Definitive Interconnection System Impact Study for Generation Interconnection Requests

(DISIS-2011-002-4)

May 2014 Revised June 2014

Generation Interconnection



Southwest Power Pool, Inc. Revision History

Revision History

Date	Author	Change Description
01/31/2012	SPP	Report Issued (DISIS-2011-002)
06/14/2012	SPP	Account for Withdrawn Projects, Report Re-Posted (DISIS-2011-002-1)
02/01/2013	SPP	Account for Withdrawn Projects, Report Re-Posted (DISIS-2011-002-2)
12/31/2013	SPP	Account for Withdrawn Projects, Report Re-Posted (DISIS-2011-002-3)
01/08/2014	SPP	Report Re-Posted (DISIS-2011-002-3) revised for appendix error
5/23/2014	SPP	Account for Withdrawn Projects, Report Re-Posted (DISIS-2011-002-4)
06/09/2014	SPP	Report Re-Posted (DISIS-2011-002-4) revised for Group 9 error

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 September 30, 2011. The customers will be referred to in this study as the DISIS-2011-002 Interconnection Customers. This System Impact Study analyzes the interconnecting of multiple generation interconnection requests associated with new generation totaling approximately 1,524.1 MW of new generation which would be located within the transmission systems of American Electric Power-West (AEPW), Nebraska Public Power District (NPPD), Oklahoma Gas and Electric (OKGE), Omaha Public Power District (OPPD), Southwestern Public Service (SPS), Westar Energy (WERE) and Western Farmers Electric Cooperative (WFEC). 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. This restudy was performed to account for withdrawals within the DISIS-2011-002 study and/or higher queued projects withdrawing.

Power flow analysis has indicated that for the power flow cases studied, 1,524.1 MW of nameplate generation may be interconnected with transmission system reinforcements within the SPP transmission system. Dynamic stability and power factor analysis has determined the need for reactive compensation in accordance with Order No. 661-A for wind farm interconnection requests and those requirements are listed for each interconnection request within the contents of this report. Dynamic stability analysis has determined that the transmission system will remain stable with the assigned Network Upgrades and necessary reactive compensation requirements.

It should be noted that although this study analyzed many of the most probable contingencies, it is not an all-inclusive list that can account for every operational situation. Additionally, the generator[s] may not be able to inject any power onto the Transmission System due to constraints that fall below the threshold of mitigation for a Generator Interconnection request. Because of this, it is likely that the Customer[s] may be required to reduce their generation output to 0 MW under certain system conditions to allow system operators to maintain the reliability of the transmission network.

The total estimated minimum cost for interconnecting the DISIS-2011-002 interconnection customers is \$49,174,873. These costs are shown in Appendix E and F. Interconnection Service to DISIS-2011-002 interconnection customers is also contingent upon higher queued customers

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.

paying for certain required network upgrades. <u>The in service date for the DISIS customers will be</u> 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 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 September 30, 2011. The customers will be referred to in this study as the DISIS-2011-002 Interconnection Customers. This System Impact Study analyzes the interconnecting of multiple generation interconnection requests associated with new generation totaling 1,524.1 MW of new generation which would be located within the transmission systems of American Electric Power-West (AEPW), Nebraska Public Power District (NPPD), Oklahoma Gas and Electric (OKGE), Omaha Public Power District (OPPD), Southwestern Public Service (SPS), Westar Energy (WERE) and Western Farmers Electric Cooperative (WFEC). 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. This restudy was performed to account for withdrawals within the DISIS-2011-002 study and/or higher queued projects withdrawing.

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.

Definitive Interconnection System Impact Study for Grouped Generation Interconnection Requests – (DISIS-2011-002-4)

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 September 30, 2011 and were subsequently accepted by Southwest Power Pool under the terms of the Generator Interconnection Procedures (GIP) that became effective March 30, 2010. The interconnection requests that are included in this study are listed in Appendix A.

Affected System Interconnection Requests

Also included in this Definitive Impact Study is a single Affected System Study, located on the Golden Spread Electric Cooperative, Inc. (GSEC) system, which shares connections to the SPS system. The Affected System Study Requests has been given the designations: ASGI-2011-004 (20 MW, POI is Pleasant Hill 69kV).

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 redispatched to account for the new generation requests using current dispatch orders.

Dynamic Stability

The 2013 series SPP Model Development Working Group (MDWG) Models 2014 winter, 2015 summer, and 2024 summer were used as starting points for this study.

Base Case Upgrades

The following facilities are part of the SPP Transmission Expansion Plan or the Balanced Portfolio or recently approved Priority Projects. These facilities, have 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-2011-002 Customers have not been assigned acceleration costs for the below listed projects. The DISIS-2011-002 Customers Generation Facilities in service dates may need to be delayed until the completion of the following upgrades. If for some reason, construction

on these projects is discontinued, additional restudies will be needed to determine the interconnection needs of the DISIS Interconnection Customers.

- Hitchland 230/115kV area projects³:
 - Hitchland Ochiltree 230kV Project, (placed in-service 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
 - o latan 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 2012)
 - Tap Stillwell Swissvale 345kV line at West Gardner, (placed in-service 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
 - o Clark Thistle double circuit 345kV, scheduled for 12/31/2014 in-service
 - o Thistle Wichita double circuit 345kV, scheduled for 12/31/2014 in-service
 - o Thistle 345/138kV autotransformer, scheduled for 12/31/2014 in-service
 - o 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
 - o Pratt Medicine Lodge 115kV rebuild, scheduled for 6/15/2014 in-service
 - Medicine Lodge 138/115kV autotransformer replacement (placed in-service in 2013)
- 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 inservice¹⁰

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.

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.

Contingent Upgrades

The following facilities do not yet have approval. These facilities have been assigned to higher queued interconnection customers. These facilities have been included in the models for the DISIS-2011-002 study and are assumed to be in service. This list may not be all inclusive. The DISIS-2011-002 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 gueue. The DISIS-2011-002 Customer Generation Facilities in service dates may need to be delayed until the completion of the following upgrades.

- Upgrades assigned to ICS-2008-001 Interconnection Customers
 - Line Traps at Amarillo South Swisher 230kV
- 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)
 - 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
 - o (NRIS only) Wolfforth 230/115kV transformer circuit #1, rebuild

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 each interconnection request modeled at 100% nameplate.

Peaking units were not dispatched in the 2014 spring model. To study peaking units' impacts, the 2014 summer and winter, 2019 summer and winter, and 2024 summer peak seasonal models were chosen and peaking units were modeled at 100% of the nameplate rating and wind generating facilities were modeled at 10% of the nameplate rating. Each interconnection request was also modeled separately at 100% nameplate for certain analyses.

Dynamic Stability

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

Identification of Network Constraints

The initial set of network constraints were found by using PTI MUST First Contingency Incremental Transfer Capability (FCITC) analysis on the entire cluster grouping dispatched at the various levels mentioned above. These constraints were then screened to determine if any of the generation interconnection requests had at least a 20% Distribution Factor (DF) upon the constraint. Constraints that measured at least a 20% DF from at least one interconnection request were considered for mitigation. Interconnection Requests that 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:

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Request X Impact Factor on Upgrade Project 1 = PTDF(%)(X) * MW(X) = X1
Request Y Impact Factor on Upgrade Project 1 = PTDF(%)(Y) * MW(Y) = Y1
Request Z Impact Factor on Upgrade Project 1 = PTDF(%)(Z) * MW(Z) = Z1
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Determine each request's Allocation of Cost for that particular project:

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

Repeat previous for each responsible GI request for each Project

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

Credits for Amounts Advanced for Network Upgrades

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

Required Interconnection Facilities

The requirement to interconnect the 1,524.1 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 \$49,174,873. 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, and the 2019 summer and winter peak, and 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 NPPD and SPS transmission systems under system intact and contingency conditions in the peak seasons.

Cluster Group 1 (Woodward Area)

In addition to the 3,680.2 MW of previously queued generation in the area, 404.4 MW of new interconnection service was studied. With the withdrawal of higher queued Interconnection Requests, it was determined that the second circuit from Woodward – Tatonga – Mathewson-Cimarron is no longer required as a Previous Network Upgrade in this area. With the other previously assigned Network Upgrades in service (for NRIS), no new constraints were found in this area. The following constraints for NRIS were observed.

Group 1: NRIS Constraints							
MONITORED ELEMENT RATE B TC%LOADING CONTINGENCY (MVA) (% MVA)							
FPL SWITCH - WOODWARD 138KV CKT 1	153	152.1678	NORTHWEST - TATONGA7 345.00 345KV CKT 1				
GLASS MOUNTAIN - MOORELAND 138KV CKT 1	124	102.4095	NORTHWEST - TATONGA7 345.00 345KV CKT 1				
FPL SWITCH - MOORELAND 138KV CKT 1	287	103.0622	NORTHWEST - TATONGA7 345.00 345KV CKT 1				

Cluster Group 2 (Hitchland Area)

In addition to the 2,662.2 MW of previously queued generation in the area, 0.0 MW of new interconnection service was studied. No new constraints were found in this area.

Cluster Group 3 (Spearville Area)

In addition to the 3,687.9 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 4 (NW Kansas Group)

In addition to the 1,888.1 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 1,853.3 MW of previously queued generation in the area, 427.0 MW of new interconnection service was studied. With previously allocated network upgrades to higher queued customers included in the analysis, no new ERIS constraints were found in this area. The replacement of the line traps on Jones – Lubbock South 230kV circuit 2 (in-service) relieved previously seen overloads on the circuit. NRIS analysis was performed and showed an overload on Allen – Lubbock South 115kV for the outage of Lubbock South – Wolfforth 230kV. The Lubbock

South transformer was observed as being overloaded. This transformer is approved to be replaced. The Wolfforth transformer was observed as being overloaded. The Wolfforth transformer is currently assigned to DISIS-2011-001 Interconnection Customers. The Yoakum transformer, which was observed as overloaded, is slated for replacement.

Group 6: NRIS Constraints							
MONITORED ELEMENT RATE B TC%LOADING CONTINGENCY (MVA)							
	160	100.4	LUBBOCK SOUTH INTERCHANGE - WOLFFORTH				
ALLEN SUB - LUBBOCK SOUTH INTERCHANGE 115KV CKT 1			INTERCHANGE 230KV CKT 1				
LUBBOCK SOUTH INTERCHANGE (ABB LLM60043)	252	109.1038	JONES STATION - LUBBOCK EAST INTERCHANGE				
230/115/13.2KV TRANSFORMER CKT 1			230KV CKT 1				
WOLFFORTH INTERCHANGE (WH 7001668)	168	100.1511	CARLISLE INTERCHANGE (WH XHS70711)				
230/115/13.2KV TRANSFORMER CKT 1			230/115/13.2KV TRANSFORMER CKT 1				
YOAKUM COUNTY INTERCHANGE (PENN C010585)	150	100.5986	YOAKUM COUNTY INTERCHANGE (GE M100899)				
230/115/13.2KV TRANSFORMER CKT 2			230/115/13.2KV TRANSFORMER CKT 1				

Cluster Group 7 (Southwestern Oklahoma)

In addition to the 1,568.2 MW of previously queued generation in the area, 257.0 MW of new interconnection service was studied. With the other previously assigned Network Upgrades in service (for NRIS), no new constraints were found in this area.

Cluster Group 8 (South Central Kansas/North Oklahoma)

In addition to the 1,759.1 MW of previously queued generation in the area, 150.4 MW of new interconnection service was studied. No new constraints were found in this area.

Cluster Group 9/10 (Nebraska)

In addition to the 1,459.2 MW of previously queued generation in the area, 64.5 MW of new interconnection service was studied. Outlet issues require mitigation for GEN-2011-055 request in this group. The requirements to interconnect GEN-2011-055 include rebuilding and reconfiguration of the POI substation, as well as, replacement of some additional terminal equipment at other substations. Additionally, for interconnection customers that requested NRIS, a couple of additional upgrades were identified.

Group 9: ERIS Constraints							
MONITORED ELEMENT	RATE B (MVA)	TC%LOADING (% MVA)	CONTINGENCY				
SUB 969 - SUB 974 69KV CKT 1	47	111.9275	SUB 968 - SUB 969 69KV CKT 1				
SUB 968 - SUB 969 69KV CKT 1	47	110.8632	SUB 969 - SUB 974 69KV CKT 1				
SUB 967 - SUB 968 69KV CKT 1	47	102.0333	SUB 969 - SUB 974 69KV CKT 1				

Group 9: NRIS Constraints						
MONITORED ELEMENT RATE B TC%LOADING CONTINGENCY (MVA) (% MVA)						
NEB CITY U SYR SUB - SUB 970 69KV CKT 1	47	104.5341	SUB 963 - SUB 977 69KV CKT 1			
HYDROCARBON TAP - SUB 974 69KV CKT 1	57	101.4337	SUB 963 - SUB 977 69KV CKT 1			

Cluster Group 12 (Northwest Arkansas)

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

Cluster Group 13 (Northwest Missouri)

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

Cluster Group 14 (South Central Oklahoma)

In addition to the 0.0 MW of previously queued generation in the area, 220.8 MW of new interconnection service was studied. No new constraints were found in this area.

Curtailment and System Reliability

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

Stability Analysis

A stability analysis was conducted for each Interconnection Customer'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)

The Group 1 stability analysis for this restudy was performed by SPP Staff. This analysis was performed to evaluate the impacts of the removal of the previously assigned Tatonga-Mathewson-Cimarron 345kV line. 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 requests in Group 1 will meet FERC Order #661A low voltage ride through (LVRT) requirements.

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)

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

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)

The Group 7 stability analysis was not performed again for this restudy.

Cluster Group 8 (South Central Kansas/North Oklahoma)

The Group 8 stability analysis was not performed again for this restudy.

Cluster Group 9/10 (Nebraska)

The Group 9/10 stability analysis was not performed again for this restudy.

Cluster Group 11 (North Central Kansas Area)

There was no stability analysis conducted in the North Central Kansas 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.

Cluster Group 15 (reserved)

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

Conclusion

The minimum cost of interconnecting 1,524.1 MW of new interconnection requests included in this Definitive Interconnection System Impact Study is estimated at \$49,174,873 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

Southwest Power Pool, Inc.	Appendix A: Generation Interconnection Requests Considered For Study								
A: Generation Interconn	ection 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-2011-004	20.00	ER	SPS	Pleasant Hill 69kV	Pleasant Hill 69kV		TBD
GEN-2011-037	7.00	ER	WFEC	Blue Canyon 5 138kV	Blue Canyon 5 138kV	1/1/2012	
GEN-2011-040	111.00	ER/NR	OKGE	Pooleville 138kV	Tap Ratliff - Pooleville (Carter County) 138kV	12/31/2012	
GEN-2011-045	205.00	ER/NR	SPS	Jones 230kV	Jones 230kV	6/1/2013	TBD
GEN-2011-046	27.00	ER/NR	SPS	Tucumcari 115kV	Lopez 115kV	6/1/2013	TBD
GEN-2011-048	175.00	ER/NR	SPS	Mustang 230kV	Mustang 230kV	3/1/2013	TBD
GEN-2011-049	250.00	ER/NR	OKGE	Border 345kV	Border 345kV	12/31/2013	TBD
GEN-2011-050	109.80	ER/NR	AEPW	Tap Rush Springs - Marlow 138kV	Santa Fe Station 138kV	12/31/2013	
GEN-2011-051	104.40	ER/NR	OKGE	Tap Woodward - Tatonga 345kV	Tap Woodward - Tatonga 345kV	12/31/2013	12/31/2014
GEN-2011-054	300.00	ER	OKGE	Cimarron 345kV	Cimarron 345kV	11/30/2013	12/31/2014
GEN-2011-055	52.80	ER/NR	OPPD	South Sterling 69kV	South Sterling 69kV	12/31/2012	TBD
GEN-2011-056	3.60	ER	NPPD	Jeffrey 115kV	Jeffrey 115kV	6/30/2012	
GEN-2011-056A	3.60	ER	NPPD	John Lake 1 115kV	John 1 115kV	6/30/2012	
GEN-2011-056B	4.50	ER	NPPD	John Lake 2 115kV	John 2 115kV	6/30/2012	
GEN-2011-057	150.40	ER	WERE	Creswell 138kV	Creswell 138kV	12/31/2013	

Total: 1,524.10

^{*}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
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	•	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			Spearville 230kV	On-Line
GEN-2003-004	100.00	WFEC	Washita 138kV	On-Line
		WFEC		
GEN-2003-005	100.00	_	Anadarko - Paradise (Blue Canyon) 138kV	On-Line
GEN-2003-006A		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		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-2008-1190	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	73.80	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

Request	Amount	Area	Requested/Proposed Point of Interconnection	Status or In-Service Date
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
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 2017
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	latan 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
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
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

Request	Amount	Area	Requested/Proposed Point of Interconnection	Status or In-Service Date
SPS Distributed (TC-Texas County)	20.00	SPS	Texas County 115kV	On-Line
Tr. 4. 1	40 == 44			

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
PRIOR QUEUED SUBTOTAL	3,680.20		
GEN-2011-051	104.40	OKGE	Tap Woodward - Tatonga 345kV
GEN-2011-054	300.00	OKGE	Cimarron 345kV
CURRENT CLUSTER SUBTOTAL	404.40		
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		
AREA TOTAL	3,687.90		

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 AF	REA	
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
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
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	1,853.30		
ASGI-2011-004	20.00	SPS	Pleasant Hill 69kV
GEN-2011-045	205.00	SPS	Jones 230kV
GEN-2011-046	27.00	SPS	Lopez 115kV
GEN-2011-048	175.00	SPS	Mustang 230kV
CURRENT CLUSTER SUBTOTAL	427.00		
AREA TOTAL	2,280.30		

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
PRIOR QUEUED SUBTOTAL	1,568.20		
GEN-2011-037	7.00	WFEC	Blue Canyon 5 138kV
GEN-2011-049	250.00	OKGE	Border 345kV
CURRENT CLUSTER SUBTOTAL	257.00		
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
PRIOR QUEUED SUBTOTAL	1,759.10		
GEN-2011-057	150.40	WERE	Creswell 138kV
CURRENT CLUSTER SUBTOTAL	150.40		
AREA TOTAL	1,909.50		

GROUP 9/10: NEBRASKA AR	EA		
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	73.80	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)
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	1,459.20		
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
CURRENT CLUSTER SUBTOTAL	64.50		
AREA TOTAL	1,523.70		

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	latan 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	
CURRENT CLUSTER SUBTOTAL	220.80			
AREA TOTAL	220.80			

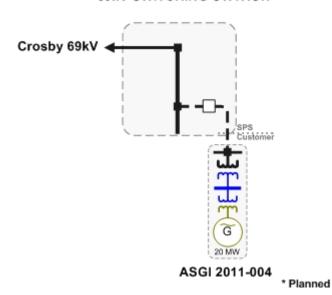
CLUSTER TOTAL (CURRENT STUDY)	1,524.1	MW
PQ TOTAL (PRIOR QUEUED)	19,776.6	MW
CLUSTER TOTAL (INCLUDING PRIOR QUEUED)	21,300.7	MW

D: Proposed Point of Interconnection One line Diagrams

Refer to most recent Facility study for each request for an updated one-line.

ASGI-2011-004

Pleasant Hill 69kV SWITCHING STATION



^ Proposed

GEN-2011-037

Refer to Facility Study for an updated one-line

GEN-2011-040

Refer to Facility Study for an updated one-line

GEN-2011-045

Refer to Facility Study for an updated one-line

GEN-2011-046

Refer to Facility Study for an updated one-line

GEN-2011-048

Refer to Facility Study for an updated one-line

GEN-2011-049

Refer to Facility Study for an updated one-line

GEN-2011-050

Refer to Facility Study for an updated one-line

GEN-2011-051

Refer to Facility Study for an updated one-line

GEN-2011-054

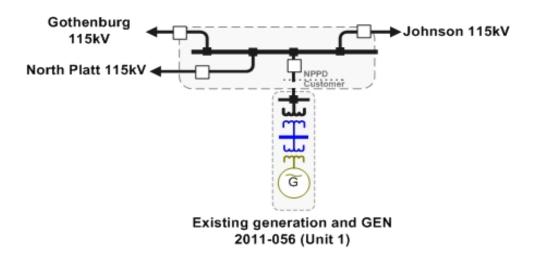
Refer to Facility Study for an updated one-line

GEN-2011-055

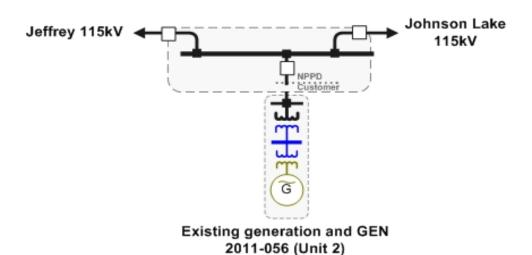
Refer to Facility Study for an updated one-line

GEN-2011-056

Jeffrey (NPPD) 138 kV SWITCHING STATION

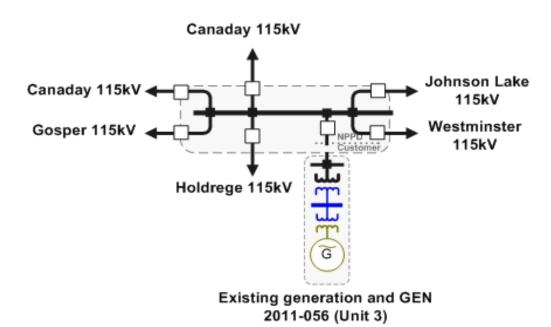


Johnson No. 1 (NPPD) 115 kV SWITCHING STATION



Johnson No. 2 (NPPD) 115 kV SWITCHING

STATION



GEN-2011-057

Refer to Facility Study for an updated one-line

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 U	Jpgrade Type	Allocated Cost	Upgrade Cost	
ASGI-2011-004				
ASGI-2011-004 Interconnection Costs	Current	\$219,400.00	\$219,400.00	
Per SPP Service Agreement Number 2872, Affected Facilities Construction Agreement.	Study			
Power System Stabilizers (PSS)	Current	\$9,836.07	\$210,000.00	
Install Power System Stabilizers @ Tolk(Units: 1,2) and Jones (Units: 1,2,3,4)	Study			
Beaver County - Woodward 345kV Dbl CKT	Previously		\$226,040,727.00	
Priority Project: Hitchland - Woodward Dbl 345kV CKT (Total Project E&C Cost Shown)	Allocated			
Beaver County 345kV Expansion	Previously		\$3,500,000.00	
Beaver County Expansion: Tap & Tie in Hitchland - Woodward 345kV CKT 2	Allocated			
Border - Tuco Interchange 345KV CKT 1	Previously		\$249,247,072.00	
Balanced Portfolio: Tuco - Woodward 345kV CKT 1 (Total Project E&C Cost Shown)	Allocated			
Border - Woodward 345KV CKT 1	Previously		\$249,247,072.00	
Balanced Portfolio: Tuco - Woodward 345kV CKT 1 (Total Project E&C Cost Shown)	Allocated			
Hitchland - Beaver County 345kV Dbl CKT	Previously		\$226,040,727.00	
Priority Project: Hitchland - Woodward Dbl 345kV CKT (Total Project E&C Cost Shown)	Allocated			
Hitchland 345/230kV Autotransformer CKT 2	Previously		\$8,883,760.00	
Priority Project: Hitchland 345/230kV Autotransformer CKT 2 (Total Project E&C Cost Shown). Allocated			
Thistle - Flat Ridge 138kV CKT 1	Previously		\$5,776,280.00	
Priority Project: Thistle - Flat Ridge 138kV CKT 1 (Total Project E&C Cost Shown.)	Allocated			
Thistle - Wichita 345KV Dbl CKT	Previously		\$426,504,292.00	
Priority Project: Thistle - Wichita Dbl 345kV CKT (Total Project E&C Cost Shown.)	Allocated			
Thistle - Woodward 345KV Dbl CKT	Previously		\$207,782,000.00	
Priority Project: Thistle - Woodward Dbl 345kV CKT (Total Project E&C Cost Shown)	Allocated			
Thistle 345/138KV Transformer CKT 1	Previously		\$6,585,986.00	
Priority Project: Thistle 345/138kV Transformer CKT 1 (Total Project E&C Cost Shown.)	Allocated			
TUCO Interchange 345/230/13.2KV Autotransformer CKT 2	Previously		\$14,900,907.00	
Balanced Portfolio: TUCO 345/230 kV Transformer CKT 2 (Total Project E&C Cost Shown)	Allocated			
Woodward XFMR 345/138/13.8kV CKT 2	Previously		\$249,247,072.00	
Balanced Portfolio: Woodward 345/138kV Transformer CKT 2 & 50 MVAR Reactor (Total Pro E&C Cost Shown).	Allocated			
Cu	urrent Study Total	\$229,236.07		

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

GEN-2011-037 Interconnection Coats Sudy Su	Interconnection Request and Upgrades	Upgrade Type	Allocated Cost	Upgrade Cost
Study Previously Allocated Previously Allocated Previously Allocated Sundament Upgrade at Clinton Jot: Per GEN-2007-032 Interconnection Previously Allocated Sundament Upgrade at Clinton Jot: Per GEN-2007-032 Interconnection Previously Allocated Sundament Upgrade at Clinton Jot: Per GEN-2007-032 Interconnection Previously Allocated Sundament Upgrade at Clinton Jot: Per GEN-2007-032 Interconnection Sundament Upgrade at Clinton Jot: Per GEN-2007-032 Interconnection Sundament Upgrade at Clinton Jot: Per GEN-2007-032 Interconnection Previously Allocated Previously Allocated Proficio: Tuco - Woodward 345KV CKT 1 (Total Project E&C Cost Shown) Previously Allocated Proficio: Tuco - Woodward 345KV CKT 1 (Total Project E&C Cost Shown) Previously Allocated Proficio: Tuco - Woodward 345KV CKT (Total Project E&C Cost Shown) Previously Allocated Proficio: Tuco - Woodward 345KV CKT (Total Project E&C Cost Shown) Previously Allocated Proficio: Tuco - Woodward 345KV CKT (Total Project E&C Cost Shown) Previously Allocated Proficio: Tuco - Woodward 345KV CKT (Total Project E&C Cost Shown) Previously Allocated Proficio: Tuco - Woodward 345KV CKT (Total Project E&C Cost Shown) Previously Allocated	GEN-2011-037			
Clinton Jd GEN-2007-032 Tap - Clinton 138kV Terminal Equipment Upgrade at Clinton Jd.: Per GEN-2007-032 Interconnection Current Study Total S0.00 GEN-2011-040 GEN-2011-040 Interconnection Costs See Onelline Diagram. Current Study Total \$4,203,401.00 \$4,203,401.00 \$4,203,401.00 Current Study Total \$4,203,401.00 \$4,203,401.00 \$4,203,401.00 Current Study Total \$4,203,401.00 \$4,203,401.00 \$5,000 GEN-2011-045 Alten - Lubbock South 115kV CKT 1 NRIS only required upgrade: Rebuild approximately 6 miles of 115kV from Alten - Lubbock South Study Study \$10,946,449.00 \$10,946,449.00 \$10,946,449.00 \$10,946,449.00 \$10,946,449.00 \$2,187,010.00	GEN-2011-037 Interconnection Costs		\$0.00	\$0.00
Current Study Total S0.00	See Oneline Diagram.	Study		
GEN-2011-040 GEN-2011-040 Interconnection Costs See Oneline Diagram. Current Study Total Study S4,203,401.00 S4,203,401.00 GEN-2011-045 Allon - Lubbook South 115kV CKT 1 NRIS only required upgrade: Rebuild approximately 6 miles of 115kV from Allen - Lubbook South NRIS only required upgrade: Rebuild approximately 6 miles of 115kV from Allen - Lubbook South Study S10,946,449.00 S	Clinton Jct - GEN-2007-032 Tap - Clinton 138kV			\$0.00
SEN-2011-040 Interconnection Costs Study S4,203,401.00 S4,203,401.00 Sep-2011-040 Study Study S4,203,401.00 S4,203,401.00 Sep-2011-045 Study S10,946,449.00 S10,946,440	Terminal Equipment Upgrade at Clinton Jct: Per GEN-2007-032 Interconnection	Allocated		
GEN-2011-04D Interconnection Costs See Onelline Diagram. Current Study Total \$4,203,401.00 Current Study Total \$4,203,401.00 GEN-2011-045 Allen - Lubbock South 115kV CKT 1 NRIS only required upgrade: Rebuild approximately 6 miles of 115kV from Allen - Lubbock South NRIS only required upgrade: Rebuild approximately 6 miles of 115kV from Allen - Lubbock South Study \$10,946,449.00 GEN-2011-045 Interconnection Costs See Oneline Diagram. Power System Stabilizers (PSS) Install Powe		Current Study Total	\$0.00	
See Oneline Diagram. Current Study Total \$4,203,401.00 GEN-2011-045 Allen - Lubbock South 115kV CKT 1 NRIS only required upgrade: Rebuild approximately 6 miles of 115kV from Allen - Lubbock South NRIS only required upgrade: Rebuild approximately 6 miles of 115kV from Allen - Lubbock South See Oneline Diagram. Current Study Study Power System Stabilizers (PSS) Install Power System Stabilizers @ Tolk(Units: 1,2) and Jones (Units: 1,2,3,4) Jones - Lubbock South 230kV CKT 2 Per SPP-2010-AGP1-AFS-8, Replace Line Traps. Beaver County - Woodward 345kV Dbl CKT Priority Project: Hitchland - Woodward Dbl 345kV CKT (Total Project E&C Cost Shown) Beaver County 345kV Expansion Beaver County 345kV Expansion Beaver County 345kV Expansion: Tap & Tie in Hitchland - Woodward 345kV CKT 2 Border - Tuco Interchange 345kV CKT 1 Balanced Portfolio: Tuco - Woodward 345kV CKT 1 (Total Project E&C Cost Shown) Border - Woodward 345kV CKT 1 Balanced Portfolio: Tuco - Woodward 345kV CKT 1 (Total Project E&C Cost Shown) Brioder - Woodward 345kV CKT 1 Balanced Portfolio: Tuco - Woodward 345kV CKT 1 (Total Project E&C Cost Shown) Brioder - Woodward 345kV CKT 1 Balanced Portfolio: Tuco - Woodward 345kV CKT 1 (Total Project E&C Cost Shown) Brioder - Woodward 345kV CKT 1 Balanced Portfolio: Tuco - Woodward 345kV CKT 1 (Total Project E&C Cost Shown) Brioder - Woodward 345kV CKT 1 (Total Project E&C Cost Shown) Brioder - Woodward 345kV CKT 1 (Total Project E&C Cost Shown) Brioder - Woodward 345kV CKT 1 (Total Project E&C Cost Shown) Brioder - Woodward 345kV CKT 1 (Total Project E&C Cost Shown) Brioder - Woodward 345kV CKT 1 (Total Project E&C Cost Shown) Brioder - Woodward 345kV CKT 1 (Total Project E&C Cost Shown) Brioder - Woodward 345kV CKT 1 (Total Project E&C Cost Shown) Brioder - Woodward 345kV CKT 1 (Total Project E&C Cost Shown)	GEN-2011-040			
Current Study Total \$4,203,401.00 GEN-2011-045 Allen - Lubbock South 115kV CKT 1 NRIS only required upgrade: Rebuild approximately 6 miles of 115kV from Allen - Lubbock South NRIS only required upgrade: Rebuild approximately 6 miles of 115kV from Allen - Lubbock South Study GEN-2011-045 Interconnection Costs See Oneline Diagram. Power System Stabilizers (PSS) See Oneline Diagram. Current Study Current Study Stud	GEN-2011-040 Interconnection Costs		\$4,203,401.00	\$4,203,401.00
GEN-2011-045 Allen - Lubbock South 115kV CKT 1 NRIS only required upgrade: Rebuild approximately 6 miles of 115kV from Allen - Lubbock South Study GEN-2011-045 Interconnection Costs See Oneline Diagram. Power System Stabilizers (PSS) Install Power System Stabilizers @ Tolk(Units: 1,2) and Jones (Units: 1,2,3,4) Jones - Lubbock South 230kV CKT 2 Per SPP-2010-AGP1-AFS-8, Replace Line Traps. Beaver County - Woodward 345kV Dbl CKT Priority Project Hitchland - Woodward Dbl 345kV CKT (Total Project E&C Cost Shown) Beaver County 345kV Expansion Beaver County Expansion: Tap & Tie in Hitchland - Woodward 345kV CKT (Total Project E&C Cost Shown) Border - Tuco Interchange 345kV CKT 1 Balanced Portfolio: Tuco - Woodward 345kV CKT 1 (Total Project E&C Cost Shown) Border - Woodward 345kV CKT 1 Balanced Portfolio: Tuco - Woodward 345kV CKT 1 (Total Project E&C Cost Shown) Border - Woodward 345kV CKT 1 Balanced Portfolio: Tuco - Woodward 345kV CKT (Total Project E&C Cost Shown) Border - Woodward 345kV CKT 1 Balanced Portfolio: Tuco - Woodward 345kV CKT (Total Project E&C Cost Shown) Border - Woodward 345kV CKT 1 Balanced Portfolio: Tuco - Woodward 345kV CKT (Total Project E&C Cost Shown) Border - Woodward 345kV CKT 1 Balanced Portfolio: Tuco - Woodward 345kV CKT (Total Project E&C Cost Shown) Border - Woodward 345kV CKT 1 Balanced Portfolio: Tuco - Woodward 345kV CKT (Total Project E&C Cost Shown) Previously Allocated Breviously Allocated Previously Allocated Breviously Allocated Previously Allocated Breviously Allocated Previously Allocated Breviously Allocated	See Oneline Diagram.	Study		
Allen - Lubbock South 115kV CKT 1 NRIS only required upgrade: Rebuild approximately 6 miles of 115kV from Allen - Lubbock South RES only required upgrade: Rebuild approximately 6 miles of 115kV from Allen - Lubbock South See Oneline Diagram. Power System Stabilizers (PSS) Install Power System Stabilizers @ Tolk(Units: 1,2) and Jones (Units: 1,2,3,4) Jones - Lubbock South 230kV CKT 2 Per SPP-2010-AGP1-AFS-8, Replace Line Traps. Beaver County - Woodward 345kV Dbl CKT Priority Project: Hitchland - Woodward Dbl 345kV CKT (Total Project E&C Cost Shown) Beaver County System Stabilizers at Fie in Hitchland - Woodward 345kV CKT 2 Border - Tuco Interchange 345kV CKT 1 Balanced Portfolio: Tuco - Woodward 345kV CKT 1 (Total Project E&C Cost Shown) Border - Woodward 345kV CKT 1 Balanced Portfolio: Tuco - Woodward 345kV CKT 1 (Total Project E&C Cost Shown) Breviously Allocated Hitchland - Beaver County 345kV CKT 1 Balanced Portfolio: Tuco - Woodward 345kV CKT 1 (Total Project E&C Cost Shown) Breviously Allocated Hitchland - Beaver County 345kV CKT 1 Breviously Allocated Hitchland - Beaver County 345kV Dbl CKT Priority Project: Hitchland - Woodward 345kV CKT 1 (Total Project E&C Cost Shown) Previously Allocated Hitchland - Beaver County 345kV Dbl CKT Priority Project: Hitchland - Woodward Dbl 345kV CKT (Total Project E&C Cost Shown) Hitchland - Beaver County 345kV Dbl CKT Priority Project: Hitchland - Woodward Dbl 345kV CKT (Total Project E&C Cost Shown) Breviously Allocated Lubbock South 230/115kV Autotransformer CKT 2 NRIS only required upgrade Per 2013-SPP-ITP-NT and SPP-NTC-200214: Install 2nd		Current Study Total	\$4,203,401.00	
NRIS only required upgrade: Rebuild approximately 6 miles of 115kV from Allen - Lubbock South Study Current Study Power System Stabilizers (PSS) Install Power System Stabilizers @ Tolk(Units: 1,2) and Jones (Units: 1,2,3,4) Jones - Lubbock South 230kV CKT 2 Per SPP-2010-AGP1-AFS-8, Replace Line Traps. Beaver County - Woodward 345kV Dbl CKT Priority Project: Hitchland - Woodward Dbl 345kV CKT 1 (Total Project E&C Cost Shown) Beaver County Expansion: Tap & Tie in Hitchland - Woodward 345kV CKT 1 (Total Project E&C Cost Shown) Border - Tuco Interchange 345kV CKT 1 Balanced Portfolic: Tuco - Woodward 345kV CKT 1 (Total Project E&C Cost Shown) Billocated Hitchland - Beaver County 345kV CKT 1 Balanced Portfolic: Tuco - Woodward 345kV CKT 1 (Total Project E&C Cost Shown) Hitchland - Beaver County 345kV CKT 1 Border - Woodward 345kV CKT 1 Border - Woodward 345kV CKT 1 (Total Project E&C Cost Shown) Hitchland - Beaver County 345kV Dbl CKT Priority Project: Hitchland - Woodward 345kV CKT (Total Project E&C Cost Shown) Previously Allocated Hitchland - Beaver County 345kV Dbl CKT Priority Project: Hitchland - Woodward 345kV CKT (Total Project E&C Cost Shown) Previously Allocated Hitchland - Beaver County 345kV Dbl CKT Priority Project: Hitchland - Woodward Dbl 345kV CKT (Total Project E&C Cost Shown) Previously Allocated Lubbock South 230/115kV Autotransformer CKT 2 NRIS only required upgrade Per 2013-SPP-HTP-NT and SPP-NTC-200214: Install 2nd	GEN-2011-045			
GEN-2011-045 Interconnection Costs See Oneline Diagram. Power System Stabilizers (PSS) Install	Allen - Lubbock South 115kV CKT 1		\$10,946,449.00	\$10,946,449.00
See Oneline Diagram. Study Power System Stabilizers (PSS) Install Power System Stabilizers @ Tolk(Units: 1,2) and Jones (Units: 1,2,3,4) Jones - Lubbock South 230kV CKT 2 Per SPP-2010-AGP1-AFS-8, Replace Line Traps. Beaver County - Woodward 345kV Dbl CKT Priority Project: Hitchland - Woodward Dbl 345kV CKT (Total Project E&C Cost Shown) Beaver County Stabilizers @ Tolk(Units: 1,2) and Jones (Units: 1,2,3,4) In-Service \$200,000.00 Previously Allocated \$226,040,727.00 Allocated \$3,500,000.00 Beaver County Stabilizers (Total Project E&C Cost Shown) Beaver County Expansion: Tap & Tie in Hitchland - Woodward 345kV CKT 2 Border - Tuco Interchange 345kV CKT 1 Balanced Portfolio: Tuco - Woodward 345kV CKT 1 (Total Project E&C Cost Shown) Border - Woodward 345kV CKT 1 Balanced Portfolio: Tuco - Woodward 345kV CKT 1 (Total Project E&C Cost Shown) Hitchland - Beaver County 345kV Dbl CKT Priority Project: Hitchland - Woodward Dbl 345kV CKT (Total Project E&C Cost Shown) Lubbock South 230/115kV Autotransformer CKT 2 NRIS only required upgrade Per 2013-SPP-ITP-NT and SPP-NTC-200214: Install 2nd	NRIS only required upgrade: Rebuild approximately 6 miles of 115kV from Allen - Lubbool	k South		
Power System Stabilizers (PSS) Install Power System Stabilizers @ Tolk(Units: 1,2) and Jones (Units: 1,2,3,4) Jones - Lubbock South 230kV CKT 2 Per SPP-2010-AGP1-AFS-8, Replace Line Traps. Beaver County - Woodward 345kV Dbl CKT Priority Project: Hitchland - Woodward Dbl 345kV CKT (Total Project E&C Cost Shown) Beaver County Expansion: Tap & Tie in Hitchland - Woodward 345kV CKT 1 Balanced Portfolio: Tuco - Woodward 345kV CKT 1 Balanced Portfolio: Tuco - Woodward 345kV CKT 1 (Total Project E&C Cost Shown) Border - Woodward 345kV CKT 1 Balanced Portfolio: Tuco - Woodward 345kV CKT 1 (Total Project E&C Cost Shown) Border - Woodward 345kV CKT 1 Balanced Portfolio: Tuco - Woodward 345kV CKT 1 (Total Project E&C Cost Shown) Border - Woodward 345kV CKT 1 Balanced Portfolio: Tuco - Woodward 345kV CKT 1 (Total Project E&C Cost Shown) Border - Woodward 345kV CKT 1 (Total Project E&C Cost Shown) Border - Woodward 345kV CKT 1 (Total Project E&C Cost Shown) Border - Woodward 345kV CKT 1 (Total Project E&C Cost Shown) Border - Woodward 345kV CKT 1 (Total Project E&C Cost Shown) Border - Woodward 345kV CKT 1 (Total Project E&C Cost Shown) Border - Woodward 345kV CKT 1 (Total Project E&C Cost Shown) Border - Woodward 345kV CKT 1 (Total Project E&C Cost Shown) Border - Woodward 345kV CKT 1 (Total Project E&C Cost Shown) Border - Woodward 345kV CKT 1 (Total Project E&C Cost Shown) Border - Woodward 345kV CKT 1 (Total Project E&C Cost Shown) Border - Woodward 345kV CKT 1 (Total Project E&C Cost Shown) Border - Woodward 345kV CKT 1 (Total Project E&C Cost Shown) Border - Woodward 345kV CKT 1 (Total Project E&C Cost Shown) Border - Woodward 345kV CKT 1 (Total Project E&C Cost Shown) Border - Woodward 345kV CKT 1 (Total Project E&C Cost Shown) Border - Woodward 345kV CKT 1 (Total Project E&C Cost Shown) Border - Woodward 345kV CKT 1 (Total Project E&C Cost Shown)	GEN-2011-045 Interconnection Costs		\$2,187,010.00	\$2,187,010.00
Install Power System Stabilizers @ Tolk(Units: 1,2) and Jones (Units: 1,2,3,4) Jones - Lubbock South 230kV CKT 2 Per SPP-2010-AGP1-AFS-8, Replace Line Traps. Beaver County - Woodward 345kV Dbl CKT Priority Project: Hitchland - Woodward Dbl 345kV CKT (Total Project E&C Cost Shown) Previously Allocated Beaver County S45kV Expansion Beaver County Expansion: Tap & Tie in Hitchland - Woodward 345kV CKT 2 Border - Tuco Interchange 345kV CKT 1 Balanced Portfolio: Tuco - Woodward 345kV CKT 1 (Total Project E&C Cost Shown) Border - Woodward 345kV CKT 1 Balanced Portfolio: Tuco - Woodward 345kV CKT 1 (Total Project E&C Cost Shown) Bilanced Portfolio: Tuco - Woodward 345kV CKT 1 (Total Project E&C Cost Shown) Hitchland - Beaver County 345kV Dbl CKT Priority Project: Hitchland - Woodward Dbl 345kV CKT (Total Project E&C Cost Shown) Lubbock South 230/115kV Autotransformer CKT 2 NRIS only required upgrade Per 2013-SPP-ITP-NT and SPP-NTC-200214: Install 2nd	See Oneline Diagram.	Study		
Jones - Lubbock South 230kV CKT 2 Per SPP-2010-AGP1-AFS-8, Replace Line Traps. Beaver County - Woodward 345kV Dbl CKT Priority Project: Hitchland - Woodward Dbl 345kV CKT (Total Project E&C Cost Shown) Beaver County 345kV Expansion Beaver County Expansion: Tap & Tie in Hitchland - Woodward 345kV CKT 2 Border - Tuco Interchange 345kV CKT 1 Balanced Portfolio: Tuco - Woodward 345kV CKT 1 (Total Project E&C Cost Shown) Border - Woodward 345kV CKT 1 Balanced Portfolio: Tuco - Woodward Dbl 345kV CKT 1 Balanced Portfolio: Tuco - Woodward Dbl 345kV CKT 1 Balanced Portfolio: Tuco - Woodward Dbl 345kV CKT (Total Project E&C Cost Shown) Breviously Allocated Previously Allocated \$226,040,727.00 Previously Allocated \$226,040,727.00 Previously Allocated	Power System Stabilizers (PSS)		\$100,819.67	\$210,000.00
Per SPP-2010-AGP1-AFS-8, Replace Line Traps. Beaver County - Woodward 345kV Dbl CKT Priority Project: Hitchland - Woodward Dbl 345kV CKT (Total Project E&C Cost Shown) Beaver County 345kV Expansion Beaver County Expansion: Tap & Tie in Hitchland - Woodward 345kV CKT 2 Border - Tuco Interchange 345KV CKT 1 Balanced Portfolio: Tuco - Woodward 345kV CKT 1 (Total Project E&C Cost Shown) Border - Woodward 345kV CKT 1 Balanced Portfolio: Tuco - Woodward 345kV CKT 1 (Total Project E&C Cost Shown) Border - Woodward 345KV CKT 1 Balanced Portfolio: Tuco - Woodward 345kV CKT 1 (Total Project E&C Cost Shown) Hitchland - Beaver County 345kV Dbl CKT Priority Project: Hitchland - Woodward Dbl 345kV CKT (Total Project E&C Cost Shown) Lubbock South 230/115kV Autotransformer CKT 2 NRIS only required upgrade Per 2013-SPP-ITP-NT and SPP-NTC-200214: Install 2nd	Install Power System Stabilizers @ Tolk(Units: 1,2) and Jones (Units: 1,2,3,4)	Study		
Beaver County - Woodward 345kV Dbl CKT Priority Project: Hitchland - Woodward Dbl 345kV CKT (Total Project E&C Cost Shown) Beaver County 345kV Expansion Beaver County Expansion: Tap & Tie in Hitchland - Woodward 345kV CKT 2 Border - Tuco Interchange 345KV CKT 1 Balanced Portfolio: Tuco - Woodward 345kV CKT 1 (Total Project E&C Cost Shown) Border - Woodward 345kV CKT 1 Balanced Portfolio: Tuco - Woodward 345kV CKT 1 (Total Project E&C Cost Shown) Border - Woodward 345kV CKT 1 Freviously Allocated Previously Allocated Previously Allocated \$249,247,072.00 Breviously Allocated Previously Allocated Previously Allocated Previously Allocated \$256,040,727.00 Priority Project: Hitchland - Woodward Dbl 345kV CKT (Total Project E&C Cost Shown) Lubbock South 230/115kV Autotransformer CKT 2 NRIS only required upgrade Per 2013-SPP-ITP-NT and SPP-NTC-200214: Install 2nd	Jones - Lubbock South 230kV CKT 2	In-Service		\$200,000.00
Priority Project: Hitchland - Woodward Dbl 345kV CKT (Total Project E&C Cost Shown) Beaver County 345kV Expansion Beaver County Expansion: Tap & Tie in Hitchland - Woodward 345kV CKT 2 Border - Tuco Interchange 345KV CKT 1 Balanced Portfolio: Tuco - Woodward 345kV CKT 1 (Total Project E&C Cost Shown) Border - Woodward 345kV CKT 1 Balanced Portfolio: Tuco - Woodward 345kV CKT 1 (Total Project E&C Cost Shown) Border - Woodward 345kV CKT 1 Balanced Portfolio: Tuco - Woodward 345kV CKT 1 (Total Project E&C Cost Shown) Hitchland - Beaver County 345kV Dbl CKT Priority Project: Hitchland - Woodward Dbl 345kV CKT (Total Project E&C Cost Shown) Lubbock South 230/115kV Autotransformer CKT 2 NRIS only required upgrade Per 2013-SPP-ITP-NT and SPP-NTC-200214: Install 2nd	Per SPP-2010-AGP1-AFS-8, Replace Line Traps.			
Beaver County 345kV Expansion Beaver County Expansion: Tap & Tie in Hitchland - Woodward 345kV CKT 2 Border - Tuco Interchange 345KV CKT 1 Balanced Portfolio: Tuco - Woodward 345kV CKT 1 (Total Project E&C Cost Shown) Border - Woodward 345KV CKT 1 Balanced Portfolio: Tuco - Woodward 345kV CKT 1 (Total Project E&C Cost Shown) Border - Woodward 345KV CKT 1 Balanced Portfolio: Tuco - Woodward 345kV CKT 1 (Total Project E&C Cost Shown) Border - Woodward 345KV CKT 1 Balanced Portfolio: Tuco - Woodward 345kV CKT 1 (Total Project E&C Cost Shown) Hitchland - Beaver County 345kV Dbl CKT Priority Project: Hitchland - Woodward Dbl 345kV CKT (Total Project E&C Cost Shown) Lubbock South 230/115kV Autotransformer CKT 2 NRIS only required upgrade Per 2013-SPP-ITP-NT and SPP-NTC-200214: Install 2nd	Beaver County - Woodward 345kV Dbl CKT	,		\$226,040,727.00
Beaver County Expansion: Tap & Tie in Hitchland - Woodward 345kV CKT 2 Border - Tuco Interchange 345KV CKT 1 Balanced Portfolio: Tuco - Woodward 345kV CKT 1 (Total Project E&C Cost Shown) Border - Woodward 345kV CKT 1 Balanced Portfolio: Tuco - Woodward 345kV CKT 1 (Total Project E&C Cost Shown) Border - Woodward 345kV CKT 1 Balanced Portfolio: Tuco - Woodward 345kV CKT 1 (Total Project E&C Cost Shown) Hitchland - Beaver County 345kV Dbl CKT Priority Project: Hitchland - Woodward Dbl 345kV CKT (Total Project E&C Cost Shown) Lubbock South 230/115kV Autotransformer CKT 2 NRIS only required upgrade Per 2013-SPP-ITP-NT and SPP-NTC-200214: Install 2nd	Priority Project: Hitchland - Woodward Dbl 345kV CKT (Total Project E&C Cost Shown)	Allocated		
Border - Tuco Interchange 345KV CKT 1 Balanced Portfolio: Tuco - Woodward 345kV CKT 1 (Total Project E&C Cost Shown) Border - Woodward 345KV CKT 1 Balanced Portfolio: Tuco - Woodward 345kV CKT 1 (Total Project E&C Cost Shown) Previously Allocated Previously Allocated \$249,247,072.00 Priority Project: Hitchland - Woodward 345kV CKT 1 (Total Project E&C Cost Shown) Previously Allocated \$226,040,727.00 Priority Project: Hitchland - Woodward Dbl 345kV CKT (Total Project E&C Cost Shown) Lubbock South 230/115kV Autotransformer CKT 2 NRIS only required upgrade Per 2013-SPP-ITP-NT and SPP-NTC-200214: Install 2nd	Beaver County 345kV Expansion	,		\$3,500,000.00
Border - Woodward 345kV CKT 1 (Total Project E&C Cost Shown) Border - Woodward 345kV CKT 1 Balanced Portfolio: Tuco - Woodward 345kV CKT 1 (Total Project E&C Cost Shown) Hitchland - Beaver County 345kV Dbl CKT Priority Project: Hitchland - Woodward Dbl 345kV CKT (Total Project E&C Cost Shown) Lubbock South 230/115kV Autotransformer CKT 2 NRIS only required upgrade Per 2013-SPP-ITP-NT and SPP-NTC-200214: Install 2nd Allocated Allocated Previously Allocated \$5,179,953.00	Beaver County Expansion: Tap & Tie in Hitchland - Woodward 345kV CKT 2	Allocated		
Balanced Portfolio: Tuco - Woodward 345kV CKT 1 (Total Project E&C Cost Shown) Border - Woodward 345kV CKT 1 Balanced Portfolio: Tuco - Woodward 345kV CKT 1 (Total Project E&C Cost Shown) Hitchland - Beaver County 345kV Dbl CKT Priority Project: Hitchland - Woodward Dbl 345kV CKT (Total Project E&C Cost Shown) Lubbock South 230/115kV Autotransformer CKT 2 NRIS only required upgrade Per 2013-SPP-ITP-NT and SPP-NTC-200214: Install 2nd Previously Allocated \$249,247,072.00 \$226,040,727.00 Previously Allocated \$5,179,953.00	Border - Tuco Interchange 345KV CKT 1			\$249,247,072.00
Balanced Portfolio: Tuco - Woodward 345kV CKT 1 (Total Project E&C Cost Shown) Hitchland - Beaver County 345kV Dbl CKT Priority Project: Hitchland - Woodward Dbl 345kV CKT (Total Project E&C Cost Shown) Lubbock South 230/115kV Autotransformer CKT 2 NRIS only required upgrade Per 2013-SPP-ITP-NT and SPP-NTC-200214: Install 2nd Allocated Allocated \$226,040,727.00 Previously Allocated \$5,179,953.00	Balanced Portfolio: Tuco - Woodward 345kV CKT 1 (Total Project E&C Cost Shown)	Allocated		
Balanced Portfolio: Tuco - Woodward 345kV CKT 1 (Total Project E&C Cost Shown) Hitchland - Beaver County 345kV Dbl CKT Priority Project: Hitchland - Woodward Dbl 345kV CKT (Total Project E&C Cost Shown) Lubbock South 230/115kV Autotransformer CKT 2 NRIS only required upgrade Per 2013-SPP-ITP-NT and SPP-NTC-200214: Install 2nd Previously Allocated \$5,179,953.00	Border - Woodward 345KV CKT 1	•		\$249,247,072.00
Priority Project: Hitchland - Woodward Dbl 345kV CKT (Total Project E&C Cost Shown) Lubbock South 230/115kV Autotransformer CKT 2 NRIS only required upgrade Per 2013-SPP-ITP-NT and SPP-NTC-200214: Install 2nd Allocated Previously Allocated \$5,179,953.00	Balanced Portfolio: Tuco - Woodward 345kV CKT 1 (Total Project E&C Cost Shown)	Allocated		
Priority Project: Hitchland - Woodward Dbl 345kV CKT (Total Project E&C Cost Shown) Lubbock South 230/115kV Autotransformer CKT 2 NRIS only required upgrade Per 2013-SPP-ITP-NT and SPP-NTC-200214: Install 2nd Previously Allocated	Hitchland - Beaver County 345kV Dbl CKT	•		\$226,040,727.00
NRIS only required upgrade Per 2013-SPP-ITP-NT and SPP-NTC-200214: Install 2nd	Priority Project: Hitchland - Woodward Dbl 345kV CKT (Total Project E&C Cost Shown)	Allocated		
NRIS only required upgrade Per 2013-SPP-TTP-NT and SPP-NTC-200214: Install 2nd	Lubbock South 230/115kV Autotransformer CKT 2			\$5,179,953.00
		Allocated		

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

Interconnection Request and Upgrades	Upgrade Type	Allocated Cost	Upgrade Cost
Thistle - Flat Ridge 138kV CKT 1 Priority Project: Thistle - Flat Ridge 138kV CKT 1 (Total Project E&C Cost Shown.)	Previously Allocated		\$5,776,280.00
Thistle - Wichita 345KV Dbl CKT Priority Project: Thistle - Wichita Dbl 345kV CKT (Total Project E&C Cost Shown.)	Previously Allocated		\$426,504,292.00
Thistle - Woodward 345KV Dbl CKT Priority Project: Thistle - Woodward Dbl 345kV CKT (Total Project E&C Cost Shown)	Previously Allocated		\$207,782,000.00
Thistle 345/138KV Transformer CKT 1 Priority Project: Thistle 345/138kV Transformer CKT 1 (Total Project E&C Cost Shown.)	Previously Allocated		\$6,585,986.00
TUCO 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
Wolfforth Interchange 230/115/13.2kV Transformer CKT 1 NRIS only required upgrade: Replace existing Wolfforth Interchange Transformer	Previously Allocated		\$6,000,000.00
Woodward XFMR 345/138/13.8kV CKT 2 Balanced Portfolio: Woodward 345/138kV Transformer CKT 2 & 50 MVAR Reactor (Total E&C Cost Shown).	Previously Allocated		\$249,247,072.00
	Current Study Total	\$13,234,278.67	
GEN-2011-046			
GEN-2011-046 Interconnection Costs See Oneline Diagram.	Current Study	\$3,433,559.00	\$3,433,559.00
Power System Stabilizers (PSS) Install Power System Stabilizers @ Tolk(Units: 1,2) and Jones (Units: 1,2,3,4)	Current Study	\$13,278.69	\$210,000.00
Beaver County - Woodward 345kV Dbl CKT Priority Project: Hitchland - Woodward Dbl 345kV CKT (Total Project E&C Cost Shown)	Previously Allocated		\$226,040,727.00
Beaver County 345kV Expansion Beaver County Expansion: Tap & Tie in Hitchland - Woodward 345kV CKT 2	Previously Allocated		\$3,500,000.00
Border - Tuco Interchange 345KV CKT 1 Balanced Portfolio: Tuco - Woodward 345kV CKT 1 (Total Project E&C Cost Shown)	Previously Allocated		\$249,247,072.00
Border - Woodward 345KV CKT 1 Balanced Portfolio: Tuco - Woodward 345kV CKT 1 (Total Project E&C Cost Shown)	Previously Allocated		\$249,247,072.00
Hitchland - Beaver County 345kV Dbl CKT Priority Project: Hitchland - Woodward Dbl 345kV CKT (Total Project E&C Cost Shown)	Previously Allocated		\$226,040,727.00
Hitchland 345/230kV Autotransformer CKT 2 Priority Project: Hitchland 345/230kV Autotransformer CKT 2 (Total Project E&C Cost Sho	Previously Allocated wn).		\$8,883,760.00

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

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Interconnection Request and Upgrades	Upgrade Type	Allocated Cost	Upgrade Cost
Lubbock South 230/115kV Autotransformer CKT 2 NRIS only required upgrade Per 2013-SPP-ITP-NT and SPP-NTC-200214: Install 2nd 230/115/13.2kV Autotransformer	Previously Allocated		\$5,179,953.00
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 F E&C Cost Shown).	Previously Allocated		\$249,247,072.00
Yoakum 230/115/13kV Transformer CKT 1 and 2 NRIS only required upgrade Per SPP-2011-AG3-AFS-11: Replace existing two Yoakum 230/115/13kV transformers.	Previously Allocated		\$7,514,514.00
	Current Study Total	\$3,446,837.69	
GEN-2011-048			
GEN-2011-048 Interconnection Costs See Oneline Diagram.	Current Study	\$1,008,667.00	\$1,008,667.00
Power System Stabilizers (PSS) Install Power System Stabilizers @ Tolk(Units: 1,2) and Jones (Units: 1,2,3,4)	Current Study	\$86,065.57	\$210,000.00
Beaver County - Woodward 345kV Dbl CKT Priority Project: Hitchland - Woodward Dbl 345kV CKT (Total Project E&C Cost Shown)	Previously Allocated		\$226,040,727.00
Beaver County 345kV Expansion Beaver County Expansion: Tap & Tie in Hitchland - Woodward 345kV CKT 2	Previously Allocated		\$3,500,000.00
Border - Tuco Interchange 345KV CKT 1 Balanced Portfolio: Tuco - Woodward 345kV CKT 1 (Total Project E&C Cost Shown)	Previously Allocated		\$249,247,072.00
Border - Woodward 345KV CKT 1 Balanced Portfolio: Tuco - Woodward 345kV CKT 1 (Total Project E&C Cost Shown)	Previously Allocated		\$249,247,072.00
Hitchland - Beaver County 345kV Dbl CKT Priority Project: Hitchland - Woodward Dbl 345kV CKT (Total Project E&C Cost Shown)	Previously Allocated		\$226,040,727.00

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

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Interconnection Request and Upgrades	Upgrade Type	Allocated Cost	Upgrade Cost
Hitchland 345/230kV Autotransformer CKT 2 Priority Project: Hitchland 345/230kV Autotransformer CKT 2 (Total Project E&C Cost Show	Previously Allocated wn).		\$8,883,760.00
Lubbock South 230/115kV Autotransformer CKT 2 NRIS only required upgrade Per 2013-SPP-ITP-NT and SPP-NTC-200214: Install 2nd 230/115/13.2kV Autotransformer	Previously Allocated		\$5,179,953.00
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 F E&C Cost Shown).	Previously Allocated		\$249,247,072.00
Yoakum 230/115/13kV Transformer CKT 1 and 2 NRIS only required upgrade Per SPP-2011-AG3-AFS-11: Replace existing two Yoakum 230/115/13kV transformers.	Previously Allocated		\$7,514,514.00
	Current Study Total	\$1,094,732.57	
GEN-2011-049			
GEN-2011-049 Interconnection Costs See Oneline Diagram.	Current Study	\$3,654,353.00	\$3,654,353.00
Cleveland - Sooner 345KV CKT 1 Balanced Portfolio: Cleveland - Sooner 345kV CKT 1 (Total Project E&C Cost Shown).	In-Service		\$58,692,000.00
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
FPL Switch - Woodward 138kV CKT 1 NRIS only required upgrade: Rebuild approximately 12 miles of 138kV line	Previously Allocated		\$6,509,948.00
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

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

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Interconnection Request and Upgrades	Upgrade Type	Allocated Cost	Upgrade Cost	
Northwest 345/138k/13.8kVAutotransformer CKT 3 NRIS only required upgrade: Per 2009-AG2-AFS6	Previously Allocated		\$15,000,000.00	
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 E&C Cost Shown).	Previously Allocated		\$249,247,072.00	
,	Current Study Total	\$3,654,353.00		
GEN-2011-050				
GEN-2011-050 Interconnection Costs See Oneline Diagram.	Current Study	\$7,310,940.00	\$7,310,940.00	
	Current Study Total	\$7,310,940.00		
GEN-2011-051				
GEN-2011-051 Interconnection Costs See Oneline Diagram.	Current Study	\$9,276,873.00	\$9,276,873.00	
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	
FPL Switch - Mooreland 138kV CKT 1 NRIS only required upgrade: Rebuild approximately 0.2 miles of 138kV line	Previously Allocated		\$820,000.00	
FPL Switch - Woodward 138kV CKT 1 NRIS only required upgrade: Rebuild approximately 12 miles of 138kV line	Previously Allocated		\$6,509,948.00	
Glass Mountain - Mooreland 138kV NRIS only required upgrade: Rebuild approximatley 24 miles of 138kV line	Previously Allocated		\$15,072,467.00	

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

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Interconnection Request and Upgrades	Upgrade Type	Allocated Cost	Upgrade Cost
Northwest 345/138k/13.8kVAutotransformer CKT 3 NRIS only required upgrade: Per 2009-AG2-AFS6	Previously Allocated		\$15,000,000.00
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 Show	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 E&C Cost Shown).	Previously Allocated		\$249,247,072.00
	Current Study Total	\$9,276,873.00	
GEN-2011-054			
GEN-2011-054 Interconnection Costs See Oneline Diagram.	Current Study	\$10,000.00	\$10,000.00
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 345/230kV Autotransformer CKT 2 Priority Project: Hitchland 345/230kV Autotransformer CKT 2 (Total Project E&C Cost Sho	Previously Allocated		\$8,883,760.00
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

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

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DY COS	TS:	\$49,174,873.00	
Curren	t Study Total	\$2,040,698.00	
	in-Service		\$58,692,000.00
	In-Service		\$58 602 <u>000 00</u>
	Study	\$2,040,698.00	\$2,040,698.00
	Curront	¢2.040.608.00	¢2.040.600.00
	-		
Curren	t Study Total	\$1.00	
	Current Study	\$1.00	\$1.00
Curren	t Study Total	\$4,673,522.00	
	·	0.1.070 7.00 0.0	
	Current Study	\$0.00	\$0.00
	Current Study	\$0.00	\$0.00
	Study	\$15,667.00	\$15,667.00
	·	¢15 667 00	\$15 GG7 00
	Current	\$15,667.00	\$15,667.00
	Current Study	\$9,793.00	\$9,793.00
	Current Study	\$4,632,395.00	\$4,632,395.00
Curren	t Study Total	\$10,000.00	
tal Project	Allocated		ΨΕ 10,Ε 11,07 Ε.00
,	Previously		\$249,247,072.00
own)	Allocated		\$14,900,907.00
		Allocated Cost	Upgrade Cost
	Curren Curren	Previously Allocated Current Study Total Current Study Current Study Total	Previously Allocated Previously Allocated Current Study Total \$10,000.00 Current Study Total \$4,632,395.00 Current Study \$9,793.00 Current \$15,667.00 Study \$15,667.00 Current \$15,667.00 Current Study \$0.00 Current Study \$0.00 Current Study \$1.00 Current Study \$1.00

Friday, June 06, 2014

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^{*} 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

	•	510,946,449.00
imately 6 miles of 115kV from Allen - Lubbock South		
GEN-2011-045	\$10,946,449.00	
Total Allocated Costs	\$10,946,449.00	_
S		\$219,400.00
ffected Facilities Construction Agreement.		
ASGI-2011-004	\$219,400.00	
Total Allocated Costs	\$219,400.00	_
		\$0.00
GEN-2011-037	\$0.00	
Total Allocated Costs	\$0.00	_
		\$4,203,401.00
GEN-2011-040	\$4,203,401.00	
Total Allocated Costs	\$4,203,401.00	_
		\$2,187,010.00
GEN-2011-045	\$2,187,010.00	
Total Allocated Costs	\$2,187,010.00	_
		\$3,433,559.00
GEN-2011-046	\$3,433,559.00	
Total Allocated Costs	\$3,433,559.00	_
		\$1,008,667.00
GEN-2011-048	\$1,008,667.00	
	Total Allocated Costs S ffected Facilities Construction Agreement. ASGI-2011-004 Total Allocated Costs GEN-2011-037 Total Allocated Costs GEN-2011-040 Total Allocated Costs GEN-2011-045 Total Allocated Costs GEN-2011-046 Total Allocated Costs	imately 6 miles of 115kV from Allen - Lubbock South GEN-2011-045 \$10,946,449.00 Total Allocated Costs \$10,946,449.00 Seffected Facilities Construction Agreement. ASGI-2011-004 \$219,400.00 Total Allocated Costs \$219,400.00 GEN-2011-037 \$0.00 Total Allocated Costs \$0.00 GEN-2011-040 \$4,203,401.00 Total Allocated Costs \$4,203,401.00 Total Allocated Costs \$2,187,010.00 GEN-2011-045 \$2,187,010.00 Total Allocated Costs \$3,433,559.00 Total Allocated Costs \$3,433,559.00

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

See Oneline Diagram.

See Oneline Diagram.			
	GEN-2011-049	\$3,654,353.00	
	Total Allocated Costs	\$3,654,353.00	
GEN-2011-050 Interconnection Costs		\$'	7,310,940.00
See Oneline Diagram.			
	GEN-2011-050	\$7,310,940.00	
	Total Allocated Costs	\$7,310,940.00	
GEN-2011-051 Interconnection Costs		\$9	9,276,873.00
See Oneline Diagram.			
	GEN-2011-051	\$9,276,873.00	
	Total Allocated Costs	\$9,276,873.00	
GEN-2011-054 Interconnection Costs			\$10,000.00
See Oneline Diagram.			
	GEN-2011-054	\$10,000.00	
	Total Allocated Costs	\$10,000.00	
GEN-2011-055 Interconnection Costs	\$	\$4	4,632,395.00
See Oneline Diagram.			
	GEN-2011-055	\$4,632,395.00	
	Total Allocated Costs	\$4,632,395.00	
GEN-2011-056 Interconnection Costs	·		\$1.00
See Oneline Diagram.			
	GEN-2011-056	\$1.00	
	Total Allocated Costs	\$1.00	
GEN-2011-057 Interconnection Costs		\$2	2,040,698.00
See Oneline Diagram.			
	GEN-2011-057	\$2,040,698.00	
	Total Allocated Costs	\$2,040,698.00	
Hydro Carbon Tap - Sub974 69kV Cl	KT 1		\$9,793.00
NRIS only required upgrade: Rewire CT on S	Sub 974		
	GEN-2011-055	\$9,793.00	

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

\$0.00

NRIS only required upgrade: Replace Terminal Equipment

	GEN-2011-055	\$15,667.00	
	Total Allocated Costs	\$15,667.00	-
Power System Stabilizers (PSS)			\$210,000.00
Install Power System Stabilizers @ Tol	k(Units: 1,2) and Jones (Units: 1,2,3,4)		
	ASGI-2011-004	\$9,836.07	
	GEN-2011-045	\$100,819.67	
	GEN-2011-046	\$13,278.69	
	GEN-2011-048	\$86,065.57	
	Total Allocated Costs	\$210,000.00	-
SUB 967 - SUB 968 69kV CKT 1			\$15,667.00
Replace terminal equipment			
	GEN-2011-055	\$15,667.00	
	Total Allocated Costs	\$15,667.00	-
SUB 968 - SUB 969 69kV CKT 1			\$0.00
Mitigated by replacing terminal equipm	nent at Sub 969		
	GEN-2011-055	\$0.00	
	Total Allocated Costs	\$0.00	-
SUB 969 - SUB 974 69kV CKT 1			\$0.00
Mitigated by replacing terminal equipm	nent at Sub 969		
	GEN-2011-055	\$0.00	

Total Allocated Costs

^{*} 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.

							RATEB		TC%LOADING	
SOLUTION	GROUP	SCENARIO	SEASON	SOURCE	DIRECTION	MONITORED ELEMENT	(MVA)	TDF	(% MVA)	CONTINGENCY
FDNS	00NR	0	24SP	G11_045	TO->FROM	ALLEN SUB - LUBBOCK SOUTH INTERCHANGE 115KV CKT 1	160	0.14877	100.4	LUBBOCK SOUTH INTERCHANGE - WOLFFORTH INTERCHANGE 230KV CKT 1
FDNS	00NR	0	14SP	G11_045	FROM->TO	LUBBOCK SOUTH INTERCHANGE (ABB LLM60043) 230/115/13.2KV TRANSFORMER CKT 1	252	0.10453	109.1038	JONES STATION - LUBBOCK EAST INTERCHANGE 230KV CKT 1
FDNS	00NR	0	14SP	G11_045	FROM->TO	LUBBOCK SOUTH INTERCHANGE (ABB LLM60043) 230/115/13.2KV TRANSFORMER CKT 1	252	0.10453	103.8213	JONES STATION - LUBBOCK EAST INTERCHANGE 230KV CKT 1
FDNS	00NR	0	14SP	G11_045	FROM->TO	LUBBOCK SOUTH INTERCHANGE (ABB LLM60043) 230/115/13.2KV TRANSFORMER CKT 1	252	0.10772	101.6165	LUBBOCK EAST INTERCHANGE (ENRCO 136162) 230/115/13.2KV TRANSFORMER CKT 1
FDNS	00NR	0	24SP	G11_045	FROM->TO	WOLFFORTH INTERCHANGE (WH 7001668) 230/115/13.2KV TRANSFORMER CKT 1	168	0.04251	100.1511	CARLISLE INTERCHANGE (WH XHS70711) 230/115/13.2KV TRANSFORMER CKT 1
FDNS	00NR	0	24SP	G11_048	FROM->TO	YOAKUM COUNTY INTERCHANGE (PENN C010585) 230/115/13.2KV TRANSFORMER CKT 2	150	0.05437	100.5986	YOAKUM COUNTY INTERCHANGE (GE M100899) 230/115/13.2KV TRANSFORMER CKT 1
FDNS	00NR	0	14SP	G11_049	FROM->TO	NORTHWEST (NORTWST2) 345/138/13.8KV TRANSFORMER CKT 1	493	0.04348	105.3313	NORTHWEST (NORTWST3) 345/138/13.8KV TRANSFORMER CKT 1
FDNS	00NR	0	14SP	G11_049	+	NORTHWEST (NORTWST2) 345/138/13.8KV TRANSFORMER CKT 1	493	0.04348		NORTHWEST (NORTWST3) 345/138/13.8KV TRANSFORMER CKT 1
FDNS	01NR	0	14G	G11_051	+	FPL SWITCH - MOORELAND 138KV CKT 1	287	0.1293		NORTHWEST - TATONGA7 345.00 345KV CKT 1
FDNS	01NR	0	-	G11_051	+	FPL SWITCH - WOODWARD 138KV CKT 1	153	0.1293		NORTHWEST - TATONGA7 345.00 345KV CKT 1
FDNS	01NR	0	-	G11_051	+	FPL SWITCH - WOODWARD 138KV CKT 1	153	0.07067		GEN520997 1-MORLND2
FDNS	01NR	0		G11_051	+	FPL SWITCH - WOODWARD 138KV CKT 1	153	0.07969		WOODWARD (WOODWRD2) 138/69/13.2KV TRANSFORMER CKT 1
FDNS	01NR	0		G11_051		FPL SWITCH - WOODWARD 138KV CKT 1	153	0.07067		GEN520998 1-MORLND3
FDNS	01NR	0	-	G11_051		FPL SWITCH - WOODWARD 138KV CKT 1	153	0.07067		GEN515787 1-OKLA WIND ENERGY CENTER
FDNS	01NR	0	-	G11_051		FPL SWITCH - WOODWARD 138KV CKT 1	153	0.1293		G11_051T 345.00 - TATONGA7 345.00 345KV CKT 1
FDNS	01NR	0	-	G11_051		FPL SWITCH - WOODWARD 138KV CKT 1	153	0.08376		IODINE - WOODWARD EHV 138KV CKT 1
FDNS	01NR	0		G11_051		GLASS MOUNTAIN - MOORELAND 138KV CKT 1	124	0.04188		NORTHWEST - TATONGA7 345.00 345KV CKT 1
FDNS	00NR 00NR	0	-	G11_051 G11_051		NORTHWEST (NORTWST2) 345/138/13.8KV TRANSFORMER CKT 1 NORTHWEST (NORTWST2) 345/138/13.8KV TRANSFORMER CKT 1	493 493	0.06204 0.06204		NORTHWEST (NORTWST3) 345/138/13.8KV TRANSFORMER CKT 1 NORTHWEST (NORTWST3) 345/138/13.8KV TRANSFORMER CKT 1
FDNS	00NR	0		G11_051 G11_055		HYDROCARBON TAP - SUB 974 69KV CKT 1	493 57	0.06204		SUB 963 - SUB 977 69KV CKT 1
FDNS FDNS	00NR	0	-	G11_055	TO->FROM	HYDROCARBON TAP - SUB 974 69KV CKT 1	57	0.18697		NEB CITY U SUB 903 - SUB 977 69KV CKT 1
FDNS	00NR	0	-	G11_055		NEB CITY U SYR SUB - SUB 970 69KV CKT 1	47	0.18697		SUB 963 - SUB 977 69KV CKT 1
FDNS	00NR	0		G11_055		NEB CITY U SYR SUB - SUB 970 69KV CKT 1	47	0.18697		NEB CITY U SUB 903 - SUB 977 69KV CKT 1
FDNS	00NR	0	-	G11_055		NEB CITY U SYR SUB - SUB 970 69KV CKT 1	47	0.18612		SUB 963 - SUB 977 69KV CKT 1
FDNS	00NR	n	-	G11_055	+	NEB CITY U SYR SUB - SUB 970 69KV CKT 1	47	0.18612		NEB CITY U SUB 903 - SUB 977 69KV CKT 1
FDNS	09G11 055	0	-	G11_055	+	SUB 967 - SUB 968 69KV CKT 1	47	1		SUB 969 - SUB 974 69KV CKT 1
FDNS	09NR		-	G11_055	+	SUB 967 - SUB 968 69KV CKT 1	47	1		SUB 969 - SUB 974 69KV CKT 1
FDNS	09G11 055	0		G11_055	TO->FROM	SUB 968 - SUB 969 69KV CKT 1	47	1		SUB 969 - SUB 974 69KV CKT 1
FDNS	09NR	0	-	G11_055		SUB 968 - SUB 969 69KV CKT 1	47	1		SUB 969 - SUB 974 69KV CKT 1
FDNS	00G11 055	0	-	G11 055		SUB 968 - SUB 969 69KV CKT 1	47	1		SUB 969 - SUB 974 69KV CKT 1
FDNS	00NR	0	-	G11 055		SUB 968 - SUB 969 69KV CKT 1	47	1		SUB 969 - SUB 974 69KV CKT 1
FDNS	00G11 055	0	-	G11 055	+	SUB 968 - SUB 969 69KV CKT 1	47	1		SUB 969 - SUB 974 69KV CKT 1
FDNS	00G11 055	0	-	G11 055		SUB 968 - SUB 969 69KV CKT 1	47	1		SUB 969 - SUB 974 69KV CKT 1
FDNS	00NR	0	19SP	G11_055	TO->FROM	SUB 968 - SUB 969 69KV CKT 1	47	1	109.1696	SUB 969 - SUB 974 69KV CKT 1
FDNS	00NR	0	24SP	G11_055	TO->FROM	SUB 968 - SUB 969 69KV CKT 1	47	1	109.1617	SUB 969 - SUB 974 69KV CKT 1
FDNS	00G11_055	0	14WP	G11_055	TO->FROM	SUB 968 - SUB 969 69KV CKT 1	47	1	108.3724	SUB 969 - SUB 974 69KV CKT 1
FDNS	00NR	0	14WP	G11_055	TO->FROM	SUB 968 - SUB 969 69KV CKT 1	47	1	108.3285	SUB 969 - SUB 974 69KV CKT 1
FDNS	00G11_055	0	19WP	G11_055	TO->FROM	SUB 968 - SUB 969 69KV CKT 1	47	1	108.2402	SUB 969 - SUB 974 69KV CKT 1
FDNS	00NR	0	19WP	G11_055	TO->FROM	SUB 968 - SUB 969 69KV CKT 1	47	1		SUB 969 - SUB 974 69KV CKT 1
FDNS	09G11_055	0	14G	G11_055		SUB 969 - SUB 974 69KV CKT 1	47	1		SUB 968 - SUB 969 69KV CKT 1
FDNS	09NR	0	-	G11_055		SUB 969 - SUB 974 69KV CKT 1	47	1		SUB 968 - SUB 969 69KV CKT 1
FDNS	00NR	0		G11_055		SUB 969 - SUB 974 69KV CKT 1	47	1		SUB 968 - SUB 969 69KV CKT 1
FDNS	00NR	0	-	G11_055	+	SUB 969 - SUB 974 69KV CKT 1	47	1		SUB 968 - SUB 969 69KV CKT 1
FDNS	00G11_055	!	-	G11_055		SUB 969 - SUB 974 69KV CKT 1	47	1		SUB 968 - SUB 969 69KV CKT 1
FDNS	00G11_055		-	G11_055	_	SUB 969 - SUB 974 69KV CKT 1	47	1		SUB 968 - SUB 969 69KV CKT 1
FDNS	00G11_055			G11_055		SUB 969 - SUB 974 69KV CKT 1	47	1		SUB 968 - SUB 969 69KV CKT 1
FDNS	00NR			G11_055		SUB 969 - SUB 974 69KV CKT 1	47	1		SUB 968 - SUB 969 69KV CKT 1
FDNS	00G11_055	0		G11_055	+	SUB 969 - SUB 974 69KV CKT 1	47	1		SUB 968 - SUB 969 69KV CKT 1
FDNS	00NR 00G11 055	0	14WP	G11_055	+	SUB 969 - SUB 974 69KV CKT 1 SUB 969 - SUB 974 69KV CKT 1	47 47	1		SUB 968 - SUB 969 69KV CKT 1
FDNS	00G11_055	0		G11_055			47	1		SUB 968 - SUB 969 69KV CKT 1
FDNS FDNS	09G11 055	n		G11_055 G11_055		SUB 969 - SUB 974 69KV CKT 1 SUB 969 - SUB 974 69KV CKT 1	47	1		SUB 968 - SUB 969 69KV CKT 1 SUB 967 - SUB 968 69KV CKT 1
FDNS	09G11_033		-	G11_055	+	SUB 969 - SUB 974 69KV CKT 1	47	1		SUB 967 - SUB 968 69KV CKT 1
FDNS	00NR	0	-	G11_055	+	SUB 969 - SUB 974 69KV CKT 1	47	0.39766		FIRTH - SHELDON 115KV CKT 1
FDNS	00NR	2	-	G11_055	+	HYDROCARBON TAP - SUB 974 69KV CKT 1	57	0.18697		SUB 963 - SUB 977 69KV CKT 1
FDNS	00NR	2	24SP	G11_055	+	HYDROCARBON TAP - SUB 974 69KV CKT 1	57	0.18697		NEB CITY U SUB 903 - SUB 977 69KV CKT 1
FDNS	00NR	2	24SP	G11_055	+	NEB CITY U SYR SUB - SUB 970 69KV CKT 1	47	0.18697		SUB 963 - SUB 977 69KV CKT 1
FDNS	00NR	2	24SP	G11_055	+	NEB CITY U SYR SUB - SUB 970 69KV CKT 1	47	0.18697		NEB CITY U SUB 903 - SUB 977 69KV CKT 1
	00NR	2	19SP	G11 055	+	NEB CITY U SYR SUB - SUB 970 69KV CKT 1	47	0.18612		SUB 963 - SUB 977 69KV CKT 1
FDNS	OUIVIN									

H: Power Flow Analy See Next Page	ysis (Other Const	raints Not Requi	<u>iring Mitigation)</u>

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

Southwest Power Pool, Inc.

							RATEB		TC%LOADING	
SOLUTION	GROUP	SCENARIO	SEASON	SOURCE	DIRECTION	MONITORED ELEMENT	(MVA)	TDF	(% MVA)	CONTINGENCY
FDNS	00ASGI_11_004	0	14SP	ASGI_11_004	TO->FROM	BAILEY COUNTY REC-EARTH INTERCHANGE - PLANT X STATION 115KV CKT 1	160	0.05659	101.9835	DEAF SMITH COUNTY INTERCHANGE - PLANT X STATION 230KV CKT 1
FDNS	0	0	14SP	ASGI_11_004	TO->FROM	BAILEY COUNTY REC-EARTH INTERCHANGE - PLANT X STATION 115KV CKT 1	160	0.05659	101.2671	DEAF SMITH COUNTY INTERCHANGE - PLANT X STATION 230KV CKT 1
FDNS	01ALL	0	14G	ASGI_11_004	TO->FROM	CLEARWATER - MILAN TAP 138KV CKT 1	110	0.03201	184.5152	DBL-WICH-THI
FDNS	1		14G	ASGI_11_004	TO->FROM	CLEARWATER - MILAN TAP 138KV CKT 1	110		162.2636	DBL-WICH-THI
	06ALL		14G	ASGI_11_004	TO->FROM	CLEARWATER - MILAN TAP 138KV CKT 1	110			DBL-WICH-THI
FDNS	07ALL		14G	ASGI_11_004		CLEARWATER - MILAN TAP 138KV CKT 1	110			DBL-WICH-THI
FDNS	06ASGI_11_004		14G			CLEARWATER - MILAN TAP 138KV CKT 1	110		!	DBL-WICH-THI
FDNS	6		14G 14G	ASGI_11_004 ASGI 11 004	TO->FROM TO->FROM	CLEARWATER - MILAN TAP 138KV CKT 1 CLEARWATER - MILAN TAP 138KV CKT 1	110 110			DBL-WICH-THI DBL-WICH-THI
FDNS FDNS	09ALL		14G			CLEARWATER - MILAN TAP 138KV CKT 1 CLEARWATER - MILAN TAP 138KV CKT 1	110	!	1	DBL-WICH-THI
FDNS	O SALL Q		14G	ASGI 11 004	TO->FROM	CLEARWATER - MILAN TAP 136KV CKT 1 CLEARWATER - MILAN TAP 138KV CKT 1	110			DBL-WICH-THI
FDNS	01ALL		14G			FLATRDG3 - THISTLE4 138.00 138KV CKT 1	286			DBL-WICH-THI
FDNS	01ALL		14G			FPL SWITCH - MOORELAND 138KV CKT 1	287			NORTHWEST - TATONGA7 345.00 345KV CKT 1
FDNS	01ALL	C	14G	ASGI_11_004	FROM->TO	FPL SWITCH - MOORELAND 138KV CKT 1	287	0.04557	107.073	DBL-THIS-WWR
FDNS	01ALL	0	14G	ASGI_11_004	FROM->TO	FPL SWITCH - MOORELAND 138KV CKT 1	287	0.04323	103.7095	DBL-WICH-THI
FDNS	01ALL	0	14G	ASGI_11_004	TO->FROM	FPL SWITCH - WOODWARD 138KV CKT 1	153	0.04469	168.8569	NORTHWEST - TATONGA7 345.00 345KV CKT 1
FDNS	01ALL	0	14G	ASGI_11_004	TO->FROM	FPL SWITCH - WOODWARD 138KV CKT 1	153	0.04557	147.6688	DBL-THIS-WWR
FDNS	01ALL		14G	ASGI_11_004	TO->FROM	FPL SWITCH - WOODWARD 138KV CKT 1	153		141.0742	DBL-WICH-THI
FDNS	1		14G			FPL SWITCH - WOODWARD 138KV CKT 1	153		141.045	
FDNS	1		14G	ASGI_11_004	TO->FROM	FPL SWITCH - WOODWARD 138KV CKT 1	153		!	DBL-THIS-WWR
FDNS	1		14G		TO->FROM	FPL SWITCH - WOODWARD 138KV CKT 1	153		!	DBL-WICH-THI
FDNS	06ALL 01ALL		14G		TO->FROM TO->FROM	FPL SWITCH - WOODWARD 138KV CKT 1	153 153			NORTHWEST - TATONGA7 345.00 345KV CKT 1
	06ALL		14G 14G			FPL SWITCH - WOODWARD 138KV CKT 1 FPL SWITCH - WOODWARD 138KV CKT 1	153			WOODWARD (WOODWRD2) 138/69/13.2KV TRANSFORMER CKT 1 DBL-WICH-THI
FDNS	01ALL		14G 14G	ASGI_11_004 ASGI 11 004	TO->FROM	FPL SWITCH - WOODWARD 138KV CKT 1 FPL SWITCH - WOODWARD 138KV CKT 1	153			THISTLE7 345.00 - WOODWARD DISTRICT EHV 345KV CKT 2
FDNS	01ALL		14G			FPL SWITCH - WOODWARD 138KV CKT 1	153		1	THISTLE? 345.00 - WOODWARD DISTRICT EHV 345KV CKT 1
FDNS	01ALL		14G		TO->FROM	FPL SWITCH - WOODWARD 138KV CKT 1	153			IODINE - WOODWARD EHV 138KV CKT 1
	01ALL		14G			FPL SWITCH - WOODWARD 138KV CKT 1	153			DEWEY - IODINE 138KV CKT 1
FDNS	01ALL	C	14G	ASGI_11_004	TO->FROM	FPL SWITCH - WOODWARD 138KV CKT 1	153	0.04469	102.7596	G11_051T 345.00 - TATONGA7 345.00 345KV CKT 1
FDNS	06ALL	0	14G	ASGI_11_004	TO->FROM	FPL SWITCH - WOODWARD 138KV CKT 1	153	0.04199	102.7495	G11_051T 345.00 - TATONGA7 345.00 345KV CKT 1
FDNS	01ALL	0	14G	ASGI_11_004	TO->FROM	FPL SWITCH - WOODWARD 138KV CKT 1	153	0.03251	101.7809	THISTLE7 345.00 - WICHITA 345KV CKT 1
FDNS	01ALL		14G	ASGI_11_004	TO->FROM	FPL SWITCH - WOODWARD 138KV CKT 1	153		101.7809	THISTLE7 345.00 - WICHITA 345KV CKT 2
FDNS	01ALL		14G		TO->FROM	FPL SWITCH - WOODWARD 138KV CKT 1	153	!		WOODWARD - WOODWARD 69KV CKT 1
FDNS	06ALL		14G		TO->FROM	FPL SWITCH - WOODWARD 138KV CKT 1	153			WOODWARD (WOODWRD2) 138/69/13.2KV TRANSFORMER CKT 1
	06ALL		14G			FPL SWITCH - WOODWARD 138KV CKT 1	153			G11_051T 345.00 - WOODWARD DISTRICT EHV 345KV CKT 1
FDNS	01411		14G 14G			FPL SWITCH - WOODWARD 138KV CKT 1 FPL SWITCH - WOODWARD 138KV CKT 1	153			WOODWARD (WOODWRD2) 138/69/13.2KV TRANSFORMER CKT 1 LAWTON EASTSIDE - OKLAUNION 345KV CKT 1
FDNS FDNS	01ALL 01ALL		14G		TO->FROM FROM->TO	HARPER - MILAN TAP 138KV CKT 1	153 110			DBL-WICH-THI
FDNS	1	-				HARPER - MILAN TAP 138KV CKT 1	110			DBL-WICH-THI
	06ALL		14G			HARPER - MILAN TAP 138KV CKT 1	110		-	DBL-WICH-THI
FDNS	07ALL		14G			HARPER - MILAN TAP 138KV CKT 1	110	!		DBL-WICH-THI
FDNS	06ASGI_11_004	C	14G	ASGI_11_004	FROM->TO	HARPER - MILAN TAP 138KV CKT 1	110	0.03189	129.3527	DBL-WICH-THI
FDNS	6	0	14G	ASGI_11_004	FROM->TO	HARPER - MILAN TAP 138KV CKT 1	110	0.03189	129.2127	DBL-WICH-THI
FDNS	7	0	14G			HARPER - MILAN TAP 138KV CKT 1	110			DBL-WICH-THI
FDNS	09ALL		14G			HARPER - MILAN TAP 138KV CKT 1	110			DBL-WICH-THI
FDNS	9		14G			HARPER - MILAN TAP 138KV CKT 1	110			DBL-WICH-THI
	14ALL		14G			HARPER - MILAN TAP 138KV CKT 1	110			DBL-WICH-THI
FDNS	14		14G			HARPER - MILAN TAP 138KV CKT 1	110			DBL-WICH-THI
FNSL	00ASGI_11_004		24SP	ASGI_11_004		PCA INTERCHANGE - REDDY 3115.00 115KV CKT 1	160			CUNNINGHAM STATION - POTASH JUNCTION INTERCHANGE 230KV CKT 1
FNSL FDNS	06ALL		24SP 14G			PCA INTERCHANGE - REDDY 3115.00 115KV CKT 1 PLANT X STATION - TOLK STATION EAST 230KV CKT 2	160 502			CUNNINGHAM STATION - POTASH JUNCTION INTERCHANGE 230KV CKT 1 PLANT X STATION - TOLK STATION WEST 230KV CKT 1
	06ALL		14G	ASGI_11_004 ASGI 11 004		PLANT X STATION - TOLK STATION WEST 230KV CKT 2 PLANT X STATION - TOLK STATION WEST 230KV CKT 1	502			PLANT X STATION - TOLK STATION WEST 230KV CKT 1
	06ALL		14G			PLANT X STATION (WH ALM20171) 230/115/13.2KV TRANSFORMER CKT 1	252			TOLK STATION EAST - TUCO INTERCHANGE 230KV CKT 1
	09ALL		14G			CLEARWATER - MILAN TAP 138KV CKT 1	110		-	DBL-WICH-THI
	09ALL		14G			HARPER - MILAN TAP 138KV CKT 1	110	 		DBL-WICH-THI
FDNS	06ALL		14G	G11_037	FROM->TO	LAWEASOKLUNI	425			BASE CASE
FDNS	06ALL					LAWEASOKLUNI	425			BASE CASE
FDNS	0			G11_045		BAILEY COUNTY REC-EARTH INTERCHANGE - PLANT X STATION 115KV CKT 1	160			DEAF SMITH COUNTY INTERCHANGE - PLANT X STATION 230KV CKT 1
FDNS	00G11_045	C	14SP	G11_045	TO->FROM	BAILEY COUNTY REC-EARTH INTERCHANGE - PLANT X STATION 115KV CKT 1	160	0.04289	101.2671	DEAF SMITH COUNTY INTERCHANGE - PLANT X STATION 230KV CKT 1
			1			LUBBOCK SOUTH INTERCHANGE (ABB LLM60043) 230/115/13.2KV		Ι.		
FDNS	0	0	14SP	G11_045	FROM->TO	TRANSFORMER CKT 1	252	0.12886	110.6619	JONES STATION - LUBBOCK EAST INTERCHANGE 230KV CKT 1
EDNC	00011 045	_	1460	C11 045	CDOM STO	LUBBOCK SOUTH INTERCHANGE (ABB LLM60043) 230/115/13.2KV	350	0.43000	110.0010	IONES CTATION LUDDOCK FAST INTERCUANCE 220KA SKT 4
FDNS	00G11_045	C	14SP	G11_045	FROM->TO	TRANSFORMER CKT 1 LUBBOCK SOUTH INTERCHANGE (ABB LLM60043) 230/115/13.2KV	252	0.12886	110.6619	JONES STATION - LUBBOCK EAST INTERCHANGE 230KV CKT 1
FDNS	0		14SP	G11 045	FROM->TO	TRANSFORMER CKT 1	252	0.12886	105 4201	JONES STATION - LUBBOCK EAST INTERCHANGE 230KV CKT 1
כאוט ו	U		1435	011_043	1 1/O/NI->10	LUBBOCK SOUTH INTERCHANGE (ABB LLM60043) 230/115/13.2KV	252	0.12880	105.4201	PONES STATION - LOBBOCK EAST INTERCHANGE 250KV CKT 1
FDNS	00G11 045		14SP	G11_045	FROM->TO	TRANSFORMER CKT 1	252	0.12886	105 4201	JONES STATION - LUBBOCK EAST INTERCHANGE 230KV CKT 1
. 5.15	22011_073		1 131	311_073	. NOM 210		232	J.12000	103.4201	POLICE STATION LODDOON END INTERCHANGE 250KV CKT 1

							RATEB		TC%LOADING	
SOLUTION	GROUP	SCENARIO	SEASON	SOURCE	DIRECTION	MONITORED ELEMENT	(MVA)	TDF	(% MVA)	CONTINGENCY
301011011	GNOOT	JCENARIO	JEASON	JOONEL	DIRECTION	LUBBOCK SOUTH INTERCHANGE (ABB LLM60043) 230/115/13.2KV	(IVIVA)		(20 1010 A)	CONTINGENCY
FDNS		0 0	14SP	G11 045	FROM->TO	TRANSFORMER CKT 1	252	0.13578	102.7524	LUBBOCK EAST INTERCHANGE (ENRCO 136162) 230/115/13.2KV TRANSFORMER CKT 1
				-	1	LUBBOCK SOUTH INTERCHANGE (ABB LLM60043) 230/115/13.2KV				
FDNS	00G11_045	0	14SP	G11_045	FROM->TO	TRANSFORMER CKT 1	252	0.13578	102.7524	LUBBOCK EAST INTERCHANGE (ENRCO 136162) 230/115/13.2KV TRANSFORMER CKT 1
FDNS			14SP	G11_048	TO->FROM	BAILEY COUNTY REC-EARTH INTERCHANGE - PLANT X STATION 115KV CKT 1	160	0.05618		DEAF SMITH COUNTY INTERCHANGE - PLANT X STATION 230KV CKT 1
FDNS	00G11_048	0	14SP	G11_048	TO->FROM	BAILEY COUNTY REC-EARTH INTERCHANGE - PLANT X STATION 115KV CKT 1	160	0.05618	101.2671	DEAF SMITH COUNTY INTERCHANGE - PLANT X STATION 230KV CKT 1
					l	LUBBOCK SOUTH INTERCHANGE (ABB LLM60043) 230/115/13.2KV				
FDNS		0	14SP	G11_048	FROM->TO	TRANSFORMER CKT 1	252	0.03046	102.7524	LUBBOCK EAST INTERCHANGE (ENRCO 136162) 230/115/13.2KV TRANSFORMER CKT 1
FDNS	00G11 048	0	14SP	G11 048	FROM->TO	LUBBOCK SOUTH INTERCHANGE (ABB LLM60043) 230/115/13.2KV TRANSFORMER CKT 1	252	0.03046	102 7524	LUBBOCK EAST INTERCHANGE (ENRCO 136162) 230/115/13.2KV TRANSFORMER CKT 1
FNSL	00011_048		24SP	G11_048		PCA INTERCHANGE - REDDY 3115.00 115KV CKT 1	160			CUNNINGHAM STATION - POTASH JUNCTION INTERCHANGE 230KV CKT 1
FNSL	00G11 048		24SP	G11_048		PCA INTERCHANGE - REDDY 3115.00 115KV CKT 1	160			CUNNINGHAM STATION - POTASH JUNCTION INTERCHANGE 230KV CKT 1
		1				YOAKUM COUNTY INTERCHANGE (PENN CO10585) 230/115/13.2KV	+			
FDNS		0	24SP	G11_048	FROM->TO	TRANSFORMER CKT 2	150	0.05935	101.1758	YOAKUM COUNTY INTERCHANGE (GE M100899) 230/115/13.2KV TRANSFORMER CKT 1
						YOAKUM COUNTY INTERCHANGE (PENN C010585) 230/115/13.2KV				
FDNS	00G11_048	0	24SP	G11_048	FROM->TO	TRANSFORMER CKT 2	150	0.05935	101.1758	YOAKUM COUNTY INTERCHANGE (GE M100899) 230/115/13.2KV TRANSFORMER CKT 1
FDNS	01ALL		14G	G11_049	TO->FROM	CLEARWATER - MILAN TAP 138KV CKT 1	110	0.04163		DBL-WICH-THI
FDNS			14G	G11_049	TO->FROM	CLEARWATER - MILAN TAP 138KV CKT 1	110	•		DBL-WICH-THI
	06ALL	_	14G	G11_049	_	CLEARWATER - MILAN TAP 138KV CKT 1	110			DBL-WICH-THI
FDNS	07ALL		14G	G11_049	TO->FROM	CLEARWATER - MILAN TAP 138KV CKT 1	110			DBL-WICH-THI
FDNS	07ND		14G	G11_049	TO->FROM	CLEARWATER - MILAN TAP 138KV CKT 1	110			DBL-WICH-THI
FDNS	07NR	_	14G 14G	G11_049 G11_049	TO->FROM TO->FROM	CLEARWATER - MILAN TAP 138KV CKT 1 CLEARWATER - MILAN TAP 138KV CKT 1	110 110			DBL-WICH-THI DBL-WICH-THI
FDNS FDNS	07G11_049		14G	G11_049 G11_049	TO->FROM	CLEARWATER - MILAN TAP 138KV CKT 1 CLEARWATER - MILAN TAP 138KV CKT 1	110			DBL-WICH-THI
FDNS	00NR		14WP	G11_049		CLEARWATER - MILAN TAP 138KV CKT 1 CLEARWATER - MILAN TAP 138KV CKT 1	110			DBL-WICH-THI
FDNS	00NR	_	19WP	G11_049	TO->FROM	CLEARWATER - MILAN TAP 138KV CKT 1	110			DBL-WICH-THI
FDNS	09ALL		14G	G11_049	TO->FROM	CLEARWATER - MILAN TAP 138KV CKT 1	110			DBL-WICH-THI
FDNS		9 0	14G	G11_049	TO->FROM	CLEARWATER - MILAN TAP 138KV CKT 1	110	0.04174		DBL-WICH-THI
FDNS	01ALL	0	14G	G11_049	TO->FROM	EL RENO - ROMAN NOSE 138KV CKT 1	153	0.031	100.3437	NORTHWEST - TATONGA7 345.00 345KV CKT 1
FDNS	01ALL	0	14G	G11_049	TO->FROM	FLATRDG3 - THISTLE4 138.00 138KV CKT 1	286	0.05874	103.1131	DBL-WICH-THI
FDNS	01ALL		14G	G11_049	FROM->TO	FPL SWITCH - MOORELAND 138KV CKT 1	287		117.9721	NORTHWEST - TATONGA7 345.00 345KV CKT 1
FDNS	01ALL		14G	G11_049	FROM->TO	FPL SWITCH - MOORELAND 138KV CKT 1	287			DBL-THIS-WWR
FDNS	01ALL		14G	G11_049	FROM->TO	FPL SWITCH - MOORELAND 138KV CKT 1	287	_		DBL-WICH-THI
FDNS	01ALL		14G	G11_049	TO->FROM	FPL SWITCH - WOODWARD 138KV CKT 1	153			NORTHWEST - TATONGA7 345.00 345KV CKT 1
FDNS	01ALL		14G	G11_049	TO->FROM	FPL SWITCH - WOODWARD 138KV CKT 1	153			DBL-THIS-WWR
FDNS FDNS	01ALL	_	14G 14G	G11_049 G11_049	TO->FROM TO->FROM	FPL SWITCH - WOODWARD 138KV CKT 1 FPL SWITCH - WOODWARD 138KV CKT 1	153 153	•	141.0742	DBL-WICH-THI
FDNS			14G	G11_049	TO->FROM	FPL SWITCH - WOODWARD 136KV CKT 1 FPL SWITCH - WOODWARD 138KV CKT 1	153			DBL-THIS-WWR
FDNS		.1	14G	G11_049		FPL SWITCH - WOODWARD 138KV CKT 1	153			DBL-WICH-THI
FDNS	06ALL		14G	G11 049		FPL SWITCH - WOODWARD 138KV CKT 1	153	1		NORTHWEST - TATONGA7 345.00 345KV CKT 1
FDNS	01ALL	0	14G	G11_049	TO->FROM	FPL SWITCH - WOODWARD 138KV CKT 1	153			WOODWARD (WOODWRD2) 138/69/13.2KV TRANSFORMER CKT 1
FDNS	01ALL	0	14G	G11_049	TO->FROM	FPL SWITCH - WOODWARD 138KV CKT 1	153	0.06192	112.6256	GEN520997 1-MORLND2
FDNS	01ALL	0	14G	G11_049	TO->FROM	FPL SWITCH - WOODWARD 138KV CKT 1	153	0.06192	112.2287	GEN515787 1-OKLA WIND ENERGY CENTER
FDNS	01ALL	0	14G	G11_049	TO->FROM	FPL SWITCH - WOODWARD 138KV CKT 1	153		109.7223	DBL-BVR-WWRD
FDNS	06ALL		14G	G11_049	TO->FROM	FPL SWITCH - WOODWARD 138KV CKT 1	153			DBL-WICH-THI
	01ALL	-	14G	G11_049	-	FPL SWITCH - WOODWARD 138KV CKT 1	153			GEN520922 1-SLEEPING BEAR
-	01ALL		14G	G11_049		FPL SWITCH - WOODWARD 138KV CKT 1	153			GEN520998 1-MORLND3
FDNS	01ALL 01ALL		14G 14G	G11_049 G11_049	-	FPL SWITCH - WOODWARD 138KV CKT 1 FPL SWITCH - WOODWARD 138KV CKT 1	153 153			THISTLE7 345.00 - WOODWARD DISTRICT EHV 345KV CKT 2
FDNS FDNS	01ALL		14G	G11_049 G11_049	TO->FROM	FPL SWITCH - WOODWARD 138KV CKT 1 FPL SWITCH - WOODWARD 138KV CKT 1	153			THISTLE7 345.00 - WOODWARD DISTRICT EHV 345KV CKT 1 IODINE - WOODWARD EHV 138KV CKT 1
FDNS	01ALL	_	14G	G11_049 G11_049	-	FPL SWITCH - WOODWARD 138KV CKT 1 FPL SWITCH - WOODWARD 138KV CKT 1	153			DEWEY - TALOGA 138KV CKT 1
FDNS	01ALL		14G	G11_049	-	FPL SWITCH - WOODWARD 138KV CKT 1	153			BORDER 7345.00 - TUCO INTERCHANGE 345KV CKT 1
FDNS	01ALL		14G	G11_049	TO->FROM	FPL SWITCH - WOODWARD 138KV CKT 1	153			DEWEY - IODINE 138KV CKT 1
FDNS	01ALL		14G	G11_049	-	FPL SWITCH - WOODWARD 138KV CKT 1	153			BASE CASE
FDNS	01ALL		14G	G11_049	TO->FROM	FPL SWITCH - WOODWARD 138KV CKT 1	153	0.08803	102.7596	G11_051T 345.00 - TATONGA7 345.00 345KV CKT 1
FDNS	06ALL		14G	G11_049	TO->FROM	FPL SWITCH - WOODWARD 138KV CKT 1	153			G11_051T 345.00 - TATONGA7 345.00 345KV CKT 1
FDNS	01ALL		14G	G11_049	-	FPL SWITCH - WOODWARD 138KV CKT 1	153			FT SUPPLY - IODINE 138KV CKT 1
FDNS	01ALL	_	14G	G11_049	-	FPL SWITCH - WOODWARD 138KV CKT 1	153			DBL-HTCH-BVR
FDNS	01ALL		14G	G11_049	-	FPL SWITCH - WOODWARD 138KV CKT 1	153			THISTLE7 345.00 - WICHITA 345KV CKT 1
FDNS	01ALL	_	14G	G11_049	+	FPL SWITCH - WOODWARD 138KV CKT 1	153			THISTLE7 345.00 - WICHITA 345KV CKT 2
FDNS FDNS	01ALL 06ALL		14G 14G	G11_049 G11_049	TO->FROM TO->FROM	FPL SWITCH - WOODWARD 138KV CKT 1 FPL SWITCH - WOODWARD 138KV CKT 1	153 153			WOODWARD - WOODWARD 69KV CKT 1 GEN520997 1-MORLND2
FDNS	UUALL		14G 14G	G11_049 G11_049		FPL SWITCH - WOODWARD 138KV CKT 1 FPL SWITCH - WOODWARD 138KV CKT 1	153			GEN520997 1-MORLND2 GEN520997 1-MORLND2
FDNS	06ALL		14G	G11_049 G11_049	-	FPL SWITCH - WOODWARD 138KV CKT 1 FPL SWITCH - WOODWARD 138KV CKT 1	153			WOODWARD (WOODWRD2) 138/69/13.2KV TRANSFORMER CKT 1
	06ALL		14G	G11_049	-	FPL SWITCH - WOODWARD 138KV CKT 1	153			G11 051T 345.00 - WOODWARD DISTRICT EHV 345KV CKT 1
FDNS	01ALL		14G	G11_049	TO->FROM	FPL SWITCH - WOODWARD 138KV CKT 1	153			IODINE - MOORELAND 138KV CKT 1
FDNS			14G	G11_049		FPL SWITCH - WOODWARD 138KV CKT 1	153	_		WOODWARD (WOODWRD2) 138/69/13.2KV TRANSFORMER CKT 1
	•				•					

							DATED		TC0/LOADING	
SOLUTION	GROUP	SCENARIO	CEACON	SOURCE	DIRECTION	MONITORED ELEMENT	RATEB (MVA)	TDF	TC%LOADING	CONTINGENCY
	01ALL		14G	G11 049		FPL SWITCH - WOODWARD 138KV CKT 1	(IVIVA)		(% MVA)	LAWTON EASTSIDE - OKLAUNION 345KV CKT 1
	01ALL		14G	G11_049 G11_049	FROM->TO	HARPER - MILAN TAP 138KV CKT 1	110	!		DBL-WICH-THI
FDNS	1		14G	G11_049	FROM->TO	HARPER - MILAN TAP 138KV CKT 1	110			DBL-WICH-THI
	06ALL		14G	G11_049	FROM->TO	HARPER - MILAN TAP 138KV CKT 1	110		i	B DBL-WICH-THI
	07ALL		14G	G11 049	FROM->TO	HARPER - MILAN TAP 138KV CKT 1	110			DBL-WICH-THI
FDNS	6		14G	G11 049	FROM->TO	HARPER - MILAN TAP 138KV CKT 1	110	!	i	DBL-WICH-THI
FDNS	07NR	0	14G	G11_049	FROM->TO	HARPER - MILAN TAP 138KV CKT 1	110	0.04734	i	DBL-WICH-THI
FDNS	07G11_049	0	14G	G11_049	FROM->TO	HARPER - MILAN TAP 138KV CKT 1	110	0.04176	126.4635	DBL-WICH-THI
FDNS	7	0	14G	G11_049	FROM->TO	HARPER - MILAN TAP 138KV CKT 1	110	0.04176	124.4864	DBL-WICH-THI
FDNS	00NR	0	19WP	G11_049	FROM->TO	HARPER - MILAN TAP 138KV CKT 1	110	0.0482	118.2558	DBL-WICH-THI
FDNS	00NR	0	14WP	G11_049	FROM->TO	HARPER - MILAN TAP 138KV CKT 1	110	0.04668	117.331	DBL-WICH-THI
FDNS	09ALL	0	14G	G11_049	FROM->TO	HARPER - MILAN TAP 138KV CKT 1	110	0.04167	113.2317	DBL-WICH-THI
FDNS	9	0	14G	G11_049	FROM->TO	HARPER - MILAN TAP 138KV CKT 1	110	0.04174	111.3956	DBL-WICH-THI
FDNS	14ALL		14G	G11_049	FROM->TO	HARPER - MILAN TAP 138KV CKT 1	110	0.04179	109.1299	DBL-WICH-THI
FDNS	14		14G	G11_049	FROM->TO	HARPER - MILAN TAP 138KV CKT 1	110			DBL-WICH-THI
	01ALL		14G	G11_049	TO->FROM	ROMAN NOSE - SOUTHARD 138KV CKT 1	153			NORTHWEST - TATONGA7 345.00 345KV CKT 1
	09ALL		14G	G11_049	TO->FROM	CLEARWATER - MILAN TAP 138KV CKT 1	110	!		DBL-WICH-THI
	09ALL		14G	G11_049	FROM->TO	HARPER - MILAN TAP 138KV CKT 1	110			DBL-WICH-THI
	00G11_050		19SP	G11_050		COMANCHE TAP - TOSCO 69KV CKT 1	39			ANADARKO - GEORGIA 138KV CKT 1
	00G11_050		19SP			DUNCAN - TOSCO GOVU CKT 1	39			ANADARKO - GEORGIA 138KV CKT 1
	00G11_050		24SP	G11_050		DUNCAN - TOSCO 69KV CKT 1	39			ANADARKO - GEORGIA 138KV CKT 1
	06ALL		14G	G11_050	FROM->TO	LAWEASOKLUNI	425			BASE CASE
	00G11_050 00G11 050		24SP 19SP	G11_050 G11_050	TO->FROM TO->FROM	OMPA-MARLOW - RUSH SPRINGS TAP 138KV CKT 1 OMPA-MARLOW - RUSH SPRINGS TAP 138KV CKT 1	106 106			COMANCHE TAP - OMPA-DUNCAN 840 138KV CKT 1 COMANCHE TAP - OMPA-DUNCAN 840 138KV CKT 1
	00G11_050 00G11 050		193P 14SP	G11_050 G11_050		OMPA-MARLOW - RUSH SPRINGS TAP 138KV CKT 1 OMPA-MARLOW - RUSH SPRINGS TAP 138KV CKT 1	106			COMANCHE TAP - OMPA-DUNCAN 840 138KV CKT 1
	01ALL		143P 14G	G11_050 G11_051	TO->FROM	CLEARWATER - MILAN TAP 138KV CKT 1	110		i	DBL-WICH-THI
	01NR		14G	G11_051	TO->FROM	CLEARWATER - MILAN TAP 138KV CKT 1 CLEARWATER - MILAN TAP 138KV CKT 1	110			DBL-WICH-THI
	01G11 051		14G	G11_051	TO->FROM	CLEARWATER - MILAN TAP 138KV CKT 1	110			DBL-WICH-THI
FDNS	1		14G	G11_051	TO->FROM	CLEARWATER - MILAN TAP 138KV CKT 1	110	!	i	DBL-WICH-THI
	06ALL		14G	G11_051		CLEARWATER - MILAN TAP 138KV CKT 1	110		i	DBL-WICH-THI
	07ALL		14G	G11_051	TO->FROM	CLEARWATER - MILAN TAP 138KV CKT 1	110		i	B DBL-WICH-THI
FDNS	6		14G	G11_051	TO->FROM	CLEARWATER - MILAN TAP 138KV CKT 1	110			B DBL-WICH-THI
FDNS	7		14G	G11_051	TO->FROM	CLEARWATER - MILAN TAP 138KV CKT 1	110			DBL-WICH-THI
	00NR		14WP	G11_051	TO->FROM	CLEARWATER - MILAN TAP 138KV CKT 1	110	!		DBL-WICH-THI
	00NR		19WP	G11 051	TO->FROM	CLEARWATER - MILAN TAP 138KV CKT 1	110	-		DBL-WICH-THI
	09ALL		14G	G11 051	TO->FROM	CLEARWATER - MILAN TAP 138KV CKT 1	110		 	DBL-WICH-THI
FDNS	9		14G	G11 051	TO->FROM	CLEARWATER - MILAN TAP 138KV CKT 1	110	0.03822	i	DBL-WICH-THI
	01ALL		14G	G11 051	TO->FROM	EL RENO - ROMAN NOSE 138KV CKT 1	153	-		NORTHWEST - TATONGA7 345.00 345KV CKT 1
FDNS	01ALL	0	14G	G11_051	TO->FROM	FLATRDG3 - THISTLE4 138.00 138KV CKT 1	286	0.05517	103.1131	DBL-WICH-THI
FDNS	01ALL	0	14G	G11_051	FROM->TO	FPL SWITCH - MOORELAND 138KV CKT 1	287	0.1107	_	NORTHWEST - TATONGA7 345.00 345KV CKT 1
FDNS	01ALL	0	14G	G11_051	FROM->TO	FPL SWITCH - MOORELAND 138KV CKT 1	287	0.08886	107.073	DBL-THIS-WWR
FDNS	01ALL	0	14G	G11_051	FROM->TO	FPL SWITCH - MOORELAND 138KV CKT 1	287	0.07806	103.7095	DBL-WICH-THI
FDNS	01ALL	0	14G	G11_051	TO->FROM	FPL SWITCH - WOODWARD 138KV CKT 1	153	0.1107	168.8569	NORTHWEST - TATONGA7 345.00 345KV CKT 1
FDNS	01ALL	0	14G	G11_051	TO->FROM	FPL SWITCH - WOODWARD 138KV CKT 1	153	0.08886	147.6688	DBL-THIS-WWR
FDNS	01G11_051	0	14G	G11_051	TO->FROM	FPL SWITCH - WOODWARD 138KV CKT 1	153	0.11042	142.5059	NF
FDNS	01ALL	0	14G	G11_051		FPL SWITCH - WOODWARD 138KV CKT 1	153			DBL-WICH-THI
FDNS	1	0	14G	G11_051		FPL SWITCH - WOODWARD 138KV CKT 1	153	0.11041	141.045	
FDNS	01NR		14G	G11_051		FPL SWITCH - WOODWARD 138KV CKT 1	153	0.09774	131.6897	DBL-THIS-WWR
	01NR		14G	G11_051		FPL SWITCH - WOODWARD 138KV CKT 1	153			DBL-WICH-THI
FDNS	01G11_051		14G	G11_051	TO->FROM	FPL SWITCH - WOODWARD 138KV CKT 1	153			DBL-THIS-WWR
FDNS	1		14G	G11_051		FPL SWITCH - WOODWARD 138KV CKT 1	153			DBL-THIS-WWR
	01G11_051		14G	G11_051		FPL SWITCH - WOODWARD 138KV CKT 1	153			DBL-WICH-THI
FDNS	1		14G	G11_051	TO->FROM	FPL SWITCH - WOODWARD 138KV CKT 1	153			DBL-WICH-THI
-	06ALL		14G	G11_051		FPL SWITCH - WOODWARD 138KV CKT 1	153		 	NORTHWEST - TATONGA7 345.00 345KV CKT 1
	01ALL		14G	G11_051		FPL SWITCH - WOODWARD 138KV CKT 1	153			WOODWARD (WOODWRD2) 138/69/13.2KV TRANSFORMER CKT 1
	01ALL		14G	G11_051	TO->FROM	FPL SWITCH - WOODWARD 138KV CKT 1	153			GEN520997 1-MORLND2
	01ALL		14G	G11_051		FPL SWITCH - WOODWARD 138KV CKT 1	153			GEN515787 1-OKLA WIND ENERGY CENTER
	01ALL		14G	G11_051		FPL SWITCH - WOODWARD 138KV CKT 1	153	_		DBL-BVR-WWRD
	06ALL		14G	G11_051		FPL SWITCH - WOODWARD 138KV CKT 1	153			DBL-WICH-THI
	01ALL		14G	G11_051		FPL SWITCH - WOODWARD 138KV CKT 1	153			GEN520922 1-SLEEPING BEAR
	01ALL		14G	G11_051	TO->FROM	FPL SWITCH - WOODWARD 138KV CKT 1	153			GEN520998 1-MORLND3
	01ALL		14G	G11_051		FPL SWITCH - WOODWARD 138KV CKT 1	153	_		THISTLE7 345.00 - WOODWARD DISTRICT EHV 345KV CKT 2
	01ALL		14G	G11_051		FPL SWITCH - WOODWARD 138KV CKT 1	153			THISTLE7 345.00 - WOODWARD DISTRICT EHV 345KV CKT 1
	01ALL		14G	G11_051		FPL SWITCH - WOODWARD 138KV CKT 1	153			IODINE - WOODWARD EHV 138KV CKT 1
	01ALL		14G	G11_051		FPL SWITCH - WOODWARD 138KV CKT 1	153			DEWEY - TALOGA 138KV CKT 1
	01ALL		14G	G11_051		FPL SWITCH - WOODWARD 138KV CKT 1	153			BORDER 7345.00 - TUCO INTERCHANGE 345KV CKT 1
FDNS	01ALL	<u> </u>	14G	G11_051	TO->FROM	FPL SWITCH - WOODWARD 138KV CKT 1	153	0.0714	103.7072	DEWEY - IODINE 138KV CKT 1

FDNS 0 FDNS 0 FDNS 0 FDNS 0	GROUP DIALL	SCENARIO SEASON		DIRECTION	MONITORED ELEMENT	RATEB (MVA)		TC%LOADING (% MVA)	
FDNS 0 FDNS 0 FDNS 0 FDNS 0 FDNS 0 FDNS 0)1ALL						TDF	1% IVIVAI	CONTINGENCY
FDNS 0 FDNS 0 FDNS 0 FDNS 0			G11 051	TO->FROM	FPL SWITCH - WOODWARD 138KV CKT 1	153	0.06113		BASE CASE
FDNS 0 FDNS 0 FDNS 0		0 14G	G11_051	TO->FROM	FPL SWITCH - WOODWARD 138KV CKT 1	153	0.1107		G11 051T 345.00 - TATONGA7 345.00 345KV CKT 1
FDNS 0	06ALL	0 14G	G11_051	TO->FROM	FPL SWITCH - WOODWARD 138KV CKT 1	153	0.108		G11_051T
	1ALL	0 14G	G11_051	TO->FROM	FPL SWITCH - WOODWARD 138KV CKT 1	153	0.06175	102.7096	FT SUPPLY - IODINE 138KV CKT 1
EDNC -	1ALL	0 14G	G11_051	TO->FROM	FPL SWITCH - WOODWARD 138KV CKT 1	153	0.06796	102.4708	DBL-HTCH-BVR
FDNS 0	01G11_051	0 14G	G11_051	TO->FROM	FPL SWITCH - WOODWARD 138KV CKT 1	153	0.06097	102.1813	GEN520997 1-MORLND2
FDNS 0	1ALL	0 14G	G11_051	TO->FROM	FPL SWITCH - WOODWARD 138KV CKT 1	153	0.0667	102.0181	BORDER 7345.00 - WOODWARD DISTRICT EHV 345KV CKT 1
FDNS 0	1ALL	0 14G	G11_051	TO->FROM	FPL SWITCH - WOODWARD 138KV CKT 1	153	0.06514	101.7809	THISTLE7 345.00 - WICHITA 345KV CKT 1
	1ALL	0 14G	G11_051	TO->FROM	FPL SWITCH - WOODWARD 138KV CKT 1	153	0.06514		THISTLE7 345.00 - WICHITA 345KV CKT 2
)1ALL	0 14G	G11_051	TO->FROM	FPL SWITCH - WOODWARD 138KV CKT 1	153	0.06872		WOODWARD - WOODWARD 69KV CKT 1
	06ALL	0 14G	G11_051	TO->FROM	FPL SWITCH - WOODWARD 138KV CKT 1	153	0.05891		GEN520997 1-MORLND2
FDNS	1	0 14G	G11_051	TO->FROM	FPL SWITCH - WOODWARD 138KV CKT 1	153	0.06096		GEN520997 1-MORLND2
	06ALL	0 14G	G11_051	TO->FROM	FPL SWITCH - WOODWARD 138KV CKT 1	153	0.06625		WOODWARD (WOODWRD2) 138/69/13.2KV TRANSFORMER CKT 1
)1ALL	0 14G	G11_051	TO->FROM	FPL SWITCH - WOODWARD 138KV CKT 1	153	0.06175		IODINE - MOORELAND 138KV CKT 1
	01G11_051	0 14G	G11_051	TO->FROM	FPL SWITCH - WOODWARD 138KV CKT 1	153	0.06853		WOODWARD (WOODWRD2) 138/69/13.2KV TRANSFORMER CKT 1
FDNS	1	0 14G	G11_051	TO->FROM	FPL SWITCH - WOODWARD 138KV CKT 1	153	0.06852		WOODWARD (WOODWRD2) 138/69/13.2KV TRANSFORMER CKT 1
	01ALL	0 14G	G11_051	TO->FROM	FPL SWITCH - WOODWARD 138KV CKT 1	153	0.06221		LAWTON EASTSIDE - OKLAUNION 345KV CKT 1
	D1ALL	0 14G	G11_051	TO->FROM	GLASS MOUNTAIN - MOORELAND 138KV CKT 1	124	0.03196		NORTHWEST - TATONGA7 345.00 345KV CKT 1
)1ALL	0 14G	G11_051	FROM->TO	HARPER - MILAN TAP 138KV CKT 1	110	0.03811		DBL-WICH-THI
)1NR	0 14G 0 14G	G11_051 G11_051	FROM->TO FROM->TO	HARPER - MILAN TAP 138KV CKT 1 HARPER - MILAN TAP 138KV CKT 1	110 110	0.04374 0.03817		DBL-WICH THI
FDNS 0	01G11_051	0 14G 0 14G	G11_051 G11_051	FROM->TO	HARPER - MILAN TAP 138KV CKT 1 HARPER - MILAN TAP 138KV CKT 1	110	0.03817		DBL-WICH-THI DBL-WICH-THI
	1								
	06ALL 07ALL	0 14G 0 14G	G11_051 G11_051	FROM->TO FROM->TO	HARPER - MILAN TAP 138KV CKT 1 HARPER - MILAN TAP 138KV CKT 1	110 110	0.03782 0.03822		DBL-WICH-THI DBL-WICH-THI
	J/ALL 6	0 14G	G11_051 G11_051	FROM->TO	HARPER - MILAN TAP 138KV CKT 1	110	0.03822		DBL-WICH-THI
FDNS FDNS	7	0 14G	G11_051 G11_051	FROM->TO	HARPER - MILAN TAP 138KV CKT 1	110	0.03799		DBL-WICH-THI
	OONR	0 19WP	G11_051 G11_051		HARPER - MILAN TAP 138KV CKT 1	110	0.03824		DBL-WICH-THI
	OONR	0 14WP	G11_051 G11_051	FROM->TO	HARPER - MILAN TAP 138KV CKT 1	110	0.04474		DBL-WICH-THI
	9ALL	0 14G	G11_051 G11_051	FROM->TO	HARPER - MILAN TAP 138KV CKT 1	110	0.04321		DBL-WICH-THI
FDNS 0	DALL Q	0 14G	G11_051 G11_051	FROM->TO	HARPER - MILAN TAP 138KV CKT 1	110	0.03813		DBL-WICH-THI
	I4ALL	0 14G	G11_051	FROM->TO	HARPER - MILAN TAP 138KV CKT 1	110	0.03827		DBL-WICH-THI
FDNS	14	0 14G	G11_051 G11_051	FROM->TO	HARPER - MILAN TAP 138KV CKT 1	110	0.03827		DBL-WICH-THI
)1ALL	0 14G	G11_051	TO->FROM	ROMAN NOSE - SOUTHARD 138KV CKT 1	153	0.03827		NORTHWEST - TATONGA7 345.00 345KV CKT 1
	9ALL	2 14G	G11_051 G11_051	TO->FROM	CLEARWATER - MILAN TAP 138KV CKT 1	110	0.03830		DBL-WICH-THI
	9ALL	2 14G	G11_051	FROM->TO	HARPER - MILAN TAP 138KV CKT 1	110	0.03815		DBL-WICH-THI
	OINR	3 14G	G11_051	TO->FROM	CLEARWATER - MILAN TAP 138KV CKT 1	110	0.03813		DBL-WICH-THI
)1NR	3 14G	G11_051	FROM->TO	HARPER - MILAN TAP 138KV CKT 1	110	0.04337		DBL-WICH-THI
	06ALL	0 14G	G11_051	FROM->TO	LAWEASOKLUNI	425	0.05917		BASE CASE
	OONR	0 24SP	G11_055		HYDROCARBON TAP - SUB 974 69KV CKT 1	57			S977NOBKR
	OONR	0 24SP	G11_055		NEB CITY U SYR SUB - SUB 970 69KV CKT 1	47	0.18697		S977NOBKR
	00G11_055	0 24SP	G11_055		NEB CITY U SYR SUB - SUB 970 69KV CKT 1	47	0.17995		SUB 963 - SUB 977 69KV CKT 1
	00G11_055	0 24SP	G11_055		NEB CITY U SYR SUB - SUB 970 69KV CKT 1	47	0.17995		S977NOBKR
	00G11 055	0 24SP	G11 055		NEB CITY U SYR SUB - SUB 970 69KV CKT 1	47	0.17995		NEB CITY U SUB 903 - SUB 977 69KV CKT 1
	DONR	0 19SP	G11 055		NEB CITY U SYR SUB - SUB 970 69KV CKT 1	47	0.18612		S977NOBKR
	09ALL	0 14G	G11_055		SUB 967 - SUB 968 69KV CKT 1	47	1		SUB 969 - SUB 974 69KV CKT 1
	9ALL	0 14G	G11_055		SUB 968 - SUB 969 69KV CKT 1	47	1		SUB 969 - SUB 974 69KV CKT 1
	09G11_055	0 14G	G11_055		SUB 969 - SUB 974 69KV CKT 1	47	1		S968LINBUS
FDNS 0	9NR	0 14G	G11_055		SUB 969 - SUB 974 69KV CKT 1	47	1		S968LINBUS
FDNS 0	9ALL	0 14G	G11_055		SUB 969 - SUB 974 69KV CKT 1	47	1	111.8879	S968LINBUS
	9ALL	0 14G	G11_055		SUB 969 - SUB 974 69KV CKT 1	47	1	111.8804	SUB 968 - SUB 969 69KV CKT 1
FDNS 0	OONR	0 14SP	G11_055	FROM->TO	SUB 969 - SUB 974 69KV CKT 1	47	1	110.5348	S968LINBUS
FDNS 0	OONR	0 24SP	G11_055		SUB 969 - SUB 974 69KV CKT 1	47	1		S968LINBUS
FDNS 0	00G11_055	0 14SP	G11_055		SUB 969 - SUB 974 69KV CKT 1	47	1	110.515	S968LINBUS
	00G11_055	0 19SP	G11_055		SUB 969 - SUB 974 69KV CKT 1	47	1	110.5085	S968LINBUS
FDNS 0	00G11_055	0 24SP	G11_055		SUB 969 - SUB 974 69KV CKT 1	47	1	110.4788	S968LINBUS
FDNS 0	OONR	0 19SP	G11_055	FROM->TO	SUB 969 - SUB 974 69KV CKT 1	47	1	110.4085	S968LINBUS
FDNS 0	00G11_055	0 14WP	G11_055	FROM->TO	SUB 969 - SUB 974 69KV CKT 1	47	1	109.5145	S968LINBUS
FDNS 0	ONR .	0 14WP	G11_055	FROM->TO	SUB 969 - SUB 974 69KV CKT 1	47	1	109.4191	S968LINBUS
FDNS 0	00G11_055	0 19WP	G11_055	FROM->TO	SUB 969 - SUB 974 69KV CKT 1	47	1	109.4068	S968LINBUS
FDNS 0	ONR .	0 19WP	G11_055		SUB 969 - SUB 974 69KV CKT 1	47	1	109.3577	S968LINBUS
	9ALL	0 14G	G11_055		SUB 969 - SUB 974 69KV CKT 1	47	1		SUB 967 - SUB 968 69KV CKT 1
FDNS 0	ONR .	2 24SP	G11_055	TO->FROM	HYDROCARBON TAP - SUB 974 69KV CKT 1	57	0.18697		S977NOBKR
FDNS 0	ONR .	2 24SP	G11_055		NEB CITY U SYR SUB - SUB 970 69KV CKT 1	47	0.18697		S977NOBKR
FDNS 0	00G11_055	2 24SP	G11_055	TO->FROM	NEB CITY U SYR SUB - SUB 970 69KV CKT 1	47	0.17995	102.0387	SUB 963 - SUB 977 69KV CKT 1
FDNS 0	00G11_055	2 24SP	G11_055	TO->FROM	NEB CITY U SYR SUB - SUB 970 69KV CKT 1	47	0.17995	100.7491	S977NOBKR
FDNS 0	00G11_055	2 24SP	G11_055	TO->FROM	NEB CITY U SYR SUB - SUB 970 69KV CKT 1	47	0.17995		NEB CITY U SUB 903 - SUB 977 69KV CKT 1
	OONR .	2 19SP	G11 055	TO->FROM	NEB CITY U SYR SUB - SUB 970 69KV CKT 1	47	0.18612	100.2686	S977NOBKR

							RATEB		TC%LOADING	
SOLUTION	GROUP	SCENARIO S	EASON	SOURCE	DIRECTION	MONITORED ELEMENT	(MVA)	TDF	(% MVA)	CONTINGENCY
FDNS	0	0 24	4SP	G11_056	TO->FROM	MAXWELL - NORTH PLATTE 115KV CKT 1	160	0.0537	1 106.02	3 BROKEN BOW - CROOKED CREEK 115KV CKT 1
FDNS	00G11_056	0 24	4SP	G11_056	TO->FROM	MAXWELL - NORTH PLATTE 115KV CKT 1	160	0.0537	1 106.02	3 BROKEN BOW - CROOKED CREEK 115KV CKT 1
FDNS	0	0 24	4SP	G11_056	TO->FROM	MAXWELL - NORTH PLATTE 115KV CKT 1	160	0.0537	1 106.01	1 CROOKED CREEK (CR.CREEK T1) 230/115/13.8KV TRANSFORMER CKT 1
FDNS	00G11_056	0 24	4SP	G11_056	TO->FROM	MAXWELL - NORTH PLATTE 115KV CKT 1	160	0.0537	1 106.01	1 CROOKED CREEK (CR.CREEK T1) 230/115/13.8KV TRANSFORMER CKT 1
FDNS	0	0 19	9SP	G11_056	TO->FROM	MAXWELL - NORTH PLATTE 115KV CKT 1	160	0.0537	3 101.254	9 CROOKED CREEK (CR.CREEK T1) 230/115/13.8KV TRANSFORMER CKT 1
FDNS	00G11_056	0 19	9SP	G11_056	TO->FROM	MAXWELL - NORTH PLATTE 115KV CKT 1	160	0.0537	3 101.254	9 CROOKED CREEK (CR.CREEK T1) 230/115/13.8KV TRANSFORMER CKT 1
FNSL	0	0 19	9SP	G11_056	TO->FROM	MAXWELL - NORTH PLATTE 115KV CKT 1	160	0.0537		3 BROKEN BOW - CROOKED CREEK 115KV CKT 1
FNSL	00G11_056	0 19		G11_056	TO->FROM	MAXWELL - NORTH PLATTE 115KV CKT 1	160	0.0537		3 BROKEN BOW - CROOKED CREEK 115KV CKT 1
FDNS	0	0 24		G11_056A	TO->FROM	MAXWELL - NORTH PLATTE 115KV CKT 1	160	0.0314		3 BROKEN BOW - CROOKED CREEK 115KV CKT 1
FDNS	00G11_056A	0 24		G11_056A	TO->FROM	MAXWELL - NORTH PLATTE 115KV CKT 1	160			3 BROKEN BOW - CROOKED CREEK 115KV CKT 1
FDNS	0	0 24		G11_056A	TO->FROM	MAXWELL - NORTH PLATTE 115KV CKT 1	160			1 CROOKED CREEK (CR.CREEK T1) 230/115/13.8KV TRANSFORMER CKT 1
FDNS	00G11_056A	0 24		G11_056A	TO->FROM	MAXWELL - NORTH PLATTE 115KV CKT 1	160	0.0314	_	1 CROOKED CREEK (CR.CREEK T1) 230/115/13.8KV TRANSFORMER CKT 1
FDNS	0	0 19		G11_056A	TO->FROM	MAXWELL - NORTH PLATTE 115KV CKT 1	160			9 CROOKED CREEK (CR.CREEK T1) 230/115/13.8KV TRANSFORMER CKT 1
FDNS	00G11_056A	0 19		G11_056A	TO->FROM	MAXWELL - NORTH PLATTE 115KV CKT 1	160	0.0314		9 CROOKED CREEK (CR.CREEK T1) 230/115/13.8KV TRANSFORMER CKT 1
FNSL	0	0 19		G11_056A	TO->FROM	MAXWELL - NORTH PLATTE 115KV CKT 1	160	0.0314		3 BROKEN BOW - CROOKED CREEK 115KV CKT 1
FNSL	00G11_056A	0 19		G11_056A	TO->FROM	MAXWELL - NORTH PLATTE 115KV CKT 1	160			3 BROKEN BOW - CROOKED CREEK 115KV CKT 1
FDNS	00G11_057	0 24		G11_057	TO->FROM	ARKANSAS CITY - PARIS 69KV CKT 1	72			4 CRESWELL - OAK 69KV CKT 1
FDNS	00G11_057	0 19		G11_057	TO->FROM	ARKANSAS CITY - PARIS 69KV CKT 1	72			7 CRESWELL - OAK 69KV CKT 1
FDNS	00011 057	0 24		G11_057		ARKANSAS CITY - PARIS 69KV CKT 1	72			9 CRESWELL - OAK 69KV CKT 1
FDNS	00G11_057	0 14		G11_057	TO->FROM	ARKANSAS CITY - PARIS 69KV CKT 1	72 72		+	8 CRESWELL - OAK 69KV CKT 1
FNSL	00011 057	0 19		G11_057	TO->FROM	ARKANSAS CITY - PARIS 69KV CKT 1	43			1 CRESWELL - OAK 69KV CKT 1
FDNS	00G11_057	0 24		G11_057 G11_057	TO->FROM TO->FROM	CITY OF WINFIELD - RAINBOW 69KV CKT 1 CITY OF WINFIELD - RAINBOW 69KV CKT 1	43			7 OAK - STROTHER FIELD (CITY OF WINFIELD) 69KV CKT 1 4 OAK - STROTHER FIELD (CITY OF WINFIELD) 69KV CKT 1
FDNS	00G11_057	0 24				CITY OF WINFIELD - RAINBOW 69KV CKT 1 CITY OF WINFIELD - RAINBOW 69KV CKT 1	43			·
FDNS FDNS	00G11 057	0 14		G11_057 G11_057	TO->FROM	CITY OF WINFIELD - RAINBOW 69KV CKT 1 CITY OF WINFIELD - RAINBOW 69KV CKT 1	43			1 OAK - STROTHER FIELD (CITY OF WINFIELD) 69KV CKT 1 7 OAK - STROTHER FIELD (CITY OF WINFIELD) 69KV CKT 1
FDNS	00G11_037 00G11_057	0 24		G11_057 G11_057	FROM->TO	CRESWELL - OAK 69KV CKT 1	108			2 CRESWELL - PARIS 69KV CKT 1
FDNS	00G11_037 00G11_057	0 19		G11_057	FROM->TO	CRESWELL - OAK 69KV CKT 1	108			5 CRESWELL - PARIS 69KV CKT 1
FDNS	00011_037	0 24		G11_057		CRESWELL - OAK 69KV CKT 1	108	0.0670		0 CRESWELL - PARIS 69KV CKT 1
FDNS	00G11 057	0 24				CRESWELL - PARIS 69KV CKT 1	100			6 CRESWELL - OAK 69KV CKT 1
FDNS	00G11_057	0 24				CRESWELL (CRESWL1X) 138/69/13.2KV TRANSFORMER CKT 1	110			5 CRESWELL (CRESWL2X) 138/69/13.2KV TRANSFORMER CKT 1
FDNS	00G11_057	0 24		G11_057		CRESWELL (CRESWL1X) 138/69/13.2KV TRANSFORMER CKT 1	110			5 WR-B3-28
FDNS	00G11 057	0 24		G11 057		CRESWELL (CRESWL1X) 138/69/13.2KV TRANSFORMER CKT 1	110			8 CRESWELL (CRESWL2X) 138/69/13.2KV TRANSFORMER CKT 1
FDNS	00G11_057	0 24		G11_057	FROM->TO	CRESWELL (CRESWL1X) 138/69/13.2KV TRANSFORMER CKT 1	110		+	8 WR-B3-28
FDNS	00G11 057	0 19		G11 057		CRESWELL (CRESWL1X) 138/69/13.2KV TRANSFORMER CKT 1	110			7 CRESWELL (CRESWL2X) 138/69/13.2KV TRANSFORMER CKT 1
FDNS	00G11 057	0 19				CRESWELL (CRESWL1X) 138/69/13.2KV TRANSFORMER CKT 1	110		_	7 WR-B3-28
FDNS	00G11_057	0 19		G11_057	FROM->TO	CRESWELL (CRESWL1X) 138/69/13.2KV TRANSFORMER CKT 1	110	0.1334	6 112.386	6 CRESWELL (CRESWL2X) 138/69/13.2KV TRANSFORMER CKT 1
FDNS	00G11_057	0 19		G11_057	FROM->TO	CRESWELL (CRESWL1X) 138/69/13.2KV TRANSFORMER CKT 1	110	0.1334		6 WR-B3-28
FDNS	00G11_057	0 14	4SP	G11_057	FROM->TO	CRESWELL (CRESWL1X) 138/69/13.2KV TRANSFORMER CKT 1	110	0.1322	9 110.296	2 CRESWELL (CRESWL2X) 138/69/13.2KV TRANSFORMER CKT 1
FDNS	00G11_057	0 14	4SP	G11_057	FROM->TO	CRESWELL (CRESWL1X) 138/69/13.2KV TRANSFORMER CKT 1	110	0.1322	9 110.296	2 WR-B3-28
FDNS	00G11_057	0 14	4SP	G11_057	FROM->TO	CRESWELL (CRESWL1X) 138/69/13.2KV TRANSFORMER CKT 1	110	0.1322	9 108.054	6 CRESWELL (CRESWL2X) 138/69/13.2KV TRANSFORMER CKT 1
FDNS	00G11_057	0 14	4SP	G11_057	FROM->TO	CRESWELL (CRESWL1X) 138/69/13.2KV TRANSFORMER CKT 1	110	0.1322	9 108.054	6 WR-B3-28
FDNS	0	0 24	4SP	G11_057	FROM->TO	CRESWELL (CRESWL1X) 138/69/13.2KV TRANSFORMER CKT 1	110	0.1334	8 106.218	5 CRESWELL (CRESWL2X) 138/69/13.2KV TRANSFORMER CKT 1
FDNS	0	0 24	4SP	G11_057	FROM->TO	CRESWELL (CRESWL1X) 138/69/13.2KV TRANSFORMER CKT 1	110	0.1334	8 106.218	5 WR-B3-28
FDNS	0	0 24		G11_057		CRESWELL (CRESWL1X) 138/69/13.2KV TRANSFORMER CKT 1	110			5 CRESWELL (CRESWL2X) 138/69/13.2KV TRANSFORMER CKT 1
FDNS	0	0 24		G11_057		CRESWELL (CRESWL1X) 138/69/13.2KV TRANSFORMER CKT 1	110			5 WR-B3-28
FDNS	0	0 19		G11_057		CRESWELL (CRESWL1X) 138/69/13.2KV TRANSFORMER CKT 1	110			5 CRESWELL (CRESWL2X) 138/69/13.2KV TRANSFORMER CKT 1
FDNS	00G11_057	0 24		G11_057	FROM->TO	CRESWELL (CRESWL2X) 138/69/13.2KV TRANSFORMER CKT 1	110			3 CRESWELL (CRESWL1X) 138/69/13.2KV TRANSFORMER CKT 1
FDNS	00G11_057	0 24		G11_057		CRESWELL (CRESWL2X) 138/69/13.2KV TRANSFORMER CKT 1	110			3 CRESWELL (CRESWL1X) 138/69/13.2KV TRANSFORMER CKT 1
FDNS	00G11_057	0 19		G11_057	FROM->TO	CRESWELL (CRESWL2X) 138/69/13.2KV TRANSFORMER CKT 1	110		_	5 CRESWELL (CRESWL1X) 138/69/13.2KV TRANSFORMER CKT 1
FDNS	00G11_057	0 19				CRESWELL (CRESWL2X) 138/69/13.2KV TRANSFORMER CKT 1	110			9 CRESWELL (CRESWL1X) 138/69/13.2KV TRANSFORMER CKT 1
FDNS	00G11_057	0 14		G11_057		CRESWELL (CRESWL2X) 138/69/13.2KV TRANSFORMER CKT 1	110			7 CRESWELL (CRESWL1X) 138/69/13.2KV TRANSFORMER CKT 1
FDNS	00G11_057	0 14				CRESWELL (CRESWL2X) 138/69/13.2KV TRANSFORMER CKT 1	110			8 CRESWELL (CRESWLIX) 138/69/13.2KV TRANSFORMER CKT 1
FDNS	0	0 24		G11_057		CRESWELL (CRESWL2X) 138/69/13.2KV TRANSFORMER CKT 1	110			2 CRESWELL (CRESWLIX) 138/69/13.2KV TRANSFORMER CKT 1
FDNS	0	0 24		G11_057		CRESWELL (CRESWL2X) 138/69/13.2KV TRANSFORMER CKT 1	110			8 CRESWELL (CRESWLIX) 138/69/13.2KV TRANSFORMER CKT 1
FNSL	0	0 19		G11_057		CRESWELL (CRESWL2X) 138/69/13.2KV TRANSFORMER CKT 1	110			4 CRESWELL (CRESWLIX) 138/69/13.2KV TRANSFORMER CKT 1
FDNS	00G11_057	0 24				OAK - RAINBOW 69KV CKT 1	43			7 OAK - STROTHER FIELD (CITY OF WINFIELD) 69KV CKT 1
FDNS	00G11_057	0 19				OAK - RAINBOW 69KV CKT 1	43			1 OAK - STROTHER FIELD (CITY OF WINFIELD) 69KV CKT 1
FDNS	00011 057	0 24				OAK - RAINBOW 69KV CKT 1	43			4 OAK - STROTHER FIELD (CITY OF WINFIELD) 69KV CKT 1
FDNS	00G11_057	0 14		G11_057		OAK - RAINBOW 69KV CKT 1	43			1 OAK - STROTHER FIELD (CITY OF WINFIELD) 69KV CKT 1
FDNS	0	0 19	725	G11_057	FKOIVI->10	OAK - RAINBOW 69KV CKT 1	43	0.0608	oj 101.145	6 OAK - STROTHER FIELD (CITY OF WINFIELD) 69KV CKT 1

I: Power Flow Analysis (Category "C" Contingencies)

Available on Request

J: Dynamic Stability Analysis Report

None