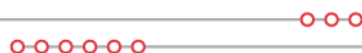


# Feasibility Cluster Study for Generator Interconnection Requests (FCS-2015-001)

February 2015

Generator Interconnection Studies



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## Revision History

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Date or Version Number	Author	Change Description	Comments
2/26/2015	Southwest Power Pool	N/A	Report Issued

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## Executive Summary

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Generator Interconnection customers have requested a Feasibility Study under the Generator 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 (FCS) window which closed December 31<sup>st</sup>, 2014. This Feasibility Cluster Study analyzes generation interconnection requests totaling approximately 400 MW which would be located within the transmission systems of Southwestern Public Service (SPS) and Sunflower Electric Power Corporation/Mid-Kansas Electric Power LLC (SUNC)/(MKEC). The generation interconnection requests have various proposed in-service dates<sup>1</sup>. The generation interconnection requests included in this Feasibility Cluster Study are listed in Appendix A by 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, 400 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 Preliminary Interconnection System Impact Study (PISIS) and Definitive Interconnection System Impact Study (DISIS) based on the wind turbine manufacturer and type requested by the Customer. Dynamic stability studies performed as part of the PISIS and DISIS Cluster Studies will provide additional guidance as to whether required reactive compensation can be static or a portion must be dynamic (such as a SVC).

In no way does this study guarantee operation for all periods of time. This interconnection study identifies and assigns transmission reinforcements for Energy Resource (ER) interconnection injection constraints and Network Resource (NR) constraints if requested by the Customer. This interconnection study does not assign transmission reinforcements for all potential transmission constraints. It should be noted that although this study analyzed many of the most probable contingencies, it is not an all-inclusive list and cannot account for every operational situation. Because of this, it is likely that the Customer(s) may be required to reduce their generation output to 0 MW, also known as curtailment, under certain system conditions to allow system operators to maintain the reliability of the transmission network.

The total estimated minimum cost for interconnecting the studied generation interconnection request is \$65,250,000. These costs are shown in Appendices E and F. GEN-2014-073 requested additional analysis for alternate Points of Interconnection (POIs). The one-line diagrams in Appendix D should be consulted for details of the alternate POIs. Separate cost allocations are included in this report for the alternate Points of Interconnection. 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 PISIS and DISIS. Most importantly, these costs do not include potential costs from upgrades that

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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.

are identified for the DISIS-2014-002 Cluster Study. If any Interconnection Requests are withdrawn from the DISIS-2014-002 study, then potential upgrades tentatively assigned to DISIS-2014-002 Interconnection Requests may be assigned to the Interconnection Requests in this FCS-2015-001 study once these Interconnection Requests execute a Definitive Interconnection System Impact Study Agreement.

Network Constraints listed in Appendix I are located 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. Those constraints are also listed in Appendix I. Additional Network constraints will have to be verified with a Transmission Service Request (TSR) and associated studies. With a defined source and sink in a TSR, this list of Network Constraints will be refined and expanded to account for all Network Upgrade requirements.

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

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## Introduction

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Generator Interconnection customers have requested a Feasibility Study under the Generator 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 (FCS) window which closed December 31<sup>st</sup>, 2014. This Feasibility Cluster Study analyzes generation interconnection requests totaling approximately 400 MW which would be located within the transmission systems of Southwestern Public Service (SPS) and Sunflower Electric Power Corporation/Mid-Kansas Electric Power LLC (SUNC)/(MKEC). The generation interconnection requests have various proposed in-service dates<sup>2</sup>. The generation interconnection requests included in this Feasibility Cluster Study are listed in Appendix A by 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 all interconnection requests that submitted a Feasibility Study Agreement no later than September 30<sup>th</sup>, 2014 and were subsequently accepted by Southwest Power Pool under the terms of the Generator Interconnection Procedures (GIP) effective at the time of this study. The interconnection requests that are included in this study are listed in Appendix A.

### **Previously Queued Interconnection Requests**

The previously queued requests included in this study are listed in Appendix B. In addition to the Base Case Upgrades, the previously queued requests and associated upgrades were assumed to be in-service and added to the Base Case models. These projects were dispatched as Energy Resources and or Network Resources (in accordance with the individual Generator Interconnection Requests) 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 2014 series Integrated Transmission Planning models (used in the 2015ITPNT) including the 2015 spring, 2015 summer peak, 2020 summer and winter peak, and 2025 summer peak scenario 0 cases were used for this study. After the cases were developed, each of the control areas' resources were then re-dispatched to account for the new generation requests using current dispatch orders.

## 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-2015-001 Customers have not been assigned cost for the below listed projects. The FCS-2015-001 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 Feasibility Study customers.

- 2012 Integrated Transmission Plan (2012 ITP10) Projects
  - Woodward-Tatonga-Mathewson-Cimarron 345kV transmission line, scheduled for 2021 in-service<sup>3</sup>
  - Chisholm – Gracemont 345kV transmission line, and Chisholm 345/230kV transformer circuit #1, scheduled for 3/1/2018 in-service<sup>4</sup>
- 2015 Integrated Transmission Plan Near Term (2015 ITPNT) Projects
  - China Draw 115kV Reactive Power Support
    - 200Mvar Capacitive and 50Mvar Inductive Static Var Compensator (SVC)
  - Road Runner 115kV Reactive Power Support
    - 200Mvar Capacitive and 50Mvar Inductive Static Var Compensator (SVC)
  - Agave Hill 115kV reactive Power Support
    - 28.8Mvar Capacitor Bank(s)
  - Potash Junction – Intrepid – IMC #1 – Livingston Ridge 115kV rebuild
- Balanced Portfolio Projects<sup>5</sup>:
  - Iatan – Nashua 345/161kV Project, scheduled for 6/1/2015 in-service
    - Iatan – Nashua 345kV circuit #1 and associated terminal equipment
    - Nashua 345/161/13kV autotransformer circuit #1
  - Northwest 345/138/13.8kV circuit #3 autotransformer, scheduled for 6/1/2017 in-service<sup>6</sup>
  - Hoskins – Neligh East 345/115kV Project<sup>7</sup>
    - Neligh East 345/115kV substation and transformer
    - Neligh East Area 115kV upgrades to support new station
    - Hoskins – Neligh East 345kV circuit #1
- High Priority Incremental Loads (HPILs) Projects<sup>8</sup>:

<sup>3</sup> SPP Notification to Construct (NTC) 200223

<sup>4</sup> SPP Notification to Construct (NTC) 200240 and 200255

<sup>5</sup> Notification to Construct (NTC) issued June 2009

<sup>6</sup> SPP Transmission Service Project identified in SPP 2009-AG2-AFS6. Per SPP NTC 20137

<sup>7</sup> SPP Regional Reliability 2012 ITP 10 Project Per SPP-NTC-200220

- TUCO Interchange – Yoakum – Hobbs Interchange 345/230kV Project
  - TUCO Interchange – Yoakum – Hobbs Interchange 345kV circuit #1 and associated terminal equipment upgrades
  - Hobbs 345/230/13kV transformer circuit #1
  - Yoakum 345/230/13kV transformer circuit #1
- Battle Axe – Road Runner 115kV circuit #1
- Chaves County – Price – CV Pines – Capitan 115kV circuit #1
- China Draw – Yeso Hills 115kV circuit #1
- Dollarhide – Toboso Flats 115kV circuit #1
- Hobbs Interchange – Kiowa 345kV circuit #1
- Kiowa – North Loving – China Draw 345/115kV Projects
  - Kiowa – North Loving – China Draw circuit #1 and associated terminal equipment upgrades
  - China Draw 345/115/13kV transformer circuit #1
  - North Loving 345/115/13kV transformer circuit #1
- Kiowa – Road Runner 345/230/115kV Projects
  - Kiowa 345/230kV transformer circuit #1
  - Road Runner 345/115/13kV transformer circuit #1
- Livingston Ridge – Sage Brush – Lagarto – Cardinal 115kV circuit #1
- North Loving – South Loving 115kV circuit #1
- Ponderosa – Ponderosa Tap 115kV circuit #1 Potash 230/115/13kV Transformer circuit #1 replacement

## 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-2015-001 study and are assumed to be in service. This list may not be all inclusive. The FCS-2015-001 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-2015-001 Customer Generation Facilities in service dates may need to be delayed until the completion of the following upgrades.

- Upgrades assigned to DISIS-2009-001 Interconnection Customers:
  - Spearville Project
    - Spearville 345/115kV transformer circuit #1 addition
    - Spearville – North Ft. Dodge 115kV addition
    - Ft Dodge – North Ft. Dodge circuit #2 addition
    - Move Fort Dodge terminal of Shooting Star 115kV at North Ft Dodge
  - Fort Randall – Meadow Grove – Kelly 230kV circuit #1 rerate (320MVA)
- Upgrades assigned to DISIS-2010-001 Interconnection Customers:
  - Switch 2749 – Wildorado 69kV circuit # 1 rebuild
- Upgrades assigned to DISIS-2010-002 Interconnection Customers:
  - Twin Church – Dixon County 230kV circuit #1 rerate (320MVA)

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<sup>8</sup> Per Network Upgrades assigned in High Priority Incremental Loads (HPILs) study, Including Direct Assigned Upgrades, Projects in SPP-NTC-200256 and SPP-NTC-200283.



- Buckner – Spearville 345kV terminal equipment
- Upgrades assigned to DISIS-2011-001 Interconnection Customers:
  - Hoskins – Dixon County – Twin Church 230kV circuit #1 conductor clearance increase
  - (NRIS only) New Deal – TUCO 345kV/115kV Project
  - (NRIS only) Wolfforth Interchange 230/115/13kV transformer circuit #1
  - (NRIS only) Woodward – FPL Switch – Mooreland – Glass Mountain 138kV circuit #1 rebuild
- Upgrades assigned to DISIS-2011-002 Interconnection Customers:
  - none at this time
- Upgrades assigned to DISIS-2012-001 Interconnection Customers:
  - None at this time
- Upgrades assigned to DISIS-2012-002 Interconnection Customers:
  - Amoco Wasson – Oxy Tap 230kV circuit #1 replace line traps
  - Associated Electric Cooperatives Inc. (AECI) Fairfax 138/69kV transformer replacement
  - Lake Creek – Lone Wolf 69kV circuit #1 reset CT
  - Remington – Fairfax 138kV circuit #1 conductor clearance increase
  - (NRIS only) Arkansas City – Paris –Creswell – Oak – Rainbow – City of Winfield 69kV circuit #1 rebuild
  - (NRIS only) Creswell 138/69/13kV Transformer circuit #1 and #2, replacements
- Upgrades assigned to DISIS-2013-001 Interconnection Customers:
  - None at this time
- Upgrades assigned to DISIS-2013-002 Interconnection Customers:
  - Battle Creek – County Line 115kV circuit #1 rebuild
  - County Line – Neligh East 115kV circuit #1 rebuild
- Upgrades assigned to DISIS 2014-001 Interconnection Customers
  - National Enrichment Plant – Targa 115kV circuit #1 rebuild
  - Targa – Cardinal 115kV circuit #1 rebuild
- Upgrades assigned to DISIS 2014-002 Interconnection Customers
  - GEN-2014-007 Tap – Border – Chisholm 345kV Project
    - Chisholm 345kV Substation Expansion for terminating Border – Woodward 345kV circuit #1 into Chisholm 345kV
    - GEN-2014-007 Tap – Border – Chisholm 345kV circuit #2 build
    - Terminate Border – Woodward 345kV circuit #1 into Chisholm 345kV
    - Chisholm – Gracemont 345kV circuit #1 build
    - Chisholm – Potter County 345kV circuit #1 build
  - TUCO 2 345kV project
    - TUCO 2 345kV Bus
    - GEN-2014-007 Tap – TUCO 2 345kV circuit #1 build
    - TUCO – TUCO 2 – Tolk 345kV circuit #1 build
  - Tolk – Potter County 345kV circuit #1 build
  - Arnold – Ransom 115kV circuit #1 replace terminal equipment
  - Bailey County Earth – Castro County 115kV circuit #1 rebuild
  - Beaver County – Grapevine 345kV circuit #1 build
  - Border 200Mvar Static VAR Compensator (SVC) and 200Mvar Capacitor Bank(s)
  - Bushland Interchange 230/115/13.2kV transformer circuit #1 replacement
  - Bushland Interchange – Hillside 115kV circuit #1 replace terminal equipment
  - Carlisle 230/115/13kV transformer circuit #1 replacement

- Cimarron – Draper Lake circuit #1 replace terminal equipment
- Cimarron – Minco 345kV circuit #1 replace 1600 amp switches
- Chaves County 115kV Reactive Power support
- Clark County 100 Mvar Static VAR Compensator (SVC)
- Elk City 230/138/13kV transformer circuit #1 upgrade terminal equipment
- GEN-2013-0059 tap – Ogallala 230kV circuit #1 replace terminal equipment
- Gavins Point – Yankton Junction 115kV circuit #1
- GEN-2014-067 tap – GEN-2014-068 tap 230kV circuit #1 build
- Gerald Gentleman Station Flowgate Stability Limit Mitigation
- Grapevine 345kV Substation build
- Grapevine – Chisholm 345kV circuit #1 build
- Harper – Milan tap 138kV circuit #1 rebuild
- Knoll – Postrock 230kV circuit #1 rebuild
- LES – GEN-2014-057 Tap – Sunnyside 345kV circuit #1 rebuild
- Meadow Grove – South Norfolk 230kV circuit #1 build
- Milan Tap – Clearwater 138kV circuit #1 rebuild
- Norton 230/115kV 24Mvar capacitor bank
- Norton – Pleasant Hill 230kV circuit #1 230kV conversion
- Oasis – San Juan Tap 230kV circuit #1 replace wave trap
- Ogallala – Gerald Gentleman Station 230kV circuit #1 replace terminal equipment and increase line clearance
- Oklaunioun 150Mvar Capacitor Bank(s) and 150Mvar Static VAR Compensator (SVC)
- Petersburg – North Petersburg 115kV circuit #1 replace strain bus
- Potter County 345/230/13kV transformer circuit #2
- Potter County – Grapevine 345kV circuit #1 build
- Smokey Hills – Summit 230kV circuit #1 structure replacement
- South Norfolk 345/230/13.8kV transformer circuit #1
- Tolk – Potter County 345kV circuit #1 build
- (NRIS only) Andrews 230/115/13kV transformer circuit #1 and #2
- (NRIS only) Cunningham – Maddox 115kV circuit #1 rebuild
- (NRIS only) Cunningham – Potash Junction 230kV circuit #1 replace terminal equipment
- (NRIS only) Deaf Smith 21 – Deaf Smith County Interchange 115kV circuit #1 rebuild
- (NRIS only) Castro County – Deaf Smith 21 115kV circuit #1
- (NRIS only) Plant X – Tolk East 230kV rebuild
- (NRIS only) Woodward 138/69/13.2kV transformer circuit #1 replacement
- (NRIS only) Woodward – Woodward EHV 138kV circuit #1 rebuild
- (NRIS only) Woodward – Woodward EHV 138kV circuit #2 rebuild

### **Potential Upgrades Not in the Base Case**

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

## Regional Groupings

The interconnection requests listed in Appendix A were grouped together in two 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 100% nameplate of maximum generation while the wind generating plants in the other areas were modeled at 20% nameplate of maximum generation. These projects were dispatched as Energy Resources with a load factor by area distribution across the SPP footprint. Certain projects that requested Network Resource Interconnection Service were dispatched as an additional analysis into the balancing authority of the interconnecting transmission owner. This method allowed for the identification of network constraints that were common to the regional groupings that could then in turn have the mitigating upgrade cost allocated throughout the entire cluster. Other sensitivity analyses are also performed with all interconnection requests in each group being dispatched at 100% nameplate.

Peaking units were not dispatched in the 2015 spring model. To study peaking units' impacts, the 2015 summer and 2020 summer and winter, and 2025 summer seasonal models were chosen and peaking units were modeled at 100% of the nameplate rating and wind generating facilities were modeled at 10% of the nameplate rating. Each interconnection request was also modeled separately at 100% nameplate for certain analyses.

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## Identification of Network Constraints

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The initial set of network constraints were found by using PSS® MUST First Contingency Incremental Transfer Capability (FCITC) analysis on the entire cluster grouping dispatched at the various levels mentioned above. The Energy Resource Interconnection Service (ERIS) constraints were then screened to determine which of the generation interconnection requests had at least a 20% Distribution Factor (DF) upon outage based constraints (n-1) and 3% DF upon system intact constraints (n-0). Interconnection Requests that have requested Network Resource Interconnection Service (NRIS) were studied in the NRIS analysis to determine if any constraint measured at least a 3% DF. If so, these constraints were also considered for mitigation under NRIS.

Other network constraints which do not require transmission reinforcements are shown in Appendix H. With a defined source and sink in a Transmission Service Request, this list of network constraints can be refined and expanded to account for all Network Upgrade requirements for firm transmission service.

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

## Identification of Electrically Isolated Groups and Requests

From the FCITC analysis, it may be 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).

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## Determination of Cost Allocated Network Upgrades

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Cost Allocated Network Upgrades of wind generation interconnection requests were determined using the 2015 spring model. Cost Allocated Network Upgrades of peaking units was determined using the 2020 summer peak model. A PSSE® MUST sensitivity analysis was performed to determine the Distribution Factors (DF), a distribution factor with no contingency that each generation interconnection request had on each new upgrade. The impact each generation interconnection request had on each upgrade project was weighted by the size of each request. Finally the costs due by each request for a particular project were then determined by allocating the portion of each request's impact over the impact of all affecting requests.

For example, assume that there are three Generator Interconnection requests, X, Y, and Z that are responsible for the costs of Upgrade Project '1'. Given that their respective DF for the project have been determined, the cost allocation for Generator 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:

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

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

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

- 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 either to credits or potentially Long Term Congestion Rights (LTCR) 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 and Network Upgrade Facilities**

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The generator interconnection customers requested interconnection within the transmission systems of Southwestern Public Service (SPS) and Sunflower Electric Power Corporation/Mid-Kansas Electric Power LLC (SUNC)/(MKEC). The requirement to interconnect the 400 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 Appendices E and F with an approximate cost of \$65,250,000. Appendices E and F also include Interconnection Facilities specific to each generation interconnection request. GEN-2014-073 requested additional analysis for alternate Points of Interconnection (POIs). The one-line diagrams in Appendix D should be consulted for details of the alternate POIs. Separate cost allocations are included in this report for the alternate Points of Interconnection.

For an explanation of how required Network Upgrades and Interconnection Facilities were determined, refer to the section on “Identification of Network Constraints” above.

A preliminary one-line drawing for each generation interconnection request are listed in Appendix D.

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## **Power Flow Analysis**

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### **Power Flow Analysis Methodology**

The FCITC function of PSS® MUST was used to simulate single element and special (i.e., breaker-to-breaker, multi-element, etc.) contingencies in portions or all of the modeled control areas of SPP, as well as, other control areas external to SPP and the resulting scenarios analyzed. This satisfies the “more probable” contingency testing criteria mandated by NERC and the SPP criteria.

### **Power Flow Analysis**

A power flow analysis was conducted for each Interconnection Customer’s facility using modified versions of the 2015 (spring and summer) peak, the 2020 (summer and winter) peak and 2025 summer peak models. The output of the Interconnection Customer’s facility was offset in each model by a reduction in output of existing online SPP generation. This method allows the request to be studied as an Energy Resource (ER) Interconnection Request. Certain requests that requested

Network Resource Interconnection Service (NRIS) had an additional analysis conducted for displacing resources in the interconnecting Transmission Owner’s balancing authority.

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

**Cluster Group 3 (Spearville Area)**

In addition to the 3,909.3 MW of previously queued generation in the area, 200.0 MW of new interconnection service was studied. NRIS Constraints were seen on the Mullergren – Spearville 230kV line and on the Hays Plant – Vine Street and Vine Street – Knoll 115kV lines. These constraints will require rebuilds of the Hays Plant – Knoll lines and replacing terminal equipment on the Mullergren – Spearville 220kV line.

MONITORED ELEMENT	NRIS Constraints		CONTINGENCY
	RATE B (MVA)	TC%LOA DING (% MVA)	
HAYS PLANT - SOUTH HAYS 115KV CKT 1	98.9	173.0863	KNOLL 230 - POSTROCK6 230.00 230KV CKT 1
HAYS PLANT - VINE STREET 115KV CKT 1	88	172.9762	KNOLL 230 - POSTROCK6 230.00 230KV CKT 1
MULLERGREN - SPEARVILLE 230KV CKT 1	396.6	107.0605	G13-010T 345.00 - POST ROCK 345KV CKT 1
N HAYS3 115.00 - VINE STREET 115KV CKT 1	98.8	124.4514	KNOLL 230 - POSTROCK6 230.00 230KV CKT 1
KNOLL - N HAYS3 115.00 115KV CKT 1	88	133.3995	KNOLL 230 - POSTROCK6 230.00 230KV CKT 1

**Cluster Group 6 (South Texas Panhandle/New Mexico)**

In addition to the 5,606.5 MW of previously queued generation in the area, 200.0 MW of new interconnection service was studied. The Interconnection Requests in Group 6 of this Feasibility Study have lower queue priority than the Interconnection Requests in Group 6 of the DISIS-2014-002 study completed on January 30<sup>th</sup>, 2015. At the time of the posting of this Feasibility Study, the Interconnection Request(s) in Group 6 of DISIS-2014-002 will require the following Network Upgrades to receive Interconnection Service.

- Upgrades assigned to DISIS 2014-002 Interconnection Customers
  - GEN-2014-007 Tap – Border – Chisholm 345kV Project
    - Chisholm 345kV Substation
    - GEN-2014-007 Tap – Border – Chisholm 345kV circuit #2 build
    - Terminate Border – Woodward 345kV circuit #1 into Chisholm 345kV
    - Chisholm – Gracemont 345kV circuit #1 build

- Chisholm – Potter County 345kV circuit #1 build
- TUCO 2 345kV project
  - TUCO 2 345kV Bus
  - GEN-2014-007 Tap – TUCO 2 345kV circuit #1 build
  - TUCO – TUCO 2 – Tolk 345kV circuit #1 build
- Tolk – Potter County 345kV circuit #1
- Beaver County – Grapevine 345kV circuit #1 build
- Border 200Mvar Static VAR Compensator (SVC) and 200Mvar Capacitor Bank(s)
- Carlisle 230/115/13kV transformer circuit #1 replacement
- Chaves County 115kV Reactive Power support
- GEN-2014-067 tap – GEN-2014-068 tap 230kV circuit #1 build
- Grapevine Substation upgrade
- Grapevine – Chisholm 345kV circuit #1 build
- Oasis – San Juan Tap 230kV circuit #1 replace wave trap
- Oklaunion 150Mvar Capacitor Bank(s) and 150Mvar Static VAR Compensator (SVC)
- Potter County 345/230/13kV transformer circuit #2
- Potter County – Grapevine 345kV circuit #1 build
- Tolk – Potter County 345kV circuit #1 build
- (NRIS only) Andrews 230/115/13kV transformer circuit #1 and #2
- (NRIS only) Plant X – Tolk East 230kV rebuild
- (NRIS only) Cunningham – Maddox 115kV circuit #1 rebuild
- (NRIS only) Cunningham – Potash Junction 230kV circuit #1 replace terminal equipment

Any change in the status of Interconnection Requests in DISIS-2014-002 (or any other higher queued DISIS study) may cause the cost of the above Network Upgrades to become the cost responsibility of the Feasibility Cluster Study 2015-001 customers. The related overloads are in Appendix H.

The powerflow results listed below were obtained by analyzing the powerflow models with the 200MW of Feasibility Study Interconnection Requests in service in addition to all 1,995.1MW of DISIS-2014-002 Interconnection Requests and the above Network Upgrades in service. These constraints are incremental to the 200MW of generation analyzed in this study.

GEN-2014-073 requested the analysis of an alternate Point of Interconnection. The one-line diagrams in Appendix D should be consulted for details of the alternate Points of Interconnection.

Constraints for GEN-2014-073 were seen around its primary POI of North Plainsview 115kV substation on the Kress – North Plainsview - Hale Co. 115kV line and the Hale Co. – Cox 115kV line. These constraints will require rebuilds of the Kres – North Plainsview – Hale 115kV and Hale – Cox 115kV lines.

No constraints were seen at the alternate POI of Swisher 230kV substation.

ERIS and NRIS Constraints			
MONITORED ELEMENT	RATE B (MVA)	TC%LOADING (% MVA)	CONTINGENCY
COX INTERCHANGE - HALE CO INTERCHANGE 115KV CKT 1	96	121.0833	KRESS_RURAL3115.00 - N_PLAINVIEW 3115.00 115KV CKT 1
COX INTERCHANGE - KISER 3115.00 115KV CKT 1	173	105.3784	KRESS_RURAL3115.00 - N_PLAINVIEW 3115.00 115KV CKT 1
KISER 3115.00 - N_PLAINVIEW 3115.00 115KV CKT 1	173	113.0128	KRESS_RURAL3115.00 - N_PLAINVIEW 3115.00 115KV CKT 1
KRESS INTERCHANGE - KRESS_RURAL3115.00 115KV CKT 1	173	111.7409	KISER 3115.00 - N_PLAINVIEW 3115.00 115KV CKT 1
KRESS_RURAL3115.00 - N_PLAINVIEW 3115.00 115KV CKT 1	173	113.0128	KISER 3115.00 - N_PLAINVIEW 3115.00 115KV CKT 1

### Curtailement and System Reliability

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



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## Conclusion

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The minimum cost of interconnecting 200 MW of new interconnection requests included in this Feasibility Cluster Study is estimated at \$65,250,000 including the Allocated Network Upgrades and Transmission Owner Interconnection Facilities, which are listed in Appendices E and F. GEN-2014-073 requested additional analysis for alternate Points of Interconnection (POIs). The one-line diagrams in Appendix D should be consulted for details of the alternate POIs. Separate cost allocations are included in this report for the alternate Points of Interconnection. These costs include the cost of upgrades of other transmission facilities listed in Appendix H which are Network Constraints.

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

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# Appendix

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## **A: Generation Interconnection Requests Considered for 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-2014-072	200.00	ER/NR	SUNC	Tap Spearville - Post Rock 345kV	Tap Spearville - Post Rock 345kV		TBD
GEN-2014-073	200.00	ER/NR	SPS	North Plainsview 115kV / Swisher 230kV	North Plainsview 115kV / Swisher 230kV		TBD
<b>Total:</b>	<b>400.00</b>						

\*In-Service Date for each request is to be determined after the Interconnection Facility Study is completed.

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

<b>Request</b>	<b>Amount</b>	<b>Area</b>	<b>Requested/Proposed Point of Interconnection</b>	<b>Status or In-Service Date</b>
ASGI-2010-006	150.00	AECI	Tap Fairfax (AECI) - Shilder (AEPW) 138kV	AECI queue Affected Study
ASGI-2010-010	42.20	SPS	Lovington 115kV	Lea County Affected Study
ASGI-2010-020	30.00	SPS	Tap LE-Tatum - LE-Crossroads 69kV	Lea County Affected Study
ASGI-2010-021	15.00	SPS	Tap LE-Saunders Tap - LE-Anderson 69kV	Lea County Affected Study
ASGI-2011-001	27.30	SPS	Lovington 115kV	On-Line
ASGI-2011-002	20.00	SPS	Herring 115kV	On-Line
ASGI-2011-003	10.00	SPS	Hendricks 115kV	On-Line
ASGI-2011-004	20.00	SPS	Pleasant Hill 69kV	Under Study (DISIS-2011-002)
ASGI-2012-002	18.15	SPS	FE-Clovis Interchange 115kV	Under Study (DISIS-2012-002)
ASGI-2012-006	22.50	SUNCMKEC	Tap Hugoton - Rolla 69kV	Under Study (DISIS-2012-001)
ASGI-2013-001	11.50	SPS	PanTex South 115kV	Under Study (DISIS-2013-001)
ASGI-2013-002	18.40	SPS	FE Tucumcari 115kV	Under Study (DISIS-2013-001)
ASGI-2013-003	18.40	SPS	FE Clovis 115kV	Under Study (DISIS-2013-001)
ASGI-2013-004	36.60	SUNCMKEC	Morris 115kV	Under Study (DISIS-2013-002)
ASGI-2013-005	1.65	SPS	FE Clovis 115kV	Under Study (DISIS-2013-002)
ASGI-2013-006	2.00	SPS	SP-Erskine 115kV	
ASGI-2013-007	90.00	AECI	Tap Hickory Creek - Locust Creek 161kV	AECI System Impact Study
ASGI-2014-001	2.50	SPS	SP-Erskine 115kV	TRANSITIONED TO IFS QUEUE
ASGI-2014-002	49.60	SPS	Tap Tucumcari - Santa Rosa 115kV	Under Study (DISIS-2014-002)
ASGI-2014-004	10.00	SPS	Livingstone Ridge 115kV	Under Study (DISIS-2014-002)
ASGI-2014-005	10.00	SPS	Strata 69kV	Under Study (DISIS-2014-002)
ASGI-2014-008	10.00	SPS	South Loving 69kV	Under Study (DISIS-2014-002)
ASGI-2014-009	10.00	SPS	Wood Draw 115kV	Under Study (DISIS-2014-002)
ASGI-2014-010	10.00	SPS	Ochoa 115kV	Under Study (DISIS-2014-002)
ASGI-2014-011	10.00	SPS	Zia 115kV	Under Study (DISIS-2014-002)
ASGI-2014-012	10.00	SPS	Cooper Ranch 115kV	Under Study (DISIS-2014-002)
ASGI-2014-013	10.00	SPS	SP-Erskine 115kV	Under Study (DISIS-2014-002)
ASGI-2014-014	56.40	GRDA	Ferguson 69kV	Under Study (DISIS-2014-002)
GEN-2001-014	96.00	WFEC	Ft Supply 138kV	On-Line
GEN-2001-026	74.25	WFEC	Washita 138kV	On-Line
GEN-2001-033	180.00	SPS	San Juan Tap 230kV	On-Line at 120MW
GEN-2001-036	80.00	SPS	Norton 115kV	On-Line
GEN-2001-037	100.00	OKGE	FPL Moreland Tap 138kV	On-Line
GEN-2001-039A	105.00	SUNCMKEC	Shooting Star Tap 115kV	On-Line
GEN-2001-039M	100.00	SUNCMKEC	Central Plains Tap 115kV	On-Line
GEN-2002-004	200.00	WERE	Latham 345kV	On-Line at 150MW
GEN-2002-005	120.00	WFEC	Red Hills Tap 138kV	On-Line
GEN-2002-008	240.00	SPS	Hitchland 345kV	On-Line at 120MW
GEN-2002-009	80.00	SPS	Hansford 115kV	On-Line
GEN-2002-022	240.00	SPS	Bushland 230kV	On-Line
GEN-2002-023N	0.80	NPPD	Harmony 115kV	On-Line
GEN-2002-025A	150.00	SUNCMKEC	Spearville 230kV	On-Line
GEN-2003-004	100.00	WFEC	Washita 138kV	On-Line
GEN-2003-005	100.00	WFEC	Anadarko - Paradise (Blue Canyon) 138kV	On-Line
GEN-2003-006A	200.00	SUNCMKEC	Elm Creek 230kV	On-Line
GEN-2003-019	250.00	MIDW	Smoky Hills Tap 230kV	On-Line
GEN-2003-020	160.00	SPS	Martin 115kV	On-Line

Request	Amount	Area	Requested/Proposed Point of Interconnection	Status or In-Service Date
GEN-2003-021N	75.00	NPPD	Ainsworth Wind Tap 115kV	On-Line
GEN-2003-022	120.00	AEPW	Washita 138kV	On-Line
GEN-2004-014	154.50	SUNCMKEC	Spearville 230kV	On-Line at 100MW
GEN-2004-020	27.00	AEPW	Washita 138kV	On-Line
GEN-2004-023	20.60	WFEC	Washita 138kV	On-Line
GEN-2004-023N	75.00	NPPD	Columbus Co 115kV	On-Line
GEN-2005-003	30.60	WFEC	Washita 138kV	On-Line
GEN-2005-008	120.00	OKGE	Woodward 138kV	On-Line
GEN-2005-012	250.00	SUNCMKEC	Ironwood 345kV	On-Line at 160MW
GEN-2005-013	201.00	WERE	Caney River 345kV	On-Line
GEN-2006-002	101.00	AEPW	Sweetwater 230kV	On-Line
GEN-2006-006	205.50	SUNCMKEC	Spearville 345kV	On Suspension
GEN-2006-018	170.00	SPS	TUCO Interchange 230kV	On-Line
GEN-2006-020N	42.00	NPPD	Bloomfield 115kV	On-Line
GEN-2006-020S	18.90	SPS	DWS Frisco 115kV	On-Line
GEN-2006-021	101.00	SUNCMKEC	Flat Ridge Tap 138kV	On-Line
GEN-2006-024S	19.80	WFEC	Buffalo Bear Tap 69kV	On-Line
GEN-2006-026	502.00	SPS	Hobbs 230kV & Hobbs 115kV	On-Line
GEN-2006-031	75.00	MIDW	Knoll 115kV	On-Line
GEN-2006-035	225.00	AEPW	Sweetwater 230kV	On-Line at 132MW
GEN-2006-037N1	75.00	NPPD	Broken Bow 115kV	On-Line
GEN-2006-038N005	80.00	NPPD	Broken Bow 115kV	On-Line
GEN-2006-038N019	80.00	NPPD	Petersburg North 115kV	On-Line
GEN-2006-040	108.00	SUNCMKEC	Mingo 115kV	On Suspension
GEN-2006-043	99.00	AEPW	Sweetwater 230kV	On-Line
GEN-2006-044	370.00	SPS	Hitchland 345kV	On-Line at 120MW
GEN-2006-044N	40.50	NPPD	North Petersburg 115kV	On-Line
GEN-2006-046	131.00	OKGE	Dewey 138kV	On-Line
GEN-2007-011	135.00	SUNCMKEC	Syracuse 115kV	On Suspension
GEN-2007-011N08	81.00	NPPD	Bloomfield 115kV	On-Line
GEN-2007-021	201.00	OKGE	Tatonga 345kV	On-Line
GEN-2007-025	300.00	WERE	Viola 345kV	On-Line
GEN-2007-032	150.00	WFEC	Tap Clinton Junction - Clinton 138kV	On Suspension
GEN-2007-040	200.00	SUNCMKEC	Buckner 345kV	On-Line at 132MW
GEN-2007-043	200.00	OKGE	Minco 345kV	On-Line
GEN-2007-044	300.00	OKGE	Tatonga 345kV	On-Line at 199MW
GEN-2007-046	200.00	SPS	Hitchland 115kV	On Schedule for 2015
GEN-2007-050	170.00	OKGE	Woodward EHV 138kV	On-Line at 150MW
GEN-2007-052	150.00	WFEC	Anadarko 138kV	On-Line
GEN-2007-062	765.00	OKGE	Woodward EHV 345kV	On Schedule for 2014
GEN-2008-003	101.00	OKGE	Woodward EHV 138kV	On-Line
GEN-2008-013	300.00	OKGE	Hunter 345kV	On-Line at 235MW
GEN-2008-017	300.00	SUNCMKEC	Setab 345kV	On Schedule for 2015
GEN-2008-018	250.00	SPS	Finney 345kV	On-Line
GEN-2008-021	42.00	WERE	Wolf Creek 345kV	On-Line
GEN-2008-022	300.00	SPS	Tap Tolk - Eddy County (Crossroads) 345kV	On Schedule for 2015
GEN-2008-023	150.00	AEPW	Hobart Junction 138kV	On-Line
GEN-2008-037	101.00	WFEC	Tap Washita - Blue Canyon Wind 138kV	On-Line
GEN-2008-044	197.80	OKGE	Tatonga 345kV	On-Line
GEN-2008-047	300.00	OKGE	Beaver County 345kV	On Schedule for 2014

Request	Amount	Area	Requested/Proposed Point of Interconnection	Status or In-Service Date
GEN-2008-051	322.00	SPS	Potter County 345kV	On-Line at 161MW
GEN-2008-079	99.20	SUNCMKEC	Crooked Creek 115kV	On-Line
GEN-2008-086N02	201.00	NPPD	Meadow Grove 230kV	On-Line
GEN-2008-088	50.60	SPS	Vega 69kV	On Suspension
GEN-2008-092	201.00	MIDW	Post Rock 230kV	On Schedule for 2014
GEN-2008-098	100.80	WERE	Waverly 345kV	On Schedule for 2015
GEN-2008-1190	60.00	OPPD	S1399 161kV	On-Line
GEN-2008-123N	89.70	NPPD	Tap Pauline - Hildreth (Rosemont) 115kV	On Schedule for 2014
GEN-2008-124	200.10	SUNCMKEC	Ironwood 345kV	On Schedule for 2016
GEN-2008-129	80.00	GMO	Pleasant Hill 161kV	On-Line
GEN-2009-008	199.50	MIDW	South Hays 230kV	On Schedule for 2015
GEN-2009-020	48.60	MIDW	Tap Nekoma - Bazine (Walnut Creek) 69kV	On Schedule for 2015
GEN-2009-025	60.00	OKGE	Nardins 69kV	On-Line
GEN-2009-040	73.80	WERE	Marshall 115kV	On Schedule for 2015
GEN-2010-001	300.00	OKGE	Beaver County 345kV	On Schedule for 2014 (204 MW) and 2015 (96 MW)
GEN-2010-003	100.80	WERE	Waverly 345kV	On Schedule for 2015
GEN-2010-005	300.00	WERE	Viola 345kV	On-Line at 170MW
GEN-2010-006	205.00	SPS	Jones 230kV	On-Line
GEN-2010-009	165.60	SUNCMKEC	Buckner 345kV	On-Line
GEN-2010-011	29.70	OKGE	Tatonga 345kV	On-Line
GEN-2010-014	358.80	SPS	Hitchland 345kV	On Suspension
GEN-2010-036	4.60	WERE	6th Street 115kV	On-Line
GEN-2010-040	300.00	OKGE	Cimarron 345kV	On-Line
GEN-2010-041	10.50	OPPD	S1399 161kV	On Schedule for 2015
GEN-2010-045	197.80	SUNCMKEC	Buckner 345kV	On Schedule for 2017
GEN-2010-046	56.00	SPS	TUCO Interchange 230kV	On Schedule for 2016
GEN-2010-048	70.00	MIDW	Tap Beach Station - Redline 115kV	DISIS Stage
GEN-2010-051	200.00	NPPD	Tap Twin Church - Hoskins 230kV	On Suspension
GEN-2010-055	4.50	AEPW	Wekiwa 138kV	On-Line
GEN-2010-057	201.00	MIDW	Rice County 230kV	On-Line
GEN-2011-007	250.10	OKGE	Tap Cimarron - Woodring (Mathewson) 345kV	On Suspension
GEN-2011-008	600.00	SUNCMKEC	Clark County 345kV	On Schedule 2019
GEN-2011-010	100.80	OKGE	Minco 345kV	On-Line
GEN-2011-011	50.00	KACP	Iatan 345kV	On-Line
GEN-2011-014	201.00	OKGE	Tap Hitchland - Woodward Dbl Ckt (GEN-2011-014 Tap) 345kV	On Schedule 2016
GEN-2011-016	200.10	SUNCMKEC	Spearville 345kV	TRANSITIONED TO IFS QUEUE
GEN-2011-017	299.00	SUNCMKEC	Tap Spearville - Post Rock (GEN-2011-017T) 345kV	On Schedule 2018
GEN-2011-018	73.60	NPPD	Steele City 115kV	On-Line
GEN-2011-019	299.00	OKGE	Woodward 345kV	On Suspension
GEN-2011-020	299.00	OKGE	Woodward 345kV	On Suspension
GEN-2011-022	299.00	SPS	Hitchland 345kV	On Suspension
GEN-2011-025	80.00	SPS	Tap Floyd County - Crosby County 115kV	On Schedule for 2015
GEN-2011-027	120.00	NPPD	Hoskins 230kV	On Schedule for 2015
GEN-2011-037	7.00	WFEC	Blue Canyon 5 138kV	On-Line
GEN-2011-040	111.00	OKGE	Carter County 138kV	On-Line
GEN-2011-045	205.00	SPS	Jones 230kV	On-Line
GEN-2011-046	27.00	SPS	Lopez 115kV	On-Line
GEN-2011-048	175.00	SPS	Mustang 230kV	On-Line
GEN-2011-049	250.00	OKGE	Border 345kV	On Suspension

Request	Amount	Area	Requested/Proposed Point of Interconnection	Status or In-Service Date
GEN-2011-050	109.80	AEPW	Santa Fe Tap 138kV	On Suspension
GEN-2011-051	104.40	OKGE	Tap Woodward - Tatonga 345kV (GEN-2011-051 Tap)	On Suspension
GEN-2011-054	300.00	OKGE	Cimarron 345kV	On Schedule for 2013 (200 MW) and 2014 (99 MW)
GEN-2011-056	3.60	NPPD	Jeffrey 115kV	On-Line
GEN-2011-056A	3.60	NPPD	John 1 115kV	On-Line
GEN-2011-056B	4.50	NPPD	John 2 115kV	On-Line
GEN-2011-057	150.40	WERE	Creswell 138kV	On Schedule for 2014
GEN-2012-001	61.20	SPS	Cirrus Tap 230kV	On-Line
GEN-2012-004	41.40	OKGE	Carter County 138kV	On Schedule for 2014
GEN-2012-007	120.00	SUNCMKEC	Rubart 115kV	On-Line
GEN-2012-009	15.00	SPS	Mustang 230kV	On Schedule for 2015
GEN-2012-010	15.00	SPS	Mustang 230kV	On Schedule for 2015
GEN-2012-020	478.00	SPS	TUCO 230kV	On Schedule for 2016
GEN-2012-021	4.80	LES	Terry Bundy Generating Station 115kV	On-Line
GEN-2012-024	180.00	SUNCMKEC	Clark County 345kV	TRANSITIONED TO IFS QUEUE
GEN-2012-027	136.00	AEPW	Shidler 138kV	On Suspension
GEN-2012-028	74.80	WFEC	Gotebo 69kV	On Schedule for 2015
GEN-2012-031	200.00	OKGE	Cimarron 345kV (GEN-2010-040 Sub)	DISIS Stage
GEN-2012-032	300.00	OKGE	Open Sky 345kV	On Schedule for 2015
GEN-2012-033	98.80	OKGE	Tap and Tie South 4th - Bunch Creek & Enid Tap - Fairmont (GEN-2012-033T) 138kV	On Schedule for 2015
GEN-2012-034	7.00	SPS	Mustang 230kV	On Schedule for 2015
GEN-2012-035	7.00	SPS	Mustang 230kV	On Schedule for 2015
GEN-2012-036	7.00	SPS	Mustang 230kV	On-Line
GEN-2012-037	203.00	SPS	TUCO 345kV	On Schedule for 2015
GEN-2012-040	76.50	WFEC	Chilocco 138kV	On Suspension
GEN-2012-041	121.50	OKGE	Ranch Road 345kV	On Schedule for 2015
GEN-2013-002	50.60	LES	Tap Sheldon - Folsom & Pleasant Hill (GEN-2013-002 Tap) 115kV CKT 2	TRANSITIONED TO IFS QUEUE
GEN-2013-007	100.30	OKGE	Tap Prices Falls - Carter 138kV	On Schedule for 2015
GEN-2013-008	1.20	NPPD	Steele City 115kV	On-Line
GEN-2013-010	99.00	SUNCMKEC	Tap Spearville - Post Rock (North of GEN-2011-017 Tap) 345kV	DISIS Stage
GEN-2013-011	30.00	AEPW	Turk 138kV	TRANSITIONED TO IFS QUEUE
GEN-2013-012	147.00	OKGE	Redbud 345kV	On-Line
GEN-2013-014	25.50	NPPD	Tap Guide Rock - Pauline (Rosemont) 115kV	On Suspension
GEN-2013-016	203.00	SPS	TUCO 345kV	TRANSITIONED TO IFS QUEUE
GEN-2013-019	73.60	LES	Tap Sheldon - Folsom & Pleasant Hill (GEN-2013-002 Tap) 115kV CKT 2	TRANSITIONED TO IFS QUEUE
GEN-2013-022	25.00	SPS	Norton 115kV	TRANSITIONED TO IFS QUEUE
GEN-2013-027	150.00	SPS	Tap Tolk - Yoakum 230kV	DISIS Stage
GEN-2013-028	559.50	GRDA	Tap N Tulsa - GRDA 1 345kV	TRANSITIONED TO IFS QUEUE
GEN-2013-029	300.00	OKGE	Renfrow 345kV	TRANSITIONED TO IFS QUEUE
GEN-2013-030	300.00	OKGE	Beaver County 345kV	TRANSITIONED TO IFS QUEUE
GEN-2013-032	204.00	NPPD	Neligh 115kV	TRANSITIONED TO IFS QUEUE
GEN-2013-033	28.00	MIDW	Goodman Energy Center 115kV	TRANSITIONED TO IFS QUEUE
GEN-2013-035	105.60	OKGE	Tap Woodward - Tatonga 345kV (GEN-2011-051 Tap)	TRANSITIONED TO IFS QUEUE
GEN-2014-001	200.60	WERE	Tap Wichita - Emporia Energy Center 345kV	TRANSITIONED TO IFS QUEUE
GEN-2014-002	10.53	OKGE	Tatonga 345kV (GEN-2007-021 POI)	TRANSITIONED TO IFS QUEUE
GEN-2014-003	15.84	OKGE	Tatonga 345kV (GEN-2007-044 POI)	TRANSITIONED TO IFS QUEUE
GEN-2014-004	3.96	NPPD	Steele City 115kV (GEN-2011-018 POI)	TRANSITIONED TO IFS QUEUE

Request	Amount	Area	Requested/Proposed Point of Interconnection	Status or In-Service Date
GEN-2014-005	5.67	OKGE	Minco 345kV (GEN-2011-010 POI)	TRANSITIONED TO IFS QUEUE
GEN-2014-007	400.00	SPS	Tap TUCO Interchange - Border 345kV	DISIS Stage
GEN-2014-012	225.00	SPS	Tap Hobbs Interchange - Andrews 230kV	TRANSITIONED TO IFS QUEUE
GEN-2014-013	73.50	NPPD	Meadow Grove (GEN-2008-086N2 Sub) 230kV	TRANSITIONED TO IFS QUEUE
GEN-2014-019	15.00	OKGE	Beaver County 345kV	DISIS Stage
GEN-2014-020	100.00	AEPW	Tuttle 138kV	DISIS Stage
GEN-2014-021	300.00	GMO	Tap Nebraska City - Mullin Creek 345kV	DISIS Stage
GEN-2014-022	15.00	OKGE	Open Sky 345kV	DISIS Stage
GEN-2014-023	79.90	NPPD	Tap Fort Randall - Meadow Grove 230kV	DISIS Stage
GEN-2014-025	2.40	MIDW	Tap Nekoma - Bazine (Walnut Creek) 69kV	DISIS Stage
GEN-2014-026	150.00	OKGE	Beaver County 345kV	DISIS Stage
GEN-2014-027	60.00	AEPW	Weleetka 138kV	DISIS Stage
GEN-2014-028	35.00	EMDE	Riverton 161kV	DISIS Stage
GEN-2014-031	35.80	NPPD	Meadow Grove 230kV	DISIS Stage
GEN-2014-032	10.20	NPPD	Meadow Grove 230kV	DISIS Stage
GEN-2014-033	70.00	SPS	Chaves County 115kV	DISIS Stage
GEN-2014-034	70.00	SPS	Chaves County 115kV	DISIS Stage
GEN-2014-035	30.00	SPS	Chaves County 115kV	DISIS Stage
GEN-2014-036	50.00	AEPW	Hollis 138kV	DISIS Stage
GEN-2014-037	200.00	SPS	Tap Hitchland - Beaver County Dbl Ckt (Optima) 345kV	DISIS Stage
GEN-2014-038	200.00	SPS	Tap Hitchland - Potter County 345kV	DISIS Stage
GEN-2014-039	73.60	NPPD	Friend 115kV	DISIS Stage
GEN-2014-040	349.00	SPS	Castro 115kV	DISIS Stage
GEN-2014-041	120.80	SUNCMKEC	Arnold 115kV	DISIS Stage
GEN-2014-046	114.00	SPS	Chaves County 115kV	DISIS Stage
GEN-2014-047	40.00	SPS	Tap Tolk - Eddy County (Crossroads) 345kV	DISIS Stage
GEN-2014-048	110.00	SPS	Tap Eddy County - Tweedy 115kV	DISIS Stage
GEN-2014-049	200.00	SUNCMKEC	Thistle 345kV	DISIS Stage
GEN-2014-050	100.00	WERE	Swissvale 345kV	DISIS Stage
GEN-2014-051	174.00	WERE	Jeffrey Energy Center 345kV	DISIS Stage
GEN-2014-052	200.00	OKGE	Tap Hitchland - Woodward Dbl Ckt (GEN-2011-014 Tap) 345kV	DISIS Stage
GEN-2014-053	80.00	SPS	Carlisle 230kV	DISIS Stage
GEN-2014-054	120.00	SPS	Carlisle 230kV	DISIS Stage
GEN-2014-055	160.00	NPPD	Belden 115kV	DISIS Stage
GEN-2014-056	250.00	OKGE	Minco 345kV	DISIS Stage
GEN-2014-057	250.00	AEPW	Tap Lawton - Sunnyside 345kV	DISIS Stage
GEN-2014-058	300.00	OKGE	Tap Tatonga - Mathewson 345kV	DISIS Stage
GEN-2014-059	161.10	NPPD	Tap Sidney - Ogallala 230kV	DISIS Stage
GEN-2014-060	125.80	NPPD	Tap Pauline - Hildreth (Rosemont) 115kV	DISIS Stage
GEN-2014-061	161.00	OKGE	Tatonga 345kV	DISIS Stage
GEN-2014-062	200.10	SPS	Tap Tolk - Eddy County (Crossroads) 345kV	DISIS Stage
GEN-2014-063	381.00	SPS	Hobbs 230kV	DISIS Stage
GEN-2014-064	248.40	OKGE	Otter 138kV	DISIS Stage
GEN-2014-066	30.00	SPS	Norton 115kV	DISIS Stage
GEN-2014-067	361.00	SPS	Tap Potter County - New Hart 230kV	DISIS Stage
GEN-2014-068	203.00	SPS	Tap Deaf Smith - Plant X 230kV	DISIS Stage
GEN-2014-069	90.00	SPS	Tap Postash Junction - Livingston Ridge 115kV	DISIS Stage
GEN-2014-070	110.00	SPS	Tap Hobbs - Yoakum 230kV	DISIS Stage
Gray County Wind (Montezuma)	110.00	SUNCMKEC	Gray County Tap 115kV	On-Line



Request	Amount	Area	Requested/Proposed Point of Interconnection	Status or In-Service Date
Llano Estacado (White Deer)	80.00	SPS	Llano Wind 115kV	On-Line
NPPD Distributed (Broken Bow)	8.30	NPPD	Broken Bow 115kV	On-Line
NPPD Distributed (Burt County Wind)	12.00	NPPD	Tekamah & Oakland 115kV	On-Line
NPPD Distributed (Burwell)	3.00	NPPD	Ord 115kV	On-Line
NPPD Distributed (Columbus Hydro)	45.00	NPPD	Columbus 115kV	On-Line
NPPD Distributed (North Platte - Lexington)	54.00	NPPD	Multiple: Jeffrey 115kV, John_1 115kV, John_2 115kV	On-Line
NPPD Distributed (Ord)	11.90	NPPD	Ord 115kV	On-Line
NPPD Distributed (Stuart)	2.10	NPPD	Ainsworth 115kV	On-Line
SPS Distributed (Dumas 19th St)	20.00	SPS	Dumas 19th Street 115kV	On-Line
SPS Distributed (Etter)	20.00	SPS	Etter 115kV	On-Line
SPS Distributed (Hopi)	10.00	SPS	Hopi 115kV	On-Line
SPS Distributed (Jal)	10.00	SPS	S Jal 115kV	On-Line
SPS Distributed (Lea Road)	10.00	SPS	Lea Road 115kV	On-Line
SPS Distributed (Monument)	10.00	SPS	Monument 115kV	On-Line
SPS Distributed (Moore E)	25.00	SPS	Moore East 115kV	On-Line
SPS Distributed (Ocotillo)	10.00	SPS	S_Jal 115kV	On-Line
SPS Distributed (Sherman)	20.00	SPS	Sherman 115kV	On-Line
SPS Distributed (Spearman)	10.00	SPS	Spearman 69kV	On-Line
SPS Distributed (TC-Texas County)	20.00	SPS	Texas County 115kV	On-Line
<b>Total:</b>	<b>32,434.8</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	96.00	WFEC	Ft Supply 138kV
GEN-2001-037	100.00	OKGE	FPL Moreland Tap 138kV
GEN-2005-008	120.00	OKGE	Woodward 138kV
GEN-2006-024S	19.80	WFEC	Buffalo Bear Tap 69kV
GEN-2006-046	131.00	OKGE	Dewey 138kV
GEN-2007-021	201.00	OKGE	Tatonga 345kV
GEN-2007-043	200.00	OKGE	Minco 345kV
GEN-2007-044	300.00	OKGE	Tatonga 345kV
GEN-2007-050	170.00	OKGE	Woodward EHV 138kV
GEN-2007-062	765.00	OKGE	Woodward EHV 345kV
GEN-2008-003	101.00	OKGE	Woodward EHV 138kV
GEN-2008-044	197.80	OKGE	Tatonga 345kV
GEN-2010-011	29.70	OKGE	Tatonga 345kV
GEN-2010-040	300.00	OKGE	Cimarron 345kV
GEN-2011-007	250.10	OKGE	Tap Cimarron - Woodring (Mathewson) 345kV
GEN-2011-010	100.80	OKGE	Minco 345kV
GEN-2011-019	299.00	OKGE	Woodward 345kV
GEN-2011-020	299.00	OKGE	Woodward 345kV
GEN-2011-051	104.40	OKGE	Tap Woodward - Tatonga 345kV (GEN-2011-051 Tap)
GEN-2011-054	300.00	OKGE	Cimarron 345kV
GEN-2012-031	200.00	OKGE	Cimarron 345kV (GEN-2010-040 Sub)
GEN-2013-035	105.60	OKGE	Tap Woodward - Tatonga 345kV (GEN-2011-051 Tap)
GEN-2014-002	10.53	OKGE	Tatonga 345kV (GEN-2007-021 POI)
GEN-2014-003	15.84	OKGE	Tatonga 345kV (GEN-2007-044 POI)
GEN-2014-005	5.67	OKGE	Minco 345kV (GEN-2011-010 POI)
GEN-2014-020	100.00	AEPW	Tuttle 138kV
GEN-2014-056	250.00	OKGE	Minco 345kV
GEN-2014-058	300.00	OKGE	Tap Tatonga - Mathewson 345kV
GEN-2014-061	161.00	OKGE	Tatonga 345kV
<b>PRIOR QUEUED SUBTOTAL</b>	<b>5,233.24</b>		
<b>AREA TOTAL</b>	<b>5,233.24</b>		

**GROUP 2: HITCHLAND AREA**

Request	Capacity	Area	Proposed Point of Interconnection
ASGI-2011-002	20.00	SPS	Herring 115kV
GEN-2002-008	240.00	SPS	Hitchland 345kV
GEN-2002-009	80.00	SPS	Hansford 115kV
GEN-2003-020	160.00	SPS	Martin 115kV
GEN-2006-020S	18.90	SPS	DWS Frisco 115kV
GEN-2006-044	370.00	SPS	Hitchland 345kV
GEN-2007-046	200.00	SPS	Hitchland 115kV
GEN-2008-047	300.00	OKGE	Beaver County 345kV
GEN-2010-001	300.00	OKGE	Beaver County 345kV
GEN-2010-014	358.80	SPS	Hitchland 345kV
GEN-2011-014	201.00	OKGE	Tap Hitchland - Woodward Dbl Ckt (GEN-2011-014 Tap) 345kV
GEN-2011-022	299.00	SPS	Hitchland 345kV
GEN-2013-030	300.00	OKGE	Beaver County 345kV
GEN-2014-019	15.00	OKGE	Beaver County 345kV
GEN-2014-026	150.00	OKGE	Beaver County 345kV
GEN-2014-037	200.00	SPS	Tap Hitchland - Beaver County Dbl Ckt (Optima) 345kV
GEN-2014-038	200.00	SPS	Tap Hitchland - Potter County 345kV
GEN-2014-052	200.00	OKGE	Tap Hitchland - Woodward Dbl Ckt (GEN-2011-014 Tap) 345kV
SPS Distributed (Dumas 19th St)	20.00	SPS	Dumas 19th Street 115kV
SPS Distributed (Etter)	20.00	SPS	Etter 115kV
SPS Distributed (Moore E)	25.00	SPS	Moore East 115kV
SPS Distributed (Sherman)	20.00	SPS	Sherman 115kV
SPS Distributed (Spearman)	10.00	SPS	Spearman 69kV
SPS Distributed (TC-Texas County)	20.00	SPS	Texas County 115kV
<b>PRIOR QUEUED SUBTOTAL</b>	<b>3,727.70</b>		
<b>AREA TOTAL</b>	<b>3,727.70</b>		

**GROUP 3: SPEARVILLE AREA**

Request	Capacity	Area	Proposed Point of Interconnection
ASGI-2012-006	22.50	SUNCMKEC	Tap Hugoton - Rolla 69kV
GEN-2001-039A	105.00	SUNCMKEC	Shooting Star Tap 115kV
GEN-2002-025A	150.00	SUNCMKEC	Spearville 230kV
GEN-2004-014	154.50	SUNCMKEC	Spearville 230kV
GEN-2005-012	250.00	SUNCMKEC	Ironwood 345kV
GEN-2006-006	205.50	SUNCMKEC	Spearville 345kV
GEN-2006-021	101.00	SUNCMKEC	Flat Ridge Tap 138kV
GEN-2007-040	200.00	SUNCMKEC	Buckner 345kV
GEN-2008-018	250.00	SPS	Finney 345kV
GEN-2008-079	99.20	SUNCMKEC	Crooked Creek 115kV
GEN-2008-124	200.10	SUNCMKEC	Ironwood 345kV
GEN-2010-009	165.60	SUNCMKEC	Buckner 345kV
GEN-2010-045	197.80	SUNCMKEC	Buckner 345kV
GEN-2011-008	600.00	SUNCMKEC	Clark County 345kV
GEN-2011-016	200.10	SUNCMKEC	Spearville 345kV
GEN-2011-017	299.00	SUNCMKEC	Tap Spearville - Post Rock (GEN-2011-017T) 345kV
GEN-2012-007	120.00	SUNCMKEC	Rubart 115kV
GEN-2012-024	180.00	SUNCMKEC	Clark County 345kV
GEN-2013-010	99.00	SUNCMKEC	Tap Spearville - Post Rock (North of GEN-2011-017 Tap) 345kV
GEN-2014-049	200.00	SUNCMKEC	Thistle 345kV
Gray County Wind (Montezuma)	110.00	SUNCMKEC	Gray County Tap 115kV
<b>PRIOR QUEUED SUBTOTAL</b>	<b>3,909.30</b>		
GEN-2014-072	200.00	SUNC	Tap Spearville - Post Rock 345kV
<b>CURRENT CLUSTER SUBTOTAL</b>	<b>200.00</b>		
<b>AREA TOTAL</b>	<b>4,109.30</b>		

**GROUP 4: NORTHWEST KANSAS AREA**

Request	Capacity	Area	Proposed Point of Interconnection
ASGI-2013-004	36.60	SUNCMKEC	Morris 115kV
GEN-2001-039M	100.00	SUNCMKEC	Central Plains Tap 115kV
GEN-2003-006A	200.00	SUNCMKEC	Elm Creek 230kV
GEN-2003-019	250.00	MIDW	Smoky Hills Tap 230kV
GEN-2006-031	75.00	MIDW	Knoll 115kV
GEN-2006-040	108.00	SUNCMKEC	Mingo 115kV
GEN-2007-011	135.00	SUNCMKEC	Syracuse 115kV
GEN-2008-017	300.00	SUNCMKEC	Setab 345kV
GEN-2008-092	201.00	MIDW	Post Rock 230kV
GEN-2009-008	199.50	MIDW	South Hays 230kV
GEN-2009-020	48.60	MIDW	Tap Nekoma - Bazine (Walnut Creek) 69kV
GEN-2010-048	70.00	MIDW	Tap Beach Station - Redline 115kV
GEN-2010-057	201.00	MIDW	Rice County 230kV
GEN-2013-033	28.00	MIDW	Goodman Energy Center 115kV
GEN-2014-025	2.40	MIDW	Tap Nekoma - Bazine (Walnut Creek) 69kV
GEN-2014-041	120.80	SUNCMKEC	Arnold 115kV
<b>PRIOR QUEUED SUBTOTAL</b>	<b>2,075.90</b>		
<b>AREA TOTAL</b>	<b>2,075.90</b>		

**GROUP 5: AMARILLO AREA**

Request	Capacity	Area	Proposed Point of Interconnection
ASGI-2013-001	11.50	SPS	PanTex South 115kV
GEN-2002-022	240.00	SPS	Bushland 230kV
GEN-2008-051	322.00	SPS	Potter County 345kV
GEN-2008-088	50.60	SPS	Vega 69kV
GEN-2014-040	349.00	SPS	Castro 115kV
GEN-2014-067	361.00	SPS	Tap Potter County - New Hart 230kV
GEN-2014-068	203.00	SPS	Tap Deaf Smith - Plant X 230kV
Llano Estacado (White Deer)	80.00	SPS	Llano Wind 115kV
<b>PRIOR QUEUED SUBTOTAL</b>	<b>1,617.10</b>		
<b>AREA TOTAL</b>	<b>1,617.10</b>		

**GROUP 6: SOUTH TEXAS PANHANDLE/NEW MEXICO AREA**

Request	Capacity	Area	Proposed Point of Interconnection
ASGI-2010-010	42.20	SPS	Lovington 115kV
ASGI-2010-020	30.00	SPS	Tap LE-Tatum - LE-Crossroads 69kV
ASGI-2010-021	15.00	SPS	Tap LE-Saunders Tap - LE-Anderson 69kV
ASGI-2011-001	27.30	SPS	Lovington 115kV
ASGI-2011-003	10.00	SPS	Hendricks 115kV
ASGI-2011-004	20.00	SPS	Pleasant Hill 69kV
ASGI-2012-002	18.15	SPS	FE-Clovis Interchange 115kV
ASGI-2013-002	18.40	SPS	FE Tucumcari 115kV
ASGI-2013-003	18.40	SPS	FE Clovis 115kV
ASGI-2013-005	1.65	SPS	FE Clovis 115kV
ASGI-2013-006	2.00	SPS	SP-Erskine 115kV
ASGI-2014-001	2.50	SPS	SP-Erskine 115kV
ASGI-2014-002	49.60	SPS	Tap Tucumcari - Santa Rosa 115kV
ASGI-2014-004	10.00	SPS	Livingstone Ridge 115kV
ASGI-2014-005	10.00	SPS	Strata 69kV
ASGI-2014-008	10.00	SPS	South Loving 69kV
ASGI-2014-009	10.00	SPS	Wood Draw 115kV
ASGI-2014-010	10.00	SPS	Ochoa 115kV
ASGI-2014-011	10.00	SPS	Zia 115kV
ASGI-2014-012	10.00	SPS	Cooper Ranch 115kV
ASGI-2014-013	10.00	SPS	SP-Erskine 115kV
GEN-2001-033	180.00	SPS	San Juan Tap 230kV
GEN-2001-036	80.00	SPS	Norton 115kV
GEN-2006-018	170.00	SPS	TUCO Interchange 230kV
GEN-2006-026	502.00	SPS	Hobbs 230kV & Hobbs 115kV
GEN-2008-022	300.00	SPS	Tap Tolk - Eddy County (Crossroads) 345kV
GEN-2010-006	205.00	SPS	Jones 230kV
GEN-2010-046	56.00	SPS	TUCO Interchange 230kV
GEN-2011-025	80.00	SPS	Tap Floyd County - Crosby County 115kV
GEN-2011-045	205.00	SPS	Jones 230kV
GEN-2011-046	27.00	SPS	Lopez 115kV
GEN-2011-048	175.00	SPS	Mustang 230kV
GEN-2012-001	61.20	SPS	Cirrus Tap 230kV
GEN-2012-009	15.00	SPS	Mustang 230kV
GEN-2012-010	15.00	SPS	Mustang 230kV
GEN-2012-020	478.00	SPS	TUCO 230kV
GEN-2012-034	7.00	SPS	Mustang 230kV
GEN-2012-035	7.00	SPS	Mustang 230kV
GEN-2012-036	7.00	SPS	Mustang 230kV
GEN-2012-037	203.00	SPS	TUCO 345kV
GEN-2013-016	203.00	SPS	TUCO 345kV
GEN-2013-022	25.00	SPS	Norton 115kV
GEN-2013-027	150.00	SPS	Tap Tolk - Yoakum 230kV
GEN-2014-007	400.00	SPS	Tap TUCO Interchange - Border 345kV
GEN-2014-012	225.00	SPS	Tap Hobbs Interchange - Andrews 230kV
GEN-2014-033	70.00	SPS	Chaves County 115kV
GEN-2014-034	70.00	SPS	Chaves County 115kV
GEN-2014-035	30.00	SPS	Chaves County 115kV
GEN-2014-046	114.00	SPS	Chaves County 115kV
GEN-2014-047	40.00	SPS	Tap Tolk - Eddy County (Crossroads) 345kV

GEN-2014-048	110.00	SPS	Tap Eddy County - Tweedy 115kV
GEN-2014-053	80.00	SPS	Carlisle 230kV
GEN-2014-054	120.00	SPS	Carlisle 230kV
GEN-2014-062	200.10	SPS	Tap Tolk - Eddy County (Crossroads) 345kV
GEN-2014-063	381.00	SPS	Hobbs 230kV
GEN-2014-066	30.00	SPS	Norton 115kV
GEN-2014-069	90.00	SPS	Tap Postash Junction - Livingston Ridge 115kV
GEN-2014-070	110.00	SPS	Tap Hobbs - Yoakum 230kV
SPS Distributed (Hopi)	10.00	SPS	Hopi 115kV
SPS Distributed (Jal)	10.00	SPS	S Jal 115kV
SPS Distributed (Lea Road)	10.00	SPS	Lea Road 115kV
SPS Distributed (Monument)	10.00	SPS	Monument 115kV
SPS Distributed (Ocotillo)	10.00	SPS	S_Jal 115kV
<b>PRIOR QUEUED SUBTOTAL</b>	<b>5,606.50</b>		
GEN-2014-073	200.00	SPS	North Plainsview 115kV / Swisher 230kV
<b>CURRENT CLUSTER SUBTOTAL</b>	<b>200.00</b>		
<b>AREA TOTAL</b>	<b>5,806.50</b>		

**GROUP 7: SOUTHWEST OKLAHOMA AREA**

Request	Capacity	Area	Proposed Point of Interconnection
GEN-2001-026	74.25	WFEC	Washita 138kV
GEN-2002-005	120.00	WFEC	Red Hills Tap 138kV
GEN-2003-004	100.00	WFEC	Washita 138kV
GEN-2003-005	100.00	WFEC	Anadarko - Paradise (Blue Canyon) 138kV
GEN-2003-022	120.00	AEPW	Washita 138kV
GEN-2004-020	27.00	AEPW	Washita 138kV
GEN-2004-023	20.60	WFEC	Washita 138kV
GEN-2005-003	30.60	WFEC	Washita 138kV
GEN-2006-002	101.00	AEPW	Sweetwater 230kV
GEN-2006-035	225.00	AEPW	Sweetwater 230kV
GEN-2006-043	99.00	AEPW	Sweetwater 230kV
GEN-2007-032	150.00	WFEC	Tap Clinton Junction - Clinton 138kV
GEN-2007-052	150.00	WFEC	Anadarko 138kV
GEN-2008-023	150.00	AEPW	Hobart Junction 138kV
GEN-2008-037	101.00	WFEC	Tap Washita - Blue Canyon Wind 138kV
GEN-2011-037	7.00	WFEC	Blue Canyon 5 138kV
GEN-2011-049	250.00	OKGE	Border 345kV
GEN-2012-028	74.80	WFEC	Gotebo 69kV
GEN-2014-036	50.00	AEPW	Hollis 138kV
<b>PRIOR QUEUED SUBTOTAL</b>	<b>1,950.25</b>		
<b>AREA TOTAL</b>	<b>1,950.25</b>		

**GROUP 8: NORTH OKLAHOMA/SOUTH CENTRAL KANSAS AREA**

Request	Capacity	Area	Proposed Point of Interconnection
ASGI-2010-006	150.00	AECI	Tap Fairfax (AECI) - Shilder (AEPW) 138kV
ASGI-2014-014	56.40	GRDA	Ferguson 69kV
GEN-2002-004	200.00	WERE	Latham 345kV
GEN-2005-013	201.00	WERE	Caney River 345kV
GEN-2007-025	300.00	WERE	Viola 345kV
GEN-2008-013	300.00	OKGE	Hunter 345kV
GEN-2008-021	42.00	WERE	Wolf Creek 345kV
GEN-2008-098	100.80	WERE	Waverly 345kV
GEN-2009-025	60.00	OKGE	Nardins 69kV
GEN-2010-003	100.80	WERE	Waverly 345kV
GEN-2010-005	300.00	WERE	Viola 345kV
GEN-2010-055	4.50	AEPW	Wekiwa 138kV
GEN-2011-057	150.40	WERE	Creswell 138kV
GEN-2012-027	136.00	AEPW	Shidler 138kV
GEN-2012-032	300.00	OKGE	Open Sky 345kV
GEN-2012-033	98.80	OKGE	Tap and Tie South 4th - Bunch Creek & Enid Tap - Fairmont (GEN-2012-033T) 138kV
GEN-2012-040	76.50	WFEC	Chilocco 138kV
GEN-2012-041	121.50	OKGE	Ranch Road 345kV
GEN-2013-012	147.00	OKGE	Redbud 345kV
GEN-2013-028	559.50	GRDA	Tap N Tulsa - GRDA 1 345kV
GEN-2013-029	300.00	OKGE	Renfrow 345kV
GEN-2014-001	200.60	WERE	Tap Wichita - Emporia Energy Center 345kV
GEN-2014-022	15.00	OKGE	Open Sky 345kV
GEN-2014-028	35.00	EMDE	Riverton 161kV
GEN-2014-064	248.40	OKGE	Otter 138kV



<b>PRIOR QUEUED SUBTOTAL</b>	<b>4,204.20</b>	
<b>AREA TOTAL</b>	<b>4,204.20</b>	

## GROUP 9: NEBRASKA AREA

Request	Capacity	Area	Proposed Point of Interconnection
GEN-2002-023N	0.80	NPPD	Harmony 115kV
GEN-2003-021N	75.00	NPPD	Ainsworth Wind Tap 115kV
GEN-2004-023N	75.00	NPPD	Columbus Co 115kV
GEN-2006-020N	42.00	NPPD	Bloomfield 115kV
GEN-2006-037N1	75.00	NPPD	Broken Bow 115kV
GEN-2006-038N005	80.00	NPPD	Broken Bow 115kV
GEN-2006-038N019	80.00	NPPD	Petersburg North 115kV
GEN-2006-044N	40.50	NPPD	North Petersburg 115kV
GEN-2007-011N08	81.00	NPPD	Bloomfield 115kV
GEN-2008-086N02	201.00	NPPD	Meadow Grove 230kV
GEN-2008-1190	60.00	OPPD	S1399 161kV
GEN-2008-123N	89.70	NPPD	Tap Pauline - Hildreth (Rosemont) 115kV
GEN-2009-040	73.80	WERE	Marshall 115kV
GEN-2010-041	10.50	OPPD	S1399 161kV
GEN-2010-051	200.00	NPPD	Tap Twin Church - Hoskins 230kV
GEN-2011-018	73.60	NPPD	Steele City 115kV
GEN-2011-027	120.00	NPPD	Hoskins 230kV
GEN-2011-056	3.60	NPPD	Jeffrey 115kV
GEN-2011-056A	3.60	NPPD	John 1 115kV
GEN-2011-056B	4.50	NPPD	John 2 115kV
GEN-2012-021	4.80	LES	Terry Bundy Generating Station 115kV
GEN-2013-002	50.60	LES	Tap Sheldon - Folsom & Pleasant Hill (GEN-2013-002 Tap) 115kV CKT 2
GEN-2013-008	1.20	NPPD	Steele City 115kV
GEN-2013-014	25.50	NPPD	Tap Guide Rock - Pauline (Rosemont) 115kV
GEN-2013-019	73.60	LES	Tap Sheldon - Folsom & Pleasant Hill (GEN-2013-002 Tap) 115kV CKT 2
GEN-2013-032	204.00	NPPD	Neligh 115kV
GEN-2014-004	3.96	NPPD	Steele City 115kV (GEN-2011-018 POI)
GEN-2014-013	73.50	NPPD	Meadow Grove (GEN-2008-086N2 Sub) 230kV
GEN-2014-023	79.90	NPPD	Tap Fort Randall - Meadow Grove 230kV
GEN-2014-031	35.80	NPPD	Meadow Grove 230kV
GEN-2014-032	10.20	NPPD	Meadow Grove 230kV
GEN-2014-039	73.60	NPPD	Friend 115kV
GEN-2014-055	160.00	NPPD	Belden 115kV
GEN-2014-059	161.10	NPPD	Tap Sidney - Ogallala 230kV
GEN-2014-060	125.80	NPPD	Tap Pauline - Hildreth (Rosemont) 115kV
NPPD Distributed (Broken Bow)	8.30	NPPD	Broken Bow 115kV
NPPD Distributed (Burt County Wind)	12.00	NPPD	Tekamah & Oakland 115kV
NPPD Distributed (Burwell)	3.00	NPPD	Ord 115kV
NPPD Distributed (Columbus Hydro)	45.00	NPPD	Columbus 115kV
NPPD Distributed (North Platte - Lexington)	54.00	NPPD	Multiple: Jeffrey 115kV, John_1 115kV, John_2 115kV
NPPD Distributed (Ord)	11.90	NPPD	Ord 115kV
NPPD Distributed (Stuart)	2.10	NPPD	Ainsworth 115kV
<b>PRIOR QUEUED SUBTOTAL</b>	<b>2,609.46</b>		
<b>AREA TOTAL</b>	<b>2,609.46</b>		

**GROUP 10: SOUTHEAST OKLAHOMA/NORTHEAST TEXAS AREA**

Request	Capacity	Area	Proposed Point of Interconnection
GEN-2014-027	60.00	AEPW	Weleetka 138kV
<b>PRIOR QUEUED SUBTOTAL</b>	<b>60.00</b>		
<b>AREA TOTAL</b>	<b>60.00</b>		

**GROUP 12: NORTHWEST ARKANSAS AREA**

Request	Capacity	Area	Proposed Point of Interconnection
GEN-2013-011	30.00	AEPW	Turk 138kV
<b>PRIOR QUEUED SUBTOTAL</b>	<b>30.00</b>		
<b>AREA TOTAL</b>	<b>30.00</b>		

**GROUP 13: NORTHWEST MISSOURI AREA**

Request	Capacity	Area	Proposed Point of Interconnection
ASGI-2013-007	90.00	AECI	Tap Hickory Creek - Locust Creek 161kV
GEN-2008-129	80.00	GMO	Pleasant Hill 161kV
GEN-2010-036	4.60	WERE	6th Street 115kV
GEN-2011-011	50.00	KACP	Iatan 345kV
GEN-2014-021	300.00	GMO	Tap Nebraska City - Mullin Creek 345kV
GEN-2014-050	100.00	WERE	Swissvale 345kV
GEN-2014-051	174.00	WERE	Jeffrey Energy Center 345kV
<b>PRIOR QUEUED SUBTOTAL</b>	<b>798.60</b>		
<b>AREA TOTAL</b>	<b>798.60</b>		

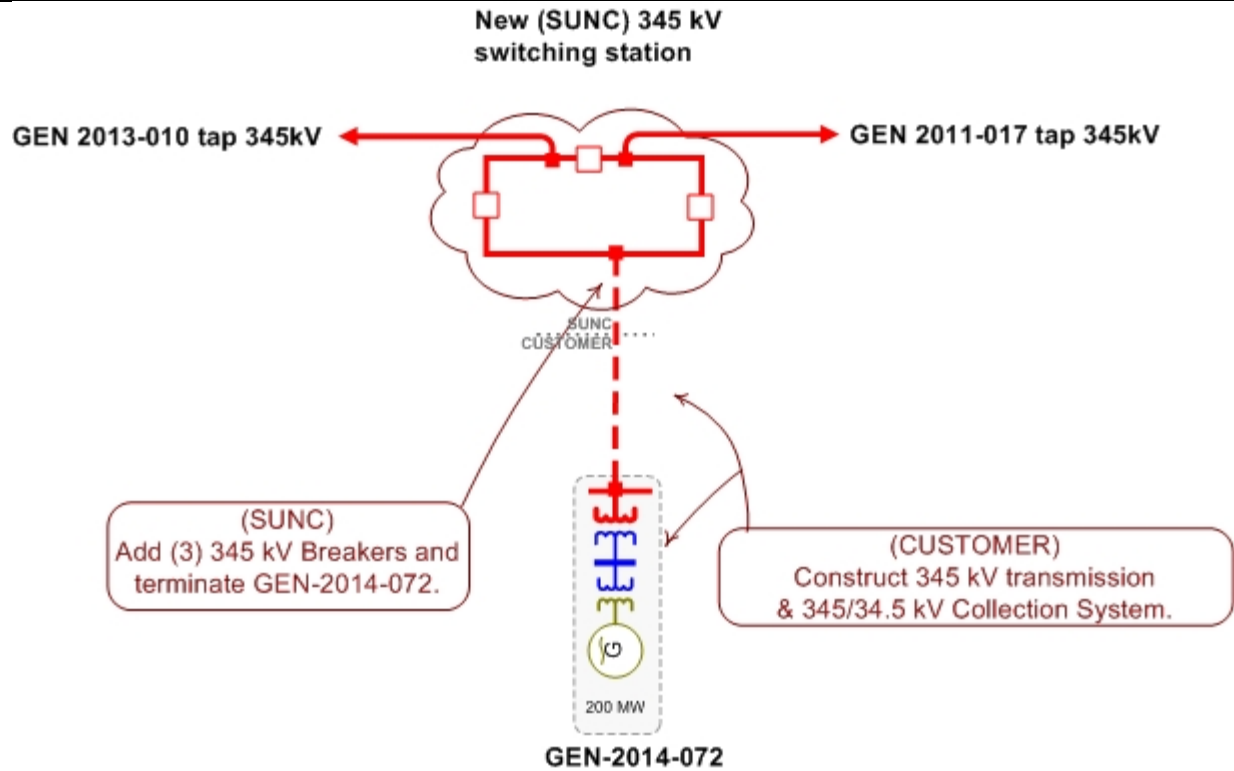
**GROUP 14: SOUTH CENTRAL OKLAHOMA AREA**

Request	Capacity	Area	Proposed Point of Interconnection
GEN-2011-040	111.00	OKGE	Carter County 138kV
GEN-2011-050	109.80	AEPW	Santa Fe Tap 138kV
GEN-2012-004	41.40	OKGE	Carter County 138kV
GEN-2013-007	100.30	OKGE	Tap Prices Falls - Carter 138kV
GEN-2014-057	250.00	AEPW	Tap Lawton - Sunnyside 345kV
<b>PRIOR QUEUED SUBTOTAL</b>	<b>612.50</b>		
<b>AREA TOTAL</b>	<b>612.50</b>		

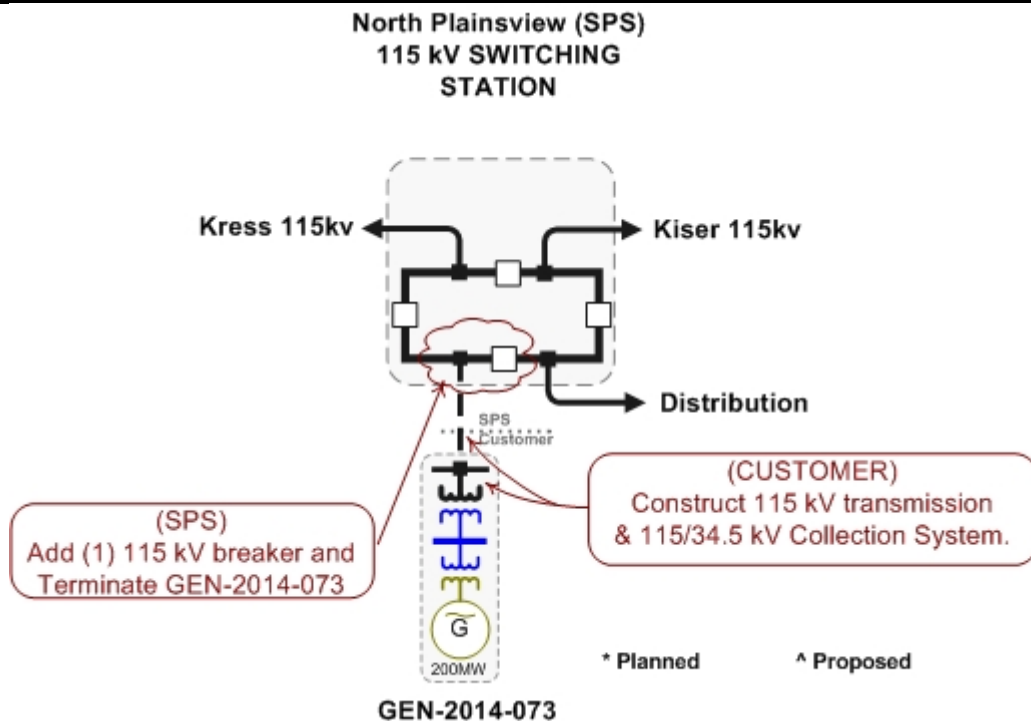
<b>CLUSTER TOTAL (CURRENT STUDY)</b>	<b>400.0</b>	<b>MW</b>
<b>PQ TOTAL (PRIOR QUEUED)</b>	<b>32,434.8</b>	<b>MW</b>
<b>CLUSTER TOTAL (INCLUDING PRIOR QUEUED)</b>	<b>32,834.8</b>	<b>MW</b>

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

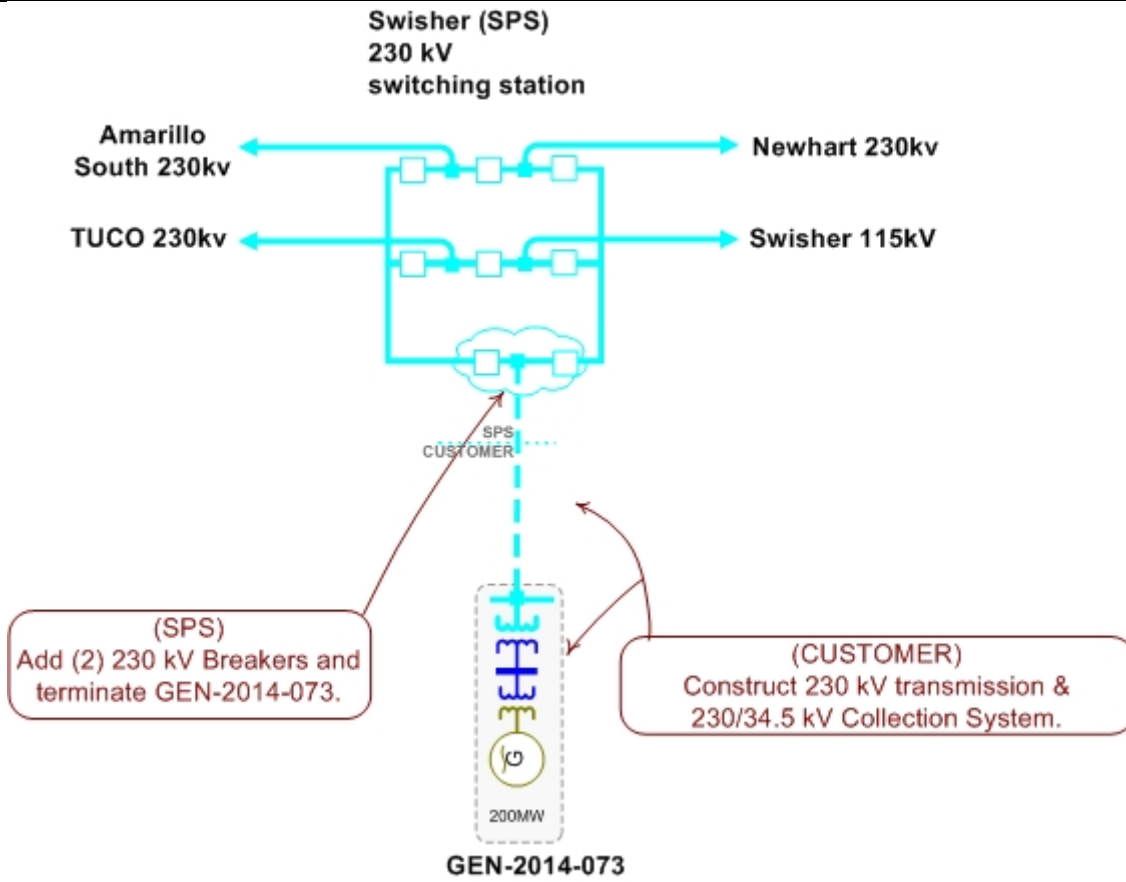
#### GEN-2014-072



#### GEN-2014-073 (North Plainsview 115kV)



**GEN-2014-073 (Swisher 230kV)**



## **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 Generator 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 an 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 Generator Interconnection Request Customer will be determined at the time of a restudy.

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

# Appendix E. Cost Allocation Per Request

(Including Previously Allocated Network Upgrades\*)

Interconnection Request and Upgrades	Upgrade Type	Allocated Cost	Upgrade Cost
<b>GEN-2014-072</b>			
GEN-2014-072 Interconnection Costs See One-Line Diagram.	Current Study	\$11,200,000	\$11,200,000
Hays Plant - Vine 115kV CKT 1 NRIS only required upgrade: Rebuild approximately 1/4 mile of 115kV	Current Study	\$1,000,000	\$1,000,000
Knoll - North Hays - Vine Street 115kV CKT 1 NRIS only required upgrade: Rebuild approximately 6 miles of 115kV line	Current Study	\$4,500,000	\$4,500,000
Mullergren - Spearville 230kV CKT 1 NRIS only required upgrade: Replace terminal equipment.	Current Study	\$1,000,000	\$1,000,000
Buckner - Holcomb 345kV Replace Terminal equipment	Previously Allocated		\$1,500,000
Clark County Reactive Power Support Install 100Mvar SVC at Clark County Substation.	Previously Allocated		\$20,000,000
Ellsworth - Mullergren 115kV CKT 1 Per SPP 2012 NT and SPP-NTC-200173 for 6/1/2015 in-service(Total Project E&C Cost Shown).	Previously Allocated		\$19,459,597
FPL Switch - Mooreland 138kV CKT 1 Rebuild approximately 0.2 miles of 138kV line	Previously Allocated		\$820,000
FPL Switch - Woodward 138kV CKT 1 Rebuild approximately 12 miles of 138kV line	Previously Allocated		\$8,499,000
Mathewson - Cimarron 345kV CKT 2 Build second 345kV circuit from Mathewson - Cimarron @ 3000 amps per ITP10.	Previously Allocated		\$42,903,753
South Hays - Hays Plant 115kV CKT 1 NRIS only required upgrade: Per NTC 200210	Previously Allocated		\$4,734,006
Tatonga - GEN-2014-058 Tap - Mathewson 345kV CKT 2 Build second 345kV circuit from Tatonga - Mathewson @ 3000 amps per ITP10.	Previously Allocated		\$104,260,473
Woodward - GEN-2011-051 Tap - Tatonga 345kV CKT 2 Build second circuit from Woodward - Tatonga 345kV	Previously Allocated		\$71,876,622
	<b>Current Study Total</b>	<b>\$17,700,000</b>	

## GEN-2014-073 (North Plainsview 115kV Substation)

\* 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>
Cox - Kiser 115kV CKT 1 Rebuild approximately 10 miles of 115kV line from Kiser to Cox	Current Study	\$7,500,000	\$7,500,000
Cox Interchange - Hale County 115kV CKT 1 Rebuild approximately 19.8 miles of 115kV line from Cox to Hale County.	Current Study	\$15,000,000	\$15,000,000
GEN-2014-073 Interconnection Costs (North Plainsview Substation) See One-Line Diagram.	Current Study	\$5,500,000	\$5,500,000
Kiser - North Plainsview 115kVCKT 1 Rebuild approximately 1.6 miles of 115kV line from North Plainsview to Kiser.	Current Study	\$1,200,000	\$1,200,000
Kress Interchange - Kress Rural 115kV CKT 1 Rebuild approximately 9 miles of 115kV line from Kress Rural to Kress Interchange	Current Study	\$6,750,000	\$6,750,000
Kress Rural - North Plainsview 115kV CKT 1 Rebuild approximately 12.1 miles of 115kV line from North Plainsview to Kress Rural	Current Study	\$9,000,000	\$9,000,000
Chisholm - Elk City 230kV CKT 1 Rebuild approximately 15 miles of 230kV from Chisholm - Elk City.	Previously Allocated		\$15,000,000
Chisholm - Gracemont 345kV CKT 1 Per SPP-NTC-200255 and 200240 (Total Project E&C Cost Shown)	Previously Allocated		\$162,952,357
Chisholm Substation Upgrade 345kV Expand planned Chisholm Substation to tap and terminate Woodward - Border 345kV into the Chisholm Substation.	Previously Allocated		\$12,000,000
Cimarron - Minco 345kV CKT 1 Replace 1600 amp switches.	Previously Allocated		\$1,000,000
Cunningham Station - Maddox Station 115kV CKT 1 NRIS only required upgrade: Rebuild approximately 3 miles of 115kV line.	Previously Allocated		\$1,914,000
El Dorado - El Dorado Junction 69kV CKT 1 Rebuild approximately 12 miles of 69kV from El Dorado - El Dorado Junction.	Previously Allocated		\$10,000,000
Elk City 230/138/13kV Transformer CKT 1 Replace terminal equipment for Elk City Transformer to achieve transformer limit of 450MVA.	Previously Allocated		\$15,000,000
Grapevine - Chisholm 345kV CKT 1 Build approximately 75 miles of new 345kV from Grapevine - Chisholm.	Previously Allocated		\$68,000,000
Grapevine Substation Upgrade 345kV Build Grapevine Substation and terminate Beaver Co - Grapevine, Potter Co - Grapevine, Grapevine - Chisholm 345kV into the Grapevine Substation.	Previously Allocated		\$12,000,000
LES - GEN-2014-057 Tap - Sunnyside 345kV CKT 1 Replace Terminal Equipment.	Previously Allocated		\$200,000

\* 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>
Targa-Cardinal 115kV CKT 1 Rebuild approximately 3 miles of 115kV from Targa to Cardinal per 2015 ITPNT.	Previously Allocated		\$2,049,062
Tolk - Potter County 345kV CKT 1 Build approximately 115 miles of 345kV from Tolk - Potter County.	Previously Allocated		\$105,000,000
Tolk - TUCO 2 345kV CKT 1 Build approximately 64 miles of 345kV from Tolk - TUCO 2.	Previously Allocated		\$64,000,000
TUCO 2 Substation Upgrade 345kV Build TUCO 2 345kV substation and approximately 1 mile 345kV from TUCO - TUCO 2.	Previously Allocated		\$15,000,000
TUCO Interchange - Yoakum - Hobbs 345/230kV Projects Per HPILs SPP-NTC-200283 (Total Project E&C Cost Shown)	Previously Allocated		\$237,543,568
Wipp - Sand Dunes 115kV CKT 1 Rebuild approximately 6 miles of 115kV from Wipp - Sand Dunes.	Previously Allocated		\$4,500,000
Yoakum 230/115/13kV Transformer CKT 1&2 NRIS only required upgrade: Replace existing two Yoakum 230/115/13kV transformers per SPP-NTC-200262.	Previously Allocated		\$7,514,514
	<b>Current Study Total</b>	<b>\$44,950,000</b>	

### **GEN-2014-073 (Swisher 230kV Substation)**

GEN-2014-073 Interconnection Costs (Swisher Substation) See One-Line Diagram.	Current Study	\$2,600,000	\$2,600,000
Carlisle 230/115/13kV Transformer CKT 1 Replace existing Carlisle 230/115/13kV Transformer circuit #1.	Previously Allocated		\$5,000,000
Chisholm - Elk City 230kV CKT 1 Rebuild approximately 15 miles of 230kV from Chisholm - Elk City.	Previously Allocated		\$15,000,000
Chisholm - Gracemont 345kV CKT 1 Per SPP-NTC-200255 and 200240 (Total Project E&C Cost Shown)	Previously Allocated		\$162,952,357
Chisholm Substation Upgrade 345kV Expand planned Chisholm Substation to tap and terminate Woodward - Border 345kV into the Chisholm Substation.	Previously Allocated		\$12,000,000
Cimarron - Minco 345kV CKT 1 Replace 1600 amp switches.	Previously Allocated		\$1,000,000
Cunningham Station - Maddox Station 115kV CKT 1 NRIS only required upgrade: Rebuild approximately 3 miles of 115kV line.	Previously Allocated		\$1,914,000
El Dorado - El Dorado Junction 69kV CKT 1 Rebuild approximately 12 miles of 69kV from El Dorado - El Dorado Junction.	Previously Allocated		\$10,000,000

\* 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>
Elk City 230/138/13kV Transformer CKT 1 Replace terminal equipment for Elk City Transformer to achieve transformer limit of 450MVA.	Previously Allocated		\$15,000,000
Grapevine - Chisholm 345kV CKT 1 Build approximately 75 miles of new 345kV from Grapevine - Chisholm.	Previously Allocated		\$68,000,000
Grapevine Substation Upgrade 345kV Build Grapevine Substation and terminate Beaver Co - Grapevine, Potter Co - Grapevine, Grapevine - Chisholm 345kV into the Grapevine Substation.	Previously Allocated		\$12,000,000
LES - GEN-2014-057 Tap - Sunnyside 345kV CKT 1 Replace Terminal Equipment.	Previously Allocated		\$200,000
Targa-Cardinal 115kV CKT 1 Rebuild approximately 3 miles of 115kV from Targa to Cardinal per 2015 ITPNT.	Previously Allocated		\$2,049,062
Tolk - Potter County 345kV CKT 1 Build approximately 115 miles of 345kV from Tolk - Potter County.	Previously Allocated		\$105,000,000
Tolk - TUCO 2 345kV CKT 1 Build approximately 64 miles of 345kV from Tolk - TUCO 2.	Previously Allocated		\$64,000,000
TUCO 2 Substation Upgrade 345kV Build TUCO 2 345kV substation and approximately 1 mile 345kV from TUCO - TUCO 2.	Previously Allocated		\$15,000,000
TUCO Interchange - Yoakum - Hobbs 345/230kV Projects Per HPILs SPP-NTC-200283 (Total Project E&C Cost Shown)	Previously Allocated		\$237,543,568
Wipp - Sand Dunes 115kV CKT 1 Rebuild approximately 6 miles of 115kV from Wipp - Sand Dunes.	Previously Allocated		\$4,500,000
Yoakum 230/115/13kV Transformer CKT 1&2 NRIS only required upgrade: Replace existing two Yoakum 230/115/13kV transformers per SPP-NTC-200262.	Previously Allocated		\$7,514,514
	<b>Current Study Total</b>	\$2,600,000	
<b>TOTAL CURRENT STUDY COSTS:</b>			<b>\$65,250,000</b>

\* 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 Generator 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

<b>Cox Interchange - Hale County 115kV CKT 1</b>	<b>\$15,000,000</b>
Rebuild approximately 19.8 miles of 115kV line from Cox to Hale County.	
GEN-2014-073 (North Plainsview 115kV Substation)	\$15,000,000
<b>Total Allocated Costs</b>	<b>\$15,000,000</b>
<b>Cox - Kiser 115kV CKT 1</b>	<b>\$7,500,000</b>
Rebuild approximately 10 miles of 115kV line from Kiser to Cox	
GEN-2014-073 (North Plainsview 115kV Substation)	\$7,500,000
<b>Total Allocated Costs</b>	<b>\$7,500,000</b>
<b>GEN-2014-072 Interconnection Costs</b>	<b>\$11,200,000</b>
See One-Line Diagram.	
GEN-2014-072	\$11,200,000
<b>Total Allocated Costs</b>	<b>\$11,200,000</b>
<b>GEN-2014-073 Interconnection Costs (North Plainsview Substation)</b>	<b>\$5,500,000</b>
See One-Line Diagram.	
GEN-2014-073 (North Plainsview 115kV Substation)	\$5,500,000
<b>Total Allocated Costs</b>	<b>\$5,500,000</b>
<b>GEN-2014-073 Interconnection Costs (Swisher Substation)</b>	<b>\$2,600,000</b>
See One-Line Diagram.	
GEN-2014-073 (Swisher 230kV Substation)	\$2,600,000
<b>Total Allocated Costs</b>	<b>\$2,600,000</b>
<b>Hays Plant - Vine 115kV CKT 1</b>	<b>\$1,000,000</b>
NRIS only required upgrade: Rebuild approximately 1/4 mile of 115kV	
GEN-2014-072	\$1,000,000
<b>Total Allocated Costs</b>	<b>\$1,000,000</b>
<b>Kiser - North Plainsview 115kVCKT 1</b>	<b>\$1,200,000</b>
Rebuild approximately 1.6 miles of 115kV line from North Plainsview to Kiser.	
GEN-2014-073 (North Plainsview 115kV Substation)	\$1,200,000
<b>Total Allocated Costs</b>	<b>\$1,200,000</b>

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

**Kress Interchange - Kress Rural 115kV CKT 1** **\$6,750,000**

Rebuild approximately 9 miles of 115kV line from Kress Rural to Kress Interchange

GEN-2014-073 (North Plainsview 115kV Substation) \$6,750,000

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**Total Allocated Costs** **\$6,750,000**

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**Kress Rural - North Plainsview 115kV CKT 1** **\$9,000,000**

Rebuild approximately 12.1 miles of 115kV line from North Plainsview to Kress Rural

GEN-2014-073 (North Plainsview 115kV Substation) \$9,000,000

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**Total Allocated Costs** **\$9,000,000**

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**Mullergren - Spearville 230kV CKT 1** **\$1,000,000**

NRIS only required upgrade: Replace terminal equipment.

GEN-2014-072 \$1,000,000

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**Total Allocated Costs** **\$1,000,000**

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**Knoll - North Hays - Vine Street 115kV CKT 1** **\$4,500,000**

NRIS only required upgrade: Rebuild approximately 6 miles of 115kV line

GEN-2014-072 \$4,500,000

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**Total Allocated Costs** **\$4,500,000**

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

**G: FCITC Analysis Constraints Requiring Reinforcement (ERIS)**

Group	Season	Scenario	Source	Monitored Element	Direction	TDF	Rating	Contingency	
								Loading %	Contingency
03ALL	25SP	0	G14_072	'BUCKNER7 345.00 - HOLCOMB 345KV CKT 1'	FROM->TO	0.28751	725.2	103.9292	'G13-010T 345.00 - POST ROCK 345KV CKT 1'
03ALL	25SP	0	G14_072	'BUCKNER7 345.00 - HOLCOMB 345KV CKT 1'	FROM->TO	0.28751	725.2	100.2612	'G13-010T 345.00 - G14_72T 345.00 345KV CKT 1'
06ALL	15G	0	G14_073	'COX INTERCHANGE - HALE CO INTERCHANGE 115KV CKT 1'	FROM->TO	0.57743	96	121.0833	'KRESS_RURAL3115.00 - N_PLAINVEW 3115.00 115KV CKT 1'
06ALL	15G	0	G14_073	'COX INTERCHANGE - HALE CO INTERCHANGE 115KV CKT 1'	FROM->TO	0.57743	96	119.625	'KRESS INTERCHANGE - KRESS_RURAL3115.00 115KV CKT 1'
06ALL	15G	0	G14_073	'KRESS_RURAL3115.00 - N_PLAINVEW 3115.00 115KV CKT 1'	TO->FROM	1	172.9	113.0128	'KISER 3115.00 - N_PLAINVEW 3115.00 115KV CKT 1'
06ALL	15G	0	G14_073	'KISER 3115.00 - N_PLAINVEW 3115.00 115KV CKT 1'	TO->FROM	1	172.9	113.0128	'KRESS_RURAL3115.00 - N_PLAINVEW 3115.00 115KV CKT 1'
06ALL	15G	0	G14_073	'KRESS INTERCHANGE - KRESS_RURAL3115.00 115KV CKT 1'	TO->FROM	1	172.9	111.6826	'KISER 3115.00 - N_PLAINVEW 3115.00 115KV CKT 1'
06ALL	15G	0	G14_073	'KISER 3115.00 - N_PLAINVEW 3115.00 115KV CKT 1'	TO->FROM	1	172.9	111.6826	'KRESS INTERCHANGE - KRESS_RURAL3115.00 115KV CKT 1'
06ALL	15G	0	G14_073	'KRESS_RURAL3115.00 - N_PLAINVEW 3115.00 115KV CKT 1'	TO->FROM	1	172.9	105.3784	'COX INTERCHANGE - KISER 3115.00 115KV CKT 1'
06ALL	15G	0	G14_073	'COX INTERCHANGE - KISER 3115.00 115KV CKT 1'	TO->FROM	1	172.9	105.3784	'KRESS_RURAL3115.00 - N_PLAINVEW 3115.00 115KV CKT 1'
06ALL	15G	0	G14_073	'KRESS INTERCHANGE - KRESS_RURAL3115.00 115KV CKT 1'	TO->FROM	1	172.9	104.106	'COX INTERCHANGE - KISER 3115.00 115KV CKT 1'
06ALL	15G	0	G14_073	'COX INTERCHANGE - KISER 3115.00 115KV CKT 1'	TO->FROM	1	172.9	104.106	'KRESS INTERCHANGE - KRESS_RURAL3115.00 115KV CKT 1'
06ALL	15SP	0	G14_073	'KRESS_RURAL3115.00 - N_PLAINVEW 3115.00 115KV CKT 1'	TO->FROM	1	172.9	111.8561	'KISER 3115.00 - N_PLAINVEW 3115.00 115KV CKT 1'
06ALL	15SP	0	G14_073	'KISER 3115.00 - N_PLAINVEW 3115.00 115KV CKT 1'	TO->FROM	1	172.9	111.8561	'KRESS_RURAL3115.00 - N_PLAINVEW 3115.00 115KV CKT 1'
06ALL	15SP	0	G14_073	'KRESS INTERCHANGE - KRESS_RURAL3115.00 115KV CKT 1'	TO->FROM	1	172.9	110.0053	'KISER 3115.00 - N_PLAINVEW 3115.00 115KV CKT 1'
06ALL	15SP	0	G14_073	'KISER 3115.00 - N_PLAINVEW 3115.00 115KV CKT 1'	TO->FROM	1	172.9	110.0053	'KRESS INTERCHANGE - KRESS_RURAL3115.00 115KV CKT 1'
06ALL	15SP	0	G14_073	'COX INTERCHANGE - KISER 3115.00 115KV CKT 1'	TO->FROM	1	172.7	101.0997	'KRESS_RURAL3115.00 - N_PLAINVEW 3115.00 115KV CKT 1'
06ALL	15SP	0	G14_073	'KRESS_RURAL3115.00 - N_PLAINVEW 3115.00 115KV CKT 1'	TO->FROM	1	172.9	100.9828	'COX INTERCHANGE - KISER 3115.00 115KV CKT 1'
06ALL	15SP	0	G14_073	'COX INTERCHANGE - HALE CO INTERCHANGE 115KV CKT 1'	FROM->TO	0.57851	95.6	100.9054	'KRESS_RURAL3115.00 - N_PLAINVEW 3115.00 115KV CKT 1'
06ALL	20SP	0	G14_073	'KRESS_RURAL3115.00 - N_PLAINVEW 3115.00 115KV CKT 1'	TO->FROM	1	172.9	111.5091	'KISER 3115.00 - N_PLAINVEW 3115.00 115KV CKT 1'
06ALL	20SP	0	G14_073	'KISER 3115.00 - N_PLAINVEW 3115.00 115KV CKT 1'	TO->FROM	1	172.9	111.5091	'KRESS_RURAL3115.00 - N_PLAINVEW 3115.00 115KV CKT 1'
06ALL	20SP	0	G14_073	'KRESS INTERCHANGE - KRESS_RURAL3115.00 115KV CKT 1'	TO->FROM	1	172.9	109.4848	'KISER 3115.00 - N_PLAINVEW 3115.00 115KV CKT 1'
06ALL	20SP	0	G14_073	'KISER 3115.00 - N_PLAINVEW 3115.00 115KV CKT 1'	TO->FROM	1	172.9	109.4848	'KRESS INTERCHANGE - KRESS_RURAL3115.00 115KV CKT 1'
06ALL	20WP	0	G14_073	'COX INTERCHANGE - HALE CO INTERCHANGE 115KV CKT 1'	FROM->TO	0.57587	105.9	112.0279	'KRESS_RURAL3115.00 - N_PLAINVEW 3115.00 115KV CKT 1'
06ALL	20WP	0	G14_073	'COX INTERCHANGE - HALE CO INTERCHANGE 115KV CKT 1'	FROM->TO	0.57587	105.9	110.6115	'KRESS INTERCHANGE - KRESS_RURAL3115.00 115KV CKT 1'
06ALL	20WP	0	G14_073	'KRESS_RURAL3115.00 - N_PLAINVEW 3115.00 115KV CKT 1'	TO->FROM	1	176.9	110.1748	'KISER 3115.00 - N_PLAINVEW 3115.00 115KV CKT 1'
06ALL	20WP	0	G14_073	'KISER 3115.00 - N_PLAINVEW 3115.00 115KV CKT 1'	TO->FROM	1	176.9	110.1748	'KRESS_RURAL3115.00 - N_PLAINVEW 3115.00 115KV CKT 1'
06ALL	20WP	0	G14_073	'KRESS INTERCHANGE - KRESS_RURAL3115.00 115KV CKT 1'	TO->FROM	1	176.9	108.8181	'KISER 3115.00 - N_PLAINVEW 3115.00 115KV CKT 1'
06ALL	20WP	0	G14_073	'KISER 3115.00 - N_PLAINVEW 3115.00 115KV CKT 1'	TO->FROM	1	176.9	108.8181	'KRESS INTERCHANGE - KRESS_RURAL3115.00 115KV CKT 1'
06ALL	20WP	0	G14_073	'COX INTERCHANGE - KISER 3115.00 115KV CKT 1'	TO->FROM	1	176.6	102.4344	'KRESS_RURAL3115.00 - N_PLAINVEW 3115.00 115KV CKT 1'
06ALL	20WP	0	G14_073	'KRESS_RURAL3115.00 - N_PLAINVEW 3115.00 115KV CKT 1'	TO->FROM	1	176.9	102.2607	'COX INTERCHANGE - KISER 3115.00 115KV CKT 1'
06ALL	20WP	0	G14_073	'COX INTERCHANGE - KISER 3115.00 115KV CKT 1'	TO->FROM	1	176.6	101.0754	'KRESS INTERCHANGE - KRESS_RURAL3115.00 115KV CKT 1'
06ALL	20WP	0	G14_073	'KRESS INTERCHANGE - KRESS_RURAL3115.00 115KV CKT 1'	TO->FROM	1	176.9	100.904	'COX INTERCHANGE - KISER 3115.00 115KV CKT 1'
06ALL	25SP	0	G14_073	'KRESS_RURAL3115.00 - N_PLAINVEW 3115.00 115KV CKT 1'	TO->FROM	1	172.9	111.1621	'KISER 3115.00 - N_PLAINVEW 3115.00 115KV CKT 1'
06ALL	25SP	0	G14_073	'KISER 3115.00 - N_PLAINVEW 3115.00 115KV CKT 1'	TO->FROM	1	173	111.0978	'KRESS_RURAL3115.00 - N_PLAINVEW 3115.00 115KV CKT 1'
06ALL	25SP	0	G14_073	'KRESS INTERCHANGE - KRESS_RURAL3115.00 115KV CKT 1'	TO->FROM	1	172.9	108.9642	'KISER 3115.00 - N_PLAINVEW 3115.00 115KV CKT 1'
06ALL	25SP	0	G14_073	'KISER 3115.00 - N_PLAINVEW 3115.00 115KV CKT 1'	TO->FROM	1	173	108.9013	'KRESS INTERCHANGE - KRESS_RURAL3115.00 115KV CKT 1'

**H: FCITC Analysis Constraints Requiring Reinforcement (NRIS)**

Group	Season	Scenario	Source	Monitored Element	Direction	TDF	Rating	Contingency	
								Loading %	Contingency
03NR	15G	0	G14_072	'HAYS PLANT - SOUTH HAYS 115KV CKT 1'	TO->FROM	0.03329	98.9	154.6593	'KNOLL 230 - POSTROCK6 230.00 230KV CKT 1'
03NR	15G	0	G14_072	'HAYS PLANT - VINE STREET 115KV CKT 1'	FROM->TO	0.03329	88	149.8386	'KNOLL 230 - POSTROCK6 230.00 230KV CKT 1'
03NR	15G	0	G14_072	'KNOLL - N HAYS3 115.00 115KV CKT 1'	TO->FROM	0.03329	87.6	133.3995	'KNOLL 230 - POSTROCK6 230.00 230KV CKT 1'
03NR	15G	0	G14_072	'N HAYS3 115.00 - VINE STREET 115KV CKT 1'	TO->FROM	0.03329	98.8	124.4514	'KNOLL 230 - POSTROCK6 230.00 230KV CKT 1'
03NR	15G	0	G14_072	'MULLERGREN - SPEARVILLE 230KV CKT 1'	TO->FROM	0.08301	396.6	107.0605	'G13-010T 345.00 - POST ROCK 345KV CKT 1'
03NR	15G	0	G14_072	'MULLERGREN - SPEARVILLE 230KV CKT 1'	TO->FROM	0.08301	396.6	101.9924	'G13-010T 345.00 - G14_72T 345.00 345KV CKT 1'
00NR	15SP	0	G14_073	'KISER 3115.00 - N_PLAINVEW 3115.00 115KV CKT 1'	TO->FROM	1	172.9	111.8566	'KRESS_RURAL3115.00 - N_PLAINVEW 3115.00 115KV CKT 1'
00NR	15SP	0	G14_073	'KRESS_RURAL3115.00 - N_PLAINVEW 3115.00 115KV CKT 1'	TO->FROM	1	172.9	111.8566	'KISER 3115.00 - N_PLAINVEW 3115.00 115KV CKT 1'
00NR	15SP	0	G14_073	'KISER 3115.00 - N_PLAINVEW 3115.00 115KV CKT 1'	TO->FROM	1	172.9	109.8901	'KRESS INTERCHANGE - KRESS_RURAL3115.00 115KV CKT 1'
00NR	15SP	0	G14_073	'KRESS INTERCHANGE - KRESS_RURAL3115.00 115KV CKT 1'	TO->FROM	1	173	109.8266	'KISER 3115.00 - N_PLAINVEW 3115.00 115KV CKT 1'
00NR	15SP	0	G14_073	'KRESS_RURAL3115.00 - N_PLAINVEW 3115.00 115KV CKT 1'	TO->FROM	1	172.9	101.0411	'COX INTERCHANGE - KISER 3115.00 115KV CKT 1'
00NR	15SP	0	G14_073	'COX INTERCHANGE - KISER 3115.00 115KV CKT 1'	TO->FROM	1	173	100.9827	'KRESS_RURAL3115.00 - N_PLAINVEW 3115.00 115KV CKT 1'
00NR	20SP	0	G14_073	'KISER 3115.00 - N_PLAINVEW 3115.00 115KV CKT 1'	TO->FROM	1	172.9	111.5096	'KRESS_RURAL3115.00 - N_PLAINVEW 3115.00 115KV CKT 1'
00NR	20SP	0	G14_073	'KRESS_RURAL3115.00 - N_PLAINVEW 3115.00 115KV CKT 1'	TO->FROM	1	173	111.4451	'KISER 3115.00 - N_PLAINVEW 3115.00 115KV CKT 1'
00NR	20SP	0	G14_073	'KISER 3115.00 - N_PLAINVEW 3115.00 115KV CKT 1'	TO->FROM	1	172.9	109.3117	'KRESS INTERCHANGE - KRESS_RURAL3115.00 115KV CKT 1'
00NR	20SP	0	G14_073	'KRESS INTERCHANGE - KRESS_RURAL3115.00 115KV CKT 1'	TO->FROM	1	173	109.2486	'KISER 3115.00 - N_PLAINVEW 3115.00 115KV CKT 1'
00NR	20WP	0	G14_073	'KISER 3115.00 - N_PLAINVEW 3115.00 115KV CKT 1'	TO->FROM	1	176.9	110.1752	'KRESS_RURAL3115.00 - N_PLAINVEW 3115.00 115KV CKT 1'
00NR	20WP	0	G14_073	'KRESS_RURAL3115.00 - N_PLAINVEW 3115.00 115KV CKT 1'	TO->FROM	1	176.9	110.1752	'KISER 3115.00 - N_PLAINVEW 3115.00 115KV CKT 1'
00NR	20WP	0	G14_073	'KISER 3115.00 - N_PLAINVEW 3115.00 115KV CKT 1'	TO->FROM	1	176.9	108.762	'KRESS INTERCHANGE - KRESS_RURAL3115.00 115KV CKT 1'
00NR	20WP	0	G14_073	'KRESS INTERCHANGE - KRESS_RURAL3115.00 115KV CKT 1'	TO->FROM	1	176.9	108.762	'KISER 3115.00 - N_PLAINVEW 3115.00 115KV CKT 1'
00NR	20WP	0	G14_073	'KRESS_RURAL3115.00 - N_PLAINVEW 3115.00 115KV CKT 1'	TO->FROM	1	176.9	102.3742	'COX INTERCHANGE - KISER 3115.00 115KV CKT 1'
00NR	20WP	0	G14_073	'COX INTERCHANGE - KISER 3115.00 115KV CKT 1'	TO->FROM	1	177	102.3164	'KRESS_RURAL3115.00 - N_PLAINVEW 3115.00 115KV CKT 1'
00NR	20WP	0	G14_073	'KRESS INTERCHANGE - KRESS_RURAL3115.00 115KV CKT 1'	TO->FROM	1	176.9	100.961	'COX INTERCHANGE - KISER 3115.00 115KV CKT 1'
00NR	20WP	0	G14_073	'COX INTERCHANGE - KISER 3115.00 115KV CKT 1'	TO->FROM	1	177	100.904	'KRESS INTERCHANGE - KRESS_RURAL3115.00 115KV CKT 1'
00NR	25SP	0	G14_073	'KISER 3115.00 - N_PLAINVEW 3115.00 115KV CKT 1'	TO->FROM	1	172.9	111.1625	'KRESS_RURAL3115.00 - N_PLAINVEW 3115.00 115KV CKT 1'
00NR	25SP	0	G14_073	'KRESS_RURAL3115.00 - N_PLAINVEW 3115.00 115KV CKT 1'	TO->FROM	1	173	111.0983	'KISER 3115.00 - N_PLAINVEW 3115.00 115KV CKT 1'
00NR	25SP	0	G14_073	'KISER 3115.00 - N_PLAINVEW 3115.00 115KV CKT 1'	TO->FROM	1	172.9	108.7334	'KRESS INTERCHANGE - KRESS_RURAL3115.00 115KV CKT 1'
00NR	25SP	0	G14_073	'KRESS INTERCHANGE - KRESS_RURAL3115.00 115KV CKT 1'	TO->FROM	1	173	108.6705	'KISER 3115.00 - N_PLAINVEW 3115.00 115KV CKT 1'
06NR	15G	0	G14_073	'KRESS_RURAL3115.00 - N_PLAINVEW 3115.00 115KV CKT 1'	TO->FROM	1	172.9	113.0133	'KISER 3115.00 - N_PLAINVEW 3115.00 115KV CKT 1'
06NR	15G	0	G14_073	'KISER 3115.00 - N_PLAINVEW 3115.00 115KV CKT 1'	TO->FROM	1	173	112.948	'KRESS_RURAL3115.00 - N_PLAINVEW 3115.00 115KV CKT 1'
06NR	15G	0	G14_073	'KRESS INTERCHANGE - KRESS_RURAL3115.00 115KV CKT 1'	TO->FROM	1	172.9	111.7409	'KISER 3115.00 - N_PLAINVEW 3115.00 115KV CKT 1'
06NR	15G	0	G14_073	'KISER 3115.00 - N_PLAINVEW 3115.00 115KV CKT 1'	TO->FROM	1	173	111.6763	'KRESS INTERCHANGE - KRESS_RURAL3115.00 115KV CKT 1'
06NR	15G	0	G14_073	'COX INTERCHANGE - HALE CO INTERCHANGE 115KV CKT 1'	FROM->TO	0.5745	96	110.9375	'KRESS_RURAL3115.00 - N_PLAINVEW 3115.00 115KV CKT 1'
06NR	15G	0	G14_073	'COX INTERCHANGE - HALE CO INTERCHANGE 115KV CKT 1'	FROM->TO	0.5745	96	109.4792	'KRESS INTERCHANGE - KRESS_RURAL3115.00 115KV CKT 1'
06NR	15G	0	G14_073	'KRESS_RURAL3115.00 - N_PLAINVEW 3115.00 115KV CKT 1'	TO->FROM	1	172.9	105.4367	'COX INTERCHANGE - KISER 3115.00 115KV CKT 1'
06NR	15G	0	G14_073	'COX INTERCHANGE - KISER 3115.00 115KV CKT 1'	TO->FROM	1	173	105.3757	'KRESS_RURAL3115.00 - N_PLAINVEW 3115.00 115KV CKT 1'
06NR	15G	0	G14_073	'KRESS INTERCHANGE - KRESS_RURAL3115.00 115KV CKT 1'	TO->FROM	1	172.9	104.1064	'COX INTERCHANGE - KISER 3115.00 115KV CKT 1'
06NR	15G	0	G14_073	'COX INTERCHANGE - KISER 3115.00 115KV CKT 1'	TO->FROM	1	173	104.0462	'KRESS INTERCHANGE - KRESS_RURAL3115.00 115KV CKT 1'



## **I: FCITC Analysis Constraints Not Requiring Reinforcement**

Group	Season	Scenario	Source	Monitored Element	Direction	TDF	Rating (MVA)	Contingency	
								Loading %	Contingency
03ALL	15G	0	G14_072	'HAYS PLANT - SOUTH HAYS 115KV CKT 1'	TO->FROM	0.0553	98.9	173.0863	'KNOLL 230 - POSTROCK6 230.00 230KV CKT 1
03ALL	15G	0	G14_072	'HAYS PLANT - VINE STREET 115KV CKT 1'	FROM->TO	0.0553	88	170.6618	'KNOLL 230 - POSTROCK6 230.00 230KV CKT 1
03ALL	15G	0	G14_072	'MULLERGREN - SPEARVILLE 230KV CKT 1'	TO->FROM	0.13525	394.5	130.4345	'G13-010T 345.00 - POST ROCK 345KV CKT 1
03ALL	15G	0	G14_072	'KNOLL - N HAYS3 115.00 115KV CKT 1	TO->FROM	0.0553	87.6	154.2037	'KNOLL 230 - POSTROCK6 230.00 230KV CKT 1
03ALL	15G	0	G14_072	'N HAYS3 115.00 - VINE STREET 115KV CKT 1	TO->FROM	0.0553	98.8	142.8972	'KNOLL 230 - POSTROCK6 230.00 230KV CKT 1
03ALL	15G	0	G14_072	'MULLERGREN - SPEARVILLE 230KV CKT 1'	TO->FROM	0.13525	394.5	124.1734	'G13-010T 345.00 - G14_72T 345.00 345KV CKT 1
03ALL	15G	0	G14_072	'SOUTH HAYS (S HAYS T1) 230/115/12.47KV TRANSFORMER CKT 1	FROM->TO	0.0553	166.6	106.8922	'KNOLL 230 - POSTROCK6 230.00 230KV CKT 1
03ALL	15G	0	G14_072	'SOUTH HAYS (S HAYS T1) 230/115/12.47KV TRANSFORMER CKT 1	FROM->TO	0.0553	166.6	106.8322	'KNOLL 230 - POSTROCK6 230.00 230KV CKT 1
03ALL	15G	0	G14_072	'MULLERGREN - SPEARVILLE 230KV CKT 1'	TO->FROM	0.09183	394.5	104.3417	'POST ROCK (POSTROCK T1) 345/230/13.8KV TRANSFORMER CKT 1
03ALL	15G	0	G14_072	'SMOKYHL6 230.00 - SUMMIT 230KV CKT 1'	FROM->TO	0.12498	355	100.9911	'AXTELL - POST ROCK 345KV CKT 1'
03ALL	15SP	0	G14_072	'HAYS PLANT - VINE STREET 115KV CKT 1'	FROM->TO	0.05559	87.2	172.9762	'KNOLL 230 - POSTROCK6 230.00 230KV CKT 1
03ALL	15SP	0	G14_072	'MULLERGREN - SPEARVILLE 230KV CKT 1'	TO->FROM	0.13675	394.4	138.9193	'G13-010T 345.00 - POST ROCK 345KV CKT 1
03ALL	15SP	0	G14_072	'MULLERGREN - SPEARVILLE 230KV CKT 1'	TO->FROM	0.13675	394.4	132.7327	'G13-010T 345.00 - G14_72T 345.00 345KV CKT 1
03ALL	15SP	0	G14_072	'KNOLL - N HAYS3 115.00 115KV CKT 1	TO->FROM	0.05559	88	145.7218	'KNOLL 230 - POSTROCK6 230.00 230KV CKT 1
03ALL	15SP	0	G14_072	'N HAYS3 115.00 - VINE STREET 115KV CKT 1	TO->FROM	0.05559	98.8	139.1044	'KNOLL 230 - POSTROCK6 230.00 230KV CKT 1
03ALL	15SP	0	G14_072	'MULLERGREN - SPEARVILLE 230KV CKT 1'	TO->FROM	0.09213	394.4	112.0623	'POST ROCK (POSTROCK T1) 345/230/13.8KV TRANSFORMER CKT 1
03ALL	15SP	0	G14_072	'SOUTH HAYS (S HAYS T1) 230/115/12.47KV TRANSFORMER CKT 1	FROM->TO	0.05559	166.1	115.0724	'KNOLL 230 - POSTROCK6 230.00 230KV CKT 1
03ALL	15SP	0	G14_072	'SOUTH HAYS (S HAYS T1) 230/115/12.47KV TRANSFORMER CKT 1	FROM->TO	0.05559	166.2	115.0031	'KNOLL 230 - POSTROCK6 230.00 230KV CKT 1
03ALL	20SP	0	G14_072	'MULLERGREN - SPEARVILLE 230KV CKT 1'	TO->FROM	0.13672	394.5	136.1434	'G13-010T 345.00 - POST ROCK 345KV CKT 1
03ALL	20SP	0	G14_072	'HAYS PLANT - VINE STREET 115KV CKT 1'	FROM->TO	0.05531	98.6	150.5761	'KNOLL 230 - POSTROCK6 230.00 230KV CKT 1
03ALL	20SP	0	G14_072	'MULLERGREN - SPEARVILLE 230KV CKT 1'	TO->FROM	0.13672	394.5	129.933	'G13-010T 345.00 - G14_72T 345.00 345KV CKT 1
03ALL	20SP	0	G14_072	'KNOLL - N HAYS3 115.00 115KV CKT 1	TO->FROM	0.05531	88	141.6682	'KNOLL 230 - POSTROCK6 230.00 230KV CKT 1
03ALL	20SP	0	G14_072	'N HAYS3 115.00 - VINE STREET 115KV CKT 1	TO->FROM	0.05531	98.9	135.7614	'KNOLL 230 - POSTROCK6 230.00 230KV CKT 1
03ALL	20SP	0	G14_072	'SOUTH HAYS (S HAYS T1) 230/115/12.47KV TRANSFORMER CKT 1	FROM->TO	0.05531	166.2	114.7822	'KNOLL 230 - POSTROCK6 230.00 230KV CKT 1
03ALL	20SP	0	G14_072	'SOUTH HAYS (S HAYS T1) 230/115/12.47KV TRANSFORMER CKT 1	FROM->TO	0.05531	166.3	114.653	'KNOLL 230 - POSTROCK6 230.00 230KV CKT 1
03ALL	20SP	0	G14_072	'MULLERGREN - SPEARVILLE 230KV CKT 1'	TO->FROM	0.09158	394.5	109.3153	'POST ROCK (POSTROCK T1) 345/230/13.8KV TRANSFORMER CKT 1
03ALL	20WP	0	G14_072	'MULLERGREN - SPEARVILLE 230KV CKT 1'	TO->FROM	0.1368	392.4	135.2459	'G13-010T 345.00 - POST ROCK 345KV CKT 1
03ALL	20WP	0	G14_072	'HAYS PLANT - VINE STREET 115KV CKT 1'	FROM->TO	0.05514	99	154.4719	'KNOLL 230 - POSTROCK6 230.00 230KV CKT 1
03ALL	20WP	0	G14_072	'KNOLL - N HAYS3 115.00 115KV CKT 1	TO->FROM	0.05514	87.7	155.2192	'KNOLL 230 - POSTROCK6 230.00 230KV CKT 1
03ALL	20WP	0	G14_072	'MULLERGREN - SPEARVILLE 230KV CKT 1'	TO->FROM	0.1368	392.4	129.0022	'G13-010T 345.00 - G14_72T 345.00 345KV CKT 1
03ALL	20WP	0	G14_072	'N HAYS3 115.00 - VINE STREET 115KV CKT 1	TO->FROM	0.05514	98.9	144.5169	'KNOLL 230 - POSTROCK6 230.00 230KV CKT 1
03ALL	20WP	0	G14_072	'SOUTH HAYS (S HAYS T1) 230/115/12.47KV TRANSFORMER CKT 1	FROM->TO	0.05514	166.7	110.2743	'KNOLL 230 - POSTROCK6 230.00 230KV CKT 1
03ALL	20WP	0	G14_072	'SOUTH HAYS (S HAYS T1) 230/115/12.47KV TRANSFORMER CKT 1	FROM->TO	0.05514	166.7	110.2143	'KNOLL 230 - POSTROCK6 230.00 230KV CKT 1
03ALL	20WP	0	G14_072	'MULLERGREN - SPEARVILLE 230KV CKT 1'	TO->FROM	0.09124	392.4	106.3876	'POST ROCK (POSTROCK T1) 345/230/13.8KV TRANSFORMER CKT 1
03ALL	25SP	0	G14_072	'HAYS PLANT - VINE STREET 115KV CKT 1'	FROM->TO	0.05548	98.9	147.3294	'KNOLL 230 - POSTROCK6 230.00 230KV CKT 1
03ALL	25SP	0	G14_072	'MULLERGREN - SPEARVILLE 230KV CKT 1'	TO->FROM	0.13755	395	127.7683	'G13-010T 345.00 - POST ROCK 345KV CKT 1
03ALL	25SP	0	G14_072	'MULLERGREN - SPEARVILLE 230KV CKT 1'	TO->FROM	0.13755	395	121.5405	'G13-010T 345.00 - G14_72T 345.00 345KV CKT 1
03ALL	25SP	0	G14_072	'KNOLL - N HAYS3 115.00 115KV CKT 1	TO->FROM	0.05548	87.7	137.6383	'KNOLL 230 - POSTROCK6 230.00 230KV CKT 1
03ALL	25SP	0	G14_072	'N HAYS3 115.00 - VINE STREET 115KV CKT 1	TO->FROM	0.05548	99	132.1301	'KNOLL 230 - POSTROCK6 230.00 230KV CKT 1
03ALL	25SP	0	G14_072	'SOUTH HAYS (S HAYS T1) 230/115/12.47KV TRANSFORMER CKT 1	FROM->TO	0.05548	166.5	114.0594	'KNOLL 230 - POSTROCK6 230.00 230KV CKT 1
03ALL	25SP	0	G14_072	'SOUTH HAYS (S HAYS T1) 230/115/12.47KV TRANSFORMER CKT 1	FROM->TO	0.05548	166.6	113.9309	'KNOLL 230 - POSTROCK6 230.00 230KV CKT 1
03ALL	25SP	0	G14_072	'MULLERGREN - SPEARVILLE 230KV CKT 1'	TO->FROM	0.09219	395	103.5684	'POST ROCK (POSTROCK T1) 345/230/13.8KV TRANSFORMER CKT 1
06ALL	15G	0	G14_072	'HAYS PLANT - SOUTH HAYS 115KV CKT 1'	TO->FROM	0.05537	98.7	111.6879	'KNOLL 230 - POSTROCK6 230.00 230KV CKT 1
06ALL	15G	0	G14_073	'Harrington Station East Bus - POTTER COUNTY INTERCHANGE 230KV CKT 1	FROM->TO	0.03724	350.8	105.9291	'CHERRY1 - HARRINGTON STATION 230KV CKT 1'
06ALL	15G	0	G14_073	'ANADARKO - GRACMNT4 138.00 138KV CKT 1'	TO->FROM	0.04815	226.8	107.1055	'CIMARRON - MINCO 345KV CKT 1'
06ALL	15G	0	G14_073	'Harrington Station East Bus - POTTER COUNTY INTERCHANGE 230KV CKT 1	FROM->TO	0.0454	350.8	101.3145	'CHERRY1 - POTTER COUNTY INTERCHANGE 230KV CKT 1
06ALL	15G	0	G14_072	'HAYS PLANT - VINE STREET 115KV CKT 1'	FROM->TO	0.05537	87.8	101.5216	'KNOLL 230 - POSTROCK6 230.00 230KV CKT 1
06ALL	15G	0	G14_073	'ELK CITY 230KV (ELKCTY-6) 230/138/13.8KV TRANSFORMER CKT 1	FROM->TO	0.08366	449.3	100.0741	'CHISHOLM7 345.00 - GRACEMONT 345KV CKT 1'
06ALL	15G	0	G14_073	'ELK CITY 230KV (ELKCTY-6) 230/138/13.8KV TRANSFORMER CKT 1	FROM->TO	0.08366	450	100.0073	'CHISHOLM7 345.00 - GRACEMONT 345KV CKT 1'
06ALL	15SP	0	G14_073	'ELK CITY 230KV (ELKCTY-6) 230/138/13.8KV TRANSFORMER CKT 1	FROM->TO	0.08864	448.8	110.2403	'CHISHOLM7 345.00 - GRACEMONT 345KV CKT 1'
06ALL	15SP	0	G14_073	'ELK CITY 230KV (ELKCTY-6) 230/138/13.8KV TRANSFORMER CKT 1	FROM->TO	0.08864	450	110.0574	'CHISHOLM7 345.00 - GRACEMONT 345KV CKT 1'
06ALL	15SP	0	G14_073	'ELK CITY 230KV (ELKCTY-6) 230/138/13.8KV TRANSFORMER CKT 1	FROM->TO	0.08151	448.8	101.843	'SPP-AEPW-32'
06ALL	15SP	0	G14_073	'ELK CITY 230KV (ELKCTY-6) 230/138/13.8KV TRANSFORMER CKT 1	FROM->TO	0.08151	450	101.6825	'SPP-AEPW-32'
06ALL	15SP	0	G14_073	'ELK CITY 230KV (ELKCTY-6) 230/138/13.8KV TRANSFORMER CKT 1	FROM->TO	0.08151	448.8	100.974	'OKLAUNION - TUCO INTERCHANGE 345KV CKT 1'
06ALL	15SP	0	G14_073	'ELK CITY 230KV (ELKCTY-6) 230/138/13.8KV TRANSFORMER CKT 1	FROM->TO	0.08125	448.8	100.9399	'SPP-SWPS-01'
06ALL	15SP	0	G14_073	'ELK CITY 230KV (ELKCTY-6) 230/138/13.8KV TRANSFORMER CKT 1	FROM->TO	0.08151	450	100.8158	'OKLAUNION - TUCO INTERCHANGE 345KV CKT 1'
06ALL	15SP	0	G14_073	'ELK CITY 230KV (ELKCTY-6) 230/138/13.8KV TRANSFORMER CKT 1	FROM->TO	0.08125	450	100.7819	'SPP-SWPS-01'
06ALL	20WP	0	G14_073	'ELK CITY 230KV (ELKCTY-6) 230/138/13.8KV TRANSFORMER CKT 1	FROM->TO	0.09221	448.7	104.6622	'CHISHOLM7 345.00 - GRACEMONT 345KV CKT 1'
06ALL	20WP	0	G14_073	'ELK CITY 230KV (ELKCTY-6) 230/138/13.8KV TRANSFORMER CKT 1	FROM->TO	0.09221	450	104.4487	'CHISHOLM7 345.00 - GRACEMONT 345KV CKT 1'