

# Feasibility Cluster Study for Generation Interconnection Requests

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Engineering Dept.  
Tariff Studies – Generation Interconnection

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# Executive Summary

On November 10, 2008, Southwest Power Pool (SPP) filed with the Federal Energy Regulatory Commission (FERC) in Docket No. ER09-262-000 a request for waiver of certain provisions of its Large Generator Interconnection Procedures to study interconnection requests in clusters rather than serially. Based on this request, certain generation interconnection requests in the SPP Generation Interconnection Queue have been clustered together for the following Feasibility Cluster Study. This Feasibility Cluster Study analyzes the interconnecting of multiple generation interconnection requests associated with new generation totaling 14,942 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), Oklahoma Gas and Electric (OKGE), Southwestern Public Service (SPS), Sunflower Electric Power Corporation (SUNC), Westar Energy (WERE), Grand River Dam Authority (GRDA) and/or Western Farmers Electric Cooperative (WFEC). The various generation interconnection requests have differing proposed in-service dates<sup>1</sup>. The generation interconnection requests included in this Feasibility Cluster Study are listed in Appendix A by their queue number, amount, area, requested interconnection point, proposed interconnection point, and the requested in-service date.

Power flow analysis has indicated that for the powerflow cases studied, 14,942 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 System Impact Cluster Study based on the wind turbine manufacturer and type requested by the Customer. Dynamic stability studies performed as part of the System Impact Cluster Study will provide additional guidance as to whether the required reactive compensation can be static or a portion must be dynamic (such as a SVC).

The total estimated minimum cost for interconnecting the studied generation interconnection request is \$1,997,800,000. These costs are shown in Appendix F and G. 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 network constraints in the SPP transmission system that were identified are shown in Appendix I.

Network Constraints listed in Appendix I 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.

The required interconnection costs listed in Appendix F and G 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.

Based on the SPP Tariff Attachment O, transmission facilities that are part of the SPP Transmission Expansion Plan (STEP) including Sponsored Economic Upgrades or the Balanced Portfolio that may

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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.

be approved by the SPP Board of Directors will receive notifications to construct. These projects will then be considered construction pending projects and would not be assignable to the Feasibility Cluster Study Generation Interconnection Requests. The network Upgrades identified in the Base Case Upgrades will not be assigned to the Feasibility Cluster Study for Generation Interconnection Requests.

# Table of Contents

<b>Introduction</b> .....	<b>5</b>
<b>Model Development</b> .....	<b>5</b>
Interconnection Requests Included in the Cluster .....	5
Electrically Isolated Interconnection Requests .....	5
Previous Queued Projects .....	5
Development of Base Cases .....	5
Base Case Upgrades.....	5
Potential Upgrades Not in the Base Case .....	7
Regional Groupings .....	7
<b>Identification of Network Constraints</b> .....	<b>7</b>
<b>Determination of Cost Allocated Network Upgrades</b> .....	<b>8</b>
<b>Interconnection Facilities</b> .....	<b>9</b>
<b>Powerflow Analysis Methodology</b> .....	<b>10</b>
<b>Powerflow Analysis</b> .....	<b>10</b>
Group 1 (Woodward Area).....	10
Group 2 (Hitchland Area).....	11
Group 3 (Spearville Area) .....	11
Group 4 (Mingo/NW Kansas Group).....	11
Group 5 (Amarillo Area).....	11
Group 6 (South Panhandle/New Mexico) .....	11
Group 7 (Southwestern Oklahoma).....	11
Group 8 (North Kansas).....	11
Group 9 (South Oklahoma).....	11
Group 10 (North Oklahoma).....	11
<b>Regional Map with Proposed Upgrades</b> .....	<b>12</b>
<b>Conclusion</b> .....	<b>13</b>
<b>Appendix</b> .....	<b>14</b>
A: Generation Interconnection Requests Considered for Feasibility Study.....	A-1
B: Prior Queued Interconnection Requests .....	B-1
C: Study Groupings .....	C-1
D: Proposed Point of Interconnection One line Diagrams .....	D-1
E: Cost Allocation per Interconnection Request .....	E-1
F: Cost Allocation per Interconnection Request with Detail .....	F-1
G: Cost Allocation per Proposed Network Upgrade .....	G-1
H: FCITC Analysis (No Upgrades).....	H-1
I: ACCC Analysis (Upgrades Included).....	I-1
J: Electrically Isolated Interconnection Request Feasibility Studies.....	J-1

## Introduction

Generation Interconnection Requests in the Southwest Power Pool (SPP) Generation Interconnection Queue have been clustered together for the following Feasibility Cluster Study. This Feasibility Cluster Study analyzes multiple generation interconnection requests associated with new generation totaling 14,942 MW 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), Oklahoma Gas and Electric (OKGE), Southwestern Public Service (SPS), Sunflower Electric Power Corporation (SUNC), Westar Energy (WERE) and/or Western Farmers Electric Cooperative (WFEC). The various generation interconnection requests have differing proposed in-service dates. The generation interconnection requests included in this Feasibility 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 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.

## Model Development

**Interconnection Requests Included in the Cluster** – SPP has included the interconnection requests listed in Appendix A to be analyzed in this cluster study.

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

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

**Development of Base Cases** – The 2009 series Transmission Service Request (TSR) Models 2010 spring and 2014 summer and winter scenario 0 peak cases were used for this study. After the 2010 spring and the 2014 summer and winter peak cases were developed, each of the control areas’ resources were then redispatched using current dispatch orders.

**Base Case Upgrades** -The following facilities have been previously assigned or are in construction stages and were assumed to be in-service at the time of dispatch and added to the base case models.

- Woodward – Northwest 345kV line and associated projects to be built by OKGE for 2010 in-service<sup>2</sup>.
- Hitchland 345/230/115kV upgrades to be built by SPS for 2010/2011 in-service<sup>3</sup>.
  - Hitchland – Pringle 230kV line
  - Hitchland – Moore County 230kV line
  - Hitchland – Perryton 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.
- Finney – Holcomb 345kV Ckt #2 line assigned to GEN-2006-044 interconnection customer for possible 2010 in-service<sup>5</sup>.
- Hitchland – Woodward 345kV Ckt #1 line assigned to GEN-2006-049 interconnection customer for undetermined in service date.
- All facilities that are to be assigned in the Impact Cluster Study (ICS-2008-001) for the 1<sup>st</sup> transitional cluster. These facilities include:
  - Hitchland – Beaver County 345kV line
  - Beaver County – Woodward 345kV line
  - Beaver County – Stevens County 345kV line
  - Stevens County – Gray County 345kV line
  - Gray County – Comanche 345kV line
  - Spearville – Comanche 345kV line
  - Spearville – Wichita 345kV line
  - Mingo – Knoll 345kV line
  - Potter – Grapevine 345kV line
  - Grapevine – Beckham County 345kV line
  - Beckham County – Anadarko 345kV line
  - Grapevine – Lawton Eastside 345kV line
- Balanced Portfolio Projects:
  - Anadarko 345/138/13.2kV Autotransformer
  - Woodward– TUCO 345kV line
  - Sooner– Cleveland 345kV line
  - Iatan– Nashua 345kV line
  - Muskogee– Seminole 345kV line
  - Knoll– Axtell 345kV line
  - Spearville– Knoll 345kV line
  - Tap Stillwell – Swissvale 345kV line at West Gardner
- Other Expansion Plan Projects:
  - Seven Rivers – Pecos 230kV line

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<sup>2</sup> Approved based on an order of the Corporation Commission of the State of Oklahoma, Cause No. PUD 200800148 Order No. 55935

<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> Based on Facility Study Posting November 2008

- Pecos – Potash Junction 230kV line
- Hobbs – Seminole 230kV line
- Seminole – Mustang 230kV line

**Note About Balanced Portfolio Upgrades** – Balanced portfolio upgrades were included in this study. However, the first cluster Impact Study, ICS-2008-001 was at an advanced stage that those upgrades could not be included in that study. As such, ICS-2008-001 did not include Balanced Portfolio Upgrades. ICS-2008-001 will need to have a restudy performed during its Facility Study stage and will have a cost re-allocation taking into account Balanced Portfolio Upgrades. This will affect the cost allocation of upgrades for Customers in this study during the Impact Study stage.

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

**Regional Groupings** – The interconnection requests listed in Appendix A were grouped together in ten different regional groups based on geographical and electrical impacts. These groupings are shown in Appendix C. Two other interconnection requests not in close proximity to any other requests were grouped by themselves.

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

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 ten 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.

Peaking units were not dispatched in the 2010 spring model. To study peaking units' impacts, the 2014 summer 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.

## **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.

Identification of Electrically Isolated Groups and Requests – From the FCITC analysis, it was determined that several of the regional groups had no common impacts with the other groups. The following requests were determined to be electrically remote.

- GEN-2008-021
- GEN-2008-030

Also, the following groups were determined to be electrically remote in that they shared no impacts with any other groups.

- Group 4 – Northwest Kansas
  - GEN-2008-025
  - GEN-2008-026
- Group 8 – North Central Kansas
  - GEN-2008-027
  - GEN-2008-049
  - GEN-2008-055
  - GEN-2008-061
- Group 9 – South Central Oklahoma
  - GEN-2008-033
  - GEN-2008-034
  - GEN-2008-046
- Group 10 – North Central Oklahoma
  - GEN-2008-038
  - GEN-2008-042
  - GEN-2008-043
  - GEN-2008-057

While these groups were determined to not share impacts with other customers in this study, it is not necessarily the case that these requests do not share impacts with higher queued projects and are using the upgrades assigned by higher queued projects to facilitate the interconnection. These determinations were made based on the base case upgrades modeled in the powerflow models. If the base case assumptions are changed (i.e. previous queued customers withdrawing from the queue, suspending their Interconnection Agreements, changes in reliability base case upgrades), these determinations will have to be re-evaluated.

## **Determination of Cost Allocated Network Upgrades**

Cost Allocated Network Upgrades of wind generation interconnection requests were determined using the 2010 spring model. Cost Allocated Network Upgrades of peaking units was determined using the 2014 summer peak model. Once a determination of the required Network Upgrades was made, a powerflow model of the 2010 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), a distribution factor with no contingency that each generation interconnection request had on each new upgrade. The impact each generation interconnection request had on each upgrade project was weighted by the size of each request. Finally the costs due by each request for a particular project were then determined by allocating the portion of each request's impact over the impact of all affecting requests.



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

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

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

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

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

- 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 14,945 MW of generation into the existing and proposed transmission systems in the affected areas of the SPP transmission footprint consist of the necessary cost allocated shared facilities listed in Appendix G. Interconnection Facilities specific to each generation interconnection request are listed in Appendix F. Appendix G lists the costs by upgrade.

Other Network Constraints in the AEPW, MIDW, OKGE, SPS, SUNC, SWPA, MKEC, WERE, AND WFEC transmission systems that were identified are shown in Appendix I. 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 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 AEPW, EMDE, Grand River Dam Authority (GRDA), Kansas City Power & Light (KCPL), MIDW, MIPU, OKGE, SPS, SUNC, WERE, 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 2010 spring peak and the 2014 summer peak 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 2014 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 the 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.

The need for reactive compensation will be determined during the Cluster System Impact Cluster 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 1 (Woodward Area)** – The Woodward area contained approximately 1,250 MW of new interconnection requests. Constraints in this area consisted of overloading the 345kV lines into Oklahoma City. These constraints were mitigated with the conversion of the 765kV line from Woodward to Comanche to Wichita which was shared with other groups

**Cluster Group 2 (Hitchland Area)** – The Hitchland area contained 860 MW of interconnection requests. The major constraints for the Hitchland area included 345kV lines out of Hitchland. The mitigation of these constraints were mitigated with the conversion of the Hitchland – Woodward 345kV line to 765kV and the Woodward – Comanche – Wichita 765kV

**Cluster Group 3 (Spearville Area)** – The Spearville area contained 1,401 MW of interconnection requests. The constraints caused by the Spearville area cluster included the Spearville – Mullergren 230kV line, and the previously proposed Spearville – Wichita 345kV line. Conversion of the Spearville-Comanche-Wichita line to 765kV alleviated the constraints.

**Cluster Group 4 (Mingo)** – The Mingo/NW Kansas group had 450 MW of interconnection requests. With the addition of balance portfolio upgrades, most constraints were local in nature.

**Cluster Group 5 (Amarillo Area)** – The Amarillo group had 5014.5 MW of interconnection requests. The major constraints were all of the SPS area tie lines. Conversion of the proposed Grapevine – Lawton Eastside 345kV line to 765kV and a new Hitchland-Grapevine 765kV in conjunction with Hitchland – Woodward – Comanche – Wichita 765kV line alleviated the constraints. A line from Lawton Eastside – Seminole 345kV was also needed to alleviate overloads on Lawton Eastside - Sunnyside

**Cluster Group 6 (New Mexico/West Texas)** – This group had 1647 MW of interconnection requests. The major constraints in this area were all SPS south to north connections. A Potter-Tolk 345kV line is proposed for this area as well as a Roosevelt County – Tuco 345kV line and a conversion of the loop from New Mexico to Tuco from 230kV to 345kV.

**Cluster Group 7 (Southwestern Oklahoma)** – This group had 520 MW of interconnection requests in addition to the 1600 MW of previous queued generation in the area. Since most of the generation in this area had requested points of interconnection into relatively strong places on the existing transmission system, most constraints were on the local system.

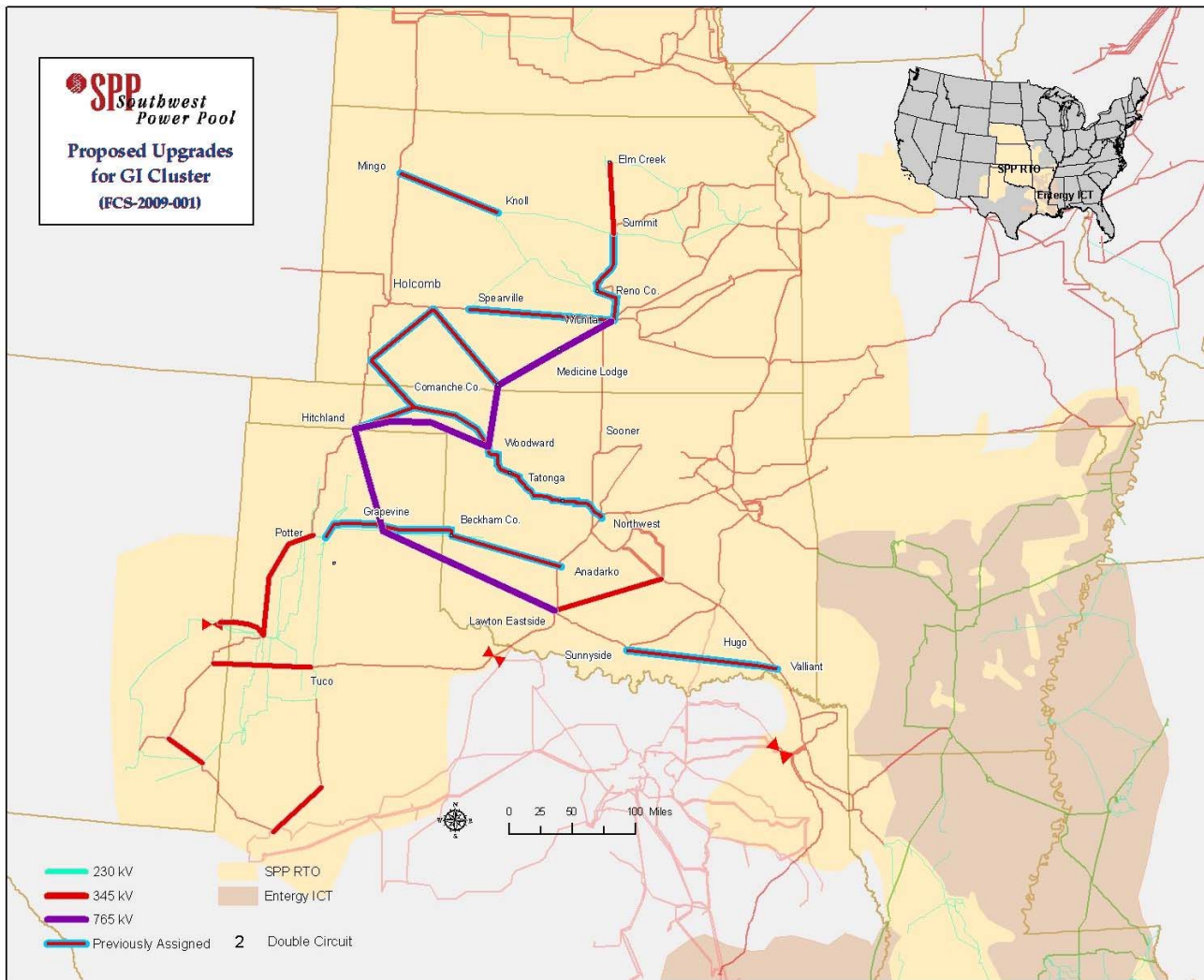
**Cluster Group 8 (North Kansas)** – The North Kansas area contained approximately 851.2 MW of new interconnection requests. Issues were local in this area.

**Cluster Group 9 (South Oklahoma)** – The South Oklahoma area contained approximately 600 MW of new interconnection requests. No constraints were found in this area.

**Cluster Group 10 (North Oklahoma)** – The North Oklahoma area contained approximately 1650 MW of new interconnection requests. With the addition of certain balanced portfolio upgrades, no constraints were found in this area.

On the next page is the map of the transmission upgrades that are recommended to interconnect the cluster of generation interconnection requests.

# Regional Map with Proposed Upgrades



**Figure 1 - Proposed Major Line Upgrades**

## Conclusion

The minimum cost of interconnecting all of the interconnection requests included in the Feasibility Cluster Study is estimated at \$1,997,800,000 for the Allocated Network Upgrades and Transmission Owner Interconnection Facilities are listed in Appendix E and F. These costs do not include the cost of upgrades of other transmission facilities listed in Appendix I which are Network Constraints.

These interconnection costs do not include any cost of Network Upgrades determined to be required by 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).

# Appendix

## A: Generation Interconnection Requests Considered for Feasibility Study

Request	Amount	Area	Requested Point of Interconnection	Proposed Point of Interconnection	Requested In-Service Date
GEN-2008-021***	41	WERE	Wolf Creek 345kV	Wolf Creek 345kV	5/16/2011
GEN-2008-022	909	SWPS	Tolk – Eddy 345kV	Tolk – Eddy 345kV	9/1/2011
GEN-2008-023	150	AEPW	Hobart Junction 138kV	Hobart Junction 138kV	12/1/2010
GEN-2008-024	1000	SUNC	*Comanche EHV 345kV	*Comanche EHV 345kV	12/1/2012
GEN-2008-025	150	SUNC	Ruleton 115kV	Ruleton 115kV	11/1/2009
GEN-2008-026	300	SUNC	Mingo 345kV	Mingo 345kV	10/15/2009
GEN-2008-027	200	WERE	Tap McDowell Creek – Morris County 230kV	Tap McDowell Creek – Morris County 230kV	12/31/2010
GEN-2008-028	360	SWPS	Hitchland 345kV	Hitchland 345kV	12/31/2012
GEN-2008-029	250	OKGE	Woodward 345kV	Woodward 345kV	1/1/2010
GEN-2008-030***	660	OKGE	Fort Smith – Muskogee 345kV	Fort Smith – Muskogee 345kV	10/1/2013
GEN-2008-031	4000	SWPS	Oklaunion 345kV	*Roberts County 765kV	11/5/2011
GEN-2008-032	80	SWPS	Tulia TAP 115kV	Tulia TAP 115kV	12/31/2010
GEN-2008-033	100	OKGE	Arbuckle 138kV	Arbuckle 138kV	12/31/2010
GEN-2008-034	100	OKGE	Arbuckle 138kV	Arbuckle 138kV	12/31/2010
GEN-2008-035	100	OKGE	EI Reno 138kV	EI Reno 138kV	12/31/2011
GEN-2008-036	100	OKGE	EI Reno 138kV	EI Reno 138kV	12/31/2011
GEN-2008-037	100	WFEC	Washita 138kV	Washita 138kV	11/30/2011
GEN-2008-038	150	AEPW	Shidler 138kV	Shidler 138kV	12/1/2010
GEN-2008-039	150	AEPW	Elk City – Grapevine 230kV	Beckham County 345kV	12/1/2010
GEN-2008-040	120	WFEC	Durham 138kV	Durham 138kV	12/1/2010
GEN-2008-041	135	SWPS	Tuco - Oklaunion 345kV	Tuco - Oklaunion 345kV	12/1/2010
GEN-2008-042	600	OKGE	Woodring 345kV	Woodring 345kV	12/1/2012
GEN-2008-043	600	OKGE	Woodring 345kV	Woodring 345kV	12/1/2011
GEN-2008-044	300	OKGE	^Tatonga EHV 345kV	^Tatonga EHV 345kV	12/1/2010
GEN-2008-045	300	OKGE	*Woodward EHV 345kV	*Woodward EHV 345kV	12/1/2010
GEN-2008-046	400	OKGE	Arbuckle 138kV	Arbuckle 138kV	12/1/2010
GEN-2008-047	300	SWPS	Hitchland 345kV	Hitchland 345kV	12/31/2012
GEN-2008-049	200	MKEC	Elm Creek 230kV	Elm Creek 230kV	12/31/2010
GEN-2008-050	201	SWPS	Tolk – Eddy 345kV	Tolk – Eddy 345kV	12/31/2009
GEN-2008-051	724.5	SWPS	Potter County 345kV	Potter County 345kV	12/31/2010
GEN-2008-052	60	SWPS	Parmer County 115kV	Parmer County 115kV	12/31/2009
GEN-2008-053	150	SWPS	McLean – McClellan 115kV	^Grapevine EHV 345 kV	12/31/2009
GEN-2008-055	300	MKEC	Tap Axtell – Knoll EHV 345kV	Tap Axtell – Knoll EHV 345kV	11/1/2011
GEN-2008-057	300	GRDA	Cleveland – Stillwater 138kV	Cleveland – Stillwater 138kV	12/31/2011
GEN-2008-058	201	SWPS	Roosevelt 230kV	Roosevelt 230kV	11/1/2010
GEN-2008-059	101	MKEC	Pratt – Medicine Lodge 115kV	^GEN-2007-025T 345KV	12/1/2010
GEN-2008-060	300	MKEC	Tap Spearville - Mullergren 230kV	Tap Spearville – Wichita 345kV	12/1/2010
GEN-2008-061	151.2	MIDW	Tap Axtell – ^Knoll EHV 345kV	Tap Axtell – ^Knoll EHV 345kV	12/1/2010
GEN-2008-062	100	SWPS	Cole 115kV	Ochiltree 115kV	12/1/2012
GEN-2008-063	100	SWPS	Cole 115kV	Ochiltree 115 115kV	12/1/2012
GEN-2008-064	201	SWPS	Oasis 230kV	Oasis 230kV	10/10/2010

Appendix A: GI Requests Considered For Feasibility Study



GEN-2008-065	200	OKGE	*Woodward EHV 345kV	*Woodward EHV 345kV	12/31/2012
<b>GROUPED TOTAL</b>	<b>14,945</b>				

- \* Planned Facility
- ^ Proposed Facility
- \*\* Alternate requests - counted as one request for study purpose
- \*\*\* Electrically Remote Interconnection Requests
- \*\*\*\*Portions of this request are alternates for other interconnection requests listed as prior queued generators



## B: Prior Queued Interconnection Requests

Request	Amount	Area	Requested/Proposed Point of Interconnection	Status or In-Service Date
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
GEN-2001-036	80	SPS	Norton 115kV	On-Line
GEN-2001-037	103	OKGE	Windfarm Switching 138kV	On-Line
GEN-2001-039A	105	MKEC	Tap Judson Large - Greensburg 115kV	On Suspension
GEN-2001-039M	105	WERE	Central Plains Tap 115kV	On-Line
GEN-2002-005	120	WFEC	Red Hills Wind 138kV	On-Line
GEN-2002-006	150	SPS	Texas County 115kV	12/31/2010
GEN-2002-008	240	SPS	*Hitchland 345kV	On-Line
GEN-2002-009	80	SPS	Hansford 115kV	On-Line
GEN-2002-022	240	SPS	Bushland 230kV	On-Line
GEN-2002-025A	150	KACP	Spearville 230kV	On-Line
GEN-2003-004	100	WFEC	Washita 138kV	On-Line
GEN-2003-005	100	WFEC	Tap Anadarko - Paradise 138kV	12/31/2008
GEN-2003-006A-E	100	EMDE	Elm Creek 230kV	On-Line
GEN-2003-006A-W	100	WERE	Elm Creek 230kV	On-Line
GEN-2003-013**	198	SPS	Tap Finney - *Hitchland 345kV	On Suspension
GEN-2003-019	250	MIDW	Smoky Hills 230kV	On-Line
GEN-2003-020	160	SPS	Martin 115kV	On-Line
GEN-2003-022	120	AEPW	Weatherford Wind Farm 138kV	On-Line
GEN-2004-003	240	SPS	Conway 115kV	On Suspension
GEN-2004-014	155	MKEC	Spearville 230kV	12/31/2009
GEN-2004-016	150	WERE	Tap Summit - East McPherson 230kV	On Suspension
GEN-2004-020	27	AEPW	Weatherford Wind Farm 138kV	On-Line
GEN-2004-023	21	WFEC	Washita 138kV	On-Line
GEN-2005-002	80	SPS	Tap Pringle - Riverview 230kV	On Suspension
GEN-2005-003	31	WFEC	Washita 138kV	On-Line
GEN-2005-008	120	OKGE	Woodward 138kV	On-Line
GEN-2005-010	160	SPS	Tap Roosevelt County North - Tolk West 230kV	On Suspension
GEN-2005-012	250	SUNC	Spearville 345kV	10/1/2011
GEN-2005-015	150	SPS	TUCO - Oklaunion 345kV	On Suspension
GEN-2005-017	340	SPS	Tap *Hitchland - Potter County 345kV	On Suspension
GEN-2005-021	86	SPS	Kirby 115kV	On Suspension
GEN-2006-002	150	AEPW	Beckham EHV 230/345 kV	On Suspension
GEN-2006-006	205.5	MKEC	Spearville 230kV	Under Study

Appendix B: Prior Queued Interconnection Requests



GEN-2006-020S	18.9	SPS	DWS Frisco Tap 115kV	12/31/2009
GEN-2006-021	100	MKEC	Flat Ridge Wind Farm Tap 138kV	On-Line
GEN-2006-022	150	MKEC	Pratt 115kV	10/2010
GEN-2006-024S	19.8	WFEC	Buffalo Bear Wind Farm Tap 69kV	On-Line
GEN-2006-027	320	WERE	Emporia Energy Center Tap (Lang) 345kV	On-Line
GEN-2006-031	75	WERE	Knoll 115kV	On-Line
GEN-2006-032	201	MIDW	South Hays 230kV	4/30/2012
GEN-2006-034	81	SUNC	Kanarado - Sharon Springs 115kV	On Suspension
GEN-2006-035	225	AEPW	Beckham EHV 230/345 kV	10/1/2010
GEN-2006-038	750	WFEC	Hugo 345kV	On Suspension
GEN-2006-039	400	SPS	Tap and Tie both Potter County - Plant X 230kV and Bushland - Deaf Smith 230kV	On Suspension
GEN-2006-040	100	SUNC	Mingo 115kV	6/30/2010
GEN-2006-043	99	AEPW	Beckham EHV 230/345 kV	12/31/2009
GEN-2006-044	370	SPS	*Hitchland 345kV	11/1/2011
GEN-2006-045	240	SPS	Tap and Tie both Potter County - Plant X 230kV and Bushland - Deaf Smith 230kV	12/31/2010
GEN-2006-046	130	OKGE	Dewey 138kV	12/31/2009
GEN-2006-047	240	SPS	^GEN-2006-046 Tap	12/31/2013
GEN-2006-049	400	SPS	Tap Finney - *Hitchland 345kV	Under Study
GEN-2007-002	160	SPS	Grapevine 115kV	10/1/2011
GEN-2007-004	150	SPS	Amoco Switching - Yoakum County 230kV	IA Pending
GEN-2007-005	200	SPS	Pringle 115kV	Under Study
GEN-2007-006	160	OKGE	Roman Nose 138kV	On Suspension
GEN-2007-008	300	SPS	^Grapevine EHV 230/345kV	Under Study
GEN-2007-010	200	SPS	^GEN-2006-045 Tap	Under Study
GEN-2007-011	135	SUNC	Syracuse 115kV	12/31/2010
GEN-2007-012	300	SUNC	Tap Red Willow - Mingo 345kV	Under Study
GEN-2007-013	99	SUNC	Selkirk 115kV	IA Pending
GEN-2007-015	135	WERE	Tap Humboldt - Kelly 161kV	Under Study
GEN-2007-019	375	SPS	Tap Lamar - Finney 345kV	Under Study
GEN-2007-021	201	OKGE	^Tatonga EHV 345kV	Under Study
GEN-2007-025	300	WERE	Tap *Comanche EHV - Wichita 345kV	Under Study
GEN-2007-026	130.2	SPS	^GEN-2006-045 Tap	Under Study
GEN-2007-027	60	SPS	Curry County - Norton 115kV	Under Study
GEN-2007-028	200	MKEC	Elm Creek 230kV	Under Study
GEN-2007-030	200	SPS	^Grapevine EHV 230/345kV	Under Study
GEN-2007-032	150	WFEC	Tap Clinton Junction - Clinton 138kV	Under Study
GEN-2007-033	200	SPS	Pringle - Harrington East 230kV	Under Study
GEN-2007-034	150	SPS	Tap Tolk - Eddy County 345kV	Under Study
GEN-2007-036	200	SUNC	Spearville 345kV	Under Study
GEN-2007-037	200	SUNC	^GEN-2007-036 345kV	Under Study
GEN-2007-038	200	SUNC	^GEN-2007-036 345kV	Under Study
GEN-2007-040	500	SUNC	Tap Holcomb - Spearville 345kV	Under Study

Appendix B: Prior Queued Interconnection Requests

GEN-2007-041	600	SPS	*Hitchland 345kV	Under Study
GEN-2007-042	360	SPS	*Hitchland 345kV	Under Study
GEN-2007-043	300	OKGE	Lawton Eastside - Cimarron 345kV	Under Study
GEN-2007-044	300	OKGE	^Tatonga EHV 345kV	Under Study
GEN-2007-045	171	SPS	Grapevine EHV 230/345kV	Under Study
GEN-2007-046	199.5	SPS	Hitchland 115kV	Under Study
GEN-2007-047	204	SUNC	Mingo 115kV	Under Study
GEN-2007-048	400	SPS	Amarillo South - Swisher County 230kV	Under Study
GEN-2007-049	60	WFEC	Carter Junction 69kV	Under Study
GEN-2007-050	200	OKGE	Woodward EHV 138kV	Under Study
GEN-2007-051	200	WFEC	Mooreland 138kV	Under Study
GEN-2007-052	150	WFEC	Anadarko 138kV	Under Study
GEN-2007-055	250	SPS	Tap ^GEN-2007-034 - Eddy County 345kV	Under Study
GEN-2007-056	600	SPS	*Hitchland 345kV	Under Study
GEN-2007-057	34.5	SPS	Moore County East 115kV	Under Study
GEN-2007-060	202	OKGE	^Tatonga EHV 345kV	Under Study
GEN-2007-061	200	OKGE	*Woodward EHV 345kV	Under Study
GEN-2007-062**	765	OKGE	*Woodward EHV 345kV	Under Study
GEN-2008-001	200	MIDW	Knoll EHV 230/345kV	Under Study
GEN-2008-003	101	OKGE	Woodward 138kV	Under Study
GEN-2008-007	102	SPS	Grassland 230kV	Under Study
GEN-2008-008	60	SPS	Graham 115kV	Under Study
GEN-2008-009	60	SPS	San Juan Mesa 230kV	Under Study
GEN-2008-011	600	SUNC	Holcomb 345kV	Under Study
GEN-2008-013	300	OKGE	Wichita - Woodring 345kV	Under Study
GEN-2008-014	150	SPS	Tap TUCO - Oklaunion 345kV	Under Study
GEN-2008-015	150	SPS	^GEN-2008-015 345kV	Under Study
GEN-2008-016	248	SPS	Grassland 230kV	Under Study
GEN-2008-017	300	SUNC	Setab 345kV	Under Study
GEN-2008-018	405	SUNC	Finney 345kV	Under Study
GEN-2008-019**	300	OKGE	^Tatonga EHV 345kV	Under Study
Llanoest	80	SPS	Llano Wind Farm Tap 115kV	On-Line
SPSDISTR	90	SPS	Dumas_19ST 115kV	On-Line
			Etter 115kV	On-Line
			Sherman 115kV	On-Line
			Spearman 115kV	On-Line
			Texas County 115kV	On-Line
BLUCAN2	151.2	WFEC	Washita 138kV (GEN-2003-004)	On-Line
			Washita 138kV (GEN-2004-023)	On-Line
			Washita 138kV (GEN-2005-003)	On-Line
Montezuma	112	MKEC	Haggard 115kV	On-Line
<b>GROUPED TOTAL</b>	<b>22,446</b>			

\* Planned Facility

## Appendix B: Prior Queued Interconnection Requests



^ Proposed Facility

\*\* Alternate requests - counted as one request for study purpose

\*\*\* Electrically Remote Interconnection Requests

**C: Study Groupings**

Cluster	Request	Amount	Area	Proposed Point of Interconnection
Prior Queued	GEN-2001-014	96	WFEC	Fort Supply 138kV
	GEN-2001-037	103	OKGE	Windfarm Switching 138kV
	GEN-2002-005	120	WFEC	Morewood - Elk City 138kV
	GEN-2005-008	120	OKGE	Woodward 138kV
	GEN-2006-046	130	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	200	OKGE	*Woodward 345kV
	GEN-2007-051	200	WFEC	Mooreland 138kV
	GEN-2007-060	202	OKGE	*Tatonga 345kV
	GEN-2007-061	200	OKGE	*Woodward 345kV
	GEN-2007-062**	765	OKGE	*Woodward 345kV
	GEN-2008-003	101	OKGE	*Woodward EHV 138kV
	GEN-2008-013	300	OKGE	Wichita - Woodring 345kV
GEN-2008-019**	300	OKGE	*Tatonga 345kV	
<b>PRIOR QUEUED SUBTOTAL</b>		<b>3,498</b>		
Cluster	Request	Amount	Area	Proposed Point of Interconnection
Woodward	GEN-2008-029	250	OKGE	Woodward 345kV
	GEN-2008-035	100	OKGE	EI Reno 138kV
	GEN-2008-036	100	OKGE	EI Reno 138kV
	GEN-2008-044	300	OKGE	Tatonga EHV 345kV
	GEN-2008-045	300	OKGE	Woodward EHV 345kV
	GEN-2008-065	200	OKGE	Woodward EHV 345kV
<b>WOODWARD SUBTOTAL</b>		<b>1,250</b>		
<b>AREA SUBTOTAL</b>		<b>4,748</b>		

Cluster	Request	Amount	Area	Proposed Point of Interconnection
	SPS Distribution	90	SPS	Various
	GEN-2002-006	150	SPS	Texas County 115kV
	GEN-2002-008	240	SPS	*Hitchland 345kV
	GEN-2002-009	80	SPS	Hansford County 115kV
	GEN-2003-013	198	SPS	*Hitchland - Finney 345kV
	GEN-2003-020	160	SPS	Carson County 115kV
	GEN-2005-002	80	SPS	Pringle - Riverview 230kV
	GEN-2005-017	340	SPS	*Hitchland - Potter County 345kV
	GEN-2006-020	20	SPS	*Hitchland - Sherman County Tap
	GEN-2006-044	370	SPS	*Hitchland 345kV
	GEN-2006-049	400	SPS	*Hitchland - Finney 345kV
	GEN-2007-005	200	SPS	Pringle 115kV
	GEN-2007-033	200	SPS	Pringle - Harrington-Nichols 230kV
	GEN-2007-041	600	SPS	*Hitchland 345kV
	GEN-2007-042	360	SPS	*Hitchland 345kV
	GEN-2007-046	200	SPS	*Hitchland 115kV
GEN-2007-056	600	SPS	*Hitchland 345kV	
GEN-2007-057	35	SPS	Moore County East 115kV	
<b>PRIOR QUEUED SUBTOTAL</b>		<b>4,323</b>		
Cluster	Request	Amount	Area	Proposed Point of Interconnection
Hitchland	GEN-2008-028	360	SPS	Hitchland 345kV
	GEN-2008-047	300	SPS	Hitchland 345kV
	GEN-2008-062	100	SPS	Ochiltree 115kV
	GEN-2008-063	100	SPS	Ochiltree 115kV
<b>HITCHLAND SUBTOTAL</b>		<b>860</b>		
<b>AREA SUBTOTAL</b>		<b>5,183</b>		

Cluster	Request	Amount	Area	Proposed Point of Interconnection
Prior Queued	Montezuma	112	MKEC	Haggard 115kV
	GEN-2001-039A	105	MKEC	Greensburg - Judson-Large 115kV
	GEN-2002-025A	150	MKEC	Spearville 230kV
	GEN-2004-014	155	MKEC	Spearville 230kV
	GEN-2005-012	250	SUNC	Spearville 345kV
	GEN-2006-006	205	MKEC	Spearville 230kV
	GEN-2007-019	375	SPS	Lamar - Finney 345kV
	GEN-2007-025	300	WERE	*Comanche - Wichita 345kV
	GEN-2007-036	200	SUNC	Spearville 345kV
	GEN-2007-037	200	SUNC	Spearville 345kV
	GEN-2007-038	200	SUNC	Spearville 345kV
	GEN-2007-040	500	SUNC	Holcomb - Spearville 345kV
	GEN-2008-011	600	SUNC	Holcomb 345kV
	GEN-2008-018	405	SUNC	Finney 345kV
<b>PRIOR QUEUED SUBTOTAL</b>		<b>3,757</b>		
Cluster	Request	Amount	Area	Proposed Point of Interconnection
Spearville	GEN-2008-024	1000	SUNC	Comanche EHV 345kV
	GEN-2008-059	101	MKEC	GEN-2007-025T 345kV
	GEN-2008-060	300	MKEC	Tap Spearville – Wichita 345kV
<b>SPEARVILLE SUBTOTAL</b>		<b>1,401</b>		
<b>AREA SUBTOTAL</b>		<b>5,158</b>		

Cluster	Request	Amount	Area	Proposed Point of Interconnection
Prior Queued	GEN-2001-039M	100	SUNC	Leoti - City Services 115kV
	GEN-2006-032	200	MIDW	South Hays 230kV
	GEN-2006-034	81	SUNC	Kanarado - Sharon Springs 115kV
	GEN-2006-040	100	SUNC	Mingo 115kV
	GEN-2007-011	135	SUNC	Syracuse 115kV
	GEN-2007-013	99	SUNC	Selkirk 115kV
	GEN-2007-012	300	SUNC	Mingo - Red Willow 345kV
	GEN-2007-047	204	SUNC	Mingo 345kV
	GEN-2008-001	200	MIDW	^Knoll 345kV
GEN-2008-017**	300	SUNC	Setab 345kV	
<b>PRIOR QUEUED SUBTOTAL</b>		<b>1,719</b>		
Cluster	Request	Amount	Area	Proposed Point of Interconnection
Mingo	GEN-2008-025	150	SUNC	Ruleton 115kV
	GEN-2008-026	300	SUNC	Mingo 345kV
<b>MINGO SUBTOTAL</b>		<b>450</b>		
<b>AREA SUBTOTAL</b>		<b>2,169</b>		

Cluster	Request	Amount	Area	Proposed Point of Interconnection
Prior Queued	Lano Estacada	80	SPS	Lano Estacada 115kV
	GEN-2002-022	240	SPS	Bushland 230kV
	GEN-2004-003	240	SPS	Conway 115kV
	GEN-2005-021	86	SPS	Kirby 115kV
	GEN-2006-039	400	SPS	Tap and Tie both Potter County - Plant X 230kV and Bushland - Deaf Smith 230kV
	GEN-2006-045	240	SPS	Dewey 138kV
	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-2007-008	300	SPS	^Grapevine 345kV
	GEN-2007-010	200	SPS	Potter County - Plant X 230kV
	GEN-2007-026	130	SPS	Potter County - Plant X 230kV
	GEN-2007-030	200	SPS	^Grapevine 345kV
	GEN-2007-045	171	SPS	^Grapevine 345kV
GEN-2007-048	400	SPS	Amarillo South - Swisher County 230kV	
<b>PRIOR QUEUED SUBTOTAL</b>		<b>3,087</b>		
Cluster	Request	Amount	Area	Proposed Point of Interconnection
Amarillo	GEN-2008-031	4000	SPS	Roberts County 765kV
	GEN-2008-032	80	SPS	Tulia TAP 115kV
	GEN-2008-051	724.5	SPS	Potter County 345kV
	GEN-2008-052	60	SPS	Parmer County 115kV
	GEN-2008-053	150	SPS	Grapevine EHV 345 kV
<b>AMARILLO SUBTOTAL</b>		<b>5,014.5</b>		
<b>AREA SUBTOTAL</b>		<b>8,101.5</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	Caprock Tap 115kV
	GEN-2005-010	160	SPS	Roosevelt County - Tolk West 230kV (Single Ckt Tap)
	GEN-2005-015	150	SPS	TUCO - Oklaunion 345kV
	GEN-2006-048	150	SPS	Seven Rivers 115kV
	GEN-2007-004	150	SPS	Amoco Switching - Yoakum County 230kV
	GEN-2007-027	60	SPS	Curry County - Norton 115kV
	GEN-2007-034	150	SPS	Tolk - Eddy County 345kV
	GEN-2007-055	250	SPS	Tolk - Eddy County 345kV
	GEN-2008-007	102	SPS	Grassland 230kV
	GEN-2008-008	60	SPS	Graham 115kV
	GEN-2008-009	60	SPS	San Juan Mesa 230kV
	GEN-2008-014	150	SPS	TUCO - Oklaunion 345kV
	GEN-2008-015	150	SPS	TUCO - Oklaunion 345kV
GEN-2008-016	248	SPS	Grassland 230kV	
<b>PRIOR QUEUED SUBTOTAL</b>		<b>2,100</b>		
Cluster	Request	Amount	Area	Proposed Point of Interconnection
New Mexico & West Texas	GEN-2008-022	909	SPS	Tolk – Eddy County 345kV
	GEN-2008-041	135	SPS	TUCO - Oklaunion 345kV
	GEN-2008-050	201	SPS	Tolk – Eddy County 345kV
	GEN-2008-058	201	SPS	Roosevelt 230kV
	GEN-2008-064	201	SPS	Oasis 230kV
<b>NM &amp; WEST TEXAS AREA SUBTOTAL</b>		<b>1,647</b>		
<b>AREA SUBTOTAL</b>		<b>3,747</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	150	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	Clinton Junction - Clinton 138kV
	GEN-2007-043	300	AEPW	Lawton Eastside - Cimarron 345kV
	GEN-2007-049	60	WFEC	Carter Junction 69kV
	GEN-2007-052	150	WFEC	Anadarko 138kV
<b>PRIOR QUEUED SUBTOTAL</b>		<b>1,608</b>		
Cluster	Request	Amount	Area	Proposed Point of Interconnection
SW Oklahoma	GEN-2008-023	150	AEPW	Hobart Junction 138kV
	GEN-2008-037	100	WFEC	Washita 138kV
	GEN-2008-039	150	AEPW	Beckham EHV 345 kV
	GEN-2008-040	120	WFEC	Durham 138kV
<b>SW OKLAHOMA SUBTOTAL</b>		<b>520</b>		
<b>AREA SUBTOTAL</b>		<b>2,128</b>		



Cluster	Request	Amount	Area	Proposed Point of Interconnection
<b>Prior Queued</b>	GEN-2003-006A	200	MKEC	Elm Creek 230kV
	GEN-2003-019	250	MIDW	Smoky Hills 230kV
	GEN-2006-027	320	WERE	Emporia 345kV
	GEN-2006-031	75	MIDW	Knoll 115kV
	GEN-2006-032	200	MIDW	South Hays 230kV
	GEN-2007-015	135	WERE	Humboldt – Kelley 115kV
	GEN-2007-028	200	MKEC	Elm Creek 230kV
	GEN-2008-001	200	MIDW	Knoll 230kV
	GEN-2006-035	225	AEPW	Grapevine - Elk City 230kV
GEN-2007-052	150	WFEC	Anadarko 138kV	
<b>PRIOR QUEUED SUBTOTAL</b>		<b>1,955</b>		

Cluster	Request	Amount	Area	Proposed Point of Interconnection
<b>North Kansas</b>	GEN-2008-027	200	WERE	Tap McDowell Creek – Morris County 230kV
	GEN-2008-049	200	MKEC	Elm Creek 230kV
	GEN-2008-055	300	MKEC	Tap Axtell – Knoll EHV 345kV
	GEN-2008-061	151.2	MIDW	Tap Knoll – Smoky Hills 230kV
<b>NORTH KANSAS SUBTOTAL</b>		<b>851.2</b>		
<b>AREA SUBTOTAL</b>		<b>2,806</b>		

Cluster	Request	Amount	Area	Proposed Point of Interconnection
<b>South Oklahoma</b>	GEN-2008-033	100	OKGE	Arbuckle 138kV
	GEN-2008-034	100	OKGE	Arbuckle 138kV
	GEN-2008-046	400	OKGE	Arbuckle 138kV
<b>AREA SUBTOTAL</b>		<b>600</b>		

Cluster	Request	Amount	Area	Proposed Point of Interconnection
<b>Prior Queued</b>	GEN-2006-021	100	MKEC	Flat Ridge 138kV
	GEN-2006-022	150	MKEC	Pratt 115kV
	GEN-2007-025	300	WERE	Comanche – Medicine Lodge 345kV
	GEN-2008-013	300	OKGE	Wichita – Woodring 345kV
<b>PRIOR QUEUED SUBTOTAL</b>		<b>850</b>		

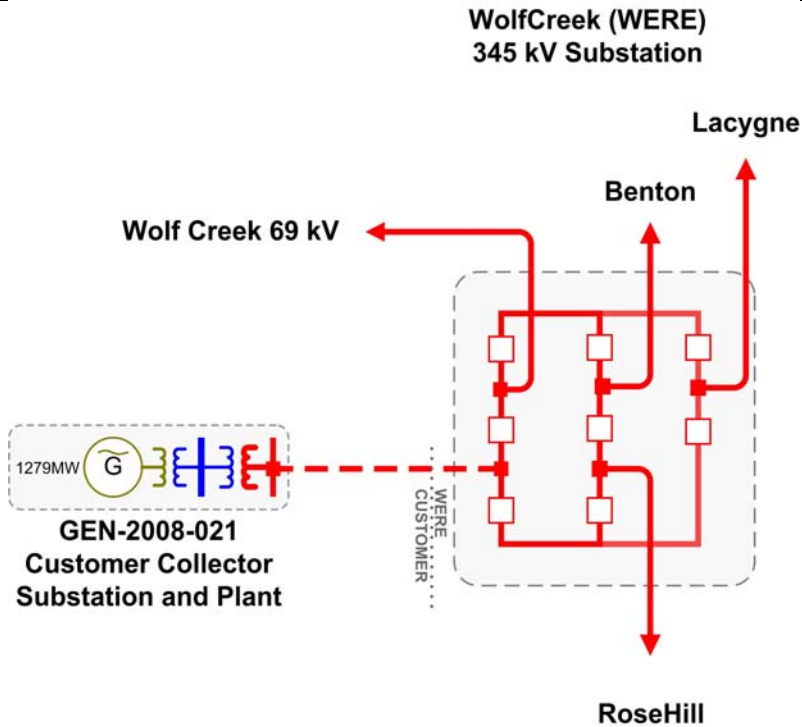
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<b>North Oklahoma</b>	GEN-2008-038	150	AEPW	Shidler 138kV
	GEN-2008-042	600	OKGE	Woodring 345kV
	GEN-2008-043	600	OKGE	Woodring 345kV
	GEN-2008-057	300	GRDA	Cleveland – Stillwater 138kV
<b>NORTH OKLAHOMA</b>		<b>1650</b>		
<b>AREA SUBTOTAL</b>		<b>2,500</b>		
<b>***CLUSTERED TOTAL (w/o PRIOR QUEUED)</b>		<b>14,243.7</b>		
<b>***CLUSTERED TOTAL (w/PRIOR QUEUED)</b>		<b>37,391</b>		

\* Planned Facility  
 ^ Proposed Facility  
 \*\* Alternate requests - counted as one request for study purpose

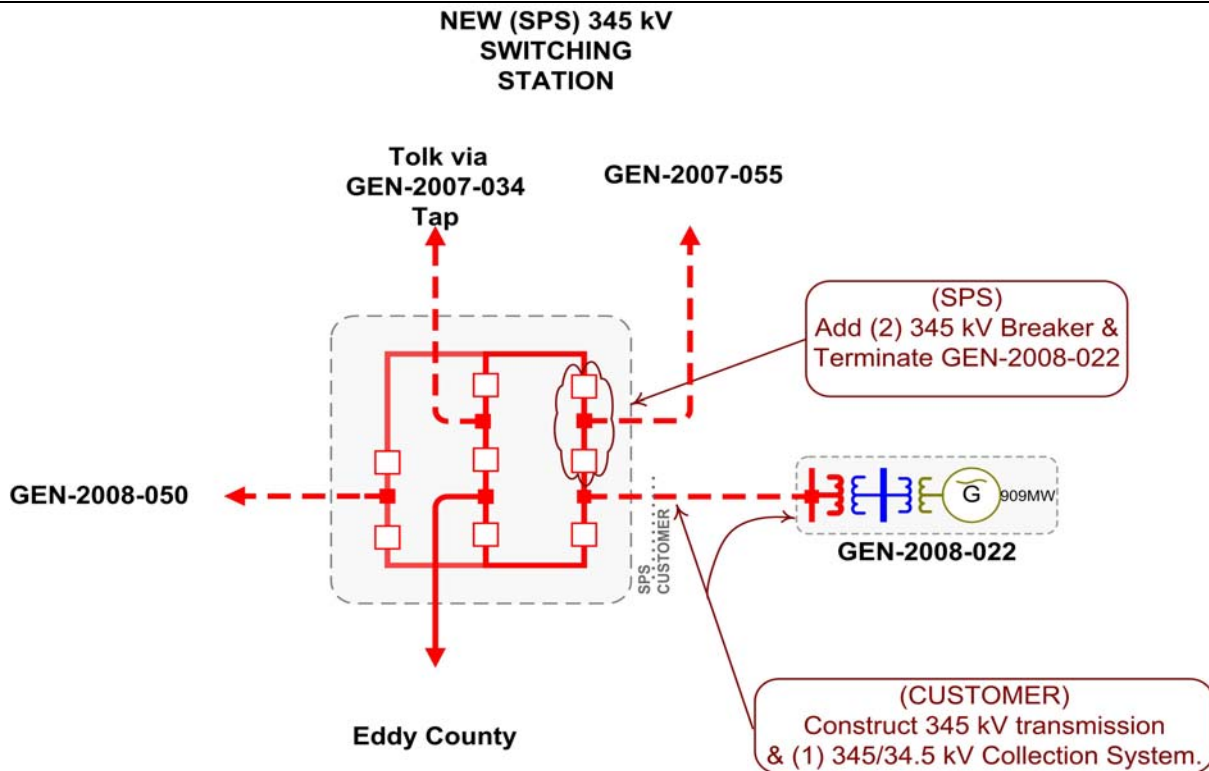
\*\*\* Electrically Remote Interconnection Requests

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

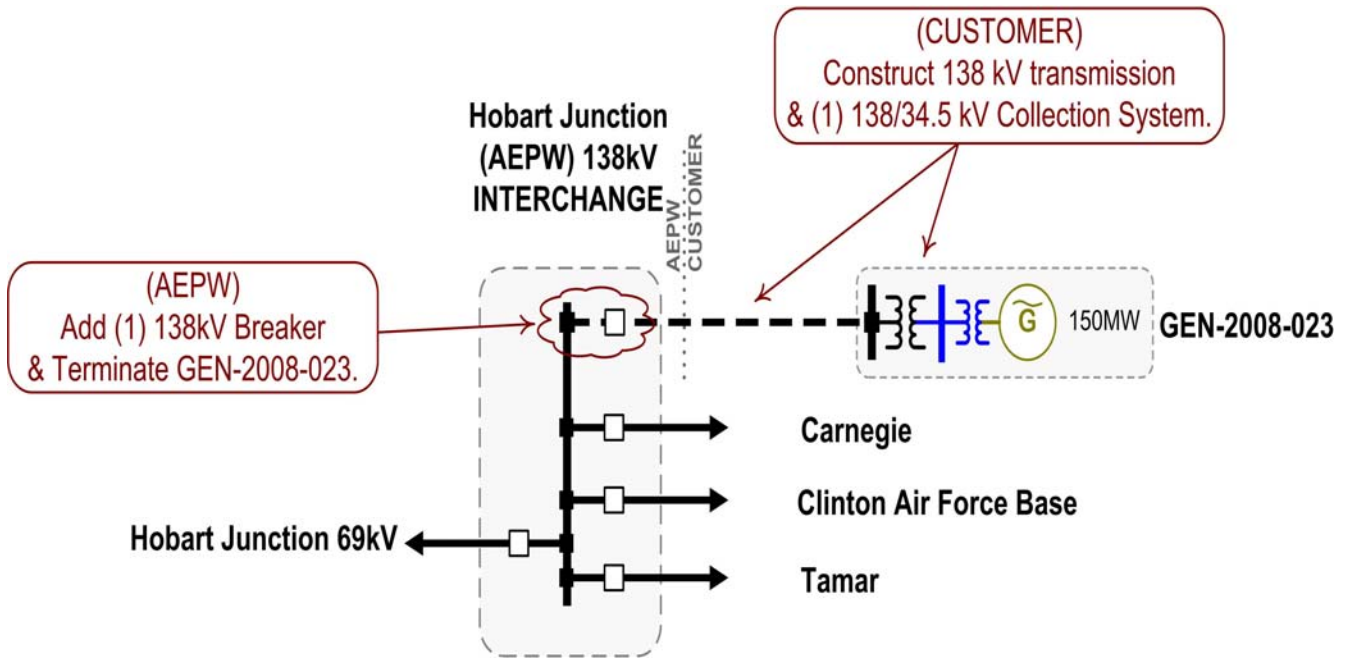
#### GEN-2008-021



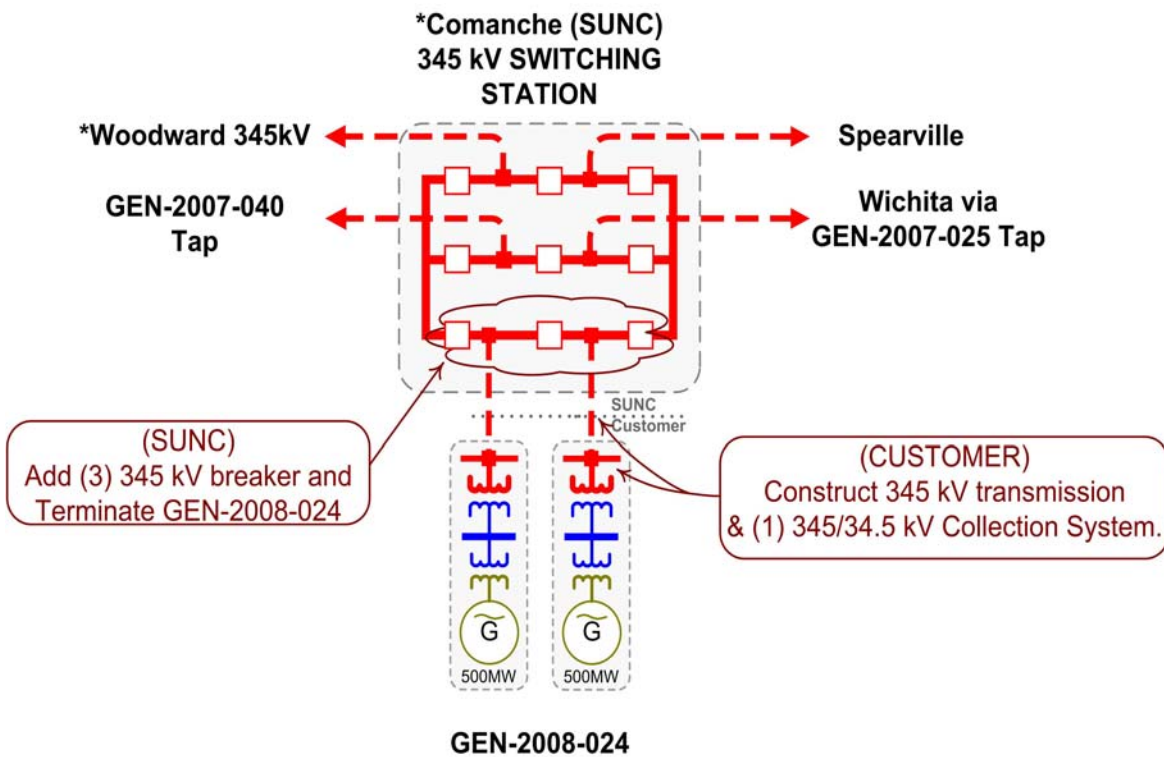
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**GEN-2008-023**

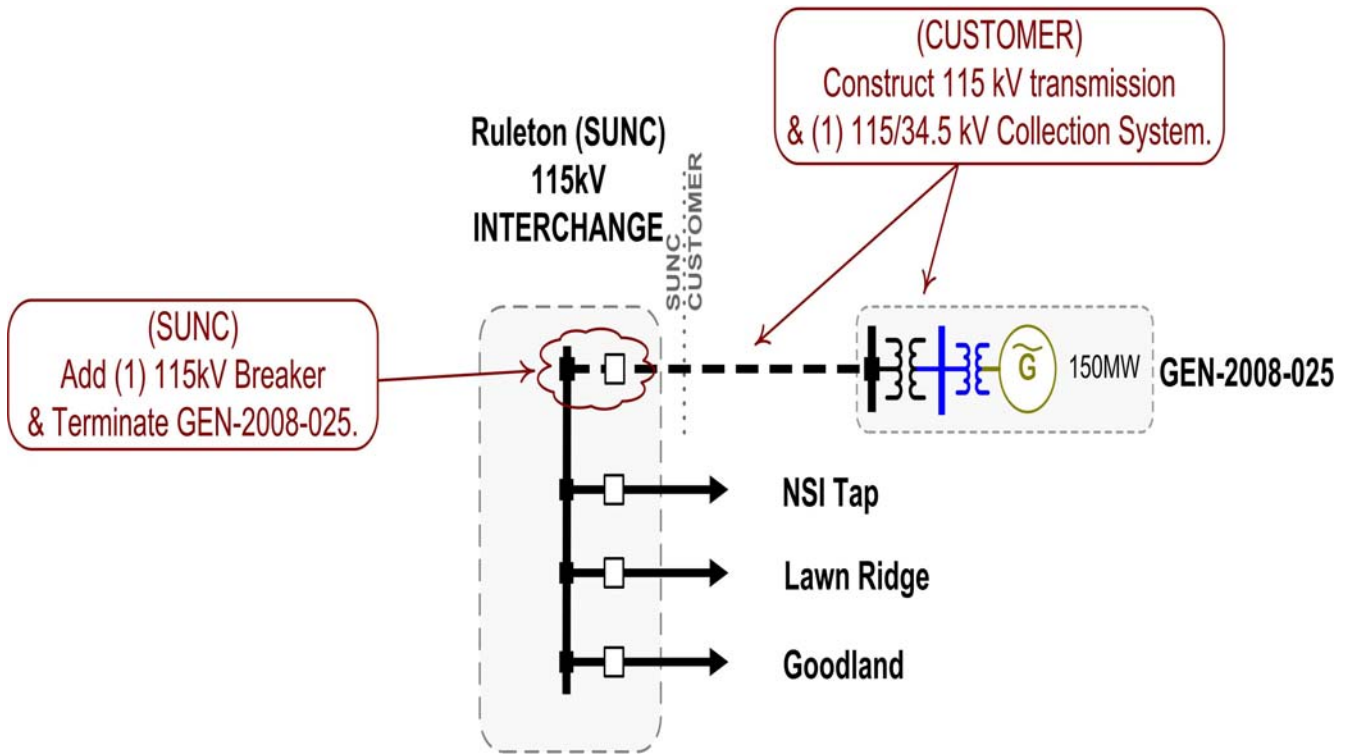


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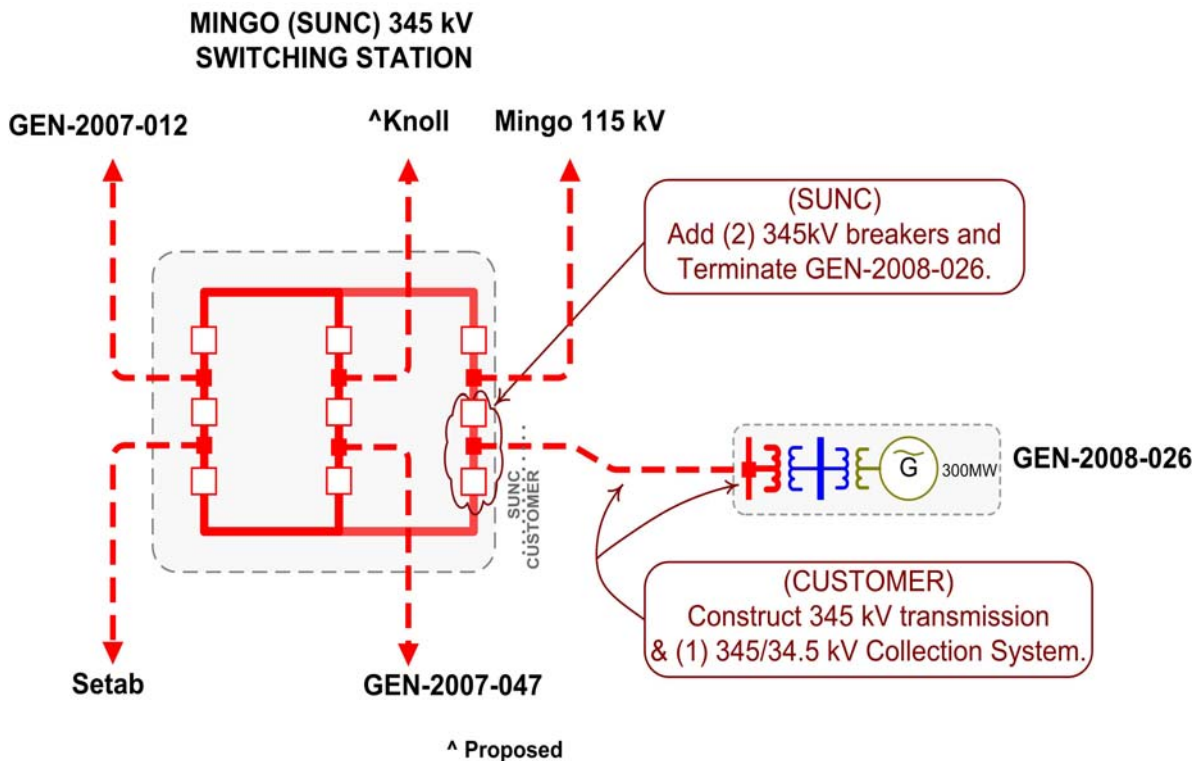


\* Planned      ^ Proposed

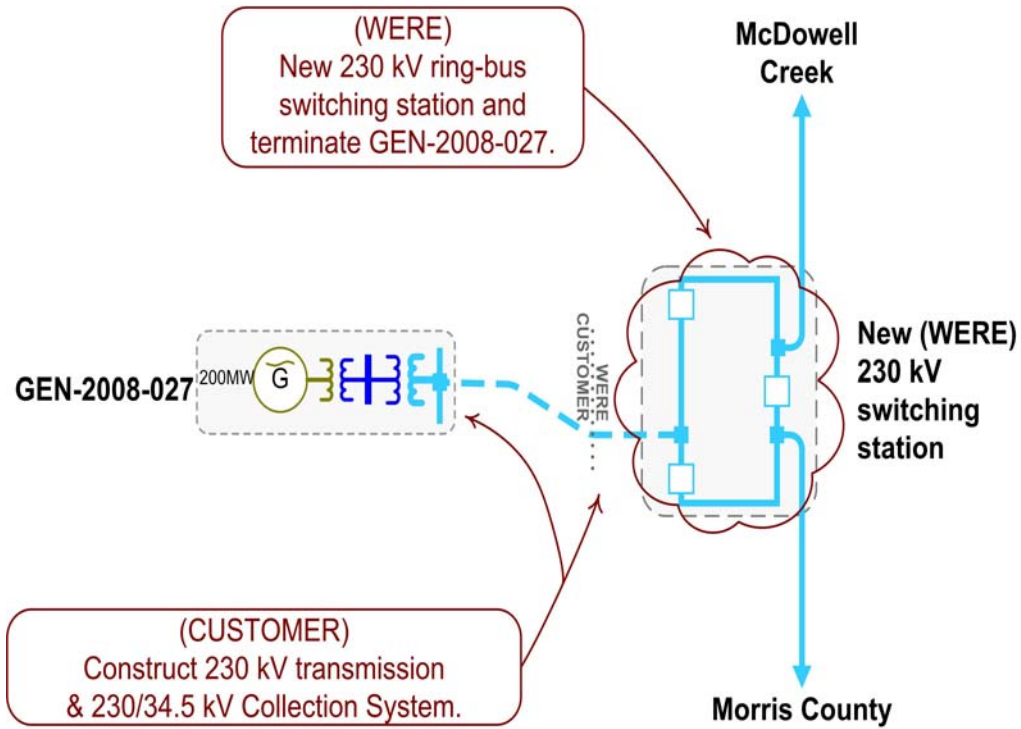
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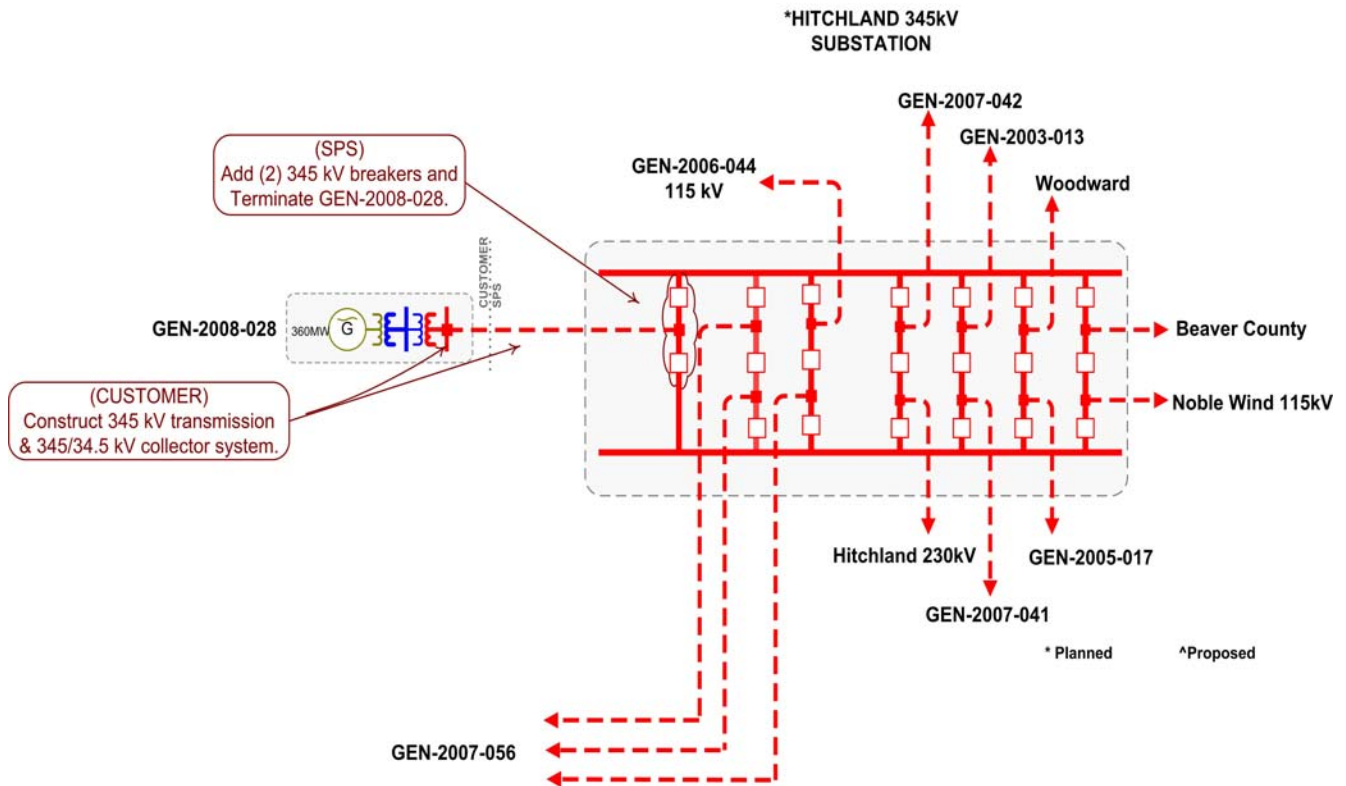
**GEN-2008-026**



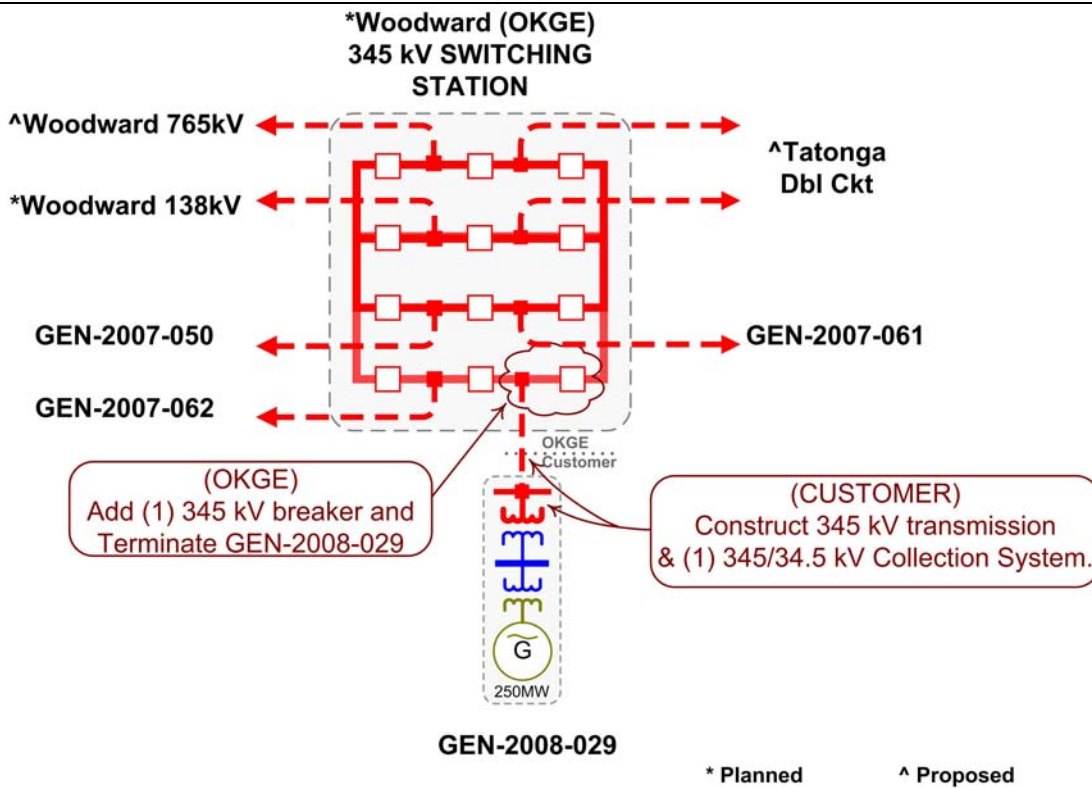
**GEN-2008-027**



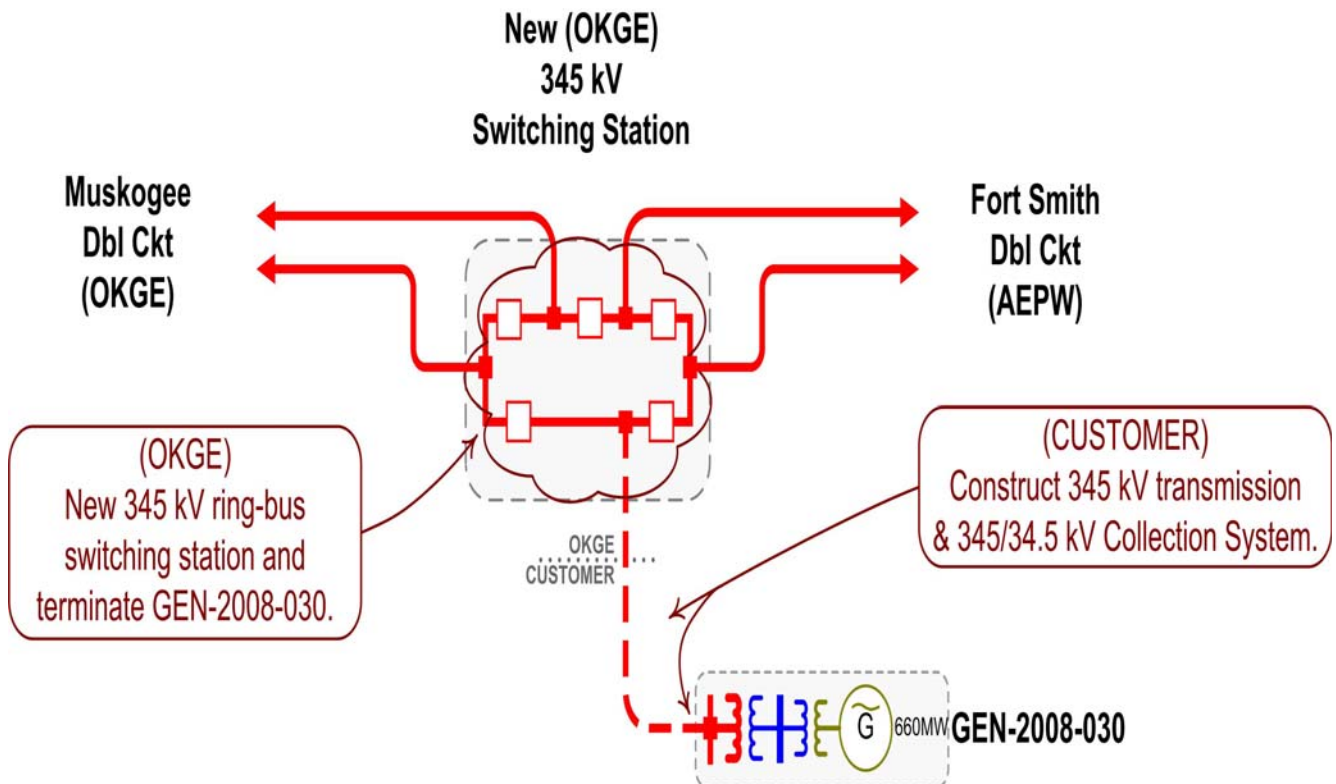
**GEN-2008-028**



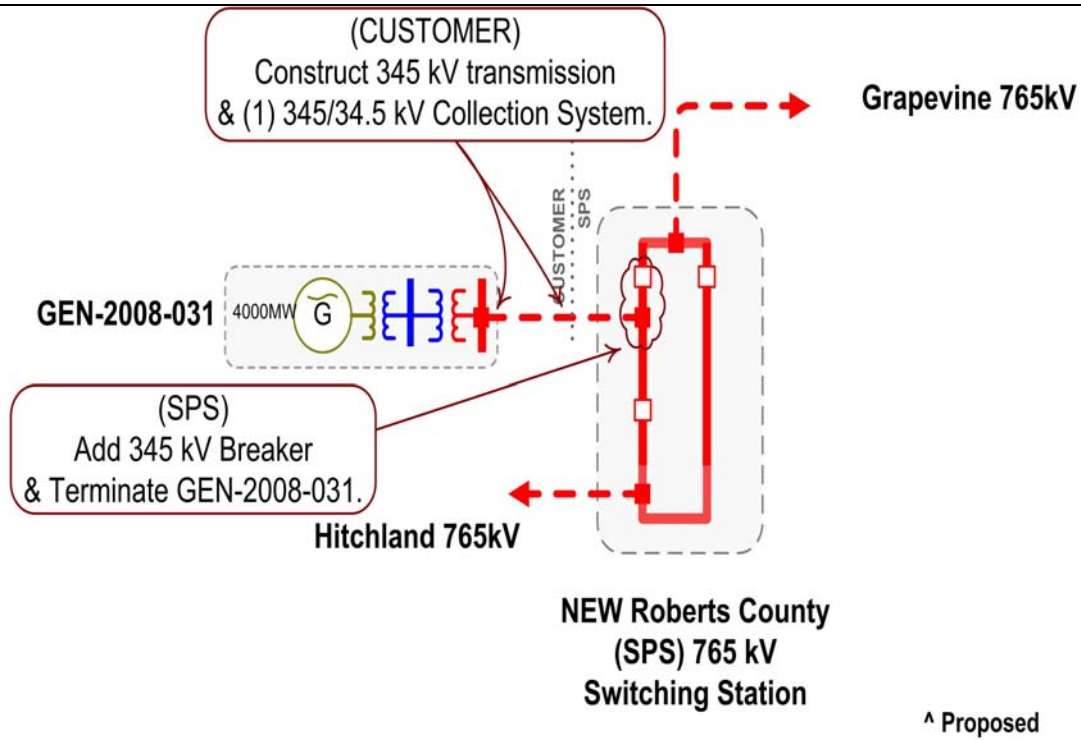
**GEN-2008-029**



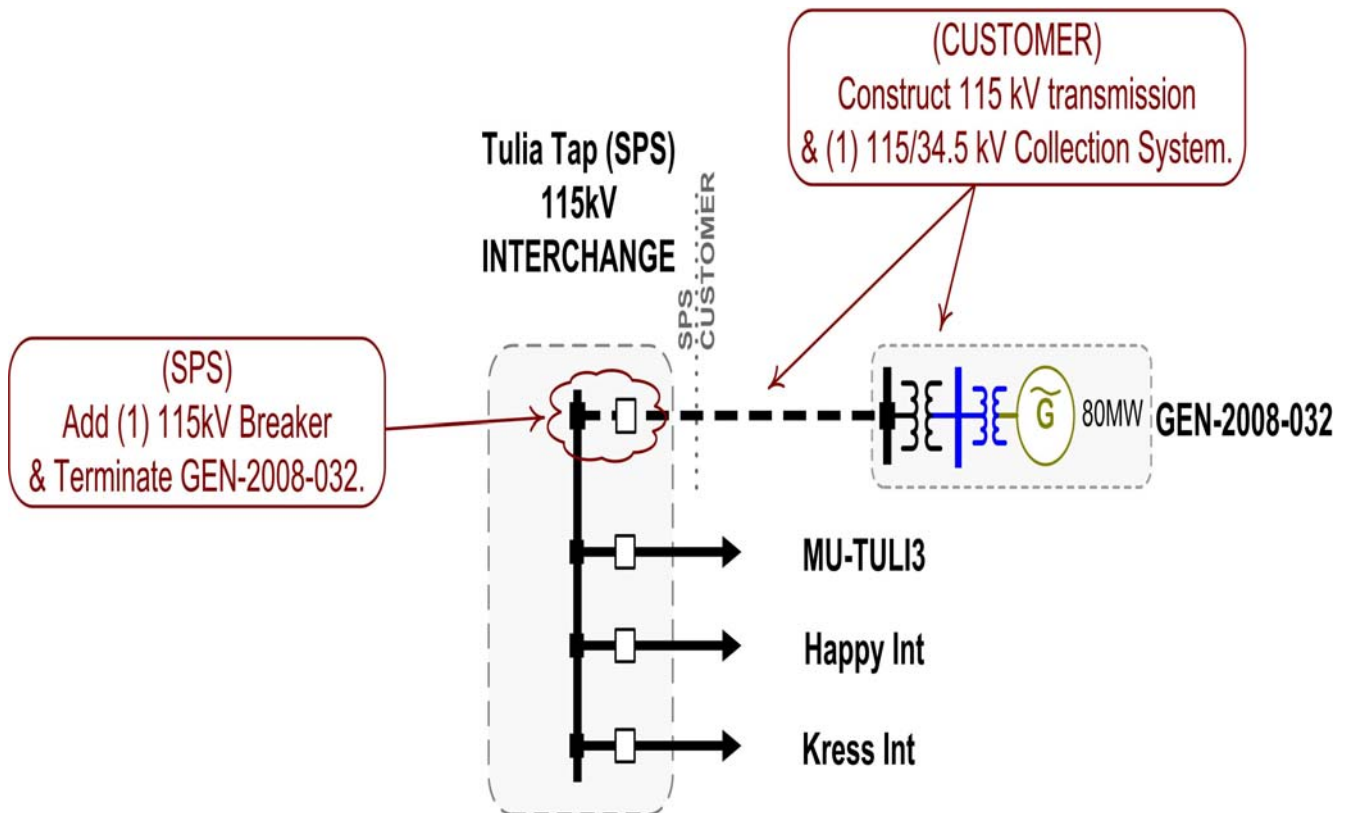
**GEN-2008-030**



**GEN-2008-031**

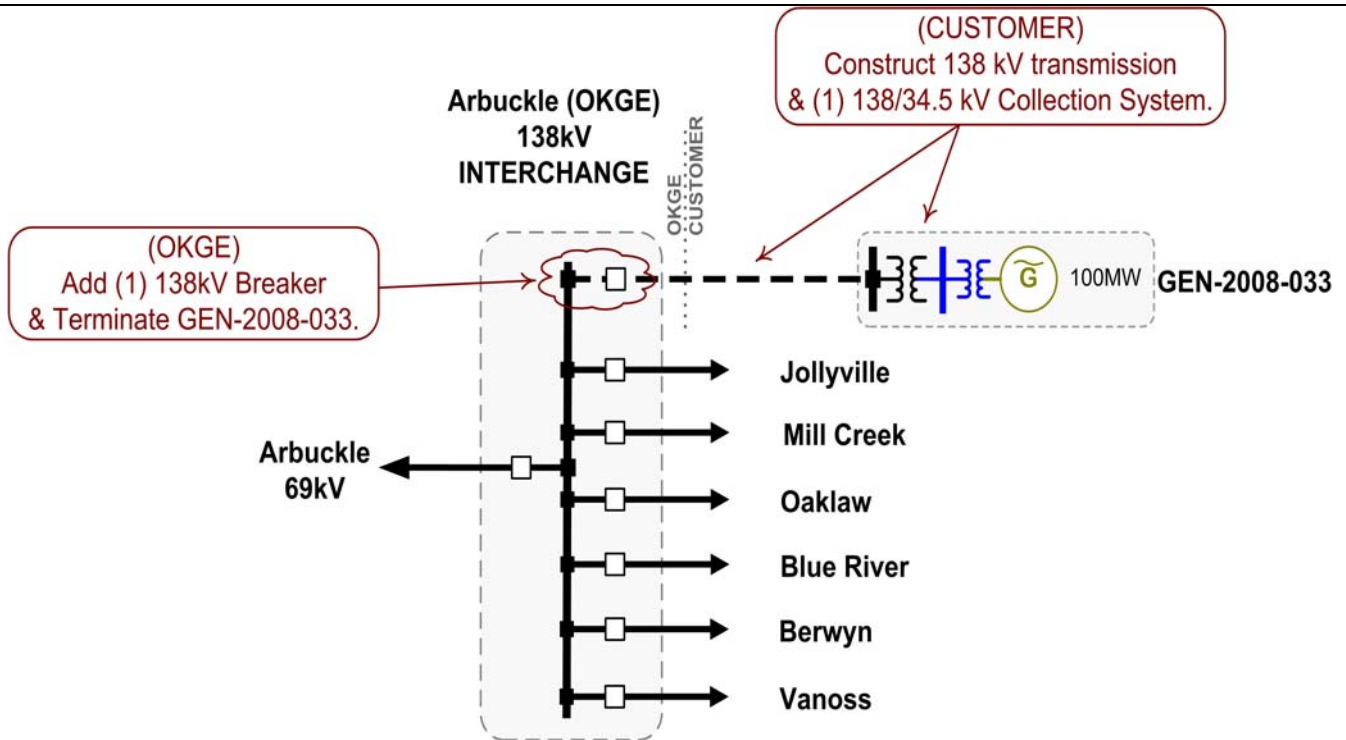


**GEN-2008-032**

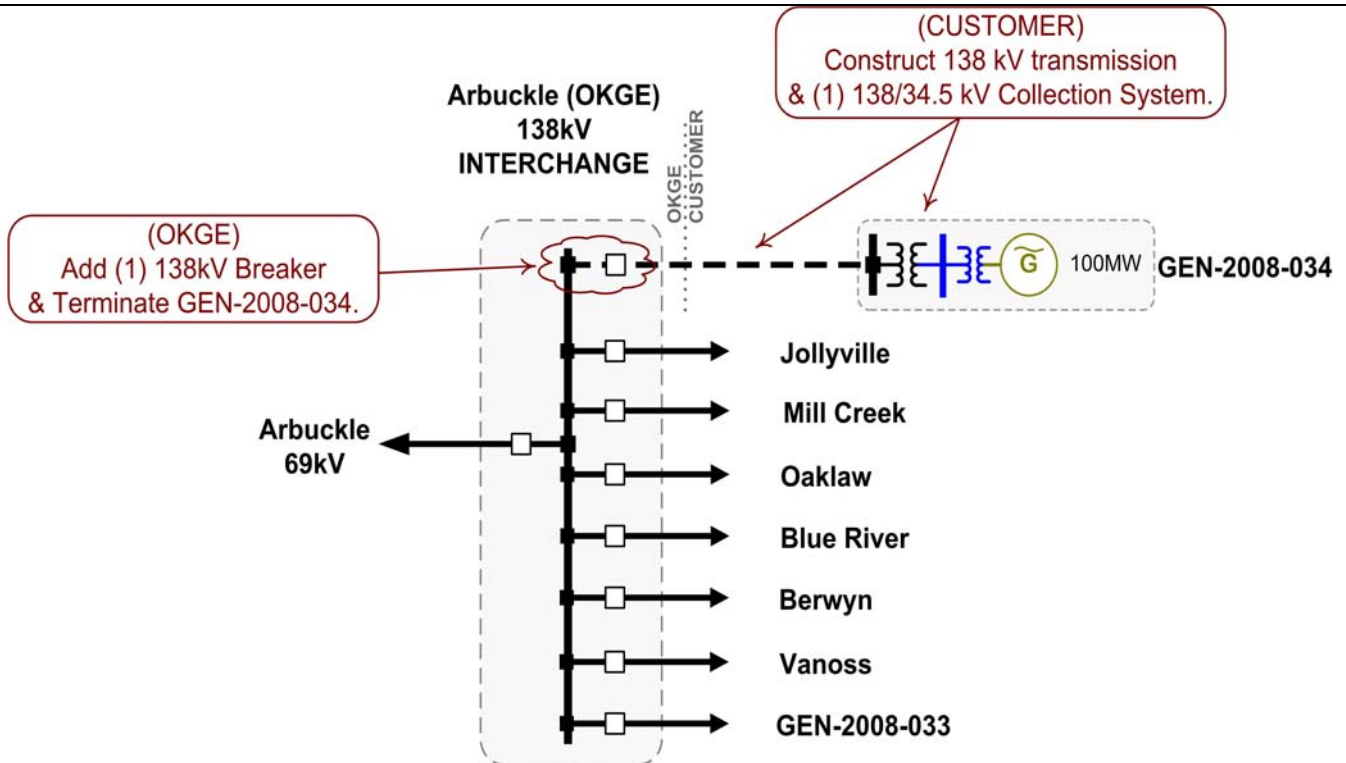




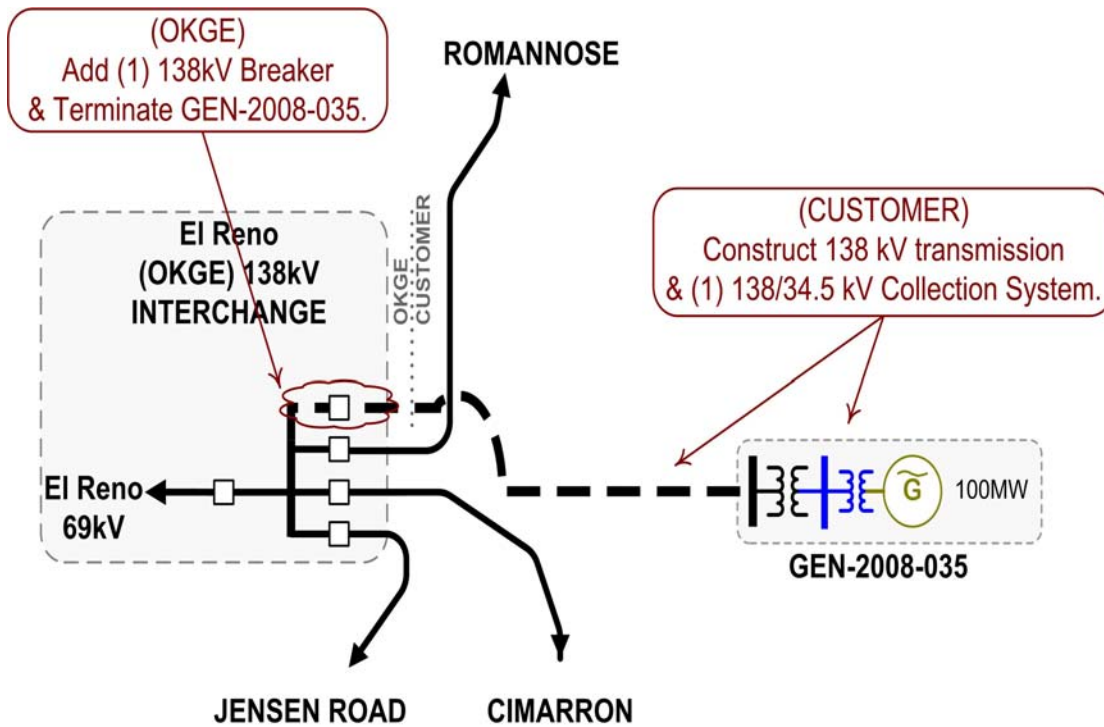
**GEN-2008-033**



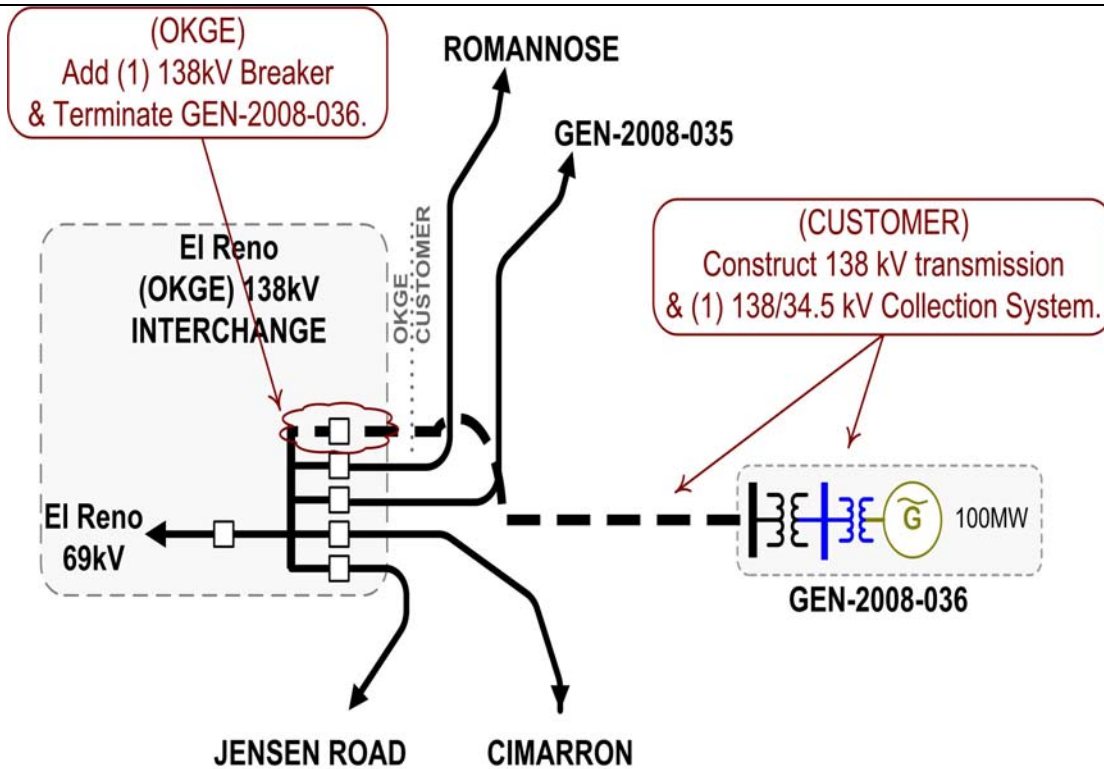
**GEN-2008-034**



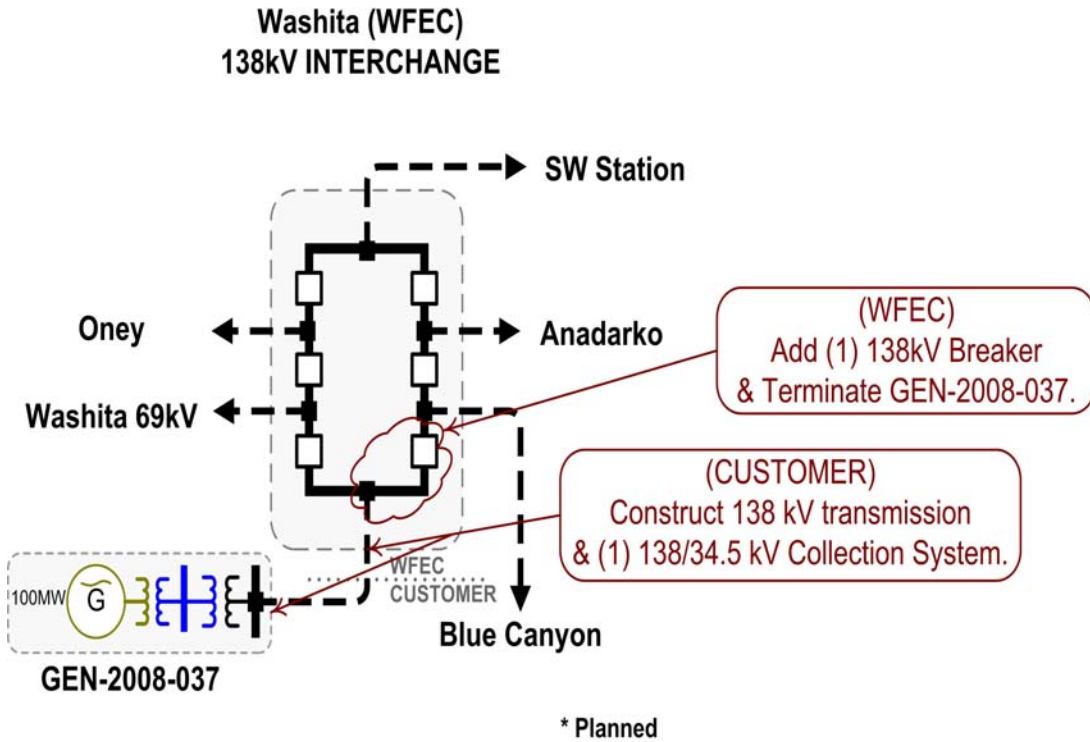
**GEN-2008-035**



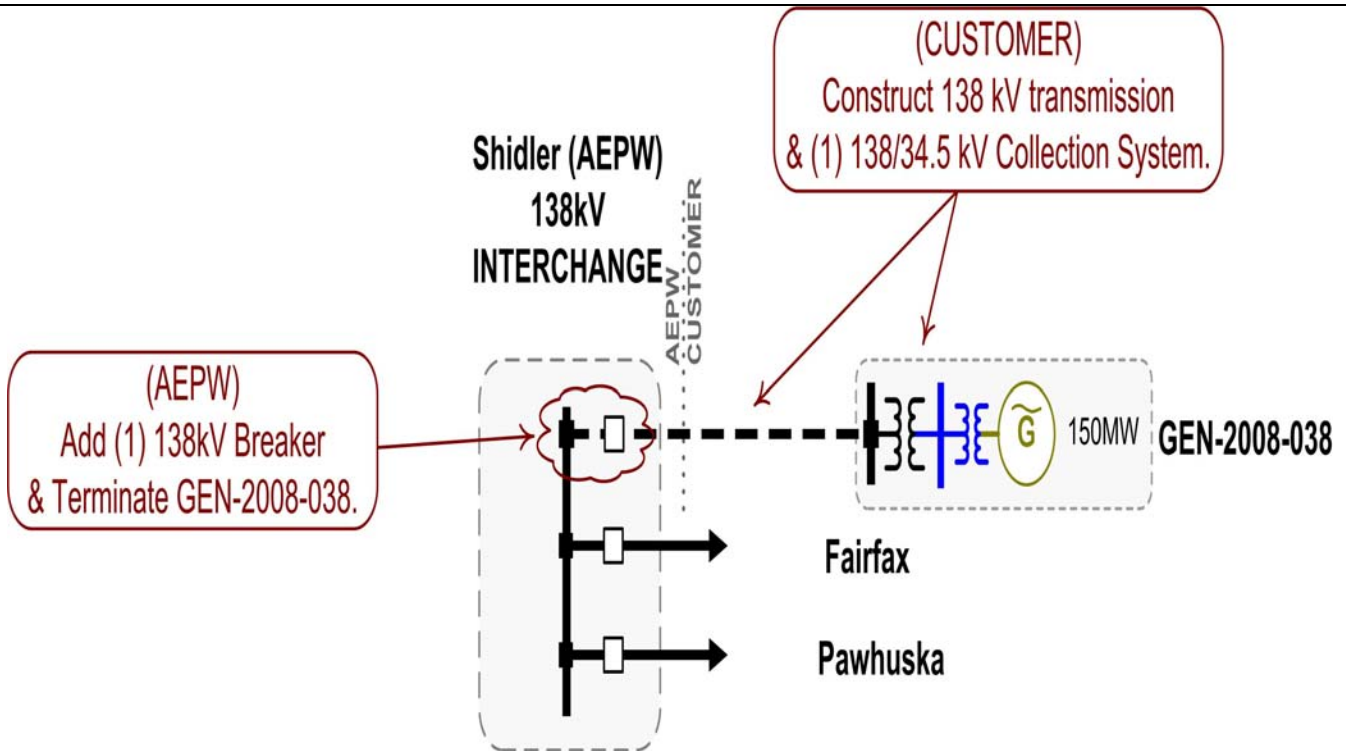
**GEN-2008-036**



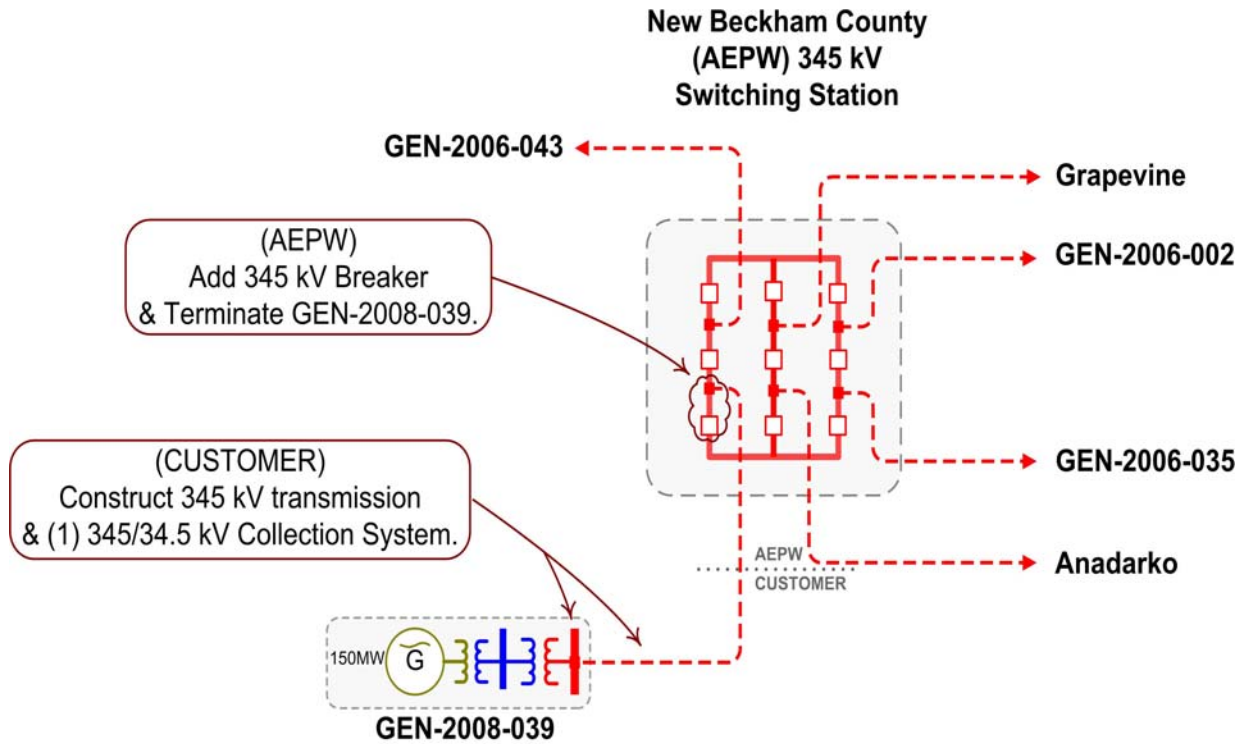
**GEN-2008-037**



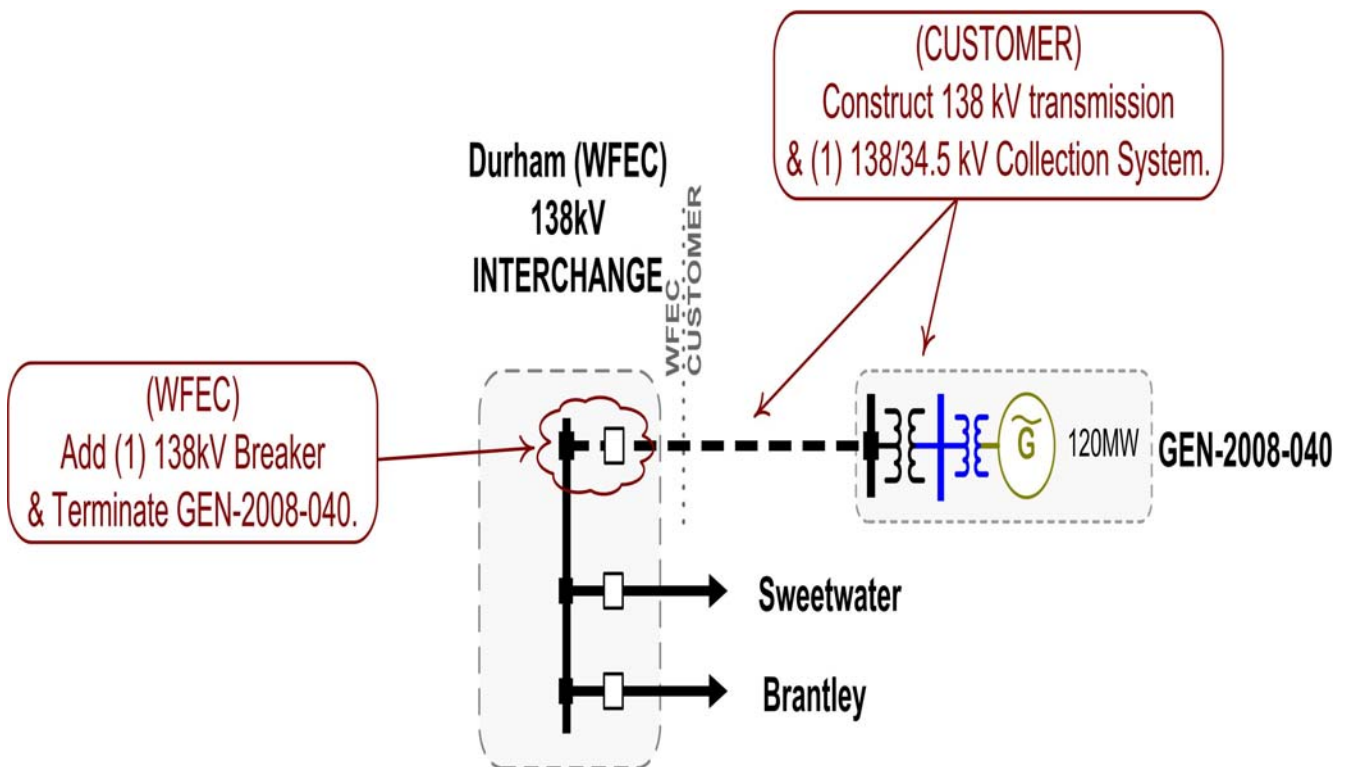
**GEN-2008-038**



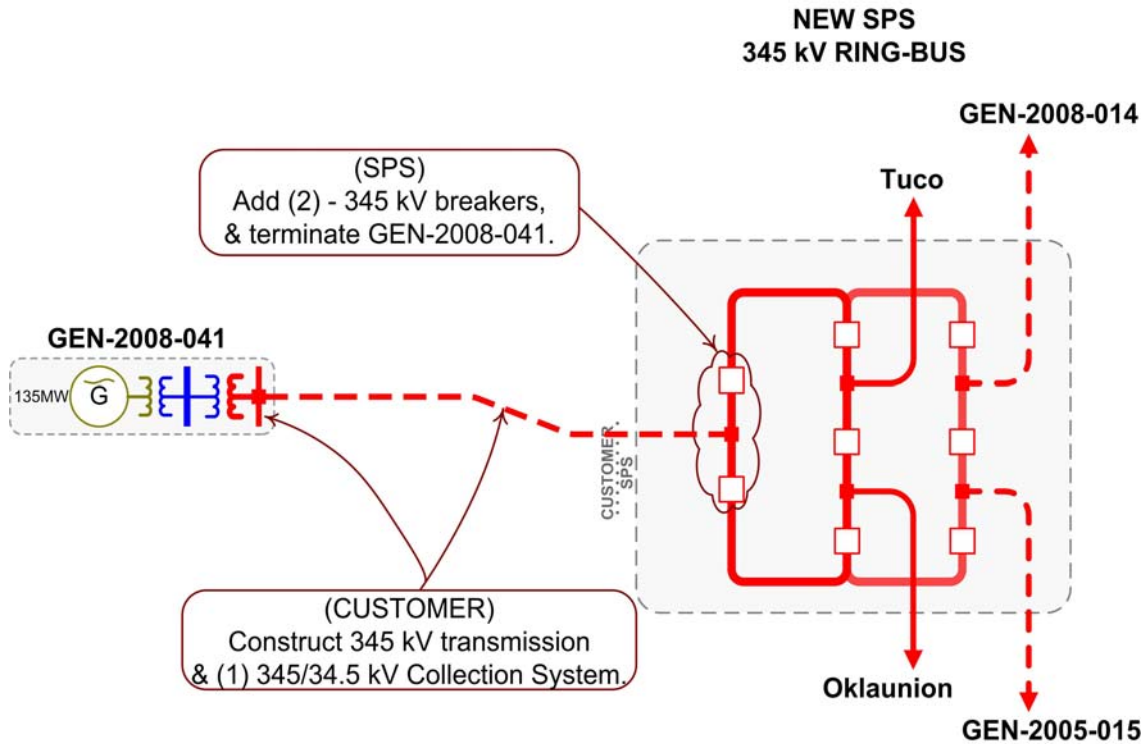
**GEN-2008-039**



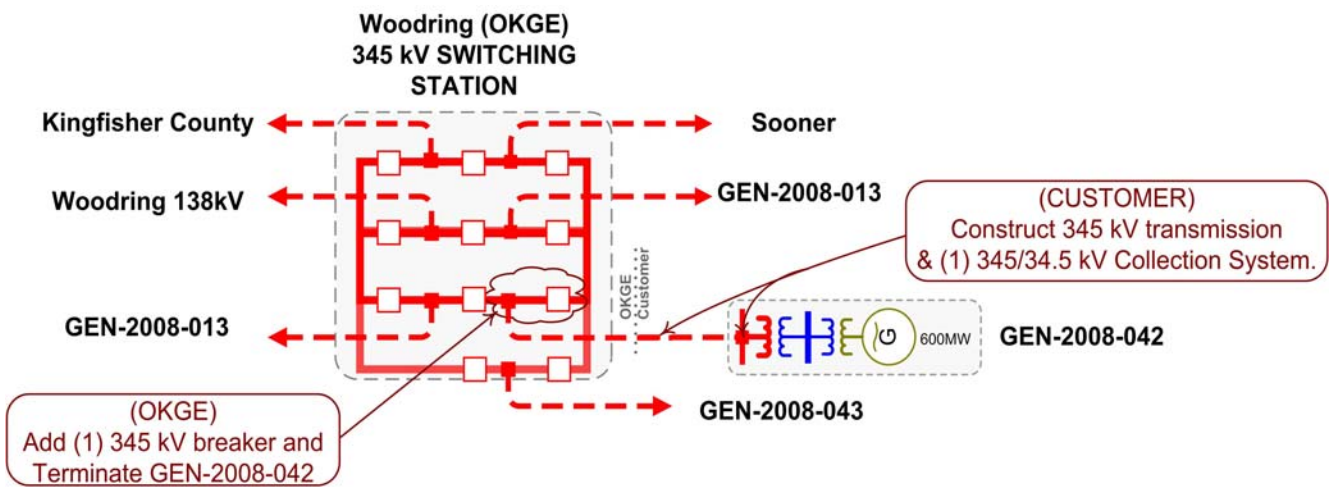
**GEN-2008-040**



**GEN-2008-041**

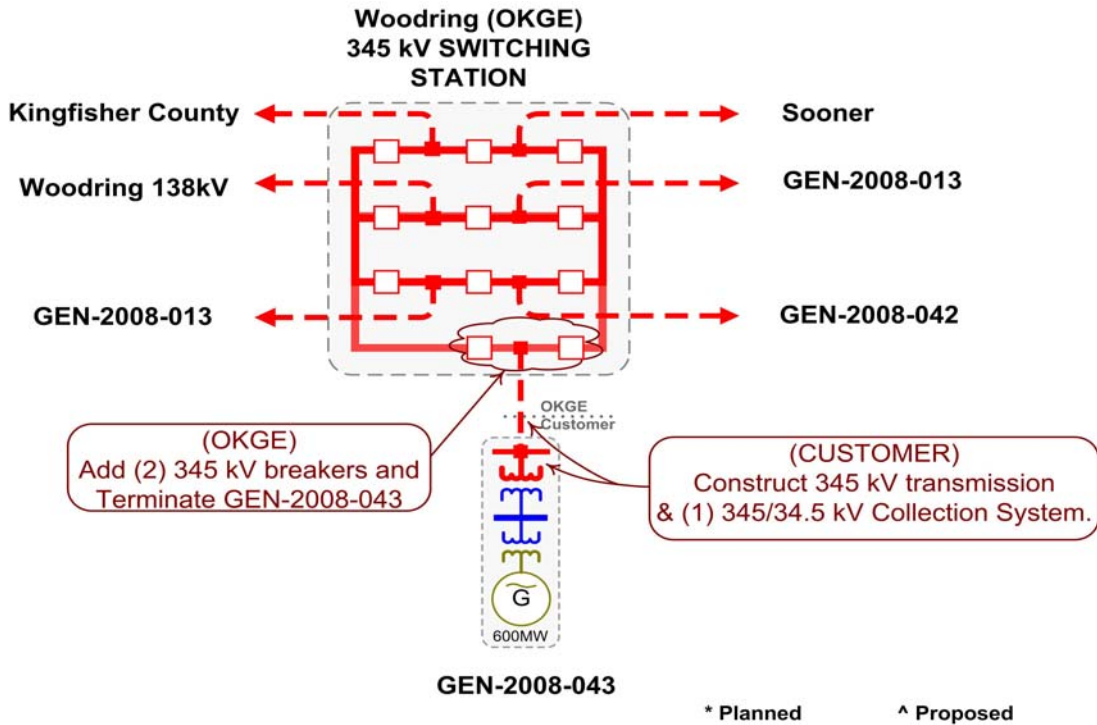


**GEN-2008-042**

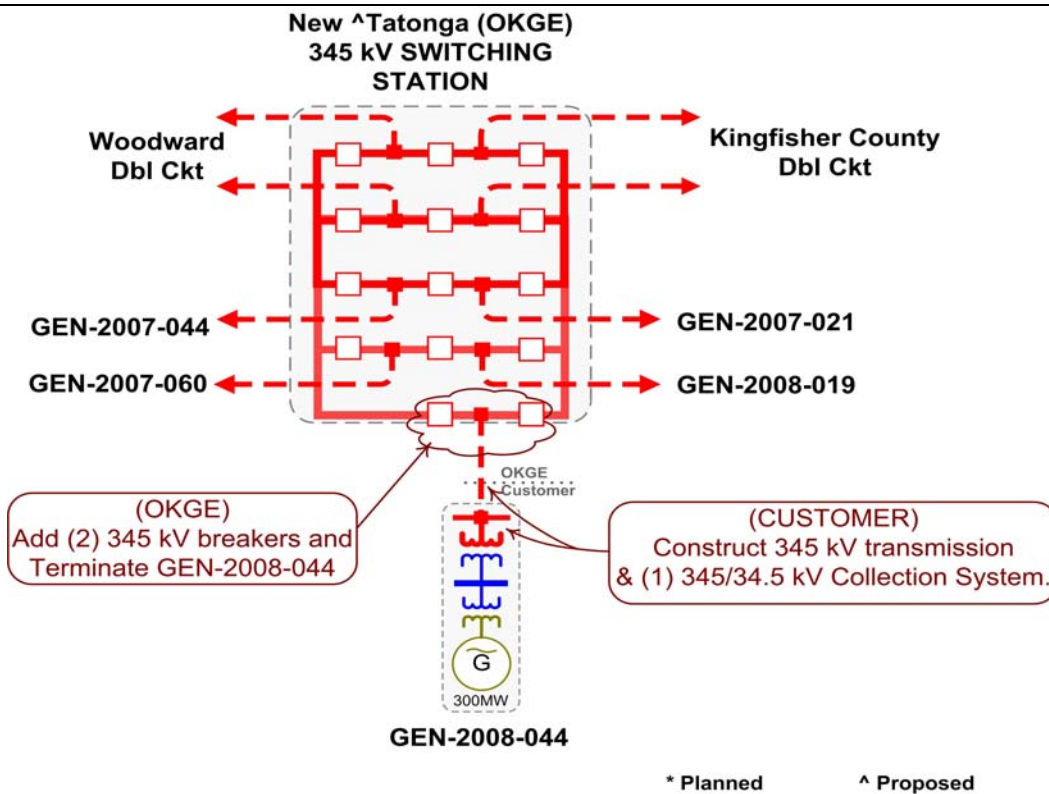


\* Planned      ^ Proposed

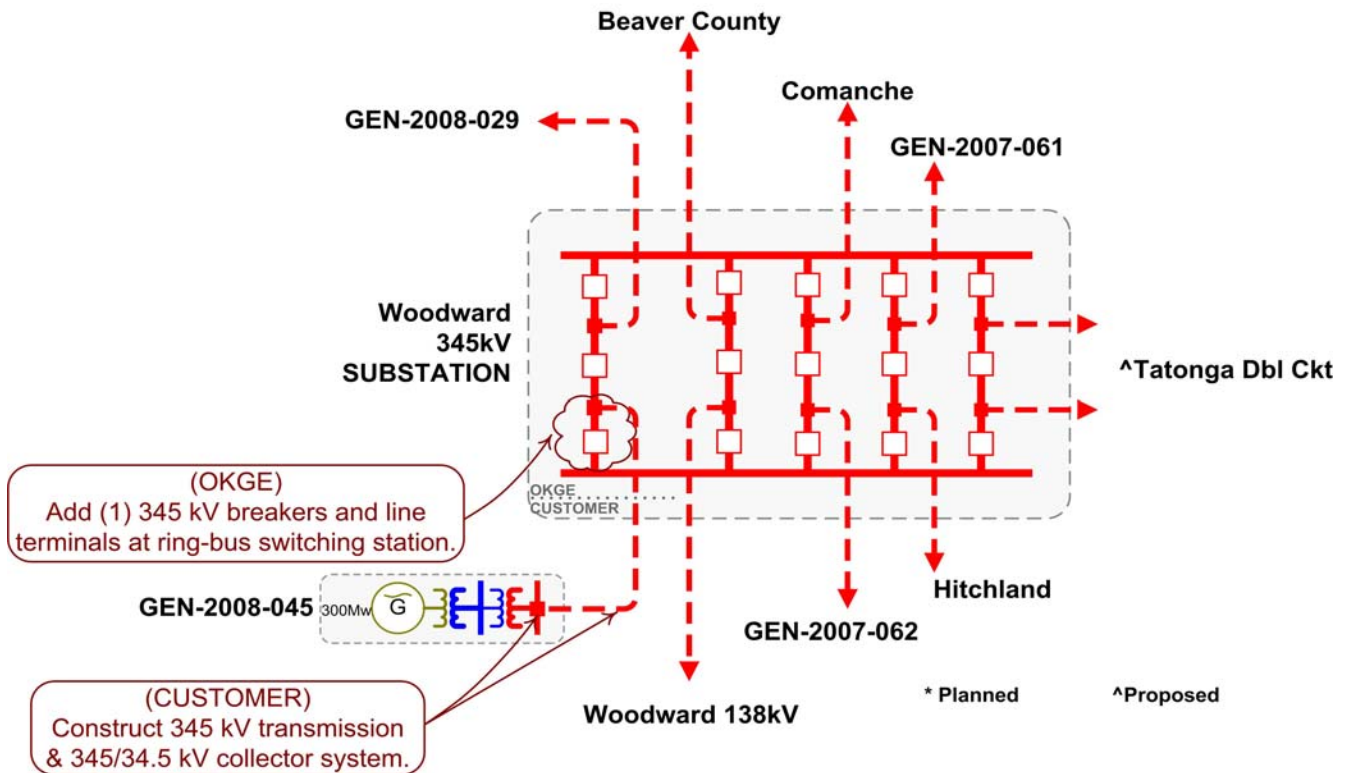
**GEN-2008-043**



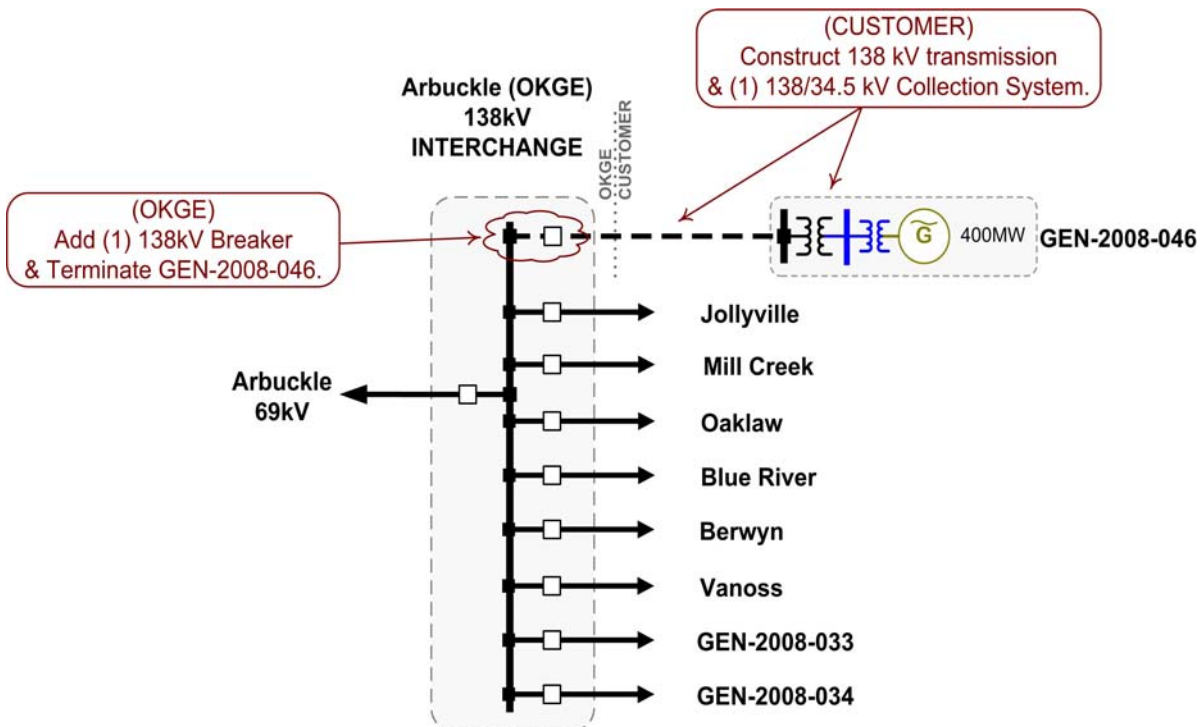
**GEN-2008-044**



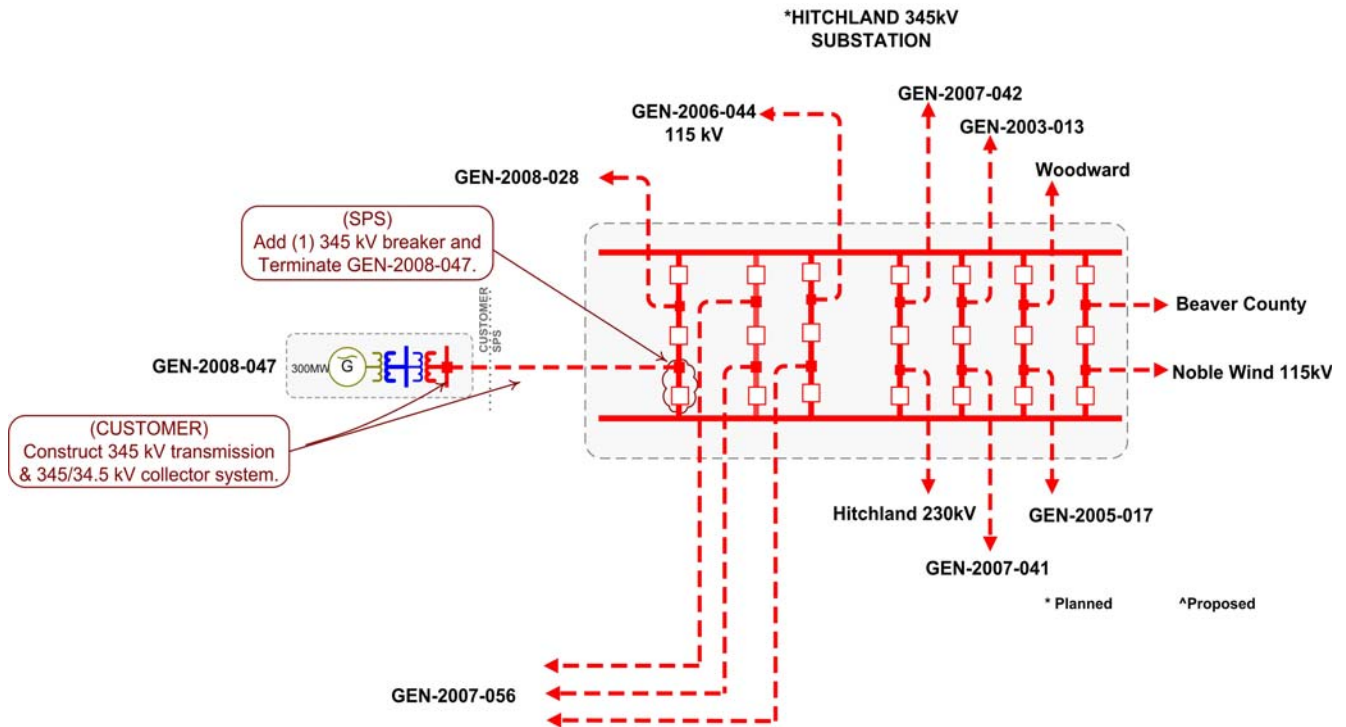
**GEN-2008-045**



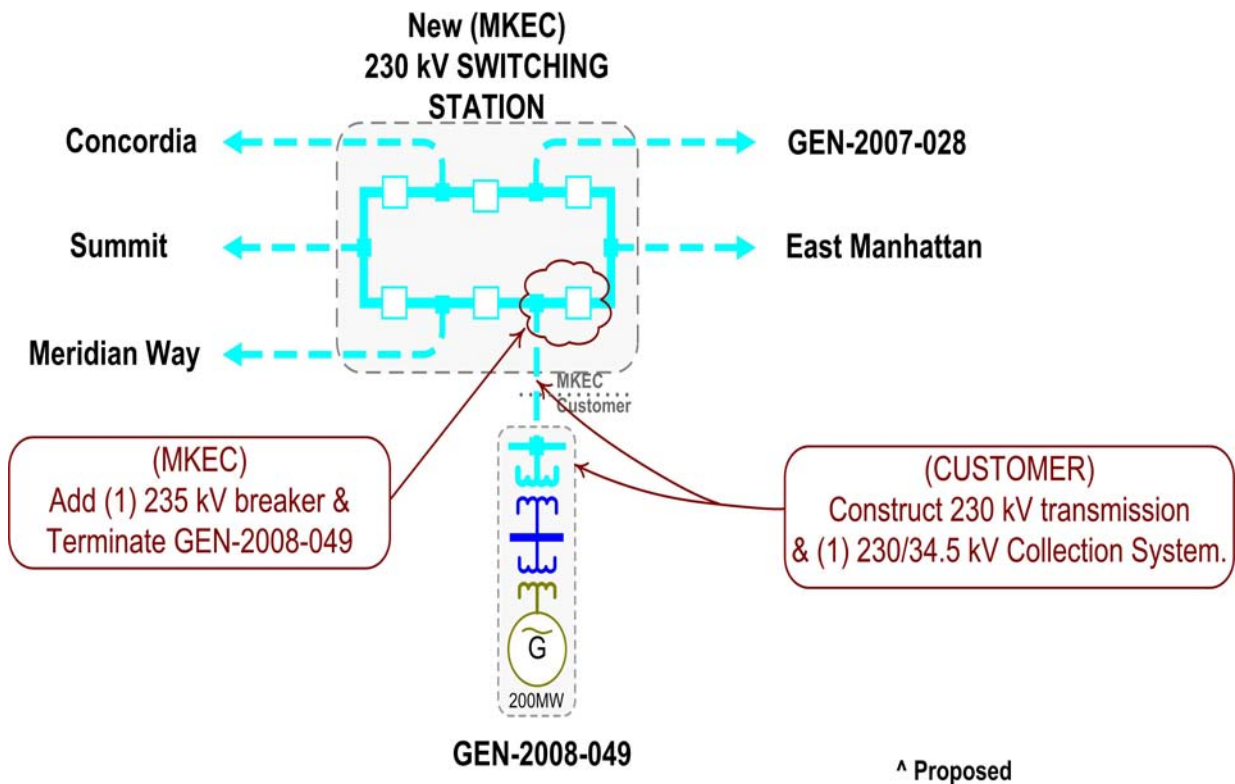
**GEN-2008-046**



**GEN-2008-047**

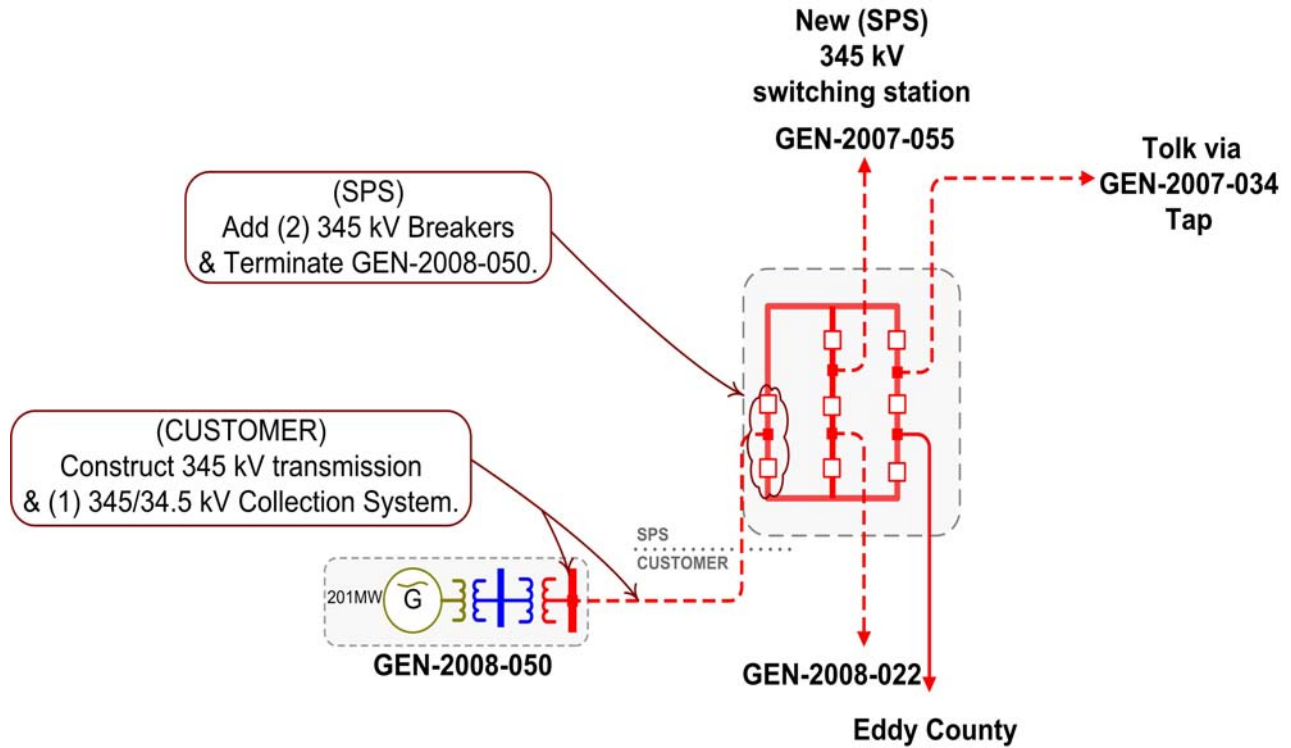


**GEN-2008-049**

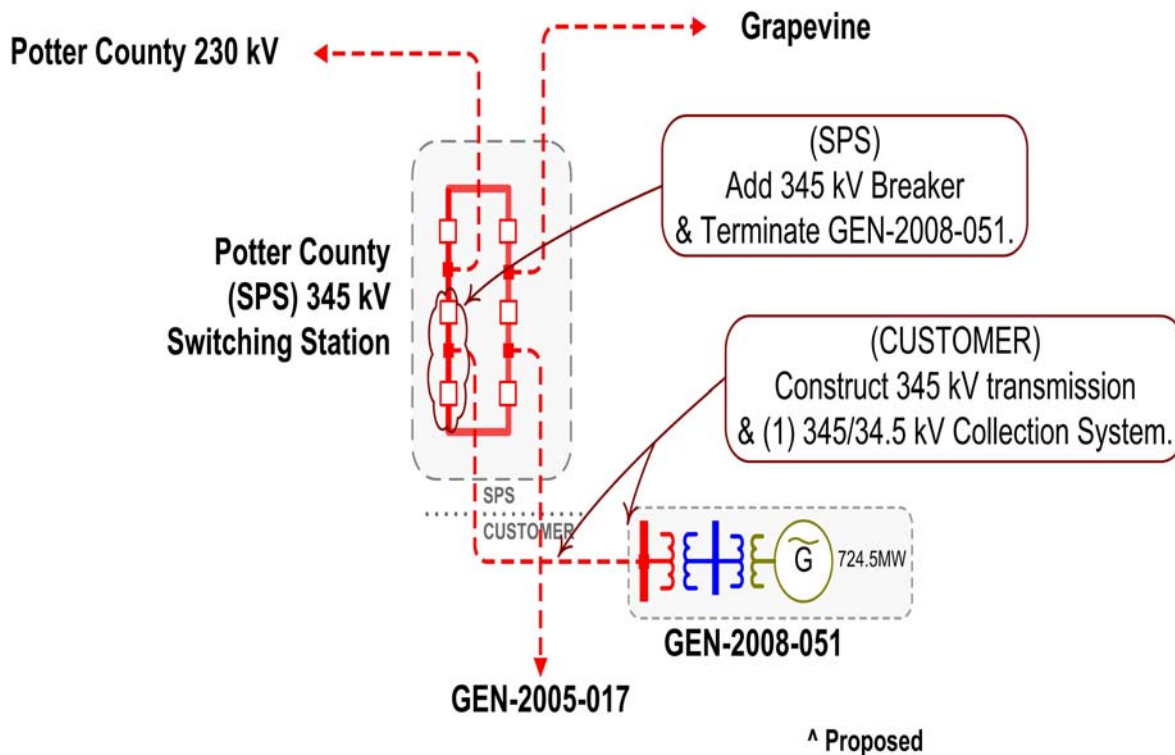




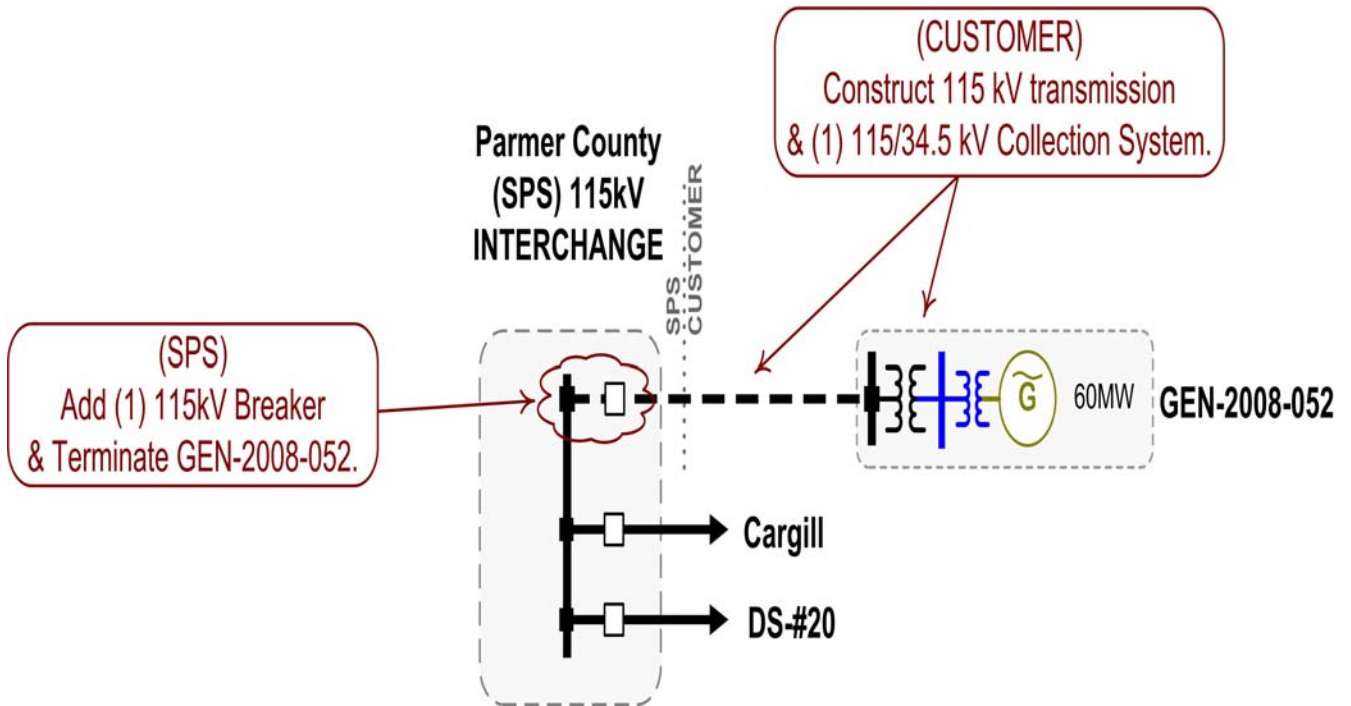
**GEN-2008-050**



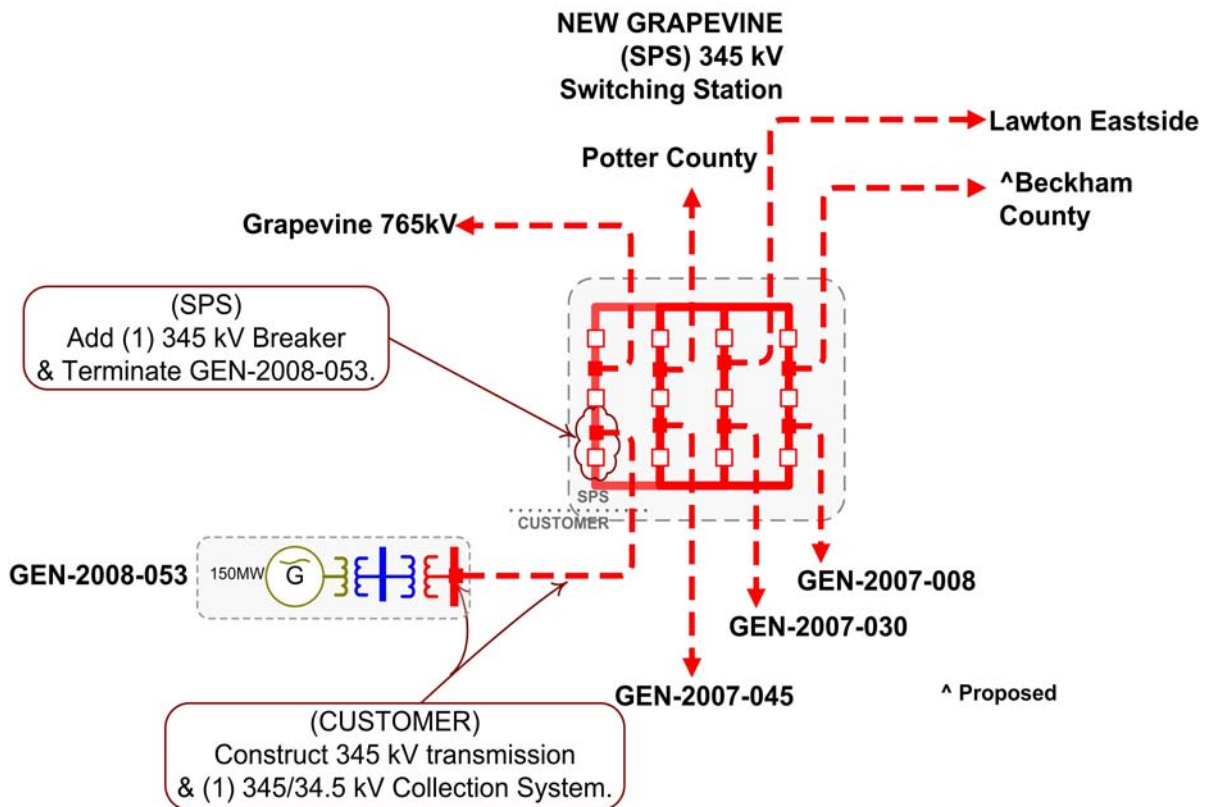
**GEN-2008-051**



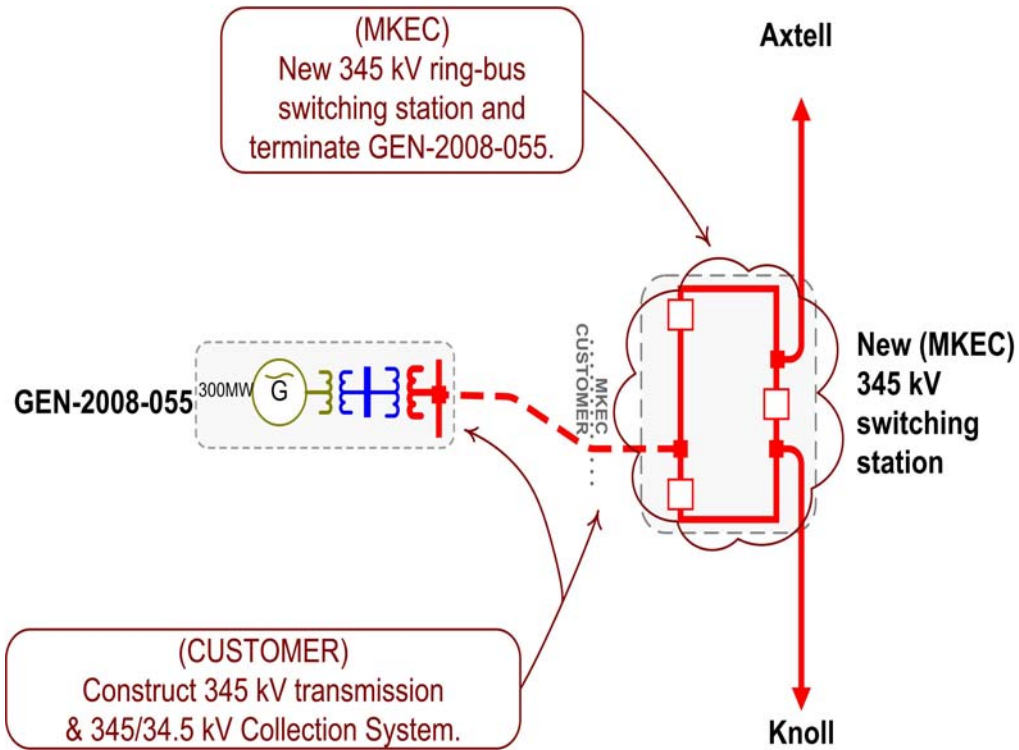
**GEN-2008-052**



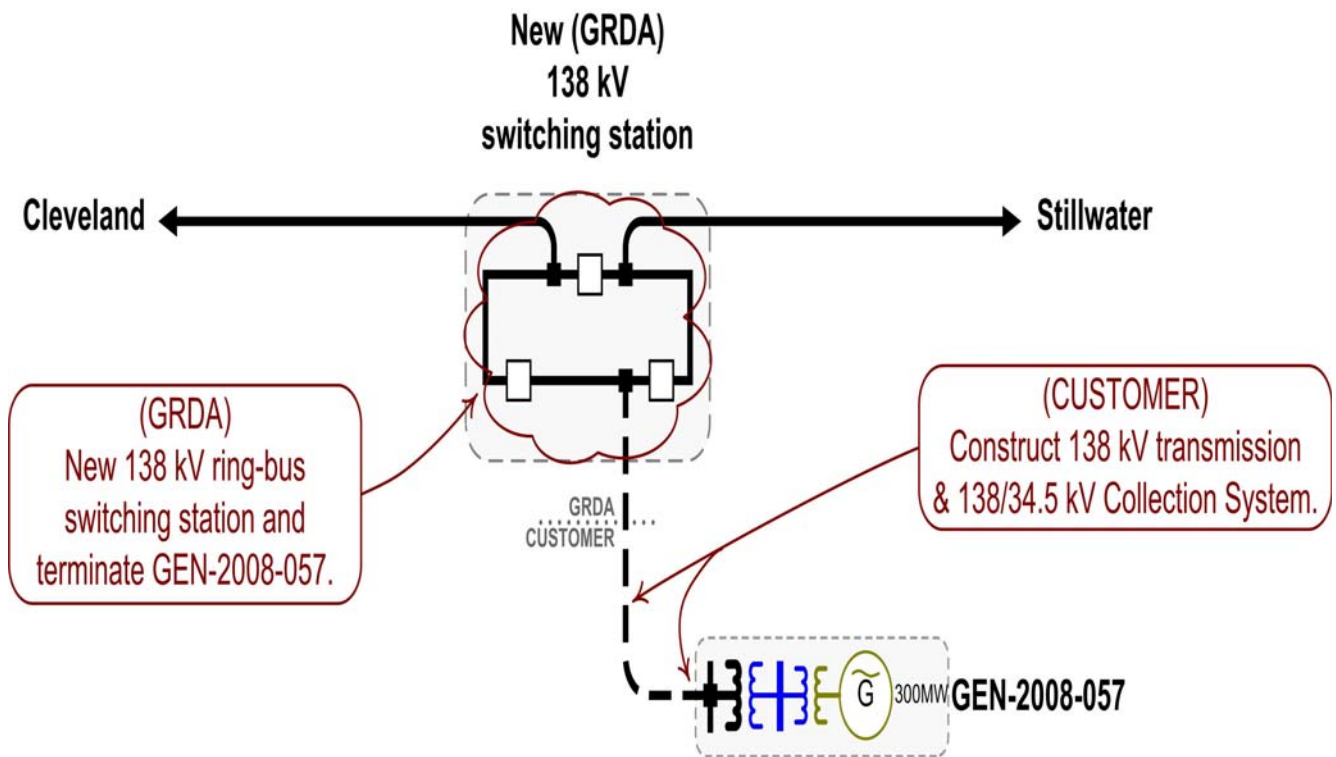
**GEN-2008-053**



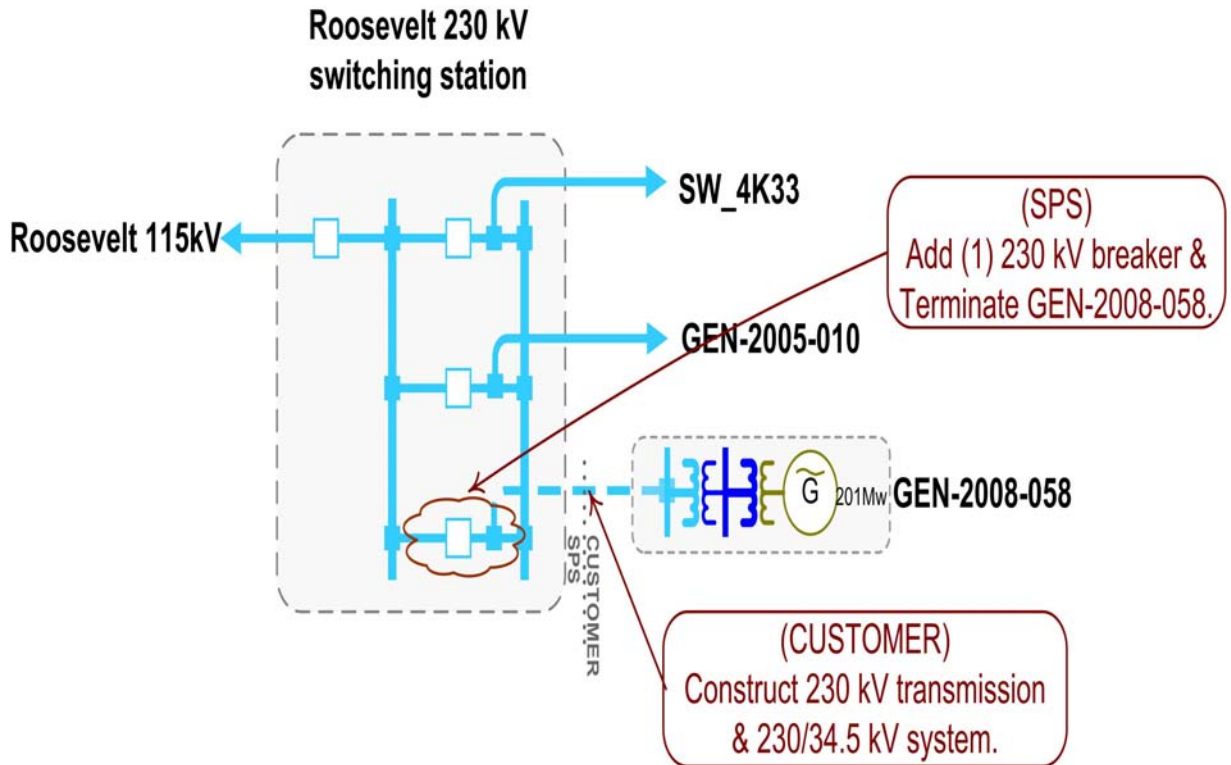
**GEN-2008-055**



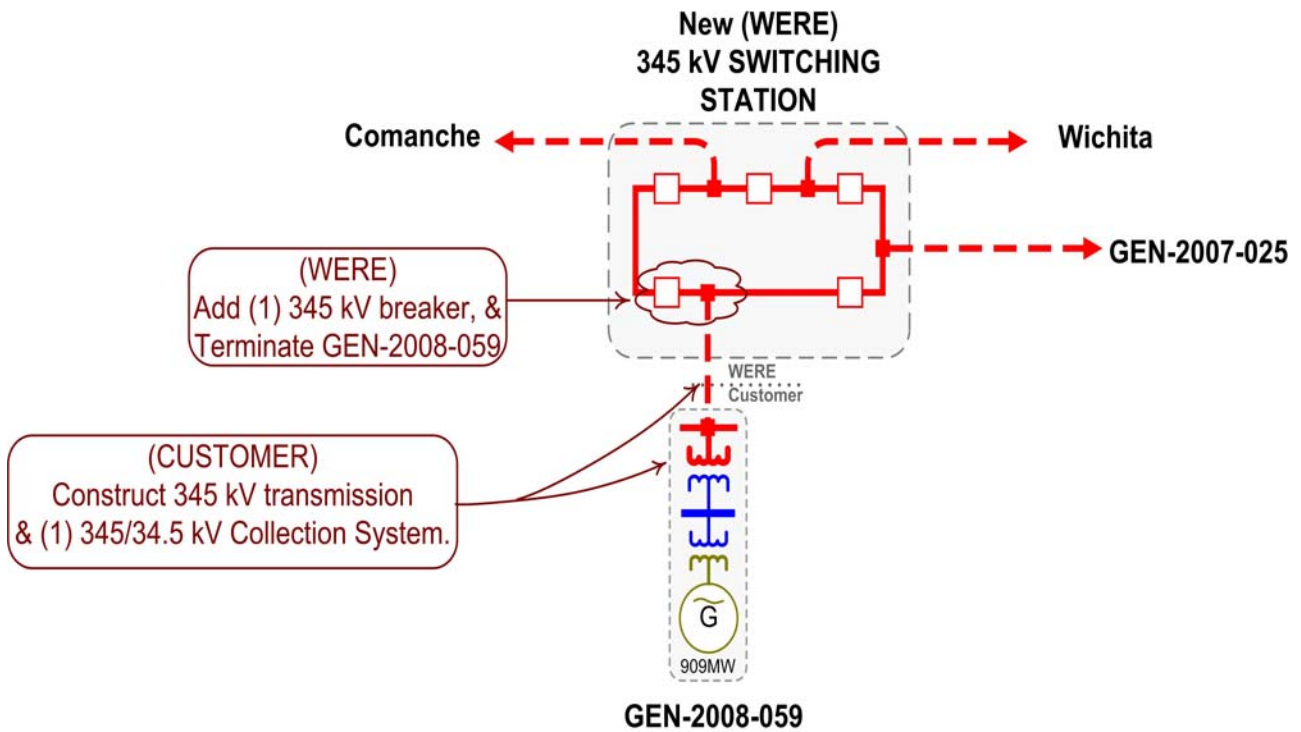
**GEN-2008-057**



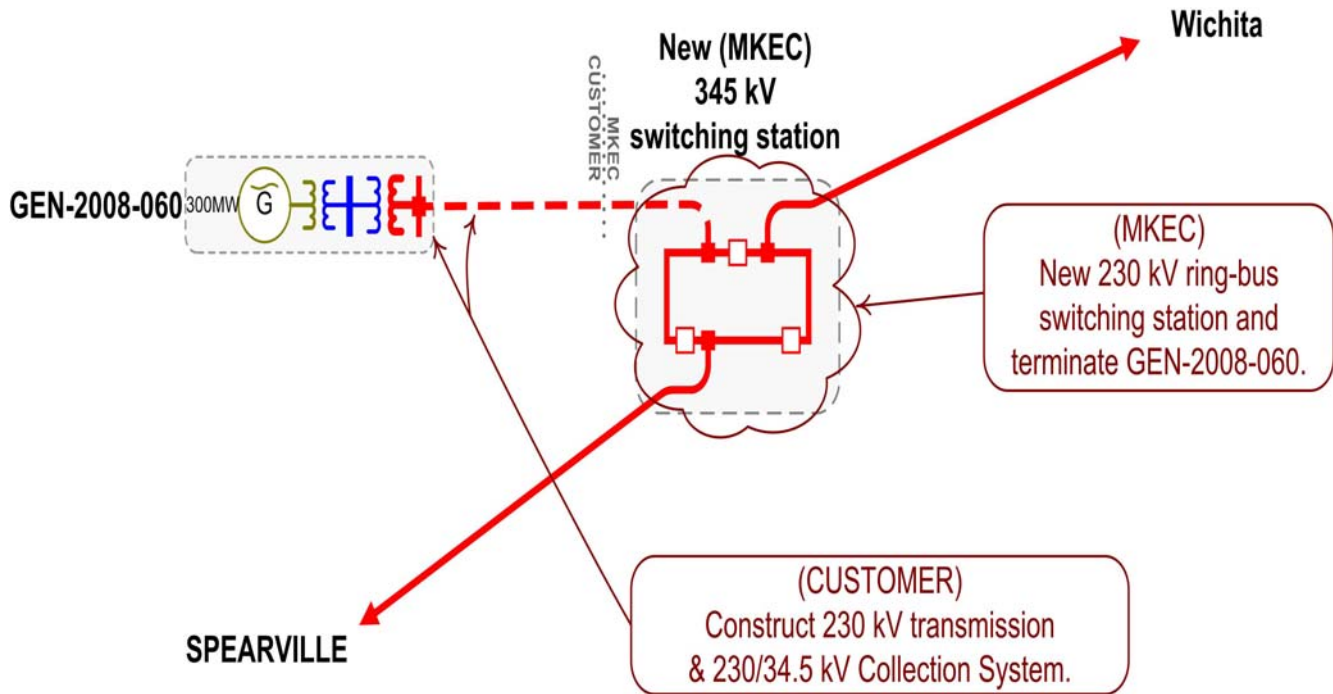
**GEN-2008-058**



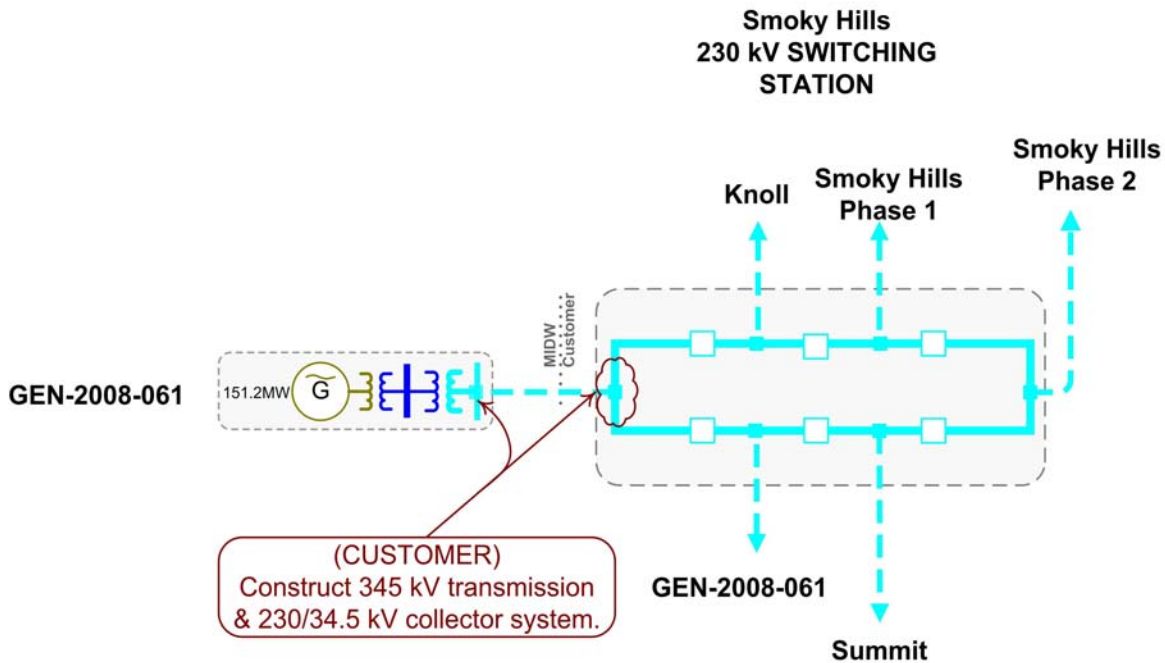
**GEN-2008-059**



**GEN-2008-060**

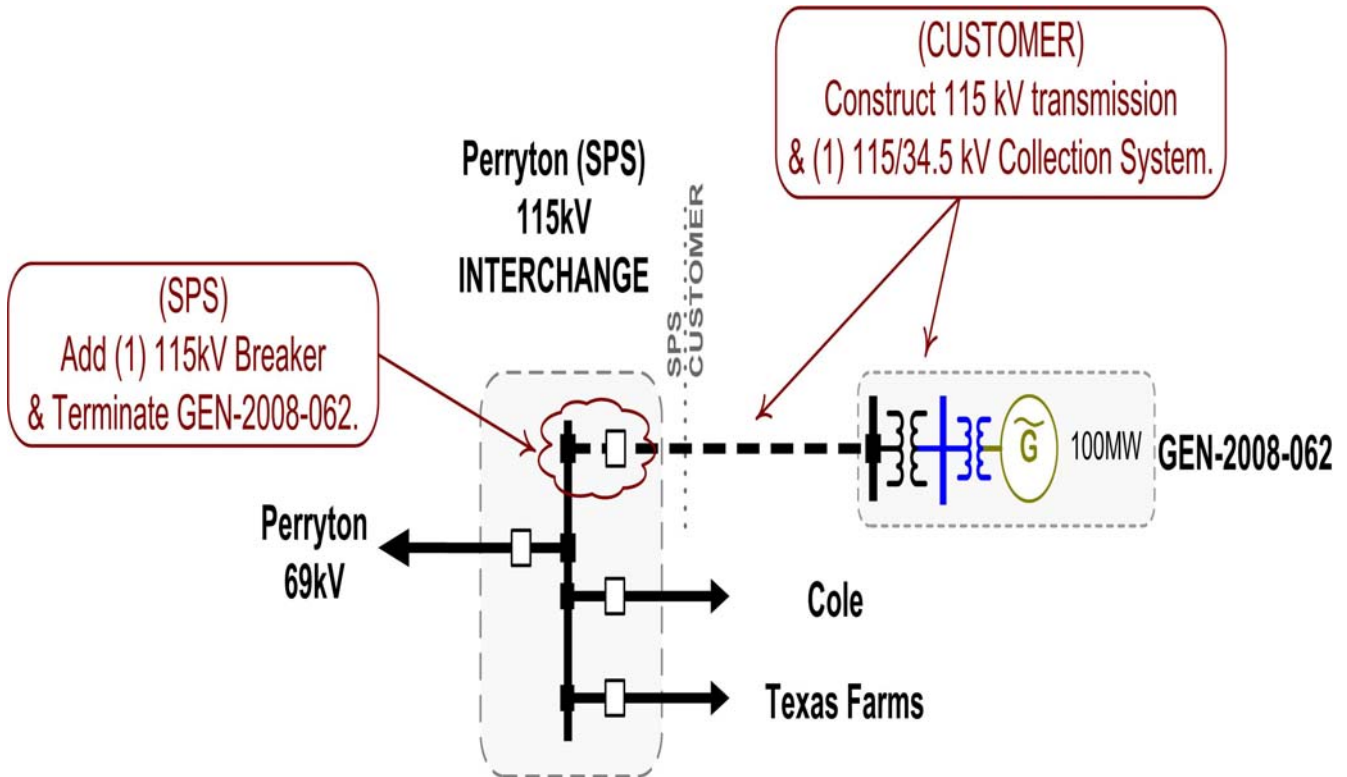


**GEN-2008-061**

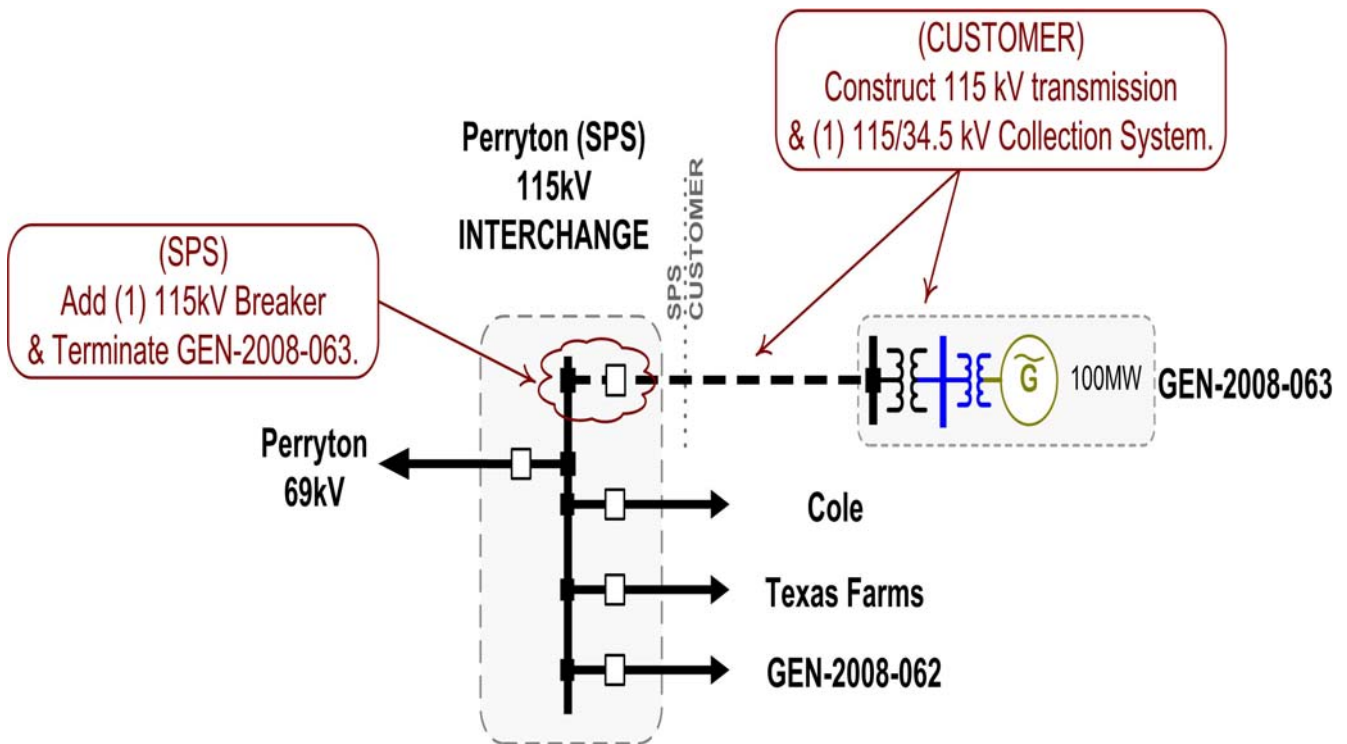


^ Proposed

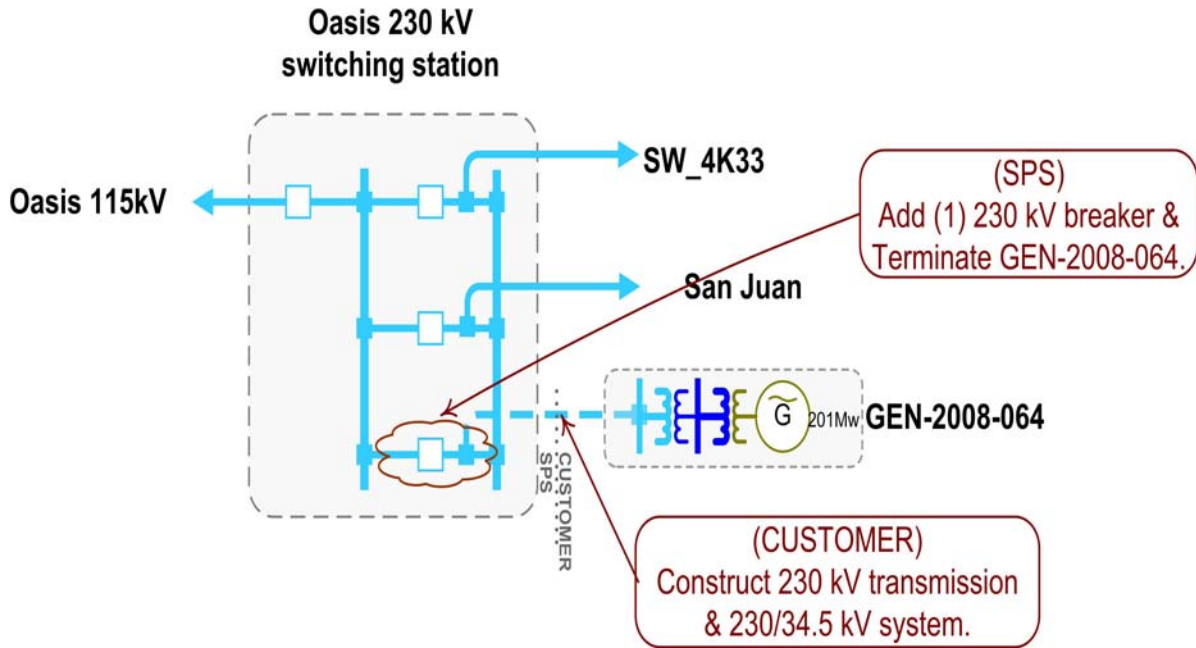
**GEN-2008-062**



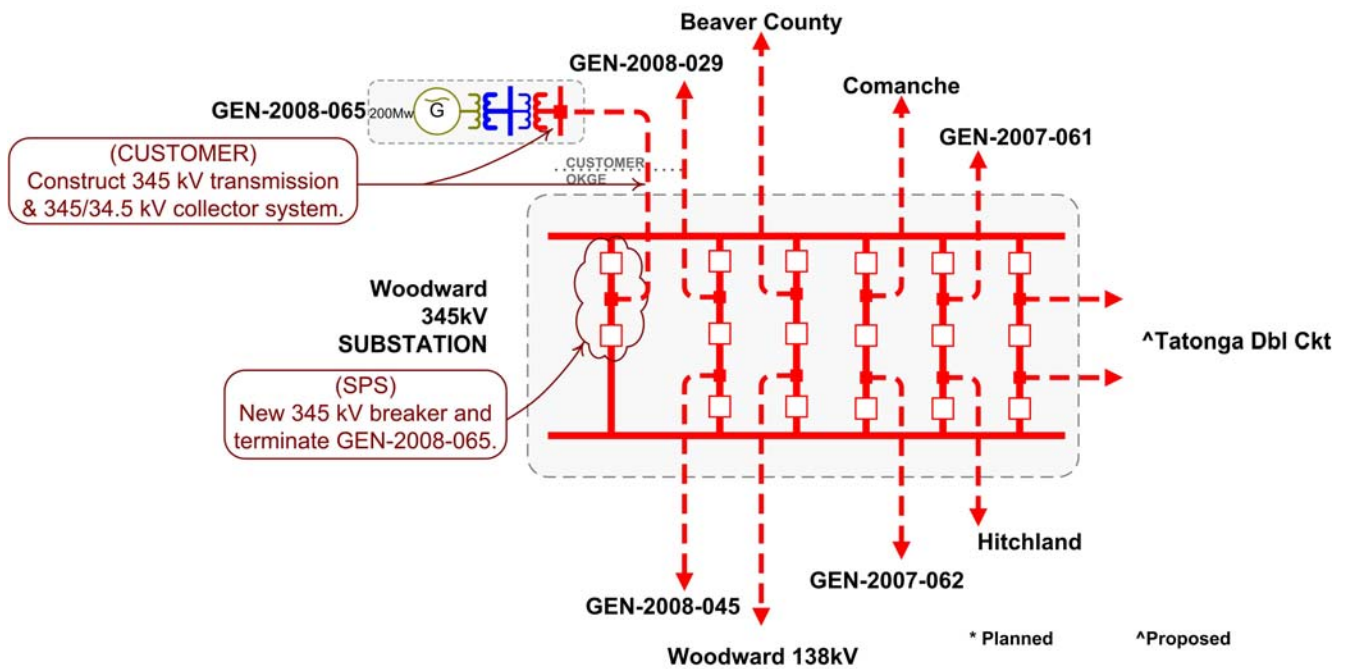
**GEN-2008-063**



**GEN-2008-064**



**GEN-2008-065**



**E: Cost Allocation per Interconnection Request**



# Appendix E.

## Generation Interconnection Cost Allocation

<u>Interconnection Request</u>	<u>Allocated Costs</u>
G08-021	\$0.01
G08-022	\$311,697,986.55
G08-023	\$5,328,006.95
G08-024	\$84,461,060.09
G08-025	\$19,539,063.69
G08-026	\$4,210,936.31
G08-027	\$4,486,498.46
G08-028	\$39,877,346.65
G08-029	\$18,769,703.69
G08-030	\$30,000,000.00
G08-031	\$892,270,902.07
G08-032	\$11,850,443.87
G08-033	\$800,000.00
G08-034	\$800,000.00
G08-035	\$2,299,647.70
G08-036	\$2,299,647.70
G08-037	\$3,353,621.45
G08-038	\$1,000,000.00
G08-039	\$6,177,209.65
G08-040	\$2,712,664.59
G08-041	\$12,239,291.00
G08-042	\$1,500,000.00
G08-043	\$2,000,000.00
G08-044	\$16,638,711.32
G08-045	\$21,623,644.43
G08-046	\$1,000,000.00
G08-047	\$33,481,122.21
G08-049	\$39,068,176.89
G08-050	\$69,870,511.88
G08-051	\$128,324,428.22
G08-052	\$17,762,072.13
G08-053	\$31,850,616.69
G08-055	\$7,200,000.00
G08-057	\$1,500,000.00
G08-058	\$55,911,731.14
G08-059	\$8,481,731.31

<b>Interconnection Request</b>	<b>Allocated Costs</b>
G08-060	\$14,195,820.20
G08-061	\$1,945,324.64
G08-062	\$9,994,538.83
G08-063	\$9,994,538.83
G08-064	\$55,867,237.90
G08-065	\$15,415,762.95
<b>All Upgrades Total</b>	<b>\$1,997,800,000.01</b>



**F: Cost Allocation per Interconnection Request with Detail**

# Appendix F.

## Generation Interconnection Cost Allocation

Interconnection Request	E + C Cost	Allocated Costs
<b>G08-021</b>		
GEN08-021 (All Facilities in Place)	\$0.01	\$0.01
<b>G08-021 Total</b>		<b>\$0.01</b>
<b>G08-022</b>		
Borden - Grassland 345kV conversion	\$20,000,000.00	\$14,808,269.72
Central Roosevelt Co - Tuco 345kV	\$125,000,000.00	\$74,396,415.37
GEN08-022 Interconnection Cost	\$2,500,000.00	\$2,500,000.00
Grapevine - Lawton Eastside 765kV conversion	\$220,000,000.00	\$16,701,740.06
Grassland - Jones 345kV conversion	\$10,000,000.00	\$6,049,123.44
Hobbs - Midland 345kV conversion	\$20,000,000.00	\$14,297,950.85
Lawton Eastside - Seminole 345kV	\$180,000,000.00	\$25,768,490.94
Lawton Eastside 765kV sub	\$35,000,000.00	\$2,642,606.67
Midland - Borden 345kV ckt 1	\$75,000,000.00	\$53,618,430.91
N Lea County - Hobbs 345kV	\$55,000,000.00	\$42,281,789.68
Tolk - Potter 345kV 345kV	\$125,000,000.00	\$42,272,573.74
Tuco - Jones 345kV ckt 1	\$36,000,000.00	\$16,360,595.18
<b>G08-022 Total</b>		<b>\$311,697,986.55</b>
<b>G08-023</b>		
GEN08-023 Interconnection Cost	\$1,250,000.00	\$1,250,000.00
Lawton Eastside - Seminole 345kV	\$180,000,000.00	\$4,078,006.95
<b>G08-023 Total</b>		<b>\$5,328,006.95</b>
<b>G08-024</b>		
Comanche - Medicine Lodge 765kV conversion	\$70,000,000.00	\$12,385,184.61
Comanche 765kV sub	\$20,000,000.00	\$11,648,639.92
GEN08-024 Interconnection Cost	\$3,000,000.00	\$3,000,000.00
Medicine Lodge - Wichita 765kV conversion	\$160,000,000.00	\$28,702,791.38
Wichita 765kV sub	\$35,000,000.00	\$6,294,809.90
Woodward - Comanche 765kV conversion	\$80,000,000.00	\$13,562,608.54
Woodward 765/345kV Transformer	\$35,000,000.00	\$8,867,025.73
<b>G08-024 Total</b>		<b>\$84,461,060.09</b>
<b>G08-025</b>		
GEN08-025 Interconnection Cost	\$750,000.00	\$750,000.00
Leoti - Selkirk 115kV ck #2	\$12,000,000.00	\$12,000,000.00
Syracuse-Will-Fletcher 115kV ckt #1	\$8,000,000.00	\$6,789,063.69

<b>Interconnection Request</b>	<b>E + C Cost</b>	<b>Allocated Costs</b>
<b>G08-025 Total</b>		<b>\$19,539,063.69</b>
<b>G08-026</b>		
GEN08-026 Interconnection Cost	\$3,000,000.00	\$3,000,000.00
Syracuse-Will-Fletcher 115kV ckt #1	\$8,000,000.00	\$1,210,936.31
<b>G08-026 Total</b>		<b>\$4,210,936.31</b>
<b>G08-027</b>		
Elm Creek - Summitt 345kV conversion	\$40,000,000.00	\$986,498.46
GEN08-027 Interconnection Cost	\$3,500,000.00	\$3,500,000.00
<b>G08-027 Total</b>		<b>\$4,486,498.46</b>
<b>G08-028</b>		
Comanche - Medicine Lodge 765kV conversion	\$70,000,000.00	\$3,461,993.57
GEN08-028 Interconnection Cost	\$1,500,000.00	\$1,500,000.00
Hitchland - Woodward 765kV ckt1 conversion	\$200,000,000.00	\$16,501,966.73
Hitchland 765/345kV ckt1	\$35,000,000.00	\$3,721,775.44
Medicine Lodge - Wichita 765kV conversion	\$160,000,000.00	\$8,023,205.32
Wichita 765kV sub	\$35,000,000.00	\$1,757,190.25
Woodward - Comanche 765kV conversion	\$80,000,000.00	\$3,188,636.14
Woodward 765/345kV Transformer	\$35,000,000.00	\$1,722,579.20
<b>G08-028 Total</b>		<b>\$39,877,346.65</b>
<b>G08-029</b>		
Comanche - Medicine Lodge 765kV conversion	\$70,000,000.00	\$2,731,042.94
Comanche 765kV sub	\$20,000,000.00	\$537,431.37
GEN08-029 Interconnection Cost	\$2,000,000.00	\$2,000,000.00
Medicine Lodge - Wichita 765kV conversion	\$160,000,000.00	\$6,329,219.80
Wichita 765kV sub	\$35,000,000.00	\$1,387,100.55
Woodward - Comanche 765kV conversion	\$80,000,000.00	\$3,486,861.12
Woodward 765/345kV Transformer	\$35,000,000.00	\$2,298,047.92
<b>G08-029 Total</b>		<b>\$18,769,703.69</b>
<b>G08-030</b>		
GEN08-030 Interconnection Cost	\$30,000,000.00	\$30,000,000.00
<b>G08-030 Total</b>		<b>\$30,000,000.00</b>
<b>G08-031</b>		
Comanche - Medicine Lodge 765kV conversion	\$70,000,000.00	\$29,350,437.85
Comanche 765kV sub	\$20,000,000.00	\$3,616,128.39
GEN08-031 Interconnection Cost	\$25,000,000.00	\$25,000,000.00
Grapevine - Lawton Eastside 765kV conversion	\$220,000,000.00	\$162,080,774.51
Grapevine - Roberts County 765kV	\$90,000,000.00	\$83,375,761.18
Grassland - Jones 345kV conversion	\$10,000,000.00	\$1,718,117.41

<b>Interconnection Request</b>	<b>E + C Cost</b>	<b>Allocated Costs</b>
Hitchland - Roberts County 765kV	\$150,000,000.00	\$140,944,352.74
Hitchland - Woodward 765kV ckt1 conversion	\$200,000,000.00	\$135,929,496.01
Hitchland 765/345kV ckt1	\$35,000,000.00	\$22,897,238.61
Lawton Eastside - Seminole 345kV	\$180,000,000.00	\$95,723,595.11
Lawton Eastside 765kV sub	\$35,000,000.00	\$25,817,948.25
Medicine Lodge - Wichita 765kV conversion	\$160,000,000.00	\$66,246,462.43
Tolk - Potter 345kV 345kV	\$125,000,000.00	\$29,085,468.31
Tolk - Roosevelt 345kV ckt 1	\$40,000,000.00	\$5,694,781.02
Tuco - Jones 345kV ckt 1	\$36,000,000.00	\$7,521,664.99
Wichita 765kV sub	\$35,000,000.00	\$14,473,389.30
Woodward - Comanche 765kV conversion	\$80,000,000.00	\$33,190,383.62
Woodward 765/345kV Transformer	\$35,000,000.00	\$9,604,902.34
<b>G08-031 Total</b>		<b>\$892,270,902.07</b>
<b>G08-032</b>		
Borden - Grassland 345kV conversion	\$20,000,000.00	\$70,240.30
Central Roosevelt Co - Tuco 345kV	\$125,000,000.00	\$326,258.37
Comanche - Medicine Lodge 765kV conversion	\$70,000,000.00	\$564,385.49
Comanche 765kV sub	\$20,000,000.00	\$70,290.87
GEN08-032 Interconnection Cost	\$600,000.00	\$600,000.00
Grapevine - Lawton Eastside 765kV conversion	\$220,000,000.00	\$1,264,743.85
Grapevine - Roberts County 765kV	\$90,000,000.00	\$187,073.79
Grassland - Jones 345kV conversion	\$10,000,000.00	\$30,477.56
Hitchland - Roberts County 765kV	\$150,000,000.00	\$255,738.71
Hitchland - Woodward 765kV ckt1 conversion	\$200,000,000.00	\$1,570,679.51
Hitchland 765/345kV ckt1	\$35,000,000.00	\$258,652.91
Hobbs - Midland 345kV conversion	\$20,000,000.00	\$67,819.70
Lawton Eastside - Seminole 345kV	\$180,000,000.00	\$1,852,172.89
Lawton Eastside 765kV sub	\$35,000,000.00	\$199,733.34
Medicine Lodge - Wichita 765kV conversion	\$160,000,000.00	\$1,272,499.59
Midland - Borden 345kV ckt 1	\$75,000,000.00	\$254,150.14
Tolk - Potter 345kV 345kV	\$125,000,000.00	\$1,364,888.08
Tolk - Roosevelt 345kV ckt 1	\$40,000,000.00	\$273,691.30
Tuco - Jones 345kV ckt 1	\$36,000,000.00	\$390,464.42
Wichita 765kV sub	\$35,000,000.00	\$277,891.95
Woodward - Comanche 765kV conversion	\$80,000,000.00	\$640,001.19
Woodward 765/345kV Transformer	\$35,000,000.00	\$58,589.90
<b>G08-032 Total</b>		<b>\$11,850,443.87</b>
<b>G08-033</b>		
GEN08-033 Interconnection Cost	\$800,000.00	\$800,000.00

<b>Interconnection Request</b>		<b>E + C Cost</b>	<b>Allocated Costs</b>
<b>G08-033</b>	<b>Total</b>		<b>\$800,000.00</b>
<b>G08-034</b>			
	GEN08-034 Interconnection Cost	\$800,000.00	\$800,000.00
<b>G08-034</b>	<b>Total</b>		<b>\$800,000.00</b>
<b>G08-035</b>			
	Comanche - Medicine Lodge 765kV conversion	\$70,000,000.00	\$192,236.22
	Comanche 765kV sub	\$20,000,000.00	\$109,422.96
	GEN08-035 Interconnection Cost	\$800,000.00	\$800,000.00
	Medicine Lodge - Wichita 765kV conversion	\$160,000,000.00	\$445,509.40
	Wichita 765kV sub	\$35,000,000.00	\$94,952.41
	Woodward - Comanche 765kV conversion	\$80,000,000.00	\$394,742.59
	Woodward 765/345kV Transformer	\$35,000,000.00	\$262,784.13
<b>G08-035</b>	<b>Total</b>		<b>\$2,299,647.70</b>
<b>G08-036</b>			
	Comanche - Medicine Lodge 765kV conversion	\$70,000,000.00	\$192,236.22
	Comanche 765kV sub	\$20,000,000.00	\$109,422.96
	GEN08-036 Interconnection Cost	\$800,000.00	\$800,000.00
	Medicine Lodge - Wichita 765kV conversion	\$160,000,000.00	\$445,509.40
	Wichita 765kV sub	\$35,000,000.00	\$94,952.41
	Woodward - Comanche 765kV conversion	\$80,000,000.00	\$394,742.59
	Woodward 765/345kV Transformer	\$35,000,000.00	\$262,784.13
<b>G08-036</b>	<b>Total</b>		<b>\$2,299,647.70</b>
<b>G08-037</b>			
	GEN08-037 Interconnection Cost	\$800,000.00	\$800,000.00
	Lawton Eastside - Seminole 345kV	\$180,000,000.00	\$2,553,621.45
<b>G08-037</b>	<b>Total</b>		<b>\$3,353,621.45</b>
<b>G08-038</b>			
	GEN08-038 Interconnection Cost	\$1,000,000.00	\$1,000,000.00
<b>G08-038</b>	<b>Total</b>		<b>\$1,000,000.00</b>
<b>G08-039</b>			
	GEN08-039 Interconnection Cost	\$1,500,000.00	\$1,500,000.00
	Lawton Eastside - Seminole 345kV	\$180,000,000.00	\$4,677,209.65
<b>G08-039</b>	<b>Total</b>		<b>\$6,177,209.65</b>
<b>G08-040</b>			
	GEN08-040 Interconnection Cost	\$800,000.00	\$800,000.00
	Lawton Eastside - Seminole 345kV	\$180,000,000.00	\$1,912,664.59
<b>G08-040</b>	<b>Total</b>		<b>\$2,712,664.59</b>

<b>Interconnection Request</b>	<b>E + C Cost</b>	<b>Allocated Costs</b>
<b>G08-041</b>		
GEN08-041 Interconnection Cost	\$1,500,000.00	\$1,500,000.00
Grapevine - Lawton Eastside 765kV conversion	\$220,000,000.00	\$586,956.23
Lawton Eastside - Seminole 345kV	\$180,000,000.00	\$4,678,804.33
Lawton Eastside 765kV sub	\$35,000,000.00	\$89,193.90
Tolk - Potter 345kV 345kV	\$125,000,000.00	\$3,328,694.99
Tuc - Jones 345kV ckt 1	\$36,000,000.00	\$2,055,641.55
<b>G08-041 Total</b>		<b>\$12,239,291.00</b>
<b>G08-042</b>		
GEN08-042 Interconnection Cost	\$1,500,000.00	\$1,500,000.00
<b>G08-042 Total</b>		<b>\$1,500,000.00</b>
<b>G08-043</b>		
GEN08-043 Interconnection Cost	\$2,000,000.00	\$2,000,000.00
<b>G08-043 Total</b>		<b>\$2,000,000.00</b>
<b>G08-044</b>		
Comanche - Medicine Lodge 765kV conversion	\$70,000,000.00	\$2,409,483.77
Comanche 765kV sub	\$20,000,000.00	\$551,243.99
GEN08-044 Interconnection Cost	\$1,500,000.00	\$1,500,000.00
Medicine Lodge - Wichita 765kV conversion	\$160,000,000.00	\$5,584,003.15
Wichita 765kV sub	\$35,000,000.00	\$1,221,124.82
Woodward - Comanche 765kV conversion	\$80,000,000.00	\$3,236,965.43
Woodward 765/345kV Transformer	\$35,000,000.00	\$2,135,890.16
<b>G08-044 Total</b>		<b>\$16,638,711.32</b>
<b>G08-045</b>		
Comanche - Medicine Lodge 765kV conversion	\$70,000,000.00	\$3,277,251.52
Comanche 765kV sub	\$20,000,000.00	\$644,917.64
GEN08-045 Interconnection Cost	\$1,500,000.00	\$1,500,000.00
Medicine Lodge - Wichita 765kV conversion	\$160,000,000.00	\$7,595,063.76
Wichita 765kV sub	\$35,000,000.00	\$1,664,520.66
Woodward - Comanche 765kV conversion	\$80,000,000.00	\$4,184,233.34
Woodward 765/345kV Transformer	\$35,000,000.00	\$2,757,657.51
<b>G08-045 Total</b>		<b>\$21,623,644.43</b>
<b>G08-046</b>		
GEN08-046 Interconnection Cost	\$1,000,000.00	\$1,000,000.00
<b>G08-046 Total</b>		<b>\$1,000,000.00</b>
<b>G08-047</b>		
Comanche - Medicine Lodge 765kV conversion	\$70,000,000.00	\$2,884,994.64
GEN08-047 Interconnection Cost	\$1,500,000.00	\$1,500,000.00



<b>Interconnection Request</b>	<b>E + C Cost</b>	<b>Allocated Costs</b>
Hitchland - Woodward 765kV ckt1 conversion	\$200,000,000.00	\$13,751,638.94
Hitchland 765/345kV ckt1	\$35,000,000.00	\$3,101,479.53
Medicine Lodge - Wichita 765kV conversion	\$160,000,000.00	\$6,686,004.43
Wichita 765kV sub	\$35,000,000.00	\$1,464,325.21
Woodward - Comanche 765kV conversion	\$80,000,000.00	\$2,657,196.78
Woodward 765/345kV Transformer	\$35,000,000.00	\$1,435,482.67
<b>G08-047 Total</b>		<b>\$33,481,122.21</b>
<b>G08-049</b>		
Elm Creek - Sumitt 345kV conversion	\$40,000,000.00	\$38,268,176.89
GEN08-049 Interconnection Cost	\$800,000.00	\$800,000.00
<b>G08-049 Total</b>		<b>\$39,068,176.89</b>
<b>G08-050</b>		
Borden - Grassland 345kV conversion	\$20,000,000.00	\$3,274,435.88
Central Roosevelt Co - Tuco 345kV	\$125,000,000.00	\$16,450,692.51
GEN08-050 Interconnection Cost	\$1,500,000.00	\$1,500,000.00
Grapevine - Lawton Eastside 765kV conversion	\$220,000,000.00	\$3,693,124.04
Grassland - Jones 345kV conversion	\$10,000,000.00	\$1,337,594.95
Hobbs - Midland 345kV conversion	\$20,000,000.00	\$3,161,593.09
Lawton Eastside - Seminole 345kV	\$180,000,000.00	\$5,697,983.14
Lawton Eastside 765kV sub	\$35,000,000.00	\$584,338.77
Midland - Borden 345kV ckt 1	\$75,000,000.00	\$11,856,220.70
N Lea County - Hobbs 345kV	\$55,000,000.00	\$9,349,438.64
Tolk - Potter 345kV 345kV	\$125,000,000.00	\$9,347,400.79
Tuco - Jones 345kV ckt 1	\$36,000,000.00	\$3,617,689.36
<b>G08-050 Total</b>		<b>\$69,870,511.88</b>
<b>G08-051</b>		
Central Roosevelt Co - Tuco 345kV	\$125,000,000.00	\$10,149,381.72
Comanche - Medicine Lodge 765kV conversion	\$70,000,000.00	\$5,179,789.78
Comanche 765kV sub	\$20,000,000.00	\$568,792.95
GEN08-051 Interconnection Cost	\$2,500,000.00	\$2,500,000.00
Grapevine - Lawton Eastside 765kV conversion	\$220,000,000.00	\$19,623,102.47
Grapevine - Roberts County 765kV	\$90,000,000.00	\$3,334,268.22
Hitchland - Roberts County 765kV	\$150,000,000.00	\$4,558,102.10
Hitchland - Woodward 765kV ckt1 conversion	\$200,000,000.00	\$18,997,281.18
Hitchland 765/345kV ckt1	\$35,000,000.00	\$2,562,599.10
Hobbs - Midland 345kV conversion	\$20,000,000.00	\$473,324.96
Lawton Eastside - Seminole 345kV	\$180,000,000.00	\$16,357,542.74
Lawton Eastside 765kV sub	\$35,000,000.00	\$3,117,424.89
Medicine Lodge - Wichita 765kV conversion	\$160,000,000.00	\$11,682,773.00

<b>Interconnection Request</b>	<b>E + C Cost</b>	<b>Allocated Costs</b>
Midland - Borden 345kV ckt 1	\$75,000,000.00	\$1,773,648.12
N Lea County - Hobbs 345kV	\$55,000,000.00	\$1,231,266.60
Tolk - Potter 345kV 345kV	\$125,000,000.00	\$14,252,927.25
Tolk - Roosevelt 345kV ckt 1	\$40,000,000.00	\$1,915,007.45
Tuco - Jones 345kV ckt 1	\$36,000,000.00	\$1,151,399.30
Wichita 765kV sub	\$35,000,000.00	\$2,551,626.90
Woodward - Comanche 765kV conversion	\$80,000,000.00	\$5,713,822.77
Woodward 765/345kV Transformer	\$35,000,000.00	\$630,346.73
<b>G08-051 Total</b>		<b>\$128,324,428.22</b>
<b>G08-052</b>		
Central Roosevelt Co - Tuco 345kV	\$125,000,000.00	\$2,590,041.98
Comanche - Medicine Lodge 765kV conversion	\$70,000,000.00	\$459,163.53
Comanche 765kV sub	\$20,000,000.00	\$57,384.48
GEN08-052 Interconnection Cost	\$500,000.00	\$500,000.00
Grapevine - Lawton Eastside 765kV conversion	\$220,000,000.00	\$1,081,547.90
Grapevine - Roberts County 765kV	\$90,000,000.00	\$192,875.56
Grassland - Jones 345kV conversion	\$10,000,000.00	\$85,385.23
Hitchland - Roberts County 765kV	\$150,000,000.00	\$263,670.00
Hitchland - Woodward 765kV ckt1 conversion	\$200,000,000.00	\$1,289,561.13
Hitchland 765/345kV ckt1	\$35,000,000.00	\$191,915.34
Hobbs - Midland 345kV conversion	\$20,000,000.00	\$215,910.02
Lawton Eastside - Seminole 345kV	\$180,000,000.00	\$1,520,784.17
Lawton Eastside 765kV sub	\$35,000,000.00	\$170,923.20
Medicine Lodge - Wichita 765kV conversion	\$160,000,000.00	\$1,035,297.18
Midland - Borden 345kV ckt 1	\$75,000,000.00	\$809,692.95
N Lea County - Hobbs 345kV	\$55,000,000.00	\$196,383.39
Tolk - Potter 345kV 345kV	\$125,000,000.00	\$2,621,391.81
Tolk - Roosevelt 345kV ckt 1	\$40,000,000.00	\$3,108,775.16
Tuco - Jones 345kV ckt 1	\$36,000,000.00	\$578,939.29
Wichita 765kV sub	\$35,000,000.00	\$226,108.51
Woodward - Comanche 765kV conversion	\$80,000,000.00	\$521,090.70
Woodward 765/345kV Transformer	\$35,000,000.00	\$45,230.59
<b>G08-052 Total</b>		<b>\$17,762,072.13</b>
<b>G08-053</b>		
Central Roosevelt Co - Tuco 345kV	\$125,000,000.00	\$289,637.53
Comanche - Medicine Lodge 765kV conversion	\$70,000,000.00	\$1,005,710.77
Comanche 765kV sub	\$20,000,000.00	\$131,740.57
GEN08-053 Interconnection Cost	\$1,500,000.00	\$1,500,000.00
Grapevine - Lawton Eastside 765kV conversion	\$220,000,000.00	\$6,156,518.71

<b>Interconnection Request</b>	<b>E + C Cost</b>	<b>Allocated Costs</b>
Grapevine - Roberts County 765kV	\$90,000,000.00	\$2,910,021.24
Grassland - Jones 345kV conversion	\$10,000,000.00	\$56,619.78
Hitchland - Roberts County 765kV	\$150,000,000.00	\$3,978,136.45
Hitchland - Woodward 765kV ckt1 conversion	\$200,000,000.00	\$4,306,927.94
Hitchland 765/345kV ckt1	\$35,000,000.00	\$539,207.58
Lawton Eastside - Seminole 345kV	\$180,000,000.00	\$3,909,767.73
Lawton Eastside 765kV sub	\$35,000,000.00	\$980,781.01
Medicine Lodge - Wichita 765kV conversion	\$160,000,000.00	\$2,264,239.59
N Lea County - Hobbs 345kV	\$55,000,000.00	\$150,595.00
Tolk - Potter 345kV 345kV	\$125,000,000.00	\$1,318,248.22
Tolk - Roosevelt 345kV ckt 1	\$40,000,000.00	\$239,647.74
Tuco - Jones 345kV ckt 1	\$36,000,000.00	\$228,133.03
Wichita 765kV sub	\$35,000,000.00	\$494,219.87
Woodward - Comanche 765kV conversion	\$80,000,000.00	\$1,154,393.46
Woodward 765/345kV Transformer	\$35,000,000.00	\$236,070.49
<b>G08-053 Total</b>		<b>\$31,850,616.69</b>
<b>G08-055</b>		
GEN08-055 Interconnection Cost	\$7,200,000.00	\$7,200,000.00
<b>G08-055 Total</b>		<b>\$7,200,000.00</b>
<b>G08-057</b>		
GEN08-057 Interconnection Cost	\$1,500,000.00	\$1,500,000.00
<b>G08-057 Total</b>		<b>\$1,500,000.00</b>
<b>G08-058</b>		
Borden - Grassland 345kV conversion	\$20,000,000.00	\$853,318.71
Central Roosevelt Co - Tuco 345kV	\$125,000,000.00	\$10,373,358.09
GEN08-058 Interconnection Cost	\$1,200,000.00	\$1,200,000.00
Grapevine - Lawton Eastside 765kV conversion	\$220,000,000.00	\$4,421,077.91
Grassland - Jones 345kV conversion	\$10,000,000.00	\$331,757.36
Hobbs - Midland 345kV conversion	\$20,000,000.00	\$823,911.86
Lawton Eastside - Seminole 345kV	\$180,000,000.00	\$5,634,411.05
Lawton Eastside 765kV sub	\$35,000,000.00	\$701,029.72
Midland - Borden 345kV ckt 1	\$75,000,000.00	\$3,089,376.48
N Lea County - Hobbs 345kV	\$55,000,000.00	\$872,443.28
Tolk - Potter 345kV 345kV	\$125,000,000.00	\$10,797,017.64
Tolk - Roosevelt 345kV ckt 1	\$40,000,000.00	\$14,833,229.09
Tuco - Jones 345kV ckt 1	\$36,000,000.00	\$1,980,799.95
<b>G08-058 Total</b>		<b>\$55,911,731.14</b>
<b>G08-059</b>		

<b>Interconnection Request</b>	<b>E + C Cost</b>	<b>Allocated Costs</b>
Comanche - Medicine Lodge 765kV conversion	\$70,000,000.00	\$1,277,466.64
Comanche 765kV sub	\$20,000,000.00	\$98,540.96
GEN08-059 Interconnection Cost	\$2,000,000.00	\$2,000,000.00
Medicine Lodge - Wichita 765kV conversion	\$160,000,000.00	\$2,960,541.93
Wichita 765kV sub	\$35,000,000.00	\$655,927.46
Woodward - Comanche 765kV conversion	\$80,000,000.00	\$901,285.73
Woodward 765/345kV Transformer	\$35,000,000.00	\$587,968.60
<b>G08-059 Total</b>		<b>\$8,481,731.31</b>
<b>G08-060</b>		
Comanche - Medicine Lodge 765kV conversion	\$70,000,000.00	\$695,322.50
Comanche 765kV sub	\$20,000,000.00	\$1,426,097.84
GEN08-060 Interconnection Cost	\$6,200,000.00	\$6,200,000.00
Medicine Lodge - Wichita 765kV conversion	\$160,000,000.00	\$1,611,416.97
Wichita 765kV sub	\$35,000,000.00	\$345,387.70
Woodward - Comanche 765kV conversion	\$80,000,000.00	\$2,371,656.15
Woodward 765/345kV Transformer	\$35,000,000.00	\$1,545,939.05
<b>G08-060 Total</b>		<b>\$14,195,820.20</b>
<b>G08-061</b>		
Elm Creek - Sumitt 345kV conversion	\$40,000,000.00	\$745,324.64
GEN08-061 Interconnection Cost	\$1,200,000.00	\$1,200,000.00
<b>G08-061 Total</b>		<b>\$1,945,324.64</b>
<b>G08-062</b>		
Comanche - Medicine Lodge 765kV conversion	\$70,000,000.00	\$874,232.80
GEN08-062 Interconnection Cost	\$800,000.00	\$800,000.00
Hitchland - Woodward 765kV ckt1 conversion	\$200,000,000.00	\$3,826,224.28
Hitchland 765/345kV ckt1	\$35,000,000.00	\$863,565.74
Medicine Lodge - Wichita 765kV conversion	\$160,000,000.00	\$2,026,043.42
Wichita 765kV sub	\$35,000,000.00	\$443,395.84
Woodward - Comanche 765kV conversion	\$80,000,000.00	\$805,945.49
Woodward 765/345kV Transformer	\$35,000,000.00	\$355,131.26
<b>G08-062 Total</b>		<b>\$9,994,538.83</b>
<b>G08-063</b>		
Comanche - Medicine Lodge 765kV conversion	\$70,000,000.00	\$874,232.80
GEN08-063 Interconnection Cost	\$800,000.00	\$800,000.00
Hitchland - Woodward 765kV ckt1 conversion	\$200,000,000.00	\$3,826,224.28
Hitchland 765/345kV ckt1	\$35,000,000.00	\$863,565.74
Medicine Lodge - Wichita 765kV conversion	\$160,000,000.00	\$2,026,043.42
Wichita 765kV sub	\$35,000,000.00	\$443,395.84

<b>Interconnection Request</b>	<b>E + C Cost</b>	<b>Allocated Costs</b>
Woodward - Comanche 765kV conversion	\$80,000,000.00	\$805,945.49
Woodward 765/345kV Transformer	\$35,000,000.00	\$355,131.26
<b>G08-063 Total</b>		<b>\$9,994,538.83</b>
<b>G08-064</b>		
Borden - Grassland 345kV conversion	\$20,000,000.00	\$993,735.39
Central Roosevelt Co - Tuco 345kV	\$125,000,000.00	\$10,424,214.44
GEN08-064 Interconnection Cost	\$1,200,000.00	\$1,200,000.00
Grapevine - Lawton Eastside 765kV conversion	\$220,000,000.00	\$4,390,414.31
Grassland - Jones 345kV conversion	\$10,000,000.00	\$390,924.28
Hobbs - Midland 345kV conversion	\$20,000,000.00	\$959,489.53
Lawton Eastside - Seminole 345kV	\$180,000,000.00	\$5,634,945.27
Lawton Eastside 765kV sub	\$35,000,000.00	\$696,020.26
Midland - Borden 345kV ckt 1	\$75,000,000.00	\$3,598,480.70
N Lea County - Hobbs 345kV	\$55,000,000.00	\$918,083.42
Tolk - Potter 345kV 345kV	\$125,000,000.00	\$10,611,389.15
Tolk - Roosevelt 345kV ckt 1	\$40,000,000.00	\$13,934,868.23
Tuco - Jones 345kV ckt 1	\$36,000,000.00	\$2,114,672.92
<b>G08-064 Total</b>		<b>\$55,867,237.90</b>
<b>G08-065</b>		
Comanche - Medicine Lodge 765kV conversion	\$70,000,000.00	\$2,184,834.35
Comanche 765kV sub	\$20,000,000.00	\$429,945.09
GEN08-065 Interconnection Cost	\$2,000,000.00	\$2,000,000.00
Medicine Lodge - Wichita 765kV conversion	\$160,000,000.00	\$5,063,375.84
Wichita 765kV sub	\$35,000,000.00	\$1,109,680.44
Woodward - Comanche 765kV conversion	\$80,000,000.00	\$2,789,488.89
Woodward 765/345kV Transformer	\$35,000,000.00	\$1,838,438.34
<b>G08-065 Total</b>		<b>\$15,415,762.95</b>
<b>All Upgrades Total</b>		<b>\$1,997,800,000.01</b>

**G: Cost Allocation per Proposed Network Upgrade**

# Appendix G. - Cost Allocation per Upgrade

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## **Borden - Grassland 345kV conversion**

**\$20,000,000.00**

Convert the Borden - Grassland 230kV line to 345kV operation. Includes Borden and Grassland 345kV substations

G08-022	\$14,808,269.72
G08-032	\$70,240.30
G08-050	\$3,274,435.88
G08-058	\$853,318.71
G08-064	\$993,735.39

### **Upgrade Total**

**\$20,000,000.00**

## **Central Roosevelt Co - Tuco 345kV**

**\$125,000,000.00**

This line is assume to be 120 miles and 2000 amp capacity. Terminal points are Tuco and the GEN-2007-034 substation

G08-022	\$74,396,415.37
G08-032	\$326,258.37
G08-050	\$16,450,692.51
G08-051	\$10,149,381.72
G08-052	\$2,590,041.98
G08-053	\$289,637.53
G08-058	\$10,373,358.09
G08-064	\$10,424,214.44

### **Upgrade Total**

**\$125,000,000.00**

## **Comanche - Medicine Lodge 765kV conversion**

**\$70,000,000.00**

This line is assumed to be 50 miles long and is a conversion of the previously assigned 345kV. Cost is incremental for 765kV. No stepdown to 138kV

G08-024	\$12,385,184.61
G08-028	\$3,461,993.57
G08-029	\$2,731,042.94
G08-031	\$29,350,437.85
G08-032	\$564,385.49
G08-035	\$192,236.22
G08-036	\$192,236.22
G08-044	\$2,409,483.77
G08-045	\$3,277,251.52
G08-047	\$2,884,994.64
G08-051	\$5,179,789.78
G08-052	\$459,163.53
G08-053	\$1,005,710.77
G08-059	\$1,277,466.64
G08-060	\$695,322.50
G08-062	\$874,232.80
G08-063	\$874,232.80
G08-065	\$2,184,834.35

<b>Upgrade Total</b>	<b>\$70,000,000.00</b>
<b>Comanche 765kV sub</b>	<b>\$20,000,000.00</b>
Two 765/345kV three phase auto banks	
G08-024	\$11,648,639.92
G08-029	\$537,431.37
G08-031	\$3,616,128.39
G08-032	\$70,290.87
G08-035	\$109,422.96
G08-036	\$109,422.96
G08-044	\$551,243.99
G08-045	\$644,917.64
G08-051	\$568,792.95
G08-052	\$57,384.48
G08-053	\$131,740.57
G08-059	\$98,540.96
G08-060	\$1,426,097.84
G08-065	\$429,945.09
<b>Upgrade Total</b>	<b>\$20,000,000.00</b>
<b>Elm Creek - Sumitt 345kV conversion</b>	<b>\$40,000,000.00</b>
This line is assumed to be 60 miles long and is a conversion of the previously assigned 230kv line. Cost is for incremental 345kV	
G08-027	\$986,498.46
G08-049	\$38,268,176.89
G08-061	\$745,324.64
<b>Upgrade Total</b>	<b>\$40,000,000.00</b>
<b>GEN08-021 (All Facilities in Place)</b>	<b>\$0.01</b>
Facilities in place	
G08-021	\$0.01
<b>Upgrade Total</b>	<b>\$0.01</b>
<b>GEN08-022 Interconnection Cost</b>	<b>\$2,500,000.00</b>
See one line diagram	
G08-022	\$2,500,000.00
<b>Upgrade Total</b>	<b>\$2,500,000.00</b>
<b>GEN08-023 Interconnection Cost</b>	<b>\$1,250,000.00</b>
See one line diagram	
G08-023	\$1,250,000.00
<b>Upgrade Total</b>	<b>\$1,250,000.00</b>
<b>GEN08-024 Interconnection Cost</b>	<b>\$3,000,000.00</b>
See one line diagram	
G08-024	\$3,000,000.00
<b>Upgrade Total</b>	<b>\$3,000,000.00</b>



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<b>GEN08-025 Interconnection Cost</b>	<b>\$750,000.00</b>
See one line diagram	
G08-025	\$750,000.00
<b>Upgrade Total</b>	<b>\$750,000.00</b>
<b>GEN08-026 Interconnection Cost</b>	<b>\$3,000,000.00</b>
See one line diagram	
G08-026	\$3,000,000.00
<b>Upgrade Total</b>	<b>\$3,000,000.00</b>
<b>GEN08-027 Interconnection Cost</b>	<b>\$3,500,000.00</b>
See one line diagram	
G08-027	\$3,500,000.00
<b>Upgrade Total</b>	<b>\$3,500,000.00</b>
<b>GEN08-028 Interconnection Cost</b>	<b>\$1,500,000.00</b>
See one line diagram	
G08-028	\$1,500,000.00
<b>Upgrade Total</b>	<b>\$1,500,000.00</b>
<b>GEN08-029 Interconnection Cost</b>	<b>\$2,000,000.00</b>
See one line diagram	
G08-029	\$2,000,000.00
<b>Upgrade Total</b>	<b>\$2,000,000.00</b>
<b>GEN08-030 Interconnection Cost</b>	<b>\$30,000,000.00</b>
See one line diagram	
G08-030	\$30,000,000.00
<b>Upgrade Total</b>	<b>\$30,000,000.00</b>
<b>GEN08-031 Interconnection Cost</b>	<b>\$25,000,000.00</b>
See one line diagram	
G08-031	\$25,000,000.00
<b>Upgrade Total</b>	<b>\$25,000,000.00</b>
<b>GEN08-032 Interconnection Cost</b>	<b>\$600,000.00</b>
See one line diagram	
G08-032	\$600,000.00
<b>Upgrade Total</b>	<b>\$600,000.00</b>
<b>GEN08-033 Interconnection Cost</b>	<b>\$800,000.00</b>
See one line diagram	
G08-033	\$800,000.00
<b>Upgrade Total</b>	<b>\$800,000.00</b>
<b>GEN08-034 Interconnection Cost</b>	<b>\$800,000.00</b>
See one line diagram	
G08-034	\$800,000.00

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<b>Upgrade Total</b>	<b>\$800,000.00</b>
<b>GEN08-035 Interconnection Cost</b>	<b>\$800,000.00</b>
See one line diagram	
G08-035	\$800,000.00
<b>Upgrade Total</b>	<b>\$800,000.00</b>
<b>GEN08-036 Interconnection Cost</b>	<b>\$800,000.00</b>
See one line diagram	
G08-036	\$800,000.00
<b>Upgrade Total</b>	<b>\$800,000.00</b>
<b>GEN08-037 Interconnection Cost</b>	<b>\$800,000.00</b>
See one line diagram	
G08-037	\$800,000.00
<b>Upgrade Total</b>	<b>\$800,000.00</b>
<b>GEN08-038 Interconnection Cost</b>	<b>\$1,000,000.00</b>
See one line diagram	
G08-038	\$1,000,000.00
<b>Upgrade Total</b>	<b>\$1,000,000.00</b>
<b>GEN08-039 Interconnection Cost</b>	<b>\$1,500,000.00</b>
See one line diagram	
G08-039	\$1,500,000.00
<b>Upgrade Total</b>	<b>\$1,500,000.00</b>
<b>GEN08-040 Interconnection Cost</b>	<b>\$800,000.00</b>
See one line diagram	
G08-040	\$800,000.00
<b>Upgrade Total</b>	<b>\$800,000.00</b>
<b>GEN08-041 Interconnection Cost</b>	<b>\$1,500,000.00</b>
See one line diagram	
G08-041	\$1,500,000.00
<b>Upgrade Total</b>	<b>\$1,500,000.00</b>
<b>GEN08-042 Interconnection Cost</b>	<b>\$1,500,000.00</b>
See one line diagram	
G08-042	\$1,500,000.00
<b>Upgrade Total</b>	<b>\$1,500,000.00</b>
<b>GEN08-043 Interconnection Cost</b>	<b>\$2,000,000.00</b>
See one line diagram	
G08-043	\$2,000,000.00
<b>Upgrade Total</b>	<b>\$2,000,000.00</b>
<b>GEN08-044 Interconnection Cost</b>	<b>\$1,500,000.00</b>
See one line diagram	

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G08-044	\$1,500,000.00
<b>Upgrade Total</b>	<b>\$1,500,000.00</b>
<b>GEN08-045 Interconnection Cost</b>	<b>\$1,500,000.00</b>
See one line diagram	
G08-045	\$1,500,000.00
<b>Upgrade Total</b>	<b>\$1,500,000.00</b>
<b>GEN08-046 Interconnection Cost</b>	<b>\$1,000,000.00</b>
See one line diagram	
G08-046	\$1,000,000.00
<b>Upgrade Total</b>	<b>\$1,000,000.00</b>
<b>GEN08-047 Interconnection Cost</b>	<b>\$1,500,000.00</b>
See one line diagram	
G08-047	\$1,500,000.00
<b>Upgrade Total</b>	<b>\$1,500,000.00</b>
<b>GEN08-049 Interconnection Cost</b>	<b>\$800,000.00</b>
See one line diagram	
G08-049	\$800,000.00
<b>Upgrade Total</b>	<b>\$800,000.00</b>
<b>GEN08-050 Interconnection Cost</b>	<b>\$1,500,000.00</b>
See one line diagram	
G08-050	\$1,500,000.00
<b>Upgrade Total</b>	<b>\$1,500,000.00</b>
<b>GEN08-051 Interconnection Cost</b>	<b>\$2,500,000.00</b>
See one line diagram	
G08-051	\$2,500,000.00
<b>Upgrade Total</b>	<b>\$2,500,000.00</b>
<b>GEN08-052 Interconnection Cost</b>	<b>\$500,000.00</b>
See one line diagram	
G08-052	\$500,000.00
<b>Upgrade Total</b>	<b>\$500,000.00</b>
<b>GEN08-053 Interconnection Cost</b>	<b>\$1,500,000.00</b>
See one line diagram	
G08-053	\$1,500,000.00
<b>Upgrade Total</b>	<b>\$1,500,000.00</b>
<b>GEN08-055 Interconnection Cost</b>	<b>\$7,200,000.00</b>
See one line diagram	
G08-055	\$7,200,000.00
<b>Upgrade Total</b>	<b>\$7,200,000.00</b>

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<b>GEN08-057 Interconnection Cost</b>	<b>\$1,500,000.00</b>
See one line diagram	
G08-057	\$1,500,000.00
<b>Upgrade Total</b>	<b>\$1,500,000.00</b>
<b>GEN08-058 Interconnection Cost</b>	<b>\$1,200,000.00</b>
See one line diagram	
G08-058	\$1,200,000.00
<b>Upgrade Total</b>	<b>\$1,200,000.00</b>
<b>GEN08-059 Interconnection Cost</b>	<b>\$2,000,000.00</b>
See one line diagram	
G08-059	\$2,000,000.00
<b>Upgrade Total</b>	<b>\$2,000,000.00</b>
<b>GEN08-060 Interconnection Cost</b>	<b>\$6,200,000.00</b>
See one line diagram	
G08-060	\$6,200,000.00
<b>Upgrade Total</b>	<b>\$6,200,000.00</b>
<b>GEN08-061 Interconnection Cost</b>	<b>\$1,200,000.00</b>
See one line diagram	
G08-061	\$1,200,000.00
<b>Upgrade Total</b>	<b>\$1,200,000.00</b>
<b>GEN08-062 Interconnection Cost</b>	<b>\$800,000.00</b>
See one line diagram	
G08-062	\$800,000.00
<b>Upgrade Total</b>	<b>\$800,000.00</b>
<b>GEN08-063 Interconnection Cost</b>	<b>\$800,000.00</b>
See one line diagram	
G08-063	\$800,000.00
<b>Upgrade Total</b>	<b>\$800,000.00</b>
<b>GEN08-064 Interconnection Cost</b>	<b>\$1,200,000.00</b>
See one line diagram	
G08-064	\$1,200,000.00
<b>Upgrade Total</b>	<b>\$1,200,000.00</b>
<b>GEN08-065 Interconnection Cost</b>	<b>\$2,000,000.00</b>
See one line diagram	
G08-065	\$2,000,000.00
<b>Upgrade Total</b>	<b>\$2,000,000.00</b>
<b>Grapevine - Lawton Eastside 765kV conversion</b>	<b>\$220,000,000.00</b>
This line is assumed to be 180 miles long and is a conversion of the previously assigne 345kV line. Cost is incremental 765kV	
G08-022	\$16,701,740.06

G08-031	\$162,080,774.51
G08-032	\$1,264,743.85
G08-041	\$586,956.23
G08-050	\$3,693,124.04
G08-051	\$19,623,102.47
G08-052	\$1,081,547.90
G08-053	\$6,156,518.71
G08-058	\$4,421,077.91
G08-064	\$4,390,414.31
<b>Upgrade Total</b>	<b>\$220,000,000.00</b>
<b>Grapevine - Roberts County 765kV</b>	<b>\$90,000,000.00</b>
This line is assumed to be 40 miles long and terminates at substation for GEN-2008-031	
G08-031	\$83,375,761.18
G08-032	\$187,073.79
G08-051	\$3,334,268.22
G08-052	\$192,875.56
G08-053	\$2,910,021.24
<b>Upgrade Total</b>	<b>\$90,000,000.00</b>
<b>Grassland - Jones 345kV conversion</b>	<b>\$10,000,000.00</b>
Convert the Grassland-Jones 230kV line to 345kV operation. Includes Jones 345kV substation	
G08-022	\$6,049,123.44
G08-031	\$1,718,117.41
G08-032	\$30,477.56
G08-050	\$1,337,594.95
G08-052	\$85,385.23
G08-053	\$56,619.78
G08-058	\$331,757.36
G08-064	\$390,924.28
<b>Upgrade Total</b>	<b>\$10,000,000.00</b>
<b>Hitchland - Roberts County 765kV</b>	<b>\$150,000,000.00</b>
This line is assumed to be 70 miles long and terminates at substation for GEN-2008-031	
G08-031	\$140,944,352.74
G08-032	\$255,738.71
G08-051	\$4,558,102.10
G08-052	\$263,670.00
G08-053	\$3,978,136.45
<b>Upgrade Total</b>	<b>\$150,000,000.00</b>
<b>Hitchland - Woodward 765kV ckt1 conversion</b>	<b>\$200,000,000.00</b>
Conversion of the previously assigned Hitchland - Woodward 345kV line. Cost is for incremental 765kV	
G08-028	\$16,501,966.73
G08-031	\$135,929,496.01
G08-032	\$1,570,679.51

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G08-047	\$13,751,638.94
G08-051	\$18,997,281.18
G08-052	\$1,289,561.13
G08-053	\$4,306,927.94
G08-062	\$3,826,224.28
G08-063	\$3,826,224.28
<b>Upgrade Total</b>	<b>\$200,000,000.00</b>
<b>Hitchland 765/345kV ckt1</b>	<b>\$35,000,000.00</b>
G08-028	\$3,721,775.44
G08-031	\$22,897,238.61
G08-032	\$258,652.91
G08-047	\$3,101,479.53
G08-051	\$2,562,599.10
G08-052	\$191,915.34
G08-053	\$539,207.58
G08-062	\$863,565.74
G08-063	\$863,565.74
<b>Upgrade Total</b>	<b>\$35,000,000.00</b>
<b>Hobbs - Midland 345kV conversion</b>	<b>\$20,000,000.00</b>
Convert the Hobbs - Midland 230kV line to 345kV operatoin. Includes Hobbs and Midland 345kV substatoins	
G08-022	\$14,297,950.85
G08-032	\$67,819.70
G08-050	\$3,161,593.09
G08-051	\$473,324.96
G08-052	\$215,910.02
G08-058	\$823,911.86
G08-064	\$959,489.53
<b>Upgrade Total</b>	<b>\$20,000,000.00</b>
<b>Lawton Eastside - Seminole 345kV</b>	<b>\$180,000,000.00</b>
This line is assumed to be 120 miles long and 3000A construction	
G08-022	\$25,768,490.94
G08-023	\$4,078,006.95
G08-031	\$95,723,595.11
G08-032	\$1,852,172.89
G08-037	\$2,553,621.45
G08-039	\$4,677,209.65
G08-040	\$1,912,664.59
G08-041	\$4,678,804.33
G08-050	\$5,697,983.14
G08-051	\$16,357,542.74
G08-052	\$1,520,784.17

G08-053	\$3,909,767.73
G08-058	\$5,634,411.05
G08-064	\$5,634,945.27
<b>Upgrade Total</b>	<b>\$180,000,000.00</b>
<b>Lawton Eastside 765kV sub</b>	<b>\$35,000,000.00</b>
Two 765/345kV three phase auto banks	
G08-022	\$2,642,606.67
G08-031	\$25,817,948.25
G08-032	\$199,733.34
G08-041	\$89,193.90
G08-050	\$584,338.77
G08-051	\$3,117,424.89
G08-052	\$170,923.20
G08-053	\$980,781.01
G08-058	\$701,029.72
G08-064	\$696,020.26
<b>Upgrade Total</b>	<b>\$35,000,000.00</b>
<b>Leoti - Selkirk 115kV ck #2</b>	<b>\$12,000,000.00</b>
New line	
G08-025	\$12,000,000.00
<b>Upgrade Total</b>	<b>\$12,000,000.00</b>
<b>Medicine Lodge - Wichita 765kV conversion</b>	<b>\$160,000,000.00</b>
This line is assumed to be 120 miles long and is a conversion of the previously assigned 345kV. Cost is incremental for 765kV. No stepdown to 138kV	
G08-024	\$28,702,791.38
G08-028	\$8,023,205.32
G08-029	\$6,329,219.80
G08-031	\$66,246,462.43
G08-032	\$1,272,499.59
G08-035	\$445,509.40
G08-036	\$445,509.40
G08-044	\$5,584,003.15
G08-045	\$7,595,063.76
G08-047	\$6,686,004.43
G08-051	\$11,682,773.00
G08-052	\$1,035,297.18
G08-053	\$2,264,239.59
G08-059	\$2,960,541.93
G08-060	\$1,611,416.97
G08-062	\$2,026,043.42
G08-063	\$2,026,043.42
G08-065	\$5,063,375.84
<b>Upgrade Total</b>	<b>\$160,000,000.00</b>

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**Midland - Borden 345kV ckt 1** **\$75,000,000.00**

This line is assume to be 70 miles long and 2000 amp capacity

G08-022	\$53,618,430.91
G08-032	\$254,150.14
G08-050	\$11,856,220.70
G08-051	\$1,773,648.12
G08-052	\$809,692.95
G08-058	\$3,089,376.48
G08-064	\$3,598,480.70

**Upgrade Total** **\$75,000,000.00**

**N Lea County - Hobbs 345kV** **\$55,000,000.00**

This line is assumed to be 50 miles long and 2000 amp capacity. Terminal points are Hobbs power station and the GEN-2007-055 substation

G08-022	\$42,281,789.68
G08-050	\$9,349,438.64
G08-051	\$1,231,266.60
G08-052	\$196,383.39
G08-053	\$150,595.00
G08-058	\$872,443.28
G08-064	\$918,083.42

**Upgrade Total** **\$55,000,000.00**

**Syracuse-Will-Fletcher 115kV ckt #1** **\$8,000,000.00**

Reconductor line

G08-025	\$6,789,063.69
G08-026	\$1,210,936.31

**Upgrade Total** **\$8,000,000.00**

**Tolk - Potter 345kV 345kV** **\$125,000,000.00**

This line is assumed to be 120 miles long and 2000 amp capacity

G08-022	\$42,272,573.74
G08-031	\$29,085,468.31
G08-032	\$1,364,888.08
G08-041	\$3,328,694.99
G08-050	\$9,347,400.79
G08-051	\$14,252,927.25
G08-052	\$2,621,391.81
G08-053	\$1,318,248.22
G08-058	\$10,797,017.64
G08-064	\$10,611,389.15

**Upgrade Total** **\$125,000,000.00**

**Tolk - Roosevelt 345kV ckt 1** **\$40,000,000.00**

This line is assumed to be 35 miles long and 2000 amp capacity. Includes Roosevelt 345kV substation

G08-031	\$5,694,781.02
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G08-032	\$273,691.30
G08-051	\$1,915,007.45
G08-052	\$3,108,775.16
G08-053	\$239,647.74
G08-058	\$14,833,229.09
G08-064	\$13,934,868.23
<b>Upgrade Total</b>	<b>\$40,000,000.00</b>
<b>Tuco - Jones 345kV ckt 1</b>	<b>\$36,000,000.00</b>
This line is assumed to be 30 miles long and 2000 amp capacity. Includes Tuco substation work	
G08-022	\$16,360,595.18
G08-031	\$7,521,664.99
G08-032	\$390,464.42
G08-041	\$2,055,641.55
G08-050	\$3,617,689.36
G08-051	\$1,151,399.30
G08-052	\$578,939.29
G08-053	\$228,133.03
G08-058	\$1,980,799.95
G08-064	\$2,114,672.92
<b>Upgrade Total</b>	<b>\$36,000,000.00</b>
<b>Wichita 765kV sub</b>	<b>\$35,000,000.00</b>
Two 765/345kV three phase auto banks	
G08-024	\$6,294,809.90
G08-028	\$1,757,190.25
G08-029	\$1,387,100.55
G08-031	\$14,473,389.30
G08-032	\$277,891.95
G08-035	\$94,952.41
G08-036	\$94,952.41
G08-044	\$1,221,124.82
G08-045	\$1,664,520.66
G08-047	\$1,464,325.21
G08-051	\$2,551,626.90
G08-052	\$226,108.51
G08-053	\$494,219.87
G08-059	\$655,927.46
G08-060	\$345,387.70
G08-062	\$443,395.84
G08-063	\$443,395.84
G08-065	\$1,109,680.44
<b>Upgrade Total</b>	<b>\$35,000,000.00</b>

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**Woodward - Comanche 765kV conversion** **\$80,000,000.00**

This line is assumed to be 62 miles long and is a conversion of the previously assigned 345kV line.  
Cost is incremental to 765kV

G08-024	\$13,562,608.54
G08-028	\$3,188,636.14
G08-029	\$3,486,861.12
G08-031	\$33,190,383.62
G08-032	\$640,001.19
G08-035	\$394,742.59
G08-036	\$394,742.59
G08-044	\$3,236,965.43
G08-045	\$4,184,233.34
G08-047	\$2,657,196.78
G08-051	\$5,713,822.77
G08-052	\$521,090.70
G08-053	\$1,154,393.46
G08-059	\$901,285.73
G08-060	\$2,371,656.15
G08-062	\$805,945.49
G08-063	\$805,945.49
G08-065	\$2,789,488.89
<b>Upgrade Total</b>	<b>\$80,000,000.00</b>

**Woodward 765/345kV Transformer** **\$35,000,000.00**

G08-024	\$8,867,025.73
G08-028	\$1,722,579.20
G08-029	\$2,298,047.92
G08-031	\$9,604,902.34
G08-032	\$58,589.90
G08-035	\$262,784.13
G08-036	\$262,784.13
G08-044	\$2,135,890.16
G08-045	\$2,757,657.51
G08-047	\$1,435,482.67
G08-051	\$630,346.73
G08-052	\$45,230.59
G08-053	\$236,070.49
G08-059	\$587,968.60
G08-060	\$1,545,939.05
G08-062	\$355,131.26
G08-063	\$355,131.26
G08-065	\$1,838,438.34
<b>Upgrade Total</b>	<b>\$35,000,000.00</b>

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**All Upgrades Total**

**\$1,997,800,000.01**

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

See Attachment

**I: ACCC Analysis (Upgrades Included)**

See Attachment