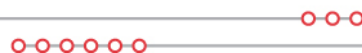




# Feasibility Cluster Study for Generation Interconnection Requests (FCS-2012-001)

February 2012

Tariff Studies – Generation Interconnection



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## Revision History

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Date or Version Number	Author	Change Description	Comments
2/29/2012	Southwest Power Pool	N/A	Report Issued

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## Executive Summary

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Generation Interconnection customers have requested a Feasibility Study under the Generation Interconnection Procedures (GIP) in the Southwest Power Pool Open Access Transmission Tariff (OATT). The Interconnection Customers' requests have been clustered together for the following Feasibility Cluster Study. This Feasibility Cluster Study analyzes the interconnecting of multiple generation interconnection requests associated with new generation totaling approximately 333 MW of new generation which would be located within the transmission system of Sunflower (SUNC), Oklahoma Gas and Electric (OKGE), and Western Farmers Electric Cooperative (WFEC). The various generation interconnection requests have differing proposed in-service dates<sup>1</sup>. The generation interconnection requests included in this Feasibility Cluster Study are listed in Appendix A by their queue number, amount, requested interconnection service, area, requested interconnection point, proposed interconnection point, and the requested in-service date.

Power flow analysis has indicated that for the power flow cases studied, 333 MW of nameplate generation may be interconnected with transmission system reinforcements within the SPP transmission system. The need for reactive compensation in accordance with Order No. 661-A for wind farm interconnection requests will be evaluated in the Interconnection System Impact Study based on the wind turbine manufacturer and type requested by the Customer. Dynamic stability studies performed as part of the System Impact Cluster Study will provide additional guidance as to whether the required reactive compensation can be static or a portion must be dynamic (such as a SVC).

The total estimated minimum cost for interconnecting the studied generation interconnection request is \$22,200,000. These costs are shown in Appendix E. 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 the possible need for reactive compensation or additional interconnection facilities or network upgrades that may be identified through additional analyses performed in the Preliminary Interconnection System Impact Study (PISIS).

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

The required interconnection costs listed in Appendix E does 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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<sup>1</sup> 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.

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## Introduction

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Generation Interconnection customers have requested a Feasibility Study under the Generation Interconnection Procedures (GIP) in the Southwest Power Pool Open Access Transmission Tariff (OATT). The Interconnection Customers' requests have been clustered together for the following Feasibility Cluster Study. This Feasibility Cluster Study analyzes the interconnecting of multiple generation interconnection requests associated with new generation totaling approximately 333 MW of new generation which would be located within the transmission system of Sunflower (SUNC), Oklahoma Gas and Electric (OKGE), and Western Farmers Electric Cooperative (WFEC). The various generation interconnection requests have differing proposed in-service dates<sup>2</sup>. The generation interconnection requests included in this Feasibility Cluster Study are listed in Appendix A by their queue number, amount, area, requested interconnection service, requested interconnection point, proposed interconnection point, and the requested in-service date.

The primary objective of this Feasibility Cluster Study is to identify the system constraints associated with connecting the generation to the area transmission system. The Feasibility 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.

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## Model Development

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**Interconnection Requests Included in the Cluster** – SPP has included the interconnection requests listed in Appendix A to be analyzed in this cluster study. These interconnection requests represent requests with an executed Feasibility Study Agreement signed by 12/31/2011 and were subsequently accepted by Southwest Power Pool under the terms of the Generator Interconnection Procedures (GIP) that became effective March 30, 2010. The interconnection requests that are included in this study are listed in Appendix A.

**Electrically Isolated Interconnection Requests** – Electrically isolated requests are discussed in the “Regional Groupings” section.

**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 were assumed to be in-service and added to the Base Case models. These projects were dispatched as Energy Resources with equal distribution across the SPP footprint.

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<sup>2</sup> 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.

**Development of Base Cases** - The 2011 series Transmission Service Request (TSR) Models 2012 spring, 2013 summer and winter, and 2017 summer and winter scenario 0 peak cases were used for this study. After the cases were developed, each of the control areas' resources were then redispatched using current dispatch orders.

**Base Case Upgrades** - The following facilities are part of the SPP Transmission Expansion Plan or the Balanced Portfolio or recently approved Priority Projects. These facilities, have an approved Notice to Construct (NTC), or are in construction stages and were assumed to be in-service at the time of dispatch and added to the base case models. The FCS-2012-001 Customers have not been assigned cost for the below listed projects. The FCS-2012-001 Customers Generation Facilities in service dates may need to be delayed until the completion of the following upgrades. If for some reason, construction on these projects is discontinued, additional restudies will be needed to determine the interconnection needs of the DISIS customers.

- Hitchland 230/115kV area projects<sup>3</sup>:
  - 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<sup>4</sup>
- Rose Hill – Sooner 345kV, scheduled for 6/15/2012 in-service<sup>5</sup>
- Balanced Portfolio Projects<sup>6</sup>:
  - Woodward – Border – TUCO 345kV project, scheduled for 5/19/2014 in-service
  - Iatan– Nashua 345kV, scheduled for 6/1/2015 in-service
  - Muskogee– Seminole 345kV, scheduled for 12/31/2012 in-service
  - Spearville – Post Rock 345kV, scheduled for 6/1/2012 in-service
  - Post Rock – Axtell 345kV & associated Post Rock 345/230kV autotransformer, 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<sup>7</sup>:
  - Hitchland – Woodward double circuit 345kV, scheduled for 6/30/2014 in-service
  - 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<sup>8</sup>
  - 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

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<sup>3</sup> 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.

<sup>4</sup> SPP Transmission Service Projects identified in SPP-2006-AG3-AFS-11.

<sup>5</sup> SPP Regional Reliability Project. Approved based on an order of the Kansas Corporation Commission issued in Docket no. 07-WSEE-715-MIS.

<sup>6</sup> Notice to Construct (NTC) issued June 2009.

<sup>7</sup> Notice to Construct (NTC) issued June 2010.

<sup>8</sup> SPP Transmission Service Projects identified in SPP-2007-AG3-AFS-9.

**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 FCS-2012-001 study and are assumed to be in service. This list may not be all inclusive. The FCS-2012-001 Customers at this time do not have responsibility for these facilities but may later be assigned the cost of these facilities if higher queued customers terminate their GIA or withdraw from the interconnection queue. The FCS-2012-001 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-2006-044 interconnection customer<sup>9</sup>
- Central Plains – Setab 115kV transmission line, assigned to GEN-2007-013 interconnection customer
- Upgrades assigned to 1<sup>st</sup> Cluster Interconnection Customers:
  - Amarillo – Swisher 230kV terminal equipment replacement
  - Bushland – Potter County 230kV terminal equipment replacement
  - Grassland – Wolfforth 230kV
  - Spearville 345/115kV autotransformer, assigned to 1<sup>st</sup> Cluster and DISIS-2009-001 Interconnection Customers
- 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
- Upgrades assigned to DISIS-2010-001 Interconnection Customers:
  - Hitchland – Border 345kV
  - Post Rock 345/230kV autotransformer #2
  - South Hays – Hays Plant – Vine Street 115kV rebuild
  - Switch 2749 – Wildorado 69kV rebuild
- Upgrades assigned to DISIS-2010-002 Interconnection Customers:
  - Beaver County – Gray County 345kV
  - Clinton Junction – Elk City 138kV rebuild
  - St. John – Huntsville – Hutchinson Energy Center 115kV project
  - FPL Switch – Woodward 138kV rebuild
- Upgrades assigned to DISIS-2011-001 Interconnection Customers:
  - Spearville – Mullergren – Circle – Reno double circuit 345kV
  - Tatonga – Matthewson – Cimarron 345kV circuit #2
  - Rice County – Circle 230kV conversion
  - Rice County – Lyons 115kV rebuild
  - Rice County 230/115kV autotransformer
  - Lyons – Wheatland 115kV rerate
  - St. John – St. John 115kV rebuild
  - Benton – Wichita 345kV rerate
  - Mullergren 345/230kv autotransformer, (NRIS)
  - Cleo Corner – Glass Mountain 138kV rebuild, (NRIS)
  - Elk City 230/138kV autotransformer terminal rerate, (NRIS)
  - Deaf Smith – South Randle County (GI POI) – Plant X 230kV terminal equipment replacement, (NRIS)
  - Dover Switch – Okeene 138kV rebuild, (NRIS)
  - El Reno – Roman Nose – Southard 138kV rebuild, (NRIS)
  - Evans Energy Center – Maize 138kV rebuild, (NRIS)

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<sup>9</sup> Facility Study posted November 2008.



- Glass Mountain – Mooreland 138kV rebuild, (NRIS)
- Upgrades assigned to DISIS-2011-002 Interconnection Customers
  - Comanche – Comanche Tap 69kV rebuild
  - GEN-2011-058 tap – Grassland 230kV circuit #2
  - Harbine – Crete 115kV
  - Jones – Lubbock South 230kV line trap replacement
  - Jones – TUCO 230kV line trap replacement
  - Potter – TUCO 345kV
  - SUB 967 – SUB 968 69kV terminal equipment replacement
  - SUB 968 – SUB 969 69kV terminal equipment replacement
  - SUB 969 – SUB 974 69kV terminal equipment replacement
  - Viola – Rose Hill 345kV
  - West Brock – SUB 967 terminal equipment replacement
  - Woodward – Tatonga 345kV circuit #2
  - Yoakum – Mustang 230kV line trap replacement
  - Allen – Lubbock South 115kV rebuild, (NRIS)
  - Cimarron – Draper 345kV line trap replacement, (NRIS)
  - Cornville Tap – Paoli 138kV CT replacement, (NRIS)
  - Duncan – Tosco 69kV rebuild, (NRIS)
  - Grapevine – Stateline 230kV terminal equipment replacement, (NRIS)
  - Hale County – TUCO 115kV rebuild, (NRIS)
  - Harbine – Beatrice 115kV rebuild, (NRIS)
  - Knoll – Post Rock 230kV rebuild, (NRIS)
  - Lubbock South – Lubbock East 115kV rebuild, (NRIS)
  - Lubbock South 230/115kV autotransformer circuit 2, (NRIS)
  - Nebraska City U Syracuse – SUB 970 terminal equipment replacement, (NRIS)
  - Knoll – North Hays – Vine Street 115kV rebuild, (NRIS)
  - Smokey Hills – Summit 230kV rebuild, (NRIS)
  - TUCO 345/230kV autotransformer circuit #3, (NRIS)
  - Wolfforth – Yuma 115kV rebuild, (NRIS)

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

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

For each group, the various wind generating plants were modeled at 80% nameplate of maximum generation. The wind generating plants in the other areas were modeled at 20% nameplate of maximum generation. This process created four different scenarios with each group being studied at 80% nameplate rating. These projects were dispatched as Energy Resources with equal distribution across the SPP footprint. Certain projects that requested Network Resource Interconnection Service were dispatched in an additional analysis into the balancing authority of the interconnecting transmission owner. This method allowed for the identification of network constraints that were common to the regional groupings that could then in turn have the mitigating upgrade cost allocated throughout the entire cluster. Each interconnection request was also modeled separately at 100% nameplate for certain analyses.

Peaking units were not dispatched in the 2012 spring model. To study peaking units' impacts, the 2013 and 2017 summer and winter peak models were chosen and peaking units were modeled at

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

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## Identification of Network Constraints

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The initial set of network constraints were found by using PTI MUST First Contingency Incremental Transfer Capability (FCITC) analysis on the entire cluster grouping dispatched at the various levels mentioned above. These constraints were then screened to determine if any of the generation interconnection requests had at least a 20% Distribution Factor (DF) upon the constraint. Constraints that measured at least a 20% DF from at least one interconnection request were considered for mitigation. Interconnection Requests that were being studied for Network Resource Interconnection Service were studied in the additional NRIS analysis to determine if any constraint had at least a 3% DF. If so, these constraints were considered for mitigation.

Identification of Electrically Isolated Groups and Requests – From the FCITC analysis, it was determined that some of the regional groups had no common impacts with the other groups. However, this determination may change as the Interconnection Customers depending upon the time at which the interconnection customers enter either the Preliminary Interconnection System Impact Study (PISIS) or the Definitive Interconnection System Impact Study (DISIS).

## Determination of Cost Allocated Network Upgrades

Cost Allocated Network Upgrades of wind generation interconnection requests were determined using the 2012 spring model. Cost Allocated Network Upgrades of peaking units was determined using the 2017 summer peak model. Once a determination of the required Network Upgrades was made, a power flow model of the 2012 spring case was developed with all cost allocated Network Upgrades in-service. A MUST FCITC analysis was performed to determine the Distribution Factors (DF), a distribution factor with no contingency that each generation interconnection request had on each new upgrade. The impact each generation interconnection request had on each upgrade project was weighted by the size of each request. Finally the costs due by each request for a particular project were then determined by allocating the portion of each request's impact over the impact of all affecting requests.

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

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

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

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

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

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

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

- Repeat previous for each responsible GI request for each Project

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

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

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## Interconnection Facilities

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The requirement to interconnect the 333 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 E with an approximate cost of \$22,000,000. Appendix E also includes Interconnection Facilities specific to each generation interconnection request.

A list of constraints with greater than or equal to a 20% DF that were identified and used for mitigation are listed in Appendix F. Other Network Constraints in the WERE and SUNC transmission systems that were identified that may be needed to deliver to load are listed in Appendix F. 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.

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## Power flow Analysis Methodology

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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 FCITC function of MUST was used to simulate single contingencies in portions or all of the modeled control areas of AEPW, EMDE, Grand River Dam Authority (GRDA), Kansas City Power & Light (KCPL), LES, MIDW, MIPU, NPPD, OPPD, OKGE, SPS, SUNC, WERE, WFEK and other control areas were applied and the resulting scenarios analyzed. This satisfies the “more probable” contingency testing criteria mandated by NERC and the SPP criteria.

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## Power Flow Analysis

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A power flow analysis was conducted for each Interconnection Customer's facility using modified versions of the 2012 (spring, summer, and winter) peak models and the 2017 (summer and winter) peak models. The output of the Interconnection Customer's facility was offset in each model by a reduction in output of existing online SPP generation. This method allows the request to be studied as an Energy Resource (ER) Interconnection Request. The available seasonal models used were through the 2017 Winter Peak. Certain requests that requested Network Resource Interconnection Service (NRIS) had an additional analysis conducted for sinking the energy in the interconnecting Transmission Owner's balancing authority.

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

The need for reactive compensation will be determined during the Interconnection System Impact Study. The need for reactive compensation will be based on the Interconnection Customer's choice of wind turbine make and manufacturer. Dynamic Stability studies performed as part of the System Impact Cluster Study will provide additional guidance as to whether the reactive compensation can be static or a portion must be dynamic (such as a SVC or STATCOM). It is possible that an SVC or STATCOM device will be required at the Customer facility because of FERC Order 661A Low Voltage Ride-Through Provisions (LVRT) which went into effect January 1, 2006. FERC Order 661A orders that wind farms stay on-line for 3-phase faults at the point of interconnection even if that requires the installation of a SVC or STATCOM device.

**Woodward Area** – In addition to the 5,714.4 MW of previously queued generation in the area, 132 MW of new interconnection service was studied. Constraints in this area were seen around the Dewey – Taloga 138kV line, the Taloga – Canton – Okeene 69kV line. Additional constraints were seen on the Arapaho – Harmon Butler – Industrial Park 69kV line. Withdrawal of higher queued customers may change this result.

**Spearville Area** – In addition to the 5,773.9 MW of previously queued generation in the area, 201 MW of new interconnection service was studied. No new constraints were identified in this area. Withdrawal of higher queued customers may change this result.

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## Conclusion

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The minimum cost of interconnecting all of the interconnection requests included in the Feasibility Cluster Study is estimated at \$22,200,000 for the Allocated Network Upgrades and Transmission Owner Interconnection Facilities are listed in Appendix E. These costs do not include the cost of upgrades of other transmission facilities listed in Appendix F which are Network Constraints.

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

The required interconnection costs listed in Appendix E, 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).

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# Appendix

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## **A: Generation Interconnection Requests Considered for Impact Study**

Request	Amount	Service	Area	Requested Point of Interconnection	Proposed Point of Interconnection	Requested In-Service Date	In Service Date Delayed Until no earlier than*
GEN-2011-059	201.0	ER	SUNC	Clark County 345kV / Spearville 345kV	Clark County 345kV / Spearville 345kV	2/11/2015	
GEN-2011-060	80.0	ER	OKGE	Dewey 138kV	Dewey 138kV	6/1/2013	
GEN-2011-061	52.0	ER	WFEC	Putnam 69kV	Putnam 69kV	6/1/2013	
<b>TOTAL</b>	<b>333.0</b>						

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



## **B: Prior Queued Interconnection Requests**

Request	Amount	Area	Requested/Proposed Point of Interconnection	Status or In-Service Date
ASGI-2010-001	400	AECI	Tap Cooper - Fairport (AECI) 345kV	AECI queue Affected Study
ASGI-2010-004	50	AECI	Tap Queen City (AECI) - Lancaster (AECI) 69kV	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-2010-007	150	AECI	Tap Fairfax Tap - Fairfax (AECI) 138kV	AECI queue Affected Study
ASGI-2010-009	201	AECI	Osborn (AECI) 161kV	AECI queue Affected Study
ASGI-2010-010	42	SPS	Lovington 115kV	Affected Study
ASGI-2010-011	48	SPS	TC-Texas County 69kV	Affected Study
ASGI-2010-020	50	SPS	Tap LE-Tatum - LE-Crossroads 69kV	Under Study (DISIS-2010-002)
ASGI-2010-021	36.6	SPS	Tap LE-Saunders Tap - LE-Anderson 69kV	Under Study (DISIS-2010-002)
ASGI-2011-001	28.8	SPS	Lovington 115kV	Under Study (DISIS-2010-002)
ASGI-2011-002	10	SPS	Herring 115kV	AECI queue Affected Study
ASGI-2011-003	10	SPS	Hendricks 115kV	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 for ????
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-2005-017	340.0	SPS	Tap Hitchland - Potter 345kV	On Suspension
GEN-2006-002	101	AEPW	Sweetwater 230kV	On-Line

Request	Amount	Area	Requested/Proposed Point of Interconnection	Status or In-Service Date
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
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-2006-044N02	100.5	NPPD	Tap Ft Randle - Columbus (Madison County) 230kV	IA Pending
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-2007-002	160	SPS	Grapevine 115kV	On Suspension
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

Request	Amount	Area	Requested/Proposed Point of Interconnection	Status or In-Service Date
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
GEN-2008-019	300	OKGE	Tatonga 345kV	On Schedule for 2015
GEN-2008-021	42.0	WERE	Wolf Creek 345kV	On-Line
GEN-2008-022	300	SPS	Tap Eddy Co - Tolk (Chaves County) 345kV	On Schedule for 2015
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-2008-037	101	WFEC	Tap Washita - Blue Canyon Wind 138kV	On-Line
GEN-2008-044	216	OKGE	Tatonga 345kV	On-Line
GEN-2008-046	200	OKGE	Sunnyside 345kV	On Suspension
GEN-2008-047	300	SPS	Tap Hitchland - Woodward Ckt 1 (Beaver County) 345kV	IA Pending
GEN-2008-051	322	SPS	Potter County 345kV	On Schedule for 2012
GEN-2008-071	76.8	OKGE	Newkirk 138kV	On Schedule for 2013
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-2008-088	50.6	SPS	Vega 69kV	IA Pending
GEN-2008-092	201	MIDW	Postrock 230kV	IA Pending
GEN-2008-098	100.8	WERE	Tap Lacygne - Wolf Creek (Anderson County) 345kV	IA Pending
GEN-2008-1190	60	OPPD	S1399 161kV	On-Line
GEN-2008-123N	89.7	NPPD	Tap Guide Rock - Pauline 115kV	On Suspension
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-2009-008	199.5	MIDW	South Hays 230kV	On Suspension
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-2009-020	48.6	MIDW	Tap Nekoma - Bazine 69kV	On Suspension
GEN-2009-025	60	OKGE	Tap Deer Creek - Sinclair Blackwell 69kV	On Schedule for 2012
GEN-2009-040	73.8	WERE	Tap Smittyville - Knob Hill 115kV	On Suspension
GEN-2009-067S	20	SPS	Seven Rivers 69kV	IA Pending
GEN-2010-001	300	SPS	Tap Hitchland - Woodward Ckt 1 (Beaver County) 345kV	IA Pending
GEN-2010-003	100.8	WERE	Tap Lacygne - Wolf Creek (Anderson County) 345kV	IA Pending
GEN-2010-005	300	WERE	Tap Wichita - Woodring (Sumner County) 345kV	On Schedule for 2012
GEN-2010-006	205	SPS	Jones 230kV	On-Line
GEN-2010-007	73.8	SPS	Tap Pringle - Riverview 115kV	IA Pending
GEN-2010-008	64.4	WFEC	Woodward 69kV	IA Pending

Request	Amount	Area	Requested/Proposed Point of Interconnection	Status or In-Service Date
GEN-2010-009	165.6	SUNCMKEC	Tap Holcomb - Spearville (Gray County) 345kV	On Schedule for 2012
GEN-2010-011	30	OKGE	Tatonga 345kV	On Line
GEN-2010-012	65	WFEC	Brantley 138kV	IA Pending
GEN-2010-014	360	SPS	Hitchland 345kV	IA Pending
GEN-2010-015	200.1	SUNCMKEC	Spearville 345kV	On Schedule for 2015
GEN-2010-020	20	SPS	Roswell 69kV	Facility Study
GEN-2010-029	450	SUNCMKEC	Spearville 345kV	Facility Study
GEN-2010-036	4.6	WERE	6th Street 115kV	On Schedule for 2012
GEN-2010-040	300	OKGE	Cimarron 345kV	On Schedule for 2012
GEN-2010-041	10.5	OPPD	S 1399 161kV	Under Study (DISIS-2010-002)
GEN-2010-043	320	WFEC	Mooreland 138kV	Under Study (DISIS-2010-002)
GEN-2010-045	197.8	SUNCMKEC	Tap Holcomb - Spearville (Gray County) 345kV	IA Pending
GEN-2010-046	56	SPS	Tuco 230kV	IA Pending
GEN-2010-048	70	MIDW	Tap Beach Station - Redline 115kV	IA Pending
GEN-2010-049	49.6	SUNCMKEC	Pratt 115kV	IA Pending
GEN-2010-051	200	NPPD	Tap Twin Church - Hoskins 230kV	IA Pending
GEN-2010-052	301.3	SPS	Finney 345kV	IA Pending
GEN-2010-053	199.8	SUNCMKEC	Clark County 345kV	IA Pending
GEN-2010-055	4.5	AEPW	Wekiwa 138kV	Under Study (DISIS-2011-001)
GEN-2010-056	151	MIPU	Tap Saint Joseph - Cooper 345kV	Under Study (DISIS-2011-001)
GEN-2010-057	201	WERE	Rice County 230kV	Under Study (DISIS-2011-001)
GEN-2010-058	20	SPS	Chaves County 115kV	Under Study (DISIS-2011-001)
GEN-2011-007	250	OKGE	Tap Cimarron - Woodring (Matthewson) 345kV	Under Study (DISIS-2011-001)
GEN-2011-008	600	SUNCMKEC	Clark County 345kV	Under Study (DISIS-2011-001)
GEN-2011-010	100.8	OKGE	Minco 345kV	Under Study (DISIS-2011-001)
GEN-2011-011	50	KACP	Iatan 345kV	Under Study (DISIS-2011-001)
GEN-2011-012	104.5	SPS	Tap Moore County - Hitchland 345kV	Under Study (DISIS-2011-001)
GEN-2011-014	201	SPS	Tap Hitchland - Woodward Ckt 1 (Beaver County) 345kV	Under Study (DISIS-2011-001)
GEN-2011-016	200.1	SUNCMKEC	Spearville 345kV	Under Study (DISIS-2011-001)
GEN-2011-017	299	SUNCMKEC	Tap Spearville - PostRock 345kV	Under Study (DISIS-2011-001)
GEN-2011-018	73.6	NPPD	Steele City 115kV	Under Study (DISIS-2011-001)
GEN-2011-019	299	OKGE	Woodward 345kV	Under Study (DISIS-2011-001)
GEN-2011-020	299	OKGE	Woodward 345kV	Under Study (DISIS-2011-001)
GEN-2011-021	299	SPS	Tap Hitchland - Beaver 345kV	Under Study (DISIS-2011-001)
GEN-2011-022	299	SPS	Hitchland 345kV	Under Study (DISIS-2011-001)
GEN-2011-023	299	SUNCMKEC	Tap Spearville - Clark 345kV	Under Study (DISIS-2011-001)
GEN-2011-024	299	OKGE	Tatonga 345kV	Under Study (DISIS-2011-001)
GEN-2011-025	82.3	SPS	Tap Floyd County - Crosby County 115kV	Under Study (DISIS-2011-001)
GEN-2011-027	120	NPPD	Tap Twin Church - Hoskins 230kV (GEN-2010-51 Tap)	Under Study (DISIS-2011-001)
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

Request	Amount	Area	Requested/Proposed Point of Interconnection	Status or In-Service Date
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
<b>TOTAL 29,163.0</b>				

## C. Study Groups

<b>GROUP 1: WOODWARD AREA</b>			
<b>Request</b>	<b>Capacity</b>	<b>Area</b>	<b>Proposed Point of Interconnection</b>
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
GEN-2008-044	216.0	OKGE	Tatonga 345kV
GEN-2010-008	64.4	WFEC	Woodward 69kV
GEN-2010-011	30.0	OKGE	Tatonga 345kV
GEN-2010-040	300.0	OKGE	Cimarron 345kV
GEN-2010-043	320.0	WFEC	Mooreland 138kV
GEN-2011-007	250.0	OKGE	Tap Cimarron - Woodring (Matthewson) 345kV
GEN-2011-010	100.8	OKGE	Minco 345kV
GEN-2011-019	299.0	OKGE	Woodward 345kV
GEN-2011-020	299.0	OKGE	Woodward 345kV
GEN-2011-024	299.0	OKGE	Tatonga 345kV
GEN-2011-051	104.4	OKGE	Tap Woodward - Tatonga 345kV
GEN-2011-054	300.0	OKGE	Cimarron 345kV
<b>PRIOR QUEUED SUBTOTAL</b>	<b>5,714.4</b>		
GEN-2011-060	80.0	OKGE	Dewey 138kV
GEN-2011-061	52.0	WFEC	Putnam 69kV
<b>CURRENT CLUSTER SUBTOTAL</b>	<b>132.0</b>		
<b>AREA TOTAL</b>	<b>5,846.4</b>		

<b>GROUP 2: HITCHLAND AREA</b>			
<b>Request</b>	<b>Capacity</b>	<b>Area</b>	<b>Proposed Point of Interconnection</b>
ASGI-2010-011	48.0	SPS	TC-Texas County 69kV
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-2005-017	340.0	SPS	Tap Hitchland - Potter 345kV
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
GEN-2008-047	300.0	SPS	Tap Hitchland - Woodward Ckt 1 (Beaver County) 345kV
GEN-2010-001	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
GEN-2011-012	104.5	SPS	Tap Moore County - Hitchland 345kV
GEN-2011-014	201.0	SPS	Tap Hitchland - Woodward Ckt 1 (Beaver County) 345kV
GEN-2011-021	299.0	SPS	Tap Hitchland - Beaver 345kV
GEN-2011-022	299.0	SPS	Hitchland 345kV
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
<b>PRIOR QUEUED SUBTOTAL</b>	<b>3,943.2</b>		
<b>AREA TOTAL</b>	<b>3,943.2</b>		

<b>GROUP 3: SPEARVILLE AREA</b>			
<b>Request</b>	<b>Capacity</b>	<b>Area</b>	<b>Proposed Point of Interconnection</b>
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
GEN-2010-009	165.6	SUNCMKEC	Tap Holcomb - Spearville (Gray County) 345kV
GEN-2010-015	200.1	SUNCMKEC	Spearville 345kV
GEN-2010-029	450.0	SUNCMKEC	Spearville 345kV
GEN-2010-045	197.8	SUNCMKEC	Tap Holcomb - Spearville (Gray County) 345kV
GEN-2010-049	49.6	SUNCMKEC	Pratt 115kV
GEN-2010-052	301.3	SPS	Finney 345kV
GEN-2010-053	199.8	SUNCMKEC	Clark County 345kV
GEN-2010-061	180.0	MIDW	Tap Post Rock - Spearville 345kV
GEN-2011-008	600.0	SUNCMKEC	Clark County 345kV
GEN-2011-016	200.1	SUNCMKEC	Spearville 345kV
GEN-2011-017	299.0	SUNCMKEC	Tap Spearville - PostRock 345kV
GEN-2011-023	299.0	SUNCMKEC	Tap Spearville - Clark 345kV
GEN-2011-043	150.0	SUNCMKEC	Thistle 345kV
GEN-2011-044	150.0	SUNCMKEC	Thistle 345kV
Gray County Wind (Montezuma)	110.0	SUNCMKEC	Haggard 115kV
<b>PRIOR QUEUED SUBTOTAL</b>	<b>5,773.8</b>		
GEN-2011-059	201.0	SUNC	Clark County 345kV / Spearville 345kV
<b>CURRENT CLUSTER SUBTOTAL</b>	<b>201.0</b>		
<b>AREA TOTAL</b>	<b>5,974.8</b>		

<b>GROUP 4: MINGO/NW KANSAS AREA</b>			
<b>Request</b>	<b>Capacity</b>	<b>Area</b>	<b>Proposed Point of Interconnection</b>
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
<b>PRIOR QUEUED SUBTOTAL</b>	<b>924.0</b>		
<b>AREA TOTAL</b>	<b>924.0</b>		



<b>GROUP 5: AMARILLO AREA</b>			
<b>Request</b>	<b>Capacity</b>	<b>Area</b>	<b>Proposed Point of Interconnection</b>
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-2007-002	160.0	SPS	Grapevine 115kV
GEN-2007-048	400.0	SPS	Tap Amarillo S - Swisher 230kV
GEN-2008-051	322.0	SPS	Potter County 345kV
GEN-2008-088	50.6	SPS	Vega 69kV
Llano Estacado (White Deer)	80.0	SPS	Llano Wind 115kV
<b>PRIOR QUEUED SUBTOTAL</b>	<b>2,132.6</b>		
<b>AREA TOTAL</b>	<b>2,132.6</b>		

<b>GROUP 6: S-TX PANHANDLE/NW AREA</b>			
<b>Request</b>	<b>Capacity</b>	<b>Area</b>	<b>Proposed Point of Interconnection</b>
ASGI-2010-010	42.0	SPS	Lovington 115kV
ASGI-2010-020	50.0	SPS	Tap LE-Tatum - LE-Crossroads 69kV
ASGI-2010-021	36.6	SPS	Tap LE-Saunders Tap - LE-Anderson 69kV
ASGI-2011-001	28.8	SPS	Lovington 115kV
ASGI-2011-002	10.0	SPS	Herring 115kV
ASGI-2011-003	10.0	SPS	Hendricks 115kV
ASGI-2011-004	20.0	SPS	Pleasant Hill 69kV
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
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
GEN-2010-020	20.0	SPS	Roswell 69kV
GEN-2010-046	56.0	SPS	Tuco 230kV
GEN-2010-058	20.0	SPS	Chaves County 115kV
GEN-2011-025	82.3	SPS	Tap Floyd County - Crosby County 115kV
GEN-2011-045	205.0	SPS	Jones 230kV
GEN-2011-046	27.0	SPS	Tucumari 115kV
GEN-2011-048	165.0	SPS	Mustang 230kV
GEN-2011-058	200.0	SPS	Tap Grassland - Borden 230kV
<b>PRIOR QUEUED SUBTOTAL</b>	<b>2,947.7</b>		
<b>AREA TOTAL</b>	<b>2,947.7</b>		

<b>GROUP 7: SW OKLAHOMA AREA</b>			
<b>Request</b>	<b>Capacity</b>	<b>Area</b>	<b>Proposed Point of Interconnection</b>
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-2008-037	101.0	WFEC	Tap Washita - Blue Canyon Wind 138kV
GEN-2009-016	100.8	AEPW	Falcon Road 138kV
GEN-2010-012	65.0	WFEC	Brantley 138kV
GEN-2011-037	7.0	WFEC	Blue Canyon 5 138kV
GEN-2011-049	250.0	OKGE	Border 345kV
<b>PRIOR QUEUED SUBTOTAL</b>	<b>1,991.0</b>		
<b>AREA TOTAL</b>	<b>1,991.0</b>		

<b>GROUP 8: N-OK/S-KS AREA</b>			
<b>Request</b>	<b>Capacity</b>	<b>Area</b>	<b>Proposed Point of Interconnection</b>
ASGI-2010-006	150.0	AECI	Tap Fairfax Tap - Fairfax (AECI) 138kV
ASGI-2010-007	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-2008-071	76.8	OKGE	Newkirk 138kV
GEN-2008-098	100.8	WERE	Tap Lacygne - Wolf Creek (Anderson County) 345kV
GEN-2008-127	200.0	WERE	Tap Rosehill - Sooner 345kV
GEN-2009-025	60.0	OKGE	Tap Deer Creek - Sinclair Blackwell 69kV
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
GEN-2010-055	4.5	AEPW	Wekiwa 138kV
GEN-2011-041	150.0	WERE	Tap Wichita - Woodring (Sumner County) 345kV
GEN-2011-042	150.0	WERE	Tap Wichita - Woodring (Sumner County) 345kV
GEN-2011-057	150.4	WERE	Creswell 138kV
<b>PRIOR QUEUED SUBTOTAL</b>	<b>2,636.3</b>		
<b>AREA TOTAL</b>	<b>2,636.3</b>		

<b>GROUP 9/10: NEBRASKA AREA</b>			
<b>Request</b>	<b>Capacity</b>	<b>Area</b>	<b>Proposed Point of Interconnection</b>
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-2006-044N02	100.5	NPPD	Tap Ft Randle - Columbus (Madison County) 230kV
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
GEN-2008-123N	89.7	NPPD	Tap Guide Rock - Pauline 115kV
GEN-2009-040	73.8	WERE	Tap Smittyville - Knob Hill 115kV
GEN-2010-041	10.5	OPPD	S 1399 161kV
GEN-2010-044	99.0	NPPD	Harbine 115kV
GEN-2010-051	200.0	NPPD	Tap Twin Church - Hoskins 230kV
GEN-2011-018	73.6	NPPD	Steele City 115kV
GEN-2011-027	120.0	NPPD	Tap Twin Church - Hoskins 230kV (GEN-2010-51 Tap)
GEN-2011-055	50.0	OPPD	South Sterling 69kV
GEN-2011-056	3.6	NPPD	John Lake 115kV and Jeffrey 115kV
GEN-2011-056	8.7	NPPD	John Lake 115kV and Jeffrey 115kV
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 (Jeffrey)	18.0	NPPD	John Lake 115kV and Jeffrey 115kV
NPPD Distributed (John Lake)	38.0	NPPD	John Lake 115kV and Jeffrey 115kV
NPPD Distributed (Ord)	10.8	NPPD	Ord 115kV
NPPD Distributed (Stuart)	2.1	NPPD	Ainsworth 115kV
<b>PRIOR QUEUED SUBTOTAL</b>	<b>1,928.9</b>		
<b>AREA TOTAL</b>	<b>1,928.9</b>		

**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-2009-008	199.5	MIDW	South Hays 230kV
GEN-2009-011	50.0	SUNCMKEC	Tap Plainsville - Phillipsburg 115kV
GEN-2009-020	48.6	MIDW	Tap Nekoma - Bazine 69kV
GEN-2010-048	70.0	MIDW	Tap Beach Station - Redline 115kV
GEN-2010-057	201.0	WERE	Rice County 230kV
<b>PRIOR QUEUED SUBTOTAL</b>	<b>1,495.1</b>		
<b>AREA TOTAL</b>	<b>1,495.1</b>		

**GROUP 12: NW AR AREA**

Request	Capacity	Area	Proposed Point of Interconnection
<b>AREA TOTAL</b>	<b>0.0</b>		

**GROUP 13: NW MISSOURI AREA**

Request	Capacity	Area	Proposed Point of Interconnection
ASGI-2010-001	400.0	AECI	Tap Cooper - Fairport (AECI) 345kV
ASGI-2010-004	50.0	AECI	Tap Queen City (AECI) - Lancaster (AECI) 69kV
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
GEN-2010-036	4.6	WERE	6th Street 115kV
GEN-2010-056	151.0	MIPU	Tap Saint Joseph - Cooper 345kV
GEN-2011-011	50.0	KACP	Iatan 345kV
<b>PRIOR QUEUED SUBTOTAL</b>	<b>1,846.1</b>		
<b>AREA TOTAL</b>	<b>1,846.1</b>		

**GROUP 14: S OKLAHOMA AREA**

Request	Capacity	Area	Proposed Point of Interconnection
GEN-2008-046	200.0	OKGE	Sunnyside 345kV
GEN-2011-040	111.0	OKGE	Tap Ratliff - Pooleville 138kV
GEN-2011-050	109.8	AEPW	Tap Rush Springs - Marlow 138kV
<b>PRIOR QUEUED SUBTOTAL</b>	<b>420.8</b>		
<b>AREA TOTAL</b>	<b>420.8</b>		

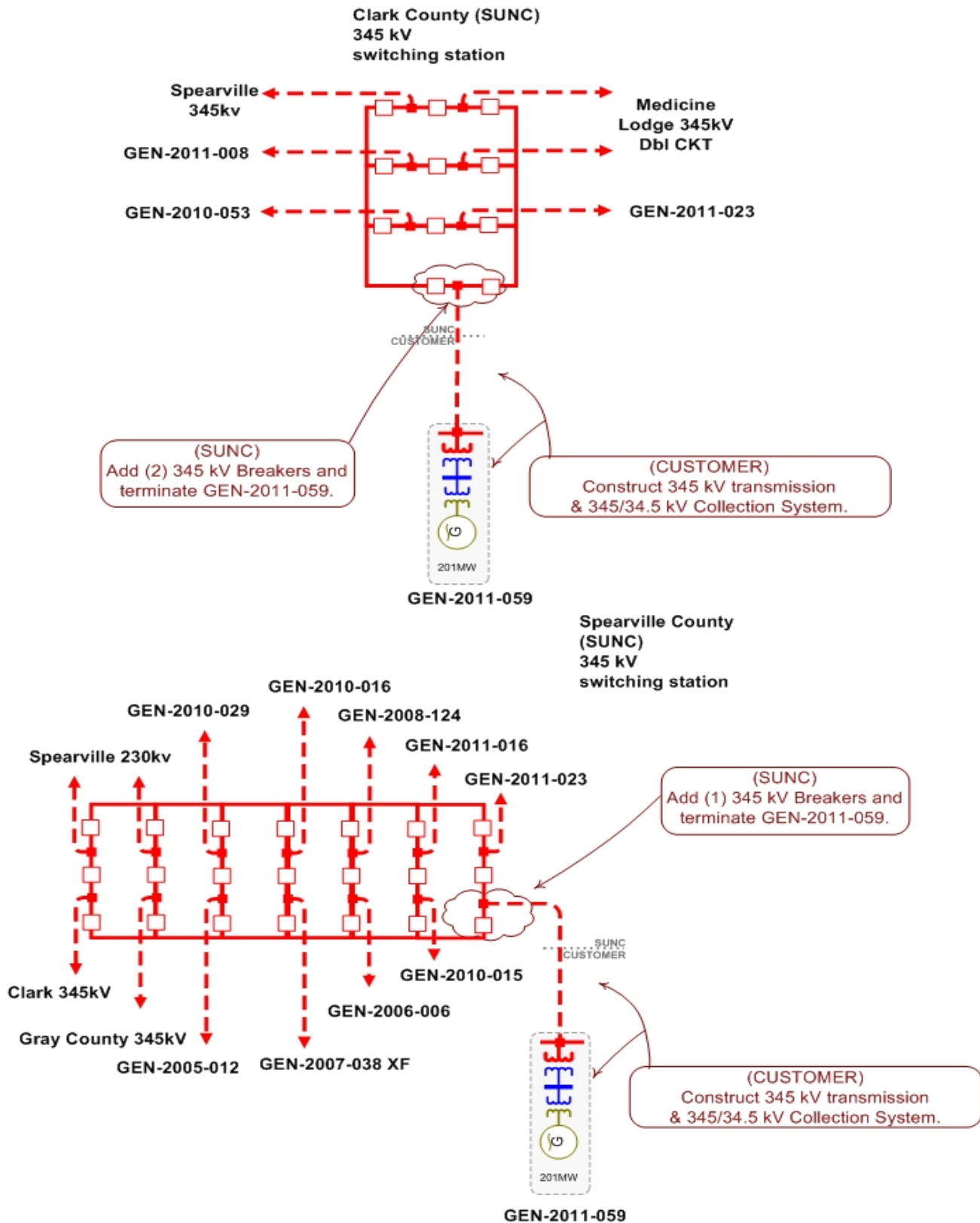
**GROUP 15: RESERVED**

Request	Capacity	Area	Proposed Point of Interconnection
<b>AREA TOTAL</b>	<b>0.0</b>		

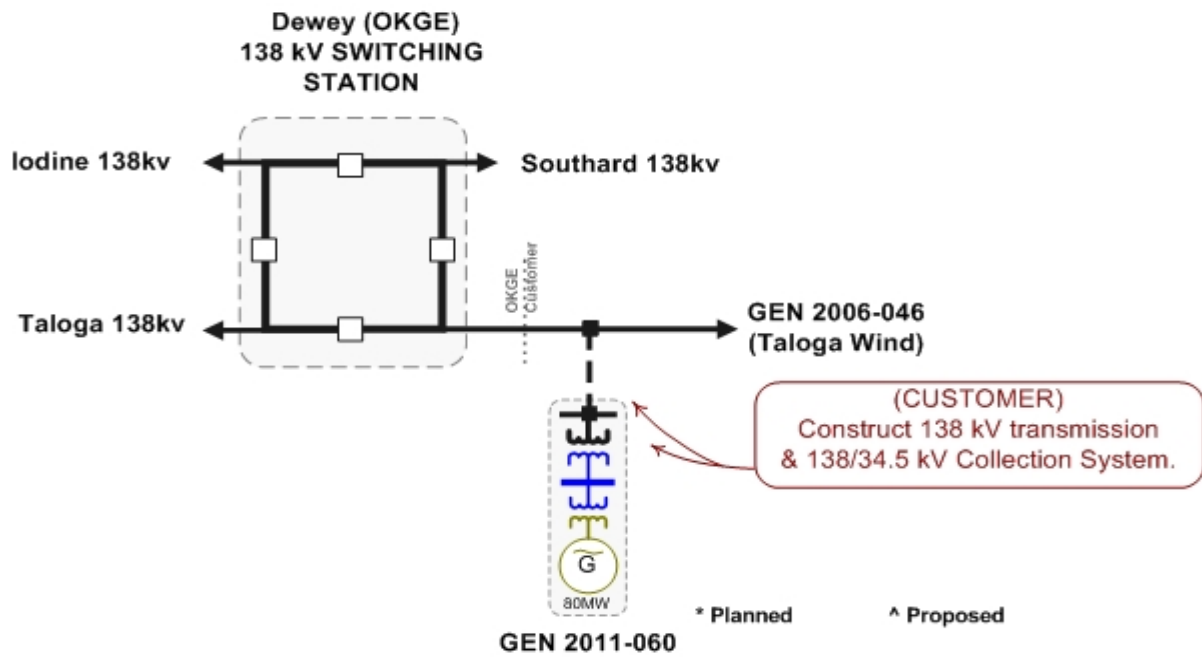
<b>CLUSTER TOTAL (CURRENT STUDY)</b>	<b>333.0</b>	<b>MW</b>
<b>PQ TOTAL (PRIOR QUEUED)</b>	<b>31,753.9</b>	<b>MW</b>
<b>CLUSTER TOTAL (INCLUDING PRIOR QUEUED)</b>	<b>32,086.9</b>	<b>MW</b>

### D: Proposed Point of Interconnection One line Diagrams

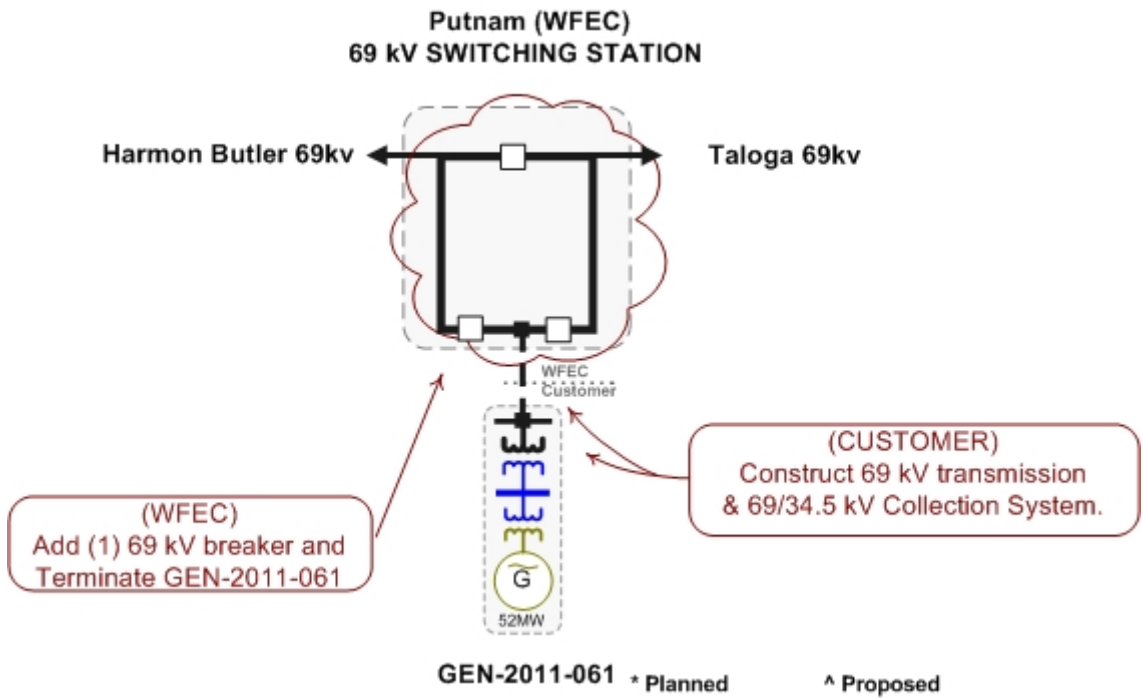
#### GEN-2011-059



#### GEN-2011-060



**GEN-2011-061**





# Appendix E. Cost Allocation Per Request

(Including Previously Allocated Network Upgrades\*)

Interconnection Request and Upgrades	Upgrade Type	Allocated Cost	Upgrade Cost
<b>GEN 2011-059</b>			
GEN 2011-059 Interconnection Costs See online diagram	Current Study	\$5,000,000.00	\$5,000,000.00
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 County - Gray County 345kV Build approximately 90 miles of 345kV from Beaver County - Gray County	Previously Allocated		\$170,209,050.00
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
Circle - Reno 345kV Dbl CKT Build new 345kV line from Circle - Reno	Previously Allocated		\$15,269,300.00
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
GEN-2011-017T - Postrock 345kV CKT 1 Balanced Portfolio: Spearville - PostRock 345kV CKT 1 (Total Project E&C Cost Shown)	Previously Allocated		\$77,703,351.00
Hitchland - Border 345 kV CKT 1 Build approximately 105 miles of 345kV and SVC at Hitchland.	Previously Allocated		\$227,757,964.00
Hitchland 345/230kV Autotransformer CKT 2 Priority Project: Hitchland 345/230kV Autotransformer CKT 2 (Total Project E&C Cost Shown).	Previously Allocated		\$8,883,760.00
Matthewson - Cimarron 345kV CKT 2 Build second 345kV circuit from Matthewson - Cimarron @ 3000 amps	Previously Allocated		\$42,903,753.00
Mullegren - Circle 345kV Dbl CKT Build new double 345kV line from Mullergren - Circle	Previously Allocated		\$132,000,000.00
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
Post Rock 345/230/13.8kV Autotransformer CKT 2 DISIS-2010-001 Restudy	Previously Allocated		\$13,749,527.00
Spearville - GEN-2011-017T 345kV CKT 1 Balanced Portfolio: Spearville - PostRock 345kV CKT 1 (Total Project E&C Cost Shown)	Previously Allocated		\$77,703,351.00

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

<b>Interconnection Request and Upgrades</b>	<b>Upgrade Type</b>	<b>Allocated Cost</b>	<b>Upgrade Cost</b>
Spearville - Mullergren 345kV Dbl CKT Build new 345kV line from Spearville - Mullergren	Previously Allocated		\$124,000,000.00
Tatonga - Matthewson 345kV CKT 2 Build second 345kV circuit from Tatonga - Matthewson @ 3000 amps	Previously Allocated		\$104,260,473.00
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
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
Viola - Rose Hill 345kV CKT 1 Build approximately 45 miles of 345kV from Viola - Rose Hill	Previously Allocated		\$75,000,000.00
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
	<b>Current Study Total</b>	<b>\$5,000,000.00</b>	

## **GEN 2011-060**

Arapaho - Harmon Butler 69kV Replace CT	Current Study	\$12,581.43	\$100,000.00
Arapaho - Industrial Park 69kV CKT 1 Replace CT	Current Study	\$12,581.43	\$100,000.00
Canton - Taloga 69kV CKT 1 Rebuild approximately 9.7 miles of 69kV from Canton to Taloga	Current Study	\$3,273,162.00	\$9,700,000.00
Dewey - Taloga 138kV CKT 1 Rebuild approximately 4.2 miles of 138kV from Dewey to Taloga	Current Study	\$4,200,000.00	\$4,200,000.00
GEN 2011-060 Interconnection Costs See online diagram	Current Study	\$1.00	\$1.00
Okeene - Canton 69kV CKT 1 Replace CT	Current Study	\$33,743.94	\$100,000.00
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

<b>Interconnection Request and Upgrades</b>	<b>Upgrade Type</b>	<b>Allocated Cost</b>	<b>Upgrade Cost</b>
Matthewson - Cimarron 345kV CKT 2 Build second 345kV circuit from Matthewson - Cimarron @ 3000 amps	Previously Allocated		\$42,903,753.00
Spearville - Mullergren 345kV Dbl CKT Build new 345kV line from Spearville - Mullergren	Previously Allocated		\$124,000,000.00
Tatonga - Matthewson 345kV CKT 2 Build second 345kV circuit from Tatonga - Matthewson @ 3000 amps	Previously Allocated		\$104,260,473.00
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
Viola - Rose Hill 345kV CKT 1 Build approximately 45 miles of 345kV from Viola - Rose Hill	Previously Allocated		\$75,000,000.00
	<b>Current Study Total</b>	<b>\$7,532,069.80</b>	

### **GEN 2011-061**

Arapaho - Harmon Butler 69kV Replace CT	Current Study	\$87,418.57	\$100,000.00
Arapaho - Industrial Park 69kV CKT 1 Replace CT	Current Study	\$87,418.57	\$100,000.00
Canton - Taloga 69kV CKT 1 Rebuild approximately 9.7 miles of 69kV from Canton to Taloga	Current Study	\$6,426,838.00	\$9,700,000.00
GEN 2011-061 Interconnection Costs See online diagram	Current Study	\$3,000,000.00	\$3,000,000.00
Okeene - Canton 69kV CKT 1 Replace CT	Current Study	\$66,256.06	\$100,000.00
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

<b>Interconnection Request and Upgrades</b>	<b>Upgrade Type</b>	<b>Allocated Cost</b>	<b>Upgrade Cost</b>
Spearville - Mullergren 345kV Dbl CKT Build new 345kV line from Spearville - Mullergren	Previously Allocated		\$124,000,000.00
Tatonga - Matthewson 345kV CKT 2 Build second 345kV circuit from Tatonga - Matthewson @ 3000 amps	Previously Allocated		\$104,260,473.00
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
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
Viola - Rose Hill 345kV CKT 1 Build approximately 45 miles of 345kV from Viola - Rose Hill	Previously Allocated		\$75,000,000.00
	<b>Current Study Total</b>		\$9,667,931.20
<b>TOTAL CURRENT STUDY COSTS:</b>			<b>\$22,200,001.00</b>

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

**F: FCITC Analysis (No Upgrades)**

SEASON	GROUP	SCENARIO	DIRECTION	SOURCE	MONITORED ELEMENT	RATE B (MVA)	TDF	(% MVA) LOADING	CONTINGENCY	
12G		1	0	TO->FROM	G11_061	'CANTON - TALOGA 69KV CKT 1'	38.3	0.21817	140.3259	'HAMON BUTLER - PUTNAM 69KV CKT 1'
12G		1	0	TO->FROM	G11_061	'CANTON - TALOGA 69KV CKT 1'	38.3	0.21817	139.8037	'ARAPAHO - HAMON BUTLER 69KV CKT 1'
12G		1	0	TO->FROM	G11_061	'CANTON - TALOGA 69KV CKT 1'	38.3	0.21817	139.8037	'ARAPAHO - INDUSTRIAL PARK 69KV CKT 1'
12G		1	0	TO->FROM	G11_061	'CANTON - TALOGA 69KV CKT 1'	38.3	0.21817	138.4982	'CORDELL - INDUSTRIAL PARK 69KV CKT 1'
12G		1	0	TO->FROM	G11_061	'CANTON - TALOGA 69KV CKT 1'	38.3	0.21817	134.5818	'CORDELL - GOTEBO 69KV CKT 1'
12G		1	0	FROM->TO	G11_060	'DEWEY - TALOGA 138KV CKT 1'	143	0.54512	117.6169	'EL RENO - ROMAN NOSE 138KV CKT 1'
12G		1	0	FROM->TO	G11_061	'CANTON - OKEENE 69KV CKT 1'	47.5	0.21817	107.4628	'HAMON BUTLER - PUTNAM 69KV CKT 1'
12G		1	0	FROM->TO	G11_061	'CANTON - OKEENE 69KV CKT 1'	47.5	0.21817	107.2523	'ARAPAHO - HAMON BUTLER 69KV CKT 1'
12G		1	0	FROM->TO	G11_061	'CANTON - OKEENE 69KV CKT 1'	47.5	0.21817	107.2523	'ARAPAHO - INDUSTRIAL PARK 69KV CKT 1'
12G		1	0	FROM->TO	G11_061	'CANTON - OKEENE 69KV CKT 1'	47.5	0.21817	105.9891	'CORDELL - INDUSTRIAL PARK 69KV CKT 1'
12G		1	0	FROM->TO	G11_061	'CANTON - OKEENE 69KV CKT 1'	47.5	0.21817	102.8312	'CORDELL - GOTEBO 69KV CKT 1'
12G	01G11_060		0	FROM->TO	G11_060	'DEWEY - TALOGA 138KV CKT 1'	143	0.54512	133.5224	'EL RENO - ROMAN NOSE 138KV CKT 1'
12G	01G11_061		0	TO->FROM	G11_061	'CANTON - TALOGA 69KV CKT 1'	38.3	0.21817	145.7796	'HAMON BUTLER - PUTNAM 69KV CKT 1'
12G	01G11_061		0	TO->FROM	G11_061	'CANTON - TALOGA 69KV CKT 1'	38.3	0.21817	145.2574	'ARAPAHO - HAMON BUTLER 69KV CKT 1'
12G	01G11_061		0	TO->FROM	G11_061	'CANTON - TALOGA 69KV CKT 1'	38.3	0.21817	145.2574	'ARAPAHO - INDUSTRIAL PARK 69KV CKT 1'
12G	01G11_061		0	TO->FROM	G11_061	'CANTON - TALOGA 69KV CKT 1'	38.3	0.21817	143.952	'CORDELL - INDUSTRIAL PARK 69KV CKT 1'
12G	01G11_061		0	TO->FROM	G11_061	'CANTON - TALOGA 69KV CKT 1'	38.3	0.21817	140.0355	'CORDELL - GOTEBO 69KV CKT 1'
12G	01G11_061		0	FROM->TO	G11_061	'CANTON - OKEENE 69KV CKT 1'	47.5	0.21817	111.8602	'HAMON BUTLER - PUTNAM 69KV CKT 1'
12G	01G11_061		0	FROM->TO	G11_061	'CANTON - OKEENE 69KV CKT 1'	47.5	0.21817	111.6497	'ARAPAHO - HAMON BUTLER 69KV CKT 1'
12G	01G11_061		0	FROM->TO	G11_061	'CANTON - OKEENE 69KV CKT 1'	47.5	0.21817	111.6497	'ARAPAHO - INDUSTRIAL PARK 69KV CKT 1'
12G	01G11_061		0	FROM->TO	G11_061	'CANTON - OKEENE 69KV CKT 1'	47.5	0.21817	110.3865	'CORDELL - INDUSTRIAL PARK 69KV CKT 1'
12G	01G11_061		0	FROM->TO	G11_061	'CANTON - OKEENE 69KV CKT 1'	47.5	0.21817	107.2286	'CORDELL - GOTEBO 69KV CKT 1'
12G	01G11_061		0	TO->FROM	G11_061	'ARAPAHO - HAMON BUTLER 69KV CKT 1'	47.4	1	105.4862	'PUTNAM - TALOGA 69KV CKT 1'
12G	01G11_061		0	FROM->TO	G11_061	'ARAPAHO - INDUSTRIAL PARK 69KV CKT 1'	47.4	1	105.4862	'PUTNAM - TALOGA 69KV CKT 1'
12SP	00G11_061		0	TO->FROM	G11_061	'ARAPAHO - HAMON BUTLER 69KV CKT 1'	47.9	1	104.1754	'PUTNAM - TALOGA 69KV CKT 1'
12SP	00G11_061		0	FROM->TO	G11_061	'ARAPAHO - INDUSTRIAL PARK 69KV CKT 1'	47.9	1	104.1754	'PUTNAM - TALOGA 69KV CKT 1'
12WP	00G11_061		0	FROM->TO	G11_061	'ARAPAHO - INDUSTRIAL PARK 69KV CKT 1'	47.8	1	104.3933	'PUTNAM - TALOGA 69KV CKT 1'
12WP	00G11_061		0	TO->FROM	G11_061	'ARAPAHO - HAMON BUTLER 69KV CKT 1'	47.8	1	104.3933	'PUTNAM - TALOGA 69KV CKT 1'
13SP	00G11_061		0	FROM->TO	G11_061	'ARAPAHO - INDUSTRIAL PARK 69KV CKT 1'	47.8	1	104.1841	'PUTNAM - TALOGA 69KV CKT 1'
13SP	00G11_061		0	TO->FROM	G11_061	'ARAPAHO - HAMON BUTLER 69KV CKT 1'	47.8	1	104.1841	'PUTNAM - TALOGA 69KV CKT 1'
13WP	00G11_061		0	FROM->TO	G11_061	'ARAPAHO - INDUSTRIAL PARK 69KV CKT 1'	47.8	1	104.3933	'PUTNAM - TALOGA 69KV CKT 1'
13WP	00G11_061		0	TO->FROM	G11_061	'ARAPAHO - HAMON BUTLER 69KV CKT 1'	47.8	1	104.3933	'PUTNAM - TALOGA 69KV CKT 1'
17SP	00G11_061		0	FROM->TO	G11_061	'ARAPAHO - INDUSTRIAL PARK 69KV CKT 1'	47.8	1	104.1841	'PUTNAM - TALOGA 69KV CKT 1'
17SP	00G11_061		0	TO->FROM	G11_061	'ARAPAHO - HAMON BUTLER 69KV CKT 1'	47.8	1	104.1841	'PUTNAM - TALOGA 69KV CKT 1'
17WP	00G11_061		0	TO->FROM	G11_061	'ARAPAHO - HAMON BUTLER 69KV CKT 1'	47.8	1	103.9749	'PUTNAM - TALOGA 69KV CKT 1'
17WP	00G11_061		0	FROM->TO	G11_061	'ARAPAHO - INDUSTRIAL PARK 69KV CKT 1'	47.8	1	103.9749	'PUTNAM - TALOGA 69KV CKT 1'
12G		1	2	TO->FROM	G11_061	'CANTON - TALOGA 69KV CKT 1'	38.3	0.21785	140.3604	'HAMON BUTLER - PUTNAM 69KV CKT 1'
12G		1	2	TO->FROM	G11_061	'CANTON - TALOGA 69KV CKT 1'	38.3	0.21785	140.0993	'ARAPAHO - INDUSTRIAL PARK 69KV CKT 1'
12G		1	2	TO->FROM	G11_061	'CANTON - TALOGA 69KV CKT 1'	38.3	0.21785	140.0993	'ARAPAHO - HAMON BUTLER 69KV CKT 1'
12G		1	2	TO->FROM	G11_061	'CANTON - TALOGA 69KV CKT 1'	38.3	0.21785	138.5328	'CORDELL - INDUSTRIAL PARK 69KV CKT 1'
12G		1	2	TO->FROM	G11_061	'CANTON - TALOGA 69KV CKT 1'	38.3	0.21785	134.8774	'CORDELL - GOTEBO 69KV CKT 1'
12G		1	2	FROM->TO	G11_061	'CANTON - OKEENE 69KV CKT 1'	47.5	0.21785	107.4906	'HAMON BUTLER - PUTNAM 69KV CKT 1'
12G		1	2	FROM->TO	G11_061	'CANTON - OKEENE 69KV CKT 1'	47.5	0.21785	107.2801	'ARAPAHO - INDUSTRIAL PARK 69KV CKT 1'
12G		1	2	FROM->TO	G11_061	'CANTON - OKEENE 69KV CKT 1'	47.5	0.21785	107.2801	'ARAPAHO - HAMON BUTLER 69KV CKT 1'

SEASON	GROUP	SCENARIO	DIRECTION	SOURCE	MONITORED ELEMENT	RATE B (MVA)	TDF	(% MVA) LOADING	CONTINGENCY
12G	1	2	FROM->TO	G11_061	'CANTON - OKEENE 69KV CKT 1'	47.5	0.21785	106.0169	'CORDELL - INDUSTRIAL PARK 69KV CKT 1'
12G	1	2	FROM->TO	G11_061	'CANTON - OKEENE 69KV CKT 1'	47.5	0.21785	103.0696	'CORDELL - GOTEBO 69KV CKT 1'
12G	01G11_061	2	TO->FROM	G11_061	'CANTON - TALOGA 69KV CKT 1'	38.3	0.21785	145.8039	'HAMON BUTLER - PUTNAM 69KV CKT 1'
12G	01G11_061	2	TO->FROM	G11_061	'CANTON - TALOGA 69KV CKT 1'	38.3	0.21785	145.5428	'ARAPAHO - INDUSTRIAL PARK 69KV CKT 1'
12G	01G11_061	2	TO->FROM	G11_061	'CANTON - TALOGA 69KV CKT 1'	38.3	0.21785	145.5428	'ARAPAHO - HAMON BUTLER 69KV CKT 1'
12G	01G11_061	2	TO->FROM	G11_061	'CANTON - TALOGA 69KV CKT 1'	38.3	0.21785	143.9762	'CORDELL - INDUSTRIAL PARK 69KV CKT 1'
12G	01G11_061	2	TO->FROM	G11_061	'CANTON - TALOGA 69KV CKT 1'	38.3	0.21785	140.3208	'CORDELL - GOTEBO 69KV CKT 1'
12G	01G11_061	2	FROM->TO	G11_061	'CANTON - OKEENE 69KV CKT 1'	47.5	0.21785	111.8797	'HAMON BUTLER - PUTNAM 69KV CKT 1'
12G	01G11_061	2	FROM->TO	G11_061	'CANTON - OKEENE 69KV CKT 1'	47.5	0.21785	111.6692	'ARAPAHO - INDUSTRIAL PARK 69KV CKT 1'
12G	01G11_061	2	FROM->TO	G11_061	'CANTON - OKEENE 69KV CKT 1'	47.5	0.21785	111.6692	'ARAPAHO - HAMON BUTLER 69KV CKT 1'
12G	01G11_061	2	FROM->TO	G11_061	'CANTON - OKEENE 69KV CKT 1'	47.5	0.21785	110.4061	'CORDELL - INDUSTRIAL PARK 69KV CKT 1'
12G	01G11_061	2	FROM->TO	G11_061	'CANTON - OKEENE 69KV CKT 1'	47.5	0.21785	107.4587	'CORDELL - GOTEBO 69KV CKT 1'