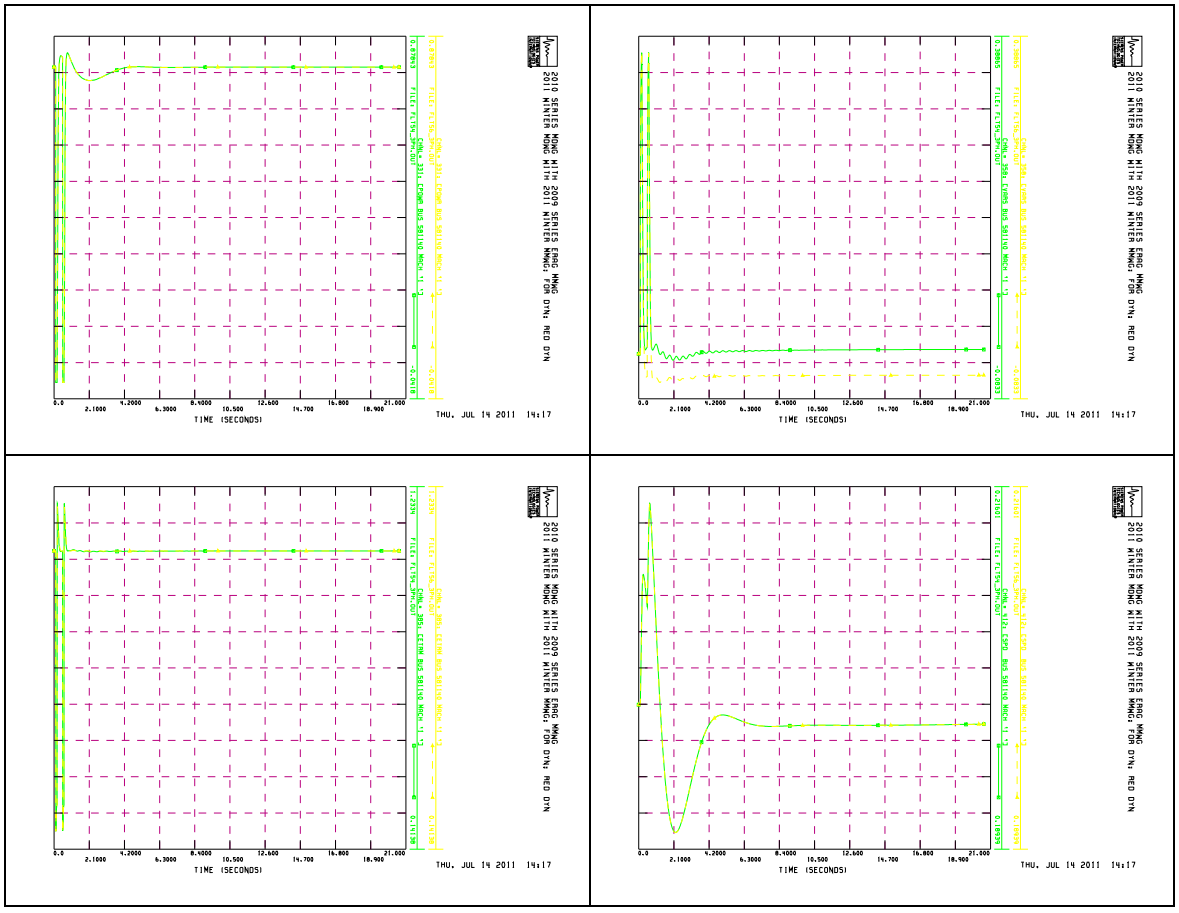


Figure 44: GEN-2011-025 output power, reactive power, terminal voltage and speed for faults FLT54-3PH and FLT56-3PH winter case

8.0 Power Factor Analysis

All interconnection requests are required by the SPP tariff to maintain a 95% lagging (producing vars) and a 95% leading (absorbing vars) power factor at the point of interconnection. These requirements are below

REQUEST	Power Factor Requirement	
	Lead	Lag
GEN-2010-020	95%	95%
GEN-2010-058	95%	95%
GEN-2010-059	95%	95%
GEN-2010-060	95%	95%

Table 5: Required Power Factor for Non-Wind Farms

A power factor analysis was performed for each wind farm request by modeling a VAR generator at the high voltage bus of each interconnection request. The VAR generator was set to hold a voltage schedule of at least 1.00 per unit at the point of interconnection for each request and all the contingencies listed in Table 6 for ASGI-2011-001, Table 7 for ASGI-2011-003 and Table 8 for GEN-2011-025 were studied.

Requests ASGI-2011-001 and ASGI-2011-003 will need to add some capacitors to meet the 95% lagging power factor requirement

POI Voltage (Summer 1.0pu / Winter 1.0pu)	ASGI-2011-001							
CONTINGENCY	MW (S)	MVAR (S)	PF (S)		MW (W)	MVAR (W)	PF (W)	
No contingency	-28.8	-21.8	0.797	LAG	-28.8	-14.3	0.896	LAG
Roswell (527563) - Riac Tap (527528) 69kV line	-28.8	-21.8	0.797	LAG	-28.8	-14.3	0.896	LAG
Roswell (527563) - SW_4702 (527575) 69kV line	-28.8	-21.8	0.797	LAG	-28.8	-14.3	0.896	LAG
Roswell Transformer 69/115 kV (527563 - 527564)	-28.8	-21.8	0.797	LAG	-28.8	-14.3	0.896	LAG
Roswell (527564) - Samson (527546) 115kV line	-28.8	-21.8	0.797	LAG	-28.8	-14.3	0.896	LAG
Chaves County Transformer 115/230 kV (527482 - 527483)	-28.8	-21.8	0.797	LAG	-28.8	-14.3	0.896	LAG
Chaves County (527482) - Urton (527501) 115kV line	-28.8	-21.8	0.797	LAG	-28.8	-14.3	0.896	LAG
Chaves County (527482) - Samson (527546) 115kV line	-28.8	-21.8	0.797	LAG	-28.8	-14.3	0.896	LAG
Chaves County (527483) - Eddy County (527800) 230 kV line	-28.8	-21.8	0.797	LAG	-28.8	-14.3	0.896	LAG
Tolk Transformer 230/345 kV (525543 - 525549)	-28.8	-21.7	0.799	LAG	-28.8	-14.2	0.897	LAG
Tolk Tap (525543) - Tolk East (525524) 230 kV line	-28.8	-21.8	0.797	LAG	-28.8	-14.3	0.896	LAG
Roosevelt South (524911) - Tolk East (525524) 230 kV line	-28.8	-21.8	0.797	LAG	-28.8	-14.3	0.896	LAG
Tolk East (525524) - Plant X (525481) 230 kV line	-28.8	-21.8	0.797	LAG	-28.8	-14.3	0.896	LAG
Tolk East (525524) - Tuco (525830) 230 kV line	-28.8	-21.9	0.796	LAG	-28.8	-14.4	0.894	LAG
Tolk Tap (525543) - Tolk West (525531) 230 kV line	-28.8	-21.8	0.797	LAG	-28.8	-14.3	0.896	LAG
Tolk West (525531) - Lamb County (525637) 230 kV line	-28.8	-21.9	0.796	LAG	-28.8	-14.4	0.894	LAG
Tolk West (525531) - Yoakum (526935) 230 kV line	-28.8	-21.8	0.797	LAG	-28.8	-14.3	0.896	LAG
Deaf Smith (524623) - Plant X (525481) 230 kV line	-28.8	-21.8	0.797	LAG	-28.8	-14.3	0.896	LAG
Sundown (526435) - Plant X (525481) 230 kV line	-28.8	-21.9	0.796	LAG	-28.8	-14.4	0.894	LAG
Plant X (525481) - GEN-2006-039 Tap (560009) 230 kV line	-28.8	-21.8	0.797	LAG	-28.8	-14.3	0.896	LAG
Tuco (525830) - Swisher (525213) 230 kV line	-28.8	-21.8	0.797	LAG	-28.8	-14.3	0.896	LAG
Tuco (525830) - Jones Bus 1 (526337) 230 kV line	-28.8	-21.8	0.797	LAG	-28.8	-14.3	0.896	LAG
Tuco Transformer 230/345 kV (525830 - 525832)	-28.8	-21.8	0.797	LAG	-28.8	-14.3	0.896	LAG
Tuco (525832) - Border (525835) 345 kV line	-28.8	-21.8	0.797	LAG	-28.8	-14.3	0.896	LAG
GEN-2008-014 Tap (560813) - Tuco (525832) 345 kV line	-28.8	-21.7	0.799	LAG	-28.8	-14.2	0.897	LAG
Jones (580504) - Grassland (580502) 345 kV line	-28.8	-22.6	0.787	LAG	-28.8	-14.8	0.889	LAG
Grassland (580502) - Borden (580501) 345 kV line	-28.8	-22.2	0.792	LAG	-28.8	-14.5	0.893	LAG
Grassland Transformer 115/230 kV (526676 - 526677)	-28.8	-21.8	0.797	LAG	-28.8	-14.3	0.896	LAG
Borden Transformer 115/345 kV (522896 - 580501)	-28.8	-21.8	0.797	LAG	-28.8	-14.3	0.896	LAG
Midland Transformer 138/345 kV (522992 - 527916)	-28.8	-21.8	0.797	LAG	-28.8	-14.3	0.896	LAG
Midland (527916) - Hobbs (527894) 345 kV line	-28.8	-21.6	0.800	LAG	-28.8	-14.1	0.898	LAG
GEN-2011-025 Tap (581137) - Floyd County (525780) 115 kV line	-28.8	-21.8	0.797	LAG	-28.8	-14.3	0.896	LAG
GEN-2011-025 Tap (581137) - Crosby County (525926) 115 kV line	-28.8	-21.8	0.797	LAG	-28.8	-14.3	0.896	LAG
Crosby County Transformer 69/115 kV (525925 - 525926)	-28.8	-21.8	0.797	LAG	-28.8	-14.3	0.896	LAG
Crosby County (525926) - Lubbock East (526298) 115kV line	-28.8	-21.8	0.797	LAG	-28.8	-14.3	0.896	LAG
Lubbock East (526299) - Jones Bus 2 (526338) 230 kV line	-28.8	-21.8	0.797	LAG	-28.8	-14.3	0.896	LAG

Floyd County (525780) - Cox (525326) 115kV line	-28.8	-21.8	0.797	LAG	-28.8	-14.3	0.896	LAG
Floyd County Transformer 69/115 kV (525779 - 525780)	-28.8	-21.8	0.797	LAG	-28.8	-14.3	0.896	LAG
Floyd County (525780) - Tuco (525828) 115kV line	-28.8	-21.8	0.797	LAG	-28.8	-14.3	0.896	LAG
Potter (523961) - GEN-2005-017 (579118) 345 kV line	-28.8	-21.9	0.796	LAG	-28.8	-14.4	0.894	LAG
Eddy County Transformer 230/345 (527800 - 527802)	-28.8	-21.6	0.800	LAG	-28.8	-14.2	0.897	LAG
Tuco (525832) - Jones (580504) 345 kV line	-28.8	-21.9	0.796	LAG	-28.8	-14.4	0.894	LAG
Midland (527916) - Borden (580501) 345 kV line	-28.8	-22.1	0.793	LAG	-28.8	-14.5	0.893	LAG
LE-Lovington (528334) - Lea County (527848) 115 kV line	-28.8	-29.6	0.697	LAG	-28.8	-22.6	0.787	LAG
LE-Lovington (528334) - Lea Waits (528325) 115 kV line	-28.8	-13.9	0.901	LAG	-28.8	-12.6	0.916	LAG
Midland (527916) - Yoakum (560022) 345 kV line	-28.8	-20.4	0.816	LAG	-28.8	-14.8	0.889	LAG
Tuco (525832) - Yoakum (560022) 345 kV line	-28.8	-19.7	0.825	LAG	-28.8	-14.3	0.896	LAG
Conestoga (560029) - Finney (523853) 345 kV line	-28.8	-19.8	0.824	LAG	-28.8	-14.3	0.896	LAG

(S) - Summer Case
(W) - Winter Case
Highest Lagging Power Factor

Table 6: ASGI-2011-001 Power Factor Table

POI Voltage (Summer 1.01783pu / Winter 1.0202pu)	ASGI-2011-003							
CONTINGENCY	MW (S)	MVAR (S)	PF (S)		MW (W)	MVAR (W)	PF (W)	
No contingency	-10	-0.2	1.000	LAG	-10	0.6	0.998	LEAD
Roswell (527563) - Riac Tap (527528) 69kV line	-10	-0.2	1.000	LAG	-10	0.6	0.998	LEAD
Roswell (527563) - SW_4702 (527575) 69kV line	-10	-0.2	1.000	LAG	-10	0.6	0.998	LEAD
Roswell Transformer 69/115 kV (527563 - 527564)	-10	-0.2	1.000	LAG	-10	0.6	0.998	LEAD
Roswell (527564) - Samson (527546) 115kV line	-10	-0.2	1.000	LAG	-10	0.6	0.998	LEAD
Chaves County Transformer 115/230 kV (527482 - 527483)	-10	-0.2	1.000	LAG	-10	0.6	0.998	LEAD
Chaves County (527482) - Urton (527501) 115kV line	-10	-0.2	1.000	LAG	-10	0.6	0.998	LEAD
Chaves County (527482) - Samson (527546) 115kV line	-10	-0.2	1.000	LAG	-10	0.6	0.998	LEAD
Chaves County (527483) - Eddy County (527800) 230 kV line	-10	-0.2	1.000	LAG	-10	0.6	0.998	LEAD
Tolk Transformer 230/345 kV (525543 - 525549)	-10	-0.2	1.000	LAG	-10	0.6	0.998	LEAD
Tolk Tap (525543) - Tolk East (525524) 230 kV line	-10	-0.2	1.000	LAG	-10	0.6	0.998	LEAD
Roosevelt South (524911) - Tolk East (525524) 230 kV line	-10	-0.2	1.000	LAG	-10	0.6	0.998	LEAD
Tolk East (525524) - Plant X (525481) 230 kV line	-10	-0.2	1.000	LAG	-10	0.6	0.998	LEAD
Tolk East (525524) - Tuco (525830) 230 kV line	-10	0	1.000	LAG	-10	0.5	0.999	LEAD
Tolk Tap (525543) - Tolk West (525531) 230 kV line	-10	-0.2	1.000	LAG	-10	0.6	0.998	LEAD
Tolk West (525531) - Lamb County (525637) 230 kV line	-10	-0.2	1.000	LAG	-10	0.6	0.998	LEAD
Tolk West (525531) - Yoakum (526935) 230 kV line	-10	-0.2	1.000	LAG	-10	0.6	0.998	LEAD

Deaf Smith (524623) - Plant X (525481) 230 kV line	-10	-0.2	1.000	LAG	-10	0.6	0.998	LEAD
Sundown (526435) - Plant X (525481) 230 kV line	-10	0	1.000	LAG	-10	0.5	0.999	LEAD
Plant X (525481) - GEN-2006-039 Tap (560009) 230 kV line	-10	-0.2	1.000	LAG	-10	0.6	0.998	LEAD
Tuco (525830) - Swisher (525213) 230 kV line	-10	-0.1	1.000	LAG	-10	0.6	0.998	LEAD
Tuco (525830) - Jones Bus 1 (526337) 230 kV line	-10	-0.3	1.000	LAG	-10	0.8	0.997	LEAD
Tuco Transformer 230/345 kV (525830 - 525832)	-10	-0.2	1.000	LAG	-10	0.6	0.998	LEAD
Tuco (525832) - Border (525835) 345 kV line	-10	-0.3	1.000	LAG	-10	0.8	0.997	LEAD
GEN-2008-014 Tap (560813) - Tuco (525832) 345 kV line	-10	-0.4	0.999	LAG	-10	0.9	0.996	LEAD
Jones (580504) - Grassland (580502) 345 kV line	-10	-0.4	0.999	LAG	-10	0.9	0.996	LEAD
Grassland (580502) - Borden (580501) 345 kV line	-10	0	1.000	LAG	-10	0.4	0.999	LEAD
Grassland Transformer 115/230 kV (526676 - 526677)	-10	0	1.000	LAG	-10	0.4	0.999	LEAD
Borden Transformer 115/345 kV (522896 - 580501)	-10	-0.2	1.000	LAG	-10	0.6	0.998	LEAD
Midland Transformer 138/345 kV (522992 - 527916)	-10	-0.2	1.000	LAG	-10	0.6	0.998	LEAD
Midland (527916) - Hobbs (527894) 345 kV line	-10	-0.2	1.000	LAG	-10	0.6	0.998	LEAD
GEN-2011-025 Tap (581137) - Floyd County (525780) 115 kV line	-10	-1.6	0.987	LAG	-10	-2.5	0.970	LAG
GEN-2011-025 Tap (581137) - Crosby County (525926) 115 kV line	-10	-0.5	0.999	LAG	-10	-2	0.981	LAG
Crosby County Transformer 69/115 kV (525925 - 525926)	-10	-2.8	0.963	LAG	-10	-1.4	0.990	LAG
Crosby County (525926) - Lubbock East (526298) 115kV line	-10	-7.6	0.796	LAG	-10	-0.3	1.000	LAG
Lubbock East (526299) - Jones Bus 2 (526338) 230 kV line	-10	-3.2	0.952	LAG	-10	-1.9	0.982	LAG
Floyd County (525780) - Cox (525326) 115kV line	-10	-0.2	1.000	LAG	-10	0.6	0.998	LEAD
Floyd County Transformer 69/115 kV (525779 - 525780)	-10	-0.6	0.998	LAG	-10	0.6	0.998	LEAD
Floyd County (525780) - Tuco (525828) 115kV line	-10	-4.1	0.925	LAG	-10	-0.4	0.999	LAG
Potter (523961) - GEN-2005-017 (579118) 345 kV line	-10	-0.5	0.999	LAG	-10	0.1	1.000	LEAD
Eddy County Transformer 230/345 (527800 - 527802)	-10	-0.4	0.999	LAG	-10	0.9	0.996	LEAD
Tuco (525832) - Jones (580504) 345 kV line	-10	-0.2	1.000	LAG	-10	0.6	0.998	LEAD
Midland (527916) - Borden (580501) 345 kV line	-10	-0.6	0.998	LAG	-10	0.4	0.999	LEAD
LE-Lovington (528334) - Lea County (527848) 115 kV line	-10	-0.4	0.999	LAG	-10	0.9	0.996	LEAD
LE-Lovington (528334) - Lea Waits (528325) 115 kV line	-10	-0.4	0.999	LAG	-10	0.9	0.996	LEAD
Midland (527916) - Yoakum (560022) 345 kV line	-10	-0.3	1.000	LAG	-10	0.8	0.997	LEAD
Tuco (525832) - Yoakum (560022) 345 kV line	-10	-0.6	0.998	LAG	-10	0.3	1.000	LEAD
Conestoga (560029) - Finney (523853) 345 kV line	-10	-0.4	0.999	LAG	-10	0.9	0.996	LEAD

(S) - Summer Case
(W) - Winter Case
Highest Lagging Power Factor
Highest Leading Power Factor

Table 7: ASGI-2011-003 Power Factor Table

POI Voltage (Summer 1.0123pu / Winter 1.0396pu)	GEN-2011-025							
CONTINGENCY	MW (S)	MVAR (S)	PF (S)		MW (W)	MVAR (W)	PF (W)	
No contingency	-80	13.2	0.987	LEAD	-80	11.4	0.990	LEAD
Roswell (527563) - Riac Tap (527528) 69kV line	-80	13.2	0.987	LEAD	-80	11.4	0.990	LEAD
Roswell (527563) - SW_4702 (527575) 69kV line	-80	13.2	0.987	LEAD	-80	11.4	0.990	LEAD
Roswell Transformer 69/115 kV (527563 - 527564)	-80	13.2	0.987	LEAD	-80	11.4	0.990	LEAD
Roswell (527564) - Samson (527546) 115kV line	-80	13.2	0.987	LEAD	-80	11.4	0.990	LEAD
Chaves County Transformer 115/230 kV (527482 - 527483)	-80	13.2	0.987	LEAD	-80	11.4	0.990	LEAD
Chaves County (527482) - Urton (527501) 115kV line	-80	13.2	0.987	LEAD	-80	11.4	0.990	LEAD
Chaves County (527482) - Samson (527546) 115kV line	-80	13.2	0.987	LEAD	-80	11.4	0.990	LEAD
Chaves County (527483) - Eddy County (527800) 230 kV line	-80	13.2	0.987	LEAD	-80	11.4	0.990	LEAD
Tolk Transformer 230/345 kV (525543 - 525549)	-80	13.1	0.987	LEAD	-80	11.4	0.990	LEAD
Tolk Tap (525543) - Tolk East (525524) 230 kV line	-80	13.2	0.987	LEAD	-80	11.4	0.990	LEAD
Roosevelt South (524911) - Tolk East (525524) 230 kV line	-80	13.2	0.987	LEAD	-80	11.4	0.990	LEAD
Tolk East (525524) - Plant X (525481) 230 kV line	-80	13.2	0.987	LEAD	-80	11.4	0.990	LEAD
Tolk East (525524) - Tuco (525830) 230 kV line	-80	13.2	0.987	LEAD	-80	11.4	0.990	LEAD
Tolk Tap (525543) - Tolk West (525531) 230 kV line	-80	13.2	0.987	LEAD	-80	11.4	0.990	LEAD
Tolk West (525531) - Lamb County (525637) 230 kV line	-80	13.2	0.987	LEAD	-80	11.4	0.990	LEAD
Tolk West (525531) - Yoakum (526935) 230 kV line	-80	13.2	0.987	LEAD	-80	11.4	0.990	LEAD
Deaf Smith (524623) - Plant X (525481) 230 kV line	-80	13.1	0.987	LEAD	-80	11.3	0.990	LEAD
Sundown (526435) - Plant X (525481) 230 kV line	-80	13.1	0.987	LEAD	-80	11.3	0.990	LEAD
Plant X (525481) - GEN-2006-039 Tap (560009) 230 kV line	-80	13.1	0.987	LEAD	-80	11.3	0.990	LEAD
Tuco (525830) - Swisher (525213) 230 kV line	-80	12.5	0.988	LEAD	-80	11	0.991	LEAD
Tuco (525830) - Jones Bus 1 (526337) 230 kV line	-80	13.1	0.987	LEAD	-80	11.3	0.990	LEAD
Tuco Transformer 230/345 kV (525830 - 525832)	-80	13.3	0.986	LEAD	-80	11.5	0.990	LEAD
Tuco (525832) - Border (525835) 345 kV line	-80	13.5	0.986	LEAD	-80	11.7	0.989	LEAD
GEN-2008-014 Tap (560813) - Tuco (525832) 345 kV line	-80	13.6	0.986	LEAD	-80	11.8	0.989	LEAD
Jones (580504) - Grassland (580502) 345 kV line	-80	11.6	0.990	LEAD	-80	9.6	0.993	LEAD
Grassland (580502) - Borden (580501) 345 kV line	-80	12.7	0.988	LEAD	-80	10.9	0.991	LEAD
Grassland Transformer 115/230 kV (526676 - 526677)	-80	13	0.987	LEAD	-80	11.7	0.989	LEAD
Borden Transformer 115/345 kV (522896 - 580501)	-80	13.2	0.987	LEAD	-80	11.4	0.990	LEAD
Midland Transformer 138/345 kV (522992 - 527916)	-80	13.2	0.987	LEAD	-80	11.4	0.990	LEAD
Midland (527916) - Hobbs (527894) 345 kV line	-80	13.3	0.986	LEAD	-80	11.5	0.990	LEAD
GEN-2011-025 Tap (581137) - Floyd County (525780) 115 kV line	-80	16.9	0.978	LEAD	-80	10.4	0.992	LEAD
GEN-2011-025 Tap (581137) - Crosby County (525926) 115 kV line	-80	14	0.985	LEAD	-80	17	0.978	LEAD
Crosby County Transformer 69/115 kV (525925 - 525926)	-80	11.9	0.989	LEAD	-80	11.3	0.990	LEAD
Crosby County (525926) - Lubbock East (526298) 115kV line	-80	2.9	0.999	LEAD	-80	8.6	0.994	LEAD
Lubbock East (526299) - Jones Bus 2 (526338) 230 kV line	-80	6.1	0.997	LEAD	-80	6.2	0.997	LEAD

Floyd County (525780) - Cox (525326) 115kV line	-80	14.6	0.984	LEAD	-80	11.3	0.990	LEAD
Floyd County Transformer 69/115 kV (525779 - 525780)	-80	10.3	0.992	LEAD	-80	11.3	0.990	LEAD
Floyd County (525780) - Tuco (525828) 115kV line	-80	9.6	0.993	LEAD	-80	6.5	0.997	LEAD
Potter (523961) - GEN-2005-017 (579118) 345 kV line	-80	12.8	0.987	LEAD	-80	9.3	0.993	LEAD
Eddy County Transformer 230/345 (527800 - 527802)	-80	13	0.987	LEAD	-80	8.2	0.995	LEAD
Tuco (525832) - Jones (580504) 345 kV line	-80	12.3	0.988	LEAD	-80	6	0.997	LEAD
Midland (527916) - Borden (580501) 345 kV line	-80	12.6	0.988	LEAD	-80	7.8	0.995	LEAD
LE-Lovington (528334) - Lea County (527848) 115 kV line	-80	13.2	0.987	LEAD	-80	11.4	0.990	LEAD
LE-Lovington (528334) - Lea Waits (528325) 115 kV line	-80	13.2	0.987	LEAD	-80	11.4	0.990	LEAD
Midland (527916) - Yoakum (560022) 345 kV line	-80	13.2	0.987	LEAD	-80	11.4	0.990	LEAD
Tuco (525832) - Yoakum (560022) 345 kV line	-80	12.1	0.989	LEAD	-80	6.9	0.996	LEAD
Conestoga (560029) - Finney (523853) 345 kV line	-80	13.2	0.987	LEAD	-80	11.4	0.990	LEAD

(S) - Summer Case
(W) - Winter Case
Highest Leading Power Factor

Table 8: GEN-2011-025 Power Factor Table

9.0 Conclusion

A transient stability study has been performed by Southwest Power Pool (SPP) to evaluate the interconnection requests in the Definitive Impact Study Interconnection Study (DISIS-2011-001) for Group 6 in the South Panhandle/New Mexico area.

The DISIS-2011-001 study has seven (7) Interconnection Requests in the South Panhandle/New Mexico area. The interconnection requests include GEN-2010-020, GEN-2010-058, GEN-2010-059, GEN-2010-060, GEN-2011-025, ASGI-2011-003 and ASGI-2011-001. The interconnection requests in DISIS-2011-001 Group 6 are dispatching 908.8MW. The total dispatch for GEN-2010-059 and GEN-2010-060 are 1508MW (winter) and 1440 (summer). This analysis simulated 2016 conditions in which 750MW were requested to be in service..

Low voltage at Oklaunion 345 kV substation and GEN-2008-014 POI, around 0.85 pu in summer and winter cases in the pre-contingency analysis was observed. Because of these conditions the model was not able to initialize properly. The solution found was to add a new 345 kV line between Oklaunion and Lawton Eastise substations and a 100 MVAr capacitor bank at Oklaunion 345 kV substation.

The ASGI-2011-003 WT3 model parameters had to be replaced with typical values to work properly.

The results of a stability analysis determined that for the addition of the DISIS-2011-001 interconnection requests, the transmission system was found to remain stable for both summer and winter peak conditions with all required network upgrades in service. Additionally, the projects that were wind farms were found to stay connected during the contingencies that were studied, meeting the Low Voltage Ride Through (LVRT) requirements of FERC Order #661A.

The power factor analysis indicated that all DISIS-2011-001 interconnection requests will be required to maintain 95% lagging (producing vars) and 95% leading (absorbing vars) power factor at the point of interconnection. The final power factor analyses are shown in Tables 6, 7 and 8. Requests ASGI-2011-001 and ASGI-2011-003 will need to add some capacitors to meet the 95% lagging power factor requirement

If any previously queued projects that were included in this study drop out, then this System Impact Study may have to be revised to determine the impacts of this Interconnection Customer's project on transmission facilities. Since this is also a preliminary System Impact Study, not all previously queued projects were assumed to be in service in this System Impact Study. If any of those projects are constructed, then this System Impact Study may have to be revised to determine the impacts of this Interconnection Customer's project on transmission facilities. In accordance with FERC and SPP procedures, the study cost for restudy shall be borne by the Interconnection Customer.

O: Stability Study for Group 7

Pterra Consulting

Technical Report R123-11

Impact Study for Generation Interconnection Request GEN-2011-001 Group 7 (Draft)

Submitted to

Southwest Power Pool

July 11, 2011

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Executive Summary

This report presents the results of impact study comprising of power factor and stability analyses of the proposed interconnection projects under DISIS-2011-001 Group 7 (the "Project") as described in the following table:

Request	Size (MW)	Wind Turbine Model	Point of Interconnection
GEN-2011-007	250.0	REpower MM92 2.05MW	Matthewson 345kV (560368)
GEN-2011-009	150.4	GE 1.6MW	Hobart Junction 138kV(511463)
GEN-2011-010	100.8	GE 1.6MW	Tap on the Cimarron – Gracemont 345kV (210431)

The analysis was conducted through the Southwest Power Pool ("SPP") Tariff. Power factor analysis and transient stability simulations were conducted with all three projects in service at their full output.

Two base cases, 2011 summer peak and 2011 winter peak conditions, each comprising of a power flow and corresponding dynamics database were provided by SPP. The power flow model and the dynamics database of the two cases were updated to reflect changes based on information from SPP.

Power Factor Test

Gen-2011-007

The results of the power factor analysis showed that GEN-2011-009 is required to maintain a 75% leading (supplying vars) to 97% lagging (absorbing vars) power factor at the point of interconnection.

GEN-2011-009

The results of the power factor analysis showed that GEN-2011-009 is required to maintain a 99% leading (supplying vars) to 99% lagging (absorbing vars) power factor at the point of interconnection.

GEN-2011-010

The results of the power factor analysis showed that GEN-2011-009 is required to maintain a 99% leading (supplying vars) to 99% lagging (absorbing vars) power factor at the point of interconnection.

Stability Simulations

Sixty (60) faults were considered for the transient stability simulations which include three-phase faults and single-line-to-ground faults at the locations defined by SPP. The results of the simulation showed neither angular nor voltage instability problems in the SPP system for the sixty faults. The study finds that the interconnection of the proposed projects does not impact the stability performance of the SPP system for the faults tested on the supplied base cases.

Section 1. Introduction

1.1. Project Overview

This report presents the results of impact study comprising of power factor and stability analyses of the proposed interconnection projects under DISIS-2011-001 Group 7 (the "Project") as described in Table 1-1:

Table 1-1 Projects Included Under DISIS-2011-001 (Group 7)

Request	Size (MW)	Wind Turbine Model	Point of Interconnection
GEN-2011-007	250.0	REpower MM92 2.05MW	Matthewson 345kV (560368)
GEN-2011-009	150.4	GE 1.6MW	Hobart Junction 138kV(511463)
GEN-2011-010	100.8	GE 1.6MW	Tap on the Cimarron – Gracemont 345kV (210431)

Figures 1-1, 1-2, and 1-3 show the interconnection diagrams of the Project to SPP's system as modeled in the power flow cases.

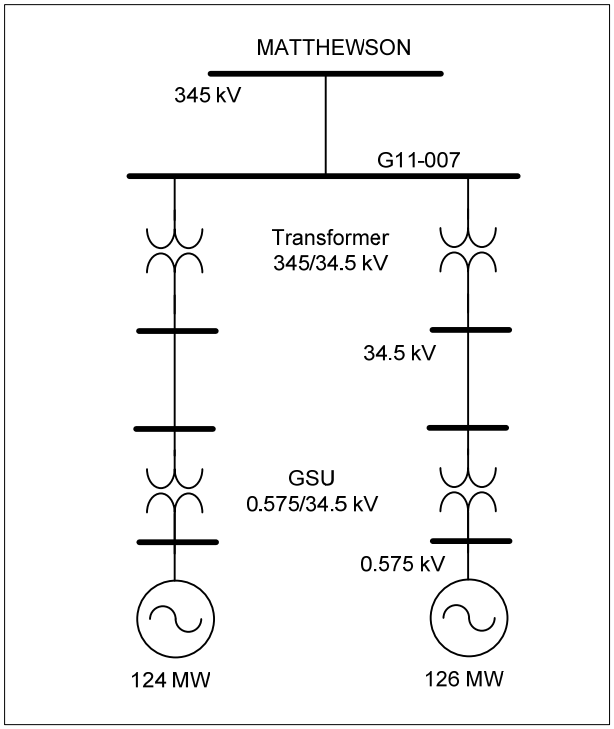

Figure 1-1 Power Flow Model for Gen-2011-007

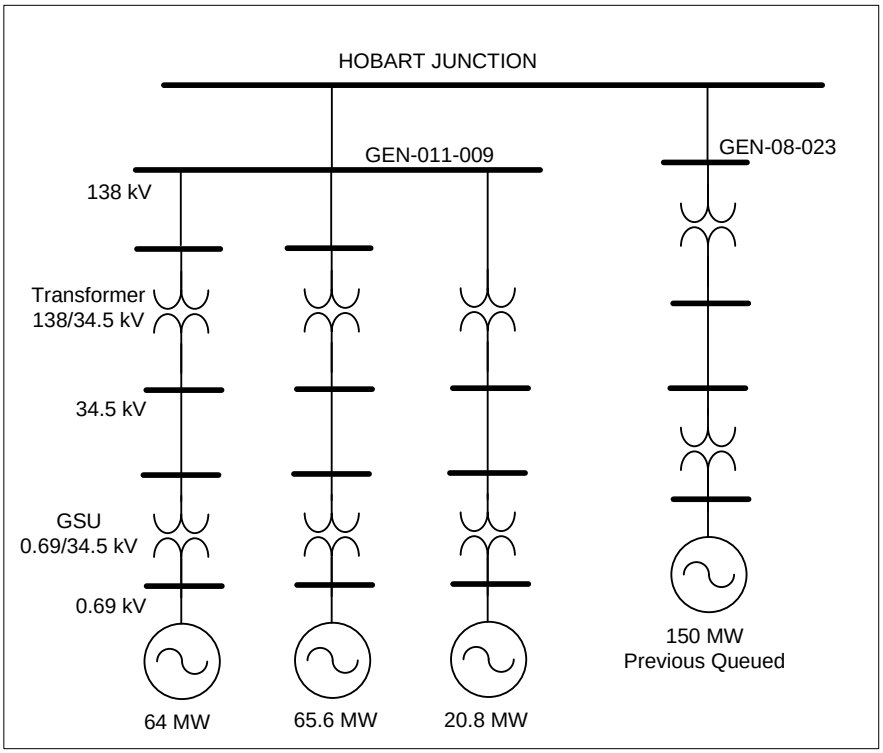

Figure 1-2 Power Flow Model for Gen-2011-009

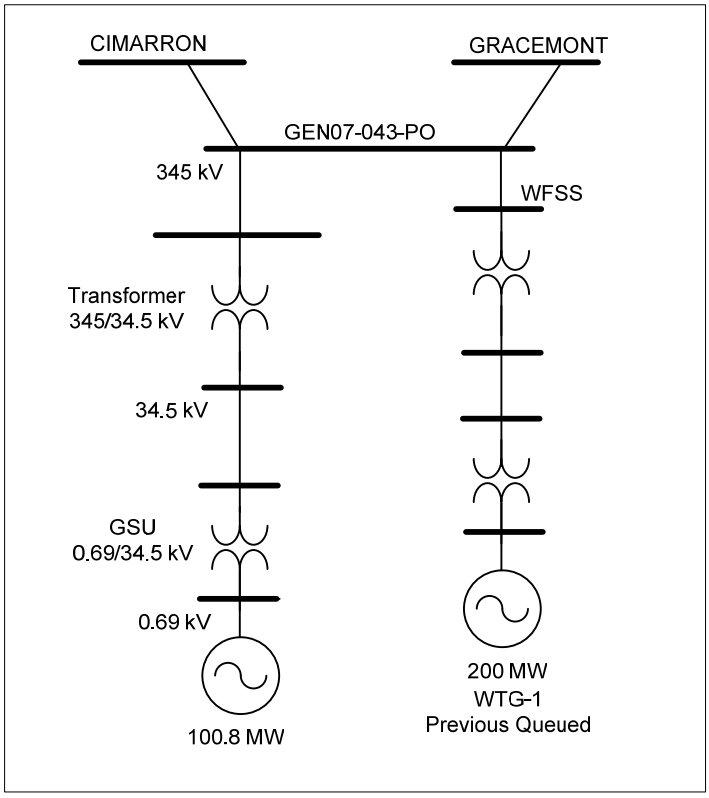

Figure 1-3 Power Flow Model for Gen-2011-010

Table 1-2 shows the list of prior queued projects modeled in the base case.

Table 1-2 List of Prior Queued Projects

Request	Size (MW)	Wind Turbine Model	Point of Interconnection
Blue Canyon I	74	CIMTR	Washita 138kV (521089)
Blue Canyon II (GEN-2003-004)	151	Vestas V80	Washita 138kV (521089)
Weatherford	147	G.E. 1.5MW	Weatherford 138kV (511506)
GEN-2003-005	100	G.E. 1.5MW	Tap on the Anadarko – Paradise 138kV line (521129)
GEN-2006-002	101	G.E. 1.5 & 1.6MW	Sweetwater 230kV (511541)
GEN-2006-035	224	Gamesa	Sweetwater 230kV (511541)
GEN-2006-043	98.9	Siemens 2.3MW	Sweetwater 230kV (511541)
GEN-2007-032	150	Acciona 1.5MW	Tap on the Clinton Jct. – Clinton 138kV line (560939)
GEN-2007-043	200	G.E. 1.6MW	Tap on the Cimarron – Gracemont 345kV line (210431)
GEN-2007-052	150	Gas Turbine	Anadarko 138kV (520814)
GEN-2008-023	150	G.E. 1.5MW	Hobart Junction 138kV (511463)
GEN-2009-016	100.8	G.E. 1.6MW	Falcon Road 138KV (511511)
GEN-2008-037	100.8	Vestas V90 1.8MW	Tap on the Washita – Blue Canyon 138kV line (Bus 573570)
GEN-2009-030	100.8	GE 1.6MW	Weatherford 138kV (521092)
GEN-2009-060	85.5	GE 1.5MW	Gotebo 69kV (520925)
GEN-2010-012	65	Clipper 2.5MW	Brantley 138kV (520832)
GEN-2010-040	300.3	Suzlon 2.1MW	Cimarron 345kV (514901)

1.2. 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 farms to SPP's transmission system.

Section 2. Power Factor Analysis

2.1. Methodology

Power factor analysis was conducted for the Project using a methodology which is summarized as follows:

1. Turn off the Project wind farm as modeled (as well as prior queued projects at the same point of interconnection). Replace the wind farms by a generator at the high side bus with the MW of the wind farms and no VAR capability.

2. Model a VAR generator at the wind farm's substation high voltage bus. 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 p.u. voltage, whichever is higher.

3. Conduct steady state contingency analysis to determine the power factor necessary at the POI for each contingency.

4. If the required power factor at the POI is beyond the capability of the studied wind turbines, 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:

    4.1. The ability of the wind farm to meet FERC Order 661A (low voltage ride through) with and without capacitor banks.
    4.2. The ability of the wind farm to meet FERC Order 661A (wind farm recovery to pre-fault voltage).
    4.3. If wind farms trips on high voltage, power factor lower than unity may be required.

2.2. Analysis

The Project and prior-queued project wind farms were turned off and replaced by a generator at the high voltage bus equivalent to the combined capacities of the plants and with no VAR capability. A VAR generator was also modeled at the same bus and was set to hold a voltage of 1.00 P.U. at the POI. Table 2-1 shows the pre-contingency voltages at the POI's in the provided power flow models.

Table 2-1 Pre-contingency Voltages at POI

Request	Point of Interconnection	Size (MW)	Base Case Voltage (p.u.)	
			Summer Peak	Winter Peak
GEN-2011-007	Matthewson 345kV (560368)	250.0	0.999	0.997
GEN-2011-009	Hobart Junction 138kV(511463)	150.4	1.000	0.996
GEN-2011-010	Tap on the Cimarron – Gracemont 345kV (210431)	100.8	0.990	0.990

A. Gen-2011-007

POI: Matthewson 345kV

The var generator either supplies or absorbs reactive power for different contingencies as summarized in Table 2-2. The highest values obtained are as follows:

1. For the summer case, the var generator supplies 172.6 MVar for the outage of Matthewson-Tatonga 345 kV line and absorbs 61.3 MVAR for the loss of Matthewson-Northwest 345 kV line.
2. For the winter case, the var generator supplies 223.1 MVAR for the outage of Matthewson-Tatonga 345 kV line and absorbs 37.9 MVAR for the loss of Matthewson-Northwest 345 kV line.
3. The corresponding power factor requirements for GEN-2011-007 are 75% leading (supplying vars) and 97% lagging (absorbing vars)

Table 2-2 VAR Generator Output in Summer and Winter Peak Cases for GEN-2011-007

CASE	CONTINGENCY	POWER FACTOR		MW @ POI	VARGEN MVAR
SP	BASE CASE	1.00	Lag	250.0	-24.4
	MATTHEWSON (560368) - TATONGA (515407) 345KV LINE	0.95	Lead	250.0	82.9
	MATTHEWSON (560368) - TATONGA (515407) 345KV LINES CKT 1 & 2	0.82	Lead	250.0	172.6
	GEN-2007-043 TAP (210431) - CIMARRON (514901) 345KV LINE	1.00	Lag	250.0	-5.4
	GEN-2007-043 TAP (210431) - GRACEMONT (515800) 345KV LINE	0.99	Lag	250.0	-35.0
	GRACEMONT (515800) - LAWTON EASTSIDE (511468) 345KV LINE	1.00	Lag	250.0	-16.9
	GRACEMONT 345KV (515800) - 138KV (515802) TRANSFORMER	1.00	Lag	250.0	-17.6
	CIMARRON (514901) - NORTHWEST (514880) 345KV LINE	1.00	Lag	250.0	-6.4
	CIMARRON (514901) - DRAPER (514934) 345KV LINE	1.00	Lead	250.0	15.9
	CIMARRON 345KV (514901) - 138KV (514898) TRANSFORMER	0.98	Lag	250.0	-51.7
	WOODRING (514715) - GEN-2008-013 TAP (210130) 345KV LINE	0.99	Lead	250.0	25.4
	WOODRING (514715) - SOONER (514803) 345KV LINE	1.00	Lag	250.0	-7.6
	WOODRING 345KV (514715) - 138KV (514714) TRANSFORMER	0.99	Lag	250.0	-39.0
	HOBART JUNCTION (511463) - CARNEGIE SOUTH (511445) 138KV LINE	1.00	Lag	250.0	-23.0
	HOBART JUNCTION. (511463) - CLINTON SHERMAN AFB TAP (511446) 138KV LINE	1.00	Lag	250.0	-23.2
	HOBART JUNCTION (511463) - TAMARACK TAP (529302) 138KV LINE	1.00	Lag	250.0	-14.8
	HOBART JUNCTION 138KV (511463) - 69KV (511464) TRANSFORMER	1.00	Lag	250.0	-19.3
	WASHITA (521089) - SOUTHWEST STATION (511477) 138KV LINE	1.00	Lag	250.0	-15.1

CASE	CONTINGENCY	POWER FACTOR		MW @ POI	VARGEN MVAR
	GRACEMONT (515802) - WASHITA (521089) 138KV LINE CKT 1	1.00	Lag	250.0	-23.1
	WASHITA (521089) - ONEY (521017) 138KV LINE	1.00	Lag	250.0	-23.8
	WEATHERFORD (521092) - WASHITA (521089) 138KV LINE	1.00	Lag	250.0	-20.8
	ELK CITY (511458) - CLINTON SHERMAN AFB TAP (511446) 138KV LINE	1.00	Lag	250.0	-23.1
	ELK CITY 138KV (511458) - 230KV (511490) TRANSFORMER	0.99	Lag	250.0	-34.2
	ELK CITY 138KV (511458) - 69KV (511459) TRANSFORMER	1.00	Lag	250.0	-22.0
	ANADARKO (520814) - SOUTHWEST (511477) 138KV LINE	0.99	Lag	250.0	-25.3
	ANADARKO (520814) - GRACEMONT (515802) 138KV LINE	1.00	Lag	250.0	-20.1
	ANADARKO (520814) - CORNVILLE TAP (520867) 138KV LINE	1.00	Lag	250.0	-13.7
	ANADARKO (520814) - GEORGIA (520923) 138KV LINE	1.00	Lag	250.0	-13.6
	ANADARKO (520814) - POCASSET (521031) 138KV LINE	1.00	Lead	250.0	9.6
	ALTUS (511440) - SNYDER (511435) 138KV LINE	1.00	Lag	250.0	-22.3
	SWEET WATER (511541) - WHEELER (523777) 230KV LINE	1.00	Lag	250.0	-12.9
	HOBART JCT (511463) - OMALTUS (529302) 138KV LINE	1.00	Lag	250.0	-14.8
	MATTHEWSON (560368) - WOODRING (514715) 345KV LINE	0.99	Lead	250.0	41.6
	MATTHEWSON (560368) - NORTHWEST (514880) 345KV LINE	0.97	Lag	250.0	-61.3
WP	BASE CASE	1.00	Lead	250.0	11.6
	MATTHEWSON (560368) - TATONGA (515407) 345KV LINE	0.90	Lead	250.0	124.0
	MATTHEWSON (560368) - TATONGA (515407) 345KV LINES CKT 1 & 2	0.75	Lead	250.0	223.1
	GEN-2007-043 TAP (210431) - CIMARRON (514901) 345KV LINE	0.99	Lead	250.0	30.1
	GEN-2007-043 TAP (210431) - GRACEMONT (515800) 345KV LINE	1.00	Lag	250.0	-3.2
	GRACEMONT (515800) - LAWTON EASTSIDE (511468) 345KV LINE	1.00	Lead	250.0	9.6
	GRACEMONT 345KV (515800) - 138KV (515802) TRANSFORMER	1.00	Lead	250.0	21.7
	CIMARRON (514901) - NORTHWEST (514880) 345KV LINE	0.99	Lead	250.0	31.2
	CIMARRON (514901) - DRAPER (514934) 345KV LINE	0.95	Lead	250.0	80.8
	CIMARRON 345KV (514901) - 138KV (514898) TRANSFORMER	1.00	Lag	250.0	-24.6
	WOODRING (514715) - GEN-2008-013 TAP (210130) 345KV LINE	0.98	Lead	250.0	47.4
	WOODRING (514715) - SOONER (514803) 345KV LINE	0.99	Lead	250.0	25.7
	WOODRING 345KV (514715) - 138KV (514714) TRANSFORMER	1.00	Lead	250.0	8.5
	HOBART JUNCTION (511463) - CARNEGIE SOUTH (511445) 138KV LINE	1.00	Lead	250.0	16.3
	HOBART JUNCTION (511463) - CLINTON SHERMAN AFB TAP (511446) 138KV LINE	1.00	Lead	250.0	12.4
	HOBART JUNCTION (511463) - TAMARACK TAP (529302) 138KV LINE	1.00	Lead	250.0	20.6
	HOBART JUNCTION 138KV (511463) - 69KV (511464) TRANSFORMER	1.00	Lead	250.0	14.8
	WASHITA (521089) - SOUTHWEST STATION (511477) 138KV LINE	1.00	Lead	250.0	20.1
	GRACEMONT (515802) - WASHITA (521089) 138KV LINE CKT 1	1.00	Lead	250.0	13.3
	WASHITA (521089) - ONEY (521017) 138KV LINE	1.00	Lead	250.0	15.3
	WEATHERFORD (521092) - WASHITA (521089) 138KV LINE	1.00	Lead	250.0	18.4
	ELK CITY (511458) - CLINTON SHERMAN AFB TAP (511446) 138KV LINE	1.00	Lead	250.0	12.5
	ELK CITY 138KV (511458) - 230KV (511490) TRANSFORMER	1.00	Lag	250.0	-8.6
	ELK CITY 138KV (511458) - 69KV (511459) TRANSFORMER	1.00	Lead	250.0	14.0
	ANADARKO (520814) - SOUTHWEST (511477) 138KV LINE	1.00	Lead	250.0	14.0
	ANADARKO (520814) - GRACEMONT (515802) 138KV LINE	1.00	Lead	250.0	20.3
	ANADARKO (520814) - CORNVILLE TAP (520867) 138KV LINE	1.00	Lead	250.0	22.1
	ANADARKO (520814) - GEORGIA (520923) 138KV LINE	1.00	Lead	250.0	24.7
	ANADARKO (520814) - POCASSET (521031) 138KV LINE	0.98	Lead	250.0	47.4
	ALTUS (511440) - SNYDER (511435) 138KV LINE	1.00	Lead	250.0	15.2
	SWEET WATER (511541) - WHEELER (523777) 230KV LINE	1.00	Lead	250.0	11.7
	HOBART JCT (511463) - OMALTUS (529302) 138KV LINE	1.00	Lead	250.0	20.6
	MATTHEWSON (560368) - WOODRING (514715) 345KV LINE	0.94	Lead	250.0	88.8
	MATTHEWSON (560368) - NORTHWEST (514880) 345KV LINE	0.99	Lag	250.0	-37.9

B. Gen-2011-009
POI: Hobart Junction 138kV

The VAR generator either supplies or absorbs reactive power for different contingencies as summarized in Table 2-3. The highest values obtained are as follows:

1. For the summer case, the var generator supplies 24.1 MVAR for the outage of Sweetwater-Wheeler 230 kV line and absorbs 42.4 MVAR for the loss of Elk City 230/138 kV transformer.
2. For the winter case, the var generator supplies 31.3 MVAR for the outage of Matthewson-Tatonga 345 kV line and absorbs 44.0 MVAR for the loss of Elk City 230/138 kV transformer.
3. The corresponding power factor requirements for GEN-2011-009 are 99% leading (supplying vars) to 99% lagging (absorbing vars).

Table 2-3 VAR Generator Output in Summer and Winter Peak Cases for GEN-2011-009

CASE	CONTINGENCY	POWER FACTOR		MW @ POI	VARGEN MVAR
SP	BASE CASE	1.00	Lag	300.4	-14.6
	MATTHEWSON (560368) - TATONGA (515407) 345KV LINE	1.00	Lag	300.4	-10.6
	MATTHEWSON (560368) - TATONGA (515407) 345KV LINES CKT 1 & 2	1.00	Lead	300.4	13.5
	GEN-2007-043 TAP (210431) - CIMARRON (514901) 345KV LINE	1.00	Lag	300.4	-20.6
	GEN-2007-043 TAP (210431) - GRACEMONT (515800) 345KV LINE	1.00	Lag	300.4	-18.9
	GRACEMONT (515800) - LAWTON EASTSIDE (511468) 345KV LINE	1.00	Lag	300.4	-12.0
	GRACEMONT 345KV (515800) - 138KV (515802) TRANSFORMER	1.00	Lag	300.4	-13.1
	CIMARRON (514901) - NORTHWEST (514880) 345KV LINE	1.00	Lag	300.4	-15.6
	CIMARRON (514901) - DRAPER (514934) 345KV LINE	1.00	Lag	300.4	-13.3
	CIMARRON 345KV (514901) - 138KV (514898) TRANSFORMER	1.00	Lag	300.4	-15.3
	WOODRING (514715) - GEN-2008-013 TAP (210130) 345KV LINE	1.00	Lag	300.4	-14.0
	WOODRING (514715) - SOONER (514803) 345KV LINE	1.00	Lag	300.4	-15.1
	WOODRING 345KV (514715) - 138KV (514714) TRANSFORMER	1.00	Lag	300.4	-15.7
	HOBART JUNCTION (511463) - CARNEGIE SOUTH (511445) 138KV LINE	1.00	Lead	300.4	11.8
	HOBART JUNCTION. (511463) - CLINTON SHERMAN AFB TAP (511446) 138KV LINE	0.99	Lag	300.4	-36.1
	HOBART JUNCTION (511463) - TAMARACK TAP (529302) 138KV LINE	1.00	Lag	300.4	-27.5
	HOBART JUNCTION 138KV (511463) - 69KV (511464) TRANSFORMER	1.00	Lead	300.4	5.0
	WASHITA (521089) - SOUTHWEST STATION (511477) 138KV LINE	1.00	Lag	300.4	-17.7
	GRACEMONT (515802) - WASHITA (521089) 138KV LINE CKT 1	1.00	Lag	300.4	-15.4
	WASHITA (521089) - ONEY (521017) 138KV LINE	1.00	Lag	300.4	-12.1
	WEATHERFORD (521092) - WASHITA (521089) 138KV LINE	1.00	Lag	300.4	-9.4
	ELK CITY (511458) - CLINTON SHERMAN AFB TAP (511446) 138KV LINE	0.99	Lag	300.4	-37.2
	ELK CITY 138KV (511458) - 230KV (511490) TRANSFORMER	0.99	Lag	300.4	-42.4
	ELK CITY 138KV (511458) - 69KV (511459) TRANSFORMER	1.00	Lag	300.4	-3.7
	ANADARKO (520814) - SOUTHWEST (511477) 138KV LINE	1.00	Lag	300.4	-18.5
	ANADARKO (520814) - GRACEMONT (515802) 138KV LINE	1.00	Lag	300.4	-14.6
	ANADARKO (520814) - CORNVILLE TAP (520867) 138KV LINE	1.00	Lag	300.4	-13.9
	ANADARKO (520814) - GEORGIA (520923) 138KV LINE	1.00	Lag	300.4	-13.7
	ANADARKO (520814) - POCASSET (521031) 138KV LINE	1.00	Lag	300.4	-16.1
	ALTUS (511440) - SNYDER (511435) 138KV LINE	1.00	Lag	300.4	-19.8
	SWEET WATER (511541) - WHEELER (523777) 230KV LINE	1.00	Lead	300.4	24.1
	HOBART JCT (511463) - OMALTUS (529302) 138KV LINE	1.00	Lag	300.4	-27.5

CASE	CONTINGENCY	POWER FACTOR		MW @ POI	VARGEN MVAR
	MATTHEWSON (560368) - WOODRING (514715) 345KV LINE	1.00	Lag	300.4	-16.2
	MATTHEWSON (560368) - NORTHWEST (514880) 345KV LINE	1.00	Lag	300.4	-14.5
WP	BASE CASE	1.00	Lag	300.4	-5.2
	MATTHEWSON (560368) - TATONGA (515407) 345KV LINE	1.00	Lead	300.4	1.1
	MATTHEWSON (560368) - TATONGA (515407) 345KV LINES CKT 1 & 2	0.99	Lead	300.4	31.3
	GEN-2007-043 TAP (210431) - CIMARRON (514901) 345KV LINE	1.00	Lag	300.4	-11.5
	GEN-2007-043 TAP (210431) - GRACEMONT (515800) 345KV LINE	1.00	Lag	300.4	-9.2
	GRACEMONT (515800) - LAWTON EASTSIDE (511468) 345KV LINE	1.00	Lag	300.4	-3.0
	GRACEMONT 345KV (515800) - 138KV (515802) TRANSFORMER	1.00	Lag	300.4	-4.6
	CIMARRON (514901) - NORTHWEST (514880) 345KV LINE	1.00	Lag	300.4	-5.3
	CIMARRON (514901) - DRAPER (514934) 345KV LINE	1.00	Lag	300.4	-1.4
	CIMARRON 345KV (514901) - 138KV (514898) TRANSFORMER	1.00	Lag	300.4	-5.3
	WOODRING (514715) - GEN-2008-013 TAP (210130) 345KV LINE	1.00	Lag	300.4	-3.8
	WOODRING (514715) - SOONER (514803) 345KV LINE	1.00	Lag	300.4	-4.5
	WOODRING 345KV (514715) - 138KV (514714) TRANSFORMER	1.00	Lag	300.4	-5.3
	HOBART JUNCTION (511463) - CARNEGIE SOUTH (511445) 138KV LINE	1.00	Lead	300.4	15.5
	HOBART JUNCTION (511463) - CLINTON SHERMAN AFB TAP (511446) 138KV LINE	0.99	Lag	300.4	-34.8
	HOBART JUNCTION (511463) - TAMARACK TAP (529302) 138KV LINE	1.00	Lag	300.4	-9.9
	HOBART JUNCTION 138KV (511463) - 69KV (511464) TRANSFORMER	1.00	Lead	300.4	10.9
	WASHITA (521089) - SOUTHWEST STATION (511477) 138KV LINE	1.00	Lag	300.4	-3.8
	GRACEMONT (515802) - WASHITA (521089) 138KV LINE CKT 1	1.00	Lag	300.4	-4.7
	WASHITA (521089) - ONEY (521017) 138KV LINE	1.00	Lead	300.4	0.7
	WEATHERFORD (521092) - WASHITA (521089) 138KV LINE	1.00	Lead	300.4	3.2
	ELK CITY (511458) - CLINTON SHERMAN AFB TAP (511446) 138KV LINE	0.99	Lag	300.4	-36.4
	ELK CITY 138KV (511458) - 230KV (511490) TRANSFORMER	0.99	Lag	300.4	-44.0
	ELK CITY 138KV (511458) - 69KV (511459) TRANSFORMER	1.00	Lead	300.4	5.4
	ANADARKO (520814) - SOUTHWEST (511477) 138KV LINE	1.00	Lag	300.4	-4.3
	ANADARKO (520814) - GRACEMONT (515802) 138KV LINE	1.00	Lag	300.4	-3.2
	ANADARKO (520814) - CORNVILLE TAP (520867) 138KV LINE	1.00	Lag	300.4	-3.6
	ANADARKO (520814) - GEORGIA (520923) 138KV LINE	1.00	Lag	300.4	-2.8
	ANADARKO (520814) - POCASSET (521031) 138KV LINE	1.00	Lag	300.4	-5.2
	ALTUS (511440) - SNYDER (511435) 138KV LINE	1.00	Lag	300.4	-9.6
	SWEET WATER (511541) - WHEELER (523777) 230KV LINE	1.00	Lag	300.4	-5.2
	HOBART JCT (511463) - OMALTUS (529302) 138KV LINE	1.00	Lag	300.4	-9.9
	MATTHEWSON (560368) - WOODRING (514715) 345KV LINE	1.00	Lag	300.4	-5.5
	MATTHEWSON (560368) - NORTHWEST (514880) 345KV LINE	1.00	Lag	300.4	-3.5

C. Gen-2011-010

POI: Tap on Cimarron – Gracemont 345 kV line

The var generator either supplies or absorbs reactive power for different contingencies as summarized in Table 2-4. The highest values obtained are as follows:

1. For the summer case, the var generator supplies 55.8 MVAR for the outage of Matthewson-Tatonga 345 kV lines 1 and 2 and absorbs 32.5 MVAR for the loss of Gen-2007-043 Tap-Gracemont 345 kV line.

2. For the winter case, the var generator supplies 98.8 MVAR for the outage of Matthewson-Tatonga 345 kV lines 1 and 2 and absorbs 18.5 MVAR for the loss of Gen-2007-043 Tap-Gracemont 345 kV line.

3. The corresponding power factor requirements for GEN-2011-010 are 95% leading (supplying vars) and 99% lagging (absorbing vars).

Table 2-4 VAR Generator Output in Summer and Winter Peak Cases for GEN-2011-010

CASE	CONTINGENCY	POWER FACTOR		MW @ POI	VARGEN MVAR
SP	BASE CASE	1.00	Lag	300.8	-11.5
	MATTHEWSON (560368) - TATONGA (515407) 345KV LINE	1.00	Lead	300.8	4.5
	MATTHEWSON (560368) - TATONGA (515407) 345KV LINES CKT 1 & 2	0.98	Lead	300.8	55.8
	GEN-2007-043 TAP (210431) - CIMARRON (514901) 345KV LINE	1.00	Lag	300.8	-14.1
	GEN-2007-043 TAP (210431) - GRACEMONT (515800) 345KV LINE	0.99	Lag	300.8	-32.5
	GRACEMONT (515800) - LAWTON EASTSIDE (511468) 345KV LINE	1.00	Lag	300.8	-20.0
	GRACEMONT 345KV (515800) - 138KV (515802) TRANSFORMER	1.00	Lag	300.8	-9.5
	CIMARRON (514901) - NORTHWEST (514880) 345KV LINE	1.00	Lag	300.8	-9.5
	CIMARRON (514901) - DRAPER (514934) 345KV LINE	1.00	Lag	300.8	-5.8
	CIMARRON 345KV (514901) - 138KV (514898) TRANSFORMER	1.00	Lag	300.8	-22.4
	WOODRING (514715) - GEN-2008-013 TAP (210130) 345KV LINE	1.00	Lag	300.8	-7.4
	WOODRING (514715) - SOONER (514803) 345KV LINE	1.00	Lag	300.8	-12.2
	WOODRING 345KV (514715) - 138KV (514714) TRANSFORMER	1.00	Lag	300.8	-16.9
	HOBART JUNCTION (511463) - CARNEGIE SOUTH (511445) 138KV LINE	1.00	Lag	300.8	-21.1
	HOBART JUNCTION. (511463) - CLINTON SHERMAN AFB TAP (511446) 138KV LINE	1.00	Lag	300.8	-21.8
	HOBART JUNCTION (511463) - TAMARACK TAP (529302) 138KV LINE	1.00	Lag	300.8	-5.4
	HOBART JUNCTION 138KV (511463) - 69KV (511464) TRANSFORMER	1.00	Lag	300.8	-10.6
	WASHITA (521089) - SOUTHWEST STATION (511477) 138KV LINE	1.00	Lead	300.8	1.5
	GRACEMONT (515802) - WASHITA (521089) 138KV LINE CKT 1	1.00	Lag	300.8	-13.9
	WASHITA (521089) - ONEY (521017) 138KV LINE	1.00	Lag	300.8	-19.5
	WEATHERFORD (521092) - WASHITA (521089) 138KV LINE	1.00	Lag	300.8	-16.6
	ELK CITY (511458) - CLINTON SHERMAN AFB TAP (511446) 138KV LINE	1.00	Lag	300.8	-22.1
	ELK CITY 138KV (511458) - 230KV (511490) TRANSFORMER	1.00	Lag	300.8	-29.0
	ELK CITY 138KV (511458) - 69KV (511459) TRANSFORMER	1.00	Lag	300.8	-14.9
	ANADARKO (520814) - SOUTHWEST (511477) 138KV LINE	1.00	Lag	300.8	-17.8
	ANADARKO (520814) - GRACEMONT (515802) 138KV LINE	1.00	Lag	300.8	-9.3
	ANADARKO (520814) - CORNVILLE TAP (520867) 138KV LINE	1.00	Lag	300.8	-6.8
	ANADARKO (520814) - GEORGIA (520923) 138KV LINE	1.00	Lag	300.8	-5.8
	ANADARKO (520814) - POCASSET (521031) 138KV LINE	1.00	Lead	300.8	3.6
	ALTUS (511440) - SNYDER (511435) 138KV LINE	1.00	Lag	300.8	-14.7
	SWEET WATER (511541) - WHEELER (523777) 230KV LINE	1.00	Lag	300.8	-0.8
	HOBART JCT (511463) - OMALTUS (529302) 138KV LINE	1.00	Lag	300.8	-5.4
	MATTHEWSON (560368) - WOODRING (514715) 345KV LINE	1.00	Lag	300.8	-7.8
	MATTHEWSON (560368) - NORTHWEST (514880) 345KV LINE	1.00	Lag	300.8	-11.5
WP	BASE CASE	1.00	Lead	300.8	11.0
	MATTHEWSON (560368) - TATONGA (515407) 345KV LINE	0.99	Lead	300.8	36.8
	MATTHEWSON (560368) - TATONGA (515407) 345KV LINES CKT 1 & 2	0.95	Lead	300.8	98.8
	GEN-2007-043 TAP (210431) - CIMARRON (514901) 345KV LINE	1.00	Lead	300.8	3.4
	GEN-2007-043 TAP (210431) - GRACEMONT (515800) 345KV LINE	1.00	Lag	300.8	-18.5
	GRACEMONT (515800) - LAWTON EASTSIDE (511468) 345KV LINE	1.00	Lead	300.8	0.3
	GRACEMONT 345KV (515800) - 138KV (515802) TRANSFORMER	1.00	Lead	300.8	12.7
	CIMARRON (514901) - NORTHWEST (514880) 345KV LINE	1.00	Lead	300.8	15.9

CASE	CONTINGENCY	POWER FACTOR		MW @ POI	VARGEN MVAR
	CIMARRON (514901) - DRAPER (514934) 345KV LINE	1.00	Lead	300.8	30.1
	CIMARRON 345KV (514901) - 138KV (514898) TRANSFORMER	1.00	Lag	300.8	-0.5
	WOODRING (514715) - GEN-2008-013 TAP (210130) 345KV LINE	1.00	Lead	300.8	18.2
	WOODRING (514715) - SOONER (514803) 345KV LINE	1.00	Lead	300.8	14.6
	WOODRING 345KV (514715) - 138KV (514714) TRANSFORMER	1.00	Lead	300.8	10.6
	HOBART JUNCTION (511463) - CARNEGIE SOUTH (511445) 138KV LINE	1.00	Lead	300.8	7.5
	HOBART JUNCTION (511463) - CLINTON SHERMAN AFB TAP (511446) 138KV LINE	1.00	Lead	300.8	4.3
	HOBART JUNCTION (511463) - TAMARACK TAP (529302) 138KV LINE	1.00	Lead	300.8	17.6
	HOBART JUNCTION 138KV (511463) - 69KV (511464) TRANSFORMER	1.00	Lead	300.8	12.8
	WASHITA (521089) - SOUTHWEST STATION (511477) 138KV LINE	1.00	Lead	300.8	20.5
	GRACEMONT (515802) - WASHITA (521089) 138KV LINE CKT 1	1.00	Lead	300.8	11.8
	WASHITA (521089) - ONEY (521017) 138KV LINE	1.00	Lead	300.8	9.6
	WEATHERFORD (521092) - WASHITA (521089) 138KV LINE	1.00	Lead	300.8	11.5
	ELK CITY (511458) - CLINTON SHERMAN AFB TAP (511446) 138KV LINE	1.00	Lead	300.8	4.0
	ELK CITY 138KV (511458) - 230KV (511490) TRANSFORMER	1.00	Lag	300.8	-8.1
	ELK CITY 138KV (511458) - 69KV (511459) TRANSFORMER	1.00	Lead	300.8	11.4
	ANADARKO (520814) - SOUTHWEST (511477) 138KV LINE	1.00	Lead	300.8	13.0
	ANADARKO (520814) - GRACEMONT (515802) 138KV LINE	1.00	Lead	300.8	21.6
	ANADARKO (520814) - CORNVILLE TAP (520867) 138KV LINE	1.00	Lead	300.8	18.6
	ANADARKO (520814) - GEORGIA (520923) 138KV LINE	1.00	Lead	300.8	20.7
	ANADARKO (520814) - POCASSET (521031) 138KV LINE	0.99	Lead	300.8	32.3
	ALTUS (511440) - SNYDER (511435) 138KV LINE	1.00	Lead	300.8	12.2
	SWEET WATER (511541) - WHEELER (523777) 230KV LINE	1.00	Lead	300.8	11.0
	HOBART JCT (511463) - OMALTUS (529302) 138KV LINE	1.00	Lead	300.8	17.6
	MATTHEWSON (560368) - WOODRING (514715) 345KV LINE	1.00	Lead	300.8	24.1
	MATTHEWSON (560368) - NORTHWEST (514880) 345KV LINE	1.00	Lead	300.8	17.3

2.3. Conclusions

Gen-2011-007

The results of the power factor analysis showed that GEN-2011-009 is required to maintain a 75% leading (supplying vars) to 97% lagging (absorbing vars) power factor at the point of interconnection.

GEN-2011-009

The results of the power factor analysis showed that GEN-2011-009 is required to maintain a 99% leading (supplying vars) to 99% lagging (absorbing vars) power factor at the point of interconnection.

GEN-2011-010

The results of the power factor analysis showed that GEN-2011-009 is required to maintain a 99% leading (supplying vars) to 99% lagging (absorbing vars) power factor at the point of interconnection.

Section 3. Stability Analysis

3.1. Assumptions

The following assumptions were adopted for the dynamic simulations:

1. Constant maximum and uniform wind speed for the entire period of study.
2. Wind turbine control models with their default values.
3. Under/over voltage/frequency protection use manufacturer settings.

3.2. Faults Simulated

Sixty (60) faults were considered for the transient stability simulations which included three phase and 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 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. Prior queued projects shown in Table 1-2 and units in areas 520, 524, 525, 526, 531, 534, and 536 were monitored in the simulations.

Table 3-1 shows the list of simulated contingencies. It also shows the fault clearing time and the time delay before re-closing for all the study contingencies.

Table 3-1 List of Simulated Faults

No.	Cont. Name	Description
1	FLT01-3PH	3 phase fault on the Matthewson (560368) to Tatonga (515407) 345kV line, near Matthewson. a. Apply fault at the Matthewson 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	FLT02-1PH	Single phase fault and sequence like previous
3	FLT03-3PH	3 phase fault on the Matthewson (560368) to Tatonga (515407) 345kV lines ckt 1 & 2, near Matthewson. a. Apply fault at the Matthewson 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	FLT04-1PH	Single phase fault and sequence like previous
5	FLT05-3PH	3 phase fault on the GEN-2007-043 Tap (210431) to Cimarron (514901) 345kV line, near GEN-2007-043 Tap. a. Apply fault at the GEN-2007-043 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	FLT06-1PH	Single phase fault and sequence like previous
7	FLT07-3PH	3 phase fault on the GEN-2007-043 Tap (210431) to Gracemont (515800) 345kV line, near GEN-2007-043 Tap. a. Apply fault at the GEN-2007-043 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.
8	FLT08-1PH	Single phase fault and sequence like previous
9	FLT09-3PH	3 phase fault on the Gracemont (515800) to Lawton Eastside (511468) 345kV line, near Gracemont. a. Apply fault at the Gracemont 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.
10	FLT10-1PH	Single phase fault and sequence like previous
11	FLT11-3PH	3 phase fault on the Gracemont 345kV (515800) to 138kV (515802) transformer, near the 345kV bus. a. Apply fault at the Gracemont 345kV bus. b. Clear fault after 5 cycles by tripping the faulted transformer.
12	FLT12-3PH	3 phase fault on the Cimarron (514901) to Northwest (514880) 345kV line, near Cimarron. a. Apply fault at the Cimarron 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.
13	FLT13-1PH	Single phase fault and sequence like previous
14	FLT14-3PH	3 phase fault on the Cimarron (514901) to Draper (514934) 345kV line, near Cimarron. a. Apply fault at the Cimarron 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.
15	FLT15-1PH	Single phase fault and sequence like previous

No.	Cont. Name	Description
16	FLT16-3PH	3 phase fault on one of the Cimarron 345kV (514901) to 138kV (514898) transformer, near the 345kV bus. a. Apply fault at the Cimarron 345kV bus. b. Clear fault after 5 cycles by tripping the faulted transformer.
17	FLT17-3PH	3 phase fault on the Woodring (514715) to GEN-2008-013 Tap (210130) 345kV line, near Woodring. a. Apply fault at the Woodring 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	Single phase fault and sequence like previous
19	FLT19-3PH	3 phase fault on the Woodring (514715) to Sooner (514803) 345kV line, near Woodring. a. Apply fault at the Woodring 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	Single phase fault and sequence like previous
21	FLT21-3PH	3 phase fault on the Woodring 345kV (514715) to 138kV (514714) transformer, near the 345kV bus. a. Apply fault at the Woodring 345kV bus. b. Clear fault after 5 cycles by tripping the faulted transformer.
22	FLT22-3PH	3 phase fault on the Hobart Junction (511463) to Carnegie South (511445) 138kV line, near Hobart Junction. a. Apply fault at Hobart Junction. 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.
23	FLT23-1PH	Single phase fault and sequence like previous
24	FLT24-3PH	3 phase fault on the Hobart Junction. (511463) to Clinton Sherman AFB Tap (511446) 138kV line, near Hobart Junction. a. Apply fault at Hobart Junction. 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	FLT25-1PH	Single phase fault and sequence like previous
26	FLT26-3PH	3 phase fault on the Hobart Junction (511463) to Tamarack Tap (529302) 138kV line, near Hobart Junction. a. Apply fault at Hobart Junction. 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.
27	FLT27-1PH	Single phase fault and sequence like previous
28	FLT28-3PH	3 phase fault on the Hobart Junction 138kV (511463) to 69kv (511464) Transformer, near the 138kV bus. a. Apply fault at Hobart Junction 138kV bus. b. Clear fault after 5 cycles by tripping the faulted auto.
29	FLT29-3PH	3 phase fault on the Washita (521089) to Southwest Station (511477) 138kV line, near Washita. a. Apply fault at the Washita 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	Single phase fault and sequence like previous

No.	Cont. Name	Description
31	FLT31-3PH	3 phase fault on one of the Gracemont (515802) to Washita (521089) 138kV line ckt 1, near Gracemont. a. Apply fault at the Gracemont 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.
32	FLT32-1PH	Single phase fault and sequence like previous
33	FLT33-3PH	3 phase fault on the Washita (521089) to Oney (521017) 138kV line, near Washita. a. Apply fault at the Washita 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	FLT34-1PH	Single phase fault and sequence like previous
35	FLT35-3PH	3 phase fault on the Weatherford (521092) to Washita (521089) 138kV line, near Weatherford. a. Apply fault at the Weatherford 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	FLT36-1PH	Single phase fault and sequence like previous
37	FLT37-3PH	3 phase fault on the Elk City (511458) to Clinton Sherman AFB Tap (511446) 138kV line, near Elk City. a. Apply fault at the Elk City 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.
38	FLT38-1PH	Single phase fault and sequence like previous
39	FLT39-3PH	3 phase fault on the Elk City 138kV (511458) to 230kV (511490) transformer, near the 138kV bus. a. Apply fault at the Elk City 138kV bus. b. Clear fault after 5 cycles by tripping the faulted transformer.
40	FLT40-3PH	3 phase fault on the Elk City 138kV (511458) to 69kV (511459) transformer, near the 138kV bus. a. Apply fault at the Elk City 138kV bus. b. Clear fault after 5 cycles by tripping the faulted transformer.
41	FLT41-3PH	3 phase fault on the Anadarko (520814) to Southwest (511477) 138kV line, near Anadarko. a. Apply fault at the Anadarko 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.
42	FLT42-1PH	Single phase fault and sequence like previous
43	FLT43-3PH	3 phase fault on the Anadarko (520814) to Gracemont (515802) 138kV line, near Gracemont. a. Apply fault at the Gracemont 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.
44	FLT44-1PH	Single phase fault and sequence like previous

No.	Cont. Name	Description
45	FLT45-3PH	3 phase fault on the Anadarko (520814) to Cornville Tap (520867) 138kV line, near Anadarko. a. Apply fault at the Anadarko 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.
46	FLT46-1PH	Single phase fault and sequence like previous
47	FLT47-3PH	3 phase fault on the Anadarko (520814) to Georgia (520923) 138kV line, near Anadarko. a. Apply fault at the Anadarko 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.
48	FLT48-1PH	Single phase fault and sequence like previous
49	FLT49-3PH	3 phase fault on the Anadarko (520814) to Pocasset (521031) 138kV line, near Anadarko. a. Apply fault at the Anadarko 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.
50	FLT50-1PH	Single phase fault and sequence like previous
51	FLT51-3PH	3 phase fault on the Altus (511440) to Snyder (511435) 138kV line, near Altus. a. Apply fault at Altus 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.
52	FLT52-1PH	Single phase fault and sequence like previous
53	FLT53-3PH	3 phase fault on the Sweet Water (511541) to Wheeler (523777) 230kV line, near Sweet Water. a. Apply fault at Sweet Water 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.
54	FLT54-1PH	Single phase fault and sequence like previous
55	FLT55-3PH	3 phase fault on the Hobart Jct (511463) to Omaltus (529302) 138kV line, near Hobart Jct. a. Apply fault at Hobart Jct 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.
56	FLT56-1PH	Single phase fault and sequence like previous
57	FLT75	3 phase fault on the Matthewson (560368) to Woodring (514715) 345kV line, near Matthewson. a. Apply fault at the Matthewson 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.
58	FLT76	Single phase fault and sequence like previous
59	FLT77	3 phase fault on the Matthewson (560368) to Northwest (514880) 345kV line, near Matthewson. a. Apply fault at the Matthewson 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.

No.	Cont. Name	Description
60	FLT78	Single phase fault and sequence like previous

The simulations were performed with a 0.1-second steady-state run followed by the appropriate disturbance as described in Table 3-1. Simulations were run for a minimum 10-second duration to confirm proper machine damping.

3.3. Simulation Results

The stability simulations with the sixty specified test faults did not find any angular or voltage instability problems in the SPP system for all three projects. The study finds that the interconnection of the proposed projects does not impact the stability performance of the SPP system for the faults tested on the supplied base cases.

Section 4. Conclusions

The findings of the impact study for the proposed interconnection projects under DISIS-2011-001 (Group 7) namely Gen-2011-007, Gen-2011-009, and Gen-2011-010, considered at 100% of their proposed installed capacities are as follows:

1. Gen-2011-007
    a. The results of the power factor analysis showed that GEN-2011-009 is required to maintain a 75% leading (supplying vars) to 97% lagging (absorbing vars) power factor at the point of interconnection.
2. GEN-2011-009
    a. The results of the power factor analysis showed that GEN-2011-009 is required to maintain a 99% leading (supplying vars) to 99% lagging (absorbing vars) power factor at the point of interconnection.
3. GEN-2011-010
    a. The results of the power factor analysis showed that GEN-2011-009 is required to maintain a 99% leading (supplying vars) to 99% lagging (absorbing vars) power factor at the point of interconnection.
4. The stability simulations with the sixty specified test faults did not find any angular or voltage instability problems in the SPP system for all three projects. The study finds that the interconnection of the proposed projects does not impact the stability performance of the SPP system for the faults tested on the supplied base cases.

P: Stability Study for Group 8

POWER SYSTEMS DIVISION
GRID SYSTEMS CONSULTING

System Impact Study for DISIS-2011-001 Group 8

DRAFT REPORT

REPORT NO.: 2010-E-6814-R0
Issued On: July 5, 2011

Prepared for:
Southwest Power Pool, Inc.

ABB Inc.
Power Systems Division
Grid Systems Consulting
940 Main Campus Drive, Suite 300
Raleigh, NC 27606

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Southwest Power Pool, Inc.	**No.** 2010-E6814-R0	
System Impact Study for DISIS-2011-001 Group 8	Date: 07/05/2011	# Pages 15

Author(s):	**Reviewed by:**	**Approved by:**
Trinadh Dwibashyam	Seshadri Subramanian	Willie Wong

Executive Summary

Southwest Power Pool, Inc. (SPP) commissioned ABB Inc. to perform a Definitive Interconnection System Impact Study (DISIS) for Group 8 generation, which included a generation of 4.5 MW (Queue # GEN-2010-055) on the SPP transmission. The proposed project is located in Tulsa County, Oklahoma and the POI is Wekiwa 138kV bus.

Request	Size	Turbine model	Point of Interconnection	County
GEN-2010-055	4.5 MW	GENROU	Wekiwa 138kV (#509757)	Tulsa County, Oklahoma

The main objective of this study was to determine the impact of proposed GEN-2010-055 project on the stability of SPP transmission systems and nearby generating stations.

To achieve this objective, transient stability analysis for several local and regional contingencies was performed on the Summer Peak and Winter Peak system conditions with GEN-2010-055 project in-service. Following is the summary of study findings:

Stability Analysis

A stability analysis was performed to determine the impact, if any, of the proposed project on the stability of SPP system. The system was found to be stable for all the tested 3-phase faults and single-line-to-ground (SLG) faults (with line re-closing, where applicable). The proposed interconnection did not have any adverse impact on the dynamic performance of the system.

The results of this analysis are based on available data and assumptions made at the time of conducting this study. If any of the data and/or assumptions made in developing the study model change, the results provided in this report may not apply.

Rev No.	Revision Description	Date	Authored by	Reviewed by	Approved by
0	Draft Report	06/22/2011	Dwibashyam, T	Subramanian, S	Wong, W
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APPENDIX B PLOTS FROM STABILITY SIMULATIONS

1 INTRODUCTION

Southwest Power Pool, Inc. (SPP) commissioned ABB Inc. to perform a System Impact Study for DISIS Group 8 generation, which included a generation of 4.5 MW (Queue # GEN-2010-055) on the SPP transmission. Tulsa County, Oklahoma and the POI is Wekiwa 138kV bus. Figure 1-1 shows the approximate POI of the proposed generation project on a Geographical Transmission Map.

This study evaluated the impact of the Gen-2010-055 project on the SPP Transmission System. The scope of this study was limited to the transient stability analysis.

The main objective of this study was to determine the impact of the proposed Project (GEN-2010-055, 4.5 MW) on the stability of SPP transmission system and nearby generating stations.

To achieve this objective transient stability analysis for various local and regional contingencies was performed on the 2010-2011 Summer Peak and Winter Peak system conditions with GEN-2010-055 project in-service

The study was performed on Summer Peak and Winter Peak cases, provided by SPP. This report documents the methods, analysis and results of the system impact study.

Table 1-1: GEN-2010-048 Project

Request	Size	Turbine model	Point of Interconnection	County
GEN-2010-055	4.5 MW	GENROU	Wekiwa 138kV (#509757)	Tulsa County, Oklahoma

1.1 REPORT ORGANIZATION

This report is organized as follows:

Section 2: Description of project
Section 3: Study methodology
Section 4: Model Development
Section 5: Stability Analysis Results
Section 6: Conclusions

The detailed study results are included in separate Appendices.

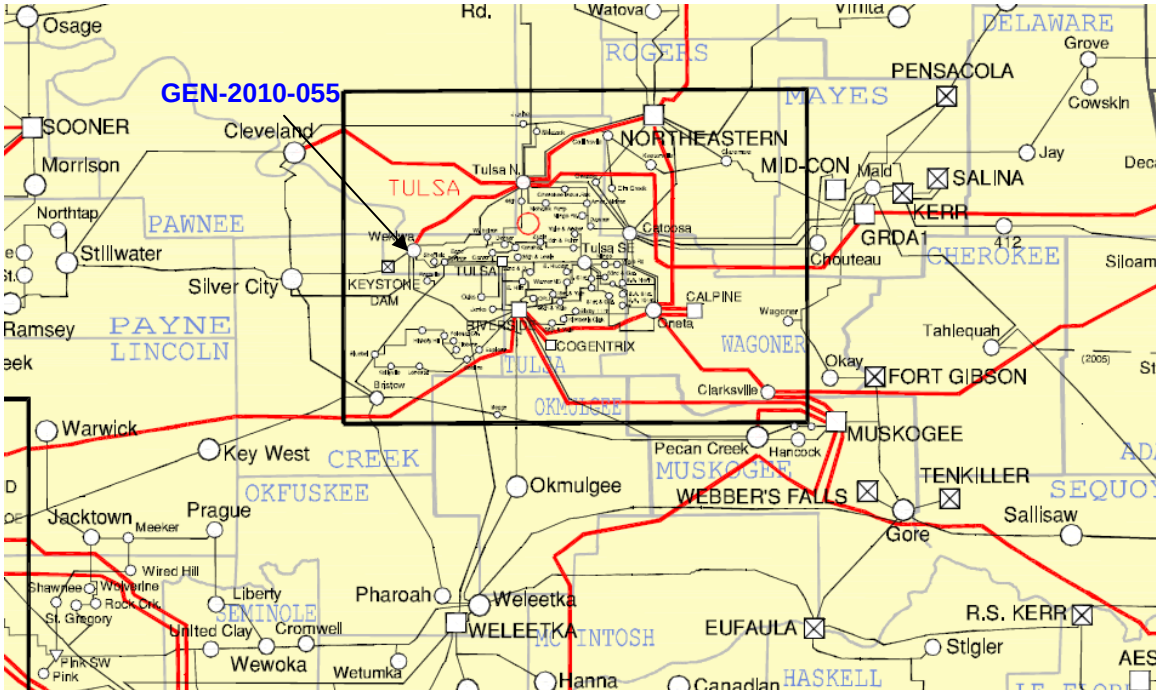

Figure 1-1 Geographical Transmission Map with GEN-2010-055 Approximate Project Location

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1.2 DESCRIPTION OF GEN-2010-055 PROJECT

The details of load flow and dynamic data for the GEN-2010-055 generator is included in Appendix A.

- Request size: 4.8 MW
- Interconnection:

  Voltage: 138 kV

  POI: Wekiwa 138kV

  Transformer: One (1) step-up transformer connecting to the 138 kV

  MVA: 33 MVA

  Voltage: 138/13.8 kV

  Z: 7.996 % on 20 MVA
- PSSE Model Used GENROU

2 STUDY METHODOLOGY

2.1 TRANSIENT STABILITY ANALYSIS

The purpose of the transient stability analysis is to determine the impact, if any, of the proposed generation project on the stability performance of the SPP transmission system and generating stations in the interconnection vicinity.

Stability analysis was performed using Siemens-PTI's PSS/E™ dynamics program V30.3.3. Three-phase and single-line-to-ground (SLG) (with re-closure where applicable) were simulated for the specified duration and synchronous machine rotor angles and wind turbine generator speeds were monitored to check whether the system is stable following the fault clearing. In addition, the voltage at the wind-farm POI and vicinity was also monitored.

For three-phase faults, a fault admittance of –j2E9 was used (essentially infinite admittance representing a bolted fault). The PSS/E dynamics program only simulates the positive sequence network. However, the unbalanced fault current computation (e.g. single-phase-ground) requires the knowledge of positive, negative, and zero sequence impedances. For a single-line-to-ground (SLG) fault, the fault admittance then equals the inverse of the sum of the positive, negative and zero sequence impedances. Typically, a single line to ground fault results in a voltage of roughly 60%. The admittance needed (over and above the positive sequence) to achieve this voltage value was computed using activity TYSL in PSS/E. This additional admittance value is the equivalent of the sum of positive and negative sequence admittances. The admittance value computed in the above step is then inserted at the faulted bus and the single line to ground fault current is computed.

The voltages at all local buses (115 kV and above) were monitored for all tested contingencies.

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3 MODEL DEVELOPMENT

SPP provided two power flow cases for this study – i) "MDWG_2010_2011SP_DISIS-2011-001-G8.sav" and ii) "MDWG_2010_2011WP_DISIS-2011-001-G8.sav" – representing respectively the 2010-2011 Summer Peak and Winter Peak conditions. The study cases included the following prior-queued projects:

Prior Queued Generator	Size (MW)	Turbine Model	Point of Interconnection
GEN-2002-004	199.5	GE.1.5MW	Latham 345kV (532800)
GEN-2005-013	199.8	Vestas V90 1.8MW	Tap on the Latham – Neosho 345kV line (574000)
GEN-2007-025	300.0	Clipper 2.5MW	Tap on the Wichita – Woodring 345kV line (532781)
GEN-2008-013	300.0	G.E. 1.5MW	Tap on the Wichita – Woodring 345kV line (210130)
GEN-2008-021	1250.0	Nuclear Steam Turbine	Wolf Creek 345kV (532797)
GEN-2008-127	200.1	Siemens 2.3MW	Tap on the Sooner – Rose Hill 345kV line (573039)
GEN-2009-025	59.4	Vestas V90 1.8MW	Tap on the Deerck – Sincblk 69KV line (573049)
GEN-2008-071	76.8	GE 1.6MW	Newkirk 138kV (514759)
GEN-2008-098	100.8	Vestas V90 1.8MW	Tap on the Wolf Creek – LaCygne 345kV line (572090)
GEN-2010-003	100.8	Vestas V90 1.8MW	Tap on the Wolf Creek – LaCygne 345kV line (572090)
GEN-2010-005	300.0	Clipper C96 2.5MW	Tap on the Wichita – Woodring 345kV line (532781)

3.1 MODEL DEVELOPMENT FOR GEN-2010-055 PROJECT

The models (power flow and dynamics) for the proposed project were included in the data supplied by SPP. Updates were provided by SPP were included in the base case:

The resulting power flow cases were saved as "MDWG_2010_2011SP_DISIS-2011-001-G8-ABB.sav" (summer peak) and "MDWG_2010_2011WP_DISIS-2011-001-G8-ABB.sav'' (winter peak). These cases were used for the analysis reported in this report. The details of the above IDEVs and any other changes made to the power flow case are given in Appendix A.

Figure 3-1 and Figure 3-2 show the one-line diagram in the local area of GEN-2010-055 for 2010-2011 summer peak and winter peak conditions respectively.

The dynamic model setup with the "snapshot" for performing stability analysis was provided by SPP. ABB performed a no-disturbance simulation to verify the models initialized correctly and there is no drift from the respective steady state quantities (e.g. machine angle, speeds, bus voltage etc.) over time.

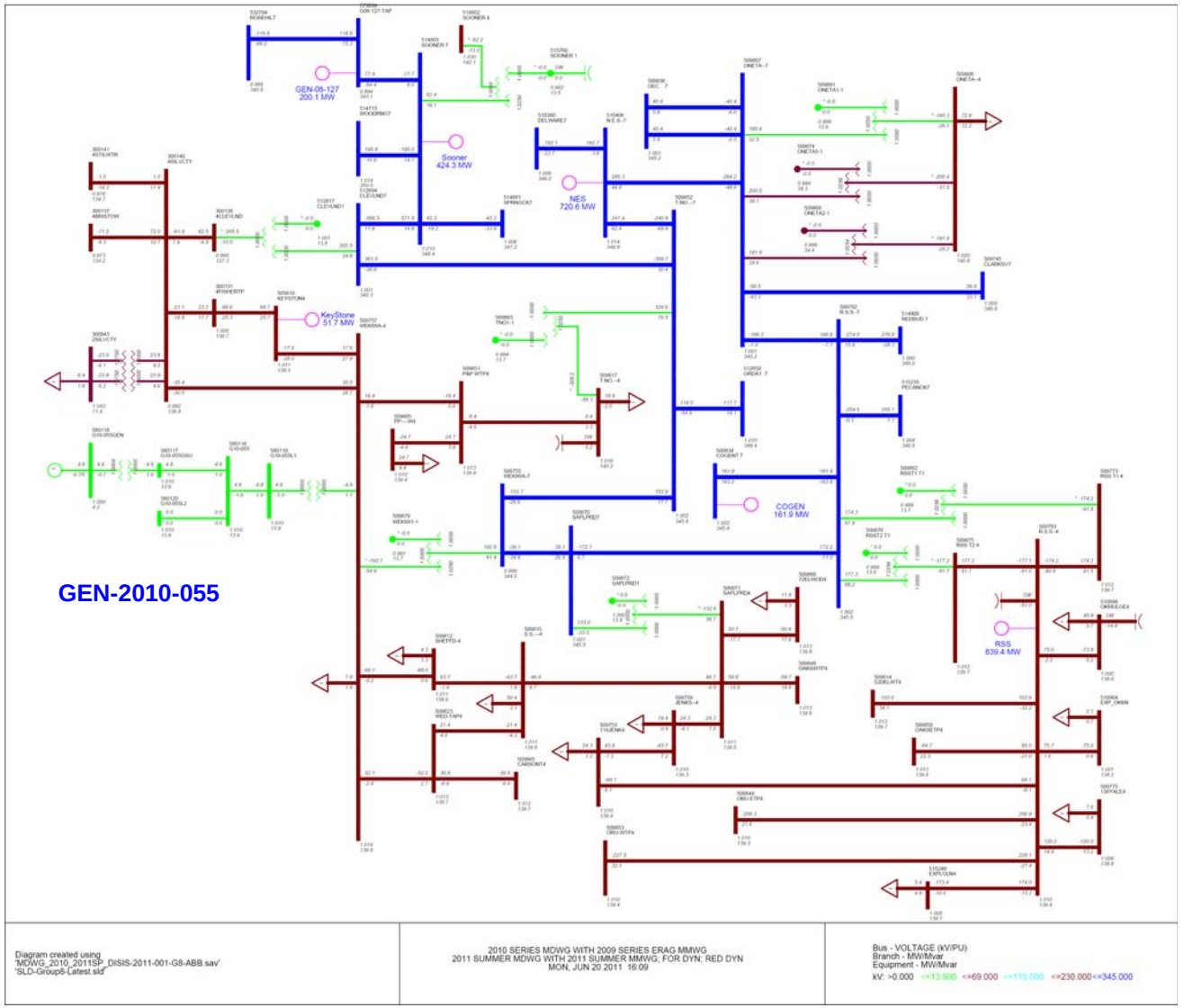

Figure 3-1 One-line Diagram of the local area of GEN-2010-055 (Summer Peak)

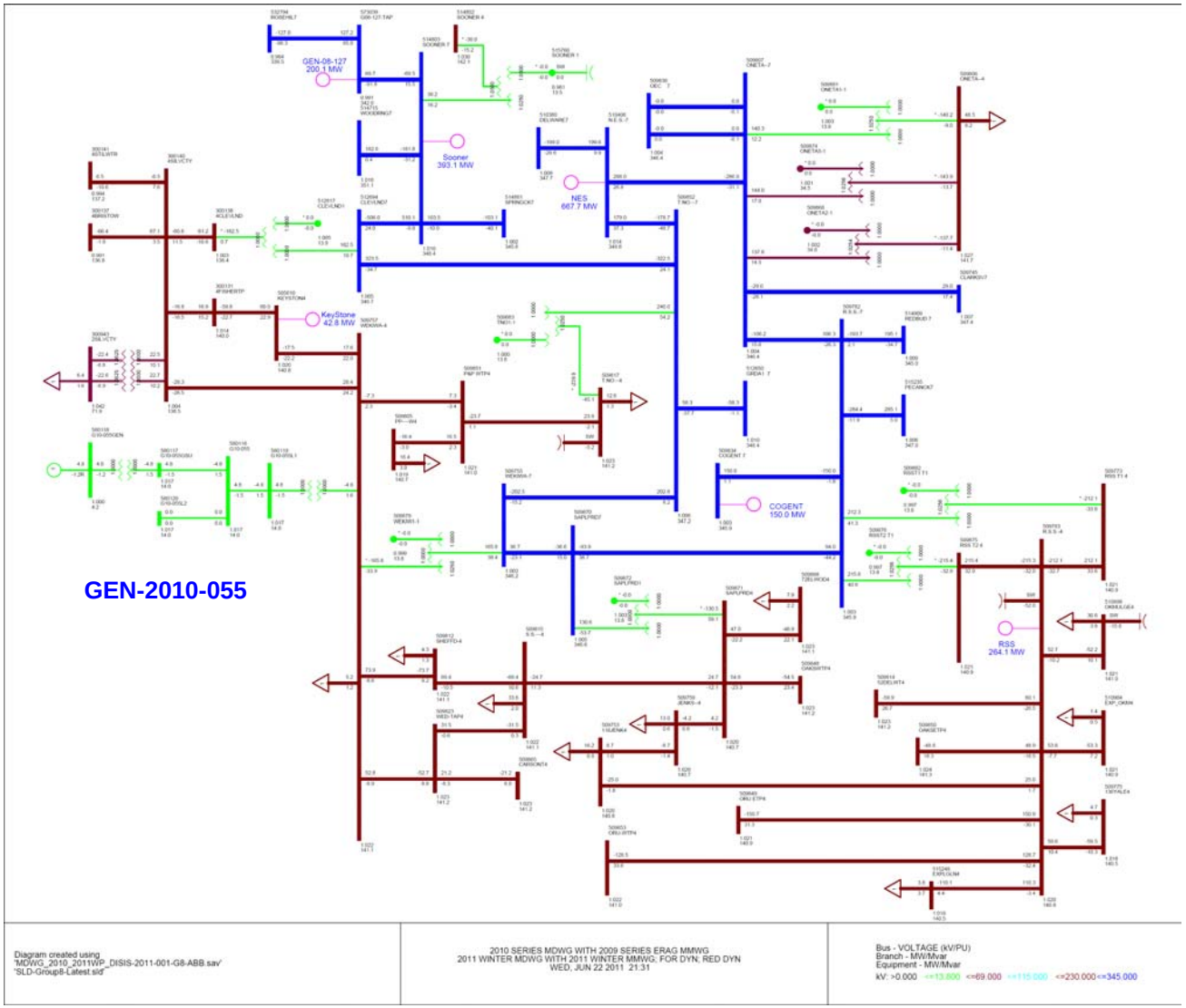

Figure 3-2 One-line Diagram of the local area of GEN-2010-055 (Winter Peak)

4 STABILITY ANALYSIS

Stability simulations were performed to examine the transient behavior of GEN-2010-055 project and its impact on the SPP system. Several faults, both three-phase and single phase faults (with re-closing where applicable) were simulated. The fault clearing times and re-closing times used for the simulations are shown inTable 4-1.

Table 4-1: Fault Clearing Times

Faulted bus kV level	Normal Clearing	Time before reclosing
138	5 cycles	20 cycles
161	5 cycles	20 cycles
345	5 cycles	20 cycles

Note: The normal fault clearing is 5cycles, with exceptions as indicated in Table 4.2

Twenty five (25) three phase and nineteen (19) single-line-to-ground faults (with re-closing where applicable) were simulated. For all tested cases the initial disturbance was applied at t = 0.1 seconds. The breaker clearing was applied at the appropriate time following the fault inception. Table 4-2 lists all the faults simulated for transient stability analysis.

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Table 4-2 List of Simulated Faults for GEN-2010-055 DISIS

Cont. No.	Cont. Name	Description
1	FLT01-3PH	3 phase fault on the Wekiwa (509757) to Silver City (300140) 138kV line, near Wekiwa. a. Apply fault at the Wekiwa 138kV bus. b. Clear fault after 3 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 3 cycles, then trip the line in (b) and remove fault.
2	FLT02-1PH	*Single phase fault and sequence like previous*
3	FLT03-3PH	3 phase fault on the Wekiwa (509757) to Keystone (505610) 138kV line, near Wekiwa. a. Apply fault at the Wekiwa 138kV bus. b. Clear fault after 3 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 3 cycles, then trip the line in (b) and remove fault.
4	FLT04-1PH	*Single phase fault and sequence like previous*
5	FLT05-3PH	3 phase fault on the Wekiwa (509757) to Sheffield Steel (509812) 138kV line, near Wekiwa. a. Apply fault at the Wekiwa 138kV bus. b. Clear fault after 3 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 3 cycles, then trip the line in (b) and remove fault.
6	FLT06-1PH	*Single phase fault and sequence like previous*
7	FLT07-3PH	3 phase fault on the Wekiwa (509757) to West Edison (509823) 138kV line, near Wekiwa. a. Apply fault at the Wekiwa 138kV bus. b. Clear fault after 3 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 3 cycles, then trip the line in (b) and remove fault.
8	FLT08-1PH	*Single phase fault and sequence like previous*
9	FLT09-3PH	3 phase fault on the Wekiwa (509757) to Pine & Peoria West Tap (509851) 138kV line, near Wekiwa. a. Apply fault at the Wekiwa 138kV bus. b. Clear fault after 3 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 3 cycles, then trip the line in (b) and remove fault.
10	FLT10-1PH	*Single phase fault and sequence like previous*
11	FLT11-3PH	3 phase fault on the Wekiwa 138kV (509757) to 345 kV (509755) transformer near the 138kV bus. a. Apply fault at the Wekiwa 138kV bus. b. Clear fault after 5 cycles by tripping the faulted line.
12	FLT12-3PH	3 phase fault on the Wekiwa (509755) to Tulsa North (509852) 345kV line, near Wekiwa. a. Apply fault at the Wekiwa 345kV bus. b. Clear fault after 3 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 3 cycles, then trip the line in (b) and remove fault.
13	FLT13-1PH	*Single phase fault and sequence like previous*
14	FLT14-3PH	3 phase fault on the Wekiwa (509755) to Sapulpa Road (509870) 345kV line, near Wekiwa. a. Apply fault at the Wekiwa 345kV bus. b. Clear fault after 3 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 3 cycles, then trip the line in (b) and remove fault.

Cont. No.	Cont. Name	Description
15	FLT15-1PH	*Single phase fault and sequence like previous*
16	FLT16-3PH	3 phase fault on the Tulsa North 138kV (509817) to 345 kV (509852) transformer near the 345kV bus. a. Apply fault at the Tulsa North 345kV bus. b. Clear fault after 5 cycles by tripping the faulted line.
17	FLT17-3PH	3 phase fault on the Keystone 138kV (505610) to 161 kV (505609) transformer near the 161 kV bus. a. Apply fault at the Keystone 161kV bus. b. Clear fault after 5 cycles by tripping the faulted line.
18	FLT18-3PH	3 phase fault on the Latham (532800) to GEN-2005-013 Tap (574000) 345kV line, near Latham. a. Apply fault at the Latham 345kV bus. b. Clear fault after 3 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 3 cycles, then trip the line in (b) and remove fault.
19	FLT19-1PH	*Single phase fault and sequence like previous*
20	FLT20-3PH	3 phase fault on the SS (509815) to Prattville (509758) 138kV line, near SS. a. Apply fault at the SS 138kV bus. b. Clear fault after 3 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 3 cycles, then trip the line in (b) and remove fault.
21	FLT21-1PH	*Single phase fault and sequence like previous*
22	FLT24-3PH	3 phase fault on the Keystone (505610) to Fisher Tap (300131) 138kV line, near Keystone. a. Apply fault at the Keystone 138kV bus. b. Clear fault after 3 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 3 cycles, then trip the line in (b) and remove fault.
23	FLT25-1PH	*Single phase fault and sequence like previous*
24	FLT26-3PH	3 phase fault on the GEN-2008-013 Tap (210130) to Woodring (514715) 345kV line, near GEN-2008-013 Tap. a. Apply fault at the GEN-2008-013 Tap 345kV bus. b. Clear fault after 3 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 3 cycles, then trip the line in (b) and remove fault.
25	FLT27-1PH	*Single phase fault and sequence like previous*
26	FLT28-3PH	3 phase fault on the Woodring 345kV (514715) to 138kV (514714) transformer near the Woodring 345kV bus. a. Apply fault at the Woodring 345kV bus. b. Clear fault after 5 cycles by tripping the faulted line.
27	FLT29-3PH	3 phase fault on the GEN-2008-127 Tap (573039) to Sooner (514803) to 345kV line, near GEN-2008-127 Tap. a. Apply fault at the GEN-2008-127 Tap 345kV bus. b. Clear fault after 3.6 cycles by tripping the faulted line.
28	FLT30-1PH	Single- phase fault on the GEN-2008-127 Tap (573039) to Sooner (514803) to 345kV line, near GEN-2008-127 Tap. a. Apply fault at the GEN-2008-127 Tap 345kV bus. b. Clear fault after 3.6 cycles by tripping the faulted line. c. Wait 300 cycles and reclose re-close the line in (b) back into the fault. d. Leave fault on for 3.6 cycles, then trip the line in (b) and remove the fault.

Cont. No.	Cont. Name	Description
29	FLT31-3PH	3 phase fault on the Sooner (514803) to Cleveland (512694) 345kV line, near Cleveland. a. Apply fault at the Cleveland 345kV bus. b. Clear fault after 3 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 3 cycles, then trip the line in (b) and remove fault.
30	FLT32-1PH	*Single phase fault and sequence like previous*
31	FLT33-3PH	3 phase fault on the Tulsa North (509852) to Cleveland (512694) 345kV line, near Tulsa North a. Apply fault at the Tulsa North 345kV bus. b. Clear fault after 3 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 3 cycles, then trip the line in (b) and remove fault.
32	FLT34-1PH	*Single phase fault and sequence like previous*
33	FLT35-3PH	3 phase fault on the Tulsa North (509852) to NES (510406) 345kV line, near Tulsa North a. Apply fault at the Tulsa North 345kV bus. b. Clear fault after 3 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 3 cycles, then trip the line in (b) and remove fault.
34	FLT36-3PH	*Single phase fault and sequence like previous*
35	FLT37-3PH	3 phase fault on the Tulsa North (509852) to GRDA1 (512650) 345kV line, near Tulsa North a. Apply fault at the Tulsa North 345kV bus. b. Clear fault after 3 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 3 cycles, then trip the line in (b) and remove fault.
36	FLT38-3PH	*Single phase fault and sequence like previous*
37	FLT39-3PH	3 phase fault on the Cimarron (514901) to Northwest (514880) 345kV line, near Cimarron. a. Apply fault at the Cimarron 345kV bus. b. Clear fault after 3 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 3 cycles, then trip the line in (b) and remove fault.
38	FLT40-1PH	*Single phase fault and sequence like previous*
39	FLT41-3PH	3 phase fault on the Cimarron (514901) to GEN-2007-043 (210431) 345kV line, near Cimarron. a. Apply fault at the Cimarron 345kV bus. b. Clear fault after 3 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 3 cycles, then trip the line in (b) and remove fault.
40	FLT42-1PH	*Single phase fault and sequence like previous*
41	FLT43-3PH	3 phase fault on the Cimarron 138/345 kV autotransformer near the 345 kV bus (514901). a. Apply fault at the 345kV bus side. b. Clear fault after 5 cycles by tripping the faulted line.
42	FLT44-3PH	3 phase fault on the Sooner 138/345 kV autotransformer near the 345 kV bus (514803). a. Apply fault at the 345kV bus side. b. Clear fault after 5 cycles by tripping the faulted line.

Cont. No.	Cont. Name	Description
43	FLT45-3PH	3 phase fault on the Northeastern (510406) to Delaware (510380) 345kV line, near Delaware. a. Apply fault at the Delaware 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.
44	FLT46-1PH	*Single phase fault and sequence like previous*

The system was stable for all the simulated 3-Phase and single-phase faults. The proposed GEN-2010-055 wind farm stayed on-line throughout the duration of the fault and thereof. The voltage recovery was acceptable, and the oscillations were damped out. A sample response of GEN-2010-055 project is shown in Figure 4-1 from the simulation of FLT03_3PH. This fault is a 3 Phase fault at the POI.

Table 4-3 summarizes the stability analysis results for 2010-2011 summer peak and winter peak system conditions.

The plots from the transient stability analysis are included in Appendix C.

Table 4-3 Results of stability analysis

	2011 Summer Peak			2011 Winter Peak		
		Post-Project			Post-Project	
FAULT	Pre-Project	Stable?	Acceptable Voltages?	Pre-Project	Stable?	Acceptable Voltages?
FLT01_3PH	---	STABLE	YES	---	STABLE	YES
FLT02_1PH	---	STABLE	YES	---	STABLE	YES
FLT03_3PH	---	STABLE	YES	---	STABLE	YES
FLT04_1PH	---	STABLE	YES	---	STABLE	YES
FLT05_3PH	---	STABLE	YES	---	STABLE	YES
FLT06_1PH	---	STABLE	YES	---	STABLE	YES
FLT07_3PH	---	STABLE	YES	---	STABLE	YES
FLT08_1PH	---	STABLE	YES	---	STABLE	YES
FLT09_3PH	---	STABLE	YES	---	STABLE	YES
FLT10_1PH	---	STABLE	YES	---	STABLE	YES
FLT11_3PH	---	STABLE	YES	---	STABLE	YES
FLT12_3PH	---	STABLE	YES	---	STABLE	YES
FLT13_1PH	---	STABLE	YES	---	STABLE	YES
FLT14_3PH	---	STABLE	YES	---	STABLE	YES
FLT15_1PH	---	STABLE	YES	---	STABLE	YES
FLT16_3PH	---	STABLE	YES	---	STABLE	YES

FAULT	2011 Summer Peak			2011 Winter Peak		
	Pre-Project	Post-Project		Pre-Project	Post-Project	
		Stable?	Acceptable Voltages?		Stable?	Acceptable Voltages?
FLT17_3PH	---	STABLE	YES	---	STABLE	YES
FLT18_3PH	---	STABLE	YES	---	STABLE	YES
FLT19_1PH	---	STABLE	YES	---	STABLE	YES
FLT20_3PH	---	STABLE	YES	---	STABLE	YES
FLT21_1PH	---	STABLE	YES	---	STABLE	YES
FLT24_3PH	---	STABLE	YES	---	STABLE	YES
FLT25_1PH	---	STABLE	YES	---	STABLE	YES
FLT26_3PH	---	STABLE	YES	---	STABLE	YES
FLT27_1PH	---	STABLE	YES	---	STABLE	YES
FLT28_3PH	---	STABLE	YES	---	STABLE	YES
FLT29_3PH	---	STABLE	YES	---	STABLE	YES
FLT30_1PH	---	STABLE	YES	---	STABLE	YES
FLT31_3PH	---	STABLE	YES	---	STABLE	YES
FLT32_1PH	---	STABLE	YES	---	STABLE	YES
FLT33_3PH	---	STABLE	YES	---	STABLE	YES
FLT34_1PH	---	STABLE	YES	---	STABLE	YES
FLT35_3PH	---	STABLE	YES	---	STABLE	YES
FLT36_1PH	---	STABLE	YES	---	STABLE	YES
FLT37_3PH	---	STABLE	YES	---	STABLE	YES
FLT38_1PH	---	STABLE	YES	---	STABLE	YES
FLT39_3PH	---	STABLE	YES	---	STABLE	YES
FLT40_1PH	---	STABLE	YES	---	STABLE	YES
FLT41_3PH	---	STABLE	YES	---	STABLE	YES
FLT42_1PH	---	STABLE	YES	---	STABLE	YES
FLT43_3PH	---	STABLE	YES	---	STABLE	YES
FLT44_3PH	---	STABLE	YES	---	STABLE	YES
FLT45_3PH	---	STABLE	YES	---	STABLE	YES
FLT46_1PH	---	STABLE	YES	---	STABLE	YES

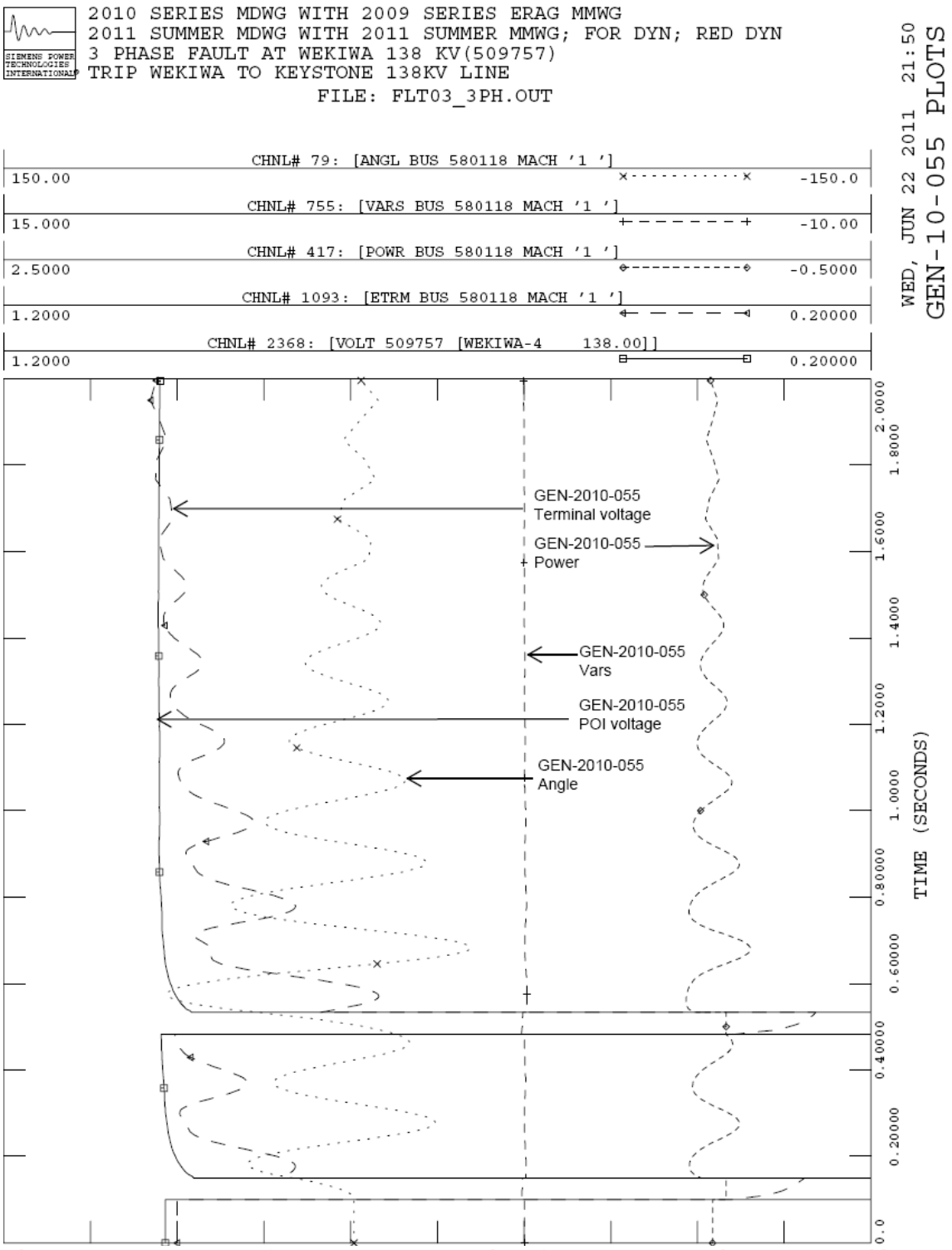


Figure 4-1 Response of GEN-2010-055 project for FLT03_3PH (summer peak)

ABB

5 CONCLUSIONS

The main objective of this study was to determine the impact of the proposed Project (GEN-2010-055, 4.5 MW) on the stability of SPP transmission system and nearby generating stations.

To achieve this objective the following analyses Transient stability analysis for various local and regional contingencies was performed on the 2010-2011 Summer Peak and Winter Peak system conditions with GEN-2010-055 in-service

A summary of the study findings is given below:

Stability Analysis

A stability analysis was performed to determine the impact, if any, of the proposed project on the stability of SPP system. The system was found to be stable for all the tested 3-phase faults and single-line-to-ground (SLG) faults (with line re-closing, where applicable).

Based on the results of the analysis, it can be concluded that the proposed GEN-2010-055 wind farm does not adversely impact the transmission performance of the SPP system.

The results of this analysis are based on available data and assumptions made at the time of conducting this study. If any of the data and/or assumptions made in developing the study model change, the results provided in this report may not apply and additional analysis may be required.

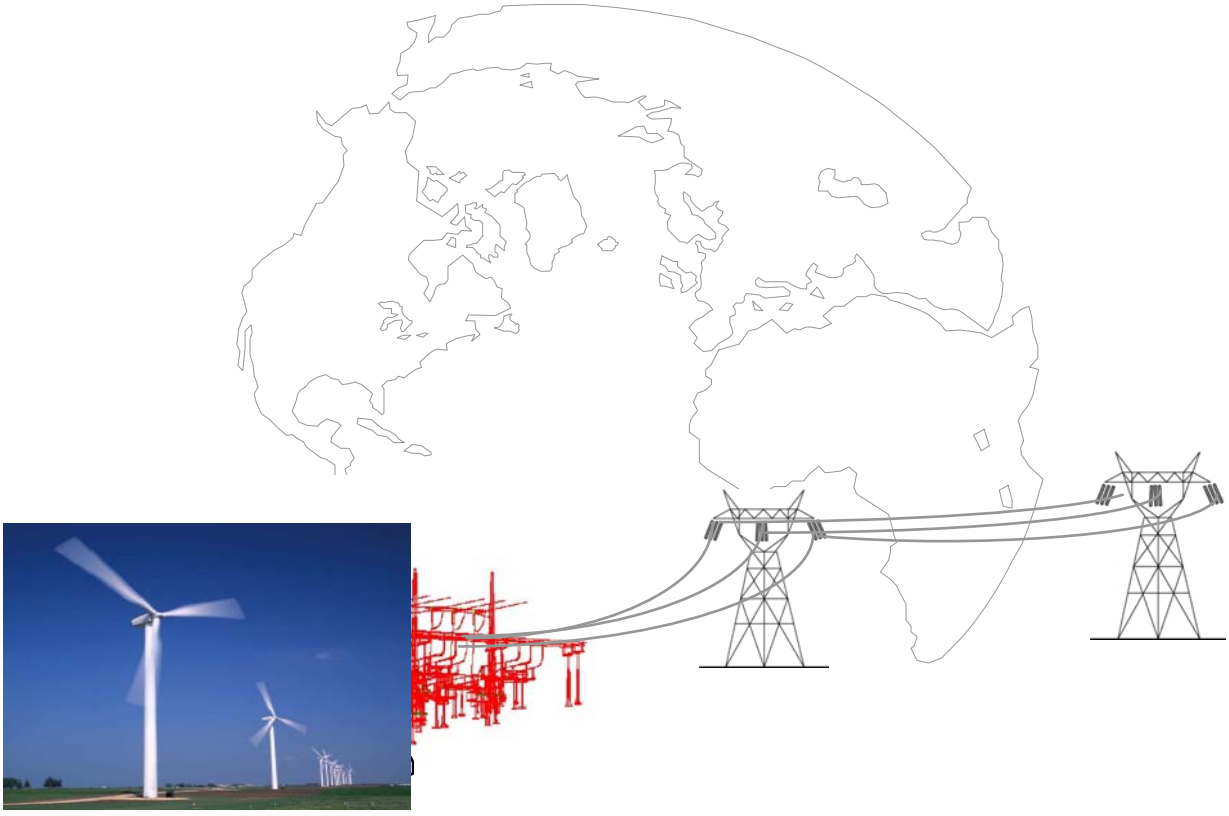
APPENDIX B PLOTS FROM STABILITY SIMULATIONS

Q: Stability Study for Group 9/10

Southwestern Power Pool Inc. (SPP)

Definitive Impact Study Report

DISIS-2011-001 (Group 9)



Submitted To

Southwest Power Pool Inc.

July 20, 2011

POWER-tek Global Inc.
irshad@powertek-usa.com, www.powertek-usa.com
4640 Colombo Crescent, Mississauga, ON L5M 7R2, Canada

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Appendix A: Summer Peak Case Stability Run Plots

Appendix B: Winter Peak Case Stability Run Plots

Appendix C: Project Model Data

Executive Summary

This report presents the results of impact study comprising of power factor and stability analyses of the proposed interconnection projects under DISIS-2011-001 Group 9 (the Project) as described in the following Table.

Interconnection Request

Request	Size (MW)	Wind Turbine Model	Point of Interconnection
GEN-2011-027	120	Nordex N100 2.5MW	Bus 580010 G10-051TAP

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

The power factor analysis indicates the GEN-2011-027 interconnection request is required to maintain a 98% lagging (supplying vars) and a 1.0 Unity power factor at the point of interconnection (the NPPD 230kV transmission bus).

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 specified test disturbances did not show instability problems in the SPP system and oscillations were damped out.

1.0 Introduction

1.1. Project Overview and Assumptions

The DISIS-2011-001 Group 9 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 projects under DISIS-2011-001 Group 9 (the "Project") as described in Table 1.1:

Table 1.1: Interconnection Request

Request	Size (MW)	Wind Turbine Model	Point of Interconnection
GEN-2011-027	120	Nordex N100 2.5MW	Bus 580010 G10-051TAP

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.

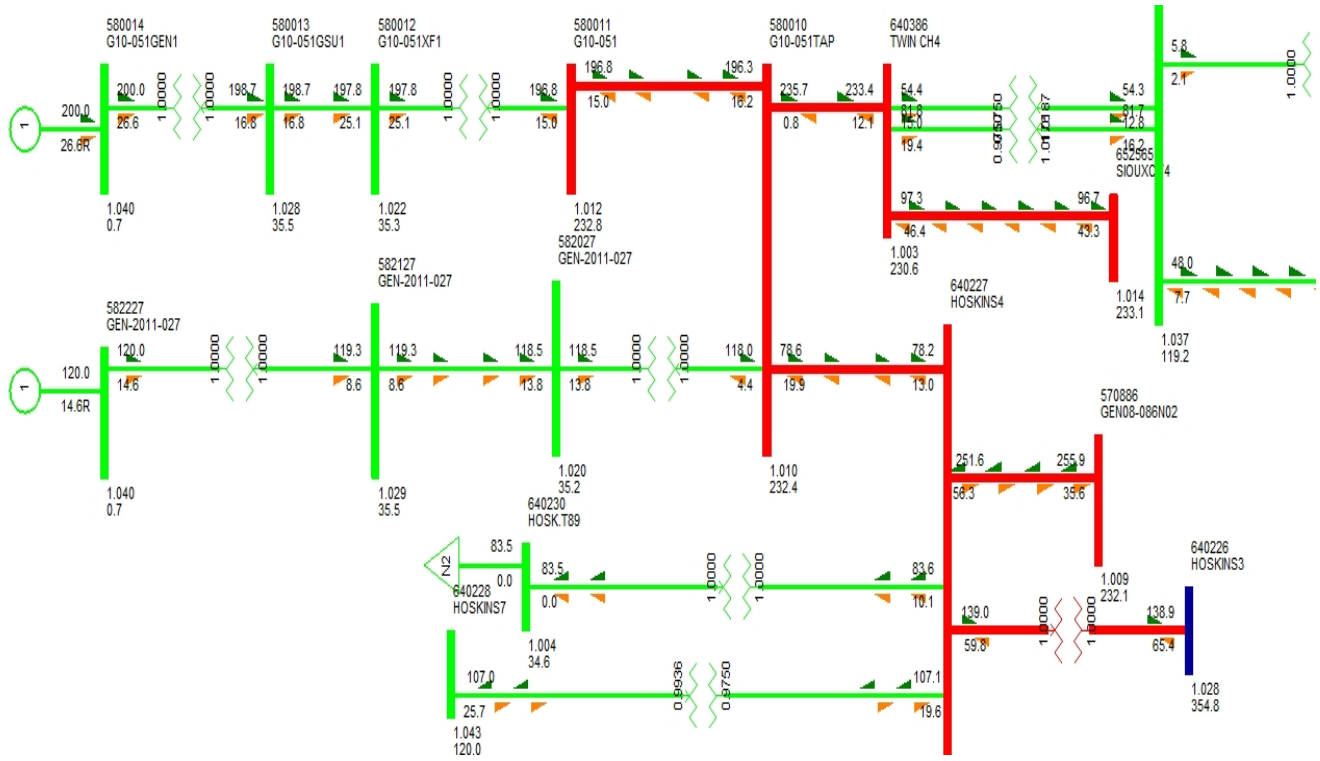

Figure 1.1: Power Flow Single Line Diagram for Gen-2011-027 and surrounding system components

Appendix C contains the machine, 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-2006-020N	42	Vestas 3.0MW	Bloomfield 115kV (640084)
GEN-2006-038N019	80	CIMTR1	Petersburg 115kV (640318)
GEN-2007-011N08	81	Vestas 3.0MW	Bloomfield 115kV (640084)
GEN-2006-037N1	75	GE 1.5MW	Broken Bow 115kV (640089)
GEN-2003-021N	75	Vestas V82 1.65 MW	Tap on the Ainsworth – Calamus 115kV line (640050)
GEN-2004-005N	30	GE 1.5MW	St Francis 115kV (640351)
GEN-2006-038N005	80	CIMTR1	Broken Bow 115kV (640089)
GEN-2006-044N	40.5	GE 1.5MW	Petersburg 115kV (640318)
GEN-2006-044N02	100.5	GE 1.5MW	Tap on the Columbus – Ft Randall 230kV line (570886)
GEN-2008-086N02	198	GE 1.5MW	Tap on the Columbus – Ft Randall 230kV line (570886)
GEN-2010-010	100.5	GE 1.5MW	Tap on the Columbus – Ft Randall 115kV line (570886)
GEN-2010-051	200	GE 1.6MW	Tap on the Twin Church – Hoskins 230kV line (580010)

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.

1.2. 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.

1.3. Models and Simulations Tools Used

Version 30.3.3 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. 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 C. All upgrades and instructions provided by SPP were made to the base cases.

Power flow single line diagram of the Project in summer peak conditions are shown in Figure 1.1. Figure 1.1 shows that wind farm model includes representation of the radial transmission line, the substation transformer

from transmission voltage to 34.5kV. The remainder of each wind farm is represented by lumped equivalents including a generator, a step-up transformer, and a 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 531, 534, 536, 540, 541, 640, 645, 650, and 652 were monitored.

2.0 Power Factor Analysis

2.1. 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 or 230 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 or 230 kV 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.

2.2. Analysis

Analysis was performed for proposed Project with all prior queued projects in service. A var generator was modeled 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 Peak	Winter Peak
GEN-2011-027	Bus 580010 G10-051TAP	120	1.01	1.011

POI: (580010) - GEN-2010-051-Hoskins 230kV line

The var generator either supplies or absorbs reactive power at different contingencies as summarized in Table 2.3. The highest values obtained are highlighted and as follows:

1. For the summer case, the maximum var generator supply is 21.8 MVARs for the outage of 640386 [TWIN CH4 230.00] to BUS 652565 [SIOUXCY4 230.00] CKT 1 line. This requires maximum power factor of 0.98 lagging. The minimum var requirement is for outage of for 570886 [GEN08-086N02230.00] to 652509 [FTRANDL4 230.00] CKT 1 requiring 0.2 MVARs at unity power factor lagging.

2. For the winter case, the maximum var generator supply is 14.8 MVARs for the outage of 640227 [HOSKINS4 230.00] to 640226 [HOSKINS3 345.00] CKT 1 line. This requires maximum power factor of 0.99 lagging. The minimum var supply is for outage of for 640227 [HOSKINS4 230.00] to 640228 [HOSKINS7 115.00] CKT 1 requiring 1.4 MVARs at unity power factor leading.

Table 2.3 Var Generator Output in Summer Peak Case for GEN-2011-027

Summer Case Power Factor Study

Cont. Name	Contingency Description			MVAR at POI	MW at POI	% of Max MVAR Capability	P.F. at POI
	Base Case			5.3	120	14.6	1.00
2 FLT-3PH	640227 [HOSKINS4 230.00]	TO	BUS 640226 [HOSKINS3 345.00] CKT 1	17.2	120	47.3	0.99
3 FLT-3PH	640227 [HOSKINS4 230.00]	TO	BUS 640228 [HOSKINS7 115.00] CKT 1	0.3	120	0.8	1.00
5 FLT-3PH	580010 [G10-051TAP 230.00]	TO	BUS 640386 [TWIN CH4 230.00] CKT 1	2.5	120	6.9	1.00
6 FLT-3PH	640386 [TWIN CH4 230.00]	TO	BUS 652565 [SIOUXCY4 230.00] CKT 1	21.8	120	59.9	0.98
7 FLT-3PH	640386 [TWIN CH4 230.00]	TO	BUS 640387 [TWIN CH7 115.00] CKT 1	5.4	120	14.8	1.00
8 FLT-3PH	640084 [BLMFLD 7 115.00]	TO	BUS 640080 [BELDEN 7 115.00] CKT 1	4.2	120	11.5	1.00
9 FLT-3PH	640084 [BLMFLD 7 115.00]	TO	BUS 640149 [CREITON7 115.00] CKT 1	4.9	120	13.5	1.00
10 FLT-3PH	640084 [BLMFLD 7 115.00]	TO	BUS 652511 [GAVINS 7 115.00] CKT 1	6.3	120	17.3	1.00
12 FLT-3PH	640084 [BLMFLD 7 115.00]	TO	BUS 652511 [GAVINS 7 115.00] CKT 1	4.9	120	13.5	1.00
13 FLT-3PH	640263 [MADISON7 115.00]	TO	BUS 640151 [CRESTON7 115.00] CKT 1	6.2	120	17.0	1.00
14 FLT-3PH	640263 [MADISON7 115.00]	TO	BUS 640298 [NORFOLK7 115.00] CKT 1	6.4	120	17.6	1.00
15 FLT-3PH	640228 [HOSKINS7 115.00]	TO	BUS 640298 [NORFOLK7 115.00] CKT 1	4.9	120	13.5	1.00
16 FLT-3PH	640298 [NORFOLK7 115.00]	TO	BUS 640296 [NORFK.N7 115.00] CKT 1	5.2	120	14.3	1.00
18 FLT-3PH	640318 [PETRSBG7 115.00]	TO	BUS 640054 [ALBION 7 115.00] CKT 1	0.2	120	0.5	1.00
19 FLT-3PH	640318 [PETRSBG7 115.00]	TO	BUS 640054 [ALBION 7 115.00] CKT 1	0.6	120	1.6	1.00
20 FLT-3PH	640228 [HOSKINS7 115.00]	TO	BUS 640296 [NORFK.N7 115.00] CKT 1	4.8	120	13.2	1.00
21 FLT-3PH	640318 [PETRSBG7 115.00]	TO	BUS 640293 [NELIGH 7 115.00] CKT 1	5.3	120	14.6	1.00
22 FLT-3PH	640089 [BROKENB7 115.00]	TO	BUS 640094 [C.CREEK7 115.00] CKT 1	5.2	120	14.3	1.00
23 FLT-3PH	640089 [BROKENB7 115.00]	TO	BUS 640098 [CALAWAY7 115.00] CKT 1	5.3	120	14.6	1.00
24 FLT-3PH	640089 [BROKENB7 115.00]	TO	BUS 640259 [LOUPCTY7 115.00] CKT 1	5.2	120	14.3	1.00
25 FLT-3PH	640050 [AINSWND7 115.00]	TO	BUS 640051 [AINSWRT7 115.00] CKT 1	6.6	120	18.1	1.00
26 FLT-3PH	640050 [AINSWND7 115.00]	TO	640096 [CALAMS 7 115.00] CKT 1	5.4	120	14.8	1.00
27 FLT-3PH	640051 [AINSWRT7 115.00]	TO	640392 [VALENTN7 115.00] CKT 1	5.2	120	14.3	1.00
28 FLT-3PH	640051 [AINSWRT7 115.00]	TO	640367 [STUART 7 115.00] CKT 1	5.9	120	16.2	1.00
29 FLT-3PH	640351 [ST.FRANC 115.00]	TO	640210 [HARMONY7 115.00] CKT 1	5.4	120	14.8	1.00
30 FLT-3PH	640351 [ST.FRANC 115.00]	TO	652482 [MISSION7 115.00] CKT 1	5.2	120	14.3	1.00
31 FLT-3PH	640293 [NELIGH 7 115.00]	TO	640113 [CLRWATR7 115.00] CKT 1	6.8	120	18.7	1.00
32 FLT-3PH	640293 [NELIGH 7 115.00]	TO	640115 [CO.LINE7 115.00] CKT 1	6.9	120	19.0	1.00
34 FLT-3PH	640293 [NELIGH 7 115.00]	TO	640149 [CREITON7 115.00] CKT 1	4.8	120	13.2	1.00
36 FLT-3PH	640054 [ALBION 7 115.00]	TO	640181 [GENOA 7 115.00] CKT 1	5.1	120	14.0	1.00

Summer Case Power Factor Study

Cont. Name	Contingency Description			MVAR at POI	MW at POI	% of Max MVAR Capability	P.F. at POI
38 FLT-3PH	640054 [ALBION 7 115.00]	TO	640347 [SPALDNG7 115.00] CKT 1	5.5	120	15.1	1.00
39 FLT-3PH	652511 [GAVINS 7 115.00]	TO	640212 [HARTGTN7 115.00] CKT 1	4.8	120	13.2	1.00
41 FLT-3PH	570886 [GEN08-086N02230.00]	TO	640133 [COLMBUS4 230.00] CKT 1	10.5	120	28.9	1.00
42 FLT-3PH	640133 [COLMBUS4 230.00]	TO	640126 [E.COL. 4 230.00] CKT 1	4.3	120	11.8	1.00
43 FLT-3PH	640133 [COLMBUS4 230.00]	TO	640131 [COLMB.W4 230.00] CKT 1	6.8	120	18.7	1.00
45 FLT-3PH	640133 [COLMBUS4 230.00]	TO	640343 [SHELCRK4 230.00] CKT 1	5.9	120	16.2	1.00
46 FLT-3PH	640134 [KELLY 7 115.00]	TO	640133 [COLMBUS4 230.00]	4.4	120	12.1	1.00
47 FLT-3PH	570886 [GEN08-086N02230.00]	TO	652509 [FTRANDL4 230.00] CKT 1	0.2	120	0.5	1.00
48 FLT-3PH	652509 [FTRANDL4 230.00]	TO	652516 [LAKPLAT4 230.00] CKT 1	6.6	120	18.1	1.00
49 FLT-3PH	652509 [FTRANDL4 230.00]	TO	652526 [UTICAJC4 230.00] CKT 1	0.4	120	1.1	1.00
50 FLT-3PH	652509 [FTRANDL4 230.00]	TO	652565 [SIOUXCY4 230.00] CKT 1	2.5	120	6.9	1.00
51 FLT-3PH	652510 [FTRANDL7 115.00]	TO	652509 [FTRANDL4 230.00] CKT 1	5.3	120	14.6	1.00
52 FLT-3PH	640226 [HOSKINS3 345.00]	TO	635200 [RAUN 3 345.00] CKT 1	4.1	120	11.3	1.00
54 FLT-3PH	640226 [HOSKINS3 345.00]	TO	640342 [SHELCRK3 345.00] CKT 1	1.6	120	4.4	1.00
55 FLT-3PH	640228 [HOSKINS7 115.00]	TO	640226 [HOSKINS3 345.00]	2.8	120	7.7	1.00
56 FLT-3PH	640080 [BELDEN 7 115.00]	TO	640228 [HOSKINS7 115.00] CKT 1	5	120	13.7	1.00
57 FLT-3PH	640080 [BELDEN 7 115.00]	TO	640387 [TWIN CH7 115.00] CKT 1	4.9	120	13.5	1.00
58 FLT-3PH	640287 [N.PLATT7 115.00]	TO	640286 [N.PLATT4 230.00]	5.3	120	14.6	1.00

Table 2.4 Var Generator Output in Winter Peak Case for GEN-2011-027

Winter Case Power Factor Study

Cont. Name	Contingency Description			MVAR at POI	MW at POI	% of Max MVAR Capability	P.F. at POI
	Base Case			4.8	120	13.2	1.00
2 FLT-3PH	640227 [HOSKINS4 230.00]	TO	640226 [HOSKINS3 345.00] CKT 1	14.8	120	40.7	0.99
3 FLT-3PH	640227 [HOSKINS4 230.00]	TO	640228 [HOSKINS7 115.00] CKT 1	1.4	120	3.8	1.00
5 FLT-3PH	580010 [G10-051TAP 230.00]	TO	640386 [TWIN CH4 230.00] CKT 1	9.4	120	25.8	1.00
6 FLT-3PH	640386 [TWIN CH4 230.00]	TO	652565 [SIOUXCY4 230.00] CKT 1	10	120	27.5	1.00
7 FLT-3PH	640386 [TWIN CH4 230.00]	TO	640387 [TWIN CH7 115.00] CKT 1	3.5	120	9.6	1.00
8 FLT-3PH	640084 [BLMFLD 7 115.00]	TO	640080 [BELDEN 7 115.00] CKT 1	4.1	120	11.3	1.00
9 FLT-3PH	640084 [BLMFLD 7 115.00]	TO	640149 [CREITON7 115.00] CKT 1	4.7	120	12.9	1.00
10 FLT-3PH	640084 [BLMFLD 7 115.00]	TO	652511 [GAVINS 7 115.00] CKT 1	4	120	11.0	1.00
12 FLT-3PH	640084 [BLMFLD 7 115.00]	TO	652511 [GAVINS 7 115.00] CKT 1	5.3	120	14.6	1.00
13 FLT-3PH	640263 [MADISON7 115.00]	TO	640151 [CRESTON7 115.00] CKT 1	5	120	13.7	1.00
14 FLT-3PH	640263 [MADISON7 115.00]	TO	640298 [NORFOLK7 115.00] CKT 1	5.5	120	15.1	1.00
15 FLT-3PH	640228 [HOSKINS7 115.00]	TO	640298 [NORFOLK7 115.00] CKT 1	4.8	120	13.2	1.00
16 FLT-3PH	640298 [NORFOLK7 115.00]	TO	640296 [NORFK.N7 115.00] CKT 1	4.6	120	12.6	1.00
18 FLT-3PH	640318 [PETRSBG7 115.00]	TO	640054 [ALBION 7 115.00] CKT 1	2	120	5.5	1.00
19 FLT-3PH	640318 [PETRSBG7 115.00]	TO	640054 [ALBION 7 115.00] CKT 1	4.8	120	13.2	1.00
20 FLT-3PH	640228 [HOSKINS7 115.00]	TO	640296 [NORFK.N7 115.00] CKT 1	4.8	120	13.2	1.00
21 FLT-3PH	640318 [PETRSBG7 115.00]	TO	640293 [NELIGH 7 115.00] CKT 1	5.7	120	15.7	1.00
22 FLT-3PH	640089 [BROKENB7 115.00]	TO	640094 [C.CREEK7 115.00] CKT 1	4.5	120	12.4	1.00
23 FLT-3PH	640089 [BROKENB7 115.00]	TO	640098 [CALAWAY7 115.00] CKT 1	4.8	120	13.2	1.00
24 FLT-3PH	640089 [BROKENB7 115.00]	TO	640259 [LOUPCTY7 115.00] CKT 1	5.7	120	15.7	1.00
25 FLT-3PH	640050 [AINSWND7 115.00]	TO	640051 [AINSWRT7 115.00] CKT 1	5.8	120	15.9	1.00
26 FLT-3PH	640050 [AINSWND7 115.00]	TO	640096 [CALAMS 7 115.00] CKT 1	5.1	120	14.0	1.00
27 FLT-3PH	640051 [AINSWRT7 115.00]	TO	640392 [VALENTN7 115.00] CKT 1	4.5	120	12.4	1.00
28 FLT-3PH	640051 [AINSWRT7 115.00]	TO	640367 [STUART 7 115.00] CKT 1	5.6	120	15.4	1.00
29 FLT-3PH	640351 [ST.FRANC 115.00]	TO	640210 [HARMONY7 115.00] CKT 1	4.7	120	12.9	1.00
30 FLT-3PH	640351 [ST.FRANC 115.00]	TO	652482 [MISSION7 115.00] CKT 1	4.5	120	12.4	1.00
31 FLT-3PH	640293 [NELIGH 7 115.00]	TO	640113 [CLRWATR7 115.00] CKT 1	5.1	120	14.0	1.00
32 FLT-3PH	640293 [NELIGH 7 115.00]	TO	640115 [CO.LINE7 115.00] CKT 1	6.6	120	18.1	1.00
34 FLT-3PH	640293 [NELIGH 7 115.00]	TO	640149 [CREITON7 115.00] CKT 1	4.5	120	12.4	1.00
36 FLT-3PH	640054 [ALBION 7 115.00]	TO	640181 [GENOA 7 115.00] CKT 1	3.7	120	10.2	1.00
38 FLT-3PH	640054 [ALBION 7 115.00]	TO	640347 [SPALDNG7 115.00] CKT 1	5	120	13.7	1.00
39 FLT-3PH	652511 [GAVINS 7 115.00]	TO	640212 [HARTGTN7 115.00] CKT 1	4.9	120	13.5	1.00
41 FLT-3PH	570886 [GEN08-086N02230.00]	TO	640133 [COLMBUS4 230.00] CKT 1	7.2	120	19.8	1.00
42 FLT-3PH	640133 [COLMBUS4 230.00]	TO	640126 [E.COL. 4 230.00] CKT 1	3.8	120	10.4	1.00
43 FLT-3PH	640133 [COLMBUS4 230.00]	TO	640131 [COLMB.W4 230.00] CKT 1	5.6	120	15.4	1.00
45 FLT-3PH	640133 [COLMBUS4 230.00]	TO	640343 [SHELCRK4 230.00] CKT 1	5.6	120	15.4	1.00
46 FLT-3PH	640134 [KELLY 7 115.00]	TO	640133 [COLMBUS4 230.00]	4.3	120	11.8	1.00
47 FLT-3PH	570886 [GEN08-086N02230.00]	TO	652509 [FTRANDL4 230.00] CKT 1	2.9	120	8.0	1.00
48 FLT-3PH	652509 [FTRANDL4 230.00]	TO	652516 [LAKPLAT4 230.00] CKT 1	5.9	120	16.2	1.00
49 FLT-3PH	652509 [FTRANDL4 230.00]	TO	652526 [UTICAJC4 230.00] CKT 1	1.5	120	4.1	1.00
50 FLT-3PH	652509 [FTRANDL4 230.00]	TO	652565 [SIOUXCY4 230.00] CKT 1	3.3	120	9.1	1.00
51 FLT-3PH	652510 [FTRANDL7 115.00]	TO	652509 [FTRANDL4 230.00] CKT 1	4.7	120	12.9	1.00

Winter Case Power Factor Study

Cont. Name	Contingency Description			MVAR at POI	MW at POI	% of Max MVAR Capability	P.F. at POI
52 FLT-3PH	640226 [HOSKINS3 345.00]	TO	635200 [RAUN 3 345.00] CKT 1	7.4	120	20.3	1.00
54 FLT-3PH	640226 [HOSKINS3 345.00]	TO	640342 [SHELCRK3 345.00] CKT 1	1.8	120	4.9	1.00
55 FLT-3PH	640228 [HOSKINS7 115.00]	TO	640226 [HOSKINS3 345.00]	1.6	120	4.4	1.00
56 FLT-3PH	640080 [BELDEN 7 115.00]	TO	640228 [HOSKINS7 115.00] CKT 1	4.4	120	12.1	1.00
57 FLT-3PH	640080 [BELDEN 7 115.00]	TO	640387 [TWIN CH7 115.00] CKT 1	4.2	120	11.5	1.00
58 FLT-3PH	640287 [N.PLATT7 115.00]	TO	640286 [N.PLATT4 230.00]	4.8	120	13.2	1.00

2.3. Conclusions

The power factor analysis indicates the GEN-2011-027 interconnection request is required to maintain a 98% lagging (supplying vars) and a 1.0 Unity power factor at the point of interconnection (the NPPD 230kV transmission bus).

3.0 Stability Analysis

3.1 Faults Simulated

Sixty (60) 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 Table 1.2 and units in areas 520, 524, 525, 526, 531, 534, 536, 640, 645, and 650 were monitored in the simulations. Table 3.1 shows the list of simulated contingencies. This list 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 3.1. Simulations were run for a minimum 15-second duration to confirm proper machine damping.

Table 3.1 summarizes the overall results for all faults run. Complete sets of plots for both summer and winter peak seasons for each fault are included in Appendices A and B respectively.

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

Table 3.1: List of simulated faults for stability analysis

Cont. No.	Cont. Name	Description	Summer Results	Winter Results
1		*Ignored. POI was moved to 580010*		
2	FLT02-3PH	3 phase fault on the Hoskins 230kV (640227) to 345kV (640226) transformer near the 230kV bus. a. Apply fault at Hoskins 230kV bus. b. Clear fault after 5.5 cycles by tripping faulted line.	Stable	Stable
3	FLT03-3PH	3 phase fault on the Hoskins 230kV (640227) to 115kV (640228) transformer near the 230kV bus. a. Apply fault at Hoskins 230kV bus. b. Clear fault after 5.5 cycles by tripping faulted line.	Stable	Stable
4		*Ignored. POI moved to 580010*		
5	FLT05-3PH	3 phase fault on the GEN-2010-051 Tap (580010) to Twin Church (640386) 230kV near GEN-2010-051 Tap. a. Apply fault at GEN-2010-051 Tap 230kV bus. b. Clear fault after 6.5 cycles by tripping faulted line.	Stable	Stable
6	FLT06-3PH	3 phase fault on the Twin Church (640386) to Sioux City (652565) 230kV near Twin Church. a. Apply fault at Twin Church 230kV bus. b. Clear fault after 6.5 cycles by tripping faulted line.	Stable	Stable
7	FLT07-3PH	3 phase fault on one of the Twin Church 230kV (640386) to 115kV (640387) transformers near the 230kV bus. a. Apply fault at Twin Church 230kV bus. b. Clear fault after 5.5 cycles by tripping faulted line.	Stable	Stable
8	FLT08-3PH	3 phase fault on the Bloomfield (640084) to Belden (640080) 115kV line, near Bloomfield. a. Apply fault at Bloomfield 115kV bus. b. Clear fault after 6.5 cycles by tripping the faulted line.	Stable	Stable
9	FLT09-3PH	3 phase fault on the Bloomfield (640084) to Creighton (640149) 115kV line, near Bloomfield. a. Apply fault at Bloomfield 115kV bus. b. Clear fault after 6.5 cycles by tripping the faulted line.	Stable	Stable
10	FLT10-3PH	3 phase fault on the Bloomfield (640084) to Gavins Point (652511) 115kV line, near Bloomfield. a. Apply fault at the Bloomfield 115kV bus. b. Clear fault after 6.5 cycles by tripping the faulted line.	Stable	Stable
11	FLT11-1PH	Single phase fault on the Bloomfield (640084) to Gavins Point (652511) 115 kV line, near Bloomfield. Stuck breaker at Gavins. a. Apply fault at Bloomfield 115 kV bus. b. Clear Bloomfield end of line at 5.5 cycles. Leave fault on end of open-ended line from Gavins Point. c. Clear Gavins Point 115 kV bus and fault at 18.0 cycles.	Stable	Stable
12	FLT12-3PH	3 phase fault on the Bloomfield (640084) to Gavins Point (652511) 115 kV line, near Bloomfield. Prior outage of Neligh (640293) to County Line (640115) 115 kV line. a. Prior Outage: Neligh to County Line 115 kV line. b. Apply fault on Bloomfield 115 kV bus. c. Clear fault after 6.5 cycles by tripping the faulted line.	Stable	Stable
13	FLT13-3PH	3 phase fault on the Madison (640263) to Creston (640151) 115kV line, near Madison. a. Apply fault at the Madison 115kV bus. b. Clear fault after 6.5 cycles by tripping the faulted line.	Stable	Stable

Cont. No.	Cont. Name	Description	Summer Results	Winter Results
14	FLT14-3PH	3 phase fault on the Norfolk (640298) to Madison (640263) 115kV line, near Madison. a. Apply fault at the Madison 115kV bus. b. Clear fault after 6.5 cycles by tripping the faulted line.	Stable	Stable
15	FLT15-3PH	3 phase fault on the Hoskins (640228) to Norfolk (640298) 115kV line, near Hoskins. a. Apply fault at the Hoskins 115kV bus. b. Clear fault after 6.5 cycles by tripping the faulted line.	Stable	Stable
16	FLT16-3PH	3 phase fault on the Norfolk (640298) to Norfolk N (640296) 115kV line, near Norfolk. a. Apply fault at the Norfolk 115kV bus. b. Clear fault after 6.5 cycles by tripping the faulted line.	Stable	Stable
17	FLT17-3PH	*Not available*		
18	FLT18-3PH	3 phase fault on the Petersburg (640318) to Albion (640054) 115kV line, near Petersburg. a. Apply fault at the Petersburg 115kV bus. b. Clear fault after 6.5 cycles by tripping the faulted line.	Stable	Stable
19	FLT19-3PH	3 phase fault on the Petersburg (640318) to Albion (640054) 115kV line, near Petersburg. Prior outage of the Neligh (640293) to County Line (640115) 115 kV line a. Prior Outage: Neligh to County Line 115 kV line. b. Apply fault at the Petersburg 115kV bus. c. Clear fault after 6.5 cycles by tripping the faulted line.	Stable	Stable
20	FLT20-3PH	3 phase fault on the Hoskins (640228) to Norfolk N (640296) 115kV line, near Hoskins. a. Apply fault at the Hoskins 115kV bus. b. Clear fault after 6.5 cycles by tripping the faulted line.	Stable	Stable
21	FLT21-3PH	3 phase fault on the Petersburg (640318) to Neligh (640293) 115kV line, near Petersburg. a. Apply fault at the Petersburg 115kV bus. b. Clear fault after 6.5 cycles by tripping the faulted line.	Stable	Stable
22	FLT22-3PH	3 phase fault on the Broken Bow (640089) to Crooked Creek (640094) 115kV line, near Broken Bow. a. Apply fault at the Broken Bow 115kV bus. b. Clear fault after 6.5 cycles by tripping the faulted line.	Stable	Stable
23	FLT23-3PH	3 phase fault on the Broken Bow (640089) to Callaway (640098) 115kV line, near Broken Bow. a. Apply fault at the Broken Bow 115kV bus. b. Clear fault after 6.5 cycles by tripping the faulted line.	Stable	Stable
24	FLT24-3PH	3 phase fault on the Broken Bow (640089) to Loup City (640259) 115kV line, near Broken Bow. a. Apply fault at the Broken Bow 115kV bus. b. Clear fault after 6.5 cycles by tripping the faulted line.	Stable	Stable
25	FLT25-3PH	Ignored		
26	FLT26-3PH	3 phase fault on the GEN-2003-021N Tap (640050) to Calamus (640096) 115kV line, near GEN-2003-021N Tap. a. Apply fault at the GEN-2003-021N Tap 115kV bus. b. Clear fault after 6.5 cycles by tripping the faulted line.	Stable	Stable
27	FLT27-3PH	3 phase fault on the Ainsworth (640051) to Valentine (640392) 115kV line, near Ainsworth. a. Apply fault at the Ainsworth 115kV bus. b. Clear fault after 6.5 cycles by tripping the faulted line.	Stable	Stable

Cont. No.	Cont. Name	Description	Summer Results	Winter Results
28	FLT28-3PH	3 phase fault on the Ainsworth (640051) to Stuart (640367) 115kV line, near Ainsworth. a. Apply fault at the Ainsworth 115kV bus. b. Clear fault after 6.5 cycles by tripping the faulted line.	Stable	Stable
29	FLT29-3PH	3 phase fault on the St. Francis (640351) to Harmony (640210) 115kV line, near St. Francis. a. Apply fault at the St. Francis 115kV bus. b. Clear fault after 6.5 cycles by tripping the faulted line.	Stable	Stable
30	FLT30-3PH	3 phase fault on the St. Francis (640351) to Mission (652482) 115kV line, near St. Francis. a. Apply fault at the St. Francis 115kV bus. b. Clear fault after 6.5 cycles by tripping the faulted line.	Stable	Stable
31	FLT31-3PH	3 phase fault on the Neligh (640293) to Clearwater (640113) to O'neill (640305) 115kV lines, near Neligh. a. Apply fault at the Neligh 115kVbus. b. Clear fault after 6.5 cycles by tripping the faulted line.	Stable	Stable
32	FLT32-3PH	3 phase fault on the Neligh (640293) to County Line (640115) to Battle Creek (640072) to N. Norfolk 115kV lines, near Neligh. a. Apply fault at the Neligh 115kVbus. b. Clear fault after 6.5 cycles by tripping the faulted line	Stable	Stable
33	FLT33-1PH	Single phase fault on the Neligh (640293) to County Line (640115) to Battle Creek (640072) to N. Norfolk, near Neligh. Stuck PCB at Neligh. a. Apply fault at the Neligh 115 kV bus. b. Clear North Norfolk end of Neligh-County Line-Battle Creek-North Norfolk 115 kV line at 6.5 cycles. Leave fault on open-ended line. c. Clear Neligh 115 kV bus and fault at 18.0 cycles.	Stable	Stable
34	FLT34-3PH	3 phase fault on the Neligh (640293) to Creighton (640149) 115kV line, near Neligh. a. Apply fault at the Neligh 115kVbus. b. Clear fault after 6.5 cycles by tripping the faulted line.	Stable	Stable
35	FLT35-1PH	Single phase fault on the Creighton (640149) to Neligh (640293) 115 kV line, near Creighton. Stuck breaker at Creighton. a. Apply fault at Creighton 115 kV bus. b. Clear Neligh end of line at 6.5 cycles. Leave fault on open-ended line from Creighton. c. Clear Creighton 115 kV bus and fault at 18.0 cycles.	Stable	Stable
36	FLT36-3PH	3 phase fault on the Albion (640054) to Genoa (640181) 115kV line, near Albion. a. Apply fault at the Albion 115kV bus. b. Clear fault after 6.5 cycles by tripping the faulted line.	Stable	Stable
37	FLT37-1PH	Single phase fault on Albion (640054) to Genoa (640181) 115 kV line near Albion. Stuck PCB at Albion. a. Apply fault on Albion 115 kV bus. b. Clear Genoa end of Albion-Genoa 115 kV line at 6.5 cycles. Leave fault on open-ended line. c. Clear Albion 115 kV bus and fault at 18.0 cycles.	Stable	Stable
38	FLT38-3PH	3 phase fault on the Albion (640054) to Spalding (640347) 115kV line, near Albion. a. Apply fault at the Albion 115kV bus. b. Clear fault after 6.5 cycles by tripping the faulted line.	Stable	Stable

Cont. No.	Cont. Name	Description	Summer Results	Winter Results
39	FLT39-3PH	3 phase fault on the Gavins Point (652511) to Hartington (640212) 115kV line, near Gavins Point. a. Apply fault at the Gavins Point 115kV bus. b. Clear fault after 6.5 cycles by tripping the faulted line.	Stable	Stable
40	FLT40-1PH	Single phase fault on the Gavins Point (652511) – Hartington (640212) 115 kV line, near Gavins Point. Stuck breaker at Gavins Point. a. Apply fault at Gavins Point 115 kV bus. b. Clear Hartington end of line at 6.5 cycles. Leave fault on open-ended line from Gavins Point. c. Clear Gavins Point 115 kV bus and fault at 18.0 cycles.	Stable	Stable
41	FLT41-3PH	3 phase fault on the Madison County (570886) to Columbus (640133) 230kV line, near Madison County. a. Apply fault at the Madison County 230V bus. b. Clear fault after 6.0 cycles by tripping the faulted line.	Stable	Stable
42	FLT42-3PH	3 phase fault on the East Columbus (640126) to Columbus (640133) 230kV line, near Columbus a. Apply fault at the Columbus 230kV bus. b. Clear fault after 6.0 cycles by tripping the faulted line.	Stable	Stable
43	FLT43-3PH	3 phase fault on the Columbus West (640131) to Columbus (640133) 230kV line, near Columbus a. Apply fault at the Columbus 230kV bus. b. Clear fault after 6.0 cycles by tripping the faulted line.	Stable	Stable
44	FLT44-1PH	Single phase fault on Columbus (640133) to Columbus West (640131) 230 kV line. Stuck PCB at Columbus. a. Apply fault on Columbus 230 kV bus. b. Clear Columbus West end of line at 6.0 cycles. Leave fault on open-ended line. c. Clear Columbus 230 kV bus and fault at 14.5 cycles.	Stable	Stable
45	FLT45-3PH	3 phase fault on the Shell Creek (640343) to Columbus (640133) 230kV line, near Columbus. a. Apply fault at the Columbus 230kV bus. b. Clear fault after 6.0 cycles by tripping the faulted line.	Stable	Stable
46	FLT46-3PH	3 phase fault on the Kelly 115kV (640134) to Columbus 230kV (640133) transformer near the Kelly 115kV. a. Apply fault at Kelly 115kV bus. b. Clear fault after 5.5 cycles by tripping faulted line.	Stable	Stable
47	FLT47-3PH	3 phase fault on the Madison County (570886) to Ft. Randall (652509) 230kV line, near Madison County. a. Apply fault at the Madison County 230V bus. b. Clear fault after 6.0 cycles by tripping the faulted line.	Stable	Stable
48	FLT48-3PH	3 phase fault on the Fort Randall (652509) to Lake Platt (652516) 230kV line, near Fort Randall. a. Apply fault at the Fort Randal 230V bus. b. Clear fault after 6.0 cycles by tripping the faulted line.	Stable	Stable
49	FLT49-3PH	3 phase fault on the Fort Randall (652509) to Utica Junction (652526) 230kV line, near Fort Randall. a. Apply fault at the Fort Randall 230V bus. b. Clear fault after 6.0 cycles by tripping the faulted line.	Stable	Stable
50	FLT50-3PH	3 phase fault on the Fort Randall (652509) to Sioux City (652565) 230kV line, near Fort Randall. a. Apply fault at the Fort Randall 230V bus. b. Clear fault after 6.0 cycles by tripping the faulted line.	Stable	Stable

Cont. No.	Cont. Name	Description	Summer Results	Winter Results
51	FLT51-3PH	3 phase fault on the Fort Randall 230kV (652509) to 115 kV (652510) transformer at the Fort Randall 230kV a. Apply fault at the Fort Randall 115kV bus. b. Clear fault after 5.5 cycles by tripping the autotransformer	Stable	Stable
52	FLT52-3PH	3 phase fault on the Hoskins (640226) to Raun (635200) 345kV line, near Hoskins. a. Apply fault at the Hoskins 345kV bus. b. Clear fault after 4.5 cycles by tripping the faulted line.	Stable	Stable
53	FLT53-3PH	3 phase fault on the Hoskins 230kV (640227) to 345kV (640226) transformer at the 230kV bus. a. Apply fault at the Hoskins 230kV bus. b. Clear fault after 5.5 cycles by tripping the transformer	Stable	Stable
54	FLT54-3PH	3 phase fault on the Hoskins (640226) to Shell Creek (640342) 345kV line, near Hoskins. a. Apply fault at the Hoskins 345kV bus. b. Clear fault after 4.5 cycles by tripping the faulted line.	Stable	Stable
55	FLT55-3PH	3 phase fault on the Hoskins 115kV (640228) to 345kV (640226) transformer at the 115kV bus. a. Apply fault at the Hoskins 115kV bus. b. Clear fault after 5.5 cycles by tripping the transformer	Stable	Stable
56	FLT56-3PH	3 phase fault on the Belden (640080) to Hoskins (640228) 115kV line, near Belden a. Apply fault at the Belden 115kV bus. b. Clear fault after 6.5 cycles by tripping the faulted line.	Stable	Stable
57	FLT57-3PH	3 phase fault on the Belden (640080) to Twin Church (640387) 115kV line, near Belden a. Apply fault at the Belden 115kV bus. b. Clear fault after 6.5 cycles by tripping the faulted line.	Stable	Stable
58	FLT58-3PH	3 phase fault on one of the North Platte 115kV (640287) to 230kV (640286) transformers. a. Apply fault at the North Platte 115kV bus. b. Clear fault after 5.5 cycles by tripping transformer	Stable	Stable
59	FLT59-1PH	Single phase fault on the GEN-2010-051 Tap (580010) to GEN-2011-027 (582500) 230kV near GEN-2011-027 Tap. a. Apply fault at GEN-2011-027 Tap 230kV bus. b. Clear fault after 6.5 cycles by tripping faulted line.	Stable	Stable
60	FLT60-1PH	Single phase fault on the Hoskins (640227) to GEN-2011-027 (582500) 230kV near GEN-2011-0527 Tap. a. Apply fault at GEN-2011-027 Tap 230kV bus. b. Clear fault after 6.5 cycles by tripping faulted line.	Stable	Stable

3.2 Simulation Results

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

4.0 Conclusions

The findings of the impact study for the proposed interconnection project under DISIS-2011-001 (Group 9), Gen-2011-027, considered at 100% of their proposed installed capacity are as follows:

1. The results of the power factor analysis indicates the GEN-2011-027 interconnection request is required to maintain a 98% lagging (supplying vars) and a 1.0 Unity power factor at the point of interconnection (the NPPD 230kV transmission bus).

2. There are no impacts on the stability performance of the SPP system for the contingencies tested on the provided base cases. The study Project stayed on-line and stable for all simulated faults. The Project stability simulations with sixty specified test disturbances did not show instability problems in the SPP system. Any oscillations were damped out.

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R: Stability Study for Group 11

POWER SYSTEMS DIVISION
GRID SYSTEMS CONSULTING

System Impact Study for DISIS-2011-001 Group 11

DRAFT REPORT

REPORT NO.: 2011-E-6801-R1
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Prepared for:
Southwest Power Pool, Inc.

ABB Inc.
Power Systems Division
Grid Systems Consulting
940 Main Campus Drive, Suite 300
Raleigh, NC 27606

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Southwest Power Pool, Inc.	**No.** 2011-E-6801-R1	
System Impact Study for DISIS-2011-001 Group 11	Date: 07/18/2011	# Pages 34

Author(s):	**Reviewed by:**	**Approved by:**
Trinadh Dwibashyam	Seshadri Subramanian	Willie Wong

Executive Summary

Southwest Power Pool, Inc. (SPP) commissioned ABB Inc. to perform a Definitive Interconnection System Impact Study (DISIS) for Group 11 generation, which included a wind-based generation of 201 MW (Queue # GEN-2010-057) on the SPP transmission. The proposed wind farm is located in Rice County, Kansas and the POI is at Rice County 230 KV substation.

Request	Size	Wind Turbine Model	Point of Interconnection	County
GEN-2010-057	201 MW	GE 1.5MW	Rice County 230kV (Bus #560012)	Rice County, Kansas

The main objectives of this study were:

1) To determine the power factor requirements for the proposed wind farm
2) To determine the impact of proposed GEN-2010-057 project on the stability of SPP transmission systems and nearby generating stations.
3) To validate the compliance with FERC LVRT requirement for the subject wind farm interconnection.

To achieve these objectives the following analyses were performed on the Summer Peak and Winter Peak system conditions with GEN-2010-057 project in-service:

- Power factor analysis for selected contingencies.
- Transient stability analysis for several local and regional contingencies.
- LVRT performance evaluation for selected contingencies near the POI.

Following is the summary of study findings:

Power factor analysis

SPP requires that the Interconnection Customer's wind farm maintain a specified voltage schedule at the POI under all system conditions (i.e. system intact and contingencies). An analysis was conducted to determine the power factor range needed to hold the voltage schedule. From the results in Table 4.2, the power factor requirements are 98.2% lagging (supplying vars) to 1.0 (unity) at the point of interconnection.

Stability Analysis

A stability analysis was performed to determine the impact, if any, of the proposed project on the stability of SPP system. The system was found to be stable for all the tested 3-phase faults and single-line-to-ground (SLG) faults (with line re-closing, where applicable).

For FLT27_3PH[1], tripping of Post Rock to South Hays 230kV line, the prior queued project GEN-2006-032 tripped on over voltage for both summer and winter peak conditions. The above fault, when re-run by turning off the capacitor bank at GEN-2006-032 bus, no tripping was observed. Hence the tripping of the prior queued project, GEN-2006-032 is not attributable to GEN-2010-057 interconnection.

FERC Order 661A Compliance

Selected faults were simulated at the Point of Interconnection (POI) of the proposed DISIS-2011-001 Group 11 wind farm to determine the compliance with FERC 661 – A post-transition period LVRT standard. The results indicated that the proposed project met the FERC LVRT requirement for wind farm interconnection.

Based on the results of the analysis, it can be concluded that the proposed GEN-2010-057 wind farm does not adversely impact the transmission performance of the SPP system.

The results of this analysis are based on available data and assumptions made at the time of conducting this study. If any of the data and/or assumptions made in developing the study model change, the results provided in this report may not apply.

Rev No.	Revision Description	Date	Authored by	Reviewed by	Approved by
0	Draft Report	06/22/2011	Dwibashyam, T	Subramanian, S	Wong, W
1	Draft Report	07/15/2011	Dwibashyam, T	Subramanian, S	Wong, W
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[1] 3 phase fault on the Post Rock (530584) to South Hays (530582) 230kV line, near Post Rock

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1 INTRODUCTION

Southwest Power Pool, Inc. (SPP) commissioned ABB Inc. to perform a System Impact Study for DISIS Group 11 generation, which included a wind-based generation of 201 MW (Queue # GEN-2010-057) on the SPP transmission. The proposed wind farm is located in Rice County, Kansas and the POI is at the Rice County 230 kV substation. Figure 1-1 shows the approximate POI of the proposed generation project on a Geographical Transmission Map.

This study evaluated the impact of the Gen-2010-057 project on the SPP Transmission System. The scope of this study was limited to the power factor evaluation and transient stability analysis.

The main objectives of this study were

1) To determine the power factor requirements for the proposed wind farm
2) To determine the impact of the proposed Project (GEN-2010-057, 201 MW) on the stability of SPP transmission system and nearby generating stations.
3) To validate the compliance with FERC LVRT requirement for the wind farm.

To achieve these objectives the following analyses were performed on the 2011 Summer Peak and Winter Peak system conditions with GEN-2010-057 project in-service

- Power factor analysis for selected contingencies.
- Transient stability analysis for various local and regional contingencies.
- LVRT performance under selected contingencies near the POI.

The study was performed on Summer Peak and Winter Peak cases, provided by SPP. This report documents the methods, analysis and results of the system impact study.

Table 1-1: GEN-2010-057 Project

Project	Size (MW)	Wind Turbine Type	Point of Interconnection	Location
GEN-2010-057	201 MW	GE 1.5MW	Rice County 230kV (Bus #560012)	Rice County, Kansas

1.1 REPORT ORGANIZATION

This report is organized as follows:

Section 2: Description of project
Section 3: Study methodology
Section 4: Model Development
Section 5: Power Factor Analysis Results
Section 6: Stability Analysis Results
Section 7: Conclusions

The detailed study results are included in separate appendices.

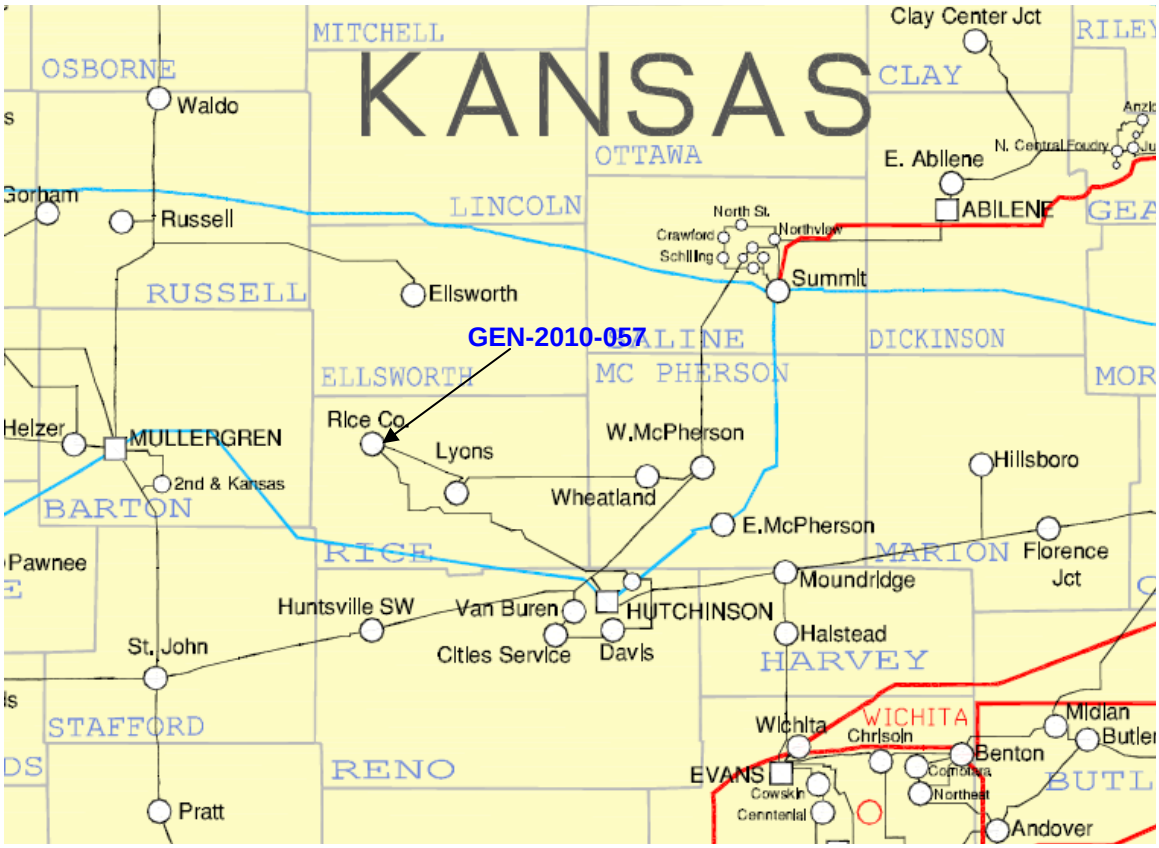

Figure 1-1 Geographical Transmission Map with GEN-2010-057 approximate Project Location

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1.2 DESCRIPTION OF GEN-2010-057 PROJECT

The details of load flow and dynamic data for the GEN-2010-057 wind farm project is included in Appendix A.

- Wind farm size: 201 MW
- Interconnection:

  Voltage: 230 kV

  POI : Rice County 230 kV

  Transformer: One (1) step-up transformer connecting to the 230 kV

  MVA: 221 MVA

  Voltage: 230/34.5 kV

  Z: 8.0 % on 133 MVA

- Wind Turbines:

  Number: One hundred and thirty four (134)

  Manufacturer: GE

  Type: Doubly F Induction Generator (DFIG)

Machine Terminal voltage: 0.700 kV

Rated Power: 1.5 MW

Frequency: 60 Hz

Generator Step-up Transformer

MVA: 1.75
High voltage: 34.5 kV
Low voltage: 0.7 kV
Z: 6.00% on 1.75 MVA

Reactive Power Capability: 0.957 (lag/lead) (100% Power rating)

- PSSE Model Used gewt_p303cvf_w51.lib

2 STUDY METHODOLOGY

2.1 POWER FACTOR ANALYSIS

SPP requires that the Interconnection Customer's wind farm maintain a specified voltage schedule at the POI for any system condition. The purpose of the power factor analysis was to determine the power factor requirement at the Point of Interconnection (POI) for system intact as well as contingency conditions.

The Power Factor Analysis involved the following Steps:

- A VAR generator with large capacity (e.g. +/- 9999 MVar) was modeled at the POI of the subject wind farm. The VAR generator was set to hold the POI voltage consistent with the voltage schedule in the power flow base cases or 1 p.u whichever is higher.
- The wind farm as modeled is turned off for the power factor analysis. The wind farm is replaced by a generator at the high side bus with the MW of the wind farms at that point of interconnection and no var capability.
- Selected contingencies in the vicinity of the subject wind farm were simulated. The results were used to identify the most-limiting contingency from steady state voltage and power factor perspective.
- The power factor requirements were determined from this analysis

It is important to note that the reactive power compensation identified in this analysis was primarily needed to meet steady state criteria. The need for dynamic reactive power support, if any, was determined through transient stability analysis.

2.2 TRANSIENT STABILITY ANALYSIS

The purpose of the transient stability analysis is to determine the impact, if any, of the proposed wind farm project on the stability performance of the SPP transmission system and generating stations in the interconnection vicinity.

Stability analysis was performed using Siemens-PTI's PSS/E™ dynamics program V30.3.3. Three-phase and single-line-to-ground (SLG) (with re-closure where applicable) were simulated for the specified duration and synchronous machine rotor angles and wind turbine generator speeds were monitored to check whether the system is stable following the fault clearing. In addition, the voltage at the wind-farm POI and vicinity was also monitored.

For three-phase faults, a fault admittance of –j2E9 was used (essentially infinite admittance representing a bolted fault). The PSS/E dynamics program only simulates the positive sequence network. However, the unbalanced fault current computation (e.g. single-phase-ground) requires the knowledge of positive, negative, and zero sequence impedances. For a single-line-to-ground (SLG) fault, the fault admittance then equals the inverse of the sum of the positive, negative and zero sequence impedances. Typically, a single line to ground fault results in a voltage of roughly 60%. The admittance needed (over and above the positive sequence) to achieve this voltage value was computed using activity TYSL in PSS/E. This additional admittance value is the equivalent of the sum of positive and negative sequence admittances. The admittance value computed in

the above step is then inserted at the faulted bus and the single line to ground fault current is computed.

The voltages at all local buses (115 kV and above) were monitored for all tested contingencies.

Another important aspect of the stability analysis was to determine the ability of the wind generators to stay connected to the grid during disturbances. This is primarily determined by their low-voltage ride-through capabilities – or lack thereof – as represented in the models by low-voltage trip settings. The Federal Energy Regulatory Commission (FERC) Post-transition period LVRT standard for Interconnection of Wind generating plants includes a Low Voltage Ride-Through (LVRT) requirement. The key features of LVRT requirements are:

- A wind generating plant must remain in-service during three-phase faults with normal clearing (maximum 9 cycles) and single-line-to-ground faults with delayed clearing, and have subsequent post-fault recovery to pre-fault voltage unless the clearing of the fault effectively disconnects the generator from the system.
- The maximum duration the wind generating plant shall be required to withstand a three-phase fault shall be 9 cycles after which, if the fault remains following the location-specific normal clearing time for three-phase faults, the wind generating plant may disconnect from the transmission system. A wind generating plant shall remain interconnected during such a fault on transmission system for a voltage level as low as zero volts, as measured at the high voltage side of the GSU connected at POI.

These criteria were used to evaluate the LVRT capability of the wind farm.

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3 MODEL DEVELOPMENT

SPP provided two power flow cases for this study – i) "MDWG_2010_2011SP_DISIS-2011-001-G11.sav" and ii) "MDWG_2010_2011WP_DISIS-2011-001-G11.sav" – representing respectively the 2010-2011 Summer Peak and Winter Peak conditions. The study cases included the following prior-queued projects:

S.No	Request	Size (MW)	Wind Turbine Model	Point of Interconnection
1	GEN-2003-006A	201.0	Vestas V90 3.0MW	Elm Creek 230kV (539639)
2	GEN-2003-019	247.5	GE 1.5MW & Vestas 3.0MW	Smoky Hills 230kV (530592)
3	GEN-2006-031	75.0	Gas	Knoll 115kV (530561)
4	GEN-2006-032	200.0	Gamesa 2.0MW	South Hays 230kV (530582)
5	GEN-2008-092	201.0	GE 1.5MW	Knoll 230kV (530558)
6	GEN-2009-011	49.7	Siemens 2.3MW	Tap on the Plainville to Phillipsburg 115kV line (570911)
7	GEN-2009-008	200.0	GE 1.6MW	South Hays 230kV (530582)
8	GEN-2009-020	48.6	Vestas V90 1.8MW (GE?)	Tap on the Balzine to Nekoma 69kV line (575040)
9	GEN-2010-048	70.0	Nordex 2.5MW	Tap on the Ross Beach to Redline 115kV line (580061)

3.1 MODEL DEVELOPMENT FOR GEN-2011-057 PROJECT

The models (power flow and dynamics) for the proposed project were included in the data supplied by SPP. Updates provided by SPP were included in the base case and the resulting power flow cases are saved as "MDWG_2010_2011SP_DISIS-2011-001-G11-ABB.sav" for summer peak and "MDWG_2010_2011WP_DISIS-2011-001-G11-ABB.sav'' for winter peak. These cases were used for the analysis.

The details of these IDEVs and the changes made are given in Appendix A.
Figure 3-1 and Figure 3-2 show the one-line diagram in the local area of GEN-2010-057 for 2010-2011 summer peak and winter peak conditions respectively.

The dynamic model setup with the "snapshot" for performing stability analysis was provided by SPP. ABB performed a no-disturbance simulation to verify the models initialized correctly and there is no drift from the respective steady state quantities (e.g. machine angle, speeds, bus voltage etc.) over time.

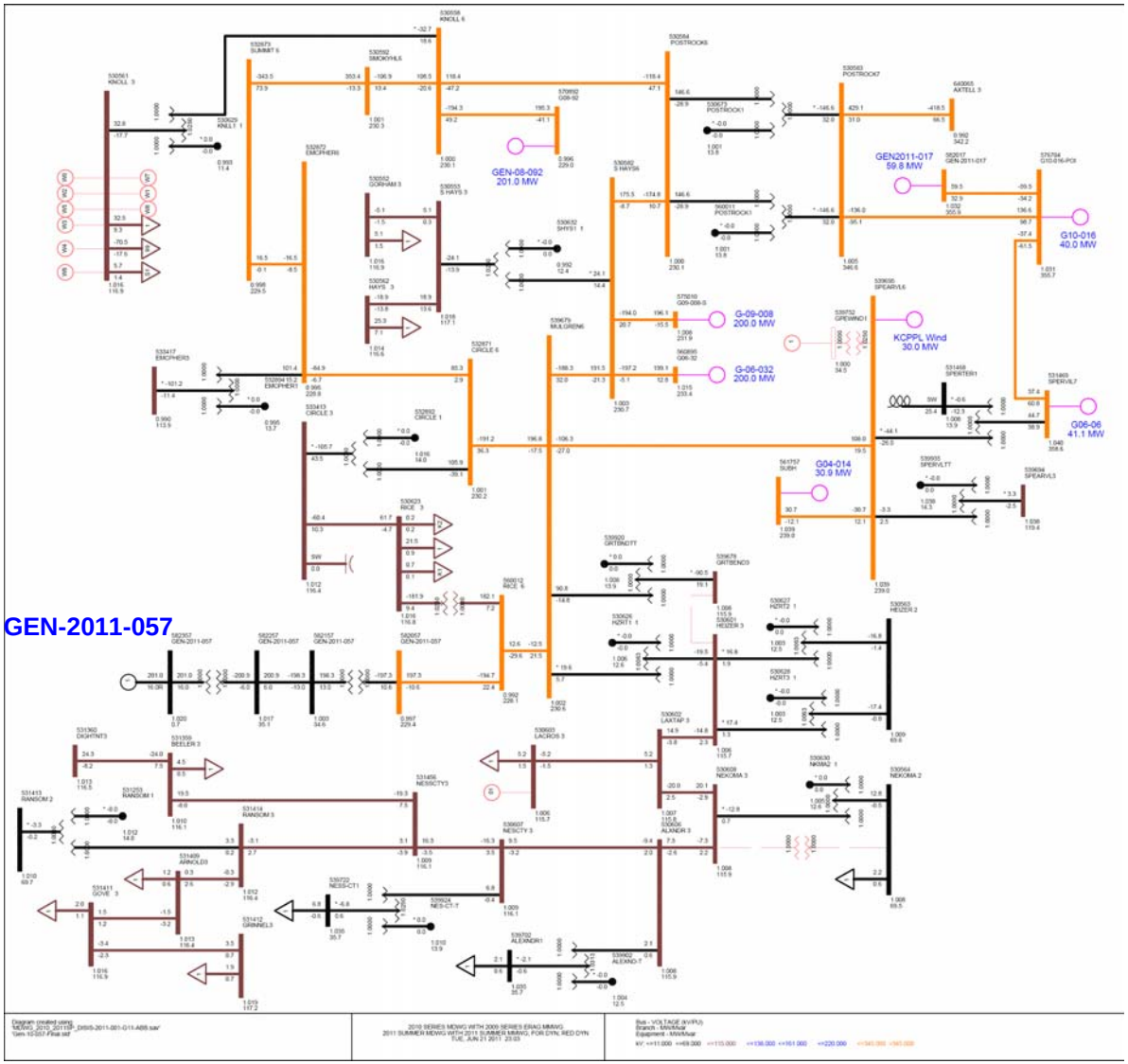

Figure 3-1 One-line Diagram of the local area of GEN-2011-057 (Summer Peak)

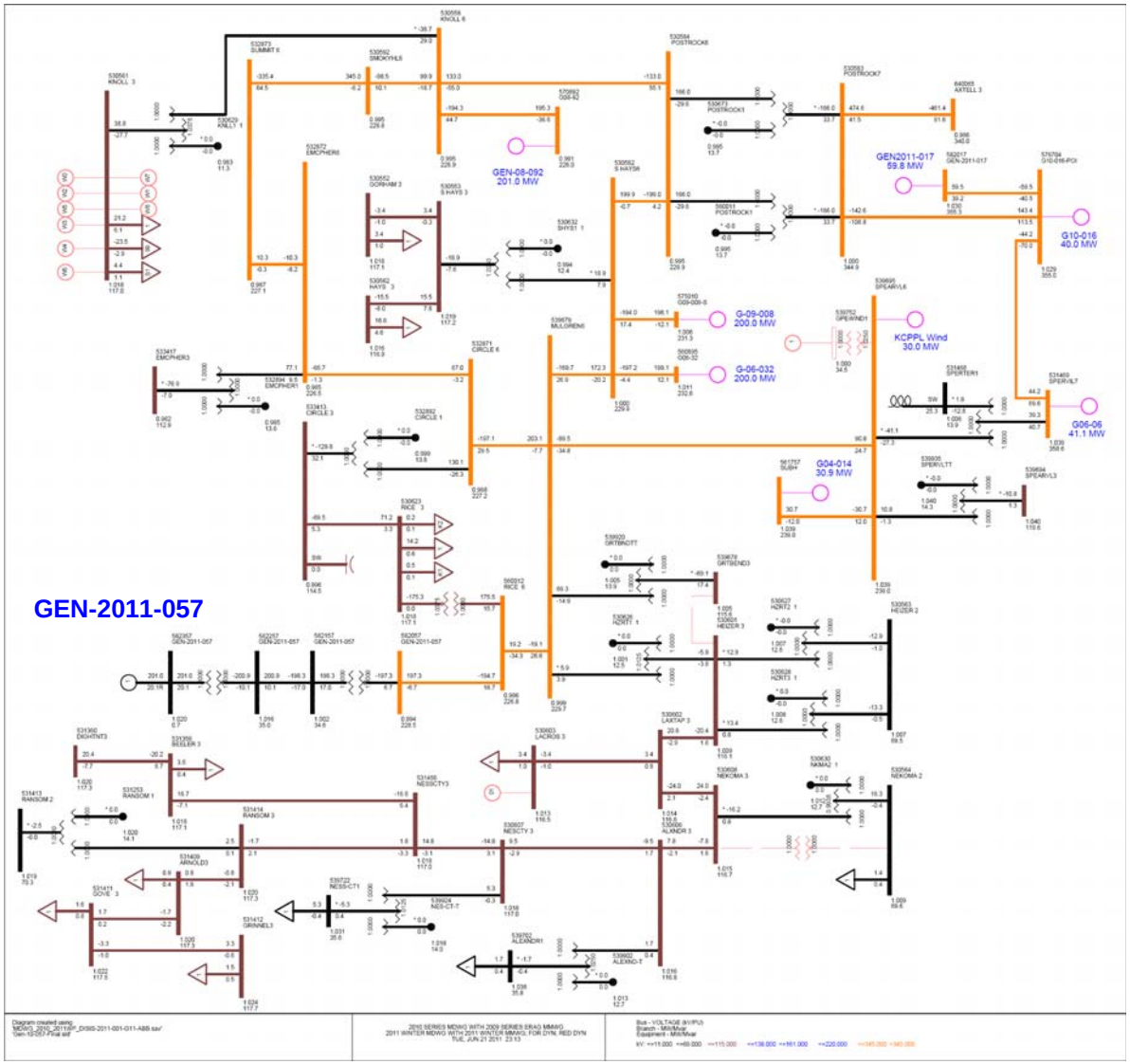

Figure 3-2 One-line Diagram of the local area of GEN-2011-057 (Winter Peak)

4 POWER FACTOR ANALYSIS RESULTS

The Power Factor analysis was performed to verify that the wind-farm interconnection met SPP's standard in terms of power factor and voltage requirements at the POI. Table 4-1 lists the contingencies simulated for Power Factor analysis.

Table 4-1: List of contingencies simulated for Power Factor Analysis

Contingency Name	Contingency Description
CONT_01	Loss of Rice County 230kV (560012) to 115kV (530623) transformer
CONT_02	Loss of Rice County (560012) to Mullergren (539679) 230kV line
CONT_03	Loss of Rice County (530623) to Lyons (530620) 115kV line
CONT_04	Loss of Rice County (530623) to Circle (533413) 115kV line
CONT_05	Loss of Circle (532871) to East McPherson (532872) 230kV line
CONT_06	Loss of Mullergren (539679) to Circle (532871) 230kV line
CONT_07	Loss of Circle 230kV (532871) / 115kV (533413) transformer
CONT_08	Loss of South Hays (530582) to Mullergren (539679) 230kV line
CONT_09	Loss of Mullergren (539679) – Spearville (539695) 230kV line
CONT_10	Loss of Mullergren (539679) 230kV/Great Bend (539678) 115kV transformer
CONT_11	Loss of Pioneer Tap (539642) to Great Bend (539678) 115kV line
CONT_12	Loss of Mullergren (539679) 230kV/ Heizer (530601) 115kV transformer
CONT_13	Loss of Smoky Hills (530592) to Knoll (530558) 230kV line
CONT_14	Loss of Smoky Hills (530592) to Summit (532873) 230kV line
CONT_15	Loss of Post Rock (530584) to Knoll (530558) 230kV line
CONT_16	Loss of Post Rock (530584) to South Hays (530582) 230kV line
CONT_17	Loss of Post Rock 230kV (530584) / 345kV (530583) transformer
CONT_18	Loss of Mingo (531451) to Red Willow (640325) 345kV line
CONT_19	Loss of Reno (532771) to Summit (532773) 345kV line
CONT_20	Loss of Reno (532771) to Wichita (532796) 345kV line
CONT_21	Loss of Reno (532771) 345/115 kV transformer
CONT_22	Loss of West McPherson (533438) to Reno (533416) 115kV line
CONT_23	Loss of West McPherson (533438) to Wheatland (533439) 115kV line
CONT_24	Loss of West McPherson (533438) to McPherson (533428) 115kV line
CONT_25	Loss of West McPherson (533438) to Manville (533426) 115kV line
CONT_26	Loss of West McPherson (533438) to SPhillip (533374) 115kV line
CONT_27	Loss of Circle (533413) to HEC (533419) 115kV line
CONT_28	Loss of Circle (533413) to Reno (533416) 115kV line ckt1

As described in section 2.1, a VAR generator was modeled at POI. The VAR generator was set to hold the 230 kV POI voltage equal to that in the base case provided by SPP or 1 pu whichever is higher.

The contingencies shown in Table 4-1 were simulated on 2010-2011 summer peak and winter peak load conditions. Table 4-2 lists the reactive power and power factor at the POI for the contingencies simulated. The results indicate that the wind farm has near unity power factor at the POI for all the contingencies. The subject wind farm will be required to maintain the power factor requirements listed in Table 4-2.

Table 4-2 VAR generator output at the GEN-2011-057 POI

	VOLTAGE OF VAR Gen.		Power factor at VAR Gen. terminal					
	Summer Peak	Winter Peak	Summer Peak			Winter Peak		
Contingency	(#560012)		Q (MVAR)	P (MW)	p.f (POI)	Q (MVAR)	P (MW)	p.f (POI)
Basecase	1.000	1.000	7.0	194.7	0.999	6.1	194.7	0.9995
CONT_01	1.000	1.000	26.2	194.7	0.991	21.4	194.7	0.994
CONT_02	1.000	1.000	12.6	194.7	0.998	24.5	194.7	0.992
CONT_03	1.000	1.000	15.4	194.7	0.997	2	194.7	0.999
CONT_04	1.000	1.000	15.9	194.7	0.997	10.1	194.7	0.998
CONT_05	1.000	1.000	7.6	194.7	0.999	6	194.7	0.999
CONT_06	1.000	1.000	0.0	194.7	1.000	11.6	194.7	0.998
CONT_07	1.000	1.000	4.0	194.7	0.999	6.9	194.7	0.999
CONT_08	1.000	1.000	15.0	194.7	0.997	2.7	194.7	0.999
CONT_09	1.000	1.000	6.8	194.7	0.999	21.6	194.7	0.994
CONT_10	1.000	1.000	3.3	194.7	0.999	9	194.7	0.999
CONT_11	1.000	1.000	7.0	194.7	0.999	7.4	194.7	0.999
CONT_12	1.000	1.000	9.3	194.7	0.999	4.3	194.7	0.999
CONT_13	1.000	1.000	0.0	194.7	1.000	11.6	194.7	0.998
CONT_14	1.000	1.000	22.9	194.7	0.993	37.6	194.7	0.982
CONT_15	1.000	1.000	9.2	194.7	0.999	5.1	194.7	0.999
CONT_16	1.000	1.000	4.9	194.7	0.999	18.4	194.7	0.995
CONT_17	1.000	1.000	5.1	194.7	0.999	8.4	194.7	0.999
CONT_18	1.000	1.000	1.1	194.7	1.000	14	194.7	0.997
CONT_19	1.000	1.000	3.2	194.7	0.999	13.1	194.7	0.997
CONT_20	1.000	1.000	11.3	194.7	0.998	2.8	194.7	0.999
CONT_21	1.000	1.000	5.3	194.7	0.999	9.4	194.7	0.998
CONT_22	1.000	1.000	3.3	194.7	0.9999	8.3	194.7	0.999
CONT_23	1.000	1.000	9.2	194.7	0.998	0	194.7	1.000
CONT_24	1.000	1.000	7.9	194.7	0.9992	5.5	194.7	0.9996
CONT_25	1.000	1.000	6.9	194.7	0.9994	6.2	194.7	0.9995
CONT_26	1.000	1.000	6.7	194.7	0.9994	6	194.7	0.9995
CONT_27	1.000	1.000	5.9	194.7	0.9995	5.6	194.7	0.9996
CONT_28	1.000	1.000	7.4	194.7	0.9993	6.2	194.7	0.9995

5 STABILITY ANALYSIS

Stability simulations were performed to examine the transient behavior of GEN-2010-057 project and its impact on the SPP system. Several faults, both three-phase and single phase faults (with re-closing where applicable) were simulated. The fault clearing times and re-closing times used for the simulations are shown inTable 5-1.

Table 5-1: Fault Clearing Times

Faulted bus kV level	Normal Clearing	Time before reclosing
115	5 cycles	20 cycles
230	5 cycles	20 cycles
345	5 cycles	20 cycles

Twenty eight (28) three phase and twenty two (22) single-line-to-ground faults (with re-closing where applicable) were simulated. For all tested cases the initial disturbance was applied at t = 0.1 seconds. The breaker clearing was applied at the appropriate time following the fault inception. Table 5-2 lists all the faults simulated for transient stability analysis.

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Table 5-2 List of Simulated Faults for DISIS 2011-001 Group11

Cont. No.	Cont. Name	Description
1	FLT01-3PH	3 phase fault on the Rice County 230kV (560012) to 115kV (530623) transformer on the 230kV bus a. Apply fault at Rice County 230kV bus b. Clear fault after 5 cycles by tripping the faulted transformer.
2	FLT02-3PH	3 phase fault on the Rice County (560012) to Mullergren (539679) 230kV line, near Rice County. a. Apply fault at Rice County 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.
3	FLT03-1PH	*Single phase fault and sequence like previous*
4	FLT04-3PH	3 phase fault on the Rice County (530623) to Lyons (530620) 115kV line, near Rice County. a. Apply fault at Rice County 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.
5	FLT05-1PH	*Single phase fault and sequence like previous*
6	FLT06-3PH	3 phase fault on the Rice County (530623) to Circle (533413) 115kV line, near Rice County. a. Apply fault at Rice County 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.
7	FLT07-1PH	*Single phase fault and sequence like previous*
8	FLT08-3PH	3 phase fault on the Circle (532871) to East McPherson (532872) 230kV line, near Circle. a. Apply fault at the Circle 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.
9	FLT09-1PH	*Single phase fault and sequence like previous*
10	FLT10-3PH	3 phase fault on the Mullergren (539679) to Circle (532871) 230kV line, near Mullergren. a. Apply fault at Mullergren 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.
11	FLT11-1PH	*Single phase fault and sequence like previous*
12	FLT12-3PH	3 phase fault on the Circle 230kV (532871) to 115kV (533413) transformer on the 230kV bus a. Apply fault at Circle 230kV bus b. Clear fault after 5 cycles by tripping the faulted transformer.
13	FLT13-3PH	3 phase fault on the South Hays (530582) to Mullergren (539679) 230kV line, near South Hays. a. Apply fault at South Hays 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	FLT14-1PH	*Single phase fault and sequence like previous*

Cont. No.	Cont. Name	Description
15	FLT15-3PH	3 phase fault on the Mullergren (539679) – Spearville (539695) 230kV line, near Mullergren. a. Apply fault at Mullergren 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	FLT16-1PH	*Single phase fault and sequence like previous*
17	FLT17-3PH	3 phase fault on the Mullergren (539679) 230kV to Great Bend (539678) 115kV transformer on the Mullergren 230kV bus a. Apply fault at Mullergren 230kV bus b. Clear fault after 5 cycles by tripping the faulted transformer.
18	FLT18-3PH	3 phase fault on the Pioneer Tap (539642) to Great Bend (539678) 115kV line, near Pioneer Tap. a. Apply fault at the Pioneer Tap 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.
19	FLT19-1PH	*Single phase fault and sequence like previous*
20	FLT20-3PH	3 phase fault on the Mullergren (539679) 230kV to Heizer (530601) 115kV transformer on the Mullergren 230kV bus a. Apply fault at Mullergren 230kV bus b. Clear fault after 5 cycles by tripping the faulted transformer.
21	FLT21-3PH	3 phase fault on the Smoky Hills (530592) to Knoll (530558) 230kV line, near Smoky Hills. a. Apply fault at Smoky Hills 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.
22	FLT22-1PH	*Single phase fault and sequence like previous*
23	FLT23-3PH	3 phase fault on the Smoky Hills (530592) to Summit (532873) 230kV line, near Smoky Hills. a. Apply fault at Smoky Hills 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.
24	FLT24-1PH	*Single phase fault and sequence like previous*
25	FLT25-3PH	3 phase fault on the Post Rock (530584) to Knoll (530558) 230kV line, near Post Rock. a. Apply fault at Post Rock 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.
26	FLT26-1PH	*Single phase fault and sequence like previous*
27	FLT27-3PH	3 phase fault on the Post Rock (530584) to South Hays (530582) 230kV line, near Post Rock. a. Apply fault at Post Rock 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.
28	FLT28-1PH	*Single phase fault and sequence like previous*

Cont. No.	Cont. Name	Description
29	FLT29-3PH	3 phase fault on one of the Post Rock 230kV (530584) to 345kV (530583) transformers, near the 230kV bus. a. Apply fault at Postrock 230kV bus. b. Clear fault after 5 cycles by tripping the faulted transformer.
30	FLT30-3PH	3 phase fault on the Mingo (531451) to Red Willow (640325) 345kV line, near Mingo. a. Apply fault at Mingo 345kV bus. b. Clear fault after 5 cycles by tripping the faulted line.
31	FLT31-1PH	Single phase fault on the line in previous fault. a. Apply fault at Mingo 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	FLT32-3PH	3 phase fault on the Reno (532771) to Summit (532773) 345kV line, near Reno. a. Apply fault at Reno 345kV bus. b. Clear fault after 5 cycles by tripping the faulted line.
33	FLT33-1PH	*Single phase fault and sequence like previous*
34	FLT34-3PH	3 phase fault on the Reno (532771) to Wichita (532796) 345kV line, near Reno. a. Apply fault at Reno 345kV bus. b. Clear fault after 5 cycles by tripping the faulted line.
35	FLT35-1PH	*Single phase fault and sequence like previous*
36	FLT36-3PH	3 phase fault on one of the Reno (532771) 345/115 kV transformers on the Reno 345kV bus a. Apply fault at Reno 345kV bus b. Clear fault after 5 cycles by tripping the faulted transformer.
37	FLT37-3PH	3 phase fault on the West McPherson (533438) to Reno (533416) 115kV line, near West McPherson. a. Apply fault at the West McPherson 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.
38	FLT38-1PH	*Single phase fault and sequence like previous*
39	FLT39-3PH	3 phase fault on the West McPherson (533438) to Wheatland (533439) 115kV line, near West McPherson. a. Apply fault at the West McPherson 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.
40	FLT40-1PH	*Single phase fault and sequence like previous*
41	FLT41-3PH	3 phase fault on the West McPherson (533438) to McPherson (533428) 115kV line, near West McPherson. a. Apply fault at the West McPherson 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.
42	FLT42-1PH	*Single phase fault and sequence like previous*
43	FLT43-3PH	3 phase fault on the West McPherson (533438) to Manville (533426) 115kV line, near West McPherson. a. Apply fault at the West McPherson 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.
44	FLT44-1PH	*Single phase fault and sequence like previous*

Cont. No.	Cont. Name	Description
45	FLT45-3PH	3 phase fault on the West McPherson (533438) to SPhillip (533374) 115kV line, near West McPherson. a. Apply fault at the West McPherson 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.
46	FLT46-1PH	*Single phase fault and sequence like previous*
47	FLT47-3PH	3 phase fault on the Circle (533413) to HEC (533419) 115kV line, near Circle. a. Apply fault at the Circle 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.
48	FLT48-1PH	*Single phase fault and sequence like previous*
49	FLT49-3PH	3 phase fault on the Circle (533413) to Reno (533416) 115kV line ckt1, near Circle. a. Apply fault at the Circle 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.
50	FLT50-1PH	*Single phase fault and sequence like previous*

The system was stable for all the simulated 3-Phase and single-phase faults. The proposed GEN-2011-057 wind farm stayed on-line throughout the duration of the fault and thereof. The voltage recovery was acceptable, and the oscillations were damped out. A sample response of GEN-2011-057 project is shown in Figure 5-1 from the simulation of FLT02_3PH. This fault is a 3 Phase fault at the POI.

For FLT27_3PH, tripping of Post Rock to South Hays 230kV line, the prior queued project GEN-2006-032 tripped on over voltage for both summer and winter peak conditions. The above fault, when re-run by turning off the capacitor bank at GEN-2006-032 bus, no tripping was observed. Hence the tripping of the prior queued project, GEN-2006-032 is not attributable to GEN-2010-057 interconnection.

Table 5-3 summarizes the stability analysis results for 2010-2011 summer peak and winter peak system conditions.

The plots from the transient stability analysis are included in Appendix C.

Table 5-3 Results of stability analysis

	2011 Summer Peak			2011 Winter Peak		
		Post-Project			Post-Project	
FAULT	Pre-Project	Stable?	Acceptable Voltages?	Pre-Project	Stable?	Acceptable Voltages?
FLT01_3PH	---	STABLE	YES	---	STABLE	YES
FLT02_3PH	---	STABLE	YES	---	STABLE	YES
FLT03_1PH	---	STABLE	YES	---	STABLE	YES
FLT04_3PH	---	STABLE	YES	---	STABLE	YES
FLT05_1PH	---	STABLE	YES	---	STABLE	YES
FLT06_3PH	---	STABLE	YES	---	STABLE	YES
FLT07_1PH	---	STABLE	YES	---	STABLE	YES
FLT08_3PH	---	STABLE	YES	---	STABLE	YES
FLT09_1PH	---	STABLE	YES	---	STABLE	YES
FLT10_3PH	---	STABLE	YES	---	STABLE	YES
FLT11_1PH	---	STABLE	YES	---	STABLE	YES
FLT12_3PH	---	STABLE	YES	---	STABLE	YES
FLT13_3PH	---	STABLE	YES	---	STABLE	YES
FLT14_1PH	---	STABLE	YES	---	STABLE	YES
FLT15_3PH	---	STABLE	YES	---	STABLE	YES
FLT16_1PH	---	STABLE	YES	---	STABLE	YES
FLT17_3PH	---	STABLE	YES	---	STABLE	YES
FLT18_3PH	---	STABLE	YES	---	STABLE	YES
FLT19_1PH	---	STABLE	YES	---	STABLE	YES

FAULT	2011 Summer Peak			2011 Winter Peak		
	Pre-Project	Post-Project		Pre-Project	Post-Project	
		Stable?	Acceptable Voltages?		Stable?	Acceptable Voltages?
FLT20_3PH	---	STABLE	YES	---	STABLE	YES
FLT21_3PH	---	STABLE	YES	---	STABLE	YES
FLT22_1PH	---	STABLE	YES	---	STABLE	YES
FLT23_3PH	---	STABLE	YES	---	STABLE	YES
FLT24_1PH	---	STABLE	YES	---	STABLE	YES
FLT25_3PH	---	STABLE	YES	---	STABLE	YES
FLT26_1PH	---	STABLE	YES	---	STABLE	YES
FLT27_3PH	---	STABLE	YES	---	STABLE	YES
FLT28_1PH	---	STABLE	YES	---	STABLE	YES
FLT29_3PH	---	STABLE	YES	---	STABLE	YES
FLT30_3PH	---	STABLE	YES	---	STABLE	YES
FLT31_1PH	---	STABLE	YES	---	STABLE	YES
FLT32_3PH	---	STABLE	YES	---	STABLE	YES
FLT33_1PH	---	STABLE	YES	---	STABLE	YES
FLT34_3PH	---	STABLE	YES	---	STABLE	YES
FLT35_1PH	---	STABLE	YES	---	STABLE	YES
FLT36_3PH	---	STABLE	YES	---	STABLE	YES
FLT37_3PH	---	STABLE	YES	---	STABLE	YES
FLT38_1PH	---	STABLE	YES	---	STABLE	YES
FLT39_3PH	---	STABLE	YES	---	STABLE	YES
FLT40_1PH	---	STABLE	YES	---	STABLE	YES
FLT41_3PH	---	STABLE	YES	---	STABLE	YES
FLT42_1PH	---	STABLE	YES	---	STABLE	YES
FLT43_3PH	---	STABLE	YES	---	STABLE	YES
FLT44_1PH	---	STABLE	YES	---	STABLE	YES
FLT45_3PH	---	STABLE	YES	---	STABLE	YES
FLT46_1PH	---	STABLE	YES	---	STABLE	YES
FLT47_3PH	---	STABLE	YES	---	STABLE	YES
FLT48_1PH	---	STABLE	YES	---	STABLE	YES
FLT49_3PH	---	STABLE	YES	---	STABLE	YES
FLT50_1PH	---	STABLE	YES	---	STABLE	YES

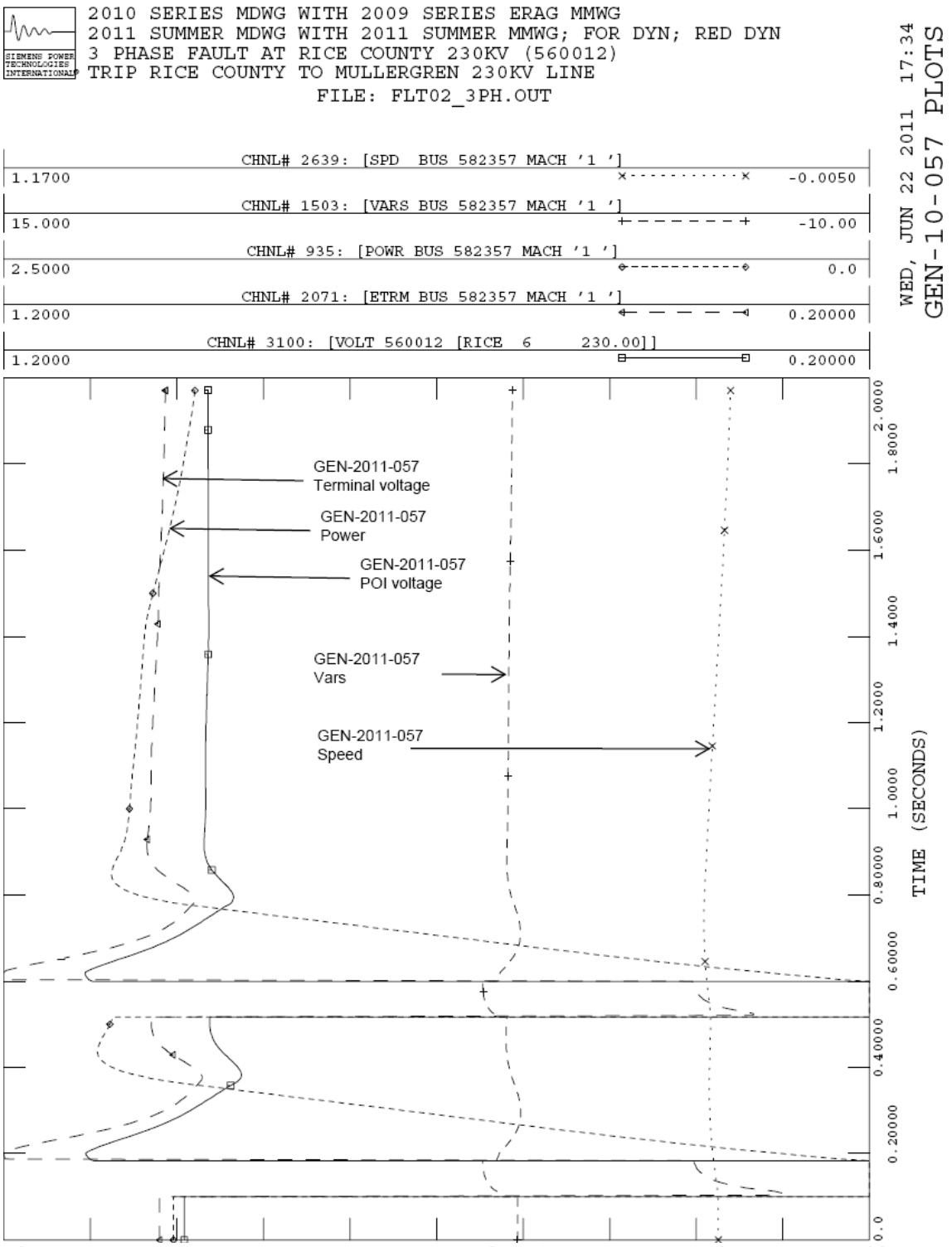

Figure 5-1 Response of GEN-2010-057 project for FLT02_3PH (summer peak)

5.1 FERC LVRT COMPLIANCE

The proposed Group 11 wind farm was modeled with the low voltage ride through capacity. To determine the LVRT compliance of the Group 11 wind farm, a total of four (4) faults were simulated. These faults were simulated at the POI of Group 11 wind farm project and cleared by tripping one transmission element. Table 5-4 lists the faults simulated for LVRT analysis.

Table 5-4: List of faults for FERC LVRT compliance

Fault Name	Description
FLT01_3PH_LVRT	3 phase fault on the Rice County 230kV (560012) to 115kV (530623) transformer on the 230kV bus
	a. Apply fault at Rice County 230kV bus
	b. Clear fault after 9 cycles by tripping the faulted transformer.
FLT01_1PH_LVRT	1 Phase fault Delayed Clearing (9 Cycles + 6 Cycles) and sequence like previous
FLT02_3PH_LVRT	3 phase fault on the Rice County (560012) to Mullergren (539679) 230kV line, near Rice County.
	a. Apply fault at Rice County 230kV bus.
	b. Clear fault after 9 cycles by tripping the faulted line.
FLT02_1PH_LVRT	1 Phase fault Delayed Clearing (9 Cycles + 6 Cycles) and sequence like previous

The results of the simulations indicated that the GEN-2010-057 wind farm project stayed online for all the faults at the POI in summer and winter peak cases.

.

Therefore the subject wind farm is expected to meet the FERC LVRT criteria for the interconnection (FERC Order 661 – A). The response of GEN-2011-057 project for FLT_01_LVRT_3PH is given in Figure 5-2.

The results from the FERC LVRT compliance evaluation are included in Appendix D.

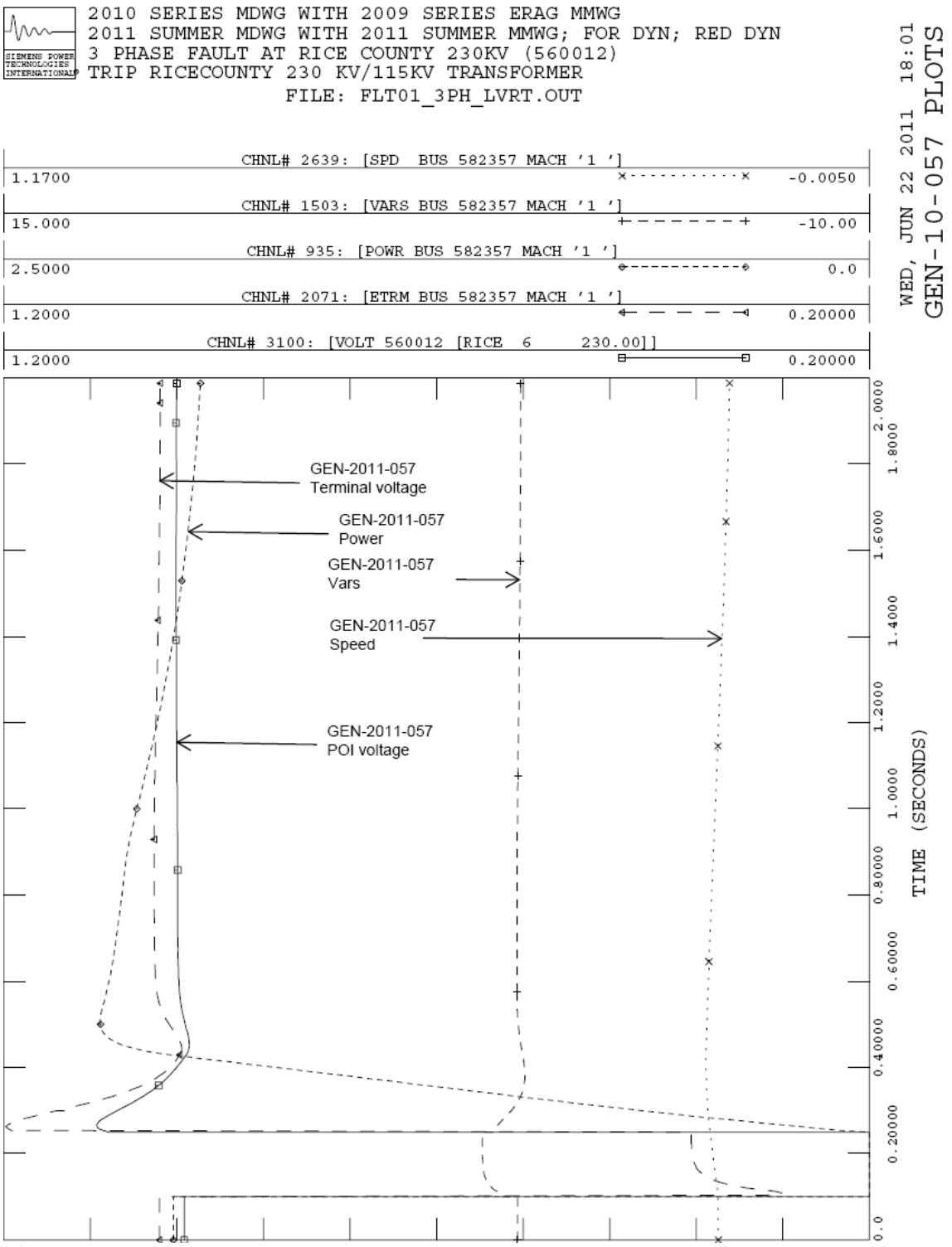

Figure 5-2 Response of GEN-2010-057 for FLT_01_LVRT_3PH (summer peak)

6 CONCLUSIONS

The main objectives of this study were

1) To determine the need for added reactive power compensation requirements, for the proposed wind farm in order to meet SPP's interconnection standards
2) To determine the impact of the proposed Project (GEN-2010-057, 201 MW) on the stability of SPP transmission system and nearby generating stations.
3) To validate the compliance with FERC LVRT requirement for the subject wind farm interconnection.

To achieve these objectives the following analyses were performed on the 2010-2011 Summer Peak and Winter Peak system conditions with GEN-2010-057 in-service

- Power factor analysis for selected contingencies.
- Transient stability analysis for various local and regional contingencies
- LVRT performance for selected contingencies near the POI.

A summary of the study findings is given below:

Power factor analysis

SPP required that the Interconnection Customer's wind farm maintain a specified voltage schedule under all system conditions (i.e. system intact and contingencies). An analysis was conducted to determine the power factor range needed to hold the voltage schedule. From the results in Table 4.2, the power factor requirements are 98.2% lagging (supplying vars) to 1.0 (unity) at the point of interconnection.

Stability Analysis

A stability analysis was performed to determine the impact, if any, of the proposed project on the stability of SPP system. The system was found to be stable for all the tested 3-phase faults and single-line-to-ground (SLG) faults (with line re-closing, where applicable).

For FLT27_3PH, tripping of Post Rock to South Hays 230kV line, the prior queued project GEN-2006-032 tripped on over voltage for both summer and winter peak conditions. The above fault, when re-run by turning off the capacitor bank at GEN-2006-032 bus, no tripping was observed. Hence the tripping of the prior queued project, GEN-2006-032 is not attributable to GEN-2010-057 interconnection.

FERC Order 661A Compliance

Selected faults were simulated at the Point of Interconnection (POI) of the proposed DISIS-2011-001 Group 11 wind farm to determine the compliance with FERC 661 – A; post-transition period LVRT standard. The results indicated that the proposed project met the FERC LVRT requirement for wind farm interconnection.

Based on the results of the analysis, it can be concluded that the proposed GEN-2010-057 wind farm does not adversely impact the transmission performance of the SPP system.

The results of this analysis are based on available data and assumptions made at the time of conducting this study. If any of the data and/or assumptions made in developing the study model change, the results provided in this report may not apply and additional analysis may be required.

APPENDIX B Results from Power Factor Analysis

Contingency Name	Contingency Description	VOLTAGE OF VAR Gen.		Power factor at VAR Gen. terminal					
		Summer Peak	Winter Peak	Summer Peak			Winter Peak		
		(#560012)		Q (MVAR)	P (MW)	p.f	Q (MVAR)	P (MW)	p.f
	BASECASE	1.000	1.000	7.0	194.7	0.9994	6.1	194.7	0.9995
CONT_01	Loss of Rice County 230kV (560012) to 115kV (530623) transformer	1.000	1.000	26.2	194.7	0.9911	21.4	194.7	0.9940
CONT_02	Loss of Rice County (560012) to Mullergren (539679) 230kV line	1.000	1.000	12.6	194.7	0.9979	24.5	194.7	0.9922
CONT_03	Loss of Rice County (530623) to Lyons (530620) 115kV line	1.000	1.000	15.4	194.7	0.9969	2	194.7	0.9999
CONT_04	Loss of Rice County (530623) to Circle (533413) 115kV line	1.000	1.000	15.9	194.7	0.9967	10.1	194.7	0.9987
CONT_05	Loss of Circle (532871) to East McPherson (532872) 230kV line	1.000	1.000	7.6	194.7	0.9992	6	194.7	0.9995
CONT_06	Loss of Mullergren (539679) to Circle (532871) 230kV line	1.000	1.000	0.0	194.7	1.0000	11.6	194.7	0.9982
CONT_07	Loss of Circle 230kV (532871) / 115kV (533413) transformer	1.000	1.000	4.0	194.7	0.9998	6.9	194.7	0.9994
CONT_08	Loss of South Hays (530582) to Mullergren (539679) 230kV line	1.000	1.000	15.0	194.7	0.9970	2.7	194.7	0.9999
CONT_09	Loss of Mullergren (539679) – Spearville (539695) 230kV line	1.000	1.000	6.8	194.7	0.9994	21.6	194.7	0.9939
CONT_10	Loss of Mullergren (539679) 230kV/Great Bend (539678) 115kV transformer	1.000	1.000	3.3	194.7	0.9999	9	194.7	0.9989
CONT_11	Loss of Pioneer Tap (539642) to Great Bend (539678) 115kV line	1.000	1.000	7.0	194.7	0.9994	7.4	194.7	0.9993
CONT_12	Loss of Mullergren (539679) 230kV/ Heizer (530601) 115kV transformer	1.000	1.000	9.3	194.7	0.9989	4.3	194.7	0.9998
CONT_13	Loss of Smoky Hills (530592) to Knoll (530558) 230kV line	1.000	1.000	0.0	194.7	1.0000	11.6	194.7	0.9982
CONT_14	Loss of Smoky Hills (530592) to Summit (532873) 230kV line	1.000	1.000	22.9	194.7	0.9932	37.6	194.7	0.9819
CONT_15	Loss of Post Rock (530584) to Knoll (530558) 230kV line	1.000	1.000	9.2	194.7	0.9989	5.1	194.7	0.9997
CONT_16	Loss of Post Rock (530584) to South Hays (530582) 230kV line	1.000	1.000	4.9	194.7	0.9997	18.4	194.7	0.9956
CONT_17	Loss of Post Rock 230kV (530584) / 345kV (530583) transformer	1.000	1.000	5.1	194.7	0.9997	8.4	194.7	0.9991
CONT_18	Loss of Mingo (531451) to Red Willow (640325) 345kV line	1.000	1.000	1.1	194.7	1.0000	14	194.7	0.9974
CONT_19	Loss of Reno (532771) to Summit (532773) 345kV line	1.000	1.000	3.2	194.7	0.9999	13.1	194.7	0.9977

Contingency Name	Contingency Description	VOLTAGE OF VAR Gen.		Power factor at VAR Gen. terminal					
		Summer Peak	Winter Peak	Summer Peak			Winter Peak		
		(#560012)		Q (MVAR)	P (MW)	p.f	Q (MVAR)	P (MW)	p.f
CONT_20	Loss of Reno (532771) to Wichita (532796) 345kV line	1.000	1.000	11.3	194.7	0.9983	2.8	194.7	0.9999
CONT_21	Loss of Reno (532771) 345/115 kV transformer	1.000	1.000	5.3	194.7	0.9996	9.4	194.7	0.9988
CONT_22	Loss of West McPherson (533438) to Reno (533416) 115kV line	1.000	1.000	3.3	194.7	0.9999	8.3	194.7	0.9991
CONT_23	Loss of West McPherson (533438) to Wheatland (533439) 115kV line	1.000	1.000	9.2	194.7	0.9989	0	194.7	1.0000
CONT_24	Loss of West McPherson (533438) to McPherson (533428) 115kV line	1.000	1.000	7.9	194.7	0.9992	5.5	194.7	0.9996
CONT_25	Loss of West McPherson (533438) to Manville (533426) 115kV line	1.000	1.000	6.9	194.7	0.9994	6.2	194.7	0.9995
CONT_26	Loss of West McPherson (533438) to SPhillip (533374) 115kV line	1.000	1.000	6.7	194.7	0.9994	6	194.7	0.9995
CONT_27	Loss of Circle (533413) to HEC (533419) 115kV line	1.000	1.000	5.9	194.7	0.9995	5.6	194.7	0.9996
CONT_28	Loss of Circle (533413) to Reno (533416) 115kV line ckt1	1.000	1.000	7.4	194.7	0.9993	6.2	194.7	0.9995

APPENDIX C PLOTS FROM STABILITY SIMULATIONS

APPENDIX D PLOTS FROM LVRT SIMULATIONS

S: Stability Study for Group 12

- No requests were located in the cluster group

T: Stability Study for Group 13

MITSUBISHI ELECTRIC

MITSUBISHI ELECTRIC POWER PRODUCTS, INC.
POWER SYSTEMS ENGINEERING SERVICES
530 KEYSTONE DRIVE
WARRENDALE, PA 15086, U.S.A.

Phone: (724) 778-5111 Fax: (724) 778-5149
Home Page: www.meppi.com

Southwest Power Pool, Inc. (SPP)

Definitive Impact Study DISIS-2011-001: Group 13

Final Report

PXE-0487
Revision #01

July 2011

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

Title: **Definitive Impact Study DISIS-2011-001: Group 13: Final Report PXE-0487**
Date: July 2011
Author: Elizabeth M. Cook; Sr. Engineer, Power Systems Engineering Dept. *Elizabeth M. Cook*
Nicholas W. Tenza; Engineer I, Power Systems Engineering Dept. *Nicholas W. Tenza*
Reviewed: Robert T. Hellested, Sr. Engineer, Power Systems Engineering Dept. *Robert T. Hellested*

EXECUTIVE SUMMARY

SPP requested an Interconnection System Impact Study for DISIS-2011-001: Group 13. The Interconnection System Impact Study required a Power Factor Analysis and a Stability Analysis detailing the impacts of the study interconnecting projects as shown in Table ES-1.

Table ES-1
Interconnection Projects Evaluated

Request	Size (MW)	Turbine Model	Point of Interconnection (POI)
GEN-2010-056	151	Vestas V90 1.8MW	Tap on Saint Joseph - Cooper 345kV line (582056)
GEN-2011-011	50	GENROU	Iatan 345kV (542982)
GEN-2011-018	73.6	Siemens 2.3MW	Steele City 115kV (640426)

SUMMARY OF POWER FACTOR ANALYSIS

Power factor analysis shows that GEN-2010-056 has a power factor requirement of 0.8211 leading (absorbing) to 0.9416 lagging (supplying) and that GEN-2011-018 has a power factor requirement of 0.9800 leading (absorbing).

Project GEN-2011-011 did not require a power factor analysis because it is a conventional generator.

SUMMARY OF STABILITY ANALYSIS

The stability analysis determined that no wind turbine tripping or system instability occurs from interconnecting Group 13 projects at 100% output.

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SECTION 1: OBJECTIVES

The objective of this report is to provide Southwest Power Pool, Inc. (SPP) with the deliverables for the "Definitive Impact Study DISIS-2011-001: Group 13." SPP requested an Interconnection System Impact Study for DISIS-2011-001: Group 13, which requires a Power Factor Analysis, a Stability Analysis, and an Impact Study Report.

SECTION 2: BACKGROUND

The Siemens Power Technologies, Inc. PSS/E power system simulation program Version 30.3.3 was used for this study. SPP provided the stability database cases for both summer peak[1] and winter peak[2] conditions and a list of contingencies to be examined. The model includes the study projects 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.

The power factor analysis will determine the power factor at the point of interconnection for each wind interconnection project for pre-contingency and post-contingency conditions. The contingencies developed are from the three-phase fault definitions provided in the Group's interconnection impact study request, which is provided in Table 2-3. If the project does not meet SPP requirements, recommendation for the reactive compensation needed to meet the power factor requirements will be provided.

The stability analysis will determine the impacts of the new interconnecting project on the stability and voltage recovery of the nearby system 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 and single-phase faults will be examined as listed in Table 2-3

A power flow one-line diagram of GEN-2010-056 and GEN-2011-011 and GEN-2011-018 interconnection projects are shown in Figure 2-1 and Figure 2-2, respectively.

[1] *MDWG_2010_2011SP_DISIS-2011-001-G13.sav – summer peak filename.*
[2] *MDWG_2010_2011WP_DISIS-2011-001-G13.sav – winter peak filename.*

Table 2-1
Interconnection Projects Evaluated

Request	Size (MW)	Turbine Model	Point of Interconnection (POI)
GEN-2010-056	151	Vestas V90 1.8MW	Tap on Saint Joseph - Cooper 345kV line (582056)
GEN-2011-011	50	GENROU	Iatan 345kV (542982)
GEN-2011-018	73.6	Siemens 2.3MW	Steele City 115kV (640426)

Table 2-2
Previously Queued Nearby Interconnection Projects Included

Request	Size (MW)	Turbine Model	Point of Interconnection (POI)
GEN-2006-014	300	G.E. 1.5MW	WFarms 161kV (89572)
GEN-2006-017	300	Clipper 2.5MW	WFarms 161kV (89572)
GEN-2007-015	135	G.E. 1.5MW	Tap on the Humboldt to Kelley 161kV line (579244)
GEN-2007-017	99	G.E. 1.5MW	WFarms 161kV (89572)
GEN-2007-053	110	Gamesa 2.0MW	Wfarms 161kV (89572)
GEN-2008-119	60	G.E. 1.5MW	S1399 161kV (646399)
GEN-2008-129	641/675	Combined Cycle	Pleasant Hill 161kV (541225)
GEN-2009-040	73.8	Vestas V90 1.8MW	Tap on Smittyville Coop to Knob Hill 115kV line (560287)
GEN-2010-036	4.6	GENROU	6th Street 115kV (533264)
GEN-2010-041	10.5	GE 1.5MW	S1399 161kV (646399)
GEN-2010-047	72	GE 1.6MW	Tap on the Beatrice to Harbine 115kV line (580056)

Table 2-3
Case List with Contingency Description

Ref. No.	Casename	Description
1	FLT01-3PH	3 phase fault on the GEN-2010-056 Tap (582056) to St. Joseph (541199) 345kV line, near GEN-2010-056 Tap.
		a. Apply fault at GEN-2010-056 Tap 345kV bus.
		b. Clear fault after 5 cycles by tripping the faulted line.
2	FLT02-1PH	*Single phase fault and sequence like previous*
3	FLT03-3PH	3 phase fault on the GEN-2010-056 Tap (582056) to Cooper (640139) 345kV line, near GEN-2010-056 Tap.
		a. Apply fault at GEN-2010-056 Tap 345kV bus.
		b. Clear fault after 5 cycles by tripping the faulted line.
4	FLT04-1PH	*Single phase fault and sequence like previous*
5	FLT05-3PH	3 phase fault on the Fairport (300039) to St. Joseph (541199) 345kV line, near Fairport.
		a. Apply fault at Fairport 345kV bus.
		b. Clear fault after 5 cycles by tripping the faulted line.
6	FLT06-1PH	*Single phase fault and sequence like previous*
7	FLT07-3PH	3 phase fault on the St. Joseph (541199) to Nashua (542980) 345kV line, near St. Joseph.
		a. Apply fault at St. Joseph 345kV bus.
		b. Clear fault after 5 cycles by tripping the faulted line.
8	FLT08-1PH	*Single phase fault and sequence like previous*
9	FLT09-3PH	3 phase fault on the Iatan (542982) to St. Joseph (541199) 345kV line, near Iatan.
		a. Apply fault at Iatan 345kV bus.
		b. Clear fault after 5 cycles by tripping the faulted line.
10	FLT10-1PH	*Single phase fault and sequence like previous*
11	FLT11-3PH	3 phase fault on one of the St. Joseph 345kv (541199) to 161kV (541253) transformers on the 345kV bus.
		a. Apply fault at St. Joseph 345kV bus.
		b. Clear fault after 5 cycles by tripping the faulted transformer.
12	FLT12-3PH	3 phase fault on the Fairport (300039) to Cooper (640139) 345kV line, near Fairport.
		a. Apply fault at Fairport 345kV bus.
		b. Clear fault after 5 cycles by tripping the faulted line.
13	FLT13-1PH	*Single phase fault and sequence like previous*
14	FLT14-3PH	3 phase fault on the Fairport 345kV (300039) to 161kV (300076) transformer on the 345kV bus.
		a. Apply fault at Fairport 345kV bus.
		b. Clear fault after 5 cycles by tripping the faulted transformer.
15	FLT15-3PH	3 phase fault on the Cooper (640139) to Atchison (635017) 345kV line, near Cooper.
		a. Apply fault at Cooper 345kV bus.
		b. Clear fault after 5 cycles by tripping the faulted line.
16	FLT16-1PH	*Single phase fault and sequence like previous*
17	FLT17-3PH	3 phase fault on the Moore (640277) to Cooper (640139) 345kV line, near Moore.
		a. Apply fault at Moore 345kV bus.
		b. Clear fault after 5 cycles by tripping the faulted line.

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

Ref. No.	Casename	Description
18	FLT18-1PH	*Single phase fault and sequence like previous*
19	FLT19-3PH	3 phase fault on the Nebraska City (645458) to Cooper (640139) 345kV line, near Cooper.
		a. Apply fault at Cooper 345kV bus.
		b. Clear fault after 5 cycles by tripping the faulted line.
20	FLT20-1PH	*Single phase fault and sequence like previous*
21	FLT21-3PH	3 phase fault on the Cooper 345kv (640139) to 161kV (640140) transformer on the 345kV bus.
		a. Apply fault at Cooper 345kV bus.
		b. Clear fault after 5 cycles by tripping the faulted transformer.
22	FLT22-3PH	3 phase fault on the Iatan (542982) to Stranger Creek (532772) 345kV line, near Iatan.
		a. Apply fault at the Iatan 345kV bus.
		b. Clear fault after 5 cycles by tripping the faulted line.
23	FLT23-1PH	*Single phase fault and sequence like previous*
24	FLT24-3PH	3 phase fault on the Iatan (542982) to Nashua (542980) 345kV line, near Iatan.
		a. Apply fault at the Iatan 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.
25	FLT25-1PH	*Single phase fault and sequence like previous*
26	FLT26-3PH	3 phase fault on the Iatan 345kv (542982) to 161kV (541350) transformer on the 345kV bus.
		a. Apply fault at Iatan 345kV bus.
		b. Clear fault after 5 cycles by tripping the faulted transformer.
27	FLT27-3PH	3 phase fault on the Steele City (640426) to Harbine (640208) 115kV line, near Steele City.
		a. Apply fault at Steele City 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	FLT28-1PH	*Single phase fault and sequence like previous*
29	FLT29-3PH	3 phase fault on the Steele City (640426) to Knob Hill (533332) 115kV line, near Steele City.
		a. Apply fault at Steele City 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.
30	FLT30-1PH	*Single phase fault and sequence like previous*
31	FLT31-3PH	3 phase fault on the Knob Hill (533332) to Greenleaf (539665) 115kV line, near Knob Hill.
		a. Apply fault at Knob Hill 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.

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

Ref. No.	Casename	Description
32	FLT32-1PH	*Single phase fault and sequence like previous*
33	FLT33-3PH	3 phase fault on the Knob Hill (533332) to GEN-2009-040 Tap (560287) 115kV line, near Knob Hill.
		a. Apply fault at Knob Hill 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.
34	FLT34-1PH	*Single phase fault and sequence like previous*
35	FLT35-3PH	3 phase fault on the Harbine (640208) to Fairbury (640169) 115kV line, near Harbine.
		a. Apply fault at Harbine 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.
36	FLT36-1PH	*Single phase fault and sequence like previous*
37	FLT37-3PH	3 phase fault on the GEN-2010-047 Tap (580056) to Harbine (640208) 115kV line, near GEN-2010-047 Tap.
		a. Apply fault at GEN-2010-047 Tap 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.
38	FLT38-1PH	*Single phase fault and sequence like previous*
39	FLT39-3PH	3 phase fault on the GEN-2010-047 Tap (580056) to Beatrice (640076) 115kV line, near GEN-2010-047 Tap.
		a. Apply fault at the GEN-2010-047 Tap 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.
40	FLT40-1PH	*Single phase fault and sequence like previous*
41	FLT41-3PH	3 phase fault on one of the Beatrice (640076) to Beatrice Power Station (640088) 115kV lines, near Beatrice.
		a. Apply fault at Beatrice 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.
42	FLT42-1PH	*Single phase fault and sequence like previous*
43	FLT43-3PH	3 phase fault on the Midway (541252) to St. Joseph (541253) 161kV lines, near Midway.
		a. Apply fault at Midway 161kV 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	*Single phase fault and sequence like previous*

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

Ref. No.	Casename	Description
45	FLT45-3PH	3 phase fault on the St. Joseph (541253) to Cook (541257) 161kV lines, near St. Joseph.
		a. Apply fault at St. Joseph 161kV 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	*Single phase fault and sequence like previous*
47	FLT47-3PH	3 phase fault on the St. Joseph (541253) to Woodbine (541258) 161kV lines, near St. Joseph.
		a. Apply fault at St. Joseph 161kV 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	*Single phase fault and sequence like previous*
49	FLT49-3PH	3 phase fault on the Kelly 161kv (532913) to 115kV (533217) transformer on the 161kV bus.
		a. Apply fault at Kelly 161kV bus.
		b. Clear fault after 5 cycles by tripping the faulted transformer.
50	FLT50-3PH	3 phase fault on the Sibley (541201) to Hawthorn (542972) 345kV line, near Sibley.
		a. Apply fault at the Sibley 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.
51	FLT51-1PH	*Single phase fault and sequence like previous*
52	FLT52-3PH	3 phase fault on the Hawthorn (542972) to Nashua (542980) 345kV line, near Hawthorn.
		a. Apply fault at the Hawthorn 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.
53	FLT53-1PH	*Single phase fault and sequence like previous*
54	FLT54-3PH	3 phase fault on the Stranger Creek (532772) to Hoyt (532765) 345kV line, near Stranger Creek.
		a. Apply fault at Stranger Creek 345kV bus.
		b. Clear fault after 5 cycles by tripping the faulted line.
55	FLT55-1PH	*Single phase fault and sequence like previous*
56	FLT56-3PH	3 phase fault on the Craig (542977) to Stranger Creek (532772) 345kV line, near Craig.
		a. Apply fault at Craig 345kV bus.
		b. Clear fault after 5 cycles by tripping the faulted line.
57	FLT57-1PH	*Single phase fault and sequence like previous*

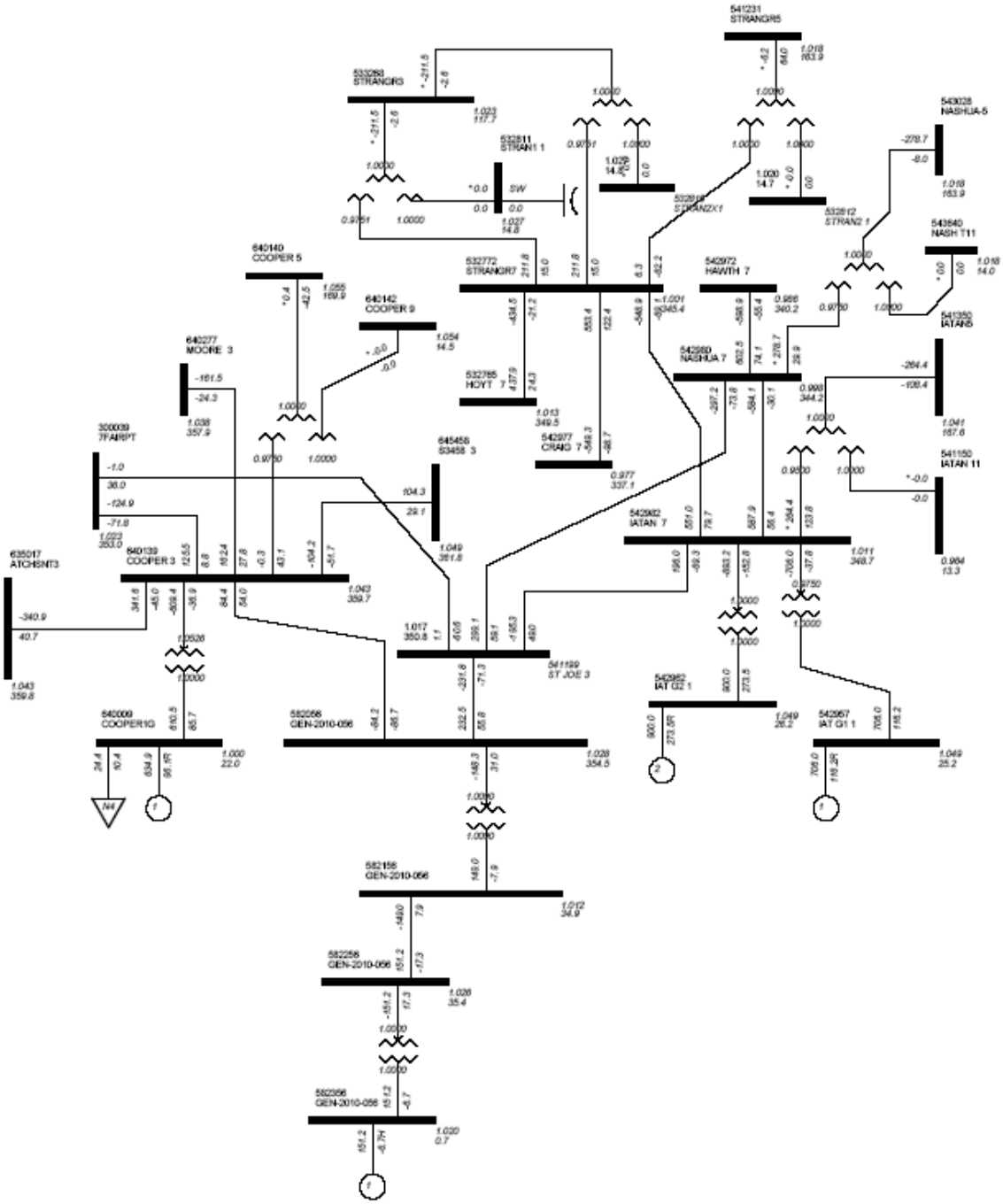

Figure 2-1. Power flow one-line diagram for interconnection project DISIS-2010-056 and DISIS-2011-011.

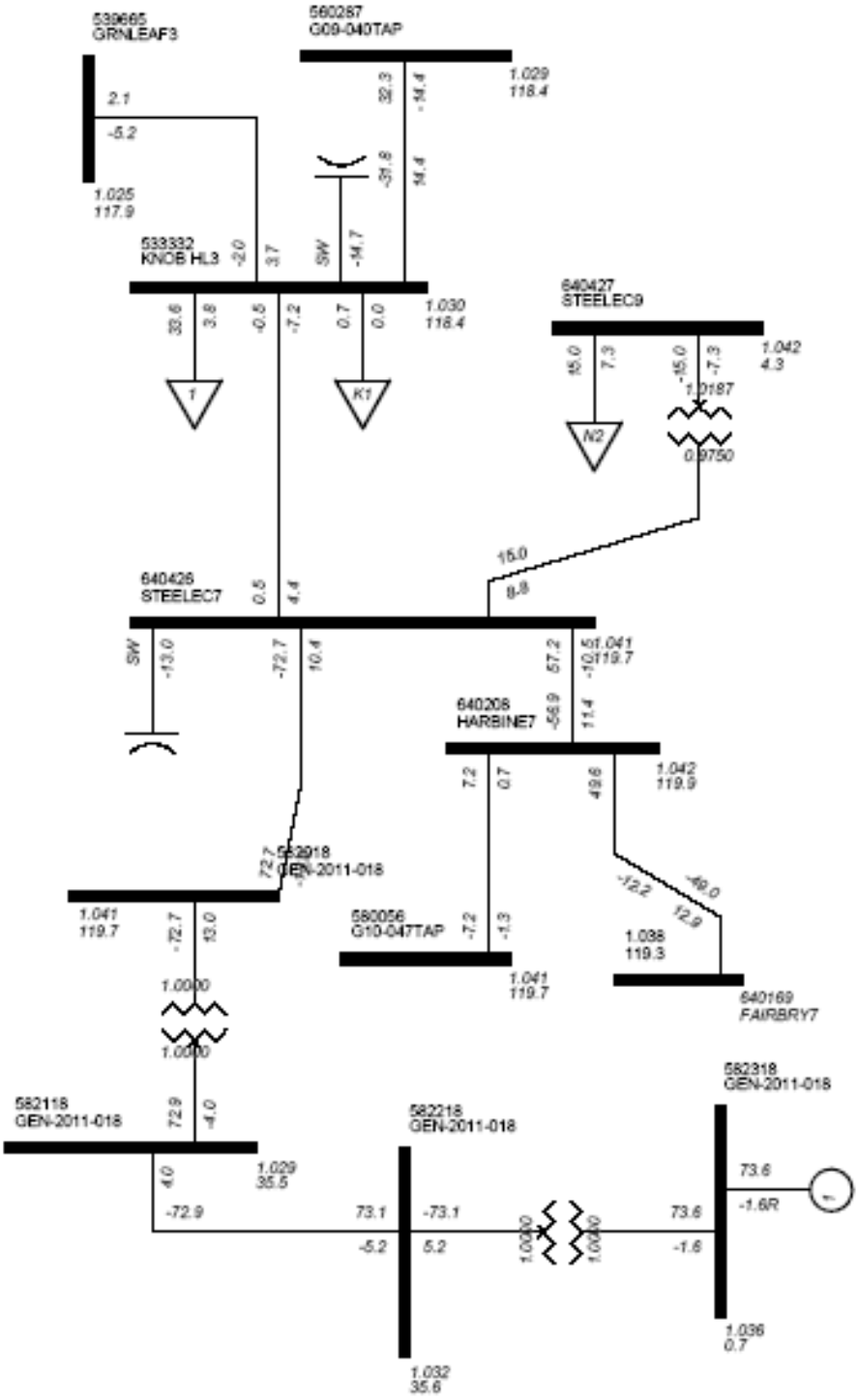

Figure 2-2. Power flow one-line diagram for interconnection project DISIS-2011-018.

SECTION 3: POWER FACTOR ANALYSIS

Objective

The objective of this task is to quantify the power factor at the point of interconnection for the wind farm during the base case and system contingencies. SPP transmission planning practice requires interconnecting generation projects to meet the following criteria:

- 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.

Approach

Both winter peak and summer peak power flows provided by SPP were examined prior to the Power Factor Analysis to ensure they contain the proposed study projects 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 projects at the point of interconnection were turned off during the power factor analysis. The wind farm was then replaced by a generator modeled at the point of interconnection bus with the same real power (MW) capability as the wind farm and open limits for the reactive power set points (Mvar). The generator was set to hold the 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. The analysis was repeated for the following interconnecting generators for Group 13: GEN-2010-056 and GEN-2011-018. For request GEN-2011-011, no power factor analysis was required since the request is for a conventional synchronous generator.

For request GEN-2010-056, the interconnecting wind farm was disabled at bus 582356 and a generator was placed at the 345 kV POI GEN-2010-056 (Bus 582056). The generator was modeled with P_{GEN} = 151.2 MW, Q_{Min} = -9999 Mvar, and Q_{Max} = 9999 Mvar. All buses and transformers connected between bus 582056 and 582356 were disabled. The scheduled voltage for GEN-2010-056 was 1.028 p.u. for summer peak and winter peak conditions.

For request GEN-2011-018, the interconnecting wind farm was disabled at bus 582318 and a generator was placed at the 115 kV POI STEELEC7 (Bus 640426). The generic generator was modeled with P_{GEN} = 73.6 MW, Q_{Min} = -9999 Mvar, and Q_{Max} = 9999 Mvar. All buses and transformers connected between bus 640426 and 582318 were disabled. The scheduled voltage for GEN-2010-018 was 1.041 p.u. for summer peak and 1.034 for winter peak conditions.

Results

The power factor was calculated for summer and winter peak conditions. Tables 3-1 and 3-2 show the power factor results for GEN-2010-056 (151.2 MW) and GEN-2011-018 (73.6 MW), respectively. 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.

Summary

Power factor analysis shows that GEN-2010-056 has a power factor requirement of 0.8211 leading (absorbing) to 0.9416 lagging (supplying) at the point of interconnection and that GEN-2011-018 has a power factor requirement of 0.9800 leading (absorbing) at the point of interconnection.

Project GEN-2011-011 did not require a power factor analysis because it is a conventional generator.

Table 3-1
Power Factor Analysis - GEN-2010-056 (151.2 MW)*

Case Reference	Summer		Winter	
	pf	Q** (MVAR)	pf	Q** (MVAR)
Base	0.9130 leading	67.5452	0.9778 leading	32.4246
C1	0.8211 leading	105.0883	0.8450 leading	95.6929
C3	0.9837 lagging	-27.6732	0.9416 lagging	-54.0597
C5	0.9703 leading	37.665	0.9974 leading	11.0209
C7	0.8401 leading	97.6184	0.9428 leading	53.4776
C9	0.8650 leading	87.7096	0.9348 leading	57.4404
C11	0.9173 leading	65.6235	0.9780 leading	32.2655
C12	0.9554 leading	46.7085	0.9998 leading	3.1736
C14	0.8922 leading	76.5327	0.9522 leading	48.4903
C15	0.9291 leading	60.1698	0.9871 leading	24.5269
C17	0.8941 leading	75.7364	0.9636 leading	41.9435
C19	0.9444 leading	52.6221	0.9966 leading	12.4885
C21	0.8893 leading	77.7519	0.9664 leading	40.2343
C22	0.9278 leading	60.7834	0.9904 leading	21.0674
C24	0.9600 leading	44.1117	0.9993 leading	5.5189
C26	0.9117 leading	68.1332	0.9819 leading	29.1343
C27	0.9148 leading	66.7527	0.9806 leading	30.2275
C29	0.9136 leading	67.3125	0.9787 leading	31.683
C31	0.9133 leading	67.4128	0.9781 leading	32.1544
C33	0.9140 leading	67.0992	0.9797 leading	30.9666
C35	0.9140 leading	67.1061	0.9788 leading	31.6229
C37	0.9132 leading	67.4606	0.9782 leading	32.0755
C39	0.9144 leading	66.9513	0.9798 leading	30.8461
C41	0.9132 leading	67.4886	0.9779 leading	32.3187
C43	0.9079 leading	69.8312	0.9788 leading	31.6311
C45	0.9194 leading	64.6992	0.9786 leading	31.7602
C47	0.8997 leading	73.3716	0.9819 leading	29.1535
C49	0.9153 leading	66.5281	0.9759 leading	33.8404
C50	0.9328 leading	58.4163	0.9874 leading	24.1972
C52	0.8840 leading	79.973	0.9792 leading	31.321
C54	0.9179 leading	65.3779	0.9844 leading	27.0355
C56	0.9153 leading	66.555	0.9909 leading	20.485

*The scheduled voltage for GEN-2010-056 was 1.028 p.u. for summer peak and winter peak conditions.

**A positive Q (Mvar) output shows 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 3-2
Power Factor Analysis - GEN-2011-018 (73.6 MW)*

Case Reference	Summer		Winter	
	pf	Q** (MVAR)	pf	Q** (MVAR)
Base	0.9928 leading	8.9100	0.9937 leading	8.2814
C1	0.9922 leading	9.2496	0.9937 leading	8.2839
C3	0.9930 leading	8.7754	0.9940 leading	8.1235
C5	0.9930 leading	8.7238	0.9940 leading	8.0756
C7	0.9924 leading	9.1225	0.9931 leading	8.6881
C9	0.9939 leading	8.1995	0.9950 leading	7.3786
C11	0.9927 leading	8.9302	0.9937 leading	8.2884
C12	0.9925 leading	9.0509	0.9942 leading	7.9711
C14	0.9923 leading	9.1802	0.9939 leading	8.137
C15	0.9930 leading	8.7591	0.9947 leading	7.5927
C17	0.9939 leading	8.1865	0.9963 leading	6.3841
C19	0.9927 leading	8.9197	0.9944 leading	7.8122
C21	0.9930 leading	8.7579	0.9964 leading	6.2934
C22	0.9925 leading	9.0371	0.9928 leading	8.8621
C24	0.9933 leading	8.5794	0.9948 leading	7.5353
C26	0.9928 leading	8.9068	0.9938 leading	8.2582
C27	0.9956 leading	6.9322	0.9959 leading	6.6627
C29	0.9800 leading	14.9448	0.9835 leading	13.5536
C31	0.9861 leading	12.4203	0.9970 leading	5.6961
C33	0.9860 leading	12.465	0.9919 leading	9.4096
C35	0.9878 leading	11.5895	0.9925 leading	9.0427
C37	0.9862 leading	12.376	0.9856 leading	12.6332
C39	0.9954 leading	7.1074	0.9960 leading	6.6019
C41	0.9940 leading	8.1191	0.9943 leading	7.877
C43	0.9931 leading	8.6721	0.9957 leading	6.8409
C45	0.9927 leading	8.9246	0.9938 leading	8.2506
C47	0.9927 leading	8.935	0.9938 leading	8.2196
C49	0.9996 leading	2.1259	0.9989 leading	3.4373
C50	0.9927 leading	8.9146	0.9939 leading	8.1583
C52	0.9924 leading	9.1286	0.9935 leading	8.4474
C54	0.9962 leading	6.4383	0.9966 leading	6.0442
C56	0.9927 leading	8.9412	0.9941 leading	8.0306

* The scheduled voltage for GEN-2010-018 was 1.041 p.u. for summer peak and 1.034 for winter peak conditions.
** A positive Q (Mvar) output shows 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.

SECTION 4: STABILITY ANALYSIS

Objective

The objective of the stability analysis was to determine the impacts of the new wind farms and the increased generation at IATAN G2 on the stability and voltage recovery of the nearby system. If problems with stability or voltage recovery were identified the need for reactive compensation or system upgrades were investigated.

Approach

Both winter peak and summer peak power flows provided by SPP were examined prior to the Stability Analysis to ensure they contain the proposed study projects 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 they initialized without errors 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 4-1 for a list of the calculated single-phase fault impedances used for the analysis.

Bus voltages and previously queued generation in the study area were monitored as were the following areas:

- 531 MIDW
- 534 SUNC
- 536 WERE
- 540 MIPU
- 541 KACP
- 640 NPPD
- 645 OPPD

The results of the analysis will determine the need for reactive compensation or system upgrades required to obtain acceptable system performance. If additional reactive compensation is required, the size, type, and location will be determined. The proposed reactive reinforcements will ensure the wind farm meets FERC Order 661A low voltage requirements and returns 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 to be 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. No tripping occurred during the analysis.

If stability problems were identified, the maximum acceptable generation level for the interconnecting generator Group to operate without causing any stability problems will also be quantified. Stability analysis results indicated that Group 13 can interconnect at 100% output power.

Results

Refer to Table 4-2 for a summary of the stability analysis results. Figure 4-1 through Figure 4-4 show the response of the following generators, GEN-2010-056, GEN-2011-011, GEN-2011-018, and IATAN G1, respectively, during a three-phase fault on the high-side of the Iatan 345/161 kV transformer (FLT26-3PH) during winter peak conditions. Figure 4-5 and 4-6 show selected bus voltages in the study area during FLT26-3PH which is a representative case for the "worst" delayed voltage recovery. Figure 4-7 and Figure 4-8 show a set of plots during a three-phase fault on the Steele City to Harbine 115 kV line (FLT26-3PH), near Steele City during winter peak conditions, which is a representative case showing the "most severe" voltage dip.

Table 4-1
Calculated Single-Phase Fault Impedances

Ref. No.	Casename	Single-Phase Fault Impedance (MVA)	Ref. No.	Casename	Single-Phase Fault Impedance (MVA)
2	FLT02-1PH	-5500	30	FLT30-1PH	-1125
4	FLT04-1PH	-5500	32	FLT32-1PH	-1625
6	FLT06-1PH	-5000	34	FLT34-1PH	-1875
8	FLT08-1PH	-8500	36	FLT36-1PH	-4500
10	FLT10-1PH	-5000	38	FLT38-1PH	-4500
12	FLT12-1PH	-9750	40	FLT40-1PH	7500
14	FLT14-1PH	-8000	42	FLT42-1PH	-8500
16	FLT16-1PH	-9750	44	FLT44-1PH	-9000
18	FLT18-1PH	-687.5	46	FLT46-1PH	-9000
20	FLT20-1PH	-687.5	48	FLT48-1PH	-4250
22	FLT22-1PH	-656.3	51	FLT51-1PH	-7000
24	FLT24-1PH	-656.3	53	FLT53-1PH	-8000
26	FLT26-1PH	-937.5	55	FLT55-1PH	-8500
28	FLT28-1PH	-1125	57	FLT57-1PH	-8500

Table 4-2
Stability Analysis Summary of Results

Ref. No.	Casename	Summer		Winter	
		Stable?	Acceptable Voltages?	Stable?	Acceptable Voltages?
1	FLT01-3PH	Yes	Yes	Yes	Yes
2	FLT02-1PH	Yes	Yes	Yes	Yes
3	FLT03-3PH	Yes	Yes	Yes	Yes
4	FLT04-1PH	Yes	Yes	Yes	Yes
5	FLT05-3PH	Yes	Yes	Yes	Yes
6	FLT06-1PH	Yes	Yes	Yes	Yes
7	FLT07-3PH	Yes	Yes	Yes	Yes
8	FLT08-1PH	Yes	Yes	Yes	Yes
9	FLT9-3PH	Yes	Yes	Yes	Yes
10	FLT10-1PH	Yes	Yes	Yes	Yes
11	FLT11-3PH	Yes	Yes	Yes	Yes
12	FLT12-3PH	Yes	Yes	Yes	Yes
13	FLT13-1PH	Yes	Yes	Yes	Yes
14	FLT14-3PH	Yes	Yes	Yes	Yes
15	FLT15-3PH	Yes	Yes	Yes	Yes
16	FLT16-1PH	Yes	Yes	Yes	Yes
17	FLT17-3PH	Yes	Yes	Yes	Yes
18	FLT18-1PH	Yes	Yes	Yes	Yes
19	FLT19-3PH	Yes	Yes	Yes	Yes

Table 4-2 (continued)
Stability Analysis Summary of Results

Ref. No.	Casename	Summer		Winter	
		Stable?	Acceptable Voltages?	Stable?	Acceptable Voltages?
20	FLT20-1PH	Yes	Yes	Yes	Yes
21	FLT21-3PH	Yes	Yes	Yes	Yes
22	FLT22-3PH	Yes	Yes	Yes	Yes
23	FLT23-1PH	Yes	Yes	Yes	Yes
24	FLT24-3PH	Yes	Yes	Yes	Yes
25	FLT25-1PH	Yes	Yes	Yes	Yes
26	FLT26-3PH	Yes	Yes	Yes	Yes
27	FLT27-3PH	Yes	Yes	Yes	Yes
28	FLT28-1PH	Yes	Yes	Yes	Yes
29	FLT29-3PH	Yes	Yes	Yes	Yes
30	FLT30-1PH	Yes	Yes	Yes	Yes
31	FLT31\-3PH	Yes	Yes	Yes	Yes
32	FLT32-1PH	Yes	Yes	Yes	Yes
33	FLT33-3PH	Yes	Yes	Yes	Yes
34	FLT34-1PH	Yes	Yes	Yes	Yes
35	FLT35-3PH	Yes	Yes	Yes	Yes
36	FLT36-1PH	Yes	Yes	Yes	Yes
37	FLT37-3PH	Yes	Yes	Yes	Yes
38	FLT38-1PH	Yes	Yes	Yes	Yes

Table 4-2 (continued)
Stability Analysis Summary of Results

Ref. No.	Casename	Summer		Winter	
		Stable?	Acceptable Voltages?	Stable?	Acceptable Voltages?
39	FLT39-3PH	Yes	Yes	Yes	Yes
40	FLT40-1PH	Yes	Yes	Yes	Yes
41	FLT41-3PH	Yes	Yes	Yes	Yes
42	FLT42-1PH	Yes	Yes	Yes	Yes
43	FLT43-3PH	Yes	Yes	Yes	Yes
44	FLT44-1PH	Yes	Yes	Yes	Yes
45	FLT45-3PH	Yes	Yes	Yes	Yes
46	FLT46-1PH	Yes	Yes	Yes	Yes
47	FLT47-3PH	Yes	Yes	Yes	Yes
48	FLT48-1PH	Yes	Yes	Yes	Yes
49	FLT49-3PH	Yes	Yes	Yes	Yes
50	FLT51-1PH	Yes	Yes	Yes	Yes
51	FLT51-3PH	Yes	Yes	Yes	Yes
52	FLT53-1PH	Yes	Yes	Yes	Yes
53	FLT53-3PH	Yes	Yes	Yes	Yes
54	FLT54-3PH	Yes	Yes	Yes	Yes
55	FLT55-1PH	Yes	Yes	Yes	Yes
56	FLT56-3PH	Yes	Yes	Yes	Yes
57	FLT57-1PH	Yes	Yes	Yes	Yes

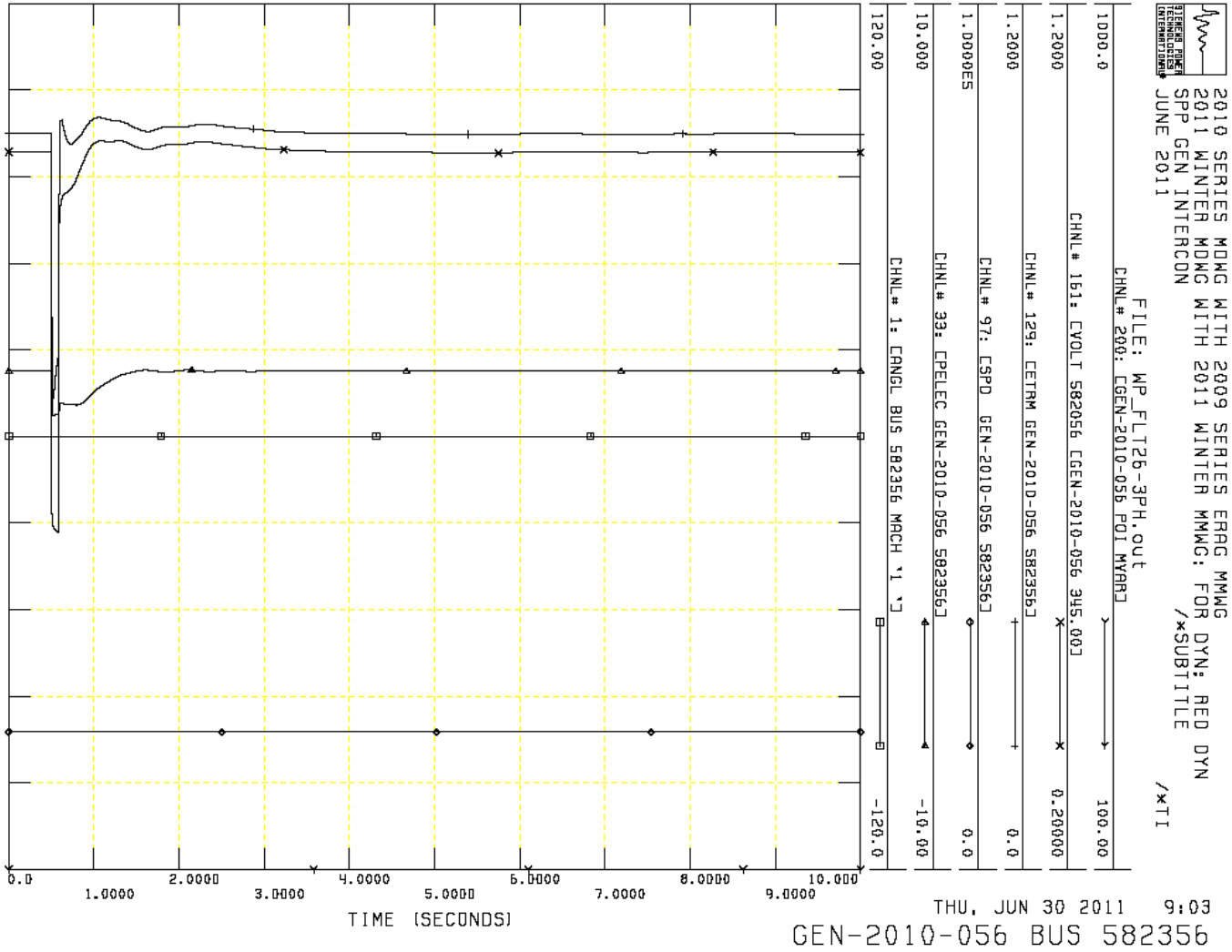

Figure 4-1. Response of GEN-2010-056 project during case FLT-26-3PH for winter peak conditions.

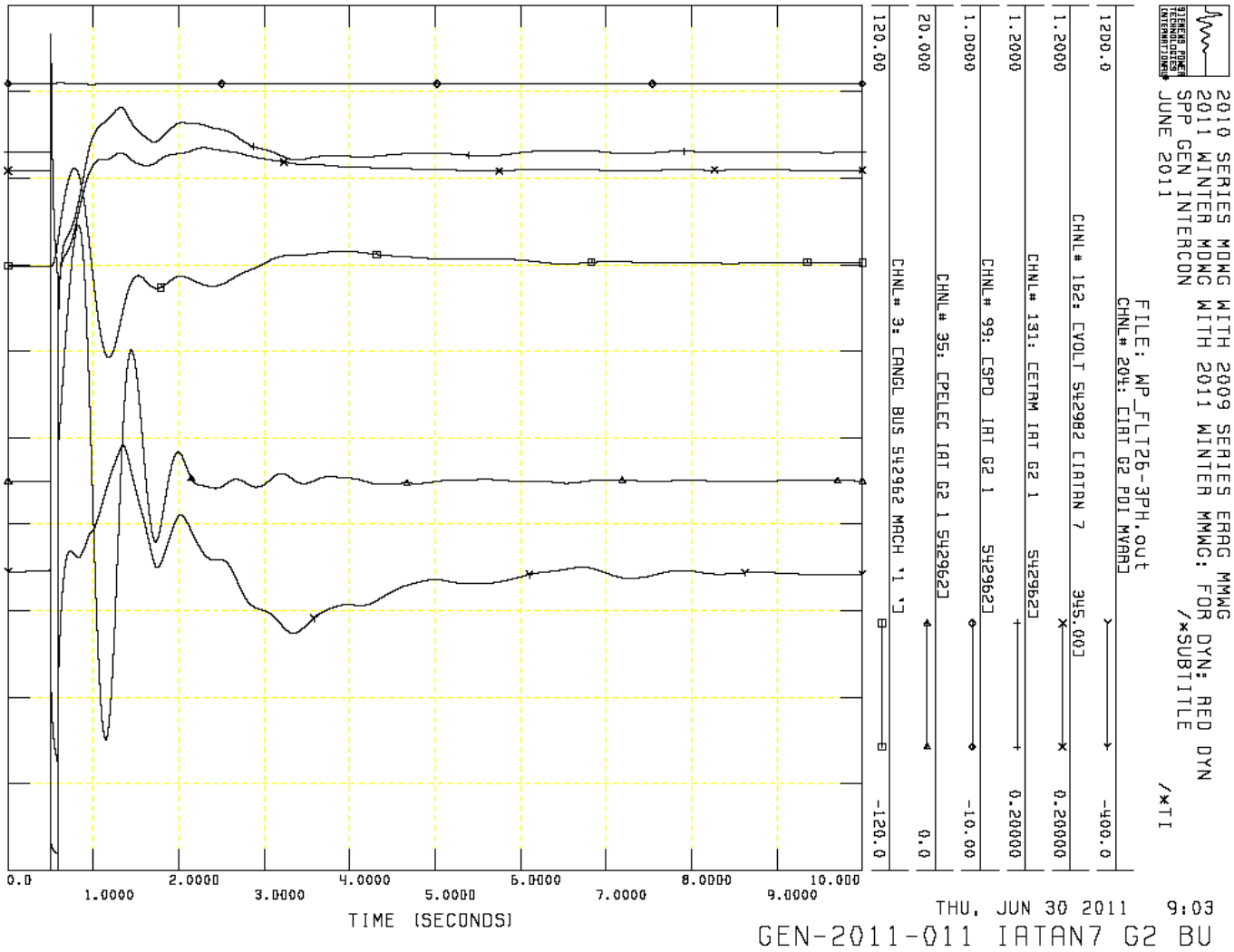

Figure 4-2. Response of GEN-2011-011 project during case FLT-26-3PH for winter peak conditions.

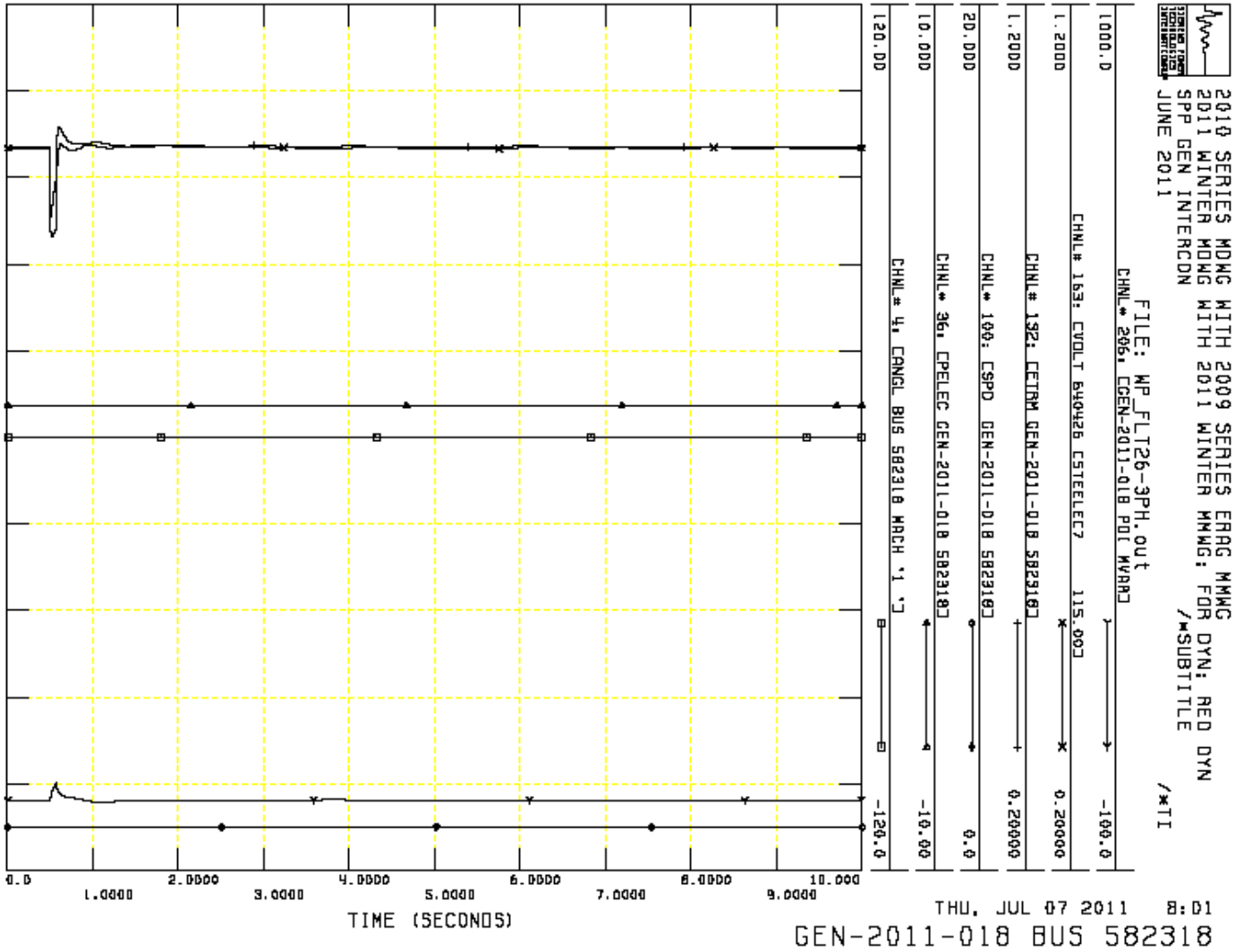

Figure 4-3. Response of GEN-2011-018 project during case FLT-26-3PH for winter peak conditions.

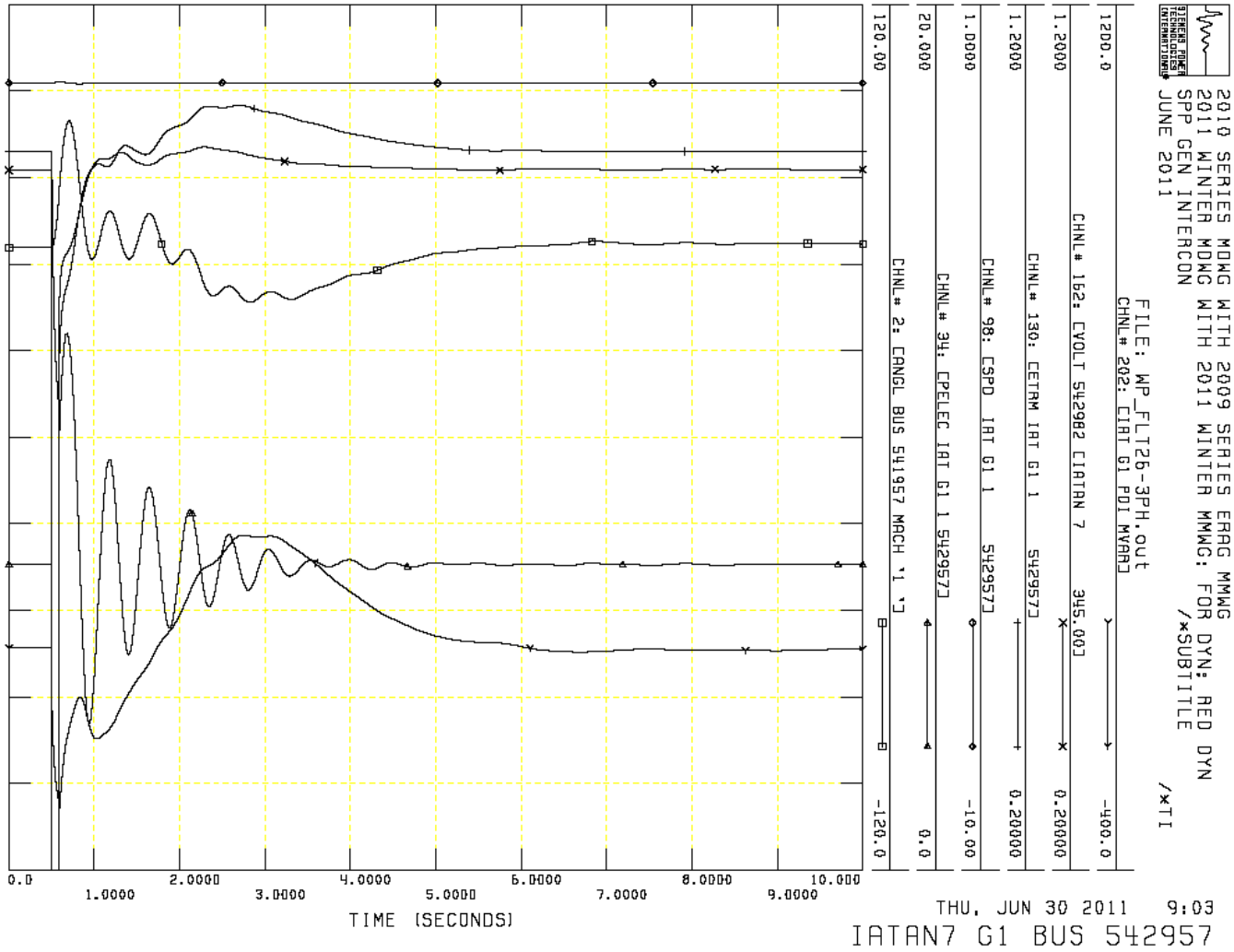

Figure 4-4. Response of IATAN G1 generator during case FLT-26-3PH for winter peak conditions.

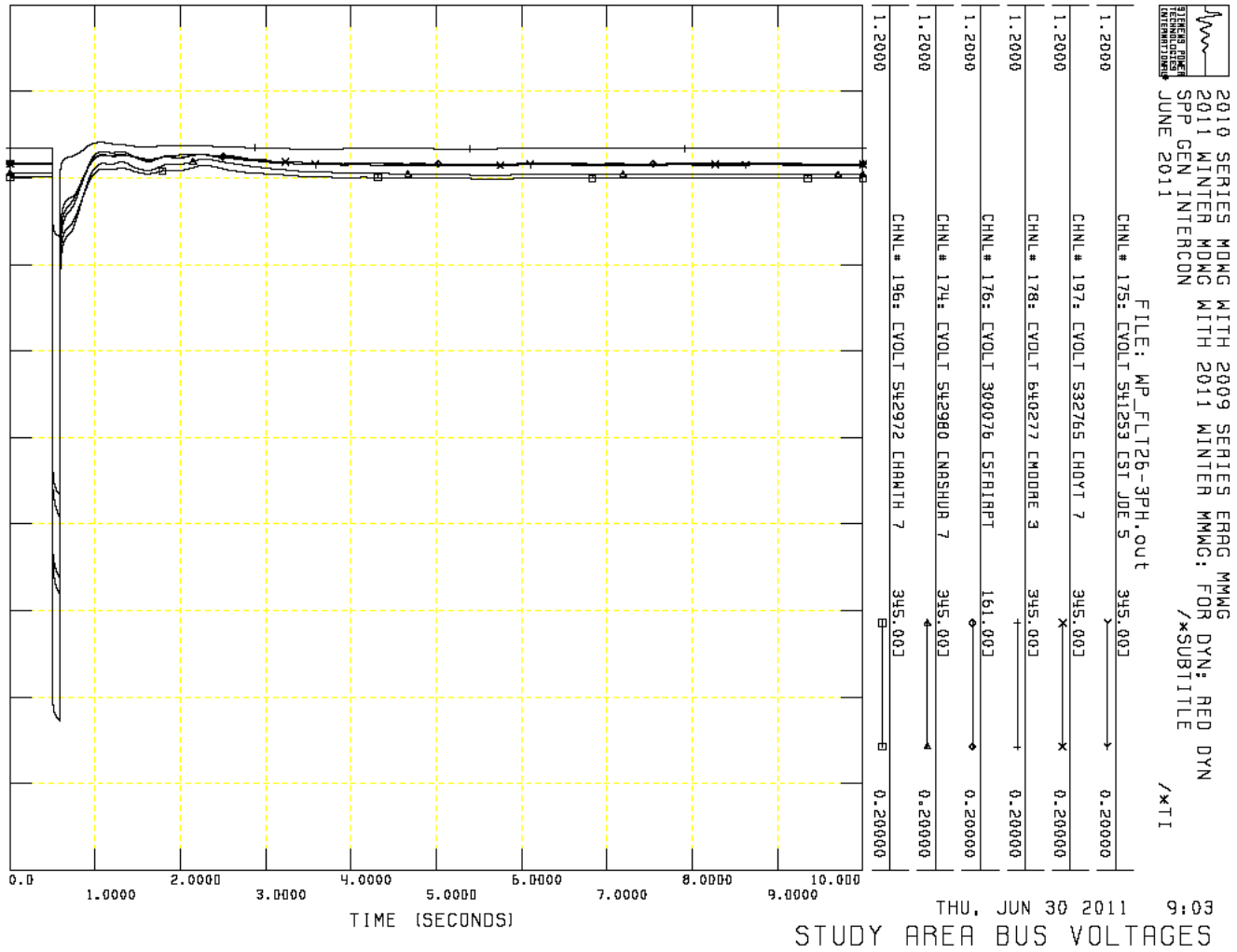

Figure 4-5. Response of system voltages in the study area during case FLT-26-3PH for winter peak conditions, which is a representative case for the "worst" delayed voltage recovery.

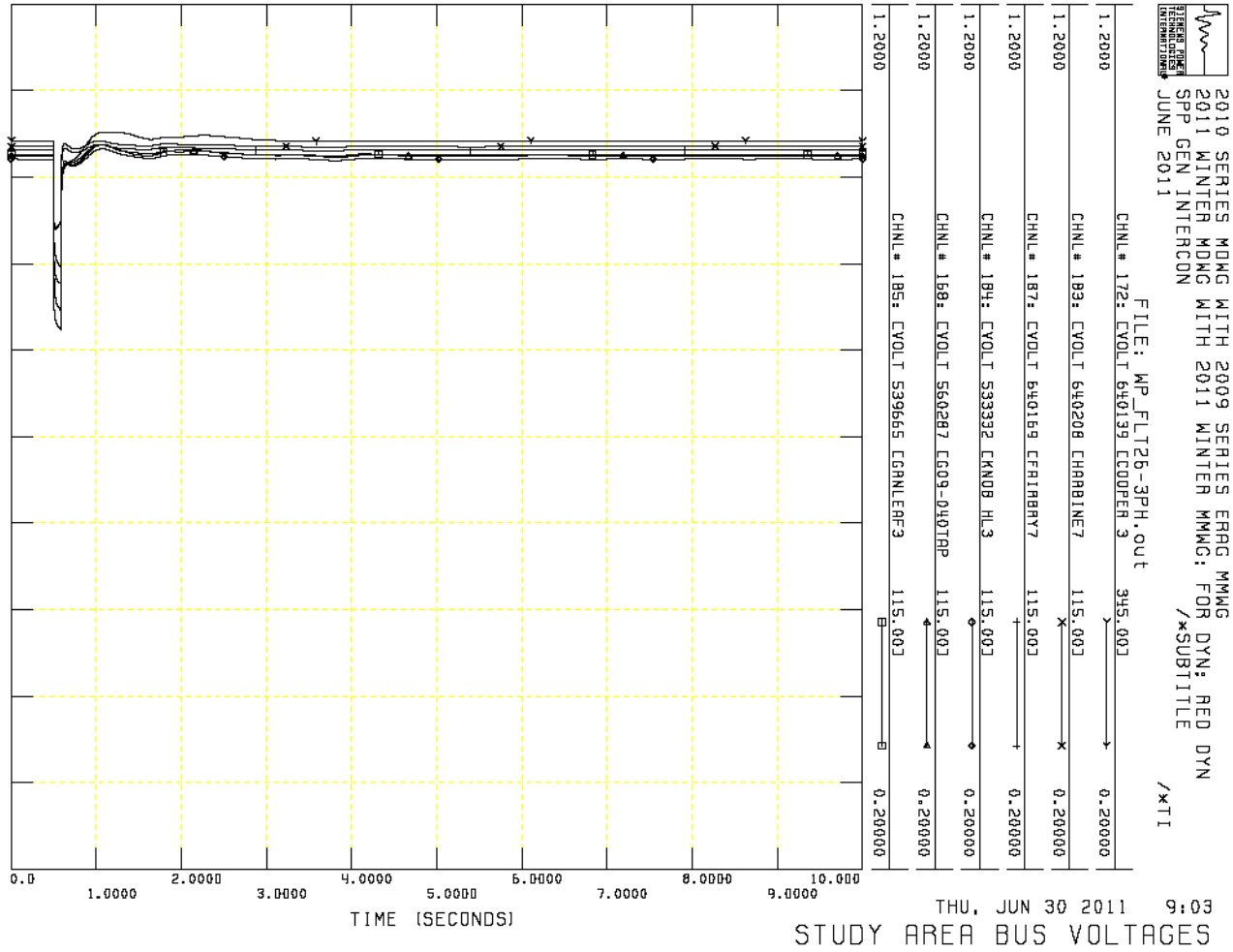

Figure 4-6. Response of system voltages in the study area during case FLT-26-3PH for winter peak conditions, which is a representative case for the "worst" delayed voltage recovery.

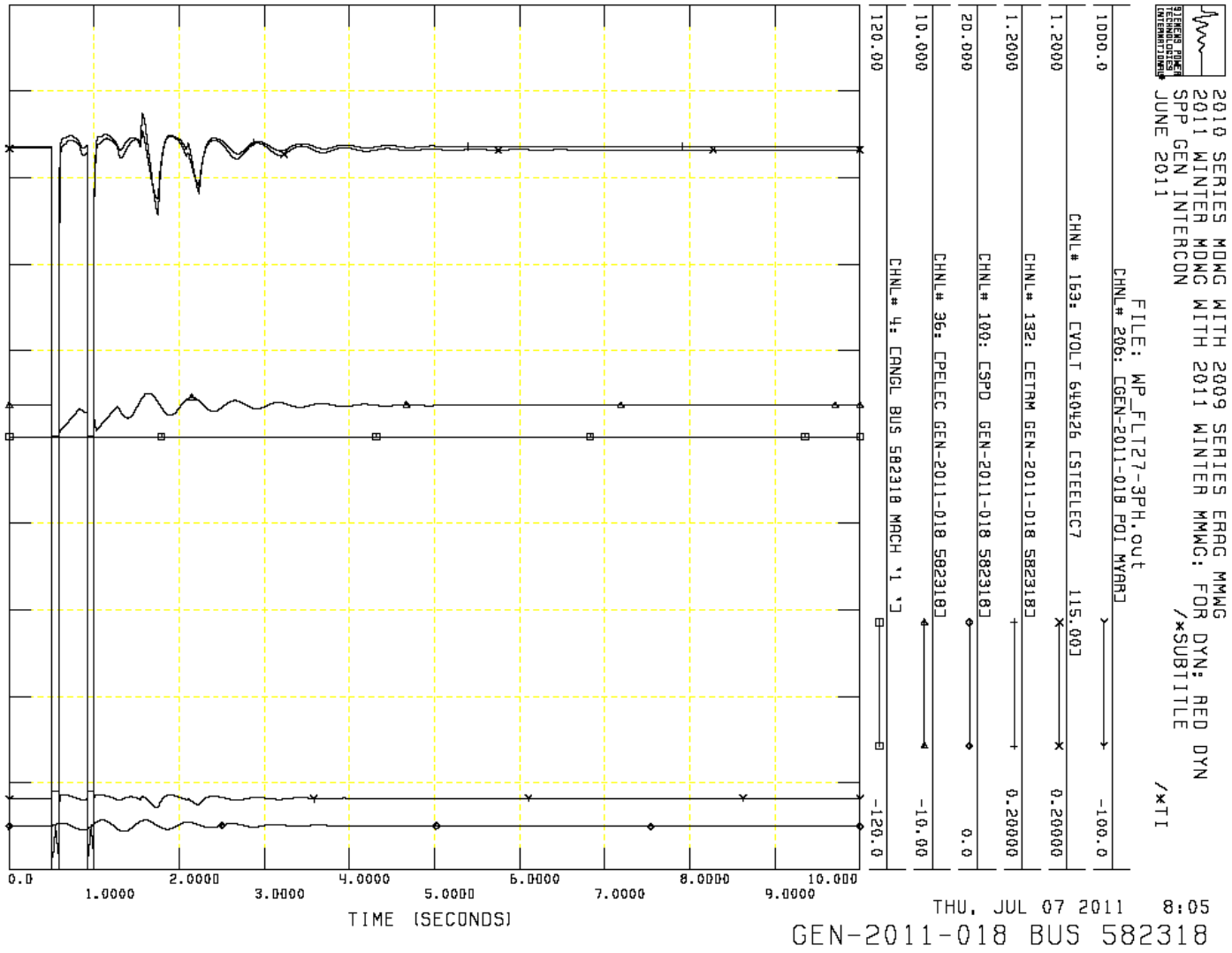

Figure 4-7. Response of GEN-2011-018 project during case FLT-27-3PH for winter peak conditions.

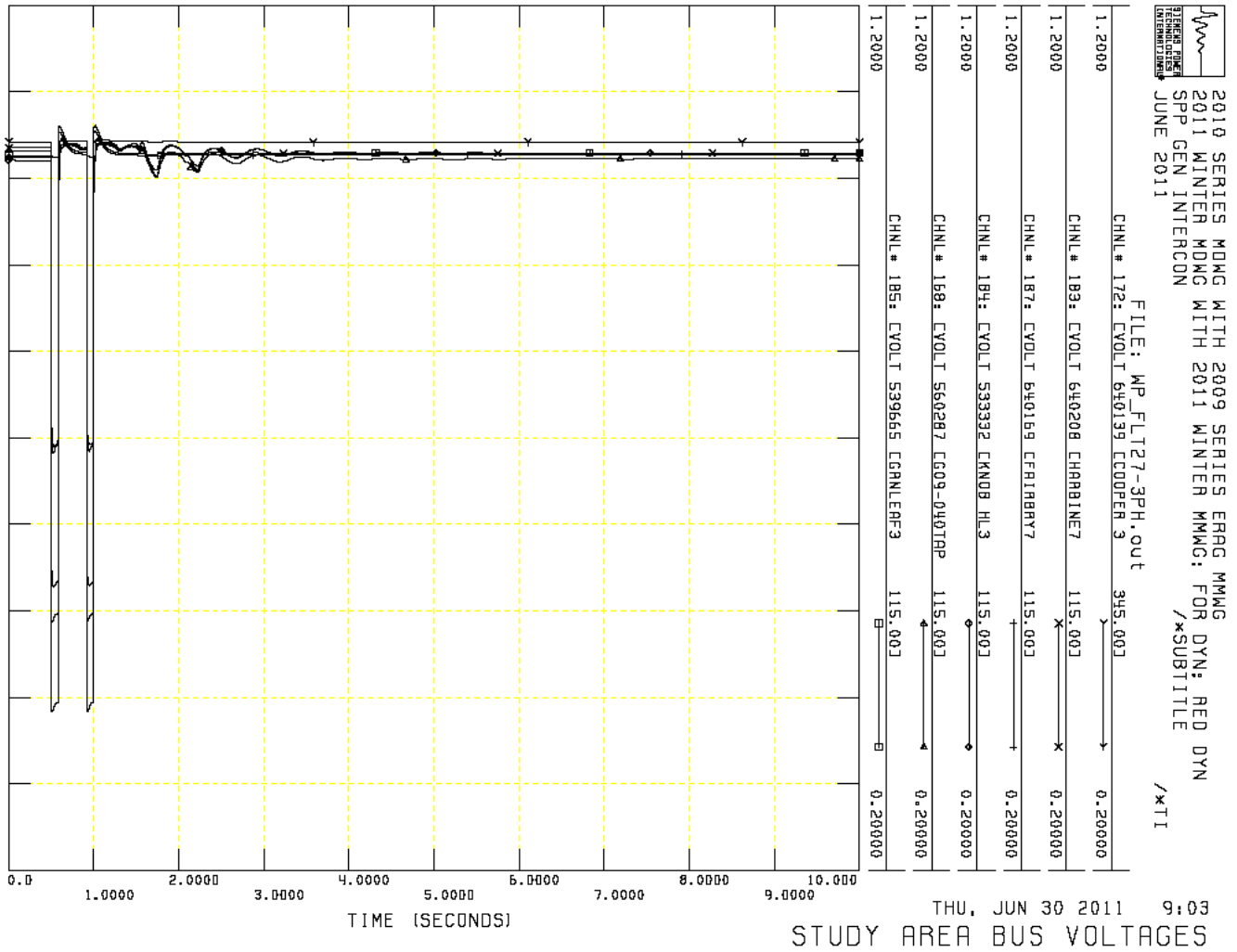

Figure 4-8. Response of system voltages in the study area during case FLT-27-3PH for winter peak conditions, which is a representative case showing the "most severe" voltage dip.

Summary

The stability analysis determined that no wind generator tripping or system instability occurs by interconnecting Group 13 projects at 100% output. Refer to Appendix B and Appendix C for the stability plots of the study area and nearby system's bus voltage and generator's angle and speed response during the disturbance for the summer peak and winter peak conditions, respectively.

SECTION 5: CONCLUSIONS

Power Factor Analysis

Power factor analysis shows that GEN-2010-056 has a power factor requirement of 0.8211 leading (absorbing) to 0.9416 lagging (supplying) and that GEN-2011-018 has a power factor requirement of 0.9800 leading (absorbing).

Project GEN-2011-011 did not require a power factor analysis because it is a conventional generator.

Stability Analysis

The stability analysis determined that no wind turbine tripping or system instability occurs from interconnecting Group 13 projects at 100% output.

U: Stability Study for Group 14

Interconnection Impact Study
DISIS-2011-001 (Group 14)

Southwest Power Pool (SPP)
July 21, 2011

BLACK & VEATCH

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EXECUTIVE SUMMARY

A transient stability study has been performed for Southwest Power Pool (SPP) Definitive Impact Study Interconnection Customers Group 14 (DISIS-2011-001 Group 14)

The Group 14 has one Interconnection Requests, GEN-2011-013. The Interconnection Queue Position GEN-2011-013 is a wind farm with a capacity of 100.8 MW. This new installation is proposed to be interconnected with the Sunnyside 345 kV bus.

The 2011 summer load flow case and 2011 winter load flow case together with the MDWG stability model were used as the basis for the transient stability analysis. The study was performed using Siemens PTI PSS/E program, which is an industry-wide accepted power system simulation program.

A power factor analysis was performed for all the contingencies that were considered in this study. The power factor range Gen-2011-013 needs to maintain at the POI will be from 0.98 lagging (supplying vars) to 0.97 leading (absorbing vars).

The study has not indicated any stability issues and the wind farms were found to be stayed connected to the grid during the contingencies studied.

Should any previously queued projects that were included in this study drop out then this System Impact Study may have to be revised to determine the impacts of this Interconnection Customer’s project on transmission facilities.

1. Introduction

This report discusses the results of a transient stability study performed for Southwest Power Pool (SPP) Definitive Impact Study Interconnection Customers Group 14 (DISIS-2011-001 Group 14).

Group 14 has one Interconnection Requests, Gen-2011-013. The Interconnection Queue Position GEN-2011-013 is a wind farm with a capacity of 100.8 MW. This wind farm is proposed to be interconnected on to Sunnyside 345 kV bus. The system one line diagram of the areas near the Queue Position GEN-2011-013 is shown in Figure 1.

The Customer has requested to study Vestas V90 1.8 MW wind turbine generators for GEN-2011-013. Transient Stability studies were conducted with the full outputs (100%) for Gen-2011-013.

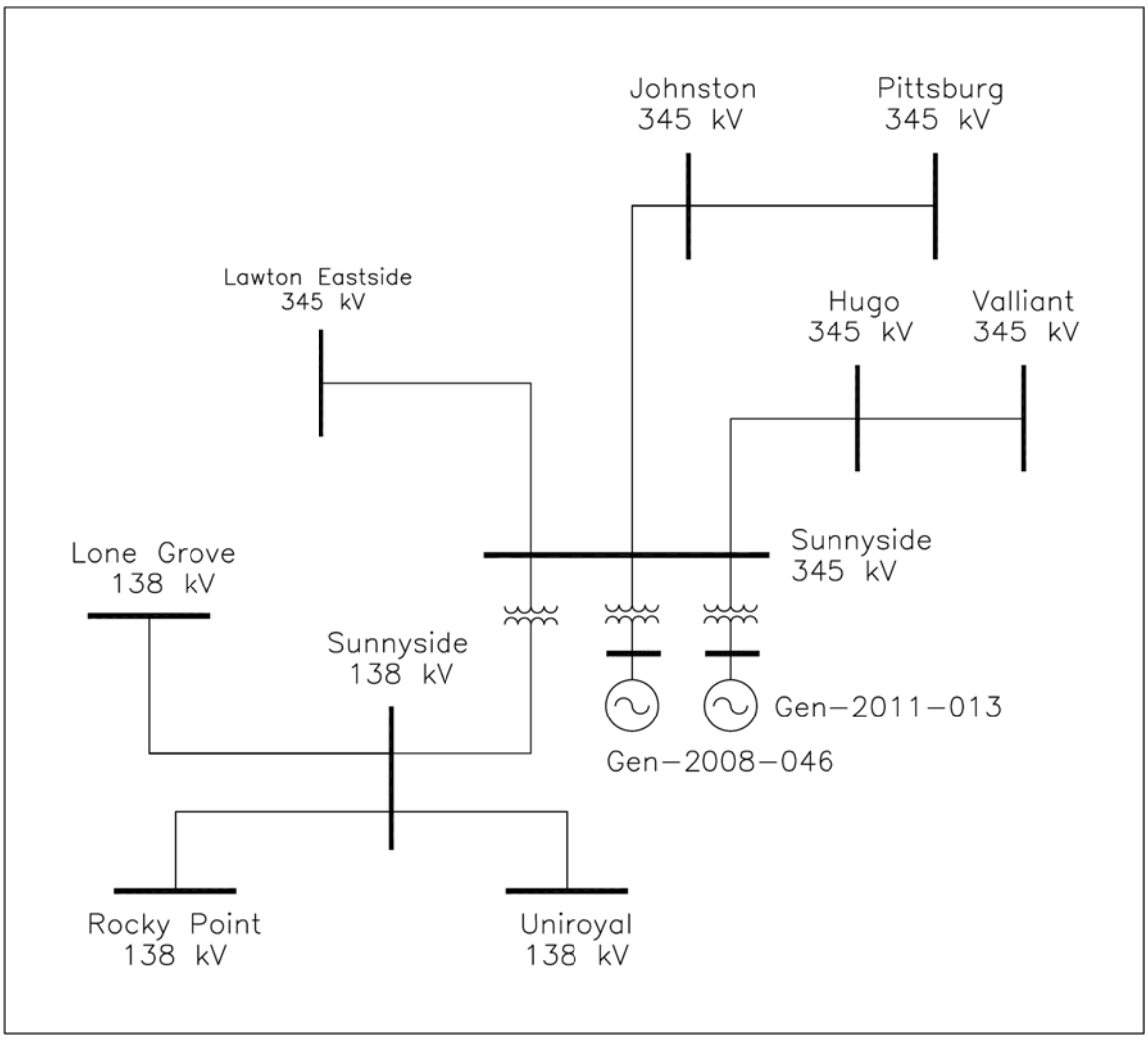


Figure 1: System One Line Diagram near GEN-2011-013

2. Stability Study Criteria

The 2011 summer load flow and 2011 winter load flow cases together with the MDWG stability model were used as the base case for the transient stability analysis. These models were provided by SPP.

Using Planning Standards approved by NERC, the following stability definition was applied in the Transient Stability Analysis:

“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.”

Disturbances such as three phase and single phase line faults were simulated for a specified duration and the synchronous machine rotor angles were monitored for their synchronism following the fault removal.

The ability of the wind generators to stay connected to the grid during the disturbances and during the fault recovery was also monitored.

3. System Models and Simulation Cases

Transient Stability studies were conducted for (i) 2011 summer and (ii) 2011 winter load flow cases. The power flow and the dynamic data provided by SPP had already contained the models of Gen-2011-013. The system models also had the models for the previous queued project, Gen-2008-046.

Figure 2 shows the PSS/E power flow diagram.

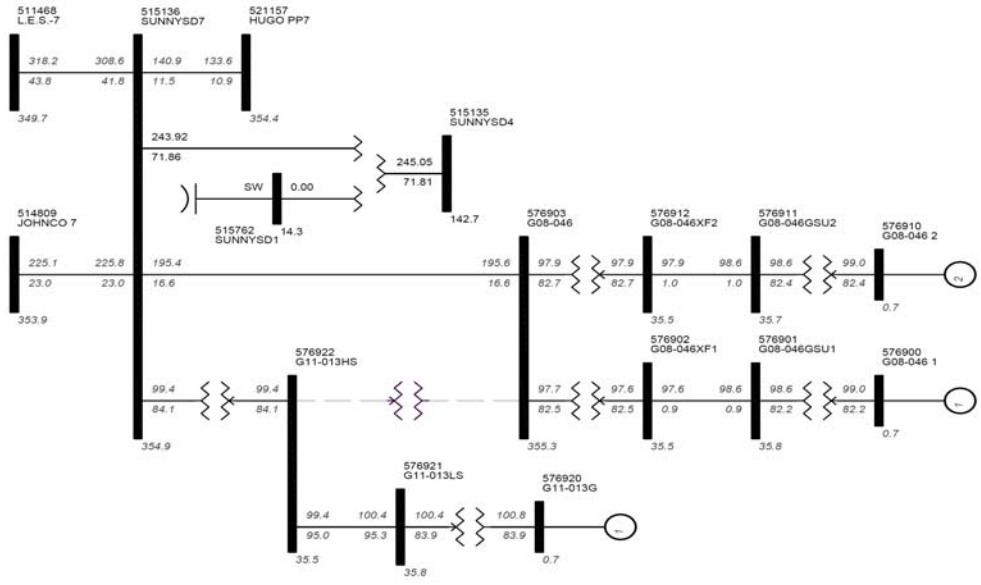


Figure 2: PSS/E Power Flow Diagram

Table 1 lists the contingencies that were studied for each of the two cases.

Cont. No.	Cont. Name	Description
1	FLT01-3PH	3 phase fault on the Sunnyside (515136) to Lawton Eastside (511468) 345kV line, near Sunnyside. a. Apply fault at Sunnyside 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	FLT02-1PH	*Single phase fault and sequence like previous*
3	FLT03-3PH	3 phase fault on the Sunnyside (515136) to Johnston County (514809) 345kV line, near Sunnyside. a. Apply fault at Sunnyside 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	FLT04-1PH	*Single phase fault and sequence like previous*
5	FLT05-3PH	3 phase fault on the Sunnyside (515136) to Hugo (521157) 345kV line, near Sunnyside. a. Apply fault at Sunnyside 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	FLT06-1PH	*Single phase fault and sequence like previous*
7	FLT07-3PH	3 phase fault on the Sunnyside 345kv (515136) to138kV (515135) transformer on the 345kV bus. a. Apply fault at Sunnyside 345kV bus. b. Clear fault after 5 cycles by tripping the faulted transformer.
8	FLT08-3PH	3 phase fault on the Lawton Eastside (511468) to Oklaunion (511456) 345kV line, near Lawton Eastside. a. Apply fault at Lawton Eastside 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.
9	FLT09-1PH	*Single phase fault and sequence like previous*
10	FLT10-3PH	3 phase fault on the Lawton Eastside (511468) to Gracemont (515800) 345kV line, near Lawton Eastside. a. Apply fault at Lawton Eastside 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.
11	FLT11-1PH	*Single phase fault and sequence like previous*
12	FLT12-3PH	3 phase fault on one of the Lawton Eastside 345kV (511468) to138kV (511467) transformers on the 345kV bus. a. Apply fault at Lawton Eastside 345kV bus. b. Clear fault after 5 cycles by tripping the faulted transformer.
13	FLT13-3PH	3 phase fault on the Johnston County (514809) to Pittsburg (510907) 345kV line, near Johnston County. a. Apply fault at Johnston 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.
14	FLT14-1PH	*Single phase fault and sequence like previous*
15	FLT15-3PH	3 phase fault on the Johnston County 345kV (514809) to 138kV (514808) transformer on the 345kV bus. a. Apply fault at Johnston County 345kV bus. b. Clear fault after 5 cycles by tripping the faulted transformer.

16	FLT16-3PH	3 phase fault on the Pittsburg (510907) to Valiant (510911) 345kV line, near Pittsburg. a. Apply fault at Pittsburg 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.
17	FLT17-1PH	*Single phase fault and sequence like previous*
18	FLT18-3PH	3 phase fault on the Kiowa (510925) to Pittsburg (510907) 345kV line, near Kiowa. a. Apply fault at Kiowa 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.
19	FLT19-1PH	*Single phase fault and sequence like previous*
20	FLT20-3PH	3 phase fault on the Seminole (515045) to Pittsburg (510907) 345kV line, near Seminole. a. Apply fault at Seminole 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.
21	FLT21-1PH	*Single phase fault and sequence like previous*
22	FLT22-3PH	3 phase fault on the Muskogee (515224) to Pittsburg (510907) 345kV line, near Muskogee. a. Apply fault at Muskogee 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.
23	FLT23-1PH	*Single phase fault and sequence like previous*
24	FLT24-3PH	3 phase fault on the Hugo (521157) to Valiant (510911) 345kV line, near Hugo. a. Apply fault at Hugo 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.
25	FLT25-1PH	*Single phase fault and sequence like previous*
26	FLT26-3PH	3 phase fault on the Hugo 345kV (521157) to 138kV (520948) transformer on the 345kV bus. a. Apply fault at Hugo 345kV bus. b. Clear fault after 5 cycles by tripping the faulted transformer.
27	FLT27-3PH	3 phase fault on the Sunnyside (515135) to Pooleville (515130) 138kV line, near Sunnyside. a. Apply fault at 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	*Single phase fault and sequence like previous*
29	FLT29-3PH	3 phase fault on the Sunnyside (515135) to Uniroyal (515137) 138kV line, near Sunnyside. a. Apply fault at 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.
30	FLT30-1PH	*Single phase fault and sequence like previous*
31	FLT31-3PH	3 phase fault on the Sunnyside (515135) to Lone Grove (515144) 138kV line, near Sunnyside. a. Apply fault at 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.
32	FLT32-1PH	*Single phase fault and sequence like previous*

33	FLT33-3PH	3 phase fault on the Sunnyside (515135) to Rocky Point (515164) 138kV line, near Sunnyside. a. Apply fault at 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.
34	FLT34-1PH	*Single phase fault and sequence like previous*
35	FLT35-3PH	3 phase fault on the Sweetwater (511541) to Wheeler (523777) 230kV line, near Sweetwater. a. Apply fault at Sweetwater 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	FLT36-1PH	*Single phase fault and sequence like previous*
37	FLT37-3PH	3 phase fault on one of the GEN-2007-043 Tap (210431) to Gracemont (515800) 345kV lines, near GEN-2007-043 Tap. a. Apply fault at GEN-2007-043 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.
38	FLT38-1PH	*Single phase fault and sequence like previous*
39	FLT39-3PH	3 phase fault on one of the GEN-2007-043 Tap (210431) to Cimarron (514901) 345kV lines, near GEN-2007-043 Tap. a. Apply fault at GEN-2007-043 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.
40	FLT40-1PH	*Single phase fault and sequence like previous*

Table 1: Study Cases

4. Power Factor Analysis

A power factor analysis was performed by modeling a VAR generator at the point of interconnection (POI), which was Sunnyside 345 kV. The VAR generator was set to hold a voltage schedule of 1.02 pu at POI. The required reactive power and thereby the required power factor to be maintained at the POI was calculated for all the contingencies listed in Table 1. Table 3 shows the calculated power factors that need to be maintained at the POI. The power factor range that would be required to be maintained at the POI will be from 0.98 lagging (supplying vars) to 0.97 leading (absorbing vars).

Table 3: Required Power Factor

	Required power factor at POI	
Fault Case	**Summer Case**	**Winter Case**
FLT01-3PH	0.9837 lead	0.9809 lead
FLT03-3PH	0.9982 lead	0.9997 lag
FLT05-3PH	0.9932 lag	0.9882 lag
FLT07-3PH	0.9978 lead	0.9977 lead
FLT08-3PH	0.9867 lead	0.9719 lead

FLT10-3PH	0.9998 lead	0.9998 lag
FLT12-3PH	0.9978 lead	0.9977 lead
FLT13-3PH	0.9996 lag	0.9987 lag
FLT15-3PH	0.9978 lead	0.9977 lead
FLT16-3PH	1.0000 lag	1.0000 lag
FLT18-3PH	0.9978 lead	0.9977 lead
FLT20-3PH	0.9938 lead	0.9936 lead
FLT22-3PH	0.9989 lead	0.9991 lead
FLT24-3PH	0.9931 lead	0.9936 lead
FLT26-3PH	0.9978 lead	0.9977 lead
FLT27-3PH	0.9973 lead	0.9973 lead
FLT29-3PH	0.9957 lead	0.9978 lead
FLT31-3PH	0.9982 lead	0.9977 lead
FLT33-3PH	0.9972 lead	0.9979 lead
FLT35-3PH	0.9978 lead	0.9977 lead
FLT37-3PH	0.9997 lead	1.0000 lead
FLT39-3PH	0.9991 lead	0.9999 lead

5. Simulation Results

Initial simulation was carried out without any disturbance to verify the numerical stability of the model and was confirmed to be stable. Table 4 provides the summary of the study results for the contingencies that were studied.

Table 4: Stability Study Results Summary

Fault Case	Summer Case	Winter Case
FLT01-3PH	- -	- -
FLT02-1PH	- -	- -
FLT03-3PH	- -	- -
FLT04-1PH	- -	- -
FLT05-3PH	- -	- -
FLT06-1PH	- -	- -
FLT07-3PH	- -	- -
FLT08-3PH	- -	- -
FLT09-1PH	- -	- -
FLT10-3PH	- -	- -
FLT11-1PH	- -	- -
FLT12-3PH	- -	- -
FLT13-3PH	- -	- -
FLT14-1PH	- -	- -
FLT15-3PH	- -	- -

FLT16-3PH	- -	- -
FLT17-1PH	- -	- -
FLT18-3PH	- -	- -
FLT19-1PH	- -	- -
FLT20-3PH	- -	- -
FLT21-1PH	- -	- -
FLT22-3PH	- -	- -
FLT23-1PH	- -	- -
FLT24-3PH	- -	- -
FLT25-1PH	- -	- -
FLT26-3PH	- -	- -
FLT27-3PH	- -	- -
FLT28-1PH	- -	- -
FLT29-3PH	- -	- -
FLT30-1PH	- -	- -
FLT31-3PH	- -	- -
FLT32-1PH	- -	- -
FLT33-3PH	- -	- -
FLT34-1PH	- -	- -
FLT35-3PH	- -	- -
FLT36-1PH	- -	- -
FLT37-3PH	- -	- -
FLT38-1PH	- -	- -
FLT39-3PH	- -	- -
FLT40-1PH	- -	- -

T : Generator tripped due to angle deviation
UV : Generator tripped due to under voltage
PT : Post-Transient voltage issues encountered
S : Stability issues encountered
PQ : Prior queued project tripped
- - : Wind Farm did not trip

Figure 3 shows the system response for FLT01-3PH from the summer case.

6. Summary

A transient stability analysis was conducted for Southwest Power Pool (SPP) Preliminary Impact Study Interconnection Customers Group 14 (DISIS-2011-001 Group 14). The study was conducted for two different power flow scenarios, i.e., one for summer peak and one for winter peak.

A power factor analysis was performed for all the contingencies that were considered in this study. The power factor range Gen-2011-013 needs to maintain at the POI will be from 0.98 lagging to 0.97 leading.

The study has not indicated any stability issues and the wind farms were found to be stayed connected to the grid during the contingencies studied.

Disclaimer

If any previously queued projects that were included in this study drop out, then this System Impact Study may have to be revised to determine the impacts of this Interconnection Customer's project on transmission facilities. Since this is also a preliminary System Impact Study, not all previously queued projects were assumed to be in service in this System Impact Study. If any of those projects are constructed, then this System Impact Study may have to be revised to determine the impacts of this Interconnection Customer's project on transmission facilities. In accordance with FERC and SPP procedures, the study cost for restudy shall be borne by the Interconnection Customer.

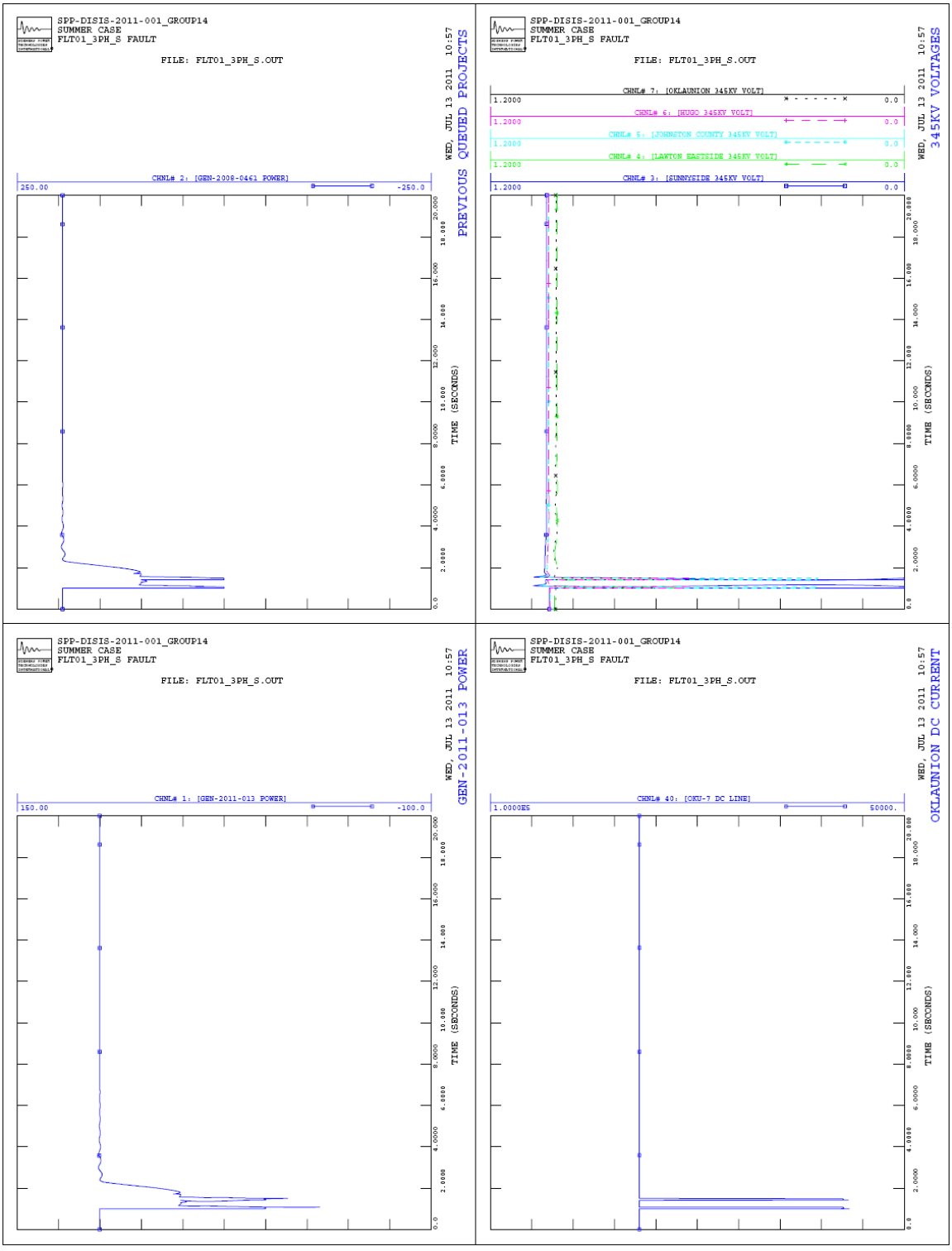


Figure 3: System Responses for FLT01-3PH

Figure 3: System Responses for FLT01-3PH (cont'd)

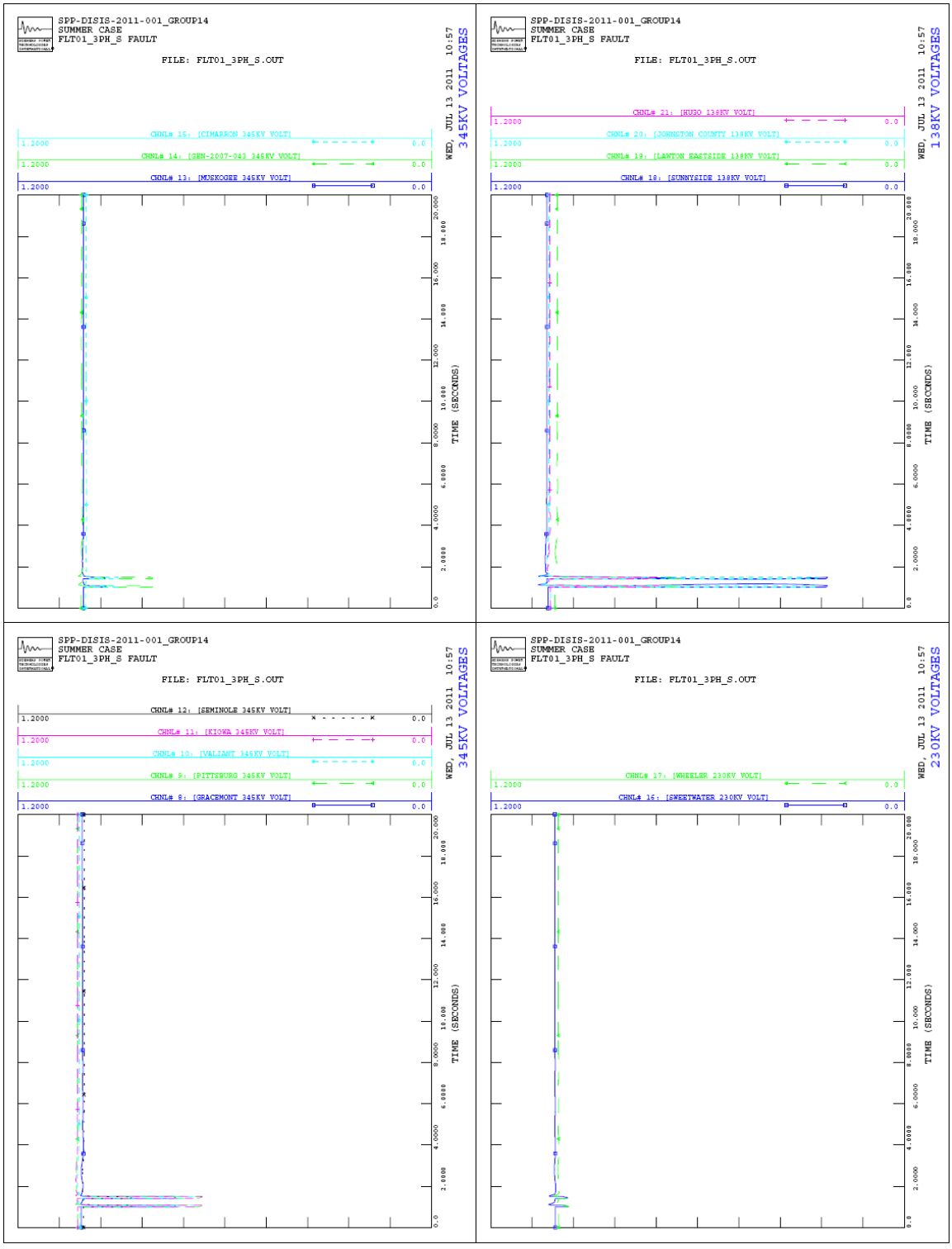


Figure 3: System Responses for FLT01-3PH (cont'd)

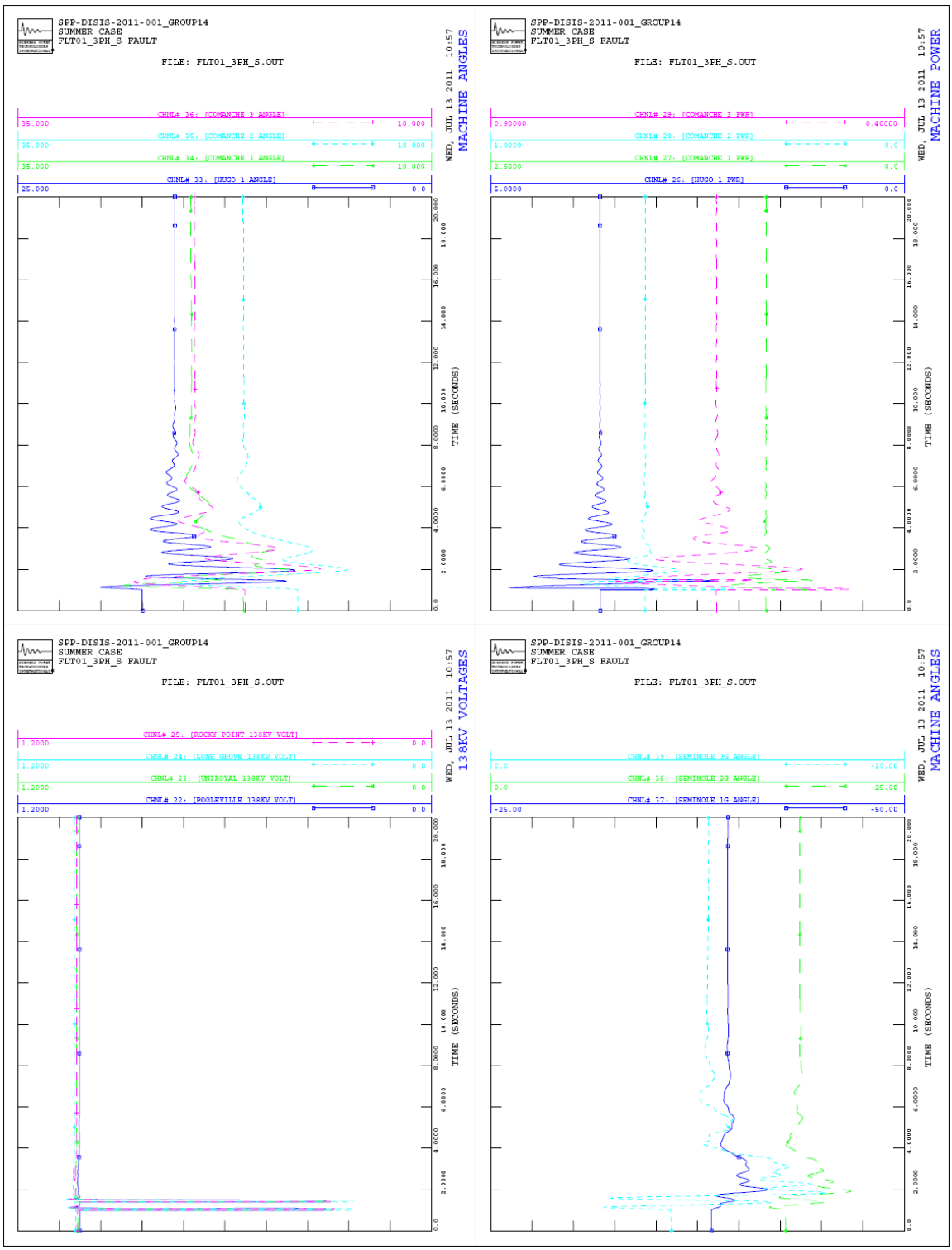
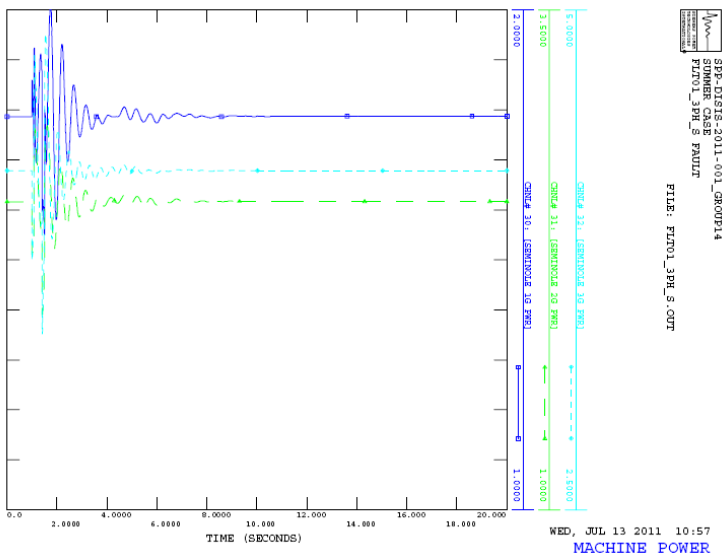


Figure 3: System Responses for FLT01-3PH (cont'd)



V: Stability Study for Group 15

- No requests were located in the cluster group