

# Definitive Interconnection System Impact Re-Study for Generation Interconnection Requests

Southwest Power Pool  
Engineering Department  
Generation Interconnection

(DISIS-2009-001-3 Study)  
April 2011



SPP RESTRICTED

# Definitive Interconnection System Impact Study for Generation Interconnection Requests

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Engineering Department  
Tariff Studies – Generation Interconnection

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## Executive Summary

Pursuant to the Southwest Power Pool (SPP) Open Access Transmission Tariff (OATT), SPP has conducted this Definitive Interconnection System Impact Study (DISIS) for certain generation interconnection requests in the SPP Generation Interconnection Queue. These interconnection requests have been clustered together for the following Impact Study. This restudy is being conducted to account for the withdrawal of GEN-2007-011N06, GEN-2007-011N09, and GEN-2008-038. The customers will be referred to in this study as the DISIS-2009-001 Interconnection Customers. This Impact Study analyzes the interconnecting of multiple generation interconnection requests associated with new generation totaling 2,565 MW of new generation which would be located within the transmission systems of American Electric Power West (AEPW), Midwest Energy Inc. (MIDW), Missouri Public Service (MIPU), Mid-Kansas Electric Power LLC (MKEC), Nebraska Public Power District (NPPD), Oklahoma Gas and Electric (OKGE), Southwestern Public Service (SPS), Sunflower Electric Power Corporation (SUNC), Westar Energy (WERE). The various generation interconnection requests have differing proposed in-service dates<sup>1</sup>. The generation interconnection requests included in this DISIS are listed in Appendix A by their queue number, amount, area, requested interconnection point, proposed interconnection point, and the requested in-service date.

Power flow analysis has indicated that for the powerflow cases studied, 2,565 MW of nameplate generation may be interconnected with transmission system reinforcements within the SPP transmission system. Previously performed dynamic stability analysis and additional powerflow analysis for power factor requirements has determined the need for reactive. Previously performed dynamic stability analysis has determined that the transmission system will remain stable with the assigned Network Upgrades and Interconnection Facilities to the DISIS.

The need for reactive compensation in accordance with Order No. 661-A for wind farm interconnection requests and those requirements were determined in the previous Impact Study DISIS-2009-001.

The total estimated minimum cost for interconnecting the DISIS-2009-001 interconnection customers is \$101,919,000. These costs are shown in Appendix E and F. Interconnection Service to DISIS-2009-001 interconnection customers is also contingent upon higher queued customers paying for certain required network upgrades and other Base Case upgrades being placed in service. The in service date for the DISIS customers may be deferred until the construction of these network upgrades can be completed.

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

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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 completion of the Facility Study.

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

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## Introduction

Pursuant to the Southwest Power Pool (SPP) Open Access Transmission Tariff (OATT), SPP has conducted this Definitive Interconnection System Impact Study (DISIS) for certain generation interconnection requests in the SPP Generation Interconnection Queue. These interconnection requests have been clustered together for the following Impact Study. The customers will be referred to in this study as the DISIS-2009-001 Interconnection Customers. This Impact Study analyzes the interconnecting of multiple generation interconnection requests associated with new generation totaling 2,565 MW of new generation which would be located within the transmission systems of American Electric Power West (AEPW), Midwest Energy Inc. (MIDW), Missouri Public Service (MIPU), Mid-Kansas Electric Power LLC (MKEC), Nebraska Public Power District (NPPD), Oklahoma Gas and Electric (OKGE), Southwestern Public Service (SPS), Sunflower Electric Power Corporation (SUNC), Westar Energy (WERE). The various generation interconnection requests have differing proposed in-service dates<sup>2</sup>. The generation interconnection requests included in this Impact Cluster Study are listed in Appendix A by their queue number, amount, area, requested interconnection point, proposed interconnection point, and the requested in-service date.

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

## Model Development

### Interconnection Requests Included in the DISIS-2009-001-3 Study

SPP has included all interconnection requests that submitted a Definitive Interconnection System Impact Study request no later than September 30, 2009 and were subsequently accepted by Southwest Power Pool under the terms of the Large Generation Interconnection Procedures (LGIP) that became effective June 2, 2009.

In addition, SPP included GEN-2009-017 which is an interconnection into the Caprock system as an affected system. GEN-2009-017 was analyzed for its impacts upon the SPP Transmission System. The report for GEN-2009-017 will be posted separately.

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

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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 completion of the Facility Study.

## Previous Queued Projects

The previous queued projects included in this study are listed in Appendix B. In addition to the Base Case Upgrades, the previous queued projects and associated upgrades were assumed to be in-service and added to the Base Case models. These projects were dispatched as Energy Resources with equal distribution across the SPP footprint.

## Development of Base Cases

**Powerflow** - The 2010 series Transmission Service Request (TSR) Models 2011 spring and 2011 and 2016 summer and winter peak scenario 0 peak cases were used for this study. Each of the control areas' resources were then re-dispatched using current dispatch orders.

**Stability** – The stability analysis was not performed for this study.

## Base Case Upgrades

The following facilities are part of the SPP Transmission Expansion Plan or the Balanced Portfolio. These facilities have been approved or are in construction stages and were assumed to be in-service at the time of dispatch and added to the base case models. The DISIS-2009-001 Customers do not have potential cost for the below listed projects. However, the DISIS-2009-001 Customers Generation Facilities in service dates may need to be delayed until the completion of the following upgrades. If for some reason, construction on these projects is discontinued, additional restudies will be needed to determine the interconnection needs of the DISIS customers.

- Hitchland 345/230/115kV upgrades to be built by SPS for 2010/2011 in-service<sup>3</sup>.
  - Hitchland – Moore County 230kV line
  - Hitchland – Ochiltree 230kV line
  - Hitchland – Texas County 115kV line
  - Hitchland – Hansford County 115kV line
  - Hitchland – Sherman County Tap 115kV line
- Valliant – Hugo – Sunnyside 345kV – assigned to Aggregate Study AG3-2006 Customers for 2011 in-service
- Wichita – Reno County – Summit 345kV to be built by WERE for 2011 in-service<sup>4</sup>.
- Rose Hill – Sooner 345kV to be built by WERE/OKGE for 2010 in-service.
- Tuco – Woodward 345kV line approved by the SPP Board of Directors as part of the Balanced Portfolio and issued an NTC in June, 2009
- Spearville – Post Rock - Axtell 345kV line approved by the SPP Board of Directors as part of the Balanced Portfolio and issued an NTC in June, 2009
- Priority Projects<sup>5</sup>
  - Hitchland-Woodward double circuit 345kV transmission line
  - Spearville – Comanche double circuit 345kV transmission line
  - Medicine Lodge-Woodward double circuit 345kV transmission line
  - Comanche-Medicine Lodge double circuit 345kV transmission line

<sup>3</sup> Approved 230kV upgrades are based on SPP 2007 STEP. Upgrades may need to be re-evaluated in the system impact study.

<sup>4</sup> Approved based on an order of the Kansas Corporation Commission issued in Docket no. 07-WSEE-715-MIS

<sup>5</sup> Notice to Construct issued June, 2010

- Medicine Lodge – Wichita double circuit 345kV transmission line
- Medicine Lodge 345/138kV autotransformer

### Contingent Upgrades

The following facilities do not yet have approval. These facilities have been assigned to higher queued interconnection customers. These facilities have been included in the models for the DISIS-2009-001 study and are assumed to be in service. The DISIS-2009-001 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 LGIA or withdraw from the interconnection queue. The DISIS-2009-001 Customer Generation Facilities in service dates may need to be delayed until the completion of the following upgrades.

- Finney – Holcomb 345kV ckt #2 line assigned to GEN-2006-044 interconnection customer. This customer is currently in suspension<sup>6</sup>.
- Central Plains – Setab 115kV transmission line assigned to GEN-2007-013 interconnection customer.
- Grassland 230/115kV autotransformer #2 assigned to GEN-2008-016

### Potential Upgrades Not in the Base Case

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

### Regional Groupings

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

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

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

Peaking units were not dispatched in the 2011 spring model. To study peaking units' impacts, the 2016 summer and winter peak model was chosen and peaking units were modeled at 100% of the nameplate rating and wind generating facilities were modeled at 10% of the nameplate rating.

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<sup>6</sup> Based on Facility Study Posting November 2008



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

## Identification of Network Constraints

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

## Determination of Cost Allocated Network Upgrades

Cost Allocated Network Upgrades of wind generation interconnection requests were determined using the 2011 spring model. Cost Allocated Network Upgrades of peaking units was determined using the 2016 summer peak model. Once a determination of the required Network Upgrades was made, a powerflow model of the 2011 spring case was developed with all cost allocated Network Upgrades in-service. A MUST FCITC analysis was performed to determine the Power Transfer Distribution Factors (PTDF), defined as a distribution factor with system impact conditions that each generation interconnection request had on each new upgrade. The impact each generation interconnection request had on each upgrade project was weighted by the size of each request. Finally the costs due by each request for a particular project were then determined by allocating the portion of each request's impact over the impact of all affecting requests.

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

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

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

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

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

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

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

- Repeat previous for each responsible GI request for each Project

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

### **Credits for Amounts Advanced for Network Upgrades**

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

## **Interconnection Facilities**

The requirement to interconnect the 2,565MW of generation into the existing and proposed transmission systems in the affected areas of the SPP transmission footprint consist of the necessary cost allocated shared facilities listed in Appendix F by upgrade. These network upgrades total \$101,919,000. Interconnection Facilities specific to each generation interconnection request are listed in Appendix E.

Network Constraints in the AEPW, MIDW, MIPU, MKEC, NPPD, OKGE, SPS, SUNC, AND WERE transmission systems that were identified are shown in Appendix G. With a defined source and sink in a TSR, this list of Network Constraints will be refined and expanded to account for all Network Upgrade requirements.

A preliminary one-line drawing for each generation interconnection request are listed in Appendix D. Figure 1 depicts the major transmission line Network Upgrades needed to support the interconnection of the generation amounts requested in this study.

## **Powerflow**

### **Powerflow Analysis Methodology**

The Southwest Power Pool (SPP) Criteria states that:

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

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

## **Powerflow Analysis**

A powerflow analysis was conducted for each Interconnection Customer’s facility using modified versions of the 2011 spring peak and the 2016 summer and winter peak models. The output of the Interconnection Customer’s facility was offset in each model by a reduction in output of existing online SPP generation. This method allows the request to be studied as an Energy Resource (ER) Interconnection Request. The available seasonal models used were through the 2016 Summer Peak.

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

### **Cluster Group 1 (Woodward Area)**

The Woodward area contained approximately 250.5 MW of new interconnection requests in addition to the 2,802 MW of prior queued interconnection requests. No new constraints were found in this area.

### **Cluster Group 2 (Hitchland Area)**

The Hitchland area contained 0 MW of interconnection request in addition to the 2,132 MW of previous queued generation interconnection requests. No new constraints were found in this area.

### **Cluster Group 3 (Spearville Area)**

The Spearville area contained 500.6 MW of interconnection requests and 1,832 MW of previous queued interconnection requests. Constraints were observed in the Judson Large area. To mitigate these issues, a second 115kV circuit from Judson Large – North Judson Large – Spearville was added. In addition, a Spearville 345/115kV autotransformer was added.

### **Cluster Group 4 (Mingo/NW Kansas Group)**

The Mingo/NW Kansas group had 101.2 MW in addition to the 823 MW of previously queued generation in the area. No new constraints were found in this area.

### **Cluster Group 5 (Amarillo Area)**

The Amarillo group had 322 MW of interconnection requests in addition to the 1,760 MW of previously queued interconnection requests in this area. No new constraints were found in this area. However, the interconnection requests in service dates in this group will be dependent upon the upgrades

assigned to higher queued interconnection requests including the completion of the Hitchland-Woodward 345kV line and Balanced Portfolio project Tuco-Woodward 345kV.

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

The Group 6 study which includes GEN-2009-017 is posted separately

#### **Cluster Group 7 (Southwestern Oklahoma)**

This group had 290 MW of interconnection requests in addition to the 1,399 MW of previous queued generation in the area. No new constraints were found in this area.

#### **Cluster Group 8 (South Central Kansas/North Oklahoma)**

This group had 302 MW of interconnection requests in addition to the 1,351 MW of previous queued generation in the area. No new constraints were found in this area.

#### **Cluster Group 9 (Northeast Nebraska)**

This group had 241 MW of interconnection requests in addition to the 207 MW of previous queued generation in the area. Constraints in the area were overloads on the Albion – Petersburg 115kV line and Petersburg – Neligh 115kV line. To mitigate these constraints, the Petersburg-Albion and Petersburg – Neligh lines will need to have line structures raised to accommodate a higher line rating. The Fort Randall – Kelley 230kV line was found to have a lower rating in the Facility Study of 192MVA. This requires the raising of structures to accommodate GEN-2008-086N2.

#### **Cluster Group 10 (North Nebraska)**

This group had 75 MW of interconnection requests in addition to the 209 MW of previous queued generation in the area. No constraints were found.

#### **Cluster Group 11 (North Kansas)**

This group had 251 MW of interconnection requests in addition to the 725 MW of previous queued generation in the area. The major constraints for the North Kansas area included several 115kV lines in the area due to too much generation requested on the 115kV system at Knoll. As a result of the constraints, the proposed point of interconnection for GEN-2008-092 was moved to Knoll 230kV.

#### **Cluster Group 13 (Kansas City Kansas)**

This group had 80 MW of interconnection requests in addition to the 1,806 MW of previous queued generation in the area. The only constraint was a line trap on the Kansas City South – Longview 161kV line.

## **Stability Analysis**

The stability analysis was not performed again for this study. The power factor analysis from the original impact study was not performed again.

## Conclusion

The minimum cost of interconnecting all of the interconnection requests included in this Impact Cluster Study is estimated at \$101,919,000 for the Allocated Network Upgrades and Transmission Owner Interconnection Facilities are listed in Appendix E and F.

These interconnection costs do not include any cost of Network Upgrades determined to be required by short circuit analysis. These studies are being performed as part of the Interconnection System Facility Study that each customer has already executed.

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

# Appendix

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

Request	Amount	Area	Requested Point of Interconnection	Proposed Point of Interconnection	Requested In-Service Date
GEN-2006-037N1	75	NPPD	BROKEN BOW 115kV	BROKEN BOW 115kV	1/1/2010
GEN-2006-044N	40.5	NPPD	TAP NELIGH-PETERSBURG 115kV	TAP NELIGH-PETERSBURG 115kV	1/1/2010
GEN-2007-040	200	SUNC	Tap Holcomb – Spearville 345kV	Tap Holcomb – Spearville 345kV	12/15/2010
GEN-2008-021	42	WERE	WOLF CREEK 345kV	WOLF CREEK 345kV	5/16/2011
GEN-2008-023	150	AEPW	HOBART JUNCTION 138kV	HOBART JUNCTION 138kV	12/31/2012
GEN-2008-025	101.2	SUNC	RULETON 115kV	RULETON 115kV	11/1/2009
GEN-2008-029	250.5	OKGE	WOODWARD EHV 138kV	WOODWARD EHV 138kV	1/1/2010
GEN-2008-051	322	SPS	POTTER 345kV	POTTER 345kV	12/31/2010
GEN-2008-079	100.5	MKEC	TAP JUDSON LARGE-CUDAHY 115kV	TAP JUDSON LARGE-CUDAHY 115kV	12/1/2010
GEN-2008-086N02	200	NPPD	TAP FT RANDALL-COLUMBUS 230kV	TAP FT RANDALL-COLUMBUS 230kV	
GEN-2008-092	201	MIDW	KNOLL 115kV	KNOLL 230kV	12/1/2011
GEN-2008-124	200.1	SUNC	SPEARVILLE 230kV	SPEARVILLE 345kV	11/30/2011
GEN-2008-127	200.1	WERE	TAP SOONER-ROSE HILL 345kV	TAP SOONER-ROSE HILL 345kV	10/31/2011
GEN-2008-129	80	MIPU	PLEASANT HILL 161kV	PLEASANT HILL 161kV	5/1/2009
GEN-2009-011	50	SUNC	TAP PLAINVILLE-PHILLIPSBURG 115kV	TAP PLAINVILLE-PHILLIPSBURG 115kV	7/31/2011
GEN-2009-016	140	MKEC	FALCON ROAD 138kV	FALCON ROAD 138kV	12/1/2011
GEN-2009-017**	151.8	SPS	TAP PEMBROOK-STILES 138kV	TAP PEMBROOK-STILES 138kV	6/1/2011
GEN-2009-025	60	OKGE	KAYCOOP 69kV	TAP Deer Creek – Sinclair 69kV	12/31/2011
<b>GROUPED TOTAL</b>	<b>2564.7</b>				

\*\* Interconnection on Caprock Electric tested for impacts on SPP

\* Planned Facility

^ Proposed Facility

\*\*\* Electrically Remote Interconnection Requests

## **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>
GEN-2001-014	96	WFEC	Fort Supply 138kV	On-Line
GEN-2001-026	74	WFEC	Washita 138kV	On-Line
GEN-2001-033	180	SPS	San Juan Mesa Tap 230kV	On-Line at 120MW
GEN-2001-036	80	SPS	Caprock Tap 115kV	On-Line
GEN-2001-037	100	OKGE	Windfarm Switching 138kV	On-Line
GEN-2001-039A	105	MKEC	Greensburg - Judson-Large 115kV	On Schedule for 2011
GEN-2001-039M	100	SUNC	Leoti – City Services 115kV	On-Line
GEN-2002-004	200	WERE	Latham 345kV	On-Line at 150MW
GEN-2002-005	120	WFEC	Morewood - Elk City 138kV	On-Line
GEN-2002-008	240	SPS	*Hitchland 345kV	On-Line at 120MW
GEN-2002-009	80	SPS	Hansford County 115kV	On-Line
GEN-2002-022	240	SPS	Bushland 230kV	On-Line at 160MW
GEN-2002-025A	150	MKEC	Spearville 230kV	On-Line at 100MW
GEN-2003-005	100	WFEC	Anadarko - Paradise 138kV	On Line
GEN-2003-006A	200	MKEC	Elm Creek 230kV	On-Line
GEN-2003-013	198	SPS	*Hitchland - Finney 345kV	On Schedule for 2012
GEN-2003-019	250	MIDW	Smoky Hills Tap 230kV	On-Line
GEN-2003-020	160	SPS	Martin 115kV	On-Line at 80MW
GEN-2003-021N	75	NPPD	Ainsworth Wind Tap	On-Line
GEN-2003-022	120	AEPW	Washita 138kV	On-Line
GEN-2004-005N	30	NPPD	St. Francis 115kV	IA Pending
GEN-2004-014	155	MKEC	Spearville 230kV	On Schedule for 2011
GEN-2004-020	27	AEPW	Washita 138kV	On-Line
GEN-2005-005	18	OKGE	Windfarm Tap 138kV	IA Pending
GEN-2005-008	120	OKGE	Woodward 138kV	On-Line
GEN-2005-012	250	SUNC	Spearville 345kV	On Suspension
GEN-2005-013	201	WERE	Tap Latham - Neosho	On Schedule for 2011
GEN-2005-017	340	SPS	*Hitchland - Potter County 345kV	On Suspension
GEN-2006-002	101	AEPW	Grapevine - Elk City 230kV	On-Line
GEN-2006-006	206	MKEC	Spearville 230kV	Under Study (ICS-2008-001)
GEN-2006-014	300	MIPU	Tap Maryville – Clarinda 161kV	On Suspension
GEN-2006-017	300	MIPU	Tap Maryville – Clarinda 161kV	On Suspension
GEN-2006-020	18.9	SPS	DWS Frisco Tap	IA Executed/On Schedule 12/31/2011
GEN-2006-020N	42	NPPD	Bloomfield 115kV	1/1/2009
GEN-2006-021	101	WPEK	Flat Ridge Tap 138kV	On-Line
GEN-2006-022	150	WPEK	Ninnescah Tap 115kV	On Suspension
GEN-2006-024	20	WFEC	South Buffalo Tap 69kV	On-Line
GEN-2006-031	75	MIDW	Knoll 115kV	On-Line
GEN-2006-032	200	MIDW	South Hays 230kV	On Suspension
GEN-2006-034	81	SUNC	Kanarado - Sharon Springs 115kV	On Suspension
GEN-2006-035	225	AEPW	Grapevine - Elk City 230kV	IA Executed/On Schedule
GEN-2006-038N005	80	NPPD	Broken Bow 115kV	IA Executed/On Schedule
GEN-2006-038N019	80	NPPD	Petersburg 115kV	On Line
GEN-2006-039	400	SPS	Tap and Tie both Potter County - Plant X 230kV and Bushland - Deaf Smith 230kV	On Suspension

B-1



Appendix B: Prior Queued Interconnection Requests



Request	Amount	Area	Requested/Proposed Point of Interconnection	Status or In-Service Date
GEN-2006-040	108	SUNC	Mingo 115kV	IA Executed/On Schedule
GEN-2006-043	99	AEPW	Grapevine - Elk City 230kV	On-Line
GEN-2006-044	370	SPS	*Hitchland 345kV	On Schedule
GEN-2006-045	240	SPS	Tap and Tie both Potter County - Plant X 230kV and Bushland - Deaf Smith 230kV	On Suspension
GEN-2006-046	131	OKGE	Dewey 138kV	On Schedule for 2011
GEN-2006-047	240	SPS	Tap and Tie both Potter County - Plant X 230kV and Bushland - Deaf Smith 230kV	On Schedule for 2013
GEN-2006-049	400	SPS	*Hitchland - Finney 345kV	On schedule for 2014
GEN-2007-002	160	SPS	Grapevine 115kV	On Suspension
GEN-2007-006	160	OKGE	Roman Nose 138kV	On Suspension
GEN-2007-011	135	SUNC	Syracuse 115kV	On Schedule
GEN-2007-011N08	81	NPPD	Bloomfield 115kV	On-Line
GEN-2007-013	99	SUNC	Selkirk 115kV	On Suspension
GEN-2007-015	135	WERE	Tap Humboldt – Kelly 161kV	On Suspension
GEN-2007-017	101	MIPU	Tap Maryville – Clarinda 161kV	On Suspension
GEN-2007-021	201	OKGE	*Tatonga 345kV	IA Executed/On Schedule
GEN-2007-025	300	WERE	Tap Woodring – Wichita 345kV	On Suspension
GEN-2007-032	150	WFEC	Tap Clinton Junction – Clinton 138kV	IA Pending
GEN-2007-038	200	SUNC	Spearville 345kV	IA Executed/On Schedule
GEN-2007-043	200	AEPW	Tap Lawton Eastside – Cimarron 345kV	On Line
GEN-2007-044	300	OKGE	*Tatonga 345kV	IA Executed/On Schedule
GEN-2007-046	200	SPS	*Hitchland 115kV	IA Executed/On Schedule
GEN-2007-048	400	SPS	Tap Amarillo South – Swisher 230kV	IA Executed/On Schedule
GEN-2007-050	170	OKGE	*Woodward 138kV	On Line
GEN-2007-051	200	WFEC	Mooreland 138kV	IA Executed/On Schedule
GEN-2007-052	150	WFEC	Anadarko 138kV	On Line
GEN-2007-053	110	MIPU	Tap Maryville – Clarinda 161kV	On Schedule for 2013
GEN-2007-057	35	SPS	Moore County East 115kV	IA Executed/On Schedule
GEN-2007-062**	765	OKGE	*Woodward 345kV	IA Pending
GEN-2008-003	101	OKGE	*Woodward EHV 138kV	On Line
GEN-2008-008	60	SPS	Graham 115kV	IA Executed/On Schedule
GEN-2008-009	60	SPS	San Juan Mesa Tap 230kV	IA Executed/On Schedule
GEN-2008-013	300	OKGE	Tap Woodring – Wichita 345kV	On Schedule for 2013
GEN-2008-014	150	SPS	Tap Tuco – Oklaunion 345kV	IA Executed/On Schedule
GEN-2008-016	248	SPS	Grassland 230kV	IA Pending
GEN-2008-017	300	SUNC	Setab 345kV	IA Executed/On Schedule
GEN-2008-018	405	SUNC	Finney 345kV	IA Pending
GEN-2008-019**	300	OKGE	*Tatonga 345kV	IA Executed/On Schedule
GEN-2008-1190	60	OPPD	Tap Humboldt – Kelly 161kV	On-Line
Broken Bow	8.3	NPPD	Broken Bow 115kV	On-Line
Ord	13.9	NPPD	Ord 115kV	On-Line
Stuart	2.1	NPPD	Stuart 115kV	On-Line
Genoa	4	NPPD	Genoa 115kV	On-Line
AECI-1	400	AECI	Tap Cooper – Fairport 345kV	Under Study by AECI
AECI-3	201	AECI	Osborn 161kV	Under Study by AECI
AECI-4	150	AECI	Tap Fairfax – Fairfax Tap 138kV	Under Study by AECI
AECI-5	100	AECI	Maryville 161kV	Under Study by AECI
AECI-6	200	AECI	Tap Fairfax – Fairfax Tap 138kV	Under Study by AECI
Llano Estacado	80	SPS	Llano Wind Farm Tap 115kV	On-Line

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Appendix B: Prior Queued Interconnection Requests



Request	Amount	Area	Requested/Proposed Point of Interconnection	Status or In-Service Date
Distribution Wind	90	SPS	DUMAS_19ST 115kV	On-Line
			Etter 115kV	On-Line
			Sherman 115kV	On-Line
			Spearman 115kV	On-Line
			Texas County 115kV	On-Line
Blue Canyon II	153	WFEC	Washita 138kV (GEN-2003-004)	On-Line
			Washita 138kV (GEN-2004-023)	On-Line
			Washita 138kV (GEN-2005-003)	On-Line
Montezuma	110	MKEC	Haggard 115kV	On-Line
<b>GROUPED TOTAL</b>	<b>15,725.2</b>			

\* Planned Facility

## C: Study Groupings

Cluster	Request	Amount	Area	Proposed Point of Interconnection
Prior Queued	GEN-2001-014	96	WFEC	Fort Supply 138kV
	GEN-2001-037	100	OKGE	Windfarm Switching 138kV
	GEN-2002-005	120	WFEC	Tap Morewood - Elk City 138kV
	GEN-2005-005	18	OKGE	Windfarm Tap 138kV
	GEN-2005-008	120	OKGE	Woodward 138kV
	GEN-2006-024	20	WFEC	South Buffalo Tap 69kV
	GEN-2006-046	131	OKGE	Dewey 138kV
	GEN-2007-006	160	OKGE	Roman Nose 138kV
	GEN-2007-021	201	OKGE	*Tatonga 345kV
	GEN-2007-044	300	OKGE	*Tatonga 345kV
	GEN-2007-050	170	OKGE	*Woodward 138kV
	GEN-2007-051	200	WFEC	Mooreland 138kV
	GEN-2007-062	765	OKGE	*Woodward 345kV
	GEN-2008-003	101	OKGE	*Woodward EHV 138kV
	GEN-2008-019	300	OKGE	*Tatonga 345kV
<b>PRIOR QUEUED SUBTOTAL</b>		<b>2,802</b>		
Cluster	Request	Amount	Area	Proposed Point of Interconnection
Woodward	GEN-2008-029	250.5	OKGE	WOODWARD EHV 138kV
<b>WOODWARD SUBTOTAL</b>		<b>250.5</b>		
<b>AREA SUBTOTAL</b>		<b>3,052.5</b>		

Cluster	Request	Amount	Area	Proposed Point of Interconnection
Prior Queued	SPS Distribution	90	SPS	Various
	GEN-2002-008	240	SPS	*Hitchland 345kV
	GEN-2002-009	80	SPS	Hansford County 115kV
	GEN-2003-013	198	SPS	*Tap Hitchland - Finney 345kV
	GEN-2003-020	160	SPS	Martin 115kV
	GEN-2005-017	340	SPS	*Tap Hitchland - Potter County 345kV
	GEN-2006-020	18.9	SPS	DWS Frisco Tap
	GEN-2006-044	370	SPS	*Hitchland 345kV
	GEN-2006-049	400	SPS	*Tap Hitchland - Finney 345kV
	GEN-2007-046	200	SPS	*Hitchland 115kV
	GEN-2007-057	35	SPS	Moore County East 115kV
<b>PRIOR QUEUED SUBTOTAL</b>		<b>2,131.9</b>		
<b>AREA SUBTOTAL</b>		<b>2,131.9</b>		

Cluster	Request	Amount	Area	Proposed Point of Interconnection
Prior Queued	Montezuma	110	MKEC	Haggard 115kV
	GEN-2001-039A	105	WPEK	Tap Greensburg - Judson-Large 115kV
	GEN-2002-025A	150	WPEK	Spearville 230kV
	GEN-2004-014	155	MIDW	Spearville 230kV
	GEN-2005-012	250	WPEK	Spearville 345kV
	GEN-2006-006	206	MKEC	Spearville 230kV
	GEN-2006-021	101	WPEK	Flat Ridge Tap 138kV
	GEN-2006-022	150	WPEK	Ninnescah Tap 115kV
	GEN-2007-038	200	SUNC	Spearville 345kV
GEN-2008-018	405	SUNC	Finney 345kV	
<b>PRIOR QUEUED SUBTOTAL</b>		<b>1,832</b>		
Cluster	Request	Amount	Area	Proposed Point of Interconnection
Spearville	GEN-2007-040	200	SUNC	Tap Holcomb – Spearville 345kV
	GEN-2008-079	100.5	MKEC	Tap Judson Large – Cudahy 115kV
	GEN-2008-124	200.1	SUNC	Spearville 230kV
<b>SPEARVILLE SUBTOTAL</b>		<b>500.6</b>		
<b>AREA SUBTOTAL</b>		<b>2,332.6</b>		

Cluster	Request	Amount	Area	Proposed Point of Interconnection
Prior Queued	GEN-2001-039M	100	SUNC	Tap Leoti - City Services 115kV
	GEN-2006-034	81	SUNC	Tap Kanarado - Sharon Springs 115kV
	GEN-2006-040	108	SUNC	Mingo 115kV
	GEN-2007-011	135	SUNC	Syracuse 115kV
	GEN-2007-013	99	SUNC	Selkirk 115kV
	GEN-2008-017	300	SUNC	Setab 345kV
<b>PRIOR QUEUED SUBTOTAL</b>		<b>823</b>		
Cluster	Request	Amount	Area	Proposed Point of Interconnection
Mingo	GEN-2008-025	101.2	SUNC	Ruleton 115kV
<b>MINGO/NW KANSAS SUBTOTAL</b>		<b>101.2</b>		
<b>AREA SUBTOTAL</b>		<b>924.2</b>		

Cluster	Request	Amount	Area	Proposed Point of Interconnection
Prior Queued	Llano Estacado	80	SPS	Llano Estacado Tap 115kV
	GEN-2002-022	240	SPS	Bushland 230kV
	GEN-2006-039	400	SPS	Tap and Tie both Potter County - Plant X 230kV and Bushland - Deaf Smith 230kV
	GEN-2006-045	240	SPS	Tap and Tie both Potter County - Plant X 230kV and Bushland - Deaf Smith 230kV
	GEN-2006-047	240	SPS	Tap and Tie both Potter County - Plant X 230kV and Bushland - Deaf Smith 230kV
	GEN-2007-002	160	SPS	Grapevine 115kV
	GEN-2007-048	400	SPS	Tap Amarillo South – Swisher 230kV
<b>PRIOR QUEUED SUBTOTAL</b>		<b>1,760</b>		
Cluster	Request	Amount	Area	Proposed Point of Interconnection
Amarillo	GEN-2008-051	322	SPS	Potter 345kV
<b>AMARILLO SUBTOTAL</b>		<b>322</b>		
<b>AREA SUBTOTAL</b>		<b>2,082</b>		

Cluster	Request	Amount	Area	Proposed Point of Interconnection
Prior Queued	GEN-2001-033	180	SPS	San Juan Mesa Tap 230kV
	GEN-2001-036	80	SPS	Norton 115kV
	GEN-2008-008	60	SPS	Graham 115kV
	GEN-2008-009	60	SPS	San Juan Mesa Tap 230kV
	GEN-2008-014	150	SPS	Tap Tuco – Oklaunion 345kV
	GEN-2008-016	248	SPS	Grassland 230kV
<b>PRIOR QUEUED SUBTOTAL</b>		<b>778</b>		
Cluster	Request	Amount	Area	Proposed Point of Interconnection
<b>S Pandle</b>	GEN-2009-017	151.8	SPS	Tap Pembroke – Stiles 138kV
<b>SOUTH PANHANDLE/NM SUBTOTAL</b>		<b>151.8</b>		
<b>AREA SUBTOTAL</b>		<b>929.8</b>		

Cluster	Request	Amount	Area	Proposed Point of Interconnection
Prior Queued	GEN-2001-026	74	WFEC	Washita 138kV
	GEN-2003-004	101	WFEC	Washita 138kV
	GEN-2003-005	100	WFEC	Anadarko - Paradise 138kV
	GEN-2003-022	120	AEPW	Washita 138kV
	GEN-2004-020	27	AEPW	Washita 138kV
	GEN-2004-023	21	WFEC	Washita 138kV
	GEN-2005-003	31	WFEC	Washita 138kV
	GEN-2006-002	101	AEPW	Grapevine - Elk City 230kV
	GEN-2006-035	225	AEPW	Grapevine - Elk City 230kV
	GEN-2006-043	99	AEPW	Grapevine - Elk City 230kV
	GEN-2007-032	150	WFEC	Tap Clinton Junction – Clinton 138kV
	GEN-2007-043	200	AEPW	Tap Lawton Eastside – Cimarron 345kV
	GEN-2007-052	150	WFEC	Anadarko 138kV
<b>PRIOR QUEUED SUBTOTAL</b>		<b>1,399</b>		
Cluster	Request	Amount	Area	Proposed Point of Interconnection
<b>SW Oklahoma</b>	GEN-2008-023	150	AEPW	Hobart Junction 138kV
	GEN-2009-016	140	AEPW	Falcon Road 138kV
<b>SW OKLAHOMA SUBTOTAL</b>		<b>290</b>		
<b>AREA SUBTOTAL</b>		<b>1,689</b>		

Cluster	Request	Amount	Area	Proposed Point of Interconnection
Prior Queued	AECI-4	150	AECI	Tap Fairfax – Fairfax Tap 138kV
	AECI-6	200	AECI	Tap Fairfax- Fairfax Tap 138kV
	GEN-2002-004	200	WERE	Latham 345kV
	GEN-2005-013	201	WERE	Tap Latham - Neosho
	GEN-2007-025	300	WERE	Tap Woodring – Wichita 345kV
	GEN-2008-013	300	OKGE	Tap Woodring – Wichita 345kV
<b>PRIOR QUEUED SUBTOTAL</b>		<b>1351</b>		
Cluster	Request	Amount	Area	Proposed Point of Interconnection
North Oklahoma	GEN-2008-021	42	WERE	Wolf Creek 345kV
	GEN-2008-127	200.1	WERE	Tap Sooner – Rose Hill 345kV
	GEN-2009-025	60	OKGE	Kay Coop 69kV
<b>North OKLAHOMA SUBTOTAL</b>		<b>302.1</b>		
<b>AREA SUBTOTAL</b>		<b>1,653.1</b>		

Cluster	Request	Amount	Area	Proposed Point of Interconnection
Prior Queued	Genoa	4	NPPD	Genoa 115kV
	GEN-2006-020N	42	NPPD	Bloomfield 115kV
	GEN-2006-038N019	80	NPPD	Petersburg 115kV
	GEN-2007-011N08	81	NPPD	Bloomfield 115kV
<b>PRIOR QUEUED SUBTOTAL</b>		<b>207</b>		
Cluster	Request	Amount	Area	Proposed Point of Interconnection
NE Nebraska	GEN-2006-044N	40.5	NPPD	Tap Neligh – Petersburg 115kV
	GEN-2008-086N02	200	NPPD	Tap Ft. Randall - Columbus
<b>NE NEBRASKA SUBTOTAL</b>		<b>240.5</b>		
<b>AREA SUBTOTAL</b>		<b>447.5</b>		

Cluster	Request	Amount	Area	Proposed Point of Interconnection
Prior Queued	Broken Bow	8.3	NPPD	Broken Bow 115kV
	Ord	13.9	NPPD	Bloomfield 115kV
	Stuart	2.1	NPPD	Petersburg 115kV
	Ainsworth	75	NPPD	Ainsworth Wind Tap 115kV
	GEN-2004-005N	30	NPPD	St. Francis 115kV
	GEN-2006-038N05	80	NPPD	Broken Bow 115kV
<b>PRIOR QUEUED SUBTOTAL</b>		<b>209.3</b>		
Cluster	Request	Amount	Area	Proposed Point of Interconnection
NORTH NEBRASKA	GEN-2006-037N1	75	NPPD	Broken Bow 115kV
<b>NORTH NEBRASKA SUBTOTAL</b>		<b>75</b>		
<b>AREA SUBTOTAL</b>		<b>284.3</b>		

Cluster	Request	Amount	Area	Proposed Point of Interconnection
Prior Queued	GEN-2003-006A-E	100	EMDE	Elm Creek 230kV
	GEN-2003-006A-W	100	WERE	Elm Creek 230kV
	GEN-2003-019	250	MIDW	Smoky Hills Tap 230kV
	GEN-2006-031	75	MIDW	Knoll 115kV
	GEN-2006-032	200	MIDW	South Hays 230kV
<b>PRIOR QUEUED SUBTOTAL</b>		<b>725</b>		
Cluster	Request	Amount	Area	Proposed Point of Interconnection
North Kansas	GEN-2008-092	201	MIDW	Knoll 115kV
	GEN-2009-011	50	MKEC	Tap Plainville – Phillipsburg 115kV
<b>NORTH KANSAS SUBTOTAL</b>		<b>251</b>		
<b>AREA SUBTOTAL</b>		<b>976</b>		

Cluster	Request	Amount	Area	Proposed Point of Interconnection
Prior Queued	AECI-1	400	AECI	Tap Cooper – Fairport 345kV
	AECI-2	99	AECI	Lathrop 161kV
	AECI-3	201	AECI	Osborn 161kV
	AECI-5	100	AECI	Maryville 161kV
	GEN-2006-014	300	MIPU	Tap Maryville – Clarinda 161kV
	GEN-2006-017	300	MIPU	Tap Maryville – Clarinda 161kV
	GEN-2007-015	135	WERE	Tap Humboldt – Kelly 161kV
	GEN-2007-017	101	MIPU	Tap Maryville – Clarinda 161kV
	GEN-2007-053	110	MIPU	Tap Maryville – Clarinda 161kV
	GEN-2008-1190	60	OPPD	Tap Humboldt – Kelly 161kV
<b>PRIOR QUEUED SUBTOTAL</b>		<b>1,806</b>		
Cluster	Request	Amount	Area	Proposed Point of Interconnection
NW Missouri	GEN-2008-129	80	MIPU	Pleasant Hill 161kV
<b>KANSAS CITY KANSAS SUBTOTAL</b>		<b>80</b>		
<b>AREA SUBTOTAL</b>		<b>1,886</b>		
<b>***CLUSTERED TOTAL (w/o PRIOR QUEUED)</b>		<b>2,564.7</b>		
<b>***CLUSTERED TOTAL (w/PRIOR QUEUED)</b>		<b>18,289.9</b>		

\* Planned Facility  
 ^ Proposed Facility  
 \*\* Alternate requests - counted as one request for study purpose  
 \*\*\* Electrically Remote Interconnection Requests included in total

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

**See Facility Studies posted for each individual request**



## **E: Cost Allocation per Interconnection Request**

This section shows each Generation Interconnection Request Customer, their current study impacted Network Upgrades, and the previously allocated upgrades upon which they may rely upon to accommodate their interconnection to the transmission system.

The costs associated with the current study Network Upgrades and Interconnection Facilities are allocated to the Customers as shown in this report.

If a higher queued interconnection request (listed in Appendix B.) withdraws or terminates their LGIA the Network Upgrades assigned to the higher queued requests may be reallocated to the remaining requests that have an impact on the Network Upgrade under a restudy. The actual costs allocated to each Generation Interconnection Request Customer will be determined at the time of a restudy.

Additionally, Expansion Plan (STEP), Aggregate Study, and Balanced Portfolio assigned projects are also included in this table so that the Customer will know that interconnection service may be delayed until the completion of these projects.

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	Upgrade Type	Allocated Costs	E + C Costs
<b>GEN-2006-037N1</b>			
GEN-2006-037N1 Interconnection Costs See Online Diagram	Current Study Allocation	\$10,000,000.00	\$10,000,000.00
	<b>Current Study Total</b>	<b>\$10,000,000.00</b>	
<b>GEN-2006-044N</b>			
GEN-2006-044N Interconnection Costs See Online Diagram	Current Study Allocation	\$1,300,000.00	\$1,300,000.00
Neligh - Petersburg 115KV CKT 1 Per GEN-2006-044N Impact Restudy	Current Study Allocation	\$540,000.00	\$540,000.00
Albion - Petersburg 115KV CKT1 Line re-rating to 100 <sup>0</sup> C	Current Study Allocation	\$360,000.00	\$360,000.00
	<b>Current Study Total</b>	<b>\$2,200,000.00</b>	
<b>GEN-2007-040</b>			
GEN-2007-040 Interconnection Costs See Online Diagram	Current Study Allocation	\$10,404,019.00	\$10,404,019.00
Spearville - Comanche 345KV CKT 1 Priority Project: Spearville-Comanche-Med Lodge-Wichita Dbl 345kV CKT (Total Project E&C Cost Shown)	Previously Allocated		\$356,300,000.00
Comanche - Medicine Lodge 345KV CKT 1 Priority Project: Spearville-Comanche-Med Lodge-Wichita Dbl 345kV CKT (Total Project E&C Cost Shown)	Previously Allocated		\$356,300,000.00
Medicine Lodge - Wichita 345KV CKT 1 Priority Project: Spearville-Comanche-Med Lodge-Wichita Dbl 345kV CKT (Total Project E&C Cost Shown)	Previously Allocated		\$356,300,000.00
Axtell - PostRock 345KV CKT 1 Balanced Portfolio: Spearville-PostRock-Axtell 345kV CKT (Total Project E&C Cost Shown)	Previously Allocated		\$112,700,000.00
Medicine Lodge - Woodward 345KV CKT 1 Priority Project: Med Lodge-Woodward 345kV CKT (Total Project E&C Cost Shown)	Previously Allocated		\$194,972,759.00
PostRock - Spearville 345KV CKT 1 Balanced Portfolio: Spearville-PostRock-Axtell 345kV CKT (Total Project E&C Cost Shown)	Previously Allocated		\$112,700,000.00
Hitchland - Woodward 345kV CKT 1 Priority Project: Hitchland-Woodward Dbl 345kV CKT (Total Project E&C Cost Shown)	Previously Allocated		\$247,005,793.00
	<b>Current Study Total</b>	<b>\$10,404,019.00</b>	
<b>GEN-2008-023</b>			
GEN-2008-023 Interconnection Costs See Online Diagram	Current Study Allocation	\$1,038,000.00	\$1,038,000.00
Gracemont Transformer 345/138/13.8KV CKT 1 Priority Project: Gracemont Transformer 345/138/13.8KV CKT 1	Previously Allocated		\$8,000,000.00
Clinton Junction - Elk City 138KV CKT 1 Replaced terminal equipment	Previously Allocated		\$0.00

\* Current Study Requests' Costs of Previously Allocated Network Upgrades will be determined by a restudy, if necessary.

**Interconnection Request**

**Upgrade Type**

**Allocated Costs**

**E + C Costs**

	<b>Current Study Total</b>	<b>\$1,038,000.00</b>	
<b>GEN-2008-025</b>			
GEN-2008-025 Interconnection Costs See Online Diagram	Current Study Allocation	\$1,767,858.00	\$1,767,858.00
Comanche - Medicine Lodge 345KV CKT 1 Priority Project: Spearville-Comanche-Med Lodge-Wichita Dbl 345kV CKT (Total Project E&C Cost Shown)	Previously Allocated		\$356,300,000.00
Spearville - Comanche 345KV CKT 1 Priority Project: Spearville-Comanche-Med Lodge-Wichita Dbl 345kV CKT (Total Project E&C Cost Shown)	Previously Allocated		\$356,300,000.00
Central Plains - Setab 115KV CKT 1 Per GEN-2007-013 Facility Study	Previously Allocated		\$4,800,000.00
Medicine Lodge - Wichita 345KV CKT 1 Priority Project: Spearville-Comanche-Med Lodge-Wichita Dbl 345kV CKT (Total Project E&C Cost Shown)	Previously Allocated		\$356,300,000.00
	<b>Current Study Total</b>	<b>\$1,767,858.00</b>	

<b>GEN-2008-029</b>			
GEN-2008-029 Interconnection Costs See Online Diagram	Current Study Allocation	\$4,610,000.00	\$4,610,000.00
Medicine Lodge - Woodward 345KV CKT 1 Priority Project: Med Lodge-Woodward 345kV CKT (Total Project E&C Cost Shown)	Previously Allocated		\$194,972,759.00
Medicine Lodge - Wichita 345KV CKT 1 Priority Project: Spearville-Comanche-Med Lodge-Wichita Dbl 345kV CKT (Total Project E&C Cost Shown)	Previously Allocated		\$356,300,000.00
Border - Woodward 345KV CKT 1 Balanced Portfolio: TUCO-Woodward 345kV (Total Project E&C Cost Shown)	Previously Allocated		\$148,727,500.00
Border - Tuco Interchange 345KV CKT 1 Balanced Portfolio: TUCO-Woodward 345kV (Total Project E&C Cost Shown)	Previously Allocated		\$148,727,500.00
Axtell - PostRock 345KV CKT 1 Balanced Portfolio: Spearville-PostRock-Axtell 345kV CKT (Total Project E&C Cost Shown)	Previously Allocated		\$112,700,000.00
PostRock - Spearville 345KV CKT 1 Balanced Portfolio: Spearville-PostRock-Axtell 345kV CKT (Total Project E&C Cost Shown)	Previously Allocated		\$112,700,000.00
	<b>Current Study Total</b>	<b>\$4,610,000.00</b>	

<b>GEN-2008-051</b>			
GEN-2008-051 Interconnection Costs See Online Diagram	Current Study Allocation	\$2,346,379.00	\$2,346,379.00
Hitchland - Woodward 345kV CKT 1 Priority Project: Hitchland-Woodward Dbl 345kV CKT (Total Project E&C Cost Shown)	Previously Allocated		\$247,005,793.00
Medicine Lodge - Woodward 345KV CKT 1 Priority Project: Med Lodge-Woodward 345kV CKT (Total Project E&C Cost Shown)	Previously Allocated		\$194,972,759.00
Medicine Lodge - Wichita 345KV CKT 1 Priority Project: Spearville-Comanche-Med Lodge-Wichita Dbl 345kV CKT (Total Project E&C Cost Shown)	Previously Allocated		\$356,300,000.00

\* Current Study Requests' Costs of Previously Allocated Network Upgrades will be determined by a restudy, if necessary.

<b>Interconnection Request</b>	<b>Upgrade Type</b>	<b>Allocated Costs</b>	<b>E + C Costs</b>
Border - Tuco Interchange 345KV CKT 1 Balanced Portfolio: TUCO-Woodward 345kV (Total Project E&C Cost Shown)	Previously Allocated		\$148,727,500.00
Border - Woodward 345KV CKT 1 Balanced Portfolio: TUCO-Woodward 345kV (Total Project E&C Cost Shown)	Previously Allocated		\$148,727,500.00
	<b>Current Study Total</b>	<b>\$2,346,379.00</b>	
<b>GEN-2008-079</b>			
GEN-2008-079 Interconnection Costs See Online Diagram	Current Study Allocation	\$3,850,000.00	\$3,850,000.00
Spearville (SPEARVLX) 345/115/13.8KV Transformer CKT 1 Install 345/230/13.8kV Transformer CKT 1	Current Study Allocation	\$10,126,000.00	\$10,126,000.00
Judson Large - North Judson Large 115KV CKT 2 Construct approximately 1 mile of new 115kV for 2nd circuit	Current Study Allocation	\$6,113,000.00	\$6,113,000.00
North Judson Large - Spearville 115KV CKT 2 Construct approximately 15 miles of new 115kV for 2nd circuit	Current Study Allocation	\$9,660,000.00	\$9,660,000.00
Comanche - Medicine Lodge 345KV CKT 1 Priority Project: Spearville-Comanche-Med Lodge-Wichita Dbl 345kV CKT (Total Project E&C Cost Shown)	Previously Allocated		\$356,300,000.00
Spearville - Comanche 345KV CKT 1 Priority Project: Spearville-Comanche-Med Lodge-Wichita Dbl 345kV CKT (Total Project E&C Cost Shown)	Previously Allocated		\$356,300,000.00
Medicine Lodge - Wichita 345KV CKT 1 Priority Project: Spearville-Comanche-Med Lodge-Wichita Dbl 345kV CKT (Total Project E&C Cost Shown)	Previously Allocated		\$356,300,000.00
Axtell - PostRock 345KV CKT 1 Balanced Portfolio: Spearville-PostRock-Axtell 345kV CKT (Total Project E&C Cost Shown)	Previously Allocated		\$112,700,000.00
Medicine Lodge - Woodward 345KV CKT 1 Priority Project: Med Lodge-Woodward 345kV CKT (Total Project E&C Cost Shown)	Previously Allocated		\$194,972,759.00
PostRock - Spearville 345KV CKT 1 Balanced Portfolio: Spearville-PostRock-Axtell 345kV CKT (Total Project E&C Cost Shown)	Previously Allocated		\$112,700,000.00
	<b>Current Study Total</b>	<b>\$29,749,000.00</b>	
<b>GEN-2008-086N2</b>			
GEN-2008-086N2 Interconnection Costs See Online Diagram	Current Study Allocation	\$6,400,000.00	\$6,400,000.00
Kelly - MadisonCO 230KV CKT 1 Total E & C Cost for Fort Randall-Madison-Kelly Project	Current Study Allocation	\$493,000.00	\$493,000.00
Ft Randal - Kelly 230.00 230KV CKT 1 Total E & C Cost for Fort Randall-Madison-Kelly Project	Current Study Allocation	\$2,407,000.00	\$2,407,000.00
	<b>Current Study Total</b>	<b>\$9,300,000.00</b>	
<b>GEN-2008-092</b>			
GEN-2008-092 Interconnection Costs See Online Diagram	Current Study Allocation	\$1,140,505.00	\$1,140,505.00
PostRock - Spearville 345KV CKT 1 Balanced Portfolio: Spearville-PostRock-Axtell 345kV CKT (Total Project E&C Cost Shown)	Previously Allocated		\$112,700,000.00

\* Current Study Requests' Costs of Previously Allocated Network Upgrades will be determined by a restudy, if necessary.

Interconnection Request	Upgrade Type	Allocated Costs	E + C Costs
Axtell - PostRock 345KV CKT 1 Balanced Portfolio: Spearville-PostRock-Axtell 345kV CKT (Total Project E&C Cost Shown)	Previously Allocated		\$112,700,000.00
Comanche - Medicine Lodge 345KV CKT 1 Priority Project: Spearville-Comanche-Med Lodge-Wichita Dbl 345kV CKT (Total Project E&C Cost Shown)	Previously Allocated		\$356,300,000.00
Spearville - Comanche 345KV CKT 1 Priority Project: Spearville-Comanche-Med Lodge-Wichita Dbl 345kV CKT (Total Project E&C Cost Shown)	Previously Allocated		\$356,300,000.00
Medicine Lodge - Wichita 345KV CKT 1 Priority Project: Spearville-Comanche-Med Lodge-Wichita Dbl 345kV CKT (Total Project E&C Cost Shown)	Previously Allocated		\$356,300,000.00
		<b>Current Study Total</b>	<b>\$1,140,505.00</b>
<b>GEN-2008-124</b>			
GEN-2008-124 Interconnection Costs See Online Diagram	Current Study Allocation	\$7,353,935.00	\$7,353,935.00
Comanche - Medicine Lodge 345KV CKT 1 Priority Project: Spearville-Comanche-Med Lodge-Wichita Dbl 345kV CKT (Total Project E&C Cost Shown)	Previously Allocated		\$356,300,000.00
Spearville - Comanche 345KV CKT 1 Priority Project: Spearville-Comanche-Med Lodge-Wichita Dbl 345kV CKT (Total Project E&C Cost Shown)	Previously Allocated		\$356,300,000.00
Medicine Lodge - Wichita 345KV CKT 1 Priority Project: Spearville-Comanche-Med Lodge-Wichita Dbl 345kV CKT (Total Project E&C Cost Shown)	Previously Allocated		\$356,300,000.00
Axtell - PostRock 345KV CKT 1 Balanced Portfolio: Spearville-PostRock-Axtell 345kV CKT (Total Project E&C Cost Shown)	Previously Allocated		\$112,700,000.00
Medicine Lodge - Woodward 345KV CKT 1 Priority Project: Med Lodge-Woodward 345kV CKT (Total Project E&C Cost Shown)	Previously Allocated		\$194,972,759.00
PostRock - Spearville 345KV CKT 1 Balanced Portfolio: Spearville-PostRock-Axtell 345kV CKT (Total Project E&C Cost Shown)	Previously Allocated		\$112,700,000.00
Border - Tuco Interchange 345KV CKT 1 Balanced Portfolio: TUCO-Woodward 345kV (Total Project E&C Cost Shown)	Previously Allocated		\$148,727,500.00
Border - Woodward 345KV CKT 1 Balanced Portfolio: TUCO-Woodward 345kV (Total Project E&C Cost Shown)	Previously Allocated		\$148,727,500.00
		<b>Current Study Total</b>	<b>\$7,353,935.00</b>
<b>GEN-2008-127</b>			
GEN-2008-127 Interconnection Costs See Online Diagram	Current Study Allocation	\$9,160,000.00	\$9,160,000.00
		<b>Current Study Total</b>	<b>\$9,160,000.00</b>
<b>GEN-2008-129</b>			
GEN-2008-129 Interconnection Costs See Online Diagram	Current Study Allocation	\$1.00	\$1.00
KC South - Longview 161KV CKT 1 Replace terminal equipment to increase limit to conductor rating	Current Study Allocation	\$150,000.00	\$150,000.00
		<b>Current Study Total</b>	<b>\$150,001.00</b>

\* Current Study Requests' Costs of Previously Allocated Network Upgrades will be determined by a restudy, if necessary.

<b>Interconnection Request</b>	<b>Upgrade Type</b>	<b>Allocated Costs</b>	<b>E + C Costs</b>
<b>GEN-2009-011</b>			
GEN-2009-011 Interconnection Costs See Online Diagram	Current Study Allocation	\$3,267,727.00	\$3,267,727.00
PostRock - Spearville 345KV CKT 1 Balanced Portfolio: Spearville-PostRock-Axtell 345kV CKT (Total Project E&C Cost Shown)	Previously Allocated		\$112,700,000.00
Axtell - PostRock 345KV CKT 1 Balanced Portfolio: Spearville-PostRock-Axtell 345kV CKT (Total Project E&C Cost Shown)	Previously Allocated		\$112,700,000.00
Comanche - Medicine Lodge 345KV CKT 1 Priority Project: Spearville-Comanche-Med Lodge-Wichita Dbl 345kV CKT (Total Project E&C Cost Shown)	Previously Allocated		\$356,300,000.00
Spearville - Comanche 345KV CKT 1 Priority Project: Spearville-Comanche-Med Lodge-Wichita Dbl 345kV CKT (Total Project E&C Cost Shown)	Previously Allocated		\$356,300,000.00
	<b>Current Study Total</b>	<b>\$3,267,727.00</b>	
<b>GEN-2009-016</b>			
GEN-2009-016 Interconnection Costs See Online Diagram	Current Study Allocation	\$4,543,000.00	\$4,543,000.00
Clinton Junction - Elk City 138KV CKT 1 Replaced terminal equipment	Previously Allocated		\$0.00
Gracemont Transformer 345/138/13.8KV CKT 1 Priority Project: Gracemont Transformer 345/138/13.8KV CKT 1	Previously Allocated		\$8,000,000.00
Medicine Lodge - Woodward 345KV CKT 1 Priority Project: Med Lodge-Woodward 345kV CKT (Total Project E&C Cost Shown)	Previously Allocated		\$194,972,759.00
	<b>Current Study Total</b>	<b>\$4,543,000.00</b>	
<b>GEN-2009-017</b>			
GEN-2009-017 Interconnection Costs** See separately posted study	Current Study Allocation	\$2,000,000.00	\$2,000,000.00
Border - Tuco Interchange 345KV CKT 1 Balanced Portfolio: TUCO-Woodward 345kV (Total Project E&C Cost Shown)	Previously Allocated		\$148,727,500.00
Border - Woodward 345KV CKT 1 Balanced Portfolio: TUCO-Woodward 345kV (Total Project E&C Cost Shown)	Previously Allocated		\$148,727,500.00
Medicine Lodge - Woodward 345KV CKT 1 Priority Project: Med Lodge-Woodward 345kV CKT (Total Project E&C Cost Shown)	Previously Allocated		\$194,972,759.00
Medicine Lodge - Wichita 345KV CKT 1 Priority Project: Spearville-Comanche-Med Lodge-Wichita Dbl 345kV CKT (Total Project E&C Cost Shown)	Previously Allocated		\$356,300,000.00
Hitchland - Woodward 345kV CKT 1 Priority Project: Hitchland-Woodward Dbl 345kV CKT (Total Project E&C Cost Shown)	Previously Allocated		\$247,005,793.00
	<b>Current Study Total</b>	<b>\$2,000,000.00</b>	
<b>GEN-2009-025</b>			
GEN-2009-025 Interconnection Costs See Online Diagram	Current Study Allocation	\$2,889,212.00	\$2,889,212.00
	<b>Current Study Total</b>	<b>\$2,889,212.00</b>	

\* Current Study Requests' Costs of Previously Allocated Network Upgrades will be determined by a restudy, if necessary.

**F: Cost Allocation per Proposed Study Network Upgrade**

# Appendix F. - Cost Allocation Per Upgrade Facility

Upgrade Facility	Allocated Costs	E + C Costs
<b>Albion - Petersburg 115KV CKT1</b> Line re-rating to 100°C GEN-2006-044N	\$360,000.00	\$360,000.00
<b>Total</b>	<b>\$360,000.00</b>	
<b>Ft Randal - Kelly 230.00 230KV CKT 1</b> Total E & C Cost for Fort Randall-Madison-Kelly Project GEN-2008-086N2	\$2,407,000.00	\$2,407,000.00
<b>Total</b>	<b>\$2,407,000.00</b>	
<b>GEN-2006-037N1 Interconnection Costs</b> See Online Diagram GEN-2006-037N1	\$10,000,000.00	\$10,000,000.00
<b>Total</b>	<b>\$10,000,000.00</b>	
<b>GEN-2006-044N Interconnection Costs</b> See Online Diagram GEN-2006-044N	\$1,300,000.00	\$1,300,000.00
<b>Total</b>	<b>\$1,300,000.00</b>	
<b>GEN-2007-040 Interconnection Costs</b> See Online Diagram GEN-2007-040	\$10,404,019.00	\$10,404,019.00
<b>Total</b>	<b>\$10,404,019.00</b>	
<b>GEN-2008-023 Interconnection Costs</b> See Online Diagram GEN-2008-023	\$1,038,000.00	\$1,038,000.00
<b>Total</b>	<b>\$1,038,000.00</b>	
<b>GEN-2008-025 Interconnection Costs</b> See Online Diagram GEN-2008-025	\$1,767,858.00	\$1,767,858.00
<b>Total</b>	<b>\$1,767,858.00</b>	
<b>GEN-2008-029 Interconnection Costs</b> See Online Diagram GEN-2008-029	\$4,610,000.00	\$4,610,000.00
<b>Total</b>	<b>\$4,610,000.00</b>	
<b>GEN-2008-051 Interconnection Costs</b> See Online Diagram GEN-2008-051	\$2,346,379.00	\$2,346,379.00
<b>Total</b>	<b>\$2,346,379.00</b>	



<b>Upgrade Facility</b>	<b>Allocated Costs</b>	<b>E + C Costs</b>
<b>GEN-2008-079 Interconnection Costs</b> See Online Diagram		<b>\$3,850,000.00</b>
GEN-2008-079	\$3,850,000.00	
<b>Total</b>	<b>\$3,850,000.00</b>	
<b>GEN-2008-086N2 Interconnection Costs</b> See Online Diagram		<b>\$6,400,000.00</b>
GEN-2008-086N2	\$6,400,000.00	
<b>Total</b>	<b>\$6,400,000.00</b>	
<b>GEN-2008-092 Interconnection Costs</b> See Online Diagram		<b>\$1,140,505.00</b>
GEN-2008-092	\$1,140,505.00	
<b>Total</b>	<b>\$1,140,505.00</b>	
<b>GEN-2008-124 Interconnection Costs</b> See Online Diagram		<b>\$7,353,935.00</b>
GEN-2008-124	\$7,353,935.00	
<b>Total</b>	<b>\$7,353,935.00</b>	
<b>GEN-2008-127 Interconnection Costs</b> See Online Diagram		<b>\$9,160,000.00</b>
GEN-2008-127	\$9,160,000.00	
<b>Total</b>	<b>\$9,160,000.00</b>	
<b>GEN-2008-129 Interconnection Costs</b> See Online Diagram		<b>\$1.00</b>
GEN-2008-129	\$1.00	
<b>Total</b>	<b>\$1.00</b>	
<b>GEN-2009-011 Interconnection Costs</b> See Online Diagram		<b>\$3,267,727.00</b>
GEN-2009-011	\$3,267,727.00	
<b>Total</b>	<b>\$3,267,727.00</b>	
<b>GEN-2009-016 Interconnection Costs</b> See Online Diagram		<b>\$4,543,000.00</b>
GEN-2009-016	\$4,543,000.00	
<b>Total</b>	<b>\$4,543,000.00</b>	
<b>GEN-2009-017 Interconnection Costs**</b> See separately posted study		<b>\$2,000,000.00</b>
GEN-2009-017	\$2,000,000.00	
<b>Total</b>	<b>\$2,000,000.00</b>	
<b>GEN-2009-025 Interconnection Costs</b> See Online Diagram		<b>\$2,889,212.00</b>

<b>Upgrade Facility</b>	<b>Allocated Costs</b>	<b>E + C Costs</b>
GEN-2009-025	\$2,889,212.00	
<b>Total</b>	<b>\$2,889,212.00</b>	
<hr/>		
<b>Judson Large - North Judson Large 115KV CKT 2</b>		<b>\$6,113,000.00</b>
Construct approximately 1 mile of new 115kV for 2nd circuit		
GEN-2008-079	\$6,113,000.00	
<b>Total</b>	<b>\$6,113,000.00</b>	
<hr/>		
<b>KC South - Longview 161KV CKT 1</b>		<b>\$150,000.00</b>
Replace terminal equipment to increase limit to conductor rating		
GEN-2008-129	\$150,000.00	
<b>Total</b>	<b>\$150,000.00</b>	
<hr/>		
<b>Kelly - MadisonCO 230KV CKT 1</b>		<b>\$493,000.00</b>
Total E & C Cost for Fort Randall-Madison-Kelly Project		
GEN-2008-086N2	\$493,000.00	
<b>Total</b>	<b>\$493,000.00</b>	
<hr/>		
<b>Neligh - Petersburg 115KV CKT 1</b>		<b>\$540,000.00</b>
Per GEN-2006-044N Impact Restudy		
GEN-2006-044N	\$540,000.00	
<b>Total</b>	<b>\$540,000.00</b>	
<hr/>		
<b>North Judson Large - Spearville 115KV CKT 2</b>		<b>\$9,660,000.00</b>
Construct approximately 15 miles of new 115kV for 2nd circuit		
GEN-2008-079	\$9,660,000.00	
<b>Total</b>	<b>\$9,660,000.00</b>	
<hr/>		
<b>Spearville (SPEARVLX) 345/115/13.8KV Transformer CKT 1</b>		<b>\$10,126,000.00</b>
Install 345/230/13.8kV Transformer CKT 1		
GEN-2008-079	\$10,126,000.00	
<b>Total</b>	<b>\$10,126,000.00</b>	
<hr/>		
<b>Current Study Upgrades Total</b>		<b>\$101,919,636.00</b>

**G: ACCC Analysis (No Upgrades)**

GROUP	SEASON	SOURCE	DIRECTION	MONITORED ELEMENT COMMON NAME	RATEB	TDF	TC%LOADING	CONTENGENC Y NAME
09G06044N	11G	G06_044N	TO->FROM	NELIGH - PETERSBURG 115KV CKT 1	113	0.99555	104.1494	ALBION - PETERSBURG 115KV CKT 1
09G06044N	11G	G06_044N	TO->FROM	ALBION - PETERSBURG 115KV CKT 1	113	0.99555	104.0155	NELIGH - PETERSBURG 115KV CKT 1
03G08079	11G	G08_079	FROM->TO	MEDICINE LODGE (MED-LDG4) 138/115/2.72KV TRANSFORMER CKT 1	62	0.35439	276.4794	NORTH JUDSON LARGE SUB - SPEARVILLE 115KV CKT 1
03G08079	11G	G08_079	FROM->TO	MEDICINE LODGE (MED-LDG4) 138/115/2.72KV TRANSFORMER CKT 1	62	0.35439	273.0688	SPEARVILLE (SPEARVL6) 230/115/13.8KV TRANSFORMER CKT 1
03G08079	11G	G08_079	FROM->TO	MEDICINE LODGE (MED-LDG4) 138/115/2.72KV TRANSFORMER CKT 1	62	0.35439	260.9091	NORTH JUDSON LARGE SUB - SPEARVILLE 115KV CKT 1
03G08079	11G	G08_079	FROM->TO	MEDICINE LODGE (MED-LDG4) 138/115/2.72KV TRANSFORMER CKT 1	62	0.35439	258.1368	SPEARVILLE (SPEARVL6) 230/115/13.8KV TRANSFORMER CKT 1
3	11G	G08_079	FROM->TO	MEDICINE LODGE (MED-LDG4) 138/115/2.72KV TRANSFORMER CKT 1	62	0.3547	256.787	NORTH JUDSON LARGE SUB - SPEARVILLE 115KV CKT 1
3	11G	G08_079	FROM->TO	MEDICINE LODGE (MED-LDG4) 138/115/2.72KV TRANSFORMER CKT 1	62	0.3547	253.8512	SPEARVILLE (SPEARVL6) 230/115/13.8KV TRANSFORMER CKT 1
3	11G	G08_079	FROM->TO	MEDICINE LODGE (MED-LDG4) 138/115/2.72KV TRANSFORMER CKT 1	62	0.3547	244.5255	NORTH JUDSON LARGE SUB - SPEARVILLE 115KV CKT 1
3	11G	G08_079	FROM->TO	MEDICINE LODGE (MED-LDG4) 138/115/2.72KV TRANSFORMER CKT 1	62	0.3547	241.9964	SPEARVILLE (SPEARVL6) 230/115/13.8KV TRANSFORMER CKT 1
03G08079	11G	G08_079	FROM->TO	MEDICINE LODGE (MED-LDG4) 138/115/2.72KV TRANSFORMER CKT 1	62	0.35574	220.328	JUDSON LARGE - NORTH JUDSON LARGE SUB 115KV CKT 1
03G08079	11G	G08_079	FROM->TO	MEDICINE LODGE (MED-LDG4) 138/115/2.72KV TRANSFORMER CKT 1	62	0.35574	212.7997	JUDSON LARGE - NORTH JUDSON LARGE SUB 115KV CKT 1
3	11G	G08_079	FROM->TO	MEDICINE LODGE (MED-LDG4) 138/115/2.72KV TRANSFORMER CKT 1	62	0.35604	204.3846	JUDSON LARGE - NORTH JUDSON LARGE SUB 115KV CKT 1
3	11G	G08_079	FROM->TO	MEDICINE LODGE (MED-LDG4) 138/115/2.72KV TRANSFORMER CKT 1	62	0.35604	198.3627	JUDSON LARGE - NORTH JUDSON LARGE SUB 115KV CKT 1
03G08079	11G	G08_079	TO->FROM	CUDAHY - G08-79T 115.00 115KV CKT 1	129.5	0.54555	151.8842	NORTH JUDSON LARGE SUB - SPEARVILLE 115KV CKT 1
03G08079	11G	G08_079	FROM->TO	G01_039AT 115.00 - GREENSBURG 115KV CKT 1	129.5	0.43987	150.5298	NORTH JUDSON LARGE SUB - SPEARVILLE 115KV CKT 1
03G08079	11G	G08_079	TO->FROM	CUDAHY - G08-79T 115.00 115KV CKT 1	129.5	0.54555	149.4849	SPEARVILLE (SPEARVL6) 230/115/13.8KV TRANSFORMER CKT 1
03G08079	11G	G08_079	FROM->TO	G01_039AT 115.00 - GREENSBURG 115KV CKT 1	129.5	0.43987	148.2188	SPEARVILLE (SPEARVL6) 230/115/13.8KV TRANSFORMER CKT 1
03G08079	11G	G08_079	FROM->TO	CUDAHY - KISMET 3 115.00 115KV CKT 1	129.5	0.54555	146.6523	NORTH JUDSON LARGE SUB - SPEARVILLE 115KV CKT 1
03G08079	11G	G08_079	TO->FROM	CIMARRON RIVER TAP - KISMET 3 115.00 115KV CKT 1	129.5	0.54555	145.1767	NORTH JUDSON LARGE SUB - SPEARVILLE 115KV CKT 1
03G08079	11G	G08_079	FROM->TO	CUDAHY - KISMET 3 115.00 115KV CKT 1	129.5	0.54555	144.3089	SPEARVILLE (SPEARVL6) 230/115/13.8KV TRANSFORMER CKT 1
03G08079	11G	G08_079	FROM->TO	GREENSBURG - SUN CITY 115KV CKT 1	129.5	0.43987	144.2445	NORTH JUDSON LARGE SUB - SPEARVILLE 115KV CKT 1
03G08079	11G	G08_079	TO->FROM	CIMARRON RIVER TAP - KISMET 3 115.00 115KV CKT 1	129.5	0.54555	142.8295	SPEARVILLE (SPEARVL6) 230/115/13.8KV TRANSFORMER CKT 1
03G08079	11G	G08_079	TO->FROM	CIMARRON RIVER PLANT - CIMARRON RIVER TAP 115KV CKT 1	89.6	0.46028	142.3922	NORTH JUDSON LARGE SUB - SPEARVILLE 115KV CKT 1
03G08079	11G	G08_079	FROM->TO	GREENSBURG - SUN CITY 115KV CKT 1	129.5	0.43987	141.9801	SPEARVILLE (SPEARVL6) 230/115/13.8KV TRANSFORMER CKT 1
03G08079	11G	G08_079	TO->FROM	MEDICINE LODGE - SUN CITY 115KV CKT 1	129.5	0.43987	141.3604	NORTH JUDSON LARGE SUB - SPEARVILLE 115KV CKT 1
03G08079	11G	G08_079	TO->FROM	CIMARRON RIVER PLANT - CIMARRON RIVER TAP 115KV CKT 1	89.6	0.46028	139.8364	SPEARVILLE (SPEARVL6) 230/115/13.8KV TRANSFORMER CKT 1
03G08079	11G	G08_079	TO->FROM	MEDICINE LODGE - SUN CITY 115KV CKT 1	129.5	0.43987	139.0937	SPEARVILLE (SPEARVL6) 230/115/13.8KV TRANSFORMER CKT 1
3	11G	G08_079	FROM->TO	G01_039AT 115.00 - GREENSBURG 115KV CKT 1	129.5	0.44024	137.4474	NORTH JUDSON LARGE SUB - SPEARVILLE 115KV CKT 1
3	11G	G08_079	FROM->TO	G01_039AT 115.00 - GREENSBURG 115KV CKT 1	129.5	0.44024	135.6054	SPEARVILLE (SPEARVL6) 230/115/13.8KV TRANSFORMER CKT 1
3	11G	G08_079	TO->FROM	CUDAHY - G08-79T 115.00 115KV CKT 1	129.5	0.546	135.3384	NORTH JUDSON LARGE SUB - SPEARVILLE 115KV CKT 1
3	11G	G08_079	TO->FROM	CUDAHY - G08-79T 115.00 115KV CKT 1	129.5	0.546	133.5359	SPEARVILLE (SPEARVL6) 230/115/13.8KV TRANSFORMER CKT 1
3	11G	G08_079	FROM->TO	GREENSBURG - SUN CITY 115KV CKT 1	129.5	0.44024	131.1941	NORTH JUDSON LARGE SUB - SPEARVILLE 115KV CKT 1
3	11G	G08_079	FROM->TO	CUDAHY - KISMET 3 115.00 115KV CKT 1	129.5	0.546	130.2175	NORTH JUDSON LARGE SUB - SPEARVILLE 115KV CKT 1
3	11G	G08_079	FROM->TO	GREENSBURG - SUN CITY 115KV CKT 1	129.5	0.44024	129.3638	SPEARVILLE (SPEARVL6) 230/115/13.8KV TRANSFORMER CKT 1
3	11G	G08_079	TO->FROM	CIMARRON RIVER TAP - KISMET 3 115.00 115KV CKT 1	129.5	0.546	128.739	NORTH JUDSON LARGE SUB - SPEARVILLE 115KV CKT 1
3	11G	G08_079	FROM->TO	CUDAHY - KISMET 3 115.00 115KV CKT 1	129.5	0.546	128.4606	SPEARVILLE (SPEARVL6) 230/115/13.8KV TRANSFORMER CKT 1
3	11G	G08_079	TO->FROM	MEDICINE LODGE - SUN CITY 115KV CKT 1	129.5	0.44024	128.3602	NORTH JUDSON LARGE SUB - SPEARVILLE 115KV CKT 1
3	11G	G08_079	TO->FROM	CIMARRON RIVER TAP - KISMET 3 115.00 115KV CKT 1	129.5	0.546	126.9854	SPEARVILLE (SPEARVL6) 230/115/13.8KV TRANSFORMER CKT 1
3	11G	G08_079	TO->FROM	MEDICINE LODGE - SUN CITY 115KV CKT 1	129.5	0.44024	126.5401	SPEARVILLE (SPEARVL6) 230/115/13.8KV TRANSFORMER CKT 1
3	11G	G08_079	TO->FROM	CIMARRON RIVER PLANT - CIMARRON RIVER TAP 115KV CKT 1	89.6	0.46066	123.4372	NORTH JUDSON LARGE SUB - SPEARVILLE 115KV CKT 1
3	11G	G08_079	TO->FROM	CIMARRON RIVER PLANT - CIMARRON RIVER TAP 115KV CKT 1	89.6	0.46066	121.3722	SPEARVILLE (SPEARVL6) 230/115/13.8KV TRANSFORMER CKT 1
03G08079	11G	G08_079	FROM->TO	NORTH JUDSON LARGE SUB - SPEARVILLE 115KV CKT 1	177.7	0.76908	121.3242	CUDAHY - G08-79T 115.00 115KV CKT 1
03G08079	11G	G08_079	FROM->TO	NORTH JUDSON LARGE SUB - SPEARVILLE 115KV CKT 1	177.7	0.66718	119.4569	G01_039AT 115.00 - GREENSBURG 115KV CKT 1
03G08079	11G	G08_079	FROM->TO	G01_039AT 115.00 - GREENSBURG 115KV CKT 1	129.5	0.44156	114.347	JUDSON LARGE - NORTH JUDSON LARGE SUB 115KV CKT 1
03G08079	11G	G08_079	TO->FROM	CUDAHY - G08-79T 115.00 115KV CKT 1	129.5	0.54708	114.111	JUDSON LARGE - NORTH JUDSON LARGE SUB 115KV CKT 1
3	11G	G08_079	FROM->TO	NORTH JUDSON LARGE SUB - SPEARVILLE 115KV CKT 1	177.7	0.76972	110.8344	CUDAHY - G08-79T 115.00 115KV CKT 1

GROUP	SEASON	SOURCE	DIRECTION	MONITORED ELEMENT COMMON NAME	RATEB	TDF	TC%LOADING	CONTINGENC Y NAME
3	11G	G08_079	FROM->TO	NORTH JUDSON LARGE SUB - SPEARVILLE 115KV CKT 1	177.7	0.66774	110.3692	G01_039AT 115.00 - GREENSBURG 115KV CKT 1
03G08079	11G	G08_079	FROM->TO	CUDAHY - KISMET 3 115.00 115KV CKT 1	129.5	0.54708	109.0874	JUDSON LARGE - NORTH JUDSON LARGE SUB 115KV CKT 1
03G08079	11G	G08_079	FROM->TO	GREENSBURG - SUN CITY 115KV CKT 1	129.5	0.44156	108.1303	JUDSON LARGE - NORTH JUDSON LARGE SUB 115KV CKT 1
03G08079	11G	G08_079	TO->FROM	CIMARRON RIVER TAP - KISMET 3 115.00 115KV CKT 1	129.5	0.54708	107.6194	JUDSON LARGE - NORTH JUDSON LARGE SUB 115KV CKT 1
03G08079	11G	G08_079	TO->FROM	MEDICINE LODGE - SUN CITY 115KV CKT 1	129.5	0.44156	105.4076	JUDSON LARGE - NORTH JUDSON LARGE SUB 115KV CKT 1
03G08079	11G	G08_079	FROM->TO	SPEARVILLE (SPEARVL) 345/230/13.8KV TRANSFORMER CKT 1	336	0.52745	104.9768	MULLERGREN - SPEARVILLE 230KV CKT 1
03G08079	11G	G08_079	FROM->TO	SPEARVILLE (SPEARVL) 345/230/13.8KV TRANSFORMER CKT 1	336	0.52745	104.6805	MULLERGREN - SPEARVILLE 230KV CKT 1
3	11G	G08_079	FROM->TO	G01_039AT 115.00 - GREENSBURG 115KV CKT 1	129.5	0.44193	104.5451	JUDSON LARGE - NORTH JUDSON LARGE SUB 115KV CKT 1
03G08079	11G	G08_079	FROM->TO	SPEARVILLE (SPEARVL6) 230/115/13.8KV TRANSFORMER CKT 1	205	0.76908	103.6185	CUDAHY - G08-79T 115.00 115KV CKT 1
03G08079	11G	G08_079	FROM->TO	SPEARVILLE (SPEARVL6) 230/115/13.8KV TRANSFORMER CKT 1	205	0.66718	101.9518	G01_039AT 115.00 - GREENSBURG 115KV CKT 1
3	11G	G08_079	TO->FROM	CUDAHY - G08-79T 115.00 115KV CKT 1	129.5	0.54753	101.941	JUDSON LARGE - NORTH JUDSON LARGE SUB 115KV CKT 1
03G08079	11G	G08_079	TO->FROM	CUDAHY - G08-79T 115.00 115KV CKT 1	129.5	0.23614	101.8719	SPP-SUNC-14
03G08079	11G	G08_079	FROM->TO	NORTH JUDSON LARGE SUB - SPEARVILLE 115KV CKT 1	177.7	0.54238	101.8428	SPP-MKEC-08
03G08079	11G	G08_079	TO->FROM	CUDAHY - G08-79T 115.00 115KV CKT 1	129.5	0.3416	101.8208	SPEARVILLE (SPEARVL) 345/230/13.8KV TRANSFORMER CKT 1
03G08079	11G	G08_079	FROM->TO	SPEARVILLE (SPEARVL6) 230/115/13.8KV TRANSFORMER CKT 1	205	0.76908	101.4282	CUDAHY - G08-79T 115.00 115KV CKT 1
3	11G	G08_079	FROM->TO	SPEARVILLE (SPEARVL) 345/230/13.8KV TRANSFORMER CKT 1	336	0.52791	101.3857	MULLERGREN - SPEARVILLE 230KV CKT 1
3	11G	G08_079	FROM->TO	SPEARVILLE (SPEARVL) 345/230/13.8KV TRANSFORMER CKT 1	336	0.52791	101.1228	MULLERGREN - SPEARVILLE 230KV CKT 1
03G08079	11G	G08_079	FROM->TO	G01_039AT 115.00 - GREENSBURG 115KV CKT 1	129.5	0.20951	100	SPEARVILLE (SPEARVL) 345/230/13.8KV TRANSFORMER CKT 1
09G08086N2	11G	G08_086N2	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	192	0.77994	105.0301	DAK02WAPAB2
09G08086N2	11G	G08_086N2	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	192	0.77963	104.5894	FT RANDAL - UTICA JCT 230KV CKT 1
09G08086N2	11G	G08_086N2	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	192	0.99265	103.4829	FT RANDAL - MADISONCO 230.00 230KV CKT 1
09G08086N2	11G	G08_086N2	TO->FROM	FT RANDAL - MADISONCO 230.00 230KV CKT 1	192	0.99265	103.4367	KELLY - MADISONCO 230.00 230KV CKT 1
09G08086N2	11G	G08_086N2	TO->FROM	KELLY - MADISONCO 230.00 230KV CKT 1	192	0.77722	101.8964	FT RANDAL - SIOUX CITY 230KV CKT 1
0	16SP	G08_129	TO->FROM	KC SOUTH - LONGVIEW 161KV CKT 1	224	0.22161	100.8599	BLUE SPRING SOUTH - PRAIRIE LEE 161KV CKT 1
00G08129	16SP	G08_129	TO->FROM	KC SOUTH - LONGVIEW 161KV CKT 1	224	0.22161	100.8582	BLUE SPRING SOUTH - PRAIRIE LEE 161KV CKT 1

**H: ACCC Analysis with no added Upgrades (Prior Queued or Base Case)**

Available upon request