

Definitive Interconnection
System Impact Study for
Generation Interconnection
Requests
(DISIS-2012-001-3)

May 2014

Generation Interconnection

Revision History

Date	Author	Change Description
07/26/2012	SPP	Report Issued (DISIS-2012-001)
02/08/2013	SPP	Account for Withdrawn Projects, Report Re-Posted (DISIS-2012-001-1)
01/21/2014	SPP	Account for Withdrawn Projects, Report Re-Posted (DISIS-2012-001-2)
05/29/2013	SPP	Account for Withdrawn Projects, Report Re-Posted (DISIS-2012-001-3)

Executive Summary

Generation Interconnection customers have requested a Definitive Interconnection System Impact Study (DISIS) under the Generation Interconnection Procedures (GIP) in the Southwest Power Pool Open Access Transmission Tariff (OATT). The Interconnection Customers' requests have been clustered together for the following System Impact Cluster Study window which closed March 31, 2012. The customers will be referred to in this study as the DISIS-2012-001 Interconnection Customers. This System Impact Study analyzes the interconnecting of multiple generation interconnection requests associated with new generation totaling approximately 475.1MW of new generation which would be located within the transmission systems of Oklahoma Gas and Electric (OKGE), Sunflower Electric Power Corporation/Mid-Kansas Electric Power LLC (SUNC)/(MKEC), and Southwestern Public Service (SPS). The various generation interconnection requests have differing proposed in-service dates¹. The generation interconnection requests included in this System Impact Cluster Study are listed in Appendix A by their queue number, amount, requested interconnection service, area, requested interconnection point, proposed interconnection point, and the requested in-service date.

Power flow analysis has indicated that for the power flow cases studied, 475.1MW of nameplate generation may be interconnected with transmission system reinforcements within the SPP transmission system. Previously performed dynamic stability analysis and additional power flow analysis for power factor requirements has determined the need for reactive. Previously performed dynamic stability analysis has determined that the transmission system will remain stable with the assigned Network Upgrades and Interconnection Facilities to the DISIS.

The total estimated minimum cost for interconnecting the DISIS-2012-001 interconnection customers is \$29,716,631.00. These costs are shown in Appendix E and F. Interconnection Service to DISIS-2012-001 interconnection customers is also contingent upon higher queued customers paying for certain required network upgrades. **The in service date for the DISIS customers will be deferred until the construction of these network upgrades can be completed.**

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

Network Constraints listed in Appendix H are in the local area of the new generation when this generation is injected throughout the SPP footprint for the Energy Resource (ERIS) Interconnection Request. Certain Interconnection Requests were also studied for Network Resource Interconnection Service (NRIS). Those constraints are also listed in Appendix H. Additional Network

¹ The generation interconnection requests in-service dates will need to be deferred based on the required lead time for the Network Upgrades necessary. The Interconnection 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.

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 System Impact Study window which closed March 31, 2012. The customers will be referred to in this study as the DISIS-2012-001 Interconnection Customers. This System Impact Study analyzes the interconnecting of multiple generation interconnection requests associated with new generation totaling 475.1 MW of new generation which would be located within the transmission systems of Oklahoma Gas and Electric (OKGE), Sunflower Electric Power Corporation/Mid-Kansas Electric Power LLC (SUNC/MKEC), and Southwestern Public Service (SPS). The various generation interconnection requests have differing proposed in-service dates². The generation interconnection requests included in this System Impact Study are listed in Appendix A by their queue number, amount, requested interconnection service, area, requested interconnection point, proposed interconnection point, and the requested in-service date.

The primary objective of this 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.

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.

Model Development

Interconnection Requests Included in the Cluster

SPP has included all interconnection requests that submitted a Definitive Interconnection System Impact Study Agreement no later than March 31, 2012 and were subsequently accepted by Southwest Power Pool under the terms of the Generator Interconnection Procedures (GIP). The interconnection requests that are included in this study are listed in Appendix A.

Affected System Interconnection Request

Also included in this Definitive Impact Study is a single Affected System Study, located on the Pioneer Electric Cooperative, Inc. system, which shares connections to the Sunflower Electric Power Corporation (SUNC) system. The Affected System Study Requests has been given the designation: ASGI-2012-006. ASGI-2012-006 capacity nameplate is 22.5 MW (and associated 17MW internal load) with Point of Interconnection (POI) at a tap on Hugoton – Rolla 69kV line.

Previously Queued Interconnection Requests

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

Development of Base Cases

Power Flow

The 2013 series Transmission Service Request (TSR) Models 2014 spring, 2014 summer and winter peak, 2019 summer and winter peak, and the 2024 summer peak scenario 0 cases were used for this study. After the cases were developed, each of the control areas' resources were then re-dispatched to account for the new generation requests using current dispatch orders.

Dynamic Stability

The stability analysis was not re-performed for this restudy.

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 an approved Notice to Construct (NTC), or are in construction stages and were assumed to be in-service at the time of dispatch and added to the base case models. The DISIS-2012-001 Customers have not been assigned acceleration costs for the below listed projects. The DISIS-2012-001 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 230/115kV area projects³:
 - Hitchland – Ochiltree 230kV Project (placed In-Service in 2013)
- Balanced Portfolio Projects⁴:
 - Woodward – Border – TUCO 345kV project, scheduled for 5/19/2014 in-service
 - Woodward 345/138kV circuit #2 autotransformer
 - TUCO 345/138kV circuit #2 autotransformer
 - Reactors at Woodward and Border
 - Iatan– Nashua 345kV, scheduled for 6/1/2015 in-service
 - Nashua 345/161kV autotransformer
 - Muskogee– Seminole 345kV, scheduled for 12/31/2013 in-service
 - Cleveland – Sooner 345kV, (placed In-Service in 2012)
 - Tap Stillwell – Swissvale 345kV line at West Gardner, (placed In-Service in 2013)
- Priority Projects⁵:
 - Hitchland – Woodward double circuit 345kV, scheduled for 6/30/2014 in-service
 - Hitchland 345/230kV circuit #2 autotransformer
 - Woodward – Thistle double circuit 345kV, scheduled for 12/31/2014 in-service
 - Spearville – Clark double circuit 345kV, scheduled for 12/31/2014 in-service
 - Clark – Thistle double circuit 345kV, scheduled for 12/31/2014 in-service
 - Thistle – Wichita double circuit 345kV, scheduled for 12/31/2014 in-service
 - Thistle 345/138kV autotransformer, scheduled for 12/31/2014 in-service
 - Thistle – Flat Ridge 138kV, scheduled for 12/31/2014 in-service
- Various MKEC Transmission System Upgrades⁶
 - Harper – Flat Ridge 138kV rebuild, (placed In-Service in 2013)
 - Flat Ridge – Medicine Lodge 138kV rebuild, scheduled for 12/31/2013 in-service
 - Pratt – Medicine Lodge 115kV rebuild, scheduled for 6/15/2014 in-service
 - Medicine Lodge 138/115kV autotransformer replacement, (placed In-Service in 2013)

³ SPP Regional Reliability Projects identified in 2007 STEP. As of the writing of this report, SPP Project Tracking TAGIT shows some of these project's in-service dates have been delayed from the original 2010/2011 in-service dates.

⁴ Notice to Construct (NTC) issued June 2009.

⁵ Notice to Construct (NTC) issued June 2010.

⁶ SPP Transmission Service Projects identified in SPP-2007-AG3-AFS-9.

- Northwest 345/138/13.8kV circuit #3 autotransformer, scheduled for 6/1/2017 in-service⁷
- Woodward (OKGE) – Woodward (WFEC) 69kV rebuild, scheduled for 6/1/2015 in-service⁸
- Sheldon – SW7th and Pleasant Hill 115kV circuit #2 rebuild, (placed In-Service in 2013)⁹
- Moundridge 138/115/13.8kV autotransformer circuit #2, scheduled for 12/1/2014 in-service¹⁰
- Fremont – S6801 161/69kV circuit #1 Project¹¹
 - Fremont 161/69/13.8kV transformer circuit #1, scheduled for 6/1/2019 in-service.
 - Fremont – S6801 69kV circuit #1, scheduled for 6/1/2019 in-service.
 - S1226 – S1301 161kV circuit #1, scheduled for 6/1/2019 in-service.

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-2012-001 study and are assumed to be in service. This list may not be all inclusive. The DISIS-2012-001 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-2012-001 Customer Generation Facilities in service dates may need to be delayed until the completion of the following upgrades.

- Upgrades assigned to DISIS-2009-001 Interconnection Customers:
 - Lancer Project
 - Spearville – Lancer 345kV, addition
 - Lancer 345/115kV transformer circuit #1, addition
 - Lancer – North Ft. Dodge 115kV, addition
 - Ft. Dodge – North Ft. Dodge circuit #2, addition
 - Move Ft. Dodge terminal of Shooting Star 115kV
 - Fort Randall – Meadow Grove – Kelly 230kV circuit #1, rerate (320MVA)
- Upgrades assigned to DISIS-2010-001 Interconnection Customers:
 - Beaver County 345kV Expansion (Tap & Tie Hitchland – Woodward circuit #2 into Beaver County 345kV)
 - Switch 2749 – Wildorado 69kV circuit # 1, rebuild
- Upgrades assigned to DISIS-2010-002 Interconnection Customers:
 - Buckner –Spearville 345kV circuit #1, replace terminal equipment
 - Twin Church – Dixon County 230kV circuit #1, rerate (320MVA)
- Upgrades assigned to DISIS-2011-001 Interconnection Customers:
 - Beaver County – Buckner 345kV circuit #1, build
 - Rice County – Circle 230kV conversion, (placed In-Service in 2012)
 - Rice County – Lyons 115kV, rebuild (placed In-Service in 2013)

⁷ SPP Transmission Service Project identified in SPP-2009-AG2-AFS6. Per SPP-NTC-20137.

⁸ SPP Regional Reliability Project. Per SPP-NTC-20003.

⁹ SPP Regional Reliability 2012 ITPNT Project. Per SPP-NTC-200171.

¹⁰ SPP Regional Reliability 2012 ITP10 Project. Per SPP-NTC-200181.

¹¹ SPP Regional Reliability 2014 ITPNT Project. Per SPP-NTC-200259.

- Rice County 230/115kV autotransformer, (placed In-Service in 2012)
- Wheatland – Lyons 115kV, rerate (199 MVA) (placed In-Service in 2012)
- Hoskins – Dixon County – Twin Church 230kV circuit #1, rerate
- (NRIS only) Mooreland – FPL Switch – Woodward 138kV circuit #1, rebuild
- (NRIS only) Glass Mountain – Mooreland 138kV circuit #1, rebuild
- (NRIS only) TUCO – New Deal – Stanton 345/115kV Project, build
- (NRIS only) Wolfforth 230/115kV transformer circuit #1, rebuild
- Upgrades assigned to DISIS-2011-002 interconnection Customers:
 - Power System Stabilizers - Install Power System Stabilizers @ Tolk(Units: 1,2) and Jones (Units: 1,2,3,4)
 - SUB 967 - SUB 968 69kV circuit #1, replace terminal equipment
 - (NRIS only) Allen – Lubbock South 115kV circuit #1, rebuild
 - (NRIS only) Hydro Carbon Tap - Sub974 69kV circuit #1, rewire CT
 - (NRIS only) Nebraska City U Syracuse – SUB 970 circuit #1, replace terminal equipment

Potential Upgrades Not in the Base Case

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

Regional Groupings

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

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

Power Flow

For each group, the various wind generating plants were modeled at 100% nameplate of maximum generation. The other wind generating plants in each area were modeled at 80% nameplate while the wind generating plants in the other areas were modeled at 20% nameplate of maximum generation. These projects were dispatched as Energy Resources with 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. Other sensitivity analyses are also performed with all interconnection requests in each group being dispatched at 100% nameplate.

Peaking units were not dispatched in the 2014 spring model. To study peaking units' impacts, the 2014 summer and winter and 2019 summer and winter, and 2024 summer seasonal models were chosen and peaking units were modeled at 100% of the nameplate rating and wind generating

facilities were modeled at 10% of the nameplate rating. Each interconnection request was also modeled separately at 100% nameplate for certain analyses.

Dynamic Stability

The stability analysis was not re-performed for this restudy.

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

Determination of Cost Allocated Network Upgrades

Cost Allocated Network Upgrades of wind generation interconnection requests were determined using the 2014 spring model. Cost Allocated Network Upgrades of peaking units was determined using the 2019 summer peak model. A MUST sensitivity analysis was performed to determine the Distribution Factors (DF), a distribution factor with no contingency that each generation interconnection request had on each new upgrade. The impact each generation interconnection request had on each upgrade project was weighted by the size of each request. Finally the costs due by each request for a particular project were then determined by allocating the portion of each request's impact over the impact of all affecting requests.

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

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

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

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

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

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

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

- Repeat previous for each responsible GI request for each Project

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

Credits for Amounts Advanced for Network Upgrades

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

Required Interconnection Facilities

The requirement to interconnect the 475.1 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 \$29,716,631.00. Interconnection Facilities specific to each generation interconnection request are listed in Appendix E. A preliminary one-line drawing for each generation interconnection request are listed in Appendix D.

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

Power Flow Analysis

Power Flow Analysis Methodology

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

Power Flow Analysis

A power flow analysis was conducted for each Interconnection Customer’s facility using modified versions of the 2014 spring peak, 2014 summer and winter peak, the 2019 summer and winter peak models, and the 2024 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. Certain requests that requested Network Resource Interconnection Service (NRIS) had an additional analysis conducted for displacing resources in the interconnecting Transmission Owner’s balancing authority.

This analysis was conducted assuming that previous queued requests in the immediate area of these interconnect requests were in-service. The analysis of each Customer’s project indicates that criteria violations will occur on the SPS and SUNC transmission systems under system intact and contingency conditions in the peak seasons.

Cluster Group 1 (Woodward Area)

In addition to the 4,084.6 MW of previously queued generation in the area, 0 MW of new interconnection service was studied. No new constraints were found in this area.

Cluster Group 2 (Hitchland Area)

In addition to the 2,662.2 MW of previously queued generation in the area, 0 MW of new interconnection service was studied. No new constraints were found in this area.

Cluster Group 3 (Spearville Area)

In addition to the 3,687.9 MW of previously queued generation in the area, 342.5 MW of new interconnection service was studied. With previously assigned Network Upgrades in service, no new constraints were found in this area.

Cluster Group 4/11 (Mingo/NW Kansas Group)

In addition to the 1,888.10 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 932.6 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 2,280.3 MW of previously queued generation in the area, 91.2 MW of new interconnection service was studied. With previously assigned Network Upgrades in service, no new constraints were found in this area.

Cluster Group 7 (Southwestern Oklahoma)

In addition to the 1,825.2 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 8 (South Central Kansas/North Oklahoma)

In addition to the 1,909.5 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 9/10 (Nebraska)

In addition to the 1,557.9 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)

Group 11 has been merged with Group 4.

Cluster Group 12 (Northwest Arkansas)

In addition to the 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 285.8 MW of previously queued generation in the area, 0 MW of new interconnection service was studied. No new constraints were found in this area.

Cluster Group 14 (South Central Oklahoma)

In addition to the 220.8 MW of previously queued generation in the area, 41.4 MW of new interconnection service was studied. No new ERIS constraints were found in this area.

Cluster Group 15 (reserved)

This group has been retired and all prior Group 15 requests have been re-designated as Group 9/10 requests.

Stability Analysis

A stability analysis was conducted for each Interconnection Customer's facility using modified versions of the 2013 series SPP Model Development Working Group (MDWG) Models 2014 winter, 2015 summer, and 2024 summer peak dynamic models. The stability analysis was conducted with all upgrades in service that were identified in the power flow analysis. For each group, the interconnection requests were studied at 100% nameplate output while the other groups were dispatched at 20% output for wind requests and 100% output for fossil requests. The output of the Interconnection Customer's facility was offset in each model by a reduction in output of existing online SPP generation. The following synopsis is included for each group.

Cluster Group 1 (Woodward Area)

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

Cluster Group 2 (Hitchland Area)

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

Cluster Group 3 (Spearville Area)

The Group 3 stability analysis for this restudy was performed by SPP Staff. Stability analysis has determined that when all previously assigned and currently assigned network upgrades are placed in-service the transmission system will remain stable and low voltage ride through requirements are satisfied for the contingencies studied.

Power Factor analysis was not performed again for this restudy. 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.

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 analysis was not performed again for this restudy.

Cluster Group 7 (Southwest Oklahoma Area)

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

Cluster Group 8 (South Central Kansas/North Oklahoma)

There was no stability analysis conducted in the South Central Kansas/North Oklahoma area due to no requests in the area.

Cluster Group 9/10 (Nebraska)

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

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)

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

Cluster Group 14 (South Central Oklahoma)

The Group 14 stability analysis was not performed again for this restudy.

Conclusion

The minimum cost of interconnecting 475.1 MW of new interconnection requests included in this Definitive Interconnection System Impact Study is estimated at \$29,716,631.00 for the Allocated Network Upgrades and Transmission Owner Interconnection Facilities are listed in Appendix E and F. These costs do not include the cost of upgrades of other transmission facilities listed in Appendix H which are Network Constraints.

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

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

Appendix

A: Generation Interconnection Requests Considered for Impact Study

See next page.

A: Generation Interconnection Requests Considered for Impact Study

Request	Amount	Service	Area	Requested Point of Interconnection	Proposed Point of Interconnection	Requested In-Service Date	In Service Date Delayed Until no earlier than*
ASGI-2012-006	22.50	ER	SUNCMKEC	Tap Hugoton - Rolla 69kV	Tap Hugoton - Rolla 69kV		
GEN-2012-001	61.20	ER	SPS	Tap Grassland - Borden County 230kV	Tap Grassland - Borden County 230kV	11/30/2012	
GEN-2012-004	41.40	ER/NR	OKGE	Pooleville 138kV	Tap Ratliff - Pooleville (Carter County) 138kV	12/31/2013	
GEN-2012-007	120.00	ER/NR	SUNCMKEC	Rubart 115kV	Rubart 115kV	4/1/2014	TBD
GEN-2012-009	15.00	ER	SPS	Mustang 230kV	Mustang 230kV	4/1/2015	
GEN-2012-010	15.00	ER	SPS	Mustang 230kV	Mustang 230kV	4/1/2015	
GEN-2012-011	200.00	ER	SUNCMKEC	Tap Spearville - Post Rock 345kV (GEN-2011-017 Tap)	Tap Spearville - Post Rock 345kV (North of GEN-2011-017 Tap)	11/1/2013	TBD
Total:						475.10	

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

B: Prior Queued Interconnection Requests

See next page.

B: Prior Queued Interconnection Requests

Request	Amount	Area	Requested/Proposed Point of Interconnection	Status or In-Service Date
ASGI-2010-006	150.00	AECI	Tap Fairfax (AECI) - Shilder (AEPW) 138kV	AECI queue Affected Study
ASGI-2010-010	42.20	SPS	Lovington 115kV	Lea County Affected Study
ASGI-2010-020	30.00	SPS	Tap LE-Tatum - LE-Crossroads 69kV	Lea County Affected Study
ASGI-2010-021	15.00	SPS	Tap LE-Saunders Tap - LE-Anderson 69kV	Lea County Affected Study
ASGI-2011-001	28.80	SPS	Lovington 115kV	On-Line
ASGI-2011-002	20.00	SPS	Herring 115kV	On-Line
ASGI-2011-003	10.00	SPS	Hendricks 115kV	On-Line
ASGI-2011-004	20.00	SPS	Pleasant Hill 69kV	Under Study (DISIS-2011-002)
GEN-2001-014	96.00	WFEC	Ft Supply 138kV	On-Line
GEN-2001-026	74.00	WFEC	Washita 138kV	On-Line
GEN-2001-033	180.00	SPS	San Juan Tap 230kV	On-Line at 120MW
GEN-2001-036	80.00	SPS	Norton 115kV	On-Line
GEN-2001-037	100.00	OKGE	FPL Moreland Tap 138kV	On-Line
GEN-2001-039A	105.00	SUNCMKEC	Tap Greensburg - Ft Dodge (Shooting Star Tap) 115kV	On-Line
GEN-2001-039M	100.00	SUNCMKEC	Central Plains Tap 115kV	On-Line
GEN-2002-004	200.00	WERE	Latham 345kV	On-Line at 150MW
GEN-2002-005	120.00	WFEC	Red Hills Tap 138kV	On-Line
GEN-2002-008	240.00	SPS	Hitchland 345kV	On-Line at 120MW
GEN-2002-009	80.00	SPS	Hansford 115kV	On-Line
GEN-2002-022	240.00	SPS	Bushland 230kV	On-Line
GEN-2002-023N	0.80	NPPD	Harmony 115kV	On-Line
GEN-2002-025A	150.00	SUNCMKEC	Spearville 230kV	On-Line
GEN-2003-004	100.00	WFEC	Washita 138kV	On-Line
GEN-2003-005	100.00	WFEC	Anadarko - Paradise (Blue Canyon) 138kV	On-Line
GEN-2003-006A	200.00	SUNCMKEC	Elm Creek 230kV	On-Line
GEN-2003-019	250.00	MIDW	Smoky Hills Tap 230kV	On-Line
GEN-2003-020	160.00	SPS	Martin 115kV	On-Line
GEN-2003-021N	75.00	NPPD	Ainsworth Wind Tap 115kV	On-Line
GEN-2003-022	120.00	AEPW	Washita 138kV	On-Line
GEN-2004-014	154.50	SUNCMKEC	Spearville 230kV	On-Line at 100MW
GEN-2004-020	27.00	AEPW	Washita 34.5kV	On-Line
GEN-2004-023	20.60	WFEC	Washita 138kV	On-Line
GEN-2004-023N	75.00	NPPD	Columbus Co 115kV	On-Line
GEN-2005-003	30.60	WFEC	Washita 138kV	On-Line
GEN-2005-008	120.00	OKGE	Woodward 138kV	On-Line
GEN-2005-012	250.00	SUNCMKEC	Ironwood 345kV	On-Line at 160MW
GEN-2005-013	201.00	WERE	Tap Latham - Neosho (Caney River) 345kV	On-Line
GEN-2006-002	101.00	AEPW	Sweetwater 230kV	On-Line
GEN-2006-006	205.50	SUNCMKEC	Spearville 345kV	On Suspension
GEN-2006-018	170.00	SPS	TUCO Interchange 230kV	On-Line
GEN-2006-020N	42.00	NPPD	Bloomfield 115kV	On-Line
GEN-2006-020S	18.90	SPS	DWS Frisco 115kV	On-Line
GEN-2006-021	101.00	SUNCMKEC	Flat Ridge Tap 138kV	On-Line
GEN-2006-024S	19.80	WFEC	Buffalo Bear Tap 69kV	On-Line
GEN-2006-026	604.00	SPS	Hobbs 230kV & Hobbs 115kV	On-Line
GEN-2006-031	75.00	MIDW	Knoll 115kV	On-Line
GEN-2006-035	225.00	AEPW	Sweetwater 230kV	On-Line at 132MW

Request	Amount	Area	Requested/Proposed Point of Interconnection	Status or In-Service Date
GEN-2006-037N1	75.00	NPPD	Broken Bow 115kV	On Schedule for 2014
GEN-2006-038N005	80.00	NPPD	Broken Bow 115kV	On-Line
GEN-2006-038N019	80.00	NPPD	Petersburg North 115kV	On-Line
GEN-2006-040	108.00	SUNCMKEC	Mingo 115kV	On Suspension
GEN-2006-043	99.00	AEPW	Sweetwater 230kV	On-Line
GEN-2006-044	370.00	SPS	Hitchland 345kV	On-Line at 120MW
GEN-2006-044N	40.50	NPPD	North Petersburg 115kV	On-Line
GEN-2006-046	131.00	OKGE	Dewey 138kV	On-Line
GEN-2006-047	240.00	SPS	Tap Bushland - Deaf Smith (Buffalo) 230kV	On Suspension
GEN-2007-011	135.00	SUNCMKEC	Syracuse 115kV	On Suspension
GEN-2007-011N08	81.00	NPPD	Bloomfield 115kV	On-Line
GEN-2007-021	201.00	OKGE	Tatonga 345kV	On Schedule for 2014
GEN-2007-025	300.00	WERE	Viola 345kV	On-Line
GEN-2007-032	150.00	WFEC	Tap Clinton Junction - Clinton 138kV	On Suspension
GEN-2007-038	200.00	SUNCMKEC	Spearville 345kV	On Schedule for 2015
GEN-2007-040	200.00	SUNCMKEC	Buckner 345kV	On-Line at 132MW
GEN-2007-043	200.00	OKGE	Minco 345kV	On-Line
GEN-2007-044	300.00	OKGE	Tatonga 345kV	On Schedule for 2014
GEN-2007-046	199.50	SPS	Hitchland 115kV	On Schedule for 2015
GEN-2007-050	170.00	OKGE	Woodward EHV 138kV	On-Line at 150MW
GEN-2007-052	150.00	WFEC	Anadarko 138kV	On-Line
GEN-2007-062	765.00	OKGE	Woodward EHV 345kV	On Schedule for 2014
GEN-2008-003	101.00	OKGE	Woodward EHV 138kV	On-Line
GEN-2008-013	300.00	OKGE	Tap Wichita - Woodring (Hunter) 345kV	On-Line at 235MW
GEN-2008-017	300.00	SUNCMKEC	Setab 345kV	On Schedule for 2015
GEN-2008-018	250.00	SPS	Finney 345kV	On-Line
GEN-2008-021	42.00	WERE	Wolf Creek 345kV	On-Line
GEN-2008-022	300.00	SPS	Tap Eddy Co - Tolk (Crossroads) 345kV	On Schedule for 2015
GEN-2008-023	150.00	AEPW	Hobart Junction 138kV	On-Line
GEN-2008-037	101.00	WFEC	Tap Washita - Blue Canyon Wind 138kV	On-Line
GEN-2008-044	197.80	OKGE	Tatonga 345kV	On-Line
GEN-2008-047	300.00	OKGE	Tap Hitchland - Woodward Dbl Ckt (Beaver County) 345kV	On Schedule for 2014
GEN-2008-051	322.00	SPS	Potter County 345kV	On-Line at 161MW
GEN-2008-079	99.20	SUNCMKEC	Tap Cudahy - Ft Dodge 115kV	On-Line
GEN-2008-086N02	200.00	NPPD	Tap Ft Randle - Columbus (Madison County) 230kV	On Schedule for 2014
GEN-2008-088	50.60	SPS	Vega 69kV	On Suspension
GEN-2008-092	201.00	MIDW	Post Rock 230kV	On Schedule for 2014
GEN-2008-098	100.80	WERE	Tap Lacygne - Wolf Creek (Anderson County) 345kV	On Schedule for 2015
GEN-2008-119O	60.00	OPPD	S1399 161kV	On-Line
GEN-2008-123N	89.70	NPPD	Tap Guide Rock - Pauline (Rosemont) 115kV	On Schedule for 2014
GEN-2008-124	200.10	SUNCMKEC	Ironwood 345kV	On Schedule for 2016
GEN-2008-129	80.00	MIPU	Pleasant Hill 161kV	On-Line
GEN-2009-008	199.50	MIDW	South Hays 230kV	On Suspension
GEN-2009-020	48.60	MIDW	Tap Nekoma - Bazine (Walnut Creek) 69kV	On Schedule for 2015
GEN-2009-025	60.00	OKGE	Nardins 69kV	On-Line
GEN-2009-040	108.00	WERE	Marshall 115kV	On Schedule for 2015
GEN-2010-001	300.00	OKGE	Tap Hitchland - Woodward Dbl Ckt (Beaver County) 345kV	On Schedule for 2015
GEN-2010-003	100.80	WERE	Tap Lacygne - Wolf Creek (Anderson County) 345kV	On Schedule for 2015
GEN-2010-005	300.00	WERE	Viola 345kV	On-Line at 170MW

Request	Amount	Area	Requested/Proposed Point of Interconnection	Status or In-Service Date
GEN-2010-006	205.00	SPS	Jones 230kV	On-Line
GEN-2010-009	165.60	SUNCMKEC	Buckner 345kV	On-Line
GEN-2010-011	29.70	OKGE	Tatonga 345kV	On Line
GEN-2010-014	358.80	SPS	Hitchland 345kV	On Schedule for 2016
GEN-2010-015	200.10	SUNCMKEC	Spearville 345kV	On Schedule for 2015
GEN-2010-036	4.60	WERE	6th Street 115kV	On-Line
GEN-2010-040	300.00	OKGE	Cimarron 345kV	On-Line
GEN-2010-041	10.50	OPPD	S 1399 161kV	IA Pending
GEN-2010-045	197.80	SUNCMKEC	Buckner 345kV	On Schedule for 2015
GEN-2010-046	56.00	SPS	TUCO Interchange 230kV	On Schedule for 2016
GEN-2010-048	70.00	MIDW	Tap Beach Station - Redline 115kV	IA Pending
GEN-2010-051	200.00	NPPD	Tap Twin Church - Hoskins 230kV	On Schedule for 2014
GEN-2010-055	4.50	AEPW	Wekiwa 138kV	On-Line
GEN-2010-056	151.20	MIPU	Tap Saint Joseph - Cooper 345kV	On Schedule for 2015
GEN-2010-057	201.00	MIDW	Rice County 230kV	On-Line
GEN-2011-007	250.10	OKGE	Tap Cimarron - Woodring (Mathewson) 345kV	On Schedule for 2015
GEN-2011-008	600.00	SUNCMKEC	Clark County 345kV	On Schedule for 2019
GEN-2011-010	100.80	OKGE	Minco 345kV	On-Line
GEN-2011-011	50.00	KACP	Iatan 345kV	On-Line
GEN-2011-014	201.00	OKGE	Tap Hitchland - Woodward Dbl Ckt (Beaver County) 345kV	IA Pending
GEN-2011-016	200.10	SUNCMKEC	Spearville 345kV	IA Pending
GEN-2011-017	299.00	SUNCMKEC	Tap Spearville - PostRock (GEN-2011-017T) 345kV	On Schedule for 2018
GEN-2011-018	73.60	NPPD	Steele City 115kV	On-Line
GEN-2011-019	299.00	OKGE	Woodward 345kV	On Schedule for 2017
GEN-2011-020	299.00	OKGE	Woodward 345kV	On Schedule for 2017
GEN-2011-022	299.00	SPS	Hitchland 345kV	On Schedule for 2017
GEN-2011-025	82.30	SPS	Tap Floyd County - Crosby County 115kV	On Suspension
GEN-2011-027	120.00	NPPD	Tap Twin Church - Hoskins 230kV (GEN-2010-51 Tap)	On Schedule for 2015
GEN-2011-037	7.00	WFEC	Blue Canyon 5 138kV	On-Line
GEN-2011-040	111.00	OKGE	Tap Ratliff - Pooleville (Carter County) 138kV	On Schedule for 2014
GEN-2011-045	205.00	SPS	Jones 230kV	On-Line
GEN-2011-046	27.00	SPS	Lopez 115kV	On-Line
GEN-2011-048	175.00	SPS	Mustang 230kV	On-Line
GEN-2011-049	250.00	OKGE	Border 345kV	On Suspension
GEN-2011-050	109.80	AEPW	Santa Fe Station 138kV	On Suspension
GEN-2011-051	104.40	OKGE	Tap Woodward - Tatonga 345kV	IA Pending
GEN-2011-054	300.00	OKGE	Cimarron 345kV	On Schedule for 2014
GEN-2011-055	52.80	OPPD	South Sterling 69kV	IA Pending
GEN-2011-056	3.60	NPPD	Jeffrey 115kV	On-Line
GEN-2011-056A	3.60	NPPD	John 1 115kV	On-Line
GEN-2011-056B	4.50	NPPD	John 2 115kV	On-Line
GEN-2011-057	150.40	WERE	Creswell 138kV	On Schedule for 2014
Gray County Wind (Montezuma)	110.00	SUNCMKEC	Gray County Tap 115kV	On-Line
Llano Estacado (White Deer)	80.00	SPS	Llano Wind 115kV	On-Line
NPPD Distributed (Broken Bow)	8.30	NPPD	Broken Bow 115kV	On-Line
NPPD Distributed (Burt County Wind)	12.00	NPPD	Tekamah & Oakland 115kV	On-Line
NPPD Distributed (Burwell)	3.00	NPPD	Ord 115kV	On-Line
NPPD Distributed (Columbus Hydro)	45.00	NPPD	Columbus 115kV	On-Line
NPPD Distributed (Ord)	11.90	NPPD	Ord 115kV	On-Line

Request	Amount	Area	Requested/Proposed Point of Interconnection	Status or In-Service Date
NPPD Distributed (Stuart)	2.10	NPPD	Ainsworth 115kV	On-Line
SPS Distributed (Dumas 19th St)	20.00	SPS	Dumas 19th Street 115kV	On-Line
SPS Distributed (Etter)	20.00	SPS	Etter 115kV	On-Line
SPS Distributed (Hopi)	10.00	SPS	Hopi 115kV	On-Line
SPS Distributed (Jal)	10.00	SPS	S Jal 115kV	On-Line
SPS Distributed (Lea Road)	10.00	SPS	Lea Road 115kV	On-Line
SPS Distributed (Monument)	10.00	SPS	Monument 115kV	On-Line
SPS Distributed (Moore E)	25.00	SPS	Moore East 115kV	On-Line
SPS Distributed (Ocotillo)	10.00	SPS	S_Jal 115kV	On-Line
SPS Distributed (Sherman)	20.00	SPS	Sherman 115kV	On-Line
SPS Distributed (Spearman)	10.00	SPS	Spearman 69kV	On-Line
SPS Distributed (TC-Texas County)	20.00	SPS	Texas County 115kV	On-Line
Total:		21,334.9		

C: Study Groupings

See next page

C. Study Groups

GROUP 1: WOODWARD AREA			
Request	Capacity	Area	Proposed Point of Interconnection
GEN-2001-014	96.00	WFEC	Ft Supply 138kV
GEN-2001-037	100.00	OKGE	FPL Moreland Tap 138kV
GEN-2005-008	120.00	OKGE	Woodward 138kV
GEN-2006-024S	19.80	WFEC	Buffalo Bear Tap 69kV
GEN-2006-046	131.00	OKGE	Dewey 138kV
GEN-2007-021	201.00	OKGE	Tatonga 345kV
GEN-2007-043	200.00	OKGE	Minco 345kV
GEN-2007-044	300.00	OKGE	Tatonga 345kV
GEN-2007-050	170.00	OKGE	Woodward EHV 138kV
GEN-2007-062	765.00	OKGE	Woodward EHV 345kV
GEN-2008-003	101.00	OKGE	Woodward EHV 138kV
GEN-2008-044	197.80	OKGE	Tatonga 345kV
GEN-2010-011	29.70	OKGE	Tatonga 345kV
GEN-2010-040	300.00	OKGE	Cimarron 345kV
GEN-2011-007	250.10	OKGE	Tap Cimarron - Woodring (Mathewson) 345kV
GEN-2011-010	100.80	OKGE	Minco 345kV
GEN-2011-019	299.00	OKGE	Woodward 345kV
GEN-2011-020	299.00	OKGE	Woodward 345kV
GEN-2011-051	104.40	OKGE	Tap Woodward - Tatonga 345kV
GEN-2011-054	300.00	OKGE	Cimarron 345kV
PRIOR QUEUED SUBTOTAL	4,084.60		
AREA TOTAL	4,084.60		

GROUP 2: HITCHLAND AREA			
Request	Capacity	Area	Proposed Point of Interconnection
ASGI-2011-002	20.00	SPS	Herring 115kV
GEN-2002-008	240.00	SPS	Hitchland 345kV
GEN-2002-009	80.00	SPS	Hansford 115kV
GEN-2003-020	160.00	SPS	Martin 115kV
GEN-2006-020S	18.90	SPS	DWS Frisco 115kV
GEN-2006-044	370.00	SPS	Hitchland 345kV
GEN-2007-046	199.50	SPS	Hitchland 115kV
GEN-2008-047	300.00	OKGE	Tap Hitchland - Woodward Dbl Ckt (Beaver County) 345kV
GEN-2010-001	300.00	OKGE	Tap Hitchland - Woodward Dbl Ckt (Beaver County) 345kV
GEN-2010-014	358.80	SPS	Hitchland 345kV
GEN-2011-014	201.00	OKGE	Tap Hitchland - Woodward Dbl Ckt (Beaver County) 345kV
GEN-2011-022	299.00	SPS	Hitchland 345kV
SPS Distributed (Dumas 19th St)	20.00	SPS	Dumas 19th Street 115kV
SPS Distributed (Etter)	20.00	SPS	Etter 115kV
SPS Distributed (Moore E)	25.00	SPS	Moore East 115kV
SPS Distributed (Sherman)	20.00	SPS	Sherman 115kV
SPS Distributed (Spearman)	10.00	SPS	Spearman 69kV
SPS Distributed (TC-Texas County)	20.00	SPS	Texas County 115kV
PRIOR QUEUED SUBTOTAL	2,662.20		
AREA TOTAL	2,662.20		

GROUP 3: SPEARVILLE AREA			
Request	Capacity	Area	Proposed Point of Interconnection
GEN-2001-039A	105.00	SUNCMKEC	Tap Greensburg - Ft Dodge (Shooting Star Tap) 115kV
GEN-2002-025A	150.00	SUNCMKEC	Spearville 230kV
GEN-2004-014	154.50	SUNCMKEC	Spearville 230kV
GEN-2005-012	250.00	SUNCMKEC	Ironwood 345kV
GEN-2006-006	205.50	SUNCMKEC	Spearville 345kV
GEN-2006-021	101.00	SUNCMKEC	Flat Ridge Tap 138kV
GEN-2007-038	200.00	SUNCMKEC	Spearville 345kV
GEN-2007-040	200.00	SUNCMKEC	Buckner 345kV
GEN-2008-018	250.00	SPS	Finney 345kV
GEN-2008-079	99.20	SUNCMKEC	Tap Cudahy - Ft Dodge 115kV
GEN-2008-124	200.10	SUNCMKEC	Ironwood 345kV
GEN-2010-009	165.60	SUNCMKEC	Buckner 345kV
GEN-2010-015	200.10	SUNCMKEC	Spearville 345kV
GEN-2010-045	197.80	SUNCMKEC	Buckner 345kV
GEN-2011-008	600.00	SUNCMKEC	Clark County 345kV
GEN-2011-016	200.10	SUNCMKEC	Spearville 345kV
GEN-2011-017	299.00	SUNCMKEC	Tap Spearville - PostRock (GEN-2011-017T) 345kV
Gray County Wind (Montezuma)	110.00	SUNCMKEC	Gray County Tap 115kV
PRIOR QUEUED SUBTOTAL	3,687.90		
ASGI-2012-006	22.50	SUNCMKEC	Tap Hugoton - Rolla 69kV
GEN-2012-007	120.00	SUNCMKEC	Rubart 115kV
GEN-2012-011	200.00	SUNCMKEC	Tap Spearville - Post Rock 345kV (North of GEN-2011-017 Tap)
CURRENT CLUSTER SUBTOTAL	342.50		
AREA TOTAL	4,030.40		

GROUP 4/11: NW KANSAS AREA

Request	Capacity	Area	Proposed Point of Interconnection
GEN-2001-039M	100.00	SUNCMKEC	Central Plains Tap 115kV
GEN-2003-006A	200.00	SUNCMKEC	Elm Creek 230kV
GEN-2003-019	250.00	MIDW	Smoky Hills Tap 230kV
GEN-2006-031	75.00	MIDW	Knoll 115kV
GEN-2006-040	108.00	SUNCMKEC	Mingo 115kV
GEN-2007-011	135.00	SUNCMKEC	Syracuse 115kV
GEN-2008-017	300.00	SUNCMKEC	Setab 345kV
GEN-2008-092	201.00	MIDW	Post Rock 230kV
GEN-2009-008	199.50	MIDW	South Hays 230kV
GEN-2009-020	48.60	MIDW	Tap Nekoma - Bazine (Walnut Creek) 69kV
GEN-2010-048	70.00	MIDW	Tap Beach Station - Redline 115kV
GEN-2010-057	201.00	MIDW	Rice County 230kV
PRIOR QUEUED SUBTOTAL	1,888.10		
AREA TOTAL	1,888.10		

GROUP 5: AMARILLO AREA

Request	Capacity	Area	Proposed Point of Interconnection
GEN-2002-022	240.00	SPS	Bushland 230kV
GEN-2006-047	240.00	SPS	Tap Bushland - Deaf Smith (Buffalo) 230kV
GEN-2008-051	322.00	SPS	Potter County 345kV
GEN-2008-088	50.60	SPS	Vega 69kV
Llano Estacado (White Deer)	80.00	SPS	Llano Wind 115kV
PRIOR QUEUED SUBTOTAL	932.60		
AREA TOTAL	932.60		

GROUP 6: S-TX PANHANDLE/W-TX AREA

Request	Capacity	Area	Proposed Point of Interconnection
ASGI-2010-010	42.20	SPS	Lovington 115kV
ASGI-2010-020	30.00	SPS	Tap LE-Tatum - LE-Crossroads 69kV
ASGI-2010-021	15.00	SPS	Tap LE-Saunders Tap - LE-Anderson 69kV
ASGI-2011-001	28.80	SPS	Lovington 115kV
ASGI-2011-003	10.00	SPS	Hendricks 115kV
ASGI-2011-004	20.00	SPS	Pleasant Hill 69kV
GEN-2001-033	180.00	SPS	San Juan Tap 230kV
GEN-2001-036	80.00	SPS	Norton 115kV
GEN-2006-018	170.00	SPS	TUCO Interchange 230kV
GEN-2006-026	604.00	SPS	Hobbs 230kV & Hobbs 115kV
GEN-2008-022	300.00	SPS	Tap Eddy Co - Tolk (Crossroads) 345kV
GEN-2010-006	205.00	SPS	Jones 230kV
GEN-2010-046	56.00	SPS	TUCO Interchange 230kV
GEN-2011-025	82.30	SPS	Tap Floyd County - Crosby County 115kV
GEN-2011-045	205.00	SPS	Jones 230kV
GEN-2011-046	27.00	SPS	Lopez 115kV
GEN-2011-048	175.00	SPS	Mustang 230kV
SPS Distributed (Hopi)	10.00	SPS	Hopi 115kV
SPS Distributed (Jal)	10.00	SPS	S Jal 115kV
SPS Distributed (Lea Road)	10.00	SPS	Lea Road 115kV
SPS Distributed (Monument)	10.00	SPS	Monument 115kV
SPS Distributed (Ocotillo)	10.00	SPS	S_Jal 115kV
PRIOR QUEUED SUBTOTAL	2,280.30		
GEN-2012-001	61.20	SPS	Tap Grassland - Borden County 230kV
GEN-2012-009	15.00	SPS	Mustang 230kV
GEN-2012-010	15.00	SPS	Mustang 230kV
CURRENT CLUSTER SUBTOTAL	91.20		
AREA TOTAL	2,371.50		

GROUP 7: SW-OKLAHOMA AREA			
Request	Capacity	Area	Proposed Point of Interconnection
GEN-2001-026	74.00	WFEC	Washita 138kV
GEN-2002-005	120.00	WFEC	Red Hills Tap 138kV
GEN-2003-004	100.00	WFEC	Washita 138kV
GEN-2003-005	100.00	WFEC	Anadarko - Paradise (Blue Canyon) 138kV
GEN-2003-022	120.00	AEPW	Washita 138kV
GEN-2004-020	27.00	AEPW	Washita 34.5kV
GEN-2004-023	20.60	WFEC	Washita 138kV
GEN-2005-003	30.60	WFEC	Washita 138kV
GEN-2006-002	101.00	AEPW	Sweetwater 230kV
GEN-2006-035	225.00	AEPW	Sweetwater 230kV
GEN-2006-043	99.00	AEPW	Sweetwater 230kV
GEN-2007-032	150.00	WFEC	Tap Clinton Junction - Clinton 138kV
GEN-2007-052	150.00	WFEC	Anadarko 138kV
GEN-2008-023	150.00	AEPW	Hobart Junction 138kV
GEN-2008-037	101.00	WFEC	Tap Washita - Blue Canyon Wind 138kV
GEN-2011-037	7.00	WFEC	Blue Canyon 5 138kV
GEN-2011-049	250.00	OKGE	Border 345kV
PRIOR QUEUED SUBTOTAL	1,825.20		
AREA TOTAL	1,825.20		

GROUP 8: N-OK/S-KS AREA			
Request	Capacity	Area	Proposed Point of Interconnection
ASGI-2010-006	150.00	AECI	Tap Fairfax (AECI) - Shilder (AEPW) 138kV
GEN-2002-004	200.00	WERE	Latham 345kV
GEN-2005-013	201.00	WERE	Tap Latham - Neosho (Caney River) 345kV
GEN-2007-025	300.00	WERE	Viola 345kV
GEN-2008-013	300.00	OKGE	Tap Wichita - Woodring (Hunter) 345kV
GEN-2008-021	42.00	WERE	Wolf Creek 345kV
GEN-2008-098	100.80	WERE	Tap Lacygne - Wolf Creek (Anderson County) 345kV
GEN-2009-025	60.00	OKGE	Nardins 69kV
GEN-2010-003	100.80	WERE	Tap Lacygne - Wolf Creek (Anderson County) 345kV
GEN-2010-005	300.00	WERE	Viola 345kV
GEN-2010-055	4.50	AEPW	Wekiwa 138kV
GEN-2011-057	150.40	WERE	Creswell 138kV
PRIOR QUEUED SUBTOTAL	1,909.50		
AREA TOTAL	1,909.50		

GROUP 9/10: NEBRASKA AREA			
Request	Capacity	Area	Proposed Point of Interconnection
GEN-2002-023N	0.80	NPPD	Harmony 115kV
GEN-2003-021N	75.00	NPPD	Ainsworth Wind Tap 115kV
GEN-2004-023N	75.00	NPPD	Columbus Co 115kV
GEN-2006-020N	42.00	NPPD	Bloomfield 115kV
GEN-2006-037N1	75.00	NPPD	Broken Bow 115kV
GEN-2006-038N005	80.00	NPPD	Broken Bow 115kV
GEN-2006-038N019	80.00	NPPD	Petersburg North 115kV
GEN-2006-044N	40.50	NPPD	North Petersburg 115kV
GEN-2007-011N08	81.00	NPPD	Bloomfield 115kV
GEN-2008-086N02	200.00	NPPD	Tap Ft Randle - Columbus (Madison County) 230kV
GEN-2008-119O	60.00	OPPD	S1399 161kV
GEN-2008-123N	89.70	NPPD	Tap Guide Rock - Pauline (Rosemont) 115kV
GEN-2009-040	108.00	WERE	Marshall 115kV
GEN-2010-041	10.50	OPPD	S 1399 161kV
GEN-2010-051	200.00	NPPD	Tap Twin Church - Hoskins 230kV
GEN-2011-018	73.60	NPPD	Steele City 115kV
GEN-2011-027	120.00	NPPD	Tap Twin Church - Hoskins 230kV (GEN-2010-51 Tap)
GEN-2011-055	52.80	OPPD	South Sterling 69kV
GEN-2011-056	3.60	NPPD	Jeffrey 115kV
GEN-2011-056A	3.60	NPPD	John 1 115kV
GEN-2011-056B	4.50	NPPD	John 2 115kV
NPPD Distributed (Broken Bow)	8.30	NPPD	Broken Bow 115kV
NPPD Distributed (Burt County Wind)	12.00	NPPD	Tekamah & Oakland 115kV
NPPD Distributed (Burwell)	3.00	NPPD	Ord 115kV
NPPD Distributed (Columbus Hydro)	45.00	NPPD	Columbus 115kV
NPPD Distributed (Ord)	11.90	NPPD	Ord 115kV
NPPD Distributed (Stuart)	2.10	NPPD	Ainsworth 115kV
PRIOR QUEUED SUBTOTAL	1,557.90		
AREA TOTAL	1,557.90		

GROUP 12: NW-AR AREA

Request	Capacity	Area	Proposed Point of Interconnection
AREA TOTAL	0.00		

GROUP 13: NW MISSOURI AREA

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

GROUP 14: S-OKLAHOMA AREA

Request	Capacity	Area	Proposed Point of Interconnection
GEN-2011-040	111.00	OKGE	Tap Ratliff - Pooleville (Carter County) 138kV
GEN-2011-050	109.80	AEPW	Santa Fe Station 138kV
PRIOR QUEUED SUBTOTAL	220.80		
GEN-2012-004	41.40	OKGE	Tap Ratliff - Pooleville (Carter County) 138kV
CURRENT CLUSTER SUBTOTAL	41.40		
AREA TOTAL	262.20		

CLUSTER TOTAL (CURRENT STUDY)	475.1	MW
PQ TOTAL (PRIOR QUEUED)	21,334.9	MW
CLUSTER TOTAL (INCLUDING PRIOR QUEUED)	21,810.0	MW

D: Proposed Point of Interconnection One line Diagrams

ASGI-2012-006

*****Facility Study one-line by Interconnecting Transmission Owner*****

GEN-2012-001

*****Please refer to the Facility Study for an updated one-line*****

GEN-2012-004

*****Please refer to the Facility Study for an updated one-line*****

GEN-2012-007

*****Please refer to the Facility Study for an updated one-line*****

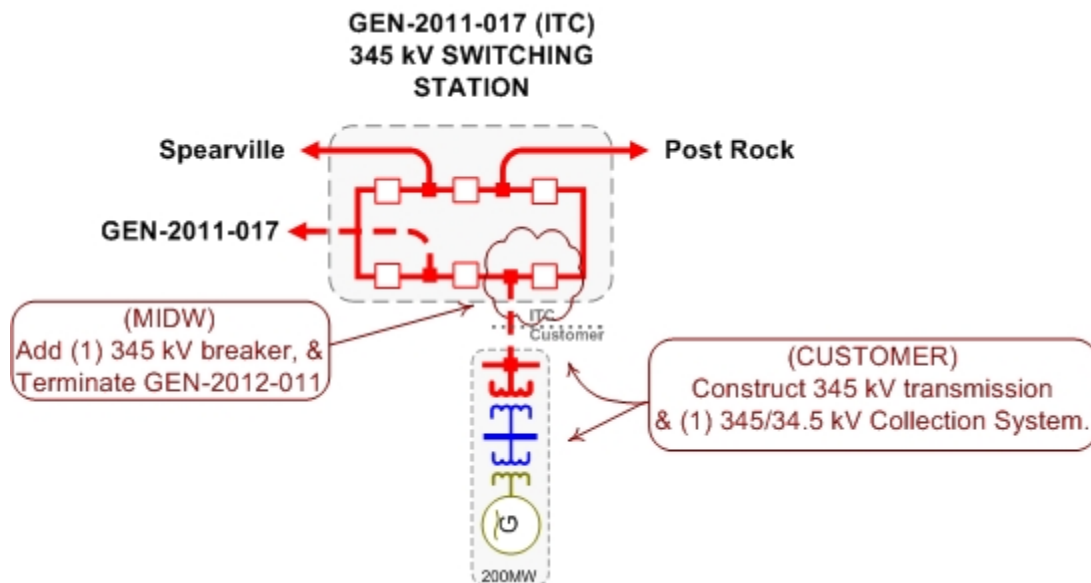
GEN-2012-009

*****Please refer to the Facility Study for an updated one-line*****

GEN-2012-010

*****Please refer to the Facility Study for an updated one-line*****

GEN-2012-011



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.

Appendix E. Cost Allocation Per Request

(Including Previously Allocated Network Upgrades*)

Interconnection Request and Upgrades	Upgrade Type	Allocated Cost	Upgrade Cost
ASGI-2012-006			
ASGI 2012-006 Interconnection Costs See Online Diagram	Current Study	\$100,000.00	\$100,000.00
Beaver County - Buckner 345kV Build approximately 90 miles of 345kV from Beaver County - Gray County @ 3000 amps	Previously Allocated		\$170,209,050.00
Beaver County - Woodward 345kV Dbl CKT Priority Project: Hitchland - Woodward Dbl 345kV CKT (Total Project E&C Cost Shown)	Previously Allocated		\$226,040,727.00
Beaver County 345kV Expansion Beaver County Expansion: Tap & Tie in Hitchland - Woodward 345kV CKT 2	Previously Allocated		\$3,500,000.00
Clark - Thistle 345kV Dbl CKT Priority Project: Spearville - Clark - Thistle Dbl 345kV CKT (Total Project E&C Cost Shown.)	Previously Allocated		\$426,504,292.00
Hitchland - Beaver County 345kV Dbl CKT Priority Project: Hitchland - Woodward Dbl 345kV CKT (Total Project E&C Cost Shown)	Previously Allocated		\$226,040,727.00
Hitchland 345/230kV Autotransformer CKT 2 Priority Project: Hitchland 345/230kV Autotransformer CKT 2 (Total Project E&C Cost Shown).	Previously Allocated		\$8,883,760.00
Spearville - Clark 345kV Dbl CKT Priority Project: Spearville - Clark - Thistle Dbl 345kV CKT (Total Project E&C Cost Shown.)	Previously Allocated		\$426,504,292.00
Thistle - Wichita 345kV Dbl CKT Priority Project: Thistle - Wichita Dbl 345kV CKT (Total Project E&C Cost Shown.)	Previously Allocated		\$426,504,292.00
Woodward XFMR 345/138/13.8kV CKT 2 Balanced Portfolio: Woodward 345/138kV Transformer CKT 2 & 50 MVAR Reactor (Total Project E&C Cost Shown).	Previously Allocated		\$249,247,072.00
	Current Study Total	\$100,000.00	

GEN-2012-001

GEN-2012-001 Interconnection Costs See Online Diagram.	Current Study	\$7,316,677.00	\$7,316,677.00
Beaver County - Woodward 345kV Dbl CKT Priority Project: Hitchland - Woodward Dbl 345kV CKT (Total Project E&C Cost Shown)	Previously Allocated		\$226,040,727.00
Beaver County 345kV Expansion Beaver County Expansion: Tap & Tie in Hitchland - Woodward 345kV CKT 2	Previously Allocated		\$3,500,000.00

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

Interconnection Request and Upgrades	Upgrade Type	Allocated Cost	Upgrade Cost
Border - Tuco Interchange 345KV CKT 1 Balanced Portfolio: Tuco - Woodward 345kV CKT 1 (Total Project E&C Cost Shown)	Previously Allocated		\$249,247,072.00
Border - Woodward 345KV CKT 1 Balanced Portfolio: Tuco - Woodward 345kV CKT 1 (Total Project E&C Cost Shown)	Previously Allocated		\$249,247,072.00
Hitchland - Beaver County 345kV Dbl CKT Priority Project: Hitchland - Woodward Dbl 345kV CKT (Total Project E&C Cost Shown)	Previously Allocated		\$226,040,727.00
Power System Stabilizers (PSS) Install Power System Stabilizers @ Tolk(Units: 1,2) and Jones (Units: 1,2,3,4)	Previously Allocated		\$210,000.00
Thistle - Flat Ridge 138kV CKT 1 Priority Project: Thistle - Flat Ridge 138kV CKT 1 (Total Project E&C Cost Shown.)	Previously Allocated		\$5,776,280.00
Thistle - Wichita 345KV Dbl CKT Priority Project: Thistle - Wichita Dbl 345kV CKT (Total Project E&C Cost Shown.)	Previously Allocated		\$426,504,292.00
Thistle - Woodward 345KV Dbl CKT Priority Project: Thistle - Woodward Dbl 345kV CKT (Total Project E&C Cost Shown)	Previously Allocated		\$207,782,000.00
Thistle 345/138KV Transformer CKT 1 Priority Project: Thistle 345/138kV Transformer CKT 1 (Total Project E&C Cost Shown.)	Previously Allocated		\$6,585,986.00
TUCO Interchange 345/230/13.2KV Autotransformer CKT 2 Balanced Portfolio: TUCO 345/230 kV Transformer CKT 2 (Total Project E&C Cost Shown)	Previously Allocated		\$14,900,907.00
Woodward XFMR 345/138/13.8kV CKT 2 Balanced Portfolio: Woodward 345/138kV Transformer CKT 2 & 50 MVAR Reactor (Total Project E&C Cost Shown).	Previously Allocated		\$249,247,072.00
	Current Study Total	\$7,316,677.00	

GEN-2012-004

GEN-2012-004 Interconnection Costs See Online Diagram.	Current Study	\$0.00	\$0.00
	Current Study Total	\$0.00	

GEN-2012-007

GEN-2012-007 Interconnection Costs See Online Diagram.	Current Study	\$12,299,954.00	\$12,299,954.00
Cleveland - Sooner 345KV CKT 1 Balanced Portfolio: Cleveland - Sooner 345kV CKT 1 (Total Project E&C Cost Shown).	In-Service		\$58,692,000.00
Beaver County - Buckner 345kV Build approximately 90 miles of 345kV from Beaver County - Gray County @ 3000 amps	Previously Allocated		\$170,209,050.00

* 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
Beaver County - Woodward 345kV Dbl CKT Priority Project: Hitchland - Woodward Dbl 345kV CKT (Total Project E&C Cost Shown)	Previously Allocated		\$226,040,727.00
Beaver County 345kV Expansion Beaver County Expansion: Tap & Tie in Hitchland - Woodward 345kV CKT 2	Previously Allocated		\$3,500,000.00
Clark - Thistle 345KV Dbl CKT Priority Project: Spearville - Clark - Thistle Dbl 345kV CKT (Total Project E&C Cost Shown.)	Previously Allocated		\$426,504,292.00
Hitchland - Beaver County 345kV Dbl CKT Priority Project: Hitchland - Woodward Dbl 345kV CKT (Total Project E&C Cost Shown)	Previously Allocated		\$226,040,727.00
Hitchland 345/230kV Autotransformer CKT 2 Priority Project: Hitchland 345/230kV Autotransformer CKT 2 (Total Project E&C Cost Shown).	Previously Allocated		\$8,883,760.00
Spearville - Clark 345KV Dbl CKT Priority Project: Spearville - Clark - Thistle Dbl 345kV CKT (Total Project E&C Cost Shown.)	Previously Allocated		\$426,504,292.00
Thistle - Wichita 345KV Dbl CKT Priority Project: Thistle - Wichita Dbl 345kV CKT (Total Project E&C Cost Shown.)	Previously Allocated		\$426,504,292.00
Woodward XFMR 345/138/13.8kV CKT 2 Balanced Portfolio: Woodward 345/138kV Transformer CKT 2 & 50 MVAR Reactor (Total Project E&C Cost Shown).	Previously Allocated		\$249,247,072.00
	Current Study Total		\$12,299,954.00

GEN-2012-009

GEN-2012-009 Interconnection Costs See Online Diagram.	Current Study	\$0.00	\$0.00
Beaver County - Woodward 345kV Dbl CKT Priority Project: Hitchland - Woodward Dbl 345kV CKT (Total Project E&C Cost Shown)	Previously Allocated		\$226,040,727.00
Beaver County 345kV Expansion Beaver County Expansion: Tap & Tie in Hitchland - Woodward 345kV CKT 2	Previously Allocated		\$3,500,000.00
Border - Tuco Interchange 345KV CKT 1 Balanced Portfolio: Tuco - Woodward 345kV CKT 1 (Total Project E&C Cost Shown)	Previously Allocated		\$249,247,072.00
Border - Woodward 345KV CKT 1 Balanced Portfolio: Tuco - Woodward 345kV CKT 1 (Total Project E&C Cost Shown)	Previously Allocated		\$249,247,072.00
Hitchland - Beaver County 345kV Dbl CKT Priority Project: Hitchland - Woodward Dbl 345kV CKT (Total Project E&C Cost Shown)	Previously Allocated		\$226,040,727.00
Nichols - Harrington Mid 230kV CKT 1 Per GEN-2008-051 LOIS: Rebuild approximately 1 mile of 230kV @ 1825 amps	Previously Allocated		\$869,251.00

* 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
Nichols - Harrington West 230kV CKT 1 Per GEN-2008-051 LOIS: Rebuild approximately 1 mile of 230kV @ 1825 amps	Previously Allocated		\$869,251.00
Power System Stabilizers (PSS) Install Power System Stabilizers @ Tolk(Units: 1,2) and Jones (Units: 1,2,3,4)	Previously Allocated		\$210,000.00
Thistle - Flat Ridge 138kV CKT 1 Priority Project: Thistle - Flat Ridge 138kV CKT 1 (Total Project E&C Cost Shown.)	Previously Allocated		\$5,776,280.00
Thistle - Wichita 345KV Dbl CKT Priority Project: Thistle - Wichita Dbl 345kV CKT (Total Project E&C Cost Shown.)	Previously Allocated		\$426,504,292.00
Thistle - Woodward 345KV Dbl CKT Priority Project: Thistle - Woodward Dbl 345kV CKT (Total Project E&C Cost Shown)	Previously Allocated		\$207,782,000.00
Thistle 345/138KV Transformer CKT 1 Priority Project: Thistle 345/138kV Transformer CKT 1 (Total Project E&C Cost Shown.)	Previously Allocated		\$6,585,986.00
TUCO Interchange 345/230/13.2KV Autotransformer CKT 2 Balanced Portfolio: TUCO 345/230 kV Transformer CKT 2 (Total Project E&C Cost Shown)	Previously Allocated		\$14,900,907.00
Woodward XFMR 345/138/13.8kV CKT 2 Balanced Portfolio: Woodward 345/138kV Transformer CKT 2 & 50 MVAR Reactor (Total Project E&C Cost Shown).	Previously Allocated		\$249,247,072.00
	Current Study Total		\$0.00

GEN-2012-010

GEN-2012-010 Interconnection Costs See Online Diagram.	Current Study	\$0.00	\$0.00
Beaver County - Woodward 345kV Dbl CKT Priority Project: Hitchland - Woodward Dbl 345kV CKT (Total Project E&C Cost Shown)	Previously Allocated		\$226,040,727.00
Beaver County 345kV Expansion Beaver County Expansion: Tap & Tie in Hitchland - Woodward 345kV CKT 2	Previously Allocated		\$3,500,000.00
Border - Tuco Interchange 345KV CKT 1 Balanced Portfolio: Tuco - Woodward 345kV CKT 1 (Total Project E&C Cost Shown)	Previously Allocated		\$249,247,072.00
Border - Woodward 345KV CKT 1 Balanced Portfolio: Tuco - Woodward 345kV CKT 1 (Total Project E&C Cost Shown)	Previously Allocated		\$249,247,072.00
Hitchland - Beaver County 345kV Dbl CKT Priority Project: Hitchland - Woodward Dbl 345kV CKT (Total Project E&C Cost Shown)	Previously Allocated		\$226,040,727.00
Nichols - Harrington Mid 230kV CKT 1 Per GEN-2008-051 LOIS: Rebuild approximately 1 mile of 230kV @ 1825 amps	Previously Allocated		\$869,251.00

* 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
Nichols - Harrington West 230kV CKT 1 Per GEN-2008-051 LOIS: Rebuild approximately 1 mile of 230kV @ 1825 amps	Previously Allocated		\$869,251.00
Power System Stabilizers (PSS) Install Power System Stabilizers @ Tolk(Units: 1,2) and Jones (Units: 1,2,3,4)	Previously Allocated		\$210,000.00
Thistle - Flat Ridge 138kV CKT 1 Priority Project: Thistle - Flat Ridge 138kV CKT 1 (Total Project E&C Cost Shown.)	Previously Allocated		\$5,776,280.00
Thistle - Wichita 345KV Dbl CKT Priority Project: Thistle - Wichita Dbl 345kV CKT (Total Project E&C Cost Shown.)	Previously Allocated		\$426,504,292.00
Thistle - Woodward 345KV Dbl CKT Priority Project: Thistle - Woodward Dbl 345kV CKT (Total Project E&C Cost Shown)	Previously Allocated		\$207,782,000.00
Thistle 345/138KV Transformer CKT 1 Priority Project: Thistle 345/138kV Transformer CKT 1 (Total Project E&C Cost Shown.)	Previously Allocated		\$6,585,986.00
TUCO Interchange 345/230/13.2KV Autotransformer CKT 2 Balanced Portfolio: TUCO 345/230 kV Transformer CKT 2 (Total Project E&C Cost Shown)	Previously Allocated		\$14,900,907.00
Woodward XFMR 345/138/13.8kV CKT 2 Balanced Portfolio: Woodward 345/138kV Transformer CKT 2 & 50 MVAR Reactor (Total Project E&C Cost Shown).	Previously Allocated		\$249,247,072.00
	Current Study Total		\$0.00

GEN-2012-011

GEN-2012-011 Interconnection Costs See Online Diagram.	Current Study	\$10,000,000.00	\$10,000,000.00
Beaver County - Buckner 345kV Build approximately 90 miles of 345kV from Beaver County - Gray County @ 3000 amps	Previously Allocated		\$170,209,050.00
Beaver County - Woodward 345kV Dbl CKT Priority Project: Hitchland - Woodward Dbl 345kV CKT (Total Project E&C Cost Shown)	Previously Allocated		\$226,040,727.00
Beaver County 345kV Expansion Beaver County Expansion: Tap & Tie in Hitchland - Woodward 345kV CKT 2	Previously Allocated		\$3,500,000.00
Border - Tuco Interchange 345KV CKT 1 Balanced Portfolio: Tuco - Woodward 345kV CKT 1 (Total Project E&C Cost Shown)	Previously Allocated		\$249,247,072.00
Border - Woodward 345KV CKT 1 Balanced Portfolio: Tuco - Woodward 345kV CKT 1 (Total Project E&C Cost Shown)	Previously Allocated		\$249,247,072.00
Buckner - Spearville 345kV CKT 1 Replace wave trap and relays at Spearville to get the line rating up.	Previously Allocated		\$771,000.00

* 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
Clark - Thistle 345KV Dbl CKT Priority Project: Spearville - Clark - Thistle Dbl 345kV CKT (Total Project E&C Cost Shown.)	Previously Allocated		\$426,504,292.00
Hitchland - Beaver County 345kV Dbl CKT Priority Project: Hitchland - Woodward Dbl 345kV CKT (Total Project E&C Cost Shown)	Previously Allocated		\$226,040,727.00
Hitchland 345/230kV Autotransformer CKT 2 Priority Project: Hitchland 345/230kV Autotransformer CKT 2 (Total Project E&C Cost Shown).	Previously Allocated		\$8,883,760.00
Spearville - Clark 345KV Dbl CKT Priority Project: Spearville - Clark - Thistle Dbl 345kV CKT (Total Project E&C Cost Shown.)	Previously Allocated		\$426,504,292.00
Thistle - Wichita 345KV Dbl CKT Priority Project: Thistle - Wichita Dbl 345kV CKT (Total Project E&C Cost Shown.)	Previously Allocated		\$426,504,292.00
Thistle - Woodward 345KV Dbl CKT Priority Project: Thistle - Woodward Dbl 345kV CKT (Total Project E&C Cost Shown)	Previously Allocated		\$207,782,000.00
TUCO Interchange 345/230/13.2KV Autotransformer CKT 2 Balanced Portfolio: TUCO 345/230 kV Transformer CKT 2 (Total Project E&C Cost Shown)	Previously Allocated		\$14,900,907.00
Woodward XFMR 345/138/13.8kV CKT 2 Balanced Portfolio: Woodward 345/138kV Transformer CKT 2 & 50 MVAR Reactor (Total Project E&C Cost Shown).	Previously Allocated		\$249,247,072.00
	Current Study Total	\$10,000,000.00	
TOTAL CURRENT STUDY COSTS:			\$29,716,631.00

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

F: Cost Allocation per Proposed Study Network Upgrade

Important Note:

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

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

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

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

Appendix F. Cost Allocation by Upgrade

ASGI-2012-006 Interconnection Costs		\$100,000.00
See Online Diagram		
	ASGI-2012-006	\$100,000.00
	Total Allocated Costs	\$100,000.00
GEN-2012-001 Interconnection Costs		\$7,316,677.00
See Online Diagram.		
	GEN-2012-001	\$7,316,677.00
	Total Allocated Costs	\$7,316,677.00
GEN-2012-004 Interconnection Costs		\$0.00
See Online Diagram.		
	GEN-2012-004	\$0.00
	Total Allocated Costs	\$0.00
GEN-2012-007 Interconnection Costs		\$12,299,954.00
See Online Diagram.		
	GEN-2012-007	\$12,299,954.00
	Total Allocated Costs	\$12,299,954.00
GEN-2012-009 Interconnection Costs		\$0.00
See Online Diagram.		
	GEN-2012-009	\$0.00
	Total Allocated Costs	\$0.00
GEN-2012-010 Interconnection Costs		\$0.00
See Online Diagram.		
	GEN-2012-010	\$0.00
	Total Allocated Costs	\$0.00
GEN-2012-011 Interconnection Costs		\$10,000,000.00
See Online Diagram.		
	GEN-2012-011	\$10,000,000.00
	Total Allocated Costs	\$10,000,000.00

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

G: Power Flow Analysis (Constraints For Mitigation)

See next page.

SOLUTION	GROUP	SCENARIO	SEASON	SOURCE	DIRECTION	MONITORED ELEMENT	RATEB (MVA)	TDF	TC%LOADING (% MVA)	CONTINGENCY
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H: Power Flow Analysis (Other Constraints Not Requiring Mitigation)

See next page.

SOLUTION	GROUP	SCENARIO	SEASON	SOURCE	DIRECTION	MONITORED ELEMENT	RATEB (MVA)	TDF	TC%LOADING (% MVA)	CONTINGENCY
FDNS	00G12_001		0 24SP	G12_001	TO->FROM	ALLEN SUB - LUBBOCK SOUTH INTERCHANGE 115KV CKT 1	160	0.15069	101.878	LUBBOCK SOUTH INTERCHANGE - WOLFFORTH INTERCHANGE 230KV CKT 1
FDNS	00G12_001		0 24SP	G12_001	TO->FROM	ALLEN SUB - LUBBOCK SOUTH INTERCHANGE 115KV CKT 1	160	0.0676	99.7	CARLISLE INTERCHANGE (WH XHS70711) 230/115/13.2KV TRANSFORMER CKT 1
FDNS	00G12_001		0 14SP	G12_001	TO->FROM	BAILEY COUNTY REC-EARTH INTERCHANGE - PLANT X STATION 115KV CKT 1	160	0.04287	103.8649	DEAF SMITH COUNTY INTERCHANGE - PLANT X STATION 230KV CKT 1
FDNS	0		0 14SP	G12_001	TO->FROM	BAILEY COUNTY REC-EARTH INTERCHANGE - PLANT X STATION 115KV CKT 1	160	0.04288	103.8329	DEAF SMITH COUNTY INTERCHANGE - PLANT X STATION 230KV CKT 1
FDNS	00G12_001		0 14SP	G12_001	TO->FROM	BAILEY COUNTY REC-EARTH INTERCHANGE - PLANT X STATION 115KV CKT 1	160	0.04294	102.6863	DEAF SMITH COUNTY INTERCHANGE - PLANT X STATION 230KV CKT 1
FDNS	0		0 14SP	G12_001	TO->FROM	BAILEY COUNTY REC-EARTH INTERCHANGE - PLANT X STATION 115KV CKT 1	160	0.04295	100.9839	DEAF SMITH COUNTY INTERCHANGE - PLANT X STATION 230KV CKT 1
FDNS	3		0 14G	G12_001	TO->FROM	CIRCLE - MULLERGREEN 230KV CKT 1	318.7	0.03322	115.7893	DBL-WICH-THI
FDNS	3		0 14G	G12_001	FROM->TO	CLEARWATER - GILL ENERGY CENTER WEST 138KV CKT 1	191	0.03056	119.736	DBL-WICH-THI
FDNS	3		0 14G	G12_001	TO->FROM	CLEARWATER - MILAN TAP 138KV CKT 1	110	0.03056	220.102	DBL-WICH-THI
FDNS	06ALL		0 14G	G12_001	TO->FROM	CLEARWATER - MILAN TAP 138KV CKT 1	110	0.03079	128.3306	DBL-WICH-THI
FDNS	06G12_001		0 14G	G12_001	TO->FROM	CLEARWATER - MILAN TAP 138KV CKT 1	110	0.03087	122.7227	DBL-WICH-THI
FDNS	6		0 14G	G12_001	TO->FROM	CLEARWATER - MILAN TAP 138KV CKT 1	110	0.03087	122.3279	DBL-WICH-THI
FDNS	14ALL		0 14G	G12_001	TO->FROM	CLEARWATER - MILAN TAP 138KV CKT 1	110	0.0311	102.5902	DBL-WICH-THI
FDNS	14		0 14G	G12_001	TO->FROM	CLEARWATER - MILAN TAP 138KV CKT 1	110	0.03111	102.3618	DBL-WICH-THI
FDNS	03ALL		0 14G	G12_001	FROM->TO	FPL SWITCH - MOORELAND 138KV CKT 1	287	0.04262	103.7315	NORTHWEST - TATONGA7 345.00 345KV CKT 1
FDNS	03ALL		0 14G	G12_001	TO->FROM	FPL SWITCH - WOODWARD 138KV CKT 1	153	0.04262	185.3616	NORTHWEST - TATONGA7 345.00 345KV CKT 1
FDNS	03ALL		0 14G	G12_001	TO->FROM	FPL SWITCH - WOODWARD 138KV CKT 1	153	0.04262	166.8044	G11_051T 345.00 - TATONGA7 345.00 345KV CKT 1
FDNS	03ALL		0 14G	G12_001	TO->FROM	FPL SWITCH - WOODWARD 138KV CKT 1	153	0.04262	165.2064	G11_051T 345.00 - WOODWARD DISTRICT EHV 345KV CKT 1
FDNS	3		0 14G	G12_001	TO->FROM	FPL SWITCH - WOODWARD 138KV CKT 1	153	0.04191	160.725	DBL-WICH-THI
FDNS	3		0 14G	G12_001	TO->FROM	FPL SWITCH - WOODWARD 138KV CKT 1	153	0.04289	152.5387	NORTHWEST - TATONGA7 345.00 345KV CKT 1
FDNS	03ALL		0 14G	G12_001	TO->FROM	FPL SWITCH - WOODWARD 138KV CKT 1	153	0.03185	148.5483	WOODWARD (WOODWRD2) 138/69/13.2KV TRANSFORMER CKT 1
FDNS	03ALL		0 14G	G12_001	TO->FROM	FPL SWITCH - WOODWARD 138KV CKT 1	153	0.03339	145.8035	IODINE - WOODWARD EHV 138KV CKT 1
FDNS	03ALL		0 14G	G12_001	TO->FROM	FPL SWITCH - WOODWARD 138KV CKT 1	153	0.03339	144.0332	DEWEY - IODINE 138KV CKT 1
FDNS	03ALL		0 14G	G12_001	TO->FROM	FPL SWITCH - WOODWARD 138KV CKT 1	153	0.03142	137.0707	THISTLE7 345.00 - WICHITA 345KV CKT 1
FDNS	03ALL		0 14G	G12_001	TO->FROM	FPL SWITCH - WOODWARD 138KV CKT 1	153	0.03142	137.0707	THISTLE7 345.00 - WICHITA 345KV CKT 2
FDNS	03ALL		0 14G	G12_001	TO->FROM	FPL SWITCH - WOODWARD 138KV CKT 1	153	0.03185	134.5966	WOODWARD - WOODWARD 69KV CKT 1
FDNS	03ALL		0 14G	G12_001	TO->FROM	FPL SWITCH - WOODWARD 138KV CKT 1	153	0.04778	134.1227	LAWTON EASTSIDE - OKLAUNION 345KV CKT 1
FDNS	3		0 14G	G12_001	TO->FROM	FPL SWITCH - WOODWARD 138KV CKT 1	153	0.04289	134.0783	G11_051T 345.00 - TATONGA7 345.00 345KV CKT 1
FDNS	3		0 14G	G12_001	TO->FROM	FPL SWITCH - WOODWARD 138KV CKT 1	153	0.04289	132.4352	G11_051T 345.00 - WOODWARD DISTRICT EHV 345KV CKT 1
FDNS	03ALL		0 14G	G12_001	TO->FROM	FPL SWITCH - WOODWARD 138KV CKT 1	153	0.03876	131.7759	SPP-SWPS-03
FDNS	03ALL		0 14G	G12_001	TO->FROM	FPL SWITCH - WOODWARD 138KV CKT 1	153	0.0386	131.3694	ELK CITY 230KV - SWEETWATER 230KV CKT 1
FDNS	03ALL		0 14G	G12_001	TO->FROM	FPL SWITCH - WOODWARD 138KV CKT 1	153	0.0386	131.3685	ELK CITY 230KV (ELKCTY-6) 230/138/13.8KV TRANSFORMER CKT 1
FDNS	03ALL		0 14G	G12_001	TO->FROM	FPL SWITCH - WOODWARD 138KV CKT 1	153	0.0386	130.7509	GRAPEVINE INTERCHANGE - STATELINE INTERCHANGE 230KV CKT 1
FDNS	03ALL		0 14G	G12_001	TO->FROM	FPL SWITCH - WOODWARD 138KV CKT 1	153	0.0386	128.2858	SPP-SWPS-02A
FDNS	03ALL		0 14G	G12_001	TO->FROM	FPL SWITCH - WOODWARD 138KV CKT 1	153	0.03374	128.1444	GRAPEVINE INTERCHANGE - NICHOLS STATION 230KV CKT 1
FDNS	03ALL		0 14G	G12_001	TO->FROM	FPL SWITCH - WOODWARD 138KV CKT 1	153	0.04778	125.281	SPP-AEPW-32
FDNS	3		0 14G	G12_001	TO->FROM	FPL SWITCH - WOODWARD 138KV CKT 1	153	0.03206	123.6658	WOODWARD (WOODWRD2) 138/69/13.2KV TRANSFORMER CKT 1
FDNS	03ALL		0 14G	G12_001	TO->FROM	FPL SWITCH - WOODWARD 138KV CKT 1	153	0.04705	122.9531	SPP-SWPS-01
FDNS	03ALL		0 14G	G12_001	TO->FROM	FPL SWITCH - WOODWARD 138KV CKT 1	153	0.0386	122.8816	STATELINE INTERCHANGE - STLN-DEMARC6 230KV CKT 1
FDNS	03ALL		0 14G	G12_001	TO->FROM	FPL SWITCH - WOODWARD 138KV CKT 1	153	0.0386	122.8715	SPP-SWPS-02
FDNS	03ALL		0 14G	G12_001	TO->FROM	FPL SWITCH - WOODWARD 138KV CKT 1	153	0.0386	122.86	STLN-DEMARC6 - SWEETWATER 230KV CKT 1
FDNS	03ALL		0 14G	G12_001	TO->FROM	FPL SWITCH - WOODWARD 138KV CKT 1	153	0.04778	122.6945	OKLAUNION - TUCO INTERCHANGE 345KV CKT 1
FDNS	3		0 14G	G12_001	TO->FROM	FPL SWITCH - WOODWARD 138KV CKT 1	153	0.0336	119.9212	IODINE - WOODWARD EHV 138KV CKT 1
FDNS	3		0 14G	G12_001	TO->FROM	FPL SWITCH - WOODWARD 138KV CKT 1	153	0.0336	118.1524	DEWEY - IODINE 138KV CKT 1
FDNS	06ALL		0 14G	G12_001	TO->FROM	FPL SWITCH - WOODWARD 138KV CKT 1	153	0.04166	114.2322	NORTHWEST - TATONGA7 345.00 345KV CKT 1
FDNS	03ALL		0 14G	G12_001	TO->FROM	FPL SWITCH - WOODWARD 138KV CKT 1	153	0.0415	113.1203	DBL-THIS-WWR
FDNS	3		0 14G	G12_001	TO->FROM	FPL SWITCH - WOODWARD 138KV CKT 1	153	0.03164	110.2125	THISTLE7 345.00 - WICHITA 345KV CKT 1
FDNS	3		0 14G	G12_001	TO->FROM	FPL SWITCH - WOODWARD 138KV CKT 1	153	0.03164	110.2125	THISTLE7 345.00 - WICHITA 345KV CKT 2
FDNS	3		0 14G	G12_001	TO->FROM	FPL SWITCH - WOODWARD 138KV CKT 1	153	0.03206	109.944	WOODWARD - WOODWARD 69KV CKT 1
FDNS	3		0 14G	G12_001	TO->FROM	FPL SWITCH - WOODWARD 138KV CKT 1	153	0.048	109.8286	LAWTON EASTSIDE - OKLAUNION 345KV CKT 1
FDNS	03ALL		0 14G	G12_001	TO->FROM	FPL SWITCH - WOODWARD 138KV CKT 1	153	0.03065	109.1102	BEAVER CO 345.00 - BUCKNER7 345.00 345KV CKT 1
FDNS	03ALL		0 14G	G12_001	TO->FROM	FPL SWITCH - WOODWARD 138KV CKT 1	153	0.03112	108.3186	MOREWOOD SW - RED HILLS WIND 138KV CKT 1
FDNS	3		0 14G	G12_001	TO->FROM	FPL SWITCH - WOODWARD 138KV CKT 1	153	0.03897	108.1633	SPP-SWPS-03
FDNS	3		0 14G	G12_001	TO->FROM	FPL SWITCH - WOODWARD 138KV CKT 1	153	0.03882	107.8951	ELK CITY 230KV - SWEETWATER 230KV CKT 1
FDNS	3		0 14G	G12_001	TO->FROM	FPL SWITCH - WOODWARD 138KV CKT 1	153	0.03882	107.8935	ELK CITY 230KV (ELKCTY-6) 230/138/13.8KV TRANSFORMER CKT 1
FDNS	06G12_001		0 14G	G12_001	TO->FROM	FPL SWITCH - WOODWARD 138KV CKT 1	153	0.04188	107.5691	NORTHWEST - TATONGA7 345.00 345KV CKT 1
FDNS	3		0 14G	G12_001	TO->FROM	FPL SWITCH - WOODWARD 138KV CKT 1	153	0.03882	107.1995	GRAPEVINE INTERCHANGE - STATELINE INTERCHANGE 230KV CKT 1
FDNS	6		0 14G	G12_001	TO->FROM	FPL SWITCH - WOODWARD 138KV CKT 1	153	0.0419	106.923	NORTHWEST - TATONGA7 345.00 345KV CKT 1
FDNS	06ALL		0 14G	G12_001	TO->FROM	FPL SWITCH - WOODWARD 138KV CKT 1	153	0.04079	106.7613	DBL-WICH-THI
FDNS	3		0 14G	G12_001	TO->FROM	FPL SWITCH - WOODWARD 138KV CKT 1	153	0.03394	105.2547	GRAPEVINE INTERCHANGE - NICHOLS STATION 230KV CKT 1
FDNS	3		0 14G	G12_001	TO->FROM	FPL SWITCH - WOODWARD 138KV CKT 1	153	0.03882	105.087	SPP-SWPS-02A
FDNS	03ALL		0 14G	G12_001	TO->FROM	FPL SWITCH - WOODWARD 138KV CKT 1	153	0.03112	104.3631	ELK CITY - RED HILLS WIND 138KV CKT 1
FDNS	3		0 14G	G12_001	TO->FROM	FPL SWITCH - WOODWARD 138KV CKT 1	153	0.048	101.8991	SPP-AEPW-32
FDNS	06G12_001		0 14G	G12_001	TO->FROM	FPL SWITCH - WOODWARD 138KV CKT 1	153	0.041	99.9	DBL-WICH-THI
FDNS	3		0 14G	G12_001	TO->FROM	FPL SWITCH - WOODWARD 138KV CKT 1	153	0.04727	99.5	SPP-SWPS-01
FDNS	00G12_001		0 14SP	G12_001	FROM->TO	GRASSLAND INTERCHANGE (PENN 0105951) 230/115/13.2KV TRANSFORMER CKT 1	100	0.10891	108.7452	LUBBOCK SOUTH INTERCHANGE (ABB LLM60043) 230/115/13.2KV TRANSFORMER CKT 1

SOLUTION	GROUP	SCENARIO	SEASON	SOURCE	DIRECTION	MONITORED ELEMENT	RATEB (MVA)	TDF	TC%LOADING (% MVA)	CONTINGENCY
FDNS	00G12_001		0 14SP	G12_001	FROM->TO	GRASSLAND INTERCHANGE (PENN 0105951) 230/115/13.2KV TRANSFORMER CKT 1	100	0.10893	107.9314	LUBBOCK SOUTH INTERCHANGE (ABB LLM60043) 230/115/13.2KV TRANSFORMER CKT 1
FDNS	00G12_001		0 14SP	G12_001	FROM->TO	GRASSLAND INTERCHANGE (PENN 0105951) 230/115/13.2KV TRANSFORMER CKT 1	100	0.10891	105.855	LUBBOCK SOUTH INTERCHANGE (ABB LLM60043) 230/115/13.2KV TRANSFORMER CKT 1
FDNS	00G12_001		0 14SP	G12_001	FROM->TO	GRASSLAND INTERCHANGE (PENN 0105951) 230/115/13.2KV TRANSFORMER CKT 1	100	0.10893	105.0451	LUBBOCK SOUTH INTERCHANGE (ABB LLM60043) 230/115/13.2KV TRANSFORMER CKT 1
FDNS	0		0 14SP	G12_001	FROM->TO	GRASSLAND INTERCHANGE (PENN 0105951) 230/115/13.2KV TRANSFORMER CKT 1	100	0.10891	103.1087	LUBBOCK SOUTH INTERCHANGE (ABB LLM60043) 230/115/13.2KV TRANSFORMER CKT 1
FDNS	0		0 14SP	G12_001	FROM->TO	GRASSLAND INTERCHANGE (PENN 0105951) 230/115/13.2KV TRANSFORMER CKT 1	100	0.10893	102.1537	LUBBOCK SOUTH INTERCHANGE (ABB LLM60043) 230/115/13.2KV TRANSFORMER CKT 1
FDNS	0		0 14SP	G12_001	FROM->TO	GRASSLAND INTERCHANGE (PENN 0105951) 230/115/13.2KV TRANSFORMER CKT 1	100	0.10891	100.3282	LUBBOCK SOUTH INTERCHANGE (ABB LLM60043) 230/115/13.2KV TRANSFORMER CKT 1
FDNS	3		0 14G	G12_001	FROM->TO	HARPER - MILAN TAP 138KV CKT 1	110	0.03056	230.5941	DBL-WICH-THI
FDNS	06ALL		0 14G	G12_001	FROM->TO	HARPER - MILAN TAP 138KV CKT 1	110	0.03079	138.9587	DBL-WICH-THI
FDNS	06G12_001		0 14G	G12_001	FROM->TO	HARPER - MILAN TAP 138KV CKT 1	110	0.03087	133.3326	DBL-WICH-THI
FDNS	6		0 14G	G12_001	FROM->TO	HARPER - MILAN TAP 138KV CKT 1	110	0.03087	132.9379	DBL-WICH-THI
FDNS	14ALL		0 14G	G12_001	FROM->TO	HARPER - MILAN TAP 138KV CKT 1	110	0.0311	113.1379	DBL-WICH-THI
FDNS	14		0 14G	G12_001	FROM->TO	HARPER - MILAN TAP 138KV CKT 1	110	0.03111	112.9086	DBL-WICH-THI
FDNS	00G12_001		0 14SP	G12_001	FROM->TO	LUBBOCK SOUTH INTERCHANGE (ABB LLM60043) 230/115/13.2KV TRANSFORMER CKT 1	252	0.0727	113.3426	JONES STATION - LUBBOCK EAST INTERCHANGE 230KV CKT 1
FDNS	00G12_001		0 14SP	G12_001	FROM->TO	LUBBOCK SOUTH INTERCHANGE (ABB LLM60043) 230/115/13.2KV TRANSFORMER CKT 1	252	0.0727	112.8732	JONES STATION - LUBBOCK EAST INTERCHANGE 230KV CKT 1
FDNS	0		0 14SP	G12_001	FROM->TO	LUBBOCK SOUTH INTERCHANGE (ABB LLM60043) 230/115/13.2KV TRANSFORMER CKT 1	252	0.07271	111.8353	JONES STATION - LUBBOCK EAST INTERCHANGE 230KV CKT 1
FDNS	0		0 14SP	G12_001	FROM->TO	LUBBOCK SOUTH INTERCHANGE (ABB LLM60043) 230/115/13.2KV TRANSFORMER CKT 1	252	0.0727	111.7879	JONES STATION - LUBBOCK EAST INTERCHANGE 230KV CKT 1
FDNS	00G12_001		0 14SP	G12_001	FROM->TO	LUBBOCK SOUTH INTERCHANGE (ABB LLM60043) 230/115/13.2KV TRANSFORMER CKT 1	252	0.0727	107.7951	JONES STATION - LUBBOCK EAST INTERCHANGE 230KV CKT 1
FDNS	00G12_001		0 14SP	G12_001	FROM->TO	LUBBOCK SOUTH INTERCHANGE (ABB LLM60043) 230/115/13.2KV TRANSFORMER CKT 1	252	0.0727	107.4625	JONES STATION - LUBBOCK EAST INTERCHANGE 230KV CKT 1
FDNS	0		0 14SP	G12_001	FROM->TO	LUBBOCK SOUTH INTERCHANGE (ABB LLM60043) 230/115/13.2KV TRANSFORMER CKT 1	252	0.0727	106.4084	JONES STATION - LUBBOCK EAST INTERCHANGE 230KV CKT 1
FDNS	0		0 14SP	G12_001	FROM->TO	LUBBOCK SOUTH INTERCHANGE (ABB LLM60043) 230/115/13.2KV TRANSFORMER CKT 1	252	0.07271	106.3539	JONES STATION - LUBBOCK EAST INTERCHANGE 230KV CKT 1
FDNS	00G12_001		0 14SP	G12_001	FROM->TO	LUBBOCK SOUTH INTERCHANGE (ABB LLM60043) 230/115/13.2KV TRANSFORMER CKT 1	252	0.07757	104.6337	LUBBOCK EAST INTERCHANGE (ENRCO 136162) 230/115/13.2KV TRANSFORMER CKT 1
FDNS	0		0 14SP	G12_001	FROM->TO	LUBBOCK SOUTH INTERCHANGE (ABB LLM60043) 230/115/13.2KV TRANSFORMER CKT 1	252	0.07758	103.2725	LUBBOCK EAST INTERCHANGE (ENRCO 136162) 230/115/13.2KV TRANSFORMER CKT 1
FDNS	00G12_001		0 14SP	G12_001	FROM->TO	LUBBOCK SOUTH INTERCHANGE (ABB LLM60043) 230/115/13.2KV TRANSFORMER CKT 1	252	0.07771	102.6633	LUBBOCK EAST INTERCHANGE (ENRCO 136162) 230/115/13.2KV TRANSFORMER CKT 1
FDNS	0		0 14SP	G12_001	FROM->TO	LUBBOCK SOUTH INTERCHANGE (ABB LLM60043) 230/115/13.2KV TRANSFORMER CKT 1	252	0.07772	101.029	LUBBOCK EAST INTERCHANGE (ENRCO 136162) 230/115/13.2KV TRANSFORMER CKT 1
FDNS	00G12_001		0 14SP	G12_001	FROM->TO	LUBBOCK SOUTH INTERCHANGE (ABB LLM60043) 230/115/13.2KV TRANSFORMER CKT 1	252	0.07757	100.4653	LUBBOCK EAST INTERCHANGE (ENRCO 136162) 230/115/13.2KV TRANSFORMER CKT 1
FDNS	03ALL		0 14G	G12_001	TO->FROM	MULLERGREN - SPEARVILLE 230KV CKT 1	398	0.03372	138.7775	G12-011T 345.00 - POST ROCK 345KV CKT 1
FDNS	03ALL		0 14G	G12_001	TO->FROM	MULLERGREN - SPEARVILLE 230KV CKT 1	398	0.03372	123.8352	G11-17T 345.00 - G12-011T 345.00 345KV CKT 1
FDNS	3		0 14G	G12_001	TO->FROM	MULLERGREN - SPEARVILLE 230KV CKT 1	398	0.03441	109.1359	G12-011T 345.00 - POST ROCK 345KV CKT 1
FDNS	03ALL		0 14G	G12_001	TO->FROM	MULLERGREN - SPEARVILLE 230KV CKT 1	398	0.03372	103.0281	G11-17T 345.00 - SPEARVILLE 345KV CKT 1
FNSL-Blown up	03ALL		0 14G	G12_001	-	Non-converged Contingency	-	0.16	-	DBL-WICH-THI
FDNS	0		2 14SP	G12_001	TO->FROM	BAILEY COUNTY REC-EARTH INTERCHANGE - PLANT X STATION 115KV CKT 1	160	0.04288	102.1755	DEAF SMITH COUNTY INTERCHANGE - PLANT X STATION 230KV CKT 1
FDNS	0		2 14SP	G12_001	FROM->TO	GRASSLAND INTERCHANGE (PENN 0105951) 230/115/13.2KV TRANSFORMER CKT 1	100	0.10891	102.969	LUBBOCK SOUTH INTERCHANGE (ABB LLM60043) 230/115/13.2KV TRANSFORMER CKT 1
FDNS	0		2 14SP	G12_001	FROM->TO	GRASSLAND INTERCHANGE (PENN 0105951) 230/115/13.2KV TRANSFORMER CKT 1	100	0.10891	100.195	LUBBOCK SOUTH INTERCHANGE (ABB LLM60043) 230/115/13.2KV TRANSFORMER CKT 1
FDNS	0		2 14SP	G12_001	FROM->TO	LUBBOCK SOUTH INTERCHANGE (ABB LLM60043) 230/115/13.2KV TRANSFORMER CKT 1	252	0.07271	111.4025	JONES STATION - LUBBOCK EAST INTERCHANGE 230KV CKT 1
FDNS	0		2 14SP	G12_001	FROM->TO	LUBBOCK SOUTH INTERCHANGE (ABB LLM60043) 230/115/13.2KV TRANSFORMER CKT 1	252	0.07271	106.0457	JONES STATION - LUBBOCK EAST INTERCHANGE 230KV CKT 1
FDNS	0		2 14SP	G12_001	FROM->TO	LUBBOCK SOUTH INTERCHANGE (ABB LLM60043) 230/115/13.2KV TRANSFORMER CKT 1	252	0.07759	102.8813	LUBBOCK EAST INTERCHANGE (ENRCO 136162) 230/115/13.2KV TRANSFORMER CKT 1
FDNS	0		0 24SP	G12_007	FROM->TO	HITCHLAND INTERCHANGE (H TP80148301) 230/115/13.2KV TRANSFORMER CKT 1	288	0.03052	99.5	OCHILTREE (H TP80219401) 230/115/13.2KV TRANSFORMER CKT 1
FDNS	0		0 24SP	G12_007	FROM->TO	HITCHLAND INTERCHANGE (H TP80148301) 230/115/13.2KV TRANSFORMER CKT 1	288	0.03047	99.5	OCHILTREE (H TP80219401) 230/115/13.2KV TRANSFORMER CKT 1
FDNS	00G12_007		0 24SP	G12_007	FROM->TO	HITCHLAND INTERCHANGE (H TP80148301) 230/115/13.2KV TRANSFORMER CKT 1	288	0.03047	99.5	OCHILTREE (H TP80219401) 230/115/13.2KV TRANSFORMER CKT 1

SOLUTION	GROUP	SCENARIO	SEASON	SOURCE	DIRECTION	MONITORED ELEMENT	RATEB (MVA)	TDF	TC%LOADING (% MVA)	CONTINGENCY
FNSL	00G12_010		0 24SP	G12_010	TO->FROM	PCA INTERCHANGE - REDDY 3115.00 115KV CKT 1	160	0.03856	106.928	CUNNINGHAM STATION - POTASH JUNCTION INTERCHANGE 230KV CKT 1
FNSL	00G12_010		0 24SP	G12_010	TO->FROM	PCA INTERCHANGE - REDDY 3115.00 115KV CKT 1	160	0.03864	104.7266	CUNNINGHAM STATION - POTASH JUNCTION INTERCHANGE 230KV CKT 1
FDNS	0		0 24SP	G12_010	TO->FROM	PCA INTERCHANGE - REDDY 3115.00 115KV CKT 1	160	0.03864	101.7045	CUNNINGHAM STATION - POTASH JUNCTION INTERCHANGE 230KV CKT 1
FDNS	0		0 24SP	G12_010	FROM->TO	YOAKUM COUNTY INTERCHANGE (PENN C010585) 230/115/13.2KV TRANSFORMER CKT 2	150	0.05932	102.2153	YOAKUM COUNTY INTERCHANGE (GE M100899) 230/115/13.2KV TRANSFORMER CKT 1
FDNS	00G12_010		0 24SP	G12_010	FROM->TO	YOAKUM COUNTY INTERCHANGE (PENN C010585) 230/115/13.2KV TRANSFORMER CKT 2	150	0.05932	101.6886	YOAKUM COUNTY INTERCHANGE (GE M100899) 230/115/13.2KV TRANSFORMER CKT 1
FDNS	0		0 24SP	G12_010	FROM->TO	YOAKUM COUNTY INTERCHANGE (PENN C010585) 230/115/13.2KV TRANSFORMER CKT 2	150	0.05934	101.6549	YOAKUM COUNTY INTERCHANGE (GE M100899) 230/115/13.2KV TRANSFORMER CKT 1
FDNS	00G12_010		0 24SP	G12_010	FROM->TO	YOAKUM COUNTY INTERCHANGE (PENN C010585) 230/115/13.2KV TRANSFORMER CKT 2	150	0.05934	101.6549	YOAKUM COUNTY INTERCHANGE (GE M100899) 230/115/13.2KV TRANSFORMER CKT 1
FDNS	0		2 14SP	G12_010	TO->FROM	BAILEY COUNTY REC-EARTH INTERCHANGE - PLANT X STATION 115KV CKT 1	160	0.05613	102.1755	DEAF SMITH COUNTY INTERCHANGE - PLANT X STATION 230KV CKT 1
FDNS	00G12_010		2 14SP	G12_010	TO->FROM	BAILEY COUNTY REC-EARTH INTERCHANGE - PLANT X STATION 115KV CKT 1	160	0.05613	102.1755	DEAF SMITH COUNTY INTERCHANGE - PLANT X STATION 230KV CKT 1
FDNS	0		2 14SP	G12_010	FROM->TO	LUBBOCK SOUTH INTERCHANGE (ABB LLM60043) 230/115/13.2KV TRANSFORMER CKT 1	252	0.03045	102.8813	LUBBOCK EAST INTERCHANGE (ENRCO 136162) 230/115/13.2KV TRANSFORMER CKT 1
FDNS	00G12_010		2 14SP	G12_010	FROM->TO	LUBBOCK SOUTH INTERCHANGE (ABB LLM60043) 230/115/13.2KV TRANSFORMER CKT 1	252	0.03045	102.8813	LUBBOCK EAST INTERCHANGE (ENRCO 136162) 230/115/13.2KV TRANSFORMER CKT 1
FNSL	0		2 24SP	G12_010	TO->FROM	PCA INTERCHANGE - REDDY 3115.00 115KV CKT 1	160	0.03864	104.7266	CUNNINGHAM STATION - POTASH JUNCTION INTERCHANGE 230KV CKT 1
FNSL	0		2 24SP	G12_010	TO->FROM	PCA INTERCHANGE - REDDY 3115.00 115KV CKT 1	160	0.03864	104.7266	CUNNINGHAM STATION - POTASH JUNCTION INTERCHANGE 230KV CKT 1
FDNS	0		2 24SP	G12_010	FROM->TO	YOAKUM COUNTY INTERCHANGE (PENN C010585) 230/115/13.2KV TRANSFORMER CKT 2	150	0.05932	101.6886	YOAKUM COUNTY INTERCHANGE (GE M100899) 230/115/13.2KV TRANSFORMER CKT 1
FDNS	0		2 24SP	G12_010	FROM->TO	YOAKUM COUNTY INTERCHANGE (PENN C010585) 230/115/13.2KV TRANSFORMER CKT 2	150	0.05932	101.6886	YOAKUM COUNTY INTERCHANGE (GE M100899) 230/115/13.2KV TRANSFORMER CKT 1
FDNS	03ALL		0 14G	G12_011	TO->FROM	CHISHOLM - MAIZEE 4 138.00 138KV CKT 1	287	0.04251	103.161	BENTON - WICHITA 345KV CKT 1
FNSL	03G12_011		0 14G	G12_011	TO->FROM	CIRCLE - MULLERGREN 230KV CKT 1	318.7	0.10437	125.4043	DBL-THIS-CLR
FDNS	3		0 14G	G12_011	TO->FROM	CIRCLE - MULLERGREN 230KV CKT 1	318.7	0.10439	123.6393	DBL-THIS-CLR
FDNS	03G12_011		0 14G	G12_011	TO->FROM	CIRCLE - MULLERGREN 230KV CKT 1	318.7	0.09063	117.2374	DBL-WICH-THI
FDNS	03ALL		0 14G	G12_011	TO->FROM	CIRCLE - MULLERGREN 230KV CKT 1	318.7	0.09479	116.9702	SMOKYHL6 230.00 - SUMMIT 230KV CKT 1
FDNS	3		0 14G	G12_011	TO->FROM	CIRCLE - MULLERGREN 230KV CKT 1	318.7	0.09065	115.7893	DBL-WICH-THI
FDNS	03ALL		0 14G	G12_011	TO->FROM	CIRCLE - MULLERGREN 230KV CKT 1	318.7	0.10379	111.4339	DBL-SPRVL-CL
FDNS	03ALL		0 14G	G12_011	TO->FROM	CIRCLE - MULLERGREN 230KV CKT 1	318.7	0.09479	109.4541	KNOLL 230 - SMOKYHL6 230.00 230KV CKT 1
FDNS	03ALL		0 14G	G12_011	TO->FROM	CIRCLE - MULLERGREN 230KV CKT 1	318.7	0.09274	108.8318	AXTELL - POST ROCK 345KV CKT 1
FDNS	03ALL		0 14G	G12_011	TO->FROM	CIRCLE - MULLERGREN 230KV CKT 1	318.7	0.07833	108.4299	CLARKCOUNTY7345.00 - THISTLE7 345.00 345KV CKT 1
FDNS	03ALL		0 14G	G12_011	TO->FROM	CIRCLE - MULLERGREN 230KV CKT 1	318.7	0.07833	108.4299	CLARKCOUNTY7345.00 - THISTLE7 345.00 345KV CKT 2
FDNS	03ALL		0 14G	G12_011	TO->FROM	CIRCLE - MULLERGREN 230KV CKT 1	318.7	0.07554	105.8854	THISTLE7 345.00 - WICHITA 345KV CKT 1
FDNS	03ALL		0 14G	G12_011	TO->FROM	CIRCLE - MULLERGREN 230KV CKT 1	318.7	0.07554	105.8854	THISTLE7 345.00 - WICHITA 345KV CKT 2
FDNS	03ALL		0 14G	G12_011	TO->FROM	CIRCLE - MULLERGREN 230KV CKT 1	318.7	0.07449	105.0891	DBL-BVR-WWRD
FDNS	03G12_011		0 14G	G12_011	TO->FROM	CIRCLE - MULLERGREN 230KV CKT 1	318.7	0.10437	104.3502	DBL-IRON-CLR
FDNS	3		0 14G	G12_011	TO->FROM	CIRCLE - MULLERGREN 230KV CKT 1	318.7	0.10439	102.7209	DBL-IRON-CLR
FDNS	03ALL		0 14G	G12_011	TO->FROM	CIRCLE - MULLERGREN 230KV CKT 1	318.7	0.07599	102.7186	BEAVER CO 345.00 - BUCKNER7 345.00 345KV CKT 1
FDNS	03ALL		0 14G	G12_011	TO->FROM	CIRCLE - MULLERGREN 230KV CKT 1	318.7	0.07471	102.684	ST JOHN - ST JOHN 115KV CKT 1
FDNS	03ALL		0 14G	G12_011	TO->FROM	CIRCLE - MULLERGREN 230KV CKT 1	318.7	0.08362	102.2259	KNOLL 230 - POSTROCK6 230.00 230KV CKT 1
FDNS	03ALL		0 14G	G12_011	TO->FROM	CIRCLE - MULLERGREN 230KV CKT 1	318.7	0.07369	102.1067	NORTHWEST - TATONGA7 345.00 345KV CKT 1
FDNS	03ALL		0 14G	G12_011	TO->FROM	CIRCLE - MULLERGREN 230KV CKT 1	318.7	0.07717	101.2849	SPP-MKEC-06
FDNS	03ALL		0 14G	G12_011	TO->FROM	CIRCLE - MULLERGREN 230KV CKT 1	318.7	0.07716	101.2309	SEWARD - ST JOHN 115KV CKT 1
FDNS	03ALL		0 14G	G12_011	TO->FROM	CIRCLE - MULLERGREN 230KV CKT 1	318.7	0.07369	100	G11_051T 345.00 - TATONGA7 345.00 345KV CKT 1
FDNS	03ALL		0 14G	G12_011	TO->FROM	CIRCLE - MULLERGREN 230KV CKT 1	318.7	0.07369	99.8	G11_051T 345.00 - WOODWARD DISTRICT EHV 345KV CKT 1
FDNS	03ALL		0 14G	G12_011	TO->FROM	CIRCLE - MULLERGREN 230KV CKT 1	318.7	0.07471	99.7	HUNTSVILLE - ST JOHN 115KV CKT 1
FDNS	03ALL		0 14G	G12_011	TO->FROM	CIRCLE - MULLERGREN 230KV CKT 1	318.7	0.07471	99.5	MIDW-CATB05
FDNS	03ALL		0 14G	G12_011	TO->FROM	CIRCLE - MULLERGREN 230KV CKT 1	318.7	0.07178	99.5	MINGO - RED WILLOW 345KV CKT 1
FDNS	03G12_011		0 14G	G12_011	FROM->TO	CLEARWATER - GILL ENERGY CENTER WEST 138KV CKT 1	191	0.03693	120.7941	DBL-WICH-THI
FDNS	3		0 14G	G12_011	FROM->TO	CLEARWATER - GILL ENERGY CENTER WEST 138KV CKT 1	191	0.03694	119.736	DBL-WICH-THI
FDNS	03G12_011		0 14G	G12_011	TO->FROM	CLEARWATER - MILAN TAP 138KV CKT 1	110	0.03693	221.9592	DBL-WICH-THI
FDNS	3		0 14G	G12_011	TO->FROM	CLEARWATER - MILAN TAP 138KV CKT 1	110	0.03694	220.102	DBL-WICH-THI
FDNS	06ALL		0 14G	G12_011	TO->FROM	CLEARWATER - MILAN TAP 138KV CKT 1	110	0.03717	128.3306	DBL-WICH-THI
FDNS	6		0 14G	G12_011	TO->FROM	CLEARWATER - MILAN TAP 138KV CKT 1	110	0.03726	122.3279	DBL-WICH-THI
FDNS	14ALL		0 14G	G12_011	TO->FROM	CLEARWATER - MILAN TAP 138KV CKT 1	110	0.03749	102.5902	DBL-WICH-THI
FDNS	14		0 14G	G12_011	TO->FROM	CLEARWATER - MILAN TAP 138KV CKT 1	110	0.0375	102.3618	DBL-WICH-THI
FDNS	03ALL		0 14G	G12_011	FROM->TO	FPL SWITCH - MOORELAND 138KV CKT 1	287	0.04188	103.7315	NORTHWEST - TATONGA7 345.00 345KV CKT 1
FDNS	03ALL		0 14G	G12_011	TO->FROM	FPL SWITCH - WOODWARD 138KV CKT 1	153	0.04188	185.3616	NORTHWEST - TATONGA7 345.00 345KV CKT 1
FDNS	03ALL		0 14G	G12_011	TO->FROM	FPL SWITCH - WOODWARD 138KV CKT 1	153	0.04188	166.8044	G11_051T 345.00 - TATONGA7 345.00 345KV CKT 1
FDNS	03ALL		0 14G	G12_011	TO->FROM	FPL SWITCH - WOODWARD 138KV CKT 1	153	0.04188	165.2064	G11_051T 345.00 - WOODWARD DISTRICT EHV 345KV CKT 1
FDNS	03G12_011		0 14G	G12_011	TO->FROM	FPL SWITCH - WOODWARD 138KV CKT 1	153	0.0446	162.6813	DBL-WICH-THI
FDNS	3		0 14G	G12_011	TO->FROM	FPL SWITCH - WOODWARD 138KV CKT 1	153	0.04461	160.725	DBL-WICH-THI
FDNS	03G12_011		0 14G	G12_011	TO->FROM	FPL SWITCH - WOODWARD 138KV CKT 1	153	0.04214	153.7395	NORTHWEST - TATONGA7 345.00 345KV CKT 1
FDNS	3		0 14G	G12_011	TO->FROM	FPL SWITCH - WOODWARD 138KV CKT 1	153	0.04215	152.5387	NORTHWEST - TATONGA7 345.00 345KV CKT 1
FDNS	03ALL		0 14G	G12_011	TO->FROM	FPL SWITCH - WOODWARD 138KV CKT 1	153	0.03304	148.5483	WOODWARD (WOODWRD2) 138/69/13.2KV TRANSFORMER CKT 1

SOLUTION	GROUP	SCENARIO	SEASON	SOURCE	DIRECTION	MONITORED ELEMENT	RATEB (MVA)	TDF	TC%LOADING (% MVA)	CONTINGENCY
FDNS	03ALL		0 14G	G12_011	TO->FROM	FPL SWITCH - WOODWARD 138KV CKT 1	153	0.03466	145.8035	IODINE - WOODWARD EHV 138KV CKT 1
FDNS	03ALL		0 14G	G12_011	TO->FROM	FPL SWITCH - WOODWARD 138KV CKT 1	153	0.03466	144.0332	DEWEY - IODINE 138KV CKT 1
FDNS	03ALL		0 14G	G12_011	TO->FROM	FPL SWITCH - WOODWARD 138KV CKT 1	153	0.03292	137.0707	THISTLE7 345.00 - WICHITA 345KV CKT 1
FDNS	03ALL		0 14G	G12_011	TO->FROM	FPL SWITCH - WOODWARD 138KV CKT 1	153	0.03292	137.0707	THISTLE7 345.00 - WICHITA 345KV CKT 2
FDNS	03G12_011		0 14G	G12_011	TO->FROM	FPL SWITCH - WOODWARD 138KV CKT 1	153	0.04214	135.3041	G11_051T 345.00 - TATONGA7 345.00 345KV CKT 1
FDNS	03ALL		0 14G	G12_011	TO->FROM	FPL SWITCH - WOODWARD 138KV CKT 1	153	0.03304	134.5966	WOODWARD - WOODWARD 69KV CKT 1
FDNS	3		0 14G	G12_011	TO->FROM	FPL SWITCH - WOODWARD 138KV CKT 1	153	0.04215	134.0783	G11_051T 345.00 - TATONGA7 345.00 345KV CKT 1
FDNS	03G12_011		0 14G	G12_011	TO->FROM	FPL SWITCH - WOODWARD 138KV CKT 1	153	0.04214	133.6596	G11_051T 345.00 - WOODWARD DISTRICT EHV 345KV CKT 1
FDNS	03ALL		0 14G	G12_011	TO->FROM	FPL SWITCH - WOODWARD 138KV CKT 1	153	0.0397	133.1395	G12-011T 345.00 - POST ROCK 345KV CKT 1
FDNS	3		0 14G	G12_011	TO->FROM	FPL SWITCH - WOODWARD 138KV CKT 1	153	0.04215	132.4352	G11_051T 345.00 - WOODWARD DISTRICT EHV 345KV CKT 1
FDNS	03ALL		0 14G	G12_011	TO->FROM	FPL SWITCH - WOODWARD 138KV CKT 1	153	0.03006	131.7759	SPP-SWPS-03
FDNS	03ALL		0 14G	G12_011	TO->FROM	FPL SWITCH - WOODWARD 138KV CKT 1	153	0.03005	131.3694	ELK CITY 230KV - SWEETWATER 230KV CKT 1
FDNS	03ALL		0 14G	G12_011	TO->FROM	FPL SWITCH - WOODWARD 138KV CKT 1	153	0.03005	131.3685	ELK CITY 230KV (ELKCTY-6) 230/138/13.8KV TRANSFORMER CKT 1
FDNS	03ALL		0 14G	G12_011	TO->FROM	FPL SWITCH - WOODWARD 138KV CKT 1	153	0.03527	131.1787	RENFROW7 345.00 - VIOLA 7 345.00 345KV CKT 1
FDNS	03ALL		0 14G	G12_011	TO->FROM	FPL SWITCH - WOODWARD 138KV CKT 1	153	0.03005	130.7509	GRAPEVINE INTERCHANGE - STATELINE INTERCHANGE 230KV CKT 1
FDNS	03ALL		0 14G	G12_011	TO->FROM	FPL SWITCH - WOODWARD 138KV CKT 1	153	0.03005	128.2858	SPP-SWPS-02A
FDNS	03ALL		0 14G	G12_011	TO->FROM	FPL SWITCH - WOODWARD 138KV CKT 1	153	0.03015	127.8419	RENFROW7 345.00 (BANK 1) 345/138/13.8KV TRANSFORMER CKT 1
FDNS	03ALL		0 14G	G12_011	TO->FROM	FPL SWITCH - WOODWARD 138KV CKT 1	153	0.03265	127.7646	BORDER 7345.00 - TUCO INTERCHANGE 345KV CKT 1
FDNS	03ALL		0 14G	G12_011	TO->FROM	FPL SWITCH - WOODWARD 138KV CKT 1	153	0.03527	126.4793	VIOLA 7 345.00 - WICHITA 345KV CKT 1
FDNS	03ALL		0 14G	G12_011	TO->FROM	FPL SWITCH - WOODWARD 138KV CKT 1	153	0.03192	126.0909	POTTER COUNTY INTERCHANGE (WAUK 90343-A) 345/230/13.2KV TRANSFORMER CKT 1
FDNS	03ALL		0 14G	G12_011	TO->FROM	FPL SWITCH - WOODWARD 138KV CKT 1	153	0.03265	125.6677	BORDER 7345.00 - WOODWARD DISTRICT EHV 345KV CKT 1
FDNS	03G12_011		0 14G	G12_011	TO->FROM	FPL SWITCH - WOODWARD 138KV CKT 1	153	0.03324	124.6095	WOODWARD (WOODWRD2) 138/69/13.2KV TRANSFORMER CKT 1
FDNS	03ALL		0 14G	G12_011	TO->FROM	FPL SWITCH - WOODWARD 138KV CKT 1	153	0.03378	124.5259	AXTELL - POST ROCK 345KV CKT 1
FDNS	03ALL		0 14G	G12_011	TO->FROM	FPL SWITCH - WOODWARD 138KV CKT 1	153	0.03192	124.4152	SPP-SWPS-04
FDNS	03ALL		0 14G	G12_011	TO->FROM	FPL SWITCH - WOODWARD 138KV CKT 1	153	0.03192	124.2984	Hitchland Interchange - POTTER COUNTY INTERCHANGE 345KV CKT 1
FDNS	3		0 14G	G12_011	TO->FROM	FPL SWITCH - WOODWARD 138KV CKT 1	153	0.03325	123.6658	WOODWARD (WOODWRD2) 138/69/13.2KV TRANSFORMER CKT 1
FDNS	03ALL		0 14G	G12_011	TO->FROM	FPL SWITCH - WOODWARD 138KV CKT 1	153	0.03005	122.8816	STATELINE INTERCHANGE - STLN-DEMARC6 230KV CKT 1
FDNS	03ALL		0 14G	G12_011	TO->FROM	FPL SWITCH - WOODWARD 138KV CKT 1	153	0.03005	122.8715	SPP-SWPS-02
FDNS	03ALL		0 14G	G12_011	TO->FROM	FPL SWITCH - WOODWARD 138KV CKT 1	153	0.03005	122.86	STLN-DEMARC6 - SWEETWATER 230KV CKT 1
FDNS	03ALL		0 14G	G12_011	TO->FROM	FPL SWITCH - WOODWARD 138KV CKT 1	153	0.03103	122.3055	BENTON - WICHITA 345KV CKT 1
FDNS	03ALL		0 14G	G12_011	TO->FROM	FPL SWITCH - WOODWARD 138KV CKT 1	153	0.03123	121.4745	SMOKYHL6 230.00 - SUMMIT 230KV CKT 1
FDNS	03ALL		0 14G	G12_011	TO->FROM	FPL SWITCH - WOODWARD 138KV CKT 1	153	0.03069	121.2946	CIRCLE - MULLERGRN 230KV CKT 1
FDNS	03G12_011		0 14G	G12_011	TO->FROM	FPL SWITCH - WOODWARD 138KV CKT 1	153	0.03487	120.9197	IODINE - WOODWARD EHV 138KV CKT 1
FDNS	03ALL		0 14G	G12_011	TO->FROM	FPL SWITCH - WOODWARD 138KV CKT 1	153	0.03044	120.7648	DEWEY - TALOGA 138KV CKT 1
FDNS	03ALL		0 14G	G12_011	TO->FROM	FPL SWITCH - WOODWARD 138KV CKT 1	153	0.03001	120.1317	GRAND ISLAND - SWEETWATER 345KV CKT 1
FDNS	3		0 14G	G12_011	TO->FROM	FPL SWITCH - WOODWARD 138KV CKT 1	153	0.03488	119.9212	IODINE - WOODWARD EHV 138KV CKT 1
FDNS	03ALL		0 14G	G12_011	TO->FROM	FPL SWITCH - WOODWARD 138KV CKT 1	153	0.0301	119.9043	FARGO JCT - WOODWARD 69KV CKT 1
FDNS	03ALL		0 14G	G12_011	TO->FROM	FPL SWITCH - WOODWARD 138KV CKT 1	153	0.03123	119.7025	KNOLL 230 - SMOKYHL6 230.00 230KV CKT 1
FDNS	03ALL		0 14G	G12_011	TO->FROM	FPL SWITCH - WOODWARD 138KV CKT 1	153	0.03196	119.5566	DBL-HTCH-BVR
FDNS	03ALL		0 14G	G12_011	TO->FROM	FPL SWITCH - WOODWARD 138KV CKT 1	153	0.03033	119.4829	AXTELL - PAULINE 345KV CKT 1
FDNS	03ALL		0 14G	G12_011	TO->FROM	FPL SWITCH - WOODWARD 138KV CKT 1	153	0.03005	119.357	HITCHLAND INTERCHANGE - MOORE COUNTY INTERCHANGE 230KV CKT 1
FDNS	03ALL		0 14G	G12_011	TO->FROM	FPL SWITCH - WOODWARD 138KV CKT 1	153	0.0317	119.1971	POST ROCK (POSTROCK T1) 345/230/13.8KV TRANSFORMER CKT 1
FDNS	03G12_011		0 14G	G12_011	TO->FROM	FPL SWITCH - WOODWARD 138KV CKT 1	153	0.03487	119.1506	DEWEY - IODINE 138KV CKT 1
FDNS	03ALL		0 14G	G12_011	TO->FROM	FPL SWITCH - WOODWARD 138KV CKT 1	153	0.0302	119.1243	MOORE - PAULINE 345KV CKT 1
FDNS	03ALL		0 14G	G12_011	TO->FROM	FPL SWITCH - WOODWARD 138KV CKT 1	153	0.03039	119.0966	BENTON - ROSE HILL 345KV CKT 1
FDNS	03ALL		0 14G	G12_011	TO->FROM	FPL SWITCH - WOODWARD 138KV CKT 1	153	0.0301	119.0088	FARGO JCT - FT SUPPLY 69KV CKT 1
FDNS	3		0 14G	G12_011	TO->FROM	FPL SWITCH - WOODWARD 138KV CKT 1	153	0.03488	118.1524	DEWEY - IODINE 138KV CKT 1
FDNS	06ALL		0 14G	G12_011	TO->FROM	FPL SWITCH - WOODWARD 138KV CKT 1	153	0.04092	114.2322	NORTHWEST - TATONGA7 345.00 345KV CKT 1
FDNS	03G12_011		0 14G	G12_011	TO->FROM	FPL SWITCH - WOODWARD 138KV CKT 1	153	0.03314	111.1671	THISTLE7 345.00 - WICHITA 345KV CKT 1
FDNS	03G12_011		0 14G	G12_011	TO->FROM	FPL SWITCH - WOODWARD 138KV CKT 1	153	0.03314	111.1671	THISTLE7 345.00 - WICHITA 345KV CKT 2
FDNS	03G12_011		0 14G	G12_011	TO->FROM	FPL SWITCH - WOODWARD 138KV CKT 1	153	0.03324	110.8581	WOODWARD - WOODWARD 69KV CKT 1
FDNS	3		0 14G	G12_011	TO->FROM	FPL SWITCH - WOODWARD 138KV CKT 1	153	0.03314	110.2125	THISTLE7 345.00 - WICHITA 345KV CKT 1
FDNS	3		0 14G	G12_011	TO->FROM	FPL SWITCH - WOODWARD 138KV CKT 1	153	0.03314	110.2125	THISTLE7 345.00 - WICHITA 345KV CKT 2
FDNS	3		0 14G	G12_011	TO->FROM	FPL SWITCH - WOODWARD 138KV CKT 1	153	0.03325	109.944	WOODWARD - WOODWARD 69KV CKT 1
FDNS	03G12_011		0 14G	G12_011	TO->FROM	FPL SWITCH - WOODWARD 138KV CKT 1	153	0.03027	109.0499	SPP-SWPS-03
FDNS	03G12_011		0 14G	G12_011	TO->FROM	FPL SWITCH - WOODWARD 138KV CKT 1	153	0.03026	108.777	ELK CITY 230KV - SWEETWATER 230KV CKT 1
FDNS	03G12_011		0 14G	G12_011	TO->FROM	FPL SWITCH - WOODWARD 138KV CKT 1	153	0.03026	108.7754	ELK CITY 230KV (ELKCTY-6) 230/138/13.8KV TRANSFORMER CKT 1
FDNS	03G12_011		0 14G	G12_011	TO->FROM	FPL SWITCH - WOODWARD 138KV CKT 1	153	0.03544	108.2448	RENFROW7 345.00 - VIOLA 7 345.00 345KV CKT 1
FDNS	3		0 14G	G12_011	TO->FROM	FPL SWITCH - WOODWARD 138KV CKT 1	153	0.03028	108.1633	SPP-SWPS-03
FDNS	03G12_011		0 14G	G12_011	TO->FROM	FPL SWITCH - WOODWARD 138KV CKT 1	153	0.03026	108.0845	GRAPEVINE INTERCHANGE - STATELINE INTERCHANGE 230KV CKT 1
FDNS	3		0 14G	G12_011	TO->FROM	FPL SWITCH - WOODWARD 138KV CKT 1	153	0.03027	107.8951	ELK CITY 230KV - SWEETWATER 230KV CKT 1
FDNS	3		0 14G	G12_011	TO->FROM	FPL SWITCH - WOODWARD 138KV CKT 1	153	0.03027	107.8935	ELK CITY 230KV (ELKCTY-6) 230/138/13.8KV TRANSFORMER CKT 1
FDNS	03G12_011		0 14G	G12_011	TO->FROM	FPL SWITCH - WOODWARD 138KV CKT 1	153	0.03032	107.4153	RENFROW7 345.00 (BANK 1) 345/138/13.8KV TRANSFORMER CKT 1
FDNS	3		0 14G	G12_011	TO->FROM	FPL SWITCH - WOODWARD 138KV CKT 1	153	0.03545	107.2831	RENFROW7 345.00 - VIOLA 7 345.00 345KV CKT 1
FDNS	3		0 14G	G12_011	TO->FROM	FPL SWITCH - WOODWARD 138KV CKT 1	153	0.03027	107.1995	GRAPEVINE INTERCHANGE - STATELINE INTERCHANGE 230KV CKT 1
FDNS	6		0 14G	G12_011	TO->FROM	FPL SWITCH - WOODWARD 138KV CKT 1	153	0.04116	106.923	NORTHWEST - TATONGA7 345.00 345KV CKT 1

SOLUTION	GROUP	SCENARIO	SEASON	SOURCE	DIRECTION	MONITORED ELEMENT	RATEB (MVA)	TDF	TC%LOADING (% MVA)	CONTINGENCY
FDNS	06ALL	0	14G	G12_011	TO->FROM	FPL SWITCH - WOODWARD 138KV CKT 1	153	0.04349	106.7613	DBL-WICH-THI
FDNS	3	0	14G	G12_011	TO->FROM	FPL SWITCH - WOODWARD 138KV CKT 1	153	0.03032	106.5714	RENFROM7 345.00 (BANK 1) 345/138/13.8KV TRANSFORMER CKT 1
FDNS	03G12_011	0	14G	G12_011	TO->FROM	FPL SWITCH - WOODWARD 138KV CKT 1	153	0.03026	105.9658	SPP-SWPS-02A
FDNS	03G12_011	0	14G	G12_011	TO->FROM	FPL SWITCH - WOODWARD 138KV CKT 1	153	0.0399	105.6592	G12-011T 345.00 - POST ROCK 345KV CKT 1
FDNS	03G12_011	0	14G	G12_011	TO->FROM	FPL SWITCH - WOODWARD 138KV CKT 1	153	0.03281	105.3056	BORDER 7345.00 - TUCO INTERCHANGE 345KV CKT 1
FDNS	3	0	14G	G12_011	TO->FROM	FPL SWITCH - WOODWARD 138KV CKT 1	153	0.03027	105.087	SPP-SWPS-02A
FDNS	3	0	14G	G12_011	TO->FROM	FPL SWITCH - WOODWARD 138KV CKT 1	153	0.0399	104.4902	G12-011T 345.00 - POST ROCK 345KV CKT 1
FDNS	3	0	14G	G12_011	TO->FROM	FPL SWITCH - WOODWARD 138KV CKT 1	153	0.03282	104.3953	BORDER 7345.00 - TUCO INTERCHANGE 345KV CKT 1
FDNS	03G12_011	0	14G	G12_011	TO->FROM	FPL SWITCH - WOODWARD 138KV CKT 1	153	0.0321	103.242	POTTER COUNTY INTERCHANGE (WAUK 90343-A) 345/230/13.2KV TRANSFORMER CKT 1
FDNS	03G12_011	0	14G	G12_011	TO->FROM	FPL SWITCH - WOODWARD 138KV CKT 1	153	0.03281	103.1068	BORDER 7345.00 - WOODWARD DISTRICT EHV 345KV CKT 1
FDNS	03G12_011	0	14G	G12_011	TO->FROM	FPL SWITCH - WOODWARD 138KV CKT 1	153	0.03544	102.9471	VIOLA 7 345.00 - WICHITA 345KV CKT 1
FDNS	3	0	14G	G12_011	TO->FROM	FPL SWITCH - WOODWARD 138KV CKT 1	153	0.0321	102.3271	POTTER COUNTY INTERCHANGE (WAUK 90343-A) 345/230/13.2KV TRANSFORMER CKT 1
FDNS	3	0	14G	G12_011	TO->FROM	FPL SWITCH - WOODWARD 138KV CKT 1	153	0.03282	102.1957	BORDER 7345.00 - WOODWARD DISTRICT EHV 345KV CKT 1
FDNS	3	0	14G	G12_011	TO->FROM	FPL SWITCH - WOODWARD 138KV CKT 1	153	0.03545	101.9839	VIOLA 7 345.00 - WICHITA 345KV CKT 1
FDNS	03G12_011	0	14G	G12_011	TO->FROM	FPL SWITCH - WOODWARD 138KV CKT 1	153	0.0321	101.6119	SPP-SWPS-04
FDNS	03G12_011	0	14G	G12_011	TO->FROM	FPL SWITCH - WOODWARD 138KV CKT 1	153	0.0321	101.5189	Hitchland Interchange - POTTER COUNTY INTERCHANGE 345KV CKT 1
FDNS	03G12_011	0	14G	G12_011	TO->FROM	FPL SWITCH - WOODWARD 138KV CKT 1	153	0.03398	100.9223	AXTELL - POST ROCK 345KV CKT 1
FDNS	3	0	14G	G12_011	TO->FROM	FPL SWITCH - WOODWARD 138KV CKT 1	153	0.0321	100.7464	SPP-SWPS-04
FDNS	3	0	14G	G12_011	TO->FROM	FPL SWITCH - WOODWARD 138KV CKT 1	153	0.0321	100.6058	Hitchland Interchange - POTTER COUNTY INTERCHANGE 345KV CKT 1
FDNS	03G12_011	0	14G	G12_011	TO->FROM	FPL SWITCH - WOODWARD 138KV CKT 1	153	0.03007	100.3938	SPP-SWPS-01
FDNS	03G12_011	0	14G	G12_011	TO->FROM	FPL SWITCH - WOODWARD 138KV CKT 1	153	0.03026	100.1522	STATELINE INTERCHANGE - STLN-DEMARC6 230KV CKT 1
FDNS	03G12_011	0	14G	G12_011	TO->FROM	FPL SWITCH - WOODWARD 138KV CKT 1	153	0.03026	100.1425	SPP-SWPS-02
FDNS	03G12_011	0	14G	G12_011	TO->FROM	FPL SWITCH - WOODWARD 138KV CKT 1	153	0.03026	100.1363	STLN-DEMARC6 - SWEETWATER 230KV CKT 1
FDNS	3	0	14G	G12_011	TO->FROM	FPL SWITCH - WOODWARD 138KV CKT 1	153	0.03398	100	AXTELL - POST ROCK 345KV CKT 1
FDNS	03G12_011	0	14G	G12_011	TO->FROM	FPL SWITCH - WOODWARD 138KV CKT 1	153	0.03011	100	MINGO - RED WILLOW 345KV CKT 1
FDNS	03G12_011	0	14G	G12_011	TO->FROM	FPL SWITCH - WOODWARD 138KV CKT 1	153	0.03122	99.8	BENTON - WICHITA 345KV CKT 1
FDNS	03G12_011	0	14G	G12_011	TO->FROM	FPL SWITCH - WOODWARD 138KV CKT 1	153	0.03004	99.7	CIMARRON - NORTHWEST 345KV CKT 1
FDNS	3	0	14G	G12_011	TO->FROM	FPL SWITCH - WOODWARD 138KV CKT 1	153	0.03008	99.5	SPP-SWPS-01
FDNS	03G12_011	0	14G	G12_011	FROM->TO	HARPER - MILAN TAP 138KV CKT 1	110	0.03693	232.4377	DBL-WICH-THI
FDNS	3	0	14G	G12_011	FROM->TO	HARPER - MILAN TAP 138KV CKT 1	110	0.03694	230.5941	DBL-WICH-THI
FDNS	06ALL	0	14G	G12_011	FROM->TO	HARPER - MILAN TAP 138KV CKT 1	110	0.03717	138.9587	DBL-WICH-THI
FDNS	6	0	14G	G12_011	FROM->TO	HARPER - MILAN TAP 138KV CKT 1	110	0.03726	132.9379	DBL-WICH-THI
FDNS	14ALL	0	14G	G12_011	FROM->TO	HARPER - MILAN TAP 138KV CKT 1	110	0.03749	113.1379	DBL-WICH-THI
FDNS	14	0	14G	G12_011	FROM->TO	HARPER - MILAN TAP 138KV CKT 1	110	0.0375	112.9086	DBL-WICH-THI
FDNS	03ALL	0	14G	G12_011	TO->FROM	HAYS PLANT - SOUTH HAYS 115KV CKT 1	99	0.0652	145.5486	KNOLL 230 - POSTROCK6 230.00 230KV CKT 1
FDNS	03G12_011	0	14G	G12_011	TO->FROM	HAYS PLANT - SOUTH HAYS 115KV CKT 1	99	0.06536	127.2535	KNOLL 230 - POSTROCK6 230.00 230KV CKT 1
FDNS	3	0	14G	G12_011	TO->FROM	HAYS PLANT - SOUTH HAYS 115KV CKT 1	99	0.06536	125.5561	KNOLL 230 - POSTROCK6 230.00 230KV CKT 1
FDNS	03ALL	0	14G	G12_011	FROM->TO	HAYS PLANT - VINE STREET 115KV CKT 1	88	0.0652	140.7137	KNOLL 230 - POSTROCK6 230.00 230KV CKT 1
FDNS	03G12_011	0	14G	G12_011	FROM->TO	HAYS PLANT - VINE STREET 115KV CKT 1	88	0.06536	120.0331	KNOLL 230 - POSTROCK6 230.00 230KV CKT 1
FDNS	3	0	14G	G12_011	FROM->TO	HAYS PLANT - VINE STREET 115KV CKT 1	88	0.06536	118.171	KNOLL 230 - POSTROCK6 230.00 230KV CKT 1
FDNS	03ALL	0	14G	G12_011	TO->FROM	KNOLL - N HAYS3 115.00 115KV CKT 1	88	0.0652	127.4401	KNOLL 230 - POSTROCK6 230.00 230KV CKT 1
FDNS	03G12_011	0	14G	G12_011	TO->FROM	KNOLL - N HAYS3 115.00 115KV CKT 1	88	0.06536	106.3339	KNOLL 230 - POSTROCK6 230.00 230KV CKT 1
FDNS	3	0	14G	G12_011	TO->FROM	KNOLL - N HAYS3 115.00 115KV CKT 1	88	0.06536	104.773	KNOLL 230 - POSTROCK6 230.00 230KV CKT 1
FDNS	03ALL	0	14G	G12_011	TO->FROM	KNOLL 230 - POSTROCK6 230.00 230KV CKT 1	398	0.19617	100	AXTELL - POST ROCK 345KV CKT 1
FDNS	03ALL	0	14G	G12_011	TO->FROM	MULLERGREN - SPEARVILLE 230KV CKT 1	398	0.12531	138.7775	G12-011T 345.00 - POST ROCK 345KV CKT 1
FNLS	03G12_011	0	14G	G12_011	TO->FROM	MULLERGREN - SPEARVILLE 230KV CKT 1	398	0.04248	114.9145	DBL-THIS-CLR
FDNS	3	0	14G	G12_011	TO->FROM	MULLERGREN - SPEARVILLE 230KV CKT 1	398	0.04251	113.9904	DBL-THIS-CLR
FDNS	03G12_011	0	14G	G12_011	TO->FROM	MULLERGREN - SPEARVILLE 230KV CKT 1	398	0.12598	110.605	G12-011T 345.00 - POST ROCK 345KV CKT 1
FDNS	03ALL	0	14G	G12_011	TO->FROM	MULLERGREN - SPEARVILLE 230KV CKT 1	398	0.07697	109.3446	POST ROCK (POSTROCK T1) 345/230/13.8KV TRANSFORMER CKT 1
FDNS	3	0	14G	G12_011	TO->FROM	MULLERGREN - SPEARVILLE 230KV CKT 1	398	0.126	109.1359	G12-011T 345.00 - POST ROCK 345KV CKT 1
FDNS	03ALL	0	14G	G12_011	TO->FROM	MULLERGREN - SPEARVILLE 230KV CKT 1	398	0.04189	102.3365	DBL-SPRVL-CL
FDNS	03ALL	0	14G	G12_011	TO->FROM	N HAYS3 115.00 - VINE STREET 115KV CKT 1	99	0.0652	117.9145	KNOLL 230 - POSTROCK6 230.00 230KV CKT 1
FNLS-Blown up	03ALL	0	14G	G12_011	-	Non-converged Contingency	-	0.28363	-	DBL-IRON-CLR
FNLS-Blown up	03ALL	0	14G	G12_011	-	Non-converged Contingency	-	0.28363	-	DBL-THIS-CLR
FNLS-Blown up	03ALL	0	14G	G12_011	-	Non-converged Contingency	-	0.17883	-	DBL-WICH-THI
FNLS	03G12_011	0	14G	G12_011	FROM->TO	SEWARD - ST JOHN 115KV CKT 1	87.6	0.03206	130.6078	DBL-THIS-CLR
FDNS	3	0	14G	G12_011	FROM->TO	SEWARD - ST JOHN 115KV CKT 1	87.6	0.03206	128.6365	DBL-THIS-CLR
FDNS	03G12_011	0	14G	G12_011	FROM->TO	SEWARD - ST JOHN 115KV CKT 1	87.6	0.03206	102.9758	DBL-IRON-CLR
FDNS	3	0	14G	G12_011	FROM->TO	SEWARD - ST JOHN 115KV CKT 1	87.6	0.03206	101.1892	DBL-IRON-CLR
FNLS	03G12_011	0	14G	G12_011	FROM->TO	SMOKYHL6 230.00 - SUMMIT 230KV CKT 1	330	0.1347	121.9145	DBL-THIS-CLR
FDNS	03ALL	0	14G	G12_011	FROM->TO	SMOKYHL6 230.00 - SUMMIT 230KV CKT 1	330	0.14478	121.6818	AXTELL - POST ROCK 345KV CKT 1
FDNS	3	0	14G	G12_011	FROM->TO	SMOKYHL6 230.00 - SUMMIT 230KV CKT 1	330	0.13472	119.6948	DBL-THIS-CLR
FDNS	03ALL	0	14G	G12_011	FROM->TO	SMOKYHL6 230.00 - SUMMIT 230KV CKT 1	330	0.12027	114.1604	CIRCLE - MULLERGREN 230KV CKT 1
FDNS	03G12_011	0	14G	G12_011	FROM->TO	SMOKYHL6 230.00 - SUMMIT 230KV CKT 1	330	0.12188	113.2079	DBL-WICH-THI
FDNS	3	0	14G	G12_011	FROM->TO	SMOKYHL6 230.00 - SUMMIT 230KV CKT 1	330	0.1219	111.3665	DBL-WICH-THI

SOLUTION	GROUP	SCENARIO	SEASON	SOURCE	DIRECTION	MONITORED ELEMENT	RATEB		TC%LOADING		CONTINGENCY
							(MVA)	TDF	(% MVA)		
FDNS	03ALL	0	14G	G12_011	FROM->TO	SMOKYHL6 230.00 - SUMMIT 230KV CKT 1	330	0.13422	111.1424	DBL-SPRVL-CL	
FDNS	03ALL	0	14G	G12_011	FROM->TO	SMOKYHL6 230.00 - SUMMIT 230KV CKT 1	330	0.11258	108.6356	CLARKCOUNTY7345.00 - THISTLE7	345.00 345KV CKT 1
FDNS	03ALL	0	14G	G12_011	FROM->TO	SMOKYHL6 230.00 - SUMMIT 230KV CKT 1	330	0.11258	108.6356	CLARKCOUNTY7345.00 - THISTLE7	345.00 345KV CKT 2
FDNS	03ALL	0	14G	G12_011	FROM->TO	SMOKYHL6 230.00 - SUMMIT 230KV CKT 1	330	0.10994	105.8481	THISTLE7	345.00 - WICHITA 345KV CKT 1
FDNS	03ALL	0	14G	G12_011	FROM->TO	SMOKYHL6 230.00 - SUMMIT 230KV CKT 1	330	0.10994	105.8481	THISTLE7	345.00 - WICHITA 345KV CKT 2
FDNS	03ALL	0	14G	G12_011	FROM->TO	SMOKYHL6 230.00 - SUMMIT 230KV CKT 1	330	0.10927	105.7485	DBL-BVR-WWRD	
FDNS	03G12_011	0	14G	G12_011	FROM->TO	SMOKYHL6 230.00 - SUMMIT 230KV CKT 1	330	0.1347	105.2171	DBL-IRON-CLR	
FDNS	03ALL	0	14G	G12_011	FROM->TO	SMOKYHL6 230.00 - SUMMIT 230KV CKT 1	330	0.11056	103.745	BEAVER CO	345.00 - BUCKNER7 345.00 345KV CKT 1
FDNS	03ALL	0	14G	G12_011	FROM->TO	SMOKYHL6 230.00 - SUMMIT 230KV CKT 1	330	0.10862	103.3337	NORTHWEST - TATONGA7	345.00 345KV CKT 1
FDNS	3	0	14G	G12_011	FROM->TO	SMOKYHL6 230.00 - SUMMIT 230KV CKT 1	330	0.13472	103.2408	DBL-IRON-CLR	
FDNS	03ALL	0	14G	G12_011	FROM->TO	SMOKYHL6 230.00 - SUMMIT 230KV CKT 1	330	0.10639	102.5384	GEN532652 1-JEFFREY ENERGY CENTER UNIT 2	
FDNS	03ALL	0	14G	G12_011	FROM->TO	SMOKYHL6 230.00 - SUMMIT 230KV CKT 1	330	0.10639	102.5377	GEN532653 1-JEFFREY ENERGY CENTER UNIT 3	
FDNS	03ALL	0	14G	G12_011	FROM->TO	SMOKYHL6 230.00 - SUMMIT 230KV CKT 1	330	0.11151	102.5328	AXTELL - PAULINE 345KV CKT 1	
FDNS	03ALL	0	14G	G12_011	FROM->TO	SMOKYHL6 230.00 - SUMMIT 230KV CKT 1	330	0.10639	102.2811	GEN532651 1-JEFFREY ENERGY CENTER UNIT 1	
FDNS	03ALL	0	14G	G12_011	FROM->TO	SMOKYHL6 230.00 - SUMMIT 230KV CKT 1	330	0.10875	101.8207	GRAND ISLAND - SWEETWATER 345KV CKT 1	
FDNS	03ALL	0	14G	G12_011	FROM->TO	SMOKYHL6 230.00 - SUMMIT 230KV CKT 1	330	0.12738	101.7277	MULLERGREN - SOUTH HAYS 230KV CKT 1	
FDNS	03G12_011	0	14G	G12_011	FROM->TO	SMOKYHL6 230.00 - SUMMIT 230KV CKT 1	330	0.14526	101.5785	AXTELL - POST ROCK 345KV CKT 1	
FDNS	03ALL	0	14G	G12_011	FROM->TO	SMOKYHL6 230.00 - SUMMIT 230KV CKT 1	330	0.10862	101.4921	G11_051T	345.00 - TATONGA7 345.00 345KV CKT 1
FDNS	03ALL	0	14G	G12_011	FROM->TO	SMOKYHL6 230.00 - SUMMIT 230KV CKT 1	330	0.10862	101.3291	G11_051T	345.00 - WOODWARD DISTRICT EHV 345KV CKT 1
FDNS	03ALL	0	14G	G12_011	FROM->TO	SMOKYHL6 230.00 - SUMMIT 230KV CKT 1	330	0.1105	101.3282	MOORE - PAULINE 345KV CKT 1	
FDNS	03ALL	0	14G	G12_011	FROM->TO	SMOKYHL6 230.00 - SUMMIT 230KV CKT 1	330	0.10639	101.3197	GEN532751 1-WOLF CREEK GENERATING STATION UNIT 1	
FDNS	03ALL	0	14G	G12_011	FROM->TO	SMOKYHL6 230.00 - SUMMIT 230KV CKT 1	330	0.10836	100.1016	SPP-SWPS-05	
FDNS	03ALL	0	14G	G12_011	FROM->TO	SMOKYHL6 230.00 - SUMMIT 230KV CKT 1	330	0.10836	100	FINNEY SWITCHING STATION - Hitchland Interchange 345KV CKT 1	
FDNS	03ALL	0	14G	G12_011	FROM->TO	SMOKYHL6 230.00 - SUMMIT 230KV CKT 1	330	0.11504	99.8	BUCKNER7	345.00 - SPEARVILLE 345KV CKT 1
FDNS	03ALL	0	14G	G12_011	FROM->TO	SMOKYHL6 230.00 - SUMMIT 230KV CKT 1	330	0.10854	99.8	CIRCLE - EAST MCPHERSON 230KV CKT 1	
FDNS	3	0	14G	G12_011	FROM->TO	SMOKYHL6 230.00 - SUMMIT 230KV CKT 1	330	0.14527	99.6	AXTELL - POST ROCK 345KV CKT 1	
FDNS	03ALL	0	14G	G12_011	FROM->TO	SMOKYHL6 230.00 - SUMMIT 230KV CKT 1	330	0.1094	99.6	CLARKCOUNTY7345.00 - IRONWOOD7	345.00 345KV CKT 1

I: Power Flow Analysis (Category C Contingencies)

Available on Request.