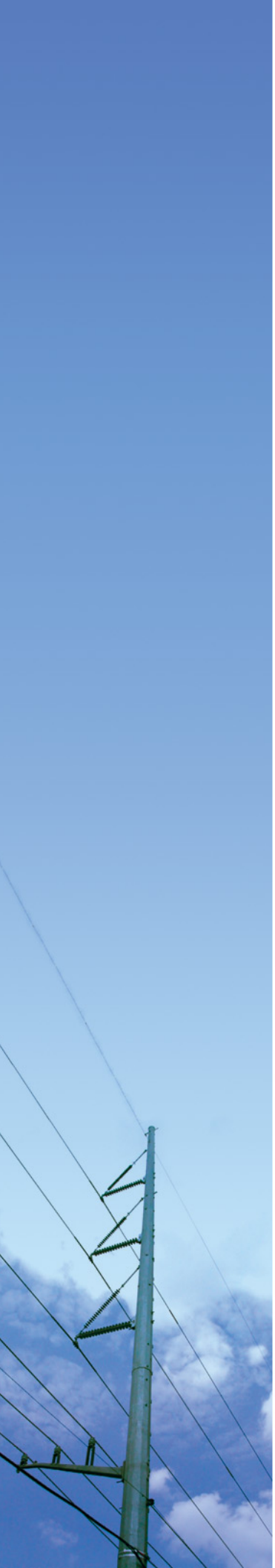

Definitive Interconnection System Impact Study for Generation Interconnection Requests

Southwest Power Pool
Engineering Department
Tariff Studies – Generation Interconnection

(DISIS-2010-001-5 Study)
March 2012

SPP RESTRICTED

SPP Southwest Power Pool

Date	Rev.	Comment
July 30, 2010	0	Issued Report
January 2011	1	Account for Withdrawn Projects
May 2011	2	Account for Withdrawn Projects
September 2011	3	Account for Withdrawn Projects
December 2011	4	Account for Withdrawn Projects
March 2012	5	Account for Withdrawn Projects

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Executive Summary

Pursuant to the Southwest Power Pool (SPP) Open Access Transmission Tariff (OATT), SPP has conducted this Definitive Interconnection System Impact Study (DISIS) for certain generation interconnection requests in the SPP Generation Interconnection Queue. These interconnection requests have been clustered together for the following Impact Study. This Impact Re-Study is being performed to account for the withdrawal of higher and equally queued customers. The customers will be referred to in this study as the DISIS-2010-001 Interconnection Customers. This Impact Study analyzes the interconnecting of multiple generation interconnection requests associated with new generation totaling 3,384.4 MW of new generation which would be located within the transmission systems of Midwest Energy Inc. (MIDW), Nebraska Public Power District (NPPD), Oklahoma Gas and Electric (OKGE), Southwestern Public Service (SPS), Sunflower Electric Power Corporation (SUNC), Westar Energy (WERE), Western Farmers Electric Cooperative (WFEC). The various generation interconnection requests have differing proposed in-service dates[1]. The generation interconnection requests included in this DISIS are listed in Appendix A by their queue number, amount, area, requested interconnection point, proposed interconnection point, and the requested in-service date.

Power flow analysis has indicated that for the power flow cases studied, 3,384.4 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.

Withdrawal of the higher queued interconnection requests has resulted in the removal of the network upgrade of the Border-Hitchland 345kV transmission line. Dynamic Stability Analysis has determined that the transmission system will remain stable with the assigned Network Upgrades and necessary reactive compensation requirements.

The total estimated minimum cost for interconnecting the DISIS-2010-001 interconnection customers is $105,391,646. These costs are shown in Appendices E and F. Interconnection Service to DISIS-2010-001 interconnection customers is also contingent upon higher queued customers paying for certain required network upgrades. The in service date for the DISIS customers will be deferred until the construction of these network upgrades can be completed.

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

Network Constraints listed in Appendix H (if provided) are in the local area of the new generation when this generation is injected throughout the SPP footprint for the Energy Resource (ER) Interconnection Request. 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.

[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 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 completion of the Facility Study.

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

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Introduction

Pursuant to the Southwest Power Pool (SPP) Open Access Transmission Tariff (OATT), SPP has conducted this Definitive Interconnection System Impact Study (DISIS) for certain generation interconnection requests in the SPP Generation Interconnection Queue. These interconnection requests have been clustered together for the following Impact Study. The customers will be referred to in this study as the DISIS-2010-001 Interconnection Customers. This Impact Study analyzes the interconnecting of multiple generation interconnection requests associated with new generation totaling 3,348.4MW of new generation which would be located within the transmission systems of Midwest Energy Inc. (MIDW), Nebraska Public Power District (NPPD), Oklahoma Gas and Electric (OKGE), Southwestern Public Service (SPS), Sunflower Electric Power Corporation (SUNC), Westar Energy (WERE), Western Farmers Electric Cooperative (WFEC). The various generation interconnection requests have differing proposed in-service dates[2]. The generation interconnection requests included in this Impact Cluster Study are listed in Appendix A by their queue number, amount, area, requested interconnection point, proposed interconnection point, and the requested in-service date.

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

Model Development

Interconnection Requests Included in the DISIS-2010-001 Study

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

Affected System Interconnection Requests - Also included in this Definitive Impact Study are four Affected System Studies, one on the Lea County Electric Cooperative system in Lea County, New Mexico (given the designation ASGI-2010-010) and wind farm requests on the Tri County Electric Cooperative system in Texas County, Oklahoma (given the designation ASGI-2010-011).

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

Previous Queued Projects

The previous queued projects included in this study are listed in Appendix B. In addition to the Base Case Upgrades, the previous queued projects and associated upgrades are assumed to be in-service

[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.

and added to the Base Case models. These projects are then dispatched as Energy Resources with equal distribution across the SPP footprint.

Development of Base Cases

Powerflow - The 2011 series Transmission Service Request (TSR) Seasonal Models including the 2012 spring, 2012 summer and winter peak, and 2017 summer and winter peak scenario 0 peak cases are used for this study. After the cases are developed, each of the control areas' resources are then re-dispatched using current dispatch orders to account for the generation interconnection requests under study.

Stability – The 2011 series SPP Model Development Working Group (MDWG) Models 2012 winter and 2012 summer are used for this study.

Base Case Upgrades

The following facilities are part of the SPP Transmission Expansion Plan or the Balanced Portfolio or recently approved Priority Projects. These facilities have been approved or are in construction stages and were assumed to be in-service at the time of dispatch and added to the base case models. The DISIS-2010-001 Customers have not been assigned cost for the below listed projects. This list may not be all inclusive. The DISIS-2010-001 Customers Generation Facilities in service dates may need to be delayed until the completion of the following upgrades. If for some reason, construction on these projects is discontinued, additional restudies will be needed to determine the interconnection needs of the DISIS customers.

- Hitchland 230/115kV area projects[3]:
  - Hitchland – Moore County 230kV, scheduled for 6/1/2012 in-service
  - Hitchland – Ochiltree 230kV Project, scheduled for 12/31/2012 in-service
- Valliant – Hugo – Sunnyside 345kV, scheduled for 4/1/2012 in-service[4]
- Rose Hill – Sooner 345kV, scheduled for 6/15/2012 in-service[5]
- Balanced Portfolio Projects[6]:
  - Woodward – Border – TUCO 345kV project, scheduled for 5/19/2014 in-service
    - Woodward 2nd 345/138kV autotransformer
    - TUCO 2nd 345/230kV autotransformer
    - Reactors at Woodward and Border
  - Iatan– Nashua 345kV, scheduled for 6/1/2015 in-service
    - Nashua 345/161kV autotransformer
  - Muskogee– Seminole 345kV, scheduled for 12/31/2012 in-service
  - Spearville – Post Rock 345kV, scheduled for 6/1/2012 in-service
    - Post Rock 345/230kV autotransformer
  - Post Rock – Axtell 345kV, scheduled for 6/1/2013 in-service
  - Cleveland – Sooner 345kV, scheduled for 12/31/2012 in-service
  - Tap Stillwell – Swissvale 345kV line at West Gardner, scheduled for 6/1/2012 in-service
- Priority Projects[7]:

[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] SPP Transmission Service Projects identified in SPP-2006-AG3-AFS-11.
[5] SPP Regional Reliability Project. Approved based on an order of the Kansas Corporation Commission issued in Docket no. 07-WSEE-715-MIS.
[6] Notice to Construct (NTC) issued June 2009.

  - Hitchland – Woodward double circuit 345kV, scheduled for 6/30/2014 in-service
    - Hitchland 345/230kV autotransfomer
  - Woodward – Thistle double circuit 345kV, scheduled for 12/31/2014 in-service
  - Spearville – Clark double circuit 345kV, scheduled for 12/31/2014 in-service
  - Clark – Thistle double circuit 345kV, scheduled for 12/31/2014 in-service
  - Thistle – Wichita double circuit 345kV, scheduled for 12/31/2014 in-service
  - Thistle 345/138kV autotransformer, scheduled for 12/31/2014 in-service
  - Thistle – Flat Ridge 138kV, scheduled for 12/31/2014 in-service
- Various Mid-Kansas Electric Transmission System Upgrades[8]
  - Harper – Flat Ridge 138kV rebuild, scheduled for 12/31/2013 in-service
  - Flat Ridge – Medicine 138kV rebuild, scheduled for 12/31/2013 in-service
  - Pratt – Medicine Lodge 115kV rebuild, scheduled for 6/1/2013 in-service
  - Medicine Lodge 138/115kV autotransformer replacement, scheduled for 6/1/2013 in-service

Contingent Upgrades

The following facilities do not yet have approval. These facilities have been assigned to higher queued interconnection customers. These facilities have been included in the models for the DISIS-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 queue. The DISIS-2011-002 Customer Generation Facilities in service dates may need to be delayed until the completion of the following upgrades.

- Finney – Holcomb 345kV circuit #2, assigned to GEN-2006-049 interconnection customer[9]
- Central Plains – Setab 115kV transmission line, assigned to GEN-2007-013 interconnection customer
- Upgrades assigned to 1st Cluster Interconnection Customers:
  - Grassland – Wolfforth 230kV
- Upgrades assigned to DISIS-2009-001 Interconnection Customers:
  - Fort Dodge – North Fort Dodge – Spearville 115kV circuit #2
  - Albion – Petersburg – Neligh 115kV rerate
  - Fort Randall – Madison County – Kelly 230kV rerate
  - Spearville 345/115kV autotransformer

Potential Upgrades Not in the Base Case

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

Regional Groupings

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

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[7] Notice to Construct (NTC) issued June 2010.
[8] SPP Transmission Service Projects identified in SPP-2007-AG3-AFS-9.
[9] Facility Study posted November 2008.

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

Powerflow - For each group, the various wind generating plants are modeled at 80% nameplate of maximum generation. The wind generating plants in the other areas are modeled at 20% nameplate of maximum generation. This process created fifteen different scenarios with each group being studied at 80% nameplate rating. These projects are dispatched as Energy Resources with equal distribution across the SPP footprint. This method allowed for the identification of network constraints that are common to the regional groupings that could then in turn have the mitigating upgrade cost allocated throughout the entire cluster. Each interconnection request is also modeled separately at 100% nameplate for certain analyses.

Peaking units are not dispatched in the 2012 spring model. To study peaking units' impacts, the 2012 and 2017 summer and winter peak model is chosen and peaking units are modeled at 100% of the nameplate rating and wind generating facilities are modeled at 10% of the nameplate rating. Each interconnection request is also modeled separately at 100% nameplate for certain analyses.

Stability - For each group, all interconnection requests (wind and non-wind) are modeled at 100% nameplate of maximum generation in both winter and summer seasonal models. The wind interconnection requests in the other areas are modeled at 20% nameplate of maximum generation while fossil units are modeled at 100% in the other areas. This process created twelve different scenarios with each group being studied at 100% nameplate rating. These projects are dispatched as Energy Resources with equal distribution across the SPP footprint.

Identification of Network Constraints

The initial set of network constraints are 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 are 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 are considered for mitigation.

Determination of Cost Allocated Network Upgrades

Cost Allocated Network Upgrades of wind generation interconnection requests are determined using the 2012 spring model. Cost Allocated Network Upgrades of peaking units is determined using the 2017 summer peak model. Once a determination of the required Network Upgrades is made, a powerflow model of the 2012 spring case is developed with all cost allocated Network Upgrades in-service. A MUST FCITC analysis is performed to determine the Power Transfer Distribution Factors (PTDF), defined as a distribution factor with system impact conditions that each generation interconnection request has on each new upgrade. The impact each generation interconnection request has on each upgrade project is weighted by the size of each request. Finally the costs due by each request for a particular project are then determined by allocating the portion of each request's impact over the impact of all the required upgrades.

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

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

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

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

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

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

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

- Repeat previous for each responsible GI request for each Project

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

Credits for Amounts Advanced for Network Upgrades

Interconnection Customer shall be entitled to credits in accordance with Attachment Z1 of the SPP Tariff for any Network Upgrades including any tax gross-up or any other tax-related payments associated with the Network Upgrades, and not refunded to the Interconnection Customer.

Interconnection Facilities

The requirement to interconnect the 3,384.4 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 $105,391,646. Interconnection Facilities, including prior allocated facilities, specific to each generation interconnection request are listed in Appendix E.

A list of constraints with greater than or equal to a 20% OTDF that are identified and used for mitigation are listed in Appendix G. Other Network Constraints in the MIDW, NPPD, OKGE, SPS, SUNC, WERE, and WFEC transmission systems that are identified are shown in Appendix H (if provided). With a defined source and sink in a TSR, this list of Network Constraints will be refined and expanded to account for all Network Upgrade requirements. A preliminary one-line drawing for each generation interconnection request are listed in Appendix D, unless a Facility Study has already been performed.

Powerflow

Powerflow Analysis Methodology

The Southwest Power Pool (SPP) Criteria states that:

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

The ACCC function of PSS/E is used to simulate single contingencies in portions or all of the modeled control areas of American Electric Power West (AEPW), Empire District Electric (EMDE), Grand River Dam Authority (GRDA), Kansas City Power & Light (KCPL), Midwest Energy (MIDW), Missouri Public Service (MIPU), Mid-Kansas Electric Company LLC (MKEC), Nebraska Public Power District (NPPD), OG&E Electric Services (OKGE), Omaha Public Power District (OPPD), Southwest Public Service (SPS), Sunflower Electric (SUNC), Westar Energy (WERE), Western Farmers Electric Cooperative (WFEC) and other control areas are applied and the resulting scenarios analyzed. This satisfies the "more probable" contingency testing criteria mandated by NERC and the SPP criteria.

Powerflow Analysis

A power flow analysis is conducted for each Interconnection Customer's facility using modified versions of the 2012 spring peak, 2012 summer and winter peak, and the 2017 summer and winter peak models. The output of the Interconnection Customer's facility is 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.

This analysis is conducted assuming that previous queued requests in the immediate area of these interconnect requests are in-service. The analysis of each Customer's project indicates that additional criteria violations will occur on the AEPW, MIDW, OKGE, SPS, SUNC, SWPA, MKEC, WERE, and WFEC transmission systems under steady state and contingency conditions in the peak seasons.

Cluster Group 1 (Woodward Area)

The Woodward area contained approximately 227.8 MW of new interconnection requests in addition to the 3,131.8 MW of prior queued interconnection requests. No new constraints were found in this area.

Cluster Group 2 (Hitchland Area)

The Hitchland area contained 781.8 MW of interconnection request in addition to the 1,617.9 MW of prior queued generation interconnection requests. No new constraints were found in this area.

Cluster Group 3 (Spearville Area)

The Spearville area contained 365.7 MW of interconnection requests and 2,331.5 MW of prior queued interconnection requests. No new constraints were found in this area.

Cluster Group 4 (Mingo/NW Kansas Group)

The Mingo/NW Kansas group had 0.0 MW in addition to the 924.0 MW of prior queued generation in the area. No new constraints were found in this area.

Cluster Group 5 (Amarillo Area)
The Amarillo group had 50.6 MW of interconnection requests in addition to the 1,922.0 MW of prior queued interconnection requests in this area. The major constraint for the GEN-2008-088 request was on the Switch 2749 substation – Wildorado 69kV line. To mitigate the constraint, the line will need to be rebuilt.

Cluster Group 6 (South Panhandle/New Mexico)
This group had 567.0 MW of interconnection requests in addition to the 1,450.0 MW of prior queued interconnection requests. The wind farm projects in Group 6 were also found to contribute to the possible voltage collapse on the Hitchland-Woodward 345kV double circuit.

Cluster Group 7 (Southwestern Oklahoma)
This group had 101.0 MW of interconnection requests in addition to the 1,568.0 MW of prior queued generation in the area. Constraints were identified near Washita. To mitigate the constraints in the area, a second Washita – Gracemont 138kV line was added.

Cluster Group 8 (South Central Kansas/North Oklahoma)
This group had 578.4 MW of interconnection requests in addition to the 1,453.0 MW of prior queued generation in the area. No new constraints were found in this area.

Cluster Group 9/10 (Nebraska)
This group had 264.0 MW of interconnection requests in addition to the 1,043.5 MW of prior queued generation in the area. The addition of this generation caused overloads on the Kelly – Madison County 230kV line. To mitigate the constraint, the rating of the line is increased by modeling certain provisions for uprating the line.

Cluster Group 11 (North Kansas)
This group had 248.1 MW of interconnection requests in addition to the 976.0 MW of prior queued generation in the area. The major constraints for the North Kansas area are the South Hays – Hays Plant – Vine Street 115kV line, and the Smoky Hills – Summit 230kV line. To mitigate the constraints, the following actions were taken: the South Hays – Hays Plant – Vine Street 115kV line was modeled as a rebuild. Also, a second Post Rock 345/230kV transformer was proposed to be added to mitigate the overloaded Smoky Hills – Summit 230kV line.

Cluster Group 12 (Northwest Arkansas)
This group had 0.0 MW of interconnection requests in addition to the 0.0 MW of prior queued generation in the area.

Cluster Group 13 (Northwest Missouri)
This group had 0.0 MW of interconnection requests in addition to the 1,590.5 MW of prior queued generation in the area. No new constraints were found in this area.

Cluster Group 14 (South Central Oklahoma)
This group had 200.0 MW of interconnection requests in addition to the 0.0 MW of prior queued generation in the area. No new constraints were found in this area.

Cluster Group 15 (Reserved)

This group has been retired and all prior Group 15 requests are now designated as Group 9/10 requests.

Stability and Power Factor Analysis

A stability analysis was performed for certain groups in this study using modified versions of the 2012 summer and 2012 winter peak models of the 2011 MDWG model series. The stability analysis is conducted with all upgrades in service that were identified in the power flow analysis. For each group, the interconnection requests are studied at 100% nameplate output while the other groups are dispatched at 20% output for wind requests and 100% output for fossil requests. The output of the Interconnection Customer's facility is offset in each model by a reduction in output of existing online SPP generation. The following synopsis is included for each group. The stability studies can be obtained upon request.

Cluster Group 1 (Woodward Area)

The analysis for Group 1 showed that a reactive power deficiency is apparent with addition of the interconnection request near Tatonga. The GEN-2008-044 and GEN-2010-011 interconnection requests will need to provide 95% lagging power factor at the point of interconnection (Tatonga). These requests combined will need to be able to provide over 71Mvar at the point of interconnection. This will require additional capacitor banks.

Power Factor Requirements:

Request	Size (MW)	Generator Model	Point of Interconnection	Final PF Requirement at POI		Estimated Capacitor Requirement (Mvar)
				Lagging (supplying)	Leading (absorbing)	
GEN-2008-044 GEN-2010-011	197.8 29.7	Siemens SWT 2.3 MW	Tatonga 345kV	0.95	1.00	TBD

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

Cluster Group 2 (Hitchland Area)

The analysis for Group 2 showed that a reactive power deficiency is apparent with addition of the interconnection request near Hitchland. The GEN-2008-047 and GEN-2010-014 interconnection requests will need to provide 95% lagging power factor at the point of interconnection. This will require additional capacitor banks. The previously assigned Border-Hitchland 345kV upgrade is no longer required for Group 2.

Power Factor Requirements:

Request	Size (MW)	Generator Model	Point of Interconnection	Final PF Requirement at POI		Estimated Capacitor Requirement (Mvar)
				Lagging (supplying)	Leading (absorbing)	
GEN-2008-047	300	G.E. 1.5MW	Tap Hitchland-Woodward 345kV	0.95	1.00	TBD
GEN-2010-014	358.8	Siemens 2.3MW	Hitchland 345kV	0.95	0.98	TBD
GEN-2010-007	73.8	Vestes V100 1.8MW	Riverside – Pringle 115kV	1.00	0.95	TBD

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

Cluster Group 3 (Spearville Area)

Power Factor Requirements:

Request	Size (MW)	Generator Model	Point of Interconnection	Final PF Requirement at POI		Estimated Capacitor Requirement (Mvar)
				Lagging (supplying)	Leading (absorbing)	
GEN-2010-009	165.6	Siemens SWT 2.3MW	Gray County 345kV (531000)(G07-040-POI)	0.95	0.95	TBD
GEN-2010-015	200.1	Siemens SWT 2.3MW	Spearville 345kV (531469)	0.95	1.000	TBD

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

Cluster Group 4 (Mingo Area)

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

Cluster Group 5 (Amarillo Area)

Power Factor Requirements:

Request	Size (MW)	Generator Model	Point of Interconnection	Final PF Requirement at POI		Estimated Capacitor Requirement (Mvar)
				Lagging (supplying)	Leading (absorbing)	
GEN-2008-088	50.6	Siemens SWT 2.3MW	Vega 69kV	1.0	0.957	No

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

Cluster Group 6 (South Panhandle Area)

Power Factor Requirements:

Request	Size (MW)	Generator Model	Point of Interconnection	Final PF Requirement at POI		Estimated Capacitor Requirement (Mvar)
				Lagging (supplying)	Leading (absorbing)	
GEN-2008-022	300	G.E. 1.5MW	Eddy – Tolk 345kV	1.00	0.96	No
GEN-2009-067S	20	Solar	Seven Rivers 69kV	0.95	0.95	
GEN-2010-006	205	GENROU	Jones 230kV	0.95	0.95	0
ASGI-2010-010	48	GENROU	Lovington 115kV	0.95	0.95	0

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

Cluster Group 7 (Southwest Oklahoma)

Power Factor Requirements:

Request	Size (MW)	Generator Model	Point of Interconnection	Final PF Requirement at POI		Estimated Capacitor Requirement (Mvar)
				Lagging (supplying)	Leading (absorbing)	
GEN-2008-037	100.8	Vestas V90 1.8MW	Washita (521089)	0.96	0.93	Yes

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

Cluster Group 8 (South Central Kansas)

Power Factor Requirements:

Request	Size (MW)	Generator Model	Point of Interconnection	Final PF Requirement at POI		Estimated Capacitor Requirement (Mvar)
				Lagging (supplying)	Leading (absorbing)	
GEN-2008-071	76.8	GE 1.6MW	Newkirk 138kV	0.95	0.95	TBD
GEN-2008-098 GEN-2010-003	100.8 100.8	Vestas V90 1.8MW	Wolf Creek – LaCygne 345kV	0.98	0.95	TBD
GEN-2010-005	300	Clipper C95 2.5MW	Wichita – Woodring 345kV	0.99	0.99	TBD

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

Cluster Group 9 (Northeast Nebraska)

Power Factor Requirements:

Request	Size (MW)	Generator Model	Point of Interconnection	Final PF Requirement at POI		Estimated Capacitor Requirement (Mvar)
				Lagging (supplying)	Leading (absorbing)	
GEN-2006-044N02	100.5	GE 1.6MW	Madison County 230kV	1.00	0.97	TBD

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

Cluster Group 10 (North Nebraska)

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

Cluster Group 11 (North Kansas)

Power Factor Requirements:

Request	Size (MW)	Generator Model	Point of Interconnection	Final PF Requirement at POI		Estimated Capacitor Requirement (Mvar)
				Lagging (supplying)	Leading (absorbing)	
GEN-2009-008	199.5	GE 1.5MW	South Hays 230kV	0.99	0.94	TBD
GEN-2009-020	48.6	Vestes V90 1.8MW	Balzine – Nekoma 69kV	1.0	0.98	+/- 15MVar SVC
GEN-2009-040	73.8	Vestes V90 1.8MW	Smittyville-Knob Hill 115kV	1.0	0.95	TBD

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

Cluster Group 12 (Northwest Arkansas)

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

Cluster Group 13 (Northwest Missouri)

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 South Central Oklahoma stability analysis revealed no stability issues with the study requests.

Power Factor Requirements:

Request	Size (MW)	Generator Model	Point of Interconnection	Final PF Requirement at POI		Estimated Capacitor Requirement (Mvar)
				Lagging (supplying)	Leading (absorbing)	
GEN-2008-046	200	Vestes V90 1.8MW	Sunnyside 345kV	0.98	0.955	TBD

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

Cluster Group 15 (Southwest Nebraska)

Power Factor Requirements:

Request	Size (MW)	Generator Model	Point of Interconnection	Final PF Requirement		Estimated Capacitor Requirement (Mvar)
				Lagging (supplying)	Leading (absorbing)	
GEN-2008-123N	89.7	Siemens SWT 2.3 MW	Pauline – Guide Rock 115kV	1.0	0.95	TBD

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

Conclusion

The minimum cost of interconnecting all of the interconnection requests included in this Impact Cluster Study is estimated at $105,391,646 for the Allocated Network Upgrades and Transmission Owner Interconnection Facilities are listed in Appendix E, F, and G. These costs do not include the cost of upgrades of other transmission facilities listed in Appendix H (if provided) 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 are being performed as part of the Interconnection System Facility Study that each customer has already executed.

The required interconnection costs listed in Appendices E, and F, and G 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).

A. Generation Interconnection Requests Considered for Impact Study

See next page.

A: Generation Interconnection Requests Considered for Impact Study

Request	Amount	Service	Area	Requested Point of Interconnection	Proposed Point of Interconnection	Requested In-Service Date
ASGI-2010-010	42.0	ER	SPS	Lovington 115kV	Lovington 115kV	
ASGI-2010-011	48.0	ER	SPS	TC-Texas County 69kV	TC-Texas County 69kV	
GEN-2006-044N02	100.5	ER	NPPD	Tap Ft Randle - Columbus (Madison County) 230kV	Tap Ft Randle - Columbus (Madison County) 230kV	
GEN-2008-022	300.0	ER	SPS	Tap Eddy Co - Tolk (Chaves County) 345kV	Tap Eddy Co - Tolk (Chaves County) 345kV	9/1/2011
GEN-2008-037	101.0	ER	WFEC	Tap Washita - Blue Canyon Wind 138kV	Tap Washita - Blue Canyon Wind 138kV	11/30/2011
GEN-2008-044	197.8	ER	OKGE	Tatonga 345kV	Tatonga 345kV	12/1/2011
GEN-2008-046	200.0	ER	OKGE	Sunnyside 345kV	Sunnyside 345kV	12/1/2010
GEN-2008-047	300.0	ER	SPS	Tap Hitchland - Woodward (Beaver County) 345kV	Tap Hitchland - Woodward Ckt 1 (Beaver County) 345kV	12/31/2012
GEN-2008-071	76.8	ER	OKGE	Newkirk 138kV	Newkirk 138kV	11/1/2010
GEN-2008-088	50.6	ER	SPS	Vega 69kV	Vega 69kV	12/1/2011
GEN-2008-098	100.8	ER	WERE	Tap Lacygne - Wolf Creek (Anderson County) 345kV	Tap Lacygne - Wolf Creek (Anderson County) 345kV	12/31/2011
GEN-2008-123N	89.7	ER	NPPD	Tap Guide Rock - Pauline 115kV	Tap Guide Rock - Pauline 115kV	
GEN-2009-008	199.5	ER	MIDW	South Hays 230kV	South Hays 230kV	9/1/2011
GEN-2009-020	48.6	ER	MIDW	Tap Nekoma - Bazine 69kV	Tap Nekoma - Bazine 69kV	12/31/2011
GEN-2009-040	73.8	ER	WERE	Tap Smittyville - Knob Hill 115kV	Tap Smittyville - Knob Hill 115kV	12/31/2012
GEN-2009-067S	20.0	ER	SPS	Seven Rivers 69kV	Seven Rivers 69kV	12/1/2010
GEN-2010-003	100.8	ER	WERE	Tap Lacygne - Wolf Creek (Anderson County) 345kV	Tap Lacygne - Wolf Creek (Anderson County) 345kV	12/31/2011
GEN-2010-005	300.0	ER	WERE	Tap Wichita - Woodring (Sumner County) 345kV	Tap Wichita - Woodring (Sumner County) 345kV	12/1/2012
GEN-2010-006	205.0	ER	SPS	Jones 230kV	Jones 230kV	6/1/2012
GEN-2010-007	73.8	ER	SPS	Tap Pringle - Riverview 115kV	Tap Pringle - Riverview 115kV	12/1/2011
GEN-2010-009	165.6	ER	SUNCMKEC	Tap Holcomb - Spearville (Gray County) 345kV	Tap Holcomb - Spearville (Gray County) 345kV	12/1/2011
GEN-2010-011	30.0	ER	OKGE	Tatonga 345kV	Tatonga 345kV	12/31/2011
GEN-2010-014	360.0	ER	SPS	Hitchland 345kV	Hitchland 345kV	12/13/2013
GEN-2010-015	200.1	ER	SUNCMKEC	Spearville 345kV	Spearville 345kV	1/1/2013
TOTAL	**3,384.4**					

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

B. Prior Queued Interconnection Requests

See next page.

B: Prior Queued Interconnection Requests

Request	Amount	Area	Requested/Proposed Point of Interconnection	Status or In-Service Date
ASGI-2010-001	400	AECI	Tap Cooper - Fairport (AECI) 345kV	AECI queue Affected Study
ASGI-2010-005	99	AECI	Lathrop (AECI) 161kV	AECI queue Affected Study
ASGI-2010-006	150	AECI	Tap Fairfax Tap - Fairfax (AECI) 138kV	AECI queue Affected Study
ASGI-2010-009	201	AECI	Osborn (AECI) 161kV	AECI queue Affected Study
GEN-2001-014	96	WFEC	Ft Supply 138kV	On-Line
GEN-2001-026	74	WFEC	Washita 138kV	On-Line
GEN-2001-033	180	SPS	San Juan Tap 230kV	On-Line
GEN-2001-036	80	SPS	Norton 115kV	On-Line
GEN-2001-037	100	OKGE	FPL Moreland Tap 138kV	On-Line
GEN-2001-039A	105	SUNCMKEC	Tap Greensburg - Ft Dodge 115kV	On Schedule for 2012
GEN-2001-039M	100	SUNCMKEC	Central Plains Tap 115kV	On-Line
GEN-2002-004	200	WERE	Latham 345kV	On-Line at 150MW
GEN-2002-005	120	WFEC	Red Hills Tap 138kV	On-Line
GEN-2002-008	240	SPS	Hitchland 345kV	On-Line at 120MW
GEN-2002-009	80	SPS	Hansford 115kV	On-Line
GEN-2002-022	240	SPS	Bushland 230kV	On-Line
GEN-2002-023N	0.8	NPPD	Harmony 115kV	On-Line
GEN-2002-025A	150	SUNCMKEC	Spearville 230kV	On-Line
GEN-2003-004 GEN-2004-023 GEN-2005-003	151.2	WFEC	Washita 138kV	On-Line
GEN-2003-005	100	WFEC	Anadarko - Paradise (Blue Canyon) 138kV	On-Line
GEN-2003-006A	200	SUNCMKEC	Elm Creek 230kV	On-Line
GEN-2003-019	250	MIDW	Smoky Hills Tap 230kV	On-Line
GEN-2003-020	160	SPS	Martin 115kV	On-Line at 80MW
GEN-2003-021N	75	NPPD	Ainsworth Wind Tap 115kV	On-Line
GEN-2003-022	120	AEPW	Washita 34.5kV	On-Line
GEN-2004-005N	30	NPPD	St Francis 115kV	IA Pending
GEN-2004-014	154.5	SUNCMKEC	Spearville 230kV	On Schedule for 2012
GEN-2004-020	27	AEPW	Washita 34.5kV	On-Line
GEN-2004-023N	75	NPPD	Columbus County 115kV	On Schedule
GEN-2005-005	18	OKGE	FPL Moreland Tap 138kV	IA Pending
GEN-2005-008	120	OKGE	Woodward 138kV	On-Line
GEN-2005-012	250	SUNCMKEC	Spearville 345kV	On Schedule for 2012
GEN-2005-013	201	WERE	Tap Latham - Neosho (Caney River) 345kV	On-Line
GEN-2006-002	101	AEPW	Sweetwater 230kV	On-Line
GEN-2006-006	205.5	SUNCMKEC	Spearville 345kV	IA Pending
GEN-2006-014	300	MIPU	Tap Maryville - Midway 161kV	On Suspension
GEN-2006-017	300	MIPU	Tap Maryville - Midway 161kV (GEN-2006-014 TAP)	On Suspension
GEN-2006-018	170	SPS	Antelope 230kV	On-Line
GEN-2006-020N	42	NPPD	Bloomfield 115kV	On-Line
GEN-2006-020S	18.9	SPS	DWS Frisco 115kV	On Schedule for 3/2012
GEN-2006-021	101	SUNCMKEC	Flat Ridge Tap 138kV	On-Line
GEN-2006-022	150	SUNCMKEC	Pratt 115kV	On Suspension
GEN-2006-024S	19.8	WFEC	Buffalo Bear Tap 69kV	On-Line
GEN-2006-026	502	SPS	Hobbs 230kV	On-Line

Request	Amount	Area	Requested/Proposed Point of Interconnection	Status or In-Service Date
GEN-2006-031	75	MIDW	Knoll 115kV	On-Line
GEN-2006-032	200	MIDW	South Hays 230kV	On Suspension
GEN-2006-034	81	SUNCMKEC	Kanarado 115kV	On Suspension
GEN-2006-035	225	AEPW	Sweetwater 230kV	On Schedule for 2011
GEN-2006-037N1	75	NPPD	Broken Bow 115kV	On Suspension
GEN-2006-038N005	80	NPPD	Broken Bow 115kV	On Schedule for 2012
GEN-2006-038N019	80	NPPD	Petersburg 115kV	On-Line
GEN-2006-039	400	SPS	Tap and Tie both Potter - Plant X 230kV and Bushland - Deaf Smith (South Randle County) 230kV	On Suspension
GEN-2006-040	108	SUNCMKEC	Mingo 115kV	On Schedule for 2012
GEN-2006-043	99	AEPW	Sweetwater 230kV	On-Line
GEN-2006-044	370	SPS	Hitchland 345kV	On Schedule for 2012
GEN-2006-044N	40.5	NPPD	Petersburg 115kV	On-Line
GEN-2006-045	240	SPS	Tap and Tie both Potter - Plant X 230kV and Bushland - Deaf Smith (South Randle County) 230kV	On Schedule for 2012
GEN-2006-046	131	OKGE	Dewey 138kV	On-Line
GEN-2006-047	240	SPS	Tap and Tie both Potter - Plant X 230kV and Bushland - Deaf Smith (South Randle County) 230kV	On Suspension
GEN-2006-049	400	SPS	Tap Finney - Hitchland (Stevens County) 345kV	On Schedule for 2014
GEN-2007-006	160	OKGE	Roman Nose 138kV	On Suspension
GEN-2007-011	135	SUNCMKEC	Syracuse 115kV	On Schedule
GEN-2007-011N08	81	NPPD	Bloomfield 115kV	On-Line
GEN-2007-013	99	SUNCMKEC	Selkirk 115kV	On Suspension
GEN-2007-015	135	WERE	Tap Kelly(WERE) - S1399(OPPD) 161kV	On Suspension
GEN-2007-017	100.5	MIPU	Tap Maryville - Midway (GEN-2006-014 TAP) 161kV	On Suspension
GEN-2007-021	201	OKGE	Tatonga 345kV	On Schedule for 2014
GEN-2007-025	300	WERE	Tap Wichita - Woodring (Sumner County) 345kV	On Schedule for 2012
GEN-2007-032	150	WFEC	Tap Clinton Junction - Clinton 138kV	On Schedule for 2012
GEN-2007-038	200	SUNCMKEC	Spearville 345kV	On Schedule for 2015
GEN-2007-040	200	SUNCMKEC	Tap Holcomb - Spearville (Gray County) 345kV	On Schedule for 2012
GEN-2007-043	200	OKGE	Minco 345kV	On-Line
GEN-2007-044	300	OKGE	Tatonga 345kV	On Schedule for 2014
GEN-2007-046	199.5	SPS	Hitchland 115kV	On Schedule for 2014
GEN-2007-048	400	SPS	Tap Amarillo S - Swisher 230kV	On Schedule for 2014
GEN-2007-050	170	OKGE	Woodward EHV 138kV	On-Line at 150MW
GEN-2007-051	200	WFEC	Mooreland 138kV	On Schedule for 2014
GEN-2007-052	150	WFEC	Anadarko 138kV	On-Line
GEN-2007-053	110	MIPU	Tap Maryville - Midway (GEN-2006-014 TAP) 161kV	On Schedule for 2013
GEN-2007-057	34.5	SPS	Moore County East 115kV	On Schedule for 2014
GEN-2007-062	765	OKGE	Woodward EHV 345kV	On Schedule for 2014
GEN-2008-003	101	OKGE	Woodward EHV 138kV	On-Line
GEN-2008-008	60	SPS	Graham 69kV	On Suspension
GEN-2008-009	60	SPS	San Juan Tap 230kV	On Schedule for 2014
GEN-2008-013	300	OKGE	Tap Wichita - Woodring (South of GEN-2007-025) 345kV	On Schedule for 2012
GEN-2008-014	150	SPS	Tap Tuco- Oklaunion 345kV	On Schedule for 2014
GEN-2008-016	248	SPS	Grassland 230kV	IA Pending
GEN-2008-017	300	SUNCMKEC	Setab 345kV	On Schedule for 2014
GEN-2008-018	405	SPS	Finney 345kV	On Schedule for 2012

Request	Amount	Area	Requested/Proposed Point of Interconnection	Status or In-Service Date
GEN-2008-019	300	OKGE	Tatonga 345kV	On Schedule for 2015
GEN-2008-021	42.0	WERE	Wolf Creek 345kV	On-Line
GEN-2008-023	150	AEPW	Hobart Junction 138kV	On Schedule for 2012
GEN-2008-025	101	SUNCMKEC	Ruleton 115kV	On Schedul for 2015
GEN-2008-029	250	OKGE	Woodward EHV 138kV	On Schedule for 2014
GEN-2008-051	322	SPS	Potter County 345kV	On Schedule for 2012
GEN-2008-079	100.5	SUNCMKEC	Tap Cudahy - Ft Dodge 115kV	On Schedule for 2012
GEN-2008-086N02	200	NPPD	Tap Ft Randle - Columbus (Madison County) 230kV	On Schedule for 2014
GEN-2008-092	201	MIDW	Postrock 230kV	IA Pending
GEN-2008-119O	60	OPPD	S1399 161kV	On-Line
GEN-2008-124	200	SUNCMKEC	Spearville 345kV	On Schedule for 2014
GEN-2008-127	200	WERE	Tap Rosehill - Sooner 345kV	On Suspension
GEN-2008-129	80	MIPU	Pleasant Hill 161kV	On-Line
GEN-2009-011	50	SUNCMKEC	Tap Plainsville - Phillipsburg 115kV	On Schedule for 2014
GEN-2009-016	100.8	AEPW	Falcon Road 138kV	On Suspension
GEN-2009-025	60	OKGE	Tap Deer Creek - Sinclair Blackwell 69kV	On Schedule for 2012
Gray County Wind (Montezuma)	110	SUNCMKEC	Haggard 115kV	On-Line
Llano Estacado (White Deer)	80	SPS	Llano Wind 115kV	On-Line
NPPD Distributed (Broken Bow)	8.3	NPPD	Broken Bow 115kV	On-Line
NPPD Distributed (Burwell)	3	NPPD	Ord 115kV	On-Line
NPPD Distributed (Columbus Hydro)	45	NPPD	Columbus 115kV	On-Line
NPPD Distributed (Jeffrey)	18.0	NPPD	Jeffrey 115kV	On-Line
NPPD Distributed (John Lake 1)	19.0	NPPD	John Lake 1 115kV	On-Line
NPPD Distributed (John Lake 2)	19.0	NPPD	John Lake 2 115kV	On-Line
NPPD Distributed (Ord)	10.8	NPPD	Ord 115kV	On-Line
NPPD Distributed (Stuart)	2.1	NPPD	Ainsworth 115kV	On-Line
SPS Distributed (Dumas 19th St)	20	SPS	Dumas 19th Street 115kV	On-Line
SPS Distributed (Etter)	20	SPS	Etter 115kV	On-Line
SPS Distributed (Moore E)	25	SPS	Moore East 115kV	On-Line
SPS Distributed (Sherman)	20	SPS	Sherman 115kV	On-Line
SPS Distributed (Spearman)	10	SPS	Spearman 69kV	On-Line
SPS Distributed (TC-Texas County)	20	SPS	Texas County 115kV	On-Line
TOTAL	**18,064.2**			

C. Study Groupings

See next page.

C. Study Groups

GROUP 1: WOODWARD AREA			
Request	**Capacity**	**Area**	**Proposed Point of Interconnection**
GEN-2001-014	96.0	WFEC	Ft Supply 138kV
GEN-2001-037	100.0	OKGE	FPL Moreland Tap 138kV
GEN-2005-005	18.0	OKGE	FPL Moreland Tap 138kV
GEN-2005-008	120.0	OKGE	Woodward 138kV
GEN-2006-024S	19.8	WFEC	Buffalo Bear Tap 69kV
GEN-2006-046	131.0	OKGE	Dewey 138kV
GEN-2007-006	160.0	OKGE	Roman Nose 138kV
GEN-2007-021	201.0	OKGE	Tatonga 345kV
GEN-2007-043	200.0	OKGE	Minco 345kV
GEN-2007-044	300.0	OKGE	Tatonga 345kV
GEN-2007-050	170.0	OKGE	Woodward EHV 138kV
GEN-2007-051	200.0	WFEC	Mooreland 138kV
GEN-2007-062	765.0	OKGE	Woodward EHV 345kV
GEN-2008-003	101.0	OKGE	Woodward EHV 138kV
GEN-2008-019	300.0	OKGE	Tatonga 345kV
GEN-2008-029	250.0	OKGE	Woodward EHV 138kV
PRIOR QUEUED SUBTOTAL	**3,131.8**		
GEN-2008-044	197.8	OKGE	Tatonga 345kV
GEN-2010-011	30.0	OKGE	Tatonga 345kV
CURRENT CLUSTER SUBTOTAL	**227.8**		
AREA TOTAL	**3,359.6**		

GROUP 2: HITCHLAND AREA			
Request	**Capacity**	**Area**	**Proposed Point of Interconnection**
GEN-2002-008	240.0	SPS	Hitchland 345kV
GEN-2002-009	80.0	SPS	Hansford 115kV
GEN-2003-020	160.0	SPS	Martin 115kV
GEN-2006-020S	18.9	SPS	DWS Frisco 115kV
GEN-2006-044	370.0	SPS	Hitchland 345kV
GEN-2006-049	400.0	SPS	Tap Finney - Hitchland (Stevens County) 345kV
GEN-2007-046	199.5	SPS	Hitchland 115kV
GEN-2007-057	34.5	SPS	Moore County East 115kV
SPS Distributed (Dumas 19th St)	20.0	SPS	Dumas 19th Street 115kV
SPS Distributed (Etter)	20.0	SPS	Etter 115kV
SPS Distributed (Moore E)	25.0	SPS	Moore East 115kV
SPS Distributed (Sherman)	20.0	SPS	Sherman 115kV
SPS Distributed (Spearman)	10.0	SPS	Spearman 69kV
SPS Distributed (TC-Texas County)	20.0	SPS	Texas County 115kV
PRIOR QUEUED SUBTOTAL	**1,617.9**		
ASGI-2010-011	48.0	SPS	TC-Texas County 69kV
GEN-2008-047	300.0	SPS	Tap Hitchland - Woodward Ckt 1 (Beaver County) 345kV
GEN-2010-007	73.8	SPS	Tap Pringle - Riverview 115kV
GEN-2010-014	360.0	SPS	Hitchland 345kV
CURRENT CLUSTER SUBTOTAL	**781.8**		
AREA TOTAL	**2,399.7**		

GROUP 3: SPEARVILLE AREA

Request	Capacity	Area	Proposed Point of Interconnection
GEN-2001-039A	105.0	SUNCMKEC	Tap Greensburg - Ft Dodge 115kV
GEN-2002-025A	150.0	SUNCMKEC	Spearville 230kV
GEN-2004-014	154.5	SUNCMKEC	Spearville 230kV
GEN-2005-012	250.0	SUNCMKEC	Spearville 345kV
GEN-2006-006	205.5	SUNCMKEC	Spearville 345kV
GEN-2006-021	101.0	SUNCMKEC	Flat Ridge Tap 138kV
GEN-2006-022	150.0	SUNCMKEC	Pratt 115kV
GEN-2007-038	200.0	SUNCMKEC	Spearville 345kV
GEN-2007-040	200.0	SUNCMKEC	Tap Holcomb - Spearville (Gray County) 345kV
GEN-2008-018	405.0	SPS	Finney 345kV
GEN-2008-079	100.5	SUNCMKEC	Tap Cudahy - Ft Dodge 115kV
GEN-2008-124	200.0	SUNCMKEC	Spearville 345kV
Gray County Wind (Montezuma)	110.0	SUNCMKEC	Haggard 115kV
PRIOR QUEUED SUBTOTAL	**2,331.5**		
GEN-2010-009	165.6	SUNCMKEC	Tap Holcomb - Spearville (Gray County) 345kV
GEN-2010-015	200.1	SUNCMKEC	Spearville 345kV
CURRENT CLUSTER SUBTOTAL	**365.7**		
AREA TOTAL	**2,697.2**		

GROUP 4: MINGO/NW KANSAS AREA

Request	Capacity	Area	Proposed Point of Interconnection
GEN-2001-039M	100.0	SUNCMKEC	Central Plains Tap 115kV
GEN-2006-034	81.0	SUNCMKEC	Kanarado 115kV
GEN-2006-040	108.0	SUNCMKEC	Mingo 115kV
GEN-2007-011	135.0	SUNCMKEC	Syracuse 115kV
GEN-2007-013	99.0	SUNCMKEC	Selkirk 115kV
GEN-2008-017	300.0	SUNCMKEC	Setab 345kV
GEN-2008-025	101.0	SUNCMKEC	Ruleton 115kV
PRIOR QUEUED SUBTOTAL	**924.0**		
AREA TOTAL	**924.0**		

GROUP 5: AMARILLO AREA			
Request	**Capacity**	**Area**	**Proposed Point of Interconnection**
GEN-2002-022	240.0	SPS	Bushland 230kV
GEN-2006-039	400.0	SPS	Tap and Tie both Potter - Plant X 230kV and Bushland - Deaf Smith (South Randle County) 230kV
GEN-2006-045	240.0	SPS	Tap and Tie both Potter - Plant X 230kV and Bushland - Deaf Smith (South Randle County) 230kV
GEN-2006-047	240.0	SPS	Tap and Tie both Potter - Plant X 230kV and Bushland - Deaf Smith (South Randle County) 230kV
GEN-2007-048	400.0	SPS	Tap Amarillo S - Swisher 230kV
GEN-2008-051	322.0	SPS	Potter County 345kV
Llano Estacado (White Deer)	80.0	SPS	Llano Wind 115kV
PRIOR QUEUED SUBTOTAL	**1,922.0**		
GEN-2008-088	50.6	SPS	Vega 69kV
CURRENT CLUSTER SUBTOTAL	**50.6**		
AREA TOTAL	**1,972.6**		

GROUP 6: S-TX PANHANDLE/NW AREA			
Request	**Capacity**	**Area**	**Proposed Point of Interconnection**
GEN-2001-033	180.0	SPS	San Juan Tap 230kV
GEN-2001-036	80.0	SPS	Norton 115kV
GEN-2006-018	170.0	SPS	Antelope 230kV
GEN-2006-026	502.0	SPS	Hobbs 230kV
GEN-2008-008	60.0	SPS	Graham 69kV
GEN-2008-009	60.0	SPS	San Juan Tap 230kV
GEN-2008-014	150.0	SPS	Tap Tuco- Oklaunion 345kV
GEN-2008-016	248.0	SPS	Grassland 230kV
PRIOR QUEUED SUBTOTAL	**1,450.0**		
ASGI-2010-010	42.0	SPS	Lovington 115kV
GEN-2008-022	300.0	SPS	Tap Eddy Co - Tolk (Chaves County) 345kV
GEN-2009-067S	20.0	SPS	Seven Rivers 69kV
GEN-2010-006	205.0	SPS	Jones 230kV
CURRENT CLUSTER SUBTOTAL	**567.0**		
AREA TOTAL	**2,017.0**		

GROUP 7: SW OKLAHOMA AREA

Request	Capacity	Area	Proposed Point of Interconnection
GEN-2001-026	74.0	WFEC	Washita 138kV
GEN-2002-005	120.0	WFEC	Red Hills Tap 138kV
GEN-2003-004 GEN-2004-023 GEN-2005-003	151.2	WFEC	Washita 138kV
GEN-2003-005	100.0	WFEC	Anadarko - Paradise (Blue Canyon) 138kV
GEN-2003-022	120.0	AEPW	Washita 34.5kV
GEN-2004-020	27.0	AEPW	Washita 34.5kV
GEN-2006-002	101.0	AEPW	Sweetwater 230kV
GEN-2006-035	225.0	AEPW	Sweetwater 230kV
GEN-2006-043	99.0	AEPW	Sweetwater 230kV
GEN-2007-032	150.0	WFEC	Tap Clinton Junction - Clinton 138kV
GEN-2007-052	150.0	WFEC	Anadarko 138kV
GEN-2008-023	150.0	AEPW	Hobart Junction 138kV
GEN-2009-016	100.8	AEPW	Falcon Road 138kV
PRIOR QUEUED SUBTOTAL	**1,568.0**		
GEN-2008-037	101.0	WFEC	Tap Washita - Blue Canyon Wind 138kV
CURRENT CLUSTER SUBTOTAL	**101.0**		
AREA TOTAL	**1,669.0**		

GROUP 8: N-OK/S-KS AREA

Request	Capacity	Area	Proposed Point of Interconnection
ASGI-2010-006	150.0	AECI	Tap Fairfax Tap - Fairfax (AECI) 138kV
GEN-2002-004	200.0	WERE	Latham 345kV
GEN-2005-013	201.0	WERE	Tap Latham - Neosho (Caney River) 345kV
GEN-2007-025	300.0	WERE	Tap Wichita - Woodring (Sumner County) 345kV
GEN-2008-013	300.0	OKGE	Tap Wichita - Woodring (South of GEN-2007-025) 345kV
GEN-2008-021	42.0	WERE	Wolf Creek 345kV
GEN-2008-127	200.0	WERE	Tap Rosehill - Sooner 345kV
GEN-2009-025	60.0	OKGE	Tap Deer Creek - Sinclair Blackwell 69kV
PRIOR QUEUED SUBTOTAL	**1,453.0**		
GEN-2008-071	76.8	OKGE	Newkirk 138kV
GEN-2008-098	100.8	WERE	Tap Lacygne - Wolf Creek (Anderson County) 345kV
GEN-2010-003	100.8	WERE	Tap Lacygne - Wolf Creek (Anderson County) 345kV
GEN-2010-005	300.0	WERE	Tap Wichita - Woodring (Sumner County) 345kV
CURRENT CLUSTER SUBTOTAL	**578.4**		
AREA TOTAL	**2,031.4**		

GROUP 9/10: NEBRASKA AREA			
Request	**Capacity**	**Area**	**Proposed Point of Interconnection**
GEN-2002-023N	0.8	NPPD	Harmony 115kV
GEN-2003-021N	75.0	NPPD	Ainsworth Wind Tap 115kV
GEN-2004-005N	30.0	NPPD	St Francis 115kV
GEN-2004-023N	75.0	NPPD	Columbus County 115kV
GEN-2006-020N	42.0	NPPD	Bloomfield 115kV
GEN-2006-037N1	75.0	NPPD	Broken Bow 115kV
GEN-2006-038N005	80.0	NPPD	Broken Bow 115kV
GEN-2006-038N019	80.0	NPPD	Petersburg 115kV
GEN-2006-044N	40.5	NPPD	Petersburg 115kV
GEN-2007-011N08	81.0	NPPD	Bloomfield 115kV
GEN-2007-015	135.0	WERE	Tap Kelly(WERE) - S1399(OPPD) 161kV
GEN-2008-086N02	200.0	NPPD	Tap Ft Randle - Columbus (Madison County) 230kV
GEN-2008-119O	60.0	OPPD	S1399 161kV
NPPD Distributed (Broken Bow)	8.3	NPPD	Broken Bow 115kV
NPPD Distributed (Burwell)	3.0	NPPD	Ord 115kV
NPPD Distributed (Columbus Hydro)	45.0	NPPD	Columbus 115kV
NPPD Distributed (Ord)	10.8	NPPD	Ord 115kV
NPPD Distributed (Stuart)	2.1	NPPD	Ainsworth 115kV
PRIOR QUEUED SUBTOTAL	**1,043.5**		
GEN-2006-044N02	100.5	NPPD	Tap Ft Randle - Columbus (Madison County) 230kV
GEN-2008-123N	89.7	NPPD	Tap Guide Rock - Pauline 115kV
GEN-2009-040	73.8	WERE	Tap Smittyville - Knob Hill 115kV
CURRENT CLUSTER SUBTOTAL	**264.0**		
AREA TOTAL	**1,307.5**		

GROUP 11: N KANSAS AREA

Request	Capacity	Area	Proposed Point of Interconnection
GEN-2003-006A	200.0	SUNCMKEC	Elm Creek 230kV
GEN-2003-019	250.0	MIDW	Smoky Hills Tap 230kV
GEN-2006-031	75.0	MIDW	Knoll 115kV
GEN-2006-032	200.0	MIDW	South Hays 230kV
GEN-2008-092	201.0	MIDW	Postrock 230kV
GEN-2009-011	50.0	SUNCMKEC	Tap Plainsville - Phillipsburg 115kV
PRIOR QUEUED SUBTOTAL	**976.0**		
GEN-2009-008	199.5	MIDW	South Hays 230kV
GEN-2009-020	48.6	MIDW	Tap Nekoma - Bazine 69kV
CURRENT CLUSTER SUBTOTAL	**248.1**		
AREA TOTAL	**1,224.1**		

GROUP 12: NW AR AREA

Request	Capacity	Area	Proposed Point of Interconnection
AREA TOTAL	**0.0**		

GROUP 13: NW MISSOURI AREA

Request	Capacity	Area	Proposed Point of Interconnection
ASGI-2010-001	400.0	AECI	Tap Cooper - Fairport (AECI) 345kV
ASGI-2010-005	99.0	AECI	Lathrop (AECI) 161kV
ASGI-2010-009	201.0	AECI	Osborn (AECI) 161kV
GEN-2006-014	300.0	MIPU	Tap Maryville - Midway 161kV
GEN-2006-017	300.0	MIPU	Tap Maryville - Midway 161kV (GEN-2006-014 TAP)
GEN-2007-017	100.5	MIPU	Tap Maryville - Midway (GEN-2006-014 TAP) 161kV
GEN-2007-053	110.0	MIPU	Tap Maryville - Midway (GEN-2006-014 TAP) 161kV
GEN-2008-129	80.0	MIPU	Pleasant Hill 161kV
PRIOR QUEUED SUBTOTAL	**1,590.5**		
AREA TOTAL	**1,590.5**		

GROUP 14: S OKLAHOMA AREA			
Request	**Capacity**	**Area**	**Proposed Point of Interconnection**
GEN-2008-046	200.0	OKGE	Sunnyside 345kV
CURRENT CLUSTER SUBTOTAL	**200.0**		
AREA TOTAL	**200.0**		

GROUP 15: RESERVED			
Request	**Capacity**	**Area**	**Proposed Point of Interconnection**
AREA TOTAL	**0.0**		

CLUSTER TOTAL (CURRENT STUDY)	**3,384.4**	**MW**
PQ TOTAL (PRIOR QUEUED)	**18,008.2**	**MW**
CLUSTER TOTAL (INCLUDING PRIOR QUEUED)	**21,392.6**	**MW**

D. Proposed Point of Interconnection One line Diagrams

Refer to the separately posted Facility Study for each request for the most up to date 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 Perviously Allocated Network Upgrades*)

Interconnection Request and Upgrades	Upgrade Type	Allocated Cost	Upgrade Cost
ASGI-2010-010			
ASGI-2010-010 Interconnection Costs See Oneline Diagram.	Current Study	$0.00	$0.00
Beaver - Woodward 345kV Dbl CKT Priority Project: Hitchland - Woodward Dbl 345kV CKT (Total Project E&C Cost Shown)	Previously Allocated		$226,790,727.00
Border - Tuco Interchange 345KV CKT 1 Balanced Portfolio: Tuco - Woodward 345kV CKT 1 (Total Project E&C Cost Shown)	Previously Allocated		$143,377,063.00
Border - Woodward 345KV CKT 1 Balanced Portfolio: Tuco - Woodward 345kV CKT 1 (Total Project E&C Cost Shown)	Previously Allocated		$143,377,063.00
Hitchland - Beaver 345kV Dbl CKT Priority Project: Hitchland - Woodward Dbl 345kV CKT (Total Project E&C Cost Shown)	Previously Allocated		$226,790,727.00
Hitchland 345/230kV Autotransformer CKT 2 Priority Project: Hitchland 345/230kV Autotransformer CKT 2 (Total Project E&C Cost Shown).	Previously Allocated		$8,883,760.00
Thistle - Wichita 345KV Dbl CKT Priority Project: Thistle - Wichita Dbl 345kV CKT (Total Project E&C Cost Shown.)	Previously Allocated		$168,750,000.00
Thistle - Woodward 345KV Dbl CKT Priority Project: Thistle - Woodward Dbl 345kV CKT (Total Project E&C Cost Shown)	Previously Allocated		$212,090,000.00
Thistle 345/138KV Transformer CKT 1 Priority Project: Thistle 345/138kV Transformer CKT 1 & Thistle - Flat Ridge 138kV CKT 1 (Total Project E&C Cost Shown.)	Previously Allocated		$9,106,306.00
Woodward XFMR 345/138/13.8kV CKT 2 Balanced Portfolio: Woodward 345/138kV Transformer CKT 2 & 50 MVAR Reactor (Total Project E&C Cost Shown).	Previously Allocated		$15,000,000.00
	Current Study Total	$0.00	
ASGI-2010-011			
ASGI-2010-011 Interconnection Costs See Oneline Diagram.	Current Study	$0.00	$0.00
Beaver - Woodward 345kV Dbl CKT Priority Project: Hitchland - Woodward Dbl 345kV CKT (Total Project E&C Cost Shown)	Previously Allocated		$226,790,727.00
Clark - Thistle 345KV Dbl CKT Priority Project: Spearville - Clark - Thistle Dbl 345kV CKT (Total Project E&C Cost Shown.)	Previously Allocated		$291,088,131.00

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

Interconnection Request and Upgrades	Upgrade Type	Allocated Cost	Upgrade Cost
Finney Switching Station - Holcomb 345KV CKT 2 Per GEN-2006-049 Facility Study	Previously Allocated		$10,507,445.00
Hitchland - Beaver 345kV Dbl CKT Priority Project: Hitchland - Woodward Dbl 345kV CKT (Total Project E&C Cost Shown)	Previously Allocated		$226,790,727.00
Hitchland 345/230kV Autotransformer CKT 2 Priority Project: Hitchland 345/230kV Autotransformer CKT 2 (Total Project E&C Cost Shown).	Previously Allocated		$8,883,760.00
Spearville -Clark 345KV Dbl CKT Priority Project: Spearville - Clark - Thistle Dbl 345kV CKT (Total Project E&C Cost Shown.)	Previously Allocated		$291,088,131.00
Thistle - Wichita 345KV Dbl CKT Priority Project: Thistle - Wichita Dbl 345kV CKT (Total Project E&C Cost Shown.)	Previously Allocated		$168,750,000.00
Thistle - Woodward 345KV Dbl CKT Priority Project: Thistle - Woodward Dbl 345kV CKT (Total Project E&C Cost Shown)	Previously Allocated		$212,090,000.00
Thistle 345/138KV Transformer CKT 1 Priority Project: Thistle 345/138kV Transformer CKT 1 & Thistle - Flat Ridge 138kV CKT 1 (Total Project E&C Cost Shown.)	Previously Allocated		$9,106,306.00
Woodward XFMR 345/138/13.8kV CKT 2 Balanced Portfolio: Woodward 345/138kV Transformer CKT 2 & 50 MVAR Reactor (Total Project E&C Cost Shown).	Previously Allocated		$15,000,000.00
	Current Study Total	$0.00	
GEN-2006-044N02			
GEN-2006-044N02 Interconnection Costs See Oneline Diagram.	Current Study	$2,100,000.00	$2,100,000.00
Madison Co - Kelly 230kV CKT 1 Upgrade conductor clearance to 100°C for 478MVA rating	Current Study	$3,600,000.00	$3,600,000.00
	Current Study Total	$5,700,000.00	
GEN-2008-022			
GEN-2008-022 Interconnection Costs See Oneline Diagram.	Current Study	$13,042,997.00	$13,042,997.00
Beaver - Woodward 345kV Dbl CKT Priority Project: Hitchland - Woodward Dbl 345kV CKT (Total Project E&C Cost Shown)	Previously Allocated		$226,790,727.00
Border - Tuco Interchange 345KV CKT 1 Balanced Portfolio: Tuco - Woodward 345kV CKT 1 (Total Project E&C Cost Shown)	Previously Allocated		$143,377,063.00
Border - Woodward 345KV CKT 1 Balanced Portfolio: Tuco - Woodward 345kV CKT 1 (Total Project E&C Cost Shown)	Previously Allocated		$143,377,063.00

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

Interconnection Request and Upgrades	Upgrade Type	Allocated Cost	Upgrade Cost
Hitchland - Beaver 345kV Dbl CKT Priority Project: Hitchland - Woodward Dbl 345kV CKT (Total Project E&C Cost Shown)	Previously Allocated		$226,790,727.00
Hitchland 345/230kV Autotransformer CKT 2 Priority Project: Hitchland 345/230kV Autotransformer CKT 2 (Total Project E&C Cost Shown).	Previously Allocated		$8,883,760.00
Thistle - Wichita 345KV Dbl CKT Priority Project: Thistle - Wichita Dbl 345kV CKT (Total Project E&C Cost Shown.)	Previously Allocated		$168,750,000.00
Thistle - Woodward 345KV Dbl CKT Priority Project: Thistle - Woodward Dbl 345kV CKT (Total Project E&C Cost Shown)	Previously Allocated		$212,090,000.00
Thistle 345/138KV Transformer CKT 1 Priority Project: Thistle 345/138kV Transformer CKT 1 & Thistle - Flat Ridge 138kV CKT 1 (Total Project E&C Cost Shown.)	Previously Allocated		$9,106,306.00
Woodward XFMR 345/138/13.8kV CKT 2 Balanced Portfolio: Woodward 345/138kV Transformer CKT 2 & 50 MVAR Reactor (Total Project E&C Cost Shown).	Previously Allocated		$15,000,000.00
	Current Study Total	$13,042,997.00	
GEN-2008-037			
GEN-2008-037 Interconnection Costs See Oneline Diagram.	Current Study	$1,500,000.00	$1,500,000.00
Washita - Gracemont 138kV CKT 2 Build approximately 11 miles of 138kV.	Current Study	$5,621,986.00	$5,621,986.00
	Current Study Total	$7,121,986.00	
GEN-2008-044			
GEN-2008-044 Interconnection Costs See Oneline Diagram.	Current Study	$3,403,020.00	$3,403,020.00
Border - Tuco Interchange 345KV CKT 1 Balanced Portfolio: Tuco - Woodward 345kV CKT 1 (Total Project E&C Cost Shown)	Previously Allocated		$143,377,063.00
Border - Woodward 345KV CKT 1 Balanced Portfolio: Tuco - Woodward 345kV CKT 1 (Total Project E&C Cost Shown)	Previously Allocated		$143,377,063.00
Thistle - Wichita 345KV Dbl CKT Priority Project: Thistle - Wichita Dbl 345kV CKT (Total Project E&C Cost Shown.)	Previously Allocated		$168,750,000.00
Thistle - Woodward 345KV Dbl CKT Priority Project: Thistle - Woodward Dbl 345kV CKT (Total Project E&C Cost Shown)	Previously Allocated		$212,090,000.00
Thistle 345/138KV Transformer CKT 1 Priority Project: Thistle 345/138kV Transformer CKT 1 & Thistle - Flat Ridge 138kV CKT 1 (Total Project E&C Cost Shown.)	Previously Allocated		$9,106,306.00

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

Interconnection Request and Upgrades	Upgrade Type	Allocated Cost	Upgrade Cost
TUCO Interchange 345/230/13.2KV Autotransformer CKT 2 Balanced Portfolio: TUCO 345/230 kV Transformer CKT 2 (Total Project E&C Cost Shown)	Previously Allocated		$14,900,907.00
Woodward XFMR 345/138/13.8kV CKT 2 Balanced Portfolio: Woodward 345/138kV Transformer CKT 2 & 50 MVAR Reactor (Total Project E&C Cost Shown).	Previously Allocated		$15,000,000.00
	Current Study Total	$3,403,020.00	
GEN-2008-046			
GEN-2008-046 Interconnection Costs See Oneline Diagram.	Current Study	$3,073,333.00	$3,073,333.00
Hugo - Valliant 345kV CKT 1 NTC 200018 for In Service 4/1/2012.	Previously Allocated		$18,000,000.00
TUCO Interchange 345/230/13.2KV Autotransformer CKT 2 Balanced Portfolio: TUCO 345/230 kV Transformer CKT 2 (Total Project E&C Cost Shown)	Previously Allocated		$14,900,907.00
	Current Study Total	$3,073,333.00	
GEN-2008-047			
GEN-2008-047 Interconnection Costs See Oneline Diagram.	Current Study	$9,276,873.00	$9,276,873.00
Beaver - Woodward 345kV Dbl CKT Priority Project: Hitchland - Woodward Dbl 345kV CKT (Total Project E&C Cost Shown)	Previously Allocated		$226,790,727.00
Border - Tuco Interchange 345KV CKT 1 Balanced Portfolio: Tuco - Woodward 345kV CKT 1 (Total Project E&C Cost Shown)	Previously Allocated		$143,377,063.00
Border - Woodward 345KV CKT 1 Balanced Portfolio: Tuco - Woodward 345kV CKT 1 (Total Project E&C Cost Shown)	Previously Allocated		$143,377,063.00
Finney Switching Station - Holcomb 345KV CKT 2 Per GEN-2006-049 Facility Study	Previously Allocated		$10,507,445.00
Thistle - Wichita 345KV Dbl CKT Priority Project: Thistle - Wichita Dbl 345kV CKT (Total Project E&C Cost Shown.)	Previously Allocated		$168,750,000.00
Thistle - Woodward 345KV Dbl CKT Priority Project: Thistle - Woodward Dbl 345kV CKT (Total Project E&C Cost Shown)	Previously Allocated		$212,090,000.00
Thistle 345/138KV Transformer CKT 1 Priority Project: Thistle 345/138kV Transformer CKT 1 & Thistle - Flat Ridge 138kV CKT 1 (Total Project E&C Cost Shown.)	Previously Allocated		$9,106,306.00
Woodward XFMR 345/138/13.8kV CKT 2 Balanced Portfolio: Woodward 345/138kV Transformer CKT 2 & 50 MVAR Reactor (Total Project E&C Cost Shown).	Previously Allocated		$15,000,000.00

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

Interconnection Request and Upgrades	Upgrade Type	Allocated Cost	Upgrade Cost
	Current Study Total	$9,276,873.00	
GEN-2008-071			
GEN-2008-071 Interconnection Costs See Oneline Diagram.	Current Study	$2,889,212.00	$2,889,212.00
Cleveland - Sooner 345KV CKT 1 Balanced Portfolio: Cleveland - Sooner 345kV CKT 1 (Total Project E&C Cost Shown).	Previously Allocated		$70,806,000.00
	Current Study Total	$2,889,212.00	
GEN-2008-088			
GEN-2008-088 Interconnection Costs See Oneline Diagram.	Current Study	$759,933.00	$759,933.00
Switch 2749 - Wildorado 69kV CKT 1 Rebuild approximately 4 miles of 69kV.	Current Study	$2,124,897.00	$2,124,897.00
Beaver - Woodward 345kV Dbl CKT Priority Project: Hitchland - Woodward Dbl 345kV CKT (Total Project E&C Cost Shown)	Previously Allocated		$226,790,727.00
Border - Tuco Interchange 345KV CKT 1 Balanced Portfolio: Tuco - Woodward 345kV CKT 1 (Total Project E&C Cost Shown)	Previously Allocated		$143,377,063.00
Border - Woodward 345KV CKT 1 Balanced Portfolio: Tuco - Woodward 345kV CKT 1 (Total Project E&C Cost Shown)	Previously Allocated		$143,377,063.00
Hitchland - Beaver 345kV Dbl CKT Priority Project: Hitchland - Woodward Dbl 345kV CKT (Total Project E&C Cost Shown)	Previously Allocated		$226,790,727.00
Hitchland 345/230kV Autotransformer CKT 2 Priority Project: Hitchland 345/230kV Autotransformer CKT 2 (Total Project E&C Cost Shown).	Previously Allocated		$8,883,760.00
Thistle - Wichita 345KV Dbl CKT Priority Project: Thistle - Wichita Dbl 345kV CKT (Total Project E&C Cost Shown.)	Previously Allocated		$168,750,000.00
Thistle - Woodward 345KV Dbl CKT Priority Project: Thistle - Woodward Dbl 345kV CKT (Total Project E&C Cost Shown)	Previously Allocated		$212,090,000.00
Thistle 345/138KV Transformer CKT 1 Priority Project: Thistle 345/138kV Transformer CKT 1 & Thistle - Flat Ridge 138kV CKT 1 (Total Project E&C Cost Shown.)	Previously Allocated		$9,106,306.00
Woodward XFMR 345/138/13.8kV CKT 2 Balanced Portfolio: Woodward 345/138kV Transformer CKT 2 & 50 MVAR Reactor (Total Project E&C Cost Shown).	Previously Allocated		$15,000,000.00
	Current Study Total	$2,884,830.00	
GEN-2008-098			

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

Interconnection Request and Upgrades	Upgrade Type	Allocated Cost	Upgrade Cost
GEN-2008-098 Interconnection Costs See Oneline Diagram.	Current Study	$8,259,000.00	$8,259,000.00
Cleveland - Sooner 345KV CKT 1 Balanced Portfolio: Cleveland - Sooner 345kV CKT 1 (Total Project E&C Cost Shown).	Previously Allocated		$70,806,000.00
	Current Study Total	$8,259,000.00	
GEN-2008-123N			
GEN-2008-123N Interconnection Costs See Oneline Diagram.Includes 115kV breakers at Guide Rock.	Current Study	$6,700,000.00	$6,700,000.00
Axtell - PostRock 345KV CKT 1 Balanced Portfolio: PostRock - Axtell 345kV CKT 1 (Total Project E&C Cost Shown)	Previously Allocated		$93,302,649.00
Post Rock 345/230/13.8KV Autotransformer CKT 1 Balanced Portfolio: PostRock Autotransformer 345/230/13.8kV CKT 1 (Total Project E&C Cost Shown)	Previously Allocated		$3,994,000.00
	Current Study Total	$6,700,000.00	
GEN-2009-008			
GEN-2009-008 Interconnection Costs See Oneline Diagram.	Current Study	$414,378.00	$414,378.00
Post Rock 345/230/13.8kV Autotransformer CKT 2 DISIS-2010-001 Restudy	Current Study	$10,529,144.40	$13,749,527.00
South Hays - Hays Plant - Vine Street 115kV CKT 1 Rebuild approximately 4 miles of 115kV.	Current Study	$2,838,857.36	$3,000,000.00
Axtell - PostRock 345KV CKT 1 Balanced Portfolio: PostRock - Axtell 345kV CKT 1 (Total Project E&C Cost Shown)	Previously Allocated		$93,302,649.00
Clark - Thistle 345KV Dbl CKT Priority Project: Spearville - Clark - Thistle Dbl 345kV CKT (Total Project E&C Cost Shown.)	Previously Allocated		$291,088,131.00
Hitchland 345/230kV Autotransformer CKT 2 Priority Project: Hitchland 345/230kV Autotransformer CKT 2 (Total Project E&C Cost Shown).	Previously Allocated		$8,883,760.00
Post Rock 345/230/13.8KV Autotransformer CKT 1 Balanced Portfolio: PostRock Autotransformer 345/230/13.8kV CKT 1 (Total Project E&C Cost Shown)	Previously Allocated		$3,994,000.00
Spearville - Postrock 345kV CKT 1 Balanced Portfolio: Spearville - PostRock 345kV CKT 1 (Total Project E&C Cost Shown)	Previously Allocated		$77,703,351.00
Spearville -Clark 345KV Dbl CKT Priority Project: Spearville - Clark - Thistle Dbl 345kV CKT (Total Project E&C Cost Shown.)	Previously Allocated		$291,088,131.00

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

Interconnection Request and Upgrades	Upgrade Type	Allocated Cost	Upgrade Cost
Thistle - Wichita 345KV Dbl CKT Priority Project: Thistle - Wichita Dbl 345kV CKT (Total Project E&C Cost Shown.)	Previously Allocated		$168,750,000.00
	Current Study Total	$13,782,379.76	

GEN-2009-020

GEN-2009-020 Interconnection Costs See Oneline Diagram.	Current Study	$1,664,657.00	$1,664,657.00
Post Rock 345/230/13.8kV Autotransformer CKT 2 DISIS-2010-001 Restudy	Current Study	$775,047.13	$13,749,527.00
South Hays - Hays Plant - Vine Street 115kV CKT 1 Rebuild approximately 4 miles of 115kV.	Current Study	$161,142.64	$3,000,000.00
Axtell - PostRock 345KV CKT 1 Balanced Portfolio: PostRock - Axtell 345kV CKT 1 (Total Project E&C Cost Shown)	Previously Allocated		$93,302,649.00
Beaver - Woodward 345kV Dbl CKT Priority Project: Hitchland - Woodward Dbl 345kV CKT (Total Project E&C Cost Shown)	Previously Allocated		$226,790,727.00
Clark - Thistle 345KV Dbl CKT Priority Project: Spearville - Clark - Thistle Dbl 345kV CKT (Total Project E&C Cost Shown.)	Previously Allocated		$291,088,131.00
Hitchland - Beaver 345kV Dbl CKT Priority Project: Hitchland - Woodward Dbl 345kV CKT (Total Project E&C Cost Shown)	Previously Allocated		$226,790,727.00
Hitchland 345/230kV Autotransformer CKT 2 Priority Project: Hitchland 345/230kV Autotransformer CKT 2 (Total Project E&C Cost Shown).	Previously Allocated		$8,883,760.00
Iatan - Nashua 345KV CKT 1 Balanced Portfolio: Iatan - Nashua 345kV CKT 1 (Total Project E&C Cost Shown).	Previously Allocated		$49,824,000.00
Post Rock 345/230/13.8KV Autotransformer CKT 1 Balanced Portfolio: PostRock Autotransformer 345/230/13.8kV CKT 1 (Total Project E&C Cost Shown)	Previously Allocated		$3,994,000.00
Spearville - Postrock 345kV CKT 1 Balanced Portfolio: Spearville - PostRock 345kV CKT 1 (Total Project E&C Cost Shown)	Previously Allocated		$77,703,351.00
Spearville -Clark 345KV Dbl CKT Priority Project: Spearville - Clark - Thistle Dbl 345kV CKT (Total Project E&C Cost Shown.)	Previously Allocated		$291,088,131.00
Thistle - Wichita 345KV Dbl CKT Priority Project: Thistle - Wichita Dbl 345kV CKT (Total Project E&C Cost Shown.)	Previously Allocated		$168,750,000.00
	Current Study Total	$2,600,846.77	

GEN-2009-040

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

Interconnection Request and Upgrades	Upgrade Type	Allocated Cost	Upgrade Cost
GEN-2009-040 Interconnection Costs See Oneline Diagram.	Current Study	$5,240,000.00	$5,240,000.00
	Current Study Total	$5,240,000.00	
GEN-2009-067S			
GEN-2009-067S Interconnection Costs See Oneline Diagram.	Current Study	$1,306,757.00	$1,306,757.00
Beaver - Woodward 345kV Dbl CKT Priority Project: Hitchland - Woodward Dbl 345kV CKT (Total Project E&C Cost Shown)	Previously Allocated		$226,790,727.00
Border - Tuco Interchange 345KV CKT 1 Balanced Portfolio: Tuco - Woodward 345kV CKT 1 (Total Project E&C Cost Shown)	Previously Allocated		$143,377,063.00
Border - Woodward 345KV CKT 1 Balanced Portfolio: Tuco - Woodward 345kV CKT 1 (Total Project E&C Cost Shown)	Previously Allocated		$143,377,063.00
Hitchland - Beaver 345kV Dbl CKT Priority Project: Hitchland - Woodward Dbl 345kV CKT (Total Project E&C Cost Shown)	Previously Allocated		$226,790,727.00
Hitchland 345/230kV Autotransformer CKT 2 Priority Project: Hitchland 345/230kV Autotransformer CKT 2 (Total Project E&C Cost Shown).	Previously Allocated		$8,883,760.00
Thistle - Wichita 345KV Dbl CKT Priority Project: Thistle - Wichita Dbl 345kV CKT (Total Project E&C Cost Shown.)	Previously Allocated		$168,750,000.00
Thistle - Woodward 345KV Dbl CKT Priority Project: Thistle - Woodward Dbl 345kV CKT (Total Project E&C Cost Shown)	Previously Allocated		$212,090,000.00
Thistle 345/138KV Transformer CKT 1 Priority Project: Thistle 345/138kV Transformer CKT 1 & Thistle - Flat Ridge 138kV CKT 1 (Total Project E&C Cost Shown.)	Previously Allocated		$9,106,306.00
Woodward XFMR 345/138/13.8kV CKT 2 Balanced Portfolio: Woodward 345/138kV Transformer CKT 2 & 50 MVAR Reactor (Total Project E&C Cost Shown).	Previously Allocated		$15,000,000.00
	Current Study Total	$1,306,757.00	
GEN-2010-003			
GEN-2010-003 Interconnection Costs See Oneline Diagram.	Current Study	$26,000.00	$26,000.00
Cleveland - Sooner 345KV CKT 1 Balanced Portfolio: Cleveland - Sooner 345kV CKT 1 (Total Project E&C Cost Shown).	Previously Allocated		$70,806,000.00
	Current Study Total	$26,000.00	
GEN-2010-005			

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

Interconnection Request and Upgrades	Upgrade Type	Allocated Cost	Upgrade Cost
GEN-2010-005 Interconnection Costs See Oneline Diagram.	Current Study	$26,000.00	$26,000.00
Cleveland - Sooner 345KV CKT 1 Balanced Portfolio: Cleveland - Sooner 345kV CKT 1 (Total Project E&C Cost Shown).	Previously Allocated		$70,806,000.00
	Current Study Total	$26,000.00	
GEN-2010-006			
GEN-2010-006 Interconnection Costs See Oneline Diagram.	Current Study	$1,408,514.00	$1,408,514.00
Beaver - Woodward 345kV Dbl CKT Priority Project: Hitchland - Woodward Dbl 345kV CKT (Total Project E&C Cost Shown)	Previously Allocated		$226,790,727.00
Thistle - Wichita 345KV Dbl CKT Priority Project: Thistle - Wichita Dbl 345kV CKT (Total Project E&C Cost Shown.)	Previously Allocated		$168,750,000.00
Thistle - Woodward 345KV Dbl CKT Priority Project: Thistle - Woodward Dbl 345kV CKT (Total Project E&C Cost Shown)	Previously Allocated		$212,090,000.00
Thistle 345/138KV Transformer CKT 1 Priority Project: Thistle 345/138kV Transformer CKT 1 & Thistle - Flat Ridge 138kV CKT 1 (Total Project E&C Cost Shown.)	Previously Allocated		$9,106,306.00
Woodward XFMR 345/138/13.8kV CKT 2 Balanced Portfolio: Woodward 345/138kV Transformer CKT 2 & 50 MVAR Reactor (Total Project E&C Cost Shown).	Previously Allocated		$15,000,000.00
	Current Study Total	$1,408,514.00	
GEN-2010-007			
GEN-2010-007 Interconnection Costs See Oneline Diagram.	Current Study	$2,867,363.00	$2,867,363.00
Beaver - Woodward 345kV Dbl CKT Priority Project: Hitchland - Woodward Dbl 345kV CKT (Total Project E&C Cost Shown)	Previously Allocated		$226,790,727.00
Finney Switching Station - Holcomb 345KV CKT 2 Per GEN-2006-049 Facility Study	Previously Allocated		$10,507,445.00
Hitchland - Beaver 345kV Dbl CKT Priority Project: Hitchland - Woodward Dbl 345kV CKT (Total Project E&C Cost Shown)	Previously Allocated		$226,790,727.00
Hitchland 345/230kV Autotransformer CKT 2 Priority Project: Hitchland 345/230kV Autotransformer CKT 2 (Total Project E&C Cost Shown).	Previously Allocated		$8,883,760.00
Thistle - Wichita 345KV Dbl CKT Priority Project: Thistle - Wichita Dbl 345kV CKT (Total Project E&C Cost Shown.)	Previously Allocated		$168,750,000.00

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

Interconnection Request and Upgrades	Upgrade Type	Allocated Cost	Upgrade Cost
Thistle - Woodward 345KV Dbl CKT Priority Project: Thistle - Woodward Dbl 345kV CKT (Total Project E&C Cost Shown)	Previously Allocated		$212,090,000.00
Thistle 345/138KV Transformer CKT 1 Priority Project: Thistle 345/138kV Transformer CKT 1 & Thistle - Flat Ridge 138kV CKT 1 (Total Project E&C Cost Shown.)	Previously Allocated		$9,106,306.00
Woodward XFMR 345/138/13.8kV CKT 2 Balanced Portfolio: Woodward 345/138kV Transformer CKT 2 & 50 MVAR Reactor (Total Project E&C Cost Shown).	Previously Allocated		$15,000,000.00
	Current Study Total	$2,867,363.00	
GEN-2010-009			
GEN-2010-009 Interconnection Costs See Oneline Diagram.	Current Study	$5,014,906.00	$5,014,906.00
Post Rock 345/230/13.8kV Autotransformer CKT 2 DISIS-2010-001 Restudy	Current Study	$958,498.26	$13,749,527.00
Axtell - PostRock 345KV CKT 1 Balanced Portfolio: PostRock - Axtell 345kV CKT 1 (Total Project E&C Cost Shown)	Previously Allocated		$93,302,649.00
Border - Tuco Interchange 345KV CKT 1 Balanced Portfolio: Tuco - Woodward 345kV CKT 1 (Total Project E&C Cost Shown)	Previously Allocated		$143,377,063.00
Border - Woodward 345KV CKT 1 Balanced Portfolio: Tuco - Woodward 345kV CKT 1 (Total Project E&C Cost Shown)	Previously Allocated		$143,377,063.00
Clark - Thistle 345KV Dbl CKT Priority Project: Spearville - Clark - Thistle Dbl 345kV CKT (Total Project E&C Cost Shown.)	Previously Allocated		$291,088,131.00
Hitchland 345/230kV Autotransformer CKT 2 Priority Project: Hitchland 345/230kV Autotransformer CKT 2 (Total Project E&C Cost Shown).	Previously Allocated		$8,883,760.00
Post Rock 345/230/13.8KV Autotransformer CKT 1 Balanced Portfolio: PostRock Autotransformer 345/230/13.8kV CKT 1 (Total Project E&C Cost Shown)	Previously Allocated		$3,994,000.00
Spearville - Postrock 345kV CKT 1 Balanced Portfolio: Spearville - PostRock 345kV CKT 1 (Total Project E&C Cost Shown)	Previously Allocated		$77,703,351.00
Spearville -Clark 345KV Dbl CKT Priority Project: Spearville - Clark - Thistle Dbl 345kV CKT (Total Project E&C Cost Shown.)	Previously Allocated		$291,088,131.00
Thistle - Wichita 345KV Dbl CKT Priority Project: Thistle - Wichita Dbl 345kV CKT (Total Project E&C Cost Shown.)	Previously Allocated		$168,750,000.00
Thistle - Woodward 345KV Dbl CKT Priority Project: Thistle - Woodward Dbl 345kV CKT (Total Project E&C Cost Shown)	Previously Allocated		$212,090,000.00

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

Interconnection Request and Upgrades	Upgrade Type	Allocated Cost	Upgrade Cost
TUCO Interchange 345/230/13.2KV Autotransformer CKT 2 Balanced Portfolio: TUCO 345/230 kV Transformer CKT 2 (Total Project E&C Cost Shown)	Previously Allocated		$14,900,907.00
Woodward XFMR 345/138/13.8kV CKT 2 Balanced Portfolio: Woodward 345/138kV Transformer CKT 2 & 50 MVAR Reactor (Total Project E&C Cost Shown).	Previously Allocated		$15,000,000.00
	Current Study Total	$5,973,404.26	

GEN-2010-011

GEN-2010-011 Interconnection Costs See Oneline Diagram. Costs included in GEN-2008-044 Interconnection	Current Study	$0.00	$0.00
Border - Tuco Interchange 345KV CKT 1 Balanced Portfolio: Tuco - Woodward 345kV CKT 1 (Total Project E&C Cost Shown)	Previously Allocated		$143,377,063.00
Border - Woodward 345KV CKT 1 Balanced Portfolio: Tuco - Woodward 345kV CKT 1 (Total Project E&C Cost Shown)	Previously Allocated		$143,377,063.00
Thistle - Wichita 345KV Dbl CKT Priority Project: Thistle - Wichita Dbl 345kV CKT (Total Project E&C Cost Shown.)	Previously Allocated		$168,750,000.00
Thistle - Woodward 345KV Dbl CKT Priority Project: Thistle - Woodward Dbl 345kV CKT (Total Project E&C Cost Shown)	Previously Allocated		$212,090,000.00
Thistle 345/138KV Transformer CKT 1 Priority Project: Thistle 345/138kV Transformer CKT 1 & Thistle - Flat Ridge 138kV CKT 1 (Total Project E&C Cost Shown.)	Previously Allocated		$9,106,306.00
TUCO Interchange 345/230/13.2KV Autotransformer CKT 2 Balanced Portfolio: TUCO 345/230 kV Transformer CKT 2 (Total Project E&C Cost Shown)	Previously Allocated		$14,900,907.00
Woodward XFMR 345/138/13.8kV CKT 2 Balanced Portfolio: Woodward 345/138kV Transformer CKT 2 & 50 MVAR Reactor (Total Project E&C Cost Shown).	Previously Allocated		$15,000,000.00
	Current Study Total	$0.00	

GEN-2010-014

GEN-2010-014 Interconnection Costs See Oneline Diagram.	Current Study	$3,307,387.00	$3,307,387.00
Beaver - Woodward 345kV Dbl CKT Priority Project: Hitchland - Woodward Dbl 345kV CKT (Total Project E&C Cost Shown)	Previously Allocated		$226,790,727.00
Border - Tuco Interchange 345KV CKT 1 Balanced Portfolio: Tuco - Woodward 345kV CKT 1 (Total Project E&C Cost Shown)	Previously Allocated		$143,377,063.00
Border - Woodward 345KV CKT 1 Balanced Portfolio: Tuco - Woodward 345kV CKT 1 (Total Project E&C Cost Shown)	Previously Allocated		$143,377,063.00

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

Interconnection Request and Upgrades	Upgrade Type	Allocated Cost	Upgrade Cost
Finney Switching Station - Holcomb 345KV CKT 2 Per GEN-2006-049 Facility Study	Previously Allocated		$10,507,445.00
Thistle - Wichita 345KV Dbl CKT Priority Project: Thistle - Wichita Dbl 345kV CKT (Total Project E&C Cost Shown.)	Previously Allocated		$168,750,000.00
Thistle - Woodward 345KV Dbl CKT Priority Project: Thistle - Woodward Dbl 345kV CKT (Total Project E&C Cost Shown)	Previously Allocated		$212,090,000.00
Thistle 345/138KV Transformer CKT 1 Priority Project: Thistle 345/138kV Transformer CKT 1 & Thistle - Flat Ridge 138kV CKT 1 (Total Project E&C Cost Shown.)	Previously Allocated		$9,106,306.00
Woodward XFMR 345/138/13.8kV CKT 2 Balanced Portfolio: Woodward 345/138kV Transformer CKT 2 & 50 MVAR Reactor (Total Project E&C Cost Shown).	Previously Allocated		$15,000,000.00
	Current Study Total	$3,307,387.00	
GEN-2010-015			
GEN-2010-015 Interconnection Costs See Oneline Diagram.	Current Study	$5,014,906.00	$5,014,906.00
Post Rock 345/230/13.8kV Autotransformer CKT 2 DISIS-2010-001 Restudy	Current Study	$1,486,837.20	$13,749,527.00
Axtell - PostRock 345KV CKT 1 Balanced Portfolio: PostRock - Axtell 345kV CKT 1 (Total Project E&C Cost Shown)	Previously Allocated		$93,302,649.00
Border - Tuco Interchange 345KV CKT 1 Balanced Portfolio: Tuco - Woodward 345kV CKT 1 (Total Project E&C Cost Shown)	Previously Allocated		$143,377,063.00
Border - Woodward 345KV CKT 1 Balanced Portfolio: Tuco - Woodward 345kV CKT 1 (Total Project E&C Cost Shown)	Previously Allocated		$143,377,063.00
Clark - Thistle 345KV Dbl CKT Priority Project: Spearville - Clark - Thistle Dbl 345kV CKT (Total Project E&C Cost Shown.)	Previously Allocated		$291,088,131.00
Hitchland 345/230kV Autotransformer CKT 2 Priority Project: Hitchland 345/230kV Autotransformer CKT 2 (Total Project E&C Cost Shown).	Previously Allocated		$8,883,760.00
Post Rock 345/230/13.8KV Autotransformer CKT 1 Balanced Portfolio: PostRock Autotransformer 345/230/13.8kV CKT 1 (Total Project E&C Cost Shown)	Previously Allocated		$3,994,000.00
Spearville - Postrock 345kV CKT 1 Balanced Portfolio: Spearville - PostRock 345kV CKT 1 (Total Project E&C Cost Shown)	Previously Allocated		$77,703,351.00
Spearville -Clark 345KV Dbl CKT Priority Project: Spearville - Clark - Thistle Dbl 345kV CKT (Total Project E&C Cost Shown.)	Previously Allocated		$291,088,131.00

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

Interconnection Request and Upgrades	Upgrade Type	Allocated Cost	Upgrade Cost
Thistle - Wichita 345KV Dbl CKT Priority Project: Thistle - Wichita Dbl 345kV CKT (Total Project E&C Cost Shown.)	Previously Allocated		$168,750,000.00
Thistle - Woodward 345KV Dbl CKT Priority Project: Thistle - Woodward Dbl 345kV CKT (Total Project E&C Cost Shown)	Previously Allocated		$212,090,000.00
TUCO Interchange 345/230/13.2KV Autotransformer CKT 2 Balanced Portfolio: TUCO 345/230 kV Transformer CKT 2 (Total Project E&C Cost Shown)	Previously Allocated		$14,900,907.00
Woodward XFMR 345/138/13.8kV CKT 2 Balanced Portfolio: Woodward 345/138kV Transformer CKT 2 & 50 MVAR Reactor (Total Project E&C Cost Shown).	Previously Allocated		$15,000,000.00
	Current Study Total	$6,501,743.20	
	TOTAL CURRENT STUDY COSTS:	**$105,391,645.99**	

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

F. Cost Allocation per Proposed Study Network Upgrade

Important Note:

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

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

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

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

Appendix F. Cost Allocation by Upgrade

ASGI-2010-010 Interconnection Costs		**$0.00**
See Oneline Diagram.		
	ASGI-2010-010	$0.00
	Total Allocated Costs	**$0.00**
ASGI-2010-011 Interconnection Costs		**$0.00**
See Oneline Diagram.		
	ASGI-2010-011	$0.00
	Total Allocated Costs	**$0.00**
GEN-2006-044N02 Interconnection Costs		**$2,100,000.00**
See Oneline Diagram.		
	GEN-2006-044N02	$2,100,000.00
	Total Allocated Costs	**$2,100,000.00**
GEN-2008-022 Interconnection Costs		**$13,042,997.00**
See Oneline Diagram.		
	GEN-2008-022	$13,042,997.00
	Total Allocated Costs	**$13,042,997.00**
GEN-2008-037 Interconnection Costs		**$1,500,000.00**
See Oneline Diagram.		
	GEN-2008-037	$1,500,000.00
	Total Allocated Costs	**$1,500,000.00**
GEN-2008-044 Interconnection Costs		**$3,403,020.00**
See Oneline Diagram.		
	GEN-2008-044	$3,403,020.00
	Total Allocated Costs	**$3,403,020.00**
GEN-2008-046 Interconnection Costs		**$3,073,333.00**
See Oneline Diagram.		
	GEN-2008-046	$3,073,333.00
	Total Allocated Costs	**$3,073,333.00**
GEN-2008-047 Interconnection Costs		**$9,276,873.00**
See Oneline Diagram.		
	GEN-2008-047	$9,276,873.00

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

Total Allocated Costs	**$9,276,873.00**	

GEN-2008-071 Interconnection Costs **$2,889,212.00**

See Oneline Diagram.

GEN-2008-071	$2,889,212.00	
Total Allocated Costs	**$2,889,212.00**	

GEN-2008-088 Interconnection Costs **$759,933.00**

See Oneline Diagram.

GEN-2008-088	$759,933.00	
Total Allocated Costs	**$759,933.00**	

GEN-2008-098 Interconnection Costs **$8,259,000.00**

See Oneline Diagram.

GEN-2008-098	$8,259,000.00	
Total Allocated Costs	**$8,259,000.00**	

GEN-2008-123N Interconnection Costs **$6,700,000.00**

See Oneline Diagram.Includes 115kV breakers at Guide Rock.

GEN-2008-123N	$6,700,000.00	
Total Allocated Costs	**$6,700,000.00**	

GEN-2009-008 Interconnection Costs **$414,378.00**

See Oneline Diagram.

GEN-2009-008	$414,378.00	
Total Allocated Costs	**$414,378.00**	

GEN-2009-020 Interconnection Costs **$1,664,657.00**

See Oneline Diagram.

GEN-2009-020	$1,664,657.00	
Total Allocated Costs	**$1,664,657.00**	

GEN-2009-040 Interconnection Costs **$5,240,000.00**

See Oneline Diagram.

GEN-2009-040	$5,240,000.00	
Total Allocated Costs	**$5,240,000.00**	

GEN-2009-067S Interconnection Costs **$1,306,757.00**

See Oneline Diagram.

GEN-2009-067S	$1,306,757.00	

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

Total Allocated Costs	**$1,306,757.00**	

GEN-2010-003 Interconnection Costs		**$26,000.00**
See Oneline Diagram.		
	GEN-2010-003	$26,000.00
Total Allocated Costs	**$26,000.00**	

GEN-2010-005 Interconnection Costs		**$26,000.00**
See Oneline Diagram.		
	GEN-2010-005	$26,000.00
Total Allocated Costs	**$26,000.00**	

GEN-2010-006 Interconnection Costs		**$1,408,514.00**
See Oneline Diagram.		
	GEN-2010-006	$1,408,514.00
Total Allocated Costs	**$1,408,514.00**	

GEN-2010-007 Interconnection Costs		**$2,867,363.00**
See Oneline Diagram.		
	GEN-2010-007	$2,867,363.00
Total Allocated Costs	**$2,867,363.00**	

GEN-2010-009 Interconnection Costs		**$5,014,906.00**
See Oneline Diagram.		
	GEN-2010-009	$5,014,906.00
Total Allocated Costs	**$5,014,906.00**	

GEN-2010-011 Interconnection Costs		**$0.00**
See Oneline Diagram. Costs included in GEN-2008-044 Interconnection		
	GEN-2010-011	$0.00
Total Allocated Costs	**$0.00**	

GEN-2010-014 Interconnection Costs		**$3,307,387.00**
See Oneline Diagram.		
	GEN-2010-014	$3,307,387.00
Total Allocated Costs	**$3,307,387.00**	

GEN-2010-015 Interconnection Costs		**$5,014,906.00**
See Oneline Diagram.		
	GEN-2010-015	$5,014,906.00

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

	Total Allocated Costs	**$5,014,906.00**

Madison Co - Kelly 230kV CKT 1 **$3,600,000.00**

Upgrade conductor clearance to 100°C for 478MVA rating

GEN-2006-044N02	$3,600,000.00
Total Allocated Costs	**$3,600,000.00**

Post Rock 345/230/13.8kV Autotransformer CKT 2 **$13,749,527.00**

DISIS-2010-001 Restudy

GEN-2009-008	$10,529,144.40
GEN-2009-020	$775,047.13
GEN-2010-009	$958,498.26
GEN-2010-015	$1,486,837.20
Total Allocated Costs	**$13,749,527.00**

South Hays - Hays Plant - Vine Street 115kV CKT 1 **$3,000,000.00**

Rebuild approximately 4 miles of 115kV.

GEN-2009-008	$2,838,857.36
GEN-2009-020	$161,142.64
Total Allocated Costs	**$3,000,000.00**

Switch 2749 - Wildorado 69kV CKT 1 **$2,124,897.00**

Rebuild approximately 4 miles of 69kV.

GEN-2008-088	$2,124,897.00
Total Allocated Costs	**$2,124,897.00**

Washita - Gracemont 138kV CKT 2 **$5,621,986.00**

Build approximately 11 miles of 138kV.

GEN-2008-037	$5,621,986.00
Total Allocated Costs	**$5,621,986.00**

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

G. Power Flow Analysis (Constraints for Mitigation)

See next page.

SOLUTION	GROUP	SCENARIO	SEASON	SOURCE	DIRECTION	MONITORED ELEMENT	RATEB (MVA)	TDF	TC%LOADING (% MVA)	CONTINGENCY
FDNS	01ALL	0	12G	ASGI_10_011	TO->FROM	NORTHWEST - TATONGA7 345.00 345KV CKT 1	1195	0.2480	124.7436	DBL-THIS-WWR
FDNS	01ALL	0	12G	ASGI_10_011	TO->FROM	NORTHWEST - TATONGA7 345.00 345KV CKT 1	1195	0.2277	115.2304	DBL-WICH-THI
FDNS	01ALL	0	12G	ASGI_10_011	TO->FROM	NORTHWEST - TATONGA7 345.00 345KV CKT 1	1195	0.2001	103.8318	LAWTON EASTSIDE - OKLAUNION 345KV CKT 1
FDNS	02ASGI_10_011	0	12G	ASGI_10_011	TO->FROM	FINNEY SWITCHING STATION - STEVENSCO 345.00 345KV CKT 1	1052	0.4671	101.1563	DBL-WWRD-BVR
FDNS	2	0	12G	ASGI_10_011	TO->FROM	FINNEY SWITCHING STATION - STEVENSCO 345.00 345KV CKT 1	1052	0.4671	100.5718	DBL-WWRD-BVR
FDNS	00G06_044N02	0	12SP	G06_044N02	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.7848	105.5446	DAK02WAPAB2
FDNS	00G06_044N02	0	12SP	G06_044N02	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.7845	105.5110	FT RANDAL - UTICA JCT 230KV CKT 1
FDNS	00G06_044N02	0	12SP	G06_044N02	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.7773	103.8513	FT THOMPSON - GRAND ISLAND 345KV CKT 1
FDNS	00G06_044N02	0	17SP	G06_044N02	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.7836	103.5014	FT RANDAL - UTICA JCT 230KV CKT 1
FDNS	00G06_044N02	0	12SP	G06_044N02	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.7821	102.8514	FT RANDAL - SIOUX CITY 230KV CKT 1
FDNS	00G06_044N02	0	12SP	G06_044N02	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.7653	101.3391	HOSKINS - RAUN 345KV CKT 1
FDNS	00G06_044N02	0	12SP	G06_044N02	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.7760	101.2826	LN-WAPA6
FDNS	00G06_044N02	0	12SP	G06_044N02	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.7760	101.2826	NEB001NPPB2
FDNS	00G06_044N02	0	12SP	G06_044N02	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.7760	101.2451	FT RANDAL - SPENCER 115KV CKT 1
FDNS	00G06_044N02	0	12SP	G06_044N02	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.7760	101.0617	ONEILL - SPENCER 115KV CKT 1
FDNS	00G06_044N02	0	12SP	G06_044N02	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.7644	100.3876	TRF-HOSKINS
FDNS	00G06_044N02	0	17SP	G06_044N02	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.7812	100.3311	FT RANDAL - SIOUX CITY 230KV CKT 1
FDNS	00G06_044N02	0	17SP	G06_044N02	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	320	0.7763	100.1556	FT THOMPSON - GRAND ISLAND 345KV CKT 1
FDNS	01ALL	0	12G	G08_022	TO->FROM	NORTHWEST - TATONGA7 345.00 345KV CKT 1	1195	0.2010	124.7436	DBL-THIS-WWR
FDNS	06G08_022	0	12G	G08_022	FROM->TO	EDDY_NORTH 6230.00 - EPE/TNP EDDY COUNTY DC TIE 230KV CKT 1	200	0.3186	108.3676	EDDY COUNTY INTERCHANGE - EDDY_NORTH 6230.00 230KV CKT 1
FDNS	06ALL	0	12G	G08_022	TO->FROM	PLANT X STATION - TOLK STATION WEST 230KV CKT 1	502	0.3473	105.3065	PLANT X STATION - TOLK STATION EAST 230KV CKT 2
FDNS	06ALL	0	12G	G08_022	FROM->TO	TUCO INTERCHANGE (GE M1022338) 345/230/13.2KV TRANSFORMER CKT 1	560	0.4022	104.9856	TUCO INTERCHANGE (UPDATE DATA) 345/230/13.2KV TRANSFORMER CKT 2
FDNS	06ALL	0	12G	G08_022	FROM->TO	TUCO INTERCHANGE (GE M1022338) 345/230/13.2KV TRANSFORMER CKT 1	560	0.4022	104.7225	TUCO INTERCHANGE (UPDATE DATA) 345/230/13.2KV TRANSFORMER CKT 2
FDNS	06ALL	0	12G	G08_022	TO->FROM	PLANT X STATION - TOLK STATION EAST 230KV CKT 2	502	0.3416	104.4725	PLANT X STATION - TOLK STATION WEST 230KV CKT 1
FDNS	01ALL	0	12G	G08_022	TO->FROM	NORTHWEST - TATONGA7 345.00 345KV CKT 1	1195	0.2012	103.8318	LAWTON EASTSIDE - OKLAUNION 345KV CKT 1
FDNS	05ALL	0	12G	G08_022	FROM->TO	BUSHLAND INTERCHANGE - POTTER COUNTY INTERCHANGE 230KV CKT 1	351	0.2470	103.2757	POTTER COUNTY INTERCHANGE - S-RANDLCO 230.00 230KV CKT 1
FDNS	05ALL	2	12G	G08_022	FROM->TO	BUSHLAND INTERCHANGE - POTTER COUNTY INTERCHANGE 230KV CKT 1	351	0.2470	103.1732	POTTER COUNTY INTERCHANGE - S-RANDLCO 230.00 230KV CKT 1
FDNS	06ALL	0	12G	G08_022	FROM->TO	TUCO INTERCHANGE (UPDATE DATA) 345/230/13.2KV TRANSFORMER CKT 2	560	0.3931	102.7714	TUCO INTERCHANGE (GE M1022338) 345/230/13.2KV TRANSFORMER CKT 1
FDNS	06ALL	0	12G	G08_022	FROM->TO	TUCO INTERCHANGE (UPDATE DATA) 345/230/13.2KV TRANSFORMER CKT 2	560	0.3931	102.7365	TUCO INTERCHANGE (GE M1022338) 345/230/13.2KV TRANSFORMER CKT 1
FDNS	2	0	12G	G08_022	TO->FROM	FINNEY SWITCHING STATION - STEVENSCO 345.00 345KV CKT 1	1052	0.2403	100.5718	DBL-WWRD-BVR
FDNS	06ALL	0	12G	G08_022	FROM->TO	EDDY_NORTH 6230.00 - EPE/TNP EDDY COUNTY DC TIE 230KV CKT 1	200	0.3187	100.5296	EDDY COUNTY INTERCHANGE - EDDY_NORTH 6230.00 230KV CKT 1
FDNS	07ALL	0	12G	G08_037	TO->FROM	GRACMNT4 138.00 - WASHITA 138KV CKT 1	228	0.8016	168.5178	SOUTHWESTERN STATION - WASHITA 138KV CKT 1
FDNS	07ALL	0	12G	G08_037	TO->FROM	SOUTHWESTERN STATION - WASHITA 138KV CKT 1	260	0.8402	152.5574	GRACMNT4 138.00 - WASHITA 138KV CKT 1
FDNS	07ALL	0	12G	G08_037	FROM->TO	G08-37T 138.00 - WASHITA 138KV CKT 1	324	1.0000	140.3107	BASE CASE
FDNS	07ALL	2	12G	G08_037	FROM->TO	G08-37T 138.00 - WASHITA 138KV CKT 1	324	1.0000	139.6353	BASE CASE
FDNS	07G08_037	0	12G	G08_037	TO->FROM	GRACMNT4 138.00 - WASHITA 138KV CKT 1	228	0.8018	131.5813	SOUTHWESTERN STATION - WASHITA 138KV CKT 1
FDNS	7	0	12G	G08_037	TO->FROM	GRACMNT4 138.00 - WASHITA 138KV CKT 1	228	0.8018	123.3222	SOUTHWESTERN STATION - WASHITA 138KV CKT 1
FDNS	07G08_037	0	12G	G08_037	TO->FROM	SOUTHWESTERN STATION - WASHITA 138KV CKT 1	260	0.8403	121.2147	GRACMNT4 138.00 - WASHITA 138KV CKT 1
FDNS	07G08_037	0	12G	G08_037	FROM->TO	G08-37T 138.00 - WASHITA 138KV CKT 1	324	1.0000	116.4567	BASE CASE
FDNS	07G08_037	2	12G	G08_037	FROM->TO	G08-37T 138.00 - WASHITA 138KV CKT 1	324	1.0000	116.2231	BASE CASE
FDNS	07ALL	0	12G	G08_037	TO->FROM	SOUTHWESTERN STATION - WASHITA 138KV CKT 1	260	0.5024	116.1449	BASE CASE
FDNS	07ALL	0	12G	G08_037	TO->FROM	SOUTHWESTERN STATION - WASHITA 138KV CKT 1	260	0.6321	115.3239	GRACEMONT (BANK 1) 345/138/13.8KV TRANSFORMER CKT 1
FDNS	7	0	12G	G08_037	TO->FROM	SOUTHWESTERN STATION - WASHITA 138KV CKT 1	260	0.8403	113.7545	GRACMNT4 138.00 - WASHITA 138KV CKT 1
FDNS	07ALL	0	12G	G08_037	FROM->TO	G08-37T 138.00 - WASHITA 138KV CKT 1	324	1.0000	111.0105	SOUTHWESTERN STATION - WASHITA 138KV CKT 1
FDNS	07ALL	2	12G	G08_037	TO->FROM	SOUTHWESTERN STATION - WASHITA 138KV CKT 1	260	0.5920	108.3945	GRACEMONT (BANK 1) 345/138/13.8KV TRANSFORMER CKT 1
FDNS	7	0	12G	G08_037	FROM->TO	G08-37T 138.00 - WASHITA 138KV CKT 1	324	1.0000	107.3620	BASE CASE
FDNS	7	2	12G	G08_037	FROM->TO	G08-37T 138.00 - WASHITA 138KV CKT 1	324	1.0000	107.1854	BASE CASE
FDNS	07ALL	0	12G	G08_037	TO->FROM	SOUTHWESTERN STATION - WASHITA 138KV CKT 1	260	0.4841	103.6396	CARNEGIE - HOBART JUNCTION 138KV CKT 1
FDNS	07ALL	0	12G	G08_037	TO->FROM	SOUTHWESTERN STATION - WASHITA 138KV CKT 1	260	0.4841	103.1186	CARNEGIE - SOUTHWESTERN STATION 138KV CKT 1
FDNS	07ALL	0	12G	G08_037	TO->FROM	GRACMNT4 138.00 - WASHITA 138KV CKT 1	228	0.3912	102.7005	BASE CASE
FDNS	07ALL	0	12G	G08_037	TO->FROM	SOUTHWESTERN STATION - WASHITA 138KV CKT 1	260	0.5074	102.0837	WEATHERFORD JCT. - WEATHERFORD SOUTHEAST 138KV CKT 1
FDNS	07ALL	0	12G	G08_037	TO->FROM	SOUTHWESTERN STATION - WASHITA 138KV CKT 1	260	0.5074	101.2816	HINTON - WEATHERFORD JCT. 138KV CKT 1
FDNS	07ALL	0	12G	G08_037	TO->FROM	SOUTHWESTERN STATION - WASHITA 138KV CKT 1	260	0.4905	101.2686	CLINTON AIR FORCE BASE TAP - ELK CITY 138KV CKT 1

SOLUTION	GROUP	SCENARIO	SEASON	SOURCE	DIRECTION	MONITORED ELEMENT	RATEB (MVA)	TDF	TC%LOADING (% MVA)	CONTINGENCY
FDNS	07ALL	0	12G	G08_037	TO->FROM	SOUTHWESTERN STATION - WASHITA 138KV CKT 1	260	0.5074	101.0539	Canadian Pump Station - HINTON 138KV CKT 1
FDNS	07ALL	0	12G	G08_037	TO->FROM	SOUTHWESTERN STATION - WASHITA 138KV CKT 1	260	0.4905	100.8738	CLINTON AIR FORCE BASE TAP - HOBART JUNCTION 138KV CKT 1
FDNS	07ALL	0	12G	G08_037	TO->FROM	GRACMNT4 138.00 - WASHITA 138KV CKT 1	228	0.3971	100.5481	WEATHERFORD JCT. - WEATHERFORD SOUTHEAST 138KV CKT 1
FDNS	01ALL	0	12G	G08_044	TO->FROM	NORTHWEST - TATONGA7 345.00 345KV CKT 1	1195	0.5811	124.7436	DBL-THIS-WWR
FDNS	01ALL	0	12G	G08_044	TO->FROM	NORTHWEST - TATONGA7 345.00 345KV CKT 1	1195	0.5380	115.2304	DBL-WICH-THI
FDNS	01G08_044	0	12G	G08_044	TO->FROM	NORTHWEST - TATONGA7 345.00 345KV CKT 1	1195	0.5808	112.7278	DBL-THIS-WWR
FDNS	01G08_044	0	12G	G08_044	TO->FROM	NORTHWEST - TATONGA7 345.00 345KV CKT 1	1195	0.5375	106.7586	DBL-WICH-THI
FDNS	01ALL	0	12G	G08_044	TO->FROM	NORTHWEST - TATONGA7 345.00 345KV CKT 1	1195	0.5008	103.8318	LAWTON EASTSIDE - OKLAUNION 345KV CKT 1
FDNS	01ALL	0	12G	G08_044	TO->FROM	NORTHWEST - TATONGA7 345.00 345KV CKT 1	1195	0.5210	102.3349	THISTLE 7 345.00 - WOODWARD DISTRICT EHV 345KV CKT 1
FDNS	01ALL	0	12G	G08_044	TO->FROM	NORTHWEST - TATONGA7 345.00 345KV CKT 1	1195	0.5210	102.3349	THISTLE 7 345.00 - WOODWARD DISTRICT EHV 345KV CKT 2
FDNS	01ALL	0	12G	G08_044	TO->FROM	NORTHWEST - TATONGA7 345.00 345KV CKT 1	1195	0.4994	100.3263	GEN337911 1-ARKANSAS NUCLEAR ONE UNIT #2
FDNS	01ALL	0	12G	G08_044	TO->FROM	NORTHWEST - TATONGA7 345.00 345KV CKT 1	1195	0.5028	100.0000	EL RENO - ROMAN NOSE 138KV CKT 1
FDNS	01ALL	0	12G	G08_047	TO->FROM	NORTHWEST - TATONGA7 345.00 345KV CKT 1	1195	0.3167	124.7436	DBL-THIS-WWR
FDNS	01ALL	0	12G	G08_047	TO->FROM	NORTHWEST - TATONGA7 345.00 345KV CKT 1	1195	0.2763	115.2304	DBL-WICH-THI
FDNS	02G08_047	0	12G	G08_047	TO->FROM	FINNEY SWITCHING STATION - STEVENSCO 345.00 345KV CKT 1	1052	0.5154	104.8557	DBL-WWRD-BVR
FDNS	01ALL	0	12G	G08_047	TO->FROM	NORTHWEST - TATONGA7 345.00 345KV CKT 1	1195	0.2326	103.8318	LAWTON EASTSIDE - OKLAUNION 345KV CKT 1
FDNS	01ALL	0	12G	G08_047	TO->FROM	NORTHWEST - TATONGA7 345.00 345KV CKT 1	1195	0.2429	102.3349	THISTLE 7 345.00 - WOODWARD DISTRICT EHV 345KV CKT 1
FDNS	01ALL	0	12G	G08_047	TO->FROM	NORTHWEST - TATONGA7 345.00 345KV CKT 1	1195	0.2429	102.3349	THISTLE 7 345.00 - WOODWARD DISTRICT EHV 345KV CKT 2
FDNS	2	0	12G	G08_047	TO->FROM	FINNEY SWITCHING STATION - STEVENSCO 345.00 345KV CKT 1	1052	0.5156	100.5718	DBL-WWRD-BVR
FDNS	01ALL	0	12G	G08_047	TO->FROM	NORTHWEST - TATONGA7 345.00 345KV CKT 1	1195	0.2164	100.3263	GEN337911 1-ARKANSAS NUCLEAR ONE UNIT #2
FDNS	01ALL	0	12G	G08_047	TO->FROM	NORTHWEST - TATONGA7 345.00 345KV CKT 1	1195	0.2231	100.0000	EL RENO - ROMAN NOSE 138KV CKT 1
FDNS	05ALL	0	12G	G08_088	TO->FROM	SWITCH 2749 - WILDORADO 69KV CKT 1	35	1.0000	132.1075	BASE CASE
FDNS	05G08_088	0	12G	G08_088	TO->FROM	SWITCH 2749 - WILDORADO 69KV CKT 1	35	1.0000	132.0210	BASE CASE
FDNS	00G08_088	0	12WP	G08_088	TO->FROM	SWITCH 2749 - WILDORADO 69KV CKT 1	35	1.0000	129.8074	BASE CASE
FDNS	00G08_088	0	17WP	G08_088	TO->FROM	SWITCH 2749 - WILDORADO 69KV CKT 1	35	1.0000	127.5562	BASE CASE
FDNS	01ALL	0	12G	G08_088	TO->FROM	NORTHWEST - TATONGA7 345.00 345KV CKT 1	1195	0.2117	124.7436	DBL-THIS-WWR
FDNS	00G08_088	0	12SP	G08_088	TO->FROM	SWITCH 2749 - WILDORADO 69KV CKT 1	35	1.0000	123.0528	BASE CASE
FDNS	00G08_088	0	17SP	G08_088	TO->FROM	SWITCH 2749 - WILDORADO 69KV CKT 1	35	1.0000	119.9551	BASE CASE
FDNS	05ALL	2	12G	G08_088	FROM->TO	SPSSPPTIESB	620	0.2642	108.6389	BASE CASE
FDNS	05ALL	2	12G	G08_088	FROM->TO	SPSSPPTIESC1	620	0.2642	108.6389	BASE CASE
FDNS	05ALL	0	12G	G08_088	FROM->TO	SPSSPPTIESB	620	0.2642	108.5784	BASE CASE
FDNS	05ALL	0	12G	G08_088	FROM->TO	SPSSPPTIESC1	620	0.2642	108.5784	BASE CASE
FDNS	5	0	12G	G08_088	TO->FROM	SWITCH 2749 - WILDORADO 69KV CKT 1	35	1.0000	105.2396	BASE CASE
FDNS	06ALL	0	12G	G08_088	FROM->TO	TUCO INTERCHANGE (GE M1022338) 345/230/13.2KV TRANSFORMER CKT 1	560	0.2175	104.9856	TUCO INTERCHANGE (UPDATE DATA) 345/230/13.2KV TRANSFORMER CKT 2
FDNS	06ALL	0	12G	G08_088	FROM->TO	TUCO INTERCHANGE (GE M1022338) 345/230/13.2KV TRANSFORMER CKT 1	560	0.2175	104.7225	TUCO INTERCHANGE (UPDATE DATA) 345/230/13.2KV TRANSFORMER CKT 2
FDNS	06ALL	0	12G	G08_088	FROM->TO	TUCO INTERCHANGE (UPDATE DATA) 345/230/13.2KV TRANSFORMER CKT 2	560	0.2125	102.7714	TUCO INTERCHANGE (GE M1022338) 345/230/13.2KV TRANSFORMER CKT 1
FDNS	06ALL	0	12G	G08_088	FROM->TO	TUCO INTERCHANGE (UPDATE DATA) 345/230/13.2KV TRANSFORMER CKT 2	560	0.2125	102.7365	TUCO INTERCHANGE (GE M1022338) 345/230/13.2KV TRANSFORMER CKT 1
FDNS	2	0	12G	G08_088	TO->FROM	FINNEY SWITCHING STATION - STEVENSCO 345.00 345KV CKT 1	1052	0.3312	100.5718	DBL-WWRD-BVR
FNSL-Blown up	00G09_008	3	12SP	G09_008		Non Converged Contingency	0	0.0332	9999.0000	TRF-STEGALL
FNSL-Blown up	00G09_008	0	12SP	G09_008		Non Converged Contingency	0	0.0324	9999.0000	TRF-STEGALL
FDNS	00G09_008	0	17WP	G09_008	TO->FROM	HAYS PLANT - SOUTH HAYS 115KV CKT 1	99	0.3573	137.7781	POSTROCK6 230.00 - SOUTH HAYS 230KV CKT 1
FDNS	00G09_008	0	17SP	G09_008	TO->FROM	HAYS PLANT - SOUTH HAYS 115KV CKT 1	99	0.3569	137.2805	POSTROCK6 230.00 - SOUTH HAYS 230KV CKT 1
FDNS	00G09_008	0	17WP	G09_008	FROM->TO	HAYS PLANT - VINE STREET 115KV CKT 1	88	0.3573	133.0283	POSTROCK6 230.00 - SOUTH HAYS 230KV CKT 1
FDNS	00G09_008	0	12SP	G09_008	TO->FROM	HAYS PLANT - SOUTH HAYS 115KV CKT 1	99	0.3578	132.0649	POSTROCK6 230.00 - SOUTH HAYS 230KV CKT 1
FDNS	11G09_008	0	12G	G09_008	TO->FROM	HAYS PLANT - SOUTH HAYS 115KV CKT 1	88	0.3578	131.0503	POSTROCK6 230.00 - SOUTH HAYS 230KV CKT 1
FDNS	00G09_008	0	12WP	G09_008	TO->FROM	HAYS PLANT - SOUTH HAYS 115KV CKT 1	99	0.3582	128.3896	POSTROCK6 230.00 - SOUTH HAYS 230KV CKT 1
FDNS	11ALL	0	12G	G09_008	TO->FROM	HAYS PLANT - SOUTH HAYS 115KV CKT 1	88	0.3578	124.4284	POSTROCK6 230.00 - SOUTH HAYS 230KV CKT 1
FDNS	00G09_008	0	12WP	G09_008	FROM->TO	HAYS PLANT - VINE STREET 115KV CKT 1	88	0.3582	122.9206	POSTROCK6 230.00 - SOUTH HAYS 230KV CKT 1
FDNS	00G09_008	0	17SP	G09_008	FROM->TO	HAYS PLANT - VINE STREET 115KV CKT 1	88	0.3569	122.1975	POSTROCK6 230.00 - SOUTH HAYS 230KV CKT 1
FDNS	11ALL	2	12G	G09_008	FROM->TO	SMOKYHL6 230.00 - SUMMIT 230KV CKT 1	319	0.3123	120.9488	POST ROCK (POSTROCK T1) 345/230/13.8KV TRANSFORMER CKT 1
FDNS	11ALL	0	12G	G09_008	FROM->TO	SMOKYHL6 230.00 - SUMMIT 230KV CKT 1	319	0.3123	120.9455	POST ROCK (POSTROCK T1) 345/230/13.8KV TRANSFORMER CKT 1
FDNS	00G09_008	0	12SP	G09_008	FROM->TO	HAYS PLANT - VINE STREET 115KV CKT 1	88	0.3578	117.2868	POSTROCK6 230.00 - SOUTH HAYS 230KV CKT 1
FDNS	11G09_008	0	12G	G09_008	FROM->TO	HAYS PLANT - VINE STREET 115KV CKT 1	88	0.3578	107.1709	POSTROCK6 230.00 - SOUTH HAYS 230KV CKT 1
FDNS	11ALL	0	12G	G09_008	FROM->TO	SMOKYHL6 230.00 - SUMMIT 230KV CKT 1	319	0.2100	106.4110	MULLERGREN - SOUTH HAYS 230KV CKT 1

SOLUTION	GROUP	SCENARIO	SEASON	SOURCE	DIRECTION	MONITORED ELEMENT	RATEB (MVA)	TDF	TC%LOADING (% MVA)	CONTINGENCY
FDNS	11ALL	2	12G	G09_008	FROM->TO	SMOKYHL6 230.00 - SUMMIT 230KV CKT 1	319	0.2100	106.4044	MULLERGREN - SOUTH HAYS 230KV CKT 1
FDNS	11G09_008	2	12G	G09_008	FROM->TO	SMOKYHL6 230.00 - SUMMIT 230KV CKT 1	319	0.3123	103.4951	POST ROCK (POSTROCK T1) 345/230/13.8KV TRANSFORMER CKT 1
FDNS	11G09_008	0	12G	G09_008	FROM->TO	SMOKYHL6 230.00 - SUMMIT 230KV CKT 1	319	0.3123	103.4899	POST ROCK (POSTROCK T1) 345/230/13.8KV TRANSFORMER CKT 1
FDNS	11ALL	0	12G	G09_008	FROM->TO	HAYS PLANT - VINE STREET 115KV CKT 1	88	0.3578	100.6092	POSTROCK6 230.00 - SOUTH HAYS 230KV CKT 1
FDNS	11	0	12G	G09_008	TO->FROM	HAYS PLANT - SOUTH HAYS 115KV CKT 1	88	0.3578	100.5175	POSTROCK6 230.00 - SOUTH HAYS 230KV CKT 1
FDNS	01ALL	0	12G	G09_067S	TO->FROM	NORTHWEST - TATONGA7 345.00 345KV CKT 1	1195	0.2004	124.7436	DBL-THIS-WWR
FDNS	06ALL	0	12G	G09_067S	TO->FROM	PLANT X STATION - TOLK STATION WEST 230KV CKT 1	502	0.2753	105.3065	PLANT X STATION - TOLK STATION EAST 230KV CKT 2
FDNS	06ALL	0	12G	G09_067S	FROM->TO	TUCO INTERCHANGE (GE M1022338) 345/230/13.2KV TRANSFORMER CKT 1	560	0.4090	104.9856	TUCO INTERCHANGE (UPDATE DATA) 345/230/13.2KV TRANSFORMER CKT 2
FDNS	06ALL	0	12G	G09_067S	FROM->TO	TUCO INTERCHANGE (GE M1022338) 345/230/13.2KV TRANSFORMER CKT 1	560	0.4090	104.7225	TUCO INTERCHANGE (UPDATE DATA) 345/230/13.2KV TRANSFORMER CKT 2
FDNS	06ALL	0	12G	G09_067S	TO->FROM	PLANT X STATION - TOLK STATION EAST 230KV CKT 2	502	0.2695	104.4725	PLANT X STATION - TOLK STATION WEST 230KV CKT 1
FDNS	01ALL	0	12G	G09_067S	TO->FROM	NORTHWEST - TATONGA7 345.00 345KV CKT 1	1195	0.2017	103.8318	LAWTON EASTSIDE - OKLAUNION 345KV CKT 1
FDNS	05ALL	0	12G	G09_067S	FROM->TO	BUSHLAND INTERCHANGE - POTTER COUNTY INTERCHANGE 230KV CKT 1	351	0.2388	103.2757	POTTER COUNTY INTERCHANGE - S-RANDLCO 230.00 230KV CKT 1
FDNS	05ALL	2	12G	G09_067S	FROM->TO	BUSHLAND INTERCHANGE - POTTER COUNTY INTERCHANGE 230KV CKT 1	351	0.2388	103.1732	POTTER COUNTY INTERCHANGE - S-RANDLCO 230.00 230KV CKT 1
FDNS	06ALL	0	12G	G09_067S	FROM->TO	TUCO INTERCHANGE (UPDATE DATA) 345/230/13.2KV TRANSFORMER CKT 2	560	0.3998	102.7714	TUCO INTERCHANGE (GE M1022338) 345/230/13.2KV TRANSFORMER CKT 1
FDNS	06ALL	0	12G	G09_067S	FROM->TO	TUCO INTERCHANGE (UPDATE DATA) 345/230/13.2KV TRANSFORMER CKT 2	560	0.3998	102.7365	TUCO INTERCHANGE (GE M1022338) 345/230/13.2KV TRANSFORMER CKT 1
FDNS	06ALL	0	12G	G09_067S	FROM->TO	JONES STATION - TUCO INTERCHANGE 230KV CKT 1	351	0.2016	100.8283	TOLK STATION EAST - TUCO INTERCHANGE 230KV CKT 1
FDNS	2	0	12G	G09_067S	TO->FROM	FINNEY SWITCHING STATION - STEVENSCO 345.00 345KV CKT 1	1052	0.2366	100.5718	DBL-WWRD-BVR
FDNS	01ALL	0	12G	G10_007	TO->FROM	NORTHWEST - TATONGA7 345.00 345KV CKT 1	1195	0.2223	124.7436	DBL-THIS-WWR
FDNS	02G10_007	0	12G	G10_007	TO->FROM	FINNEY SWITCHING STATION - STEVENSCO 345.00 345KV CKT 1	1052	0.3759	101.3312	DBL-WWRD-BVR
FDNS	2	0	12G	G10_007	TO->FROM	FINNEY SWITCHING STATION - STEVENSCO 345.00 345KV CKT 1	1052	0.3760	100.5718	DBL-WWRD-BVR
FNSL-Blown up	00G10_009	0	12SP	G10_009		Non Converged Contingency	0	0.0397	9999.0000	TRF-STEGALL
FDNS	01ALL	0	12G	G10_011	TO->FROM	NORTHWEST - TATONGA7 345.00 345KV CKT 1	1195	0.5811	124.7436	DBL-THIS-WWR
FDNS	01ALL	0	12G	G10_011	TO->FROM	NORTHWEST - TATONGA7 345.00 345KV CKT 1	1195	0.5380	115.2304	DBL-WICH-THI
FDNS	01G10_011	0	12G	G10_011	TO->FROM	NORTHWEST - TATONGA7 345.00 345KV CKT 1	1195	0.5808	112.7278	DBL-THIS-WWR
FDNS	01G10_011	0	12G	G10_011	TO->FROM	NORTHWEST - TATONGA7 345.00 345KV CKT 1	1195	0.5375	106.7586	DBL-WICH-THI
FDNS	01ALL	0	12G	G10_011	TO->FROM	NORTHWEST - TATONGA7 345.00 345KV CKT 1	1195	0.5008	103.8318	LAWTON EASTSIDE - OKLAUNION 345KV CKT 1
FDNS	01ALL	0	12G	G10_011	TO->FROM	NORTHWEST - TATONGA7 345.00 345KV CKT 1	1195	0.5210	102.3349	THISTLE 7 345.00 - WOODWARD DISTRICT EHV 345KV CKT 1
FDNS	01ALL	0	12G	G10_011	TO->FROM	NORTHWEST - TATONGA7 345.00 345KV CKT 1	1195	0.5210	102.3349	THISTLE 7 345.00 - WOODWARD DISTRICT EHV 345KV CKT 2
FDNS	01ALL	0	12G	G10_011	TO->FROM	NORTHWEST - TATONGA7 345.00 345KV CKT 1	1195	0.4994	100.3263	GEN337911 1-ARKANSAS NUCLEAR ONE UNIT #2
FDNS	01ALL	0	12G	G10_011	TO->FROM	NORTHWEST - TATONGA7 345.00 345KV CKT 1	1195	0.5028	100.0000	EL RENO - ROMAN NOSE 138KV CKT 1
FDNS	01ALL	0	12G	G10_014	TO->FROM	NORTHWEST - TATONGA7 345.00 345KV CKT 1	1195	0.3167	124.7436	DBL-THIS-WWR
FDNS	02G10_014	0	12G	G10_014	TO->FROM	FINNEY SWITCHING STATION - STEVENSCO 345.00 345KV CKT 1	1052	0.5150	115.6203	DBL-WWRD-BVR
FDNS	01ALL	0	12G	G10_014	TO->FROM	NORTHWEST - TATONGA7 345.00 345KV CKT 1	1195	0.2763	115.2304	DBL-WICH-THI
FDNS	01ALL	0	12G	G10_014	TO->FROM	NORTHWEST - TATONGA7 345.00 345KV CKT 1	1195	0.2326	103.8318	LAWTON EASTSIDE - OKLAUNION 345KV CKT 1
FDNS	01ALL	0	12G	G10_014	TO->FROM	NORTHWEST - TATONGA7 345.00 345KV CKT 1	1195	0.2429	102.3349	THISTLE 7 345.00 - WOODWARD DISTRICT EHV 345KV CKT 1
FDNS	01ALL	0	12G	G10_014	TO->FROM	NORTHWEST - TATONGA7 345.00 345KV CKT 1	1195	0.2429	102.3349	THISTLE 7 345.00 - WOODWARD DISTRICT EHV 345KV CKT 2
FDNS	2	0	12G	G10_014	TO->FROM	FINNEY SWITCHING STATION - STEVENSCO 345.00 345KV CKT 1	1052	0.5156	100.5718	DBL-WWRD-BVR
FDNS	01ALL	0	12G	G10_014	TO->FROM	NORTHWEST - TATONGA7 345.00 345KV CKT 1	1195	0.2164	100.3263	GEN337911 1-ARKANSAS NUCLEAR ONE UNIT #2
FDNS	01ALL	0	12G	G10_014	TO->FROM	NORTHWEST - TATONGA7 345.00 345KV CKT 1	1195	0.2231	100.0000	EL RENO - ROMAN NOSE 138KV CKT 1

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

**The results will be available by request*