



***Feasibility Study
For
Generation Interconnection
Request
GEN-2007-004***

***SPP Tariff Studies
(#GEN-2007-004)***

July, 2007

Executive Summary

<OMITTED TEXT> (Customer) has requested a Feasibility Study for the purpose of interconnecting 150 MW of wind generation within the control area of Southwestern Public Service (SPS) located in Terry County, Texas. The proposed method and point of interconnection is a new 230 kV ring-bus switching station to be located on the existing Yoakum County Interchange – Amoco Switching Station 230 kV transmission line, owned by SPS. The proposed in-service date is May 1, 2009.

Power flow analysis has indicated that for the powerflow cases studied, it is possible to interconnect the 150 MW of generation with transmission system reinforcements within the local transmission system. In order to maintain acceptable reactive power compensation, the customer will be required to pay for the installation of a combined total of at least 34 Mvar of 34.5 kV capacitor bank(s) to be installed in the Customer's collector substation. Dynamic Stability studies performed as part of the System Impact 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 requirement to interconnect the 150 MW of wind generation on the existing Yoakum County Interchange – Amoco Switching Station 230 kV transmission line consists of constructing a new 230 kV three-breaker ring-bus switching station. The Customer did not propose a specific route for the 230 kV line extending to serve its 230/34.5 kV facilities. It is assumed that obtaining all necessary right-of-way for the new transmission line to serve its facilities will not be a significant expense.

The total minimum cost for building the required facilities for this 150 MW of generation is \$3,000,000. These costs are shown in Table 2. Network constraints in the SPS transmission system that were identified are shown in Table 3. These Network constraints will have to be verified with a Transmission Service Request (TSR) and associated studies. Network Constraints are in the local area of the new generation when this generation is sunk throughout the SPP footprint for the Energy Resource (ER) Interconnection request. With a defined source and sink in a Transmission Service Request, this list of Network Constraints will be refined and expanded to account for all Network Upgrade requirements. This cost does not include building the 230 kV line from the Customer 230/34.5 kV collector substation into the new SPS ring-bus switching station. This cost also does not include the Customer's 230/34.5 kV collector substation or the 34.5 kV, 34 Mvar capacitor bank(s).

In Table 4, a value of Available Transfer Capability (ATC) associated with each overloaded facility is included. These values may be used by the Customer for future analyses including the determination of lower generation capacity levels that may be installed. When transmission service associated with this interconnection is evaluated, the loading of the facilities listed in this table may be greater due to higher priority reservations. If the loading of a facility is higher, the level of ATC will be lower.

There are several other proposed generation additions in the general area of the Customer's facility. It was assumed in this preliminary analysis that not all of these other projects within the SPS control area will be in service. Those previously queued projects that have advanced to nearly complete phases were included in this Feasibility Study. In the event that another request for a generation interconnection with a higher priority withdraws, then this request may have to be re-evaluated to determine the local Network Constraints.

The required interconnection costs listed in Tables 1 and 2 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 through Southwest Power Pool's OASIS.

Introduction

<OMITTED TEXT> (Customer) has requested a Feasibility Study for the purpose of interconnecting 150 MW of wind generation within the control area of Southwestern Public Service (SPS) located in Terry County, Texas. The proposed method and point of interconnection is a new 230 kV ring-bus switching station to be located on the existing Yoakum County Interchange – Amoco Switching Station 230 kV transmission line, owned by SPS. The proposed in-service date is May 1, 2009.

Interconnection Facilities

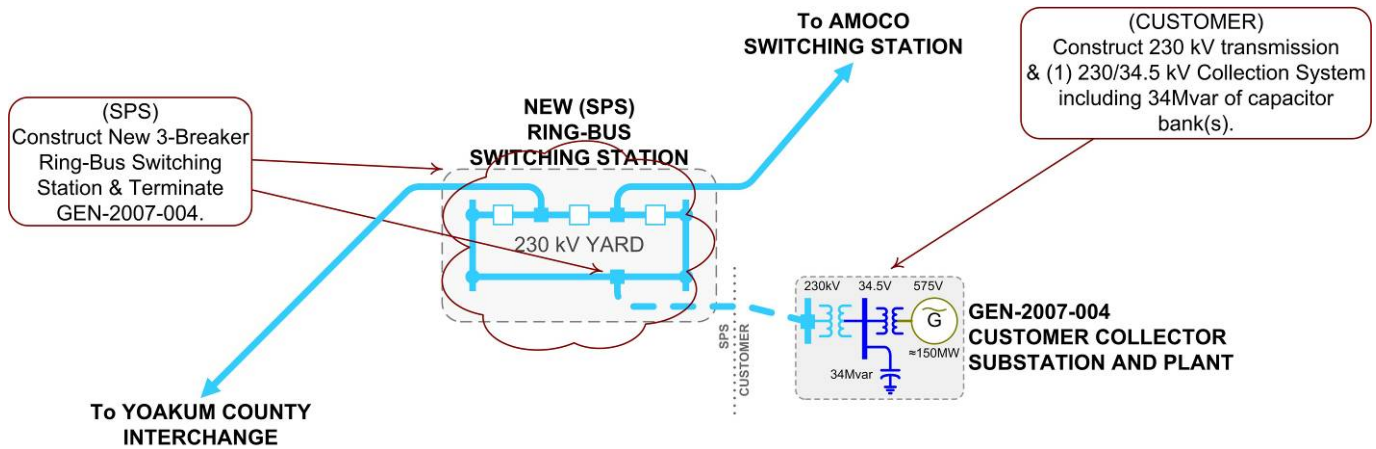
The primary objective of this study is to identify the system problems associated with connecting the plant to the area transmission system. The Feasibility and other subsequent Interconnection Studies are designed to identify attachment facilities, Network Upgrades and other Direct Assignment Facilities needed to accept power into the grid at the interconnection receipt point.

The requirements for interconnection of the 150 MW consist of constructing a new three-breaker ring-bus switching station on the existing Yoakum County Interchange – Amoco Switching Station 230 kV transmission line, owned by SPS. This substation shall be constructed and maintained by SPS. The Customer did not propose a specific route of its 230 kV line to serve its 230/34.5 kV collection system facilities. It is assumed that obtaining all necessary right-of-way for construction of the Customer 230 kV transmission line and the 230/34.5 kV collector substation will not be a significant expense.

The minimum cost for constructing a new three-breaker ring-bus switching station and the required interconnection facilities is estimated at \$3,000,000. These costs are listed in Tables 1 and 2. These estimates will be refined during the development of the System Impact Study based on the final designs. This cost does not include building the Customer's 230 kV transmission line extending from the point of interconnection to serve its 230/34.5 kV collection facilities. This cost also does not include the Customer's 230/34.5 kV collector substation or the 34 Mvar (combined total) of capacitor bank(s), all of which should be determined by the Customer. The Customer is responsible for these 230 – 34.5 kV facilities up to the point of interconnection. Other Network Constraints in the SPS transmission systems that were identified are shown in Table 3

These costs do not include any cost that might be associated with short circuit study results or dynamic stability study results. These costs will be determined when and if a System Impact Study is conducted.

A preliminary one-line drawing of each interconnection option and direct assigned facilities are shown in Figure 1.



**FIGURE 1: Proposed Method of Interconnection
(Final design to be determined)**

Interconnection Estimated Costs

TABLE 1: Direct Assignment Facilities

FACILITY	ESTIMATED COST (2007 DOLLARS)
Customer – (1) 230/34.5 kV Customer collector substation facilities.	*
Customer – (1) 230 kV transmission line from Customer collector substation to the New SPS 3-Breaker Ring-Bus Switching Station.	*
Customer – 34.5 kV, 34 Mvar capacitor bank(s) to be installed in the Customer 230/34.5 kV collector substation.	*
Customer – Right-of-Way for all Customer facilities.	*
TOTAL	*

* Estimates of cost to be determined.

TABLE 2: Required Interconnection Network Upgrade Facilities

FACILITY	ESTIMATED COST (2007 DOLLARS)
SPS – (1) 230 kV 3-Breaker Ring-Bus Switching Station. Station to include breakers, switches, control relaying, high speed communications, metering and related equipment and all structures.	\$3,000,000
TOTAL	\$3,000,000

Powerflow Analysis

A powerflow analysis was conducted for the facility using modified versions of the 2009 and 2012 summer and winter peak models, and 2017 summer peak model. The output of the 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 proposed in-service date of the generation is May 1, 2009. The available seasonal models used were through the 2017 Summer Peak of which is the end of the current SPP planning horizon.

SPS has plans to complete the 230 kV transmission loop in the eastern New Mexico in 2009. The proposed portion of the 230 kV transmission loop will extend from Seven Rivers Interchange to Potash Junction substation. The completion of this loop is contingent upon approval of a New Mexico Public Service Commission Certificate of Convenience and Necessity (CCN). This loop has been included in the analysis of the Customer project. Also included in the analysis of the Customer project is the addition of a base load power plant in New Mexico. Given the assumptions for this study, the analysis of the Customer's project indicates that, given the requested generation level of 150 MW and location, additional criteria violations will occur on the existing SPS transmission system under steady state and contingency conditions in the peak seasons.

In order to maintain a zero reactive power flow exchanged at the point of interconnection, additional reactive compensation is required. The Customer will be required to install a total of 34 Mvar of capacitor bank(s) in the Customer's 230/34.5 kV collector substation on the 34.5 kV bus. Dynamic Stability studies performed as part of the System Impact 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.

There are several other proposed generation additions in the general area of the Customer's facility. Some of the local projects that were previously queued were assumed to be in service in this Feasibility Study. Not all local projects that were previously queued and have advanced to nearly complete phases were included in this Feasibility 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 Planning Standards* for System Adequacy and Security – Transmission System Table I hereafter referred to as NERC Table I) and its applicable standards and measurements".

Using the created models and the ACCC function of PSS/E, single contingencies in portions or all of the modeled control areas of Sunflower Electric Power Corporation (SUNC), Missouri Public Service (MIPU), Westar (WESTAR), Kansas City Power & Light (KCPL), West Plains (WEPL), Midwest Energy (MIDW), Oklahoma Gas and Electric OKGE, American Electric Power West (AEPW), Grand River Dam Authority (GRDA), Southwestern Public Service Company (SPS), Western Farmers Electric Cooperative (WFEC) and other control areas were applied and the resulting scenarios analyzed. This satisfies the 'more probable' contingency testing criteria mandated by NERC and the SPP criteria.

Powerflow Results

TABLE 3: Network Constraints

AREA	OVERLOADED ELEMENT
SPS	2006-39 230.00 - POTTER COUNTY INTERCHANGE 230KV CKT 1
SPS	2007-04 230.00 - AMOCO SWITCHING STATION 230KV CKT 1
SPS	BAILEY COUNTY REC-EARTH INTERCHANGE - CASTRO COUNTY INTERCHANGE 115KV CKT 1
SPS	BAILEY COUNTY REC-EARTH INTERCHANGE - PLANT X STATION 115KV CKT 1
SPS	BOWERS INTERCHANGE - MCCULLOUGH SUB 69KV CKT 1
SPS	CARLISLE INTERCHANGE - DOUD SUB 115KV CKT 1
SPS	CONWAY SUB - KIRBY SWITCHING STATION 115KV CKT 1
SPS	CONWAY SUB - YARNELL SUB 115KV CKT 1
SPS	CURRY COUNTY INTERCHANGE - DEAF SMITH REC-#20 115KV CKT 1
SPS	DEAF SMITH COUNTY INTERCHANGE - PLANT X STATION 230KV CKT 1
SPS	DEAF SMITH REC-#20 - PARMER COUNTY SUB 115KV CKT 1
SPS	DOUD SUB - SOUTH PLAINS REC-YUMA 115KV CKT 1
AEPW/SPS	ELK CITY 230KV - GRAPEVINE INTERCHANGE 230KV CKT 1
AEPW	ELK CITY 230KV (ELKCTY-4) 138/69/13.8KV TRANSFORMER CKT 1
AEPW	ELK CITY 230KV (ELKCTY-6) 230/138/13.8KV TRANSFORMER CKT 1
SPS	GRAPEVINE INTERCHANGE - NICHOLS STATION 230KV CKT 1
SPS	GRAY COUNTY INTERCHANGE 115/69KV TRANSFORMER CKT 1
SPS	HEREFORD INTERCHANGE - PNDAHFD3 115.00 115KV CKT 1
AEPW	JERICHO (JERIC2WT) 115/69/14.4KV TRANSFORMER CKT 1
SPS	KINGSMILL INTERCHANGE - MCCULLOUGH SUB 69KV CKT 1
SPS	KINGSMILL INTERCHANGE 115/69KV TRANSFORMER CKT 1
SPS	KIRBY SWITCHING STATION - MCCLELLAN SUB 115KV CKT 1
AEPW/WFEC	LAKE PAULINE - RUSSELL 138KV CKT 1
SPS	LAMB COUNTY REC-SOUTH OLTON - PLANT X STATION 115KV CKT 1
SPS	LAMTON INTERCHANGE - LAMB COUNTY REC-SOUTH OLTON 115KV CKT 1
SPS	LUBBOCK POWER & LIGHT-CO-OP - LUBBOCK POWER & LIGHT-MC CULLOUGH 69KV CKT 1
SPS	LUBBOCK POWER & LIGHT-CO-OP - LUBBOCK POWER & LIGHT-WADSWORTH 69KV CKT 1
SPS	LUBBOCK POWER & LIGHT-ERSKINE - LUBBOCK POWER & LIGHT-MACKENZIE GEN 69KV CKT 1
SPS	LUBBOCK POWER & LIGHT-HOLLY PLANT 230/69KV TRANSFORMER CKT 1
SPS	LUBBOCK POWER & LIGHT-MILWAUKEE 230/69KV TRANSFORMER CKT 1
SPS	LUBBOCK POWER & LIGHT-SLATON - LUBBOCK POWER & LIGHT-SOUTHEAST 69KV CKT 1
SPS	LUBBOCK POWER & LIGHT-SOUTHEAST 230/69KV TRANSFORMER CKT 1
SPS	LUBBOCK POWER & LIGHT-WADSWORTH 230/69KV TRANSFORMER CKT 1
SPS	MCCLELLAN SUB - MCLEAN RURAL SUB 115KV CKT 1
SPS	MOORE COUNTY INTERCHANGE 230/115KV TRANSFORMER CKT 1
SPS	NICHOLS STATION - YARNELL SUB 115KV CKT 1
SPS	PLANT X STATION - TOLK STATION WEST 230KV CKT 1
SPS	PLANT X STATION 230/115KV TRANSFORMER CKT 1
SPS	POTTER COUNTY INTERCHANGE (POTTR CO) 345/230/13.2KV TRANSFORMER CKT 1
AEPW/SPS	SHAMROCK - MCLEAN RURAL 115KV CKT 1
AEPW	SHAMROCK (SHAMRCK1) 115/69/14.4KV TRANSFORMER CKT 1
AEPW	SHAMROCK (SHAMRCK2) 138/69/14.4KV TRANSFORMER CKT 1
SPS	SOUTH PLAINS REC-YUMA - WOLFFORTH INTERCHANGE 115KV CKT 1
SPS	SUNDOWN INTERCHANGE - WOLFFORTH INTERCHANGE 230KV CKT 1
SPS	TERRY COUNTY INTERCHANGE - WOLFFORTH INTERCHANGE 115KV CKT 1
SPS	TOLK STATION EAST - TUCO INTERCHANGE 230KV CKT 1
SPS	TUCO INTERCHANGE (TUCO XX4) 345/230/13.2KV TRANSFORMER CKT 1

TABLE 3: Network Constraints (continued)

AREA	OVERLOADED ELEMENT
SPS	YOAKUM COUNTY INTERCHANGE 230/115KV TRANSFORMER CKT 1
AEPW	AMERICAN ELECTRIC POWER WEST
SPS	SOUTHWESTERN PUBLIC SERVICE
WFEC	WESTERN FARMERS ELECTRIC COOPERATIVE

TABLE 4: Contingency Analysis

SEASON	OVERLOADED ELEMENT	RATING (MVA)	LOADING (%)	ATC (MW)	CONTINGENCY
09SP	YOAKUM COUNTY INTERCHANGE 230/115KV TRANSFORMER CKT 1	150	134	0	2007-04 230.00 - AMOCO SWITCHING STATION 230KV CKT 1
09SP	PLANT X STATION 230/115KV TRANSFORMER CKT 1	252	126	0	2006-39 230.00 - POTTER COUNTY INTERCHANGE 230KV CKT 1
09SP	DOUD SUB - SOUTH PLAINS REC-YUMA 115KV CKT 1	161	123	0	LUBBOCK SOUTH INTERCHANGE - WOLFFORTH INTERCHANGE 230KV CKT 1
09SP	SOUTH PLAINS REC-YUMA - WOLFFORTH INTERCHANGE 115KV CKT 1	197	110	60	LUBBOCK SOUTH INTERCHANGE - WOLFFORTH INTERCHANGE 230KV CKT 1
09SP	ELK CITY 230KV (ELKCTY-6) 230/138/13.8KV TRANSFORMER CKT 1	287	108	73	TUCO INTERCHANGE (TUCO XX4) 345/230/13.2KV TRANSFORMER CKT 1
09SP	CARLISLE INTERCHANGE - DOUD SUB 115KV CKT 1	161	106	110	LUBBOCK SOUTH INTERCHANGE - WOLFFORTH INTERCHANGE 230KV CKT 1
09WP	ELK CITY 230KV (ELKCTY-6) 230/138/13.8KV TRANSFORMER CKT 1	287	191	0	OKLAUNION - TUCO INTERCHANGE 345KV CKT 1
09WP	ELK CITY 230KV - GRAPEVINE INTERCHANGE 230KV CKT 1	351	156	0	OKLAUNION - TUCO INTERCHANGE 345KV CKT 1
09WP	SHAMROCK (SHAMRCK1) 115/69/14.4KV TRANSFORMER CKT 1	69	146	0	OKLAUNION - TUCO INTERCHANGE 345KV CKT 1
09WP	TUCO INTERCHANGE (TUCO XX4) 345/230/13.2KV TRANSFORMER CKT 1	560	137	0	(SPP-SWPS-04A): LAMAR - FINNEY SWITCHING STATION 345KV CKT 1, FINNEY SWITCHING STATION - POTTER COUNTY INTERCHANGE 345KV CKT 1
09WP	SHAMROCK (SHAMRCK2) 138/69/14.4KV TRANSFORMER CKT 1	69	135	0	OKLAUNION - TUCO INTERCHANGE 345KV CKT 1
09WP	DOUD SUB - SOUTH PLAINS REC-YUMA 115KV CKT 1	195	124	0	LUBBOCK SOUTH INTERCHANGE - WOLFFORTH INTERCHANGE 230KV CKT 1
09WP	YOAKUM COUNTY INTERCHANGE 230/115KV TRANSFORMER CKT 1	150	124	0	2007-04 230.00 - AMOCO SWITCHING STATION 230KV CKT 1
09WP	JERICHO (JERIC2WT) 115/69/14.4KV TRANSFORMER CKT 1	46	117	0	OKLAUNION - TUCO INTERCHANGE 345KV CKT 1
09WP	GRAPEVINE INTERCHANGE 230/115KV TRANSFORMER CKT 1	140	113	0	GRAPEVINE INTERCHANGE - NICHOLS STATION 230KV CKT 1
09WP	PLANT X STATION 230/115KV TRANSFORMER CKT 1	252	105	29	TOLK STATION EAST - TUCO INTERCHANGE 230KV CKT 1
09WP	POTTER COUNTY INTERCHANGE (POTTR CO) 345/230/13.2KV TRANSFORMER CKT 1	560	118	32	OKLAUNION - TUCO INTERCHANGE 345KV CKT 1
09WP	CARLISLE INTERCHANGE - DOUD SUB 115KV CKT 1	195	114	36	LUBBOCK SOUTH INTERCHANGE - WOLFFORTH INTERCHANGE 230KV CKT 1
09WP	LAKE PAULINE - RUSSELL 138KV CKT 1	72	108	71	OKLAUNION - TUCO INTERCHANGE 345KV CKT 1
09WP	SOUTH PLAINS REC-YUMA - WOLFFORTH INTERCHANGE 115KV CKT 1	235	107	81	LUBBOCK SOUTH INTERCHANGE - WOLFFORTH INTERCHANGE 230KV CKT 1
09WP	KINGSMILL INTERCHANGE - MCCULLOUGH SUB 69KV CKT 1	117	101	128	GRAPEVINE INTERCHANGE - NICHOLS STATION 230KV CKT 1
09WP	KIRBY SWITCHING STATION - MCCLELLAN SUB 115KV CKT 1	107	101	133	OKLAUNION - TUCO INTERCHANGE 345KV CKT 1
09WP	2006-39 230.00 - POTTER COUNTY INTERCHANGE 230KV CKT 1	606	101	143	OKLAUNION - TUCO INTERCHANGE 345KV CKT 1
12SP	ELK CITY 230KV (ELKCTY-6) 230/138/13.8KV TRANSFORMER CKT 1	287	163	0	TUCO INTERCHANGE (TUCO XX4) 345/230/13.2KV TRANSFORMER CKT 1
12SP	DOUD SUB - SOUTH PLAINS REC-YUMA 115KV CKT 1	161	155	0	LUBBOCK SOUTH INTERCHANGE - WOLFFORTH INTERCHANGE 230KV CKT 1
12SP	YOAKUM COUNTY INTERCHANGE 230/115KV TRANSFORMER CKT 1	150	150	0	2007-04 230.00 - AMOCO SWITCHING STATION 230KV CKT 1

TABLE 4: Contingency Analysis (continued)

SEASON	OVERLOADED ELEMENT	RATING (MVA)	LOADING (%)	ATC (MW)	CONTINGENCY
12SP	SOUTH PLAINS REC-YUMA - WOLFFORTH INTERCHANGE 115KV CKT 1	197	138	0	LUBBOCK SOUTH INTERCHANGE - WOLFFORTH INTERCHANGE 230KV CKT 1
12SP	CARLISLE INTERCHANGE - DOUD SUB 115KV CKT 1	161	138	0	LUBBOCK SOUTH INTERCHANGE - WOLFFORTH INTERCHANGE 230KV CKT 1
12SP	ELK CITY 230KV - GRAPEVINE INTERCHANGE 230KV CKT 1	351	134	0	TUCO INTERCHANGE (TUCO XX4) 345/230/13.2KV TRANSFORMER CKT 1
12SP	TUCO INTERCHANGE (TUCO XX4) 345/230/13.2KV TRANSFORMER CKT 1	560	125	0	FINNEY SWITCHING STATION - HOLCOMB 345KV CKT 1
12SP	CONWAY SUB - YARNELL SUB 115KV CKT 1	180	119	0	GRAPEVINE INTERCHANGE - NICHOLS STATION 230KV CKT 1
12SP	NICHOLS STATION - YARNELL SUB 115KV CKT 1	180	119	0	GRAPEVINE INTERCHANGE - NICHOLS STATION 230KV CKT 1
12SP	PLANT X STATION 230/115KV TRANSFORMER CKT 1	252	113	0	TOLK STATION EAST - TUCO INTERCHANGE 230KV CKT 1
12SP	JERICHO (JERIC2WT) 115/69/14.4KV TRANSFORMER CKT 1	46	113	0	KIRBY SWITCHING STATION - MCCLELLAN SUB 115KV CKT 1
12SP	GRAPEVINE INTERCHANGE 230/115KV TRANSFORMER CKT 1	129	112	0	ELK CITY 230KV (ELKCTY-6) 230/138/13.8KV TRANSFORMER CKT 1
12SP	BAILEY COUNTY REC-EARTH INTERCHANGE - PLANT X STATION 115KV CKT 1	161	109	0	DEAF SMITH COUNTY INTERCHANGE - PLANT X STATION 230KV CKT 1
12SP	TOLKSTATION EAST - TUCO INTERCHANGE 230KV CKT 1	497	109	0	FINNEY SWITCHING STATION - HOLCOMB 345KV CKT 1
12SP	KIRBY SWITCHING STATION - MCCLELLAN SUB 115KV CKT 1	90	111	5	(SPP-SWPS-02): ELK CITY 230KV (ELKCTY-6) 230/138/13.8KV TRANSFORMER CKT 1, ELK CITY 230KV - GRAPEVINE INTERCHANGE 230KV CKT 1
12SP	CONWAY SUB - KIRBY SWITCHING STATION 115KV CKT 1	180	110	23	GRAPEVINE INTERCHANGE - NICHOLS STATION 230KV CKT 1
12SP	MCCLELLAN SUB - MCLEAN RURAL SUB 115KV CKT 1	90	109	31	ELK CITY 230KV (ELKCTY-6) 230/138/13.8KV TRANSFORMER CKT 1
12SP	DOUD SUB - SOUTH PLAINS REC-YUMA 115KV CKT 1	146	108	40	BASE CASE
12SP	TERRY COUNTY INTERCHANGE - WOLFFORTH INTERCHANGE 115KV CKT 1	197	109	50	SUNDOWN INTERCHANGE - WOLFFORTH INTERCHANGE 230KV CKT 1
12SP	GRAPEVINE INTERCHANGE - NICHOLS STATION 230KV CKT 1	497	102	113	TUCO INTERCHANGE (TUCO XX4) 345/230/13.2KV TRANSFORMER CKT 1
12SP	LAMB COUNTY REC-SOUTH OLTON - PLANT X STATION 115KV CKT 1	161	101	134	TOLK STATION EAST - TUCO INTERCHANGE 230KV CKT 1
12WP	ELK CITY 230KV (ELKCTY-6) 230/138/13.8KV TRANSFORMER CKT 1	287	235	0	TUCO INTERCHANGE (TUCO XX4) 345/230/13.2KV TRANSFORMER CKT 1
12WP	ELK CITY 230KV - GRAPEVINE INTERCHANGE 230KV CKT 1	351	192	0	TUCO INTERCHANGE (TUCO XX4) 345/230/13.2KV TRANSFORMER CKT 1
12WP	SHAMROCK (SHAMRCK1) 115/69/14.4KV TRANSFORMER CKT 1	69	171	0	TUCO INTERCHANGE (TUCO XX4) 345/230/13.2KV TRANSFORMER CKT 1
12WP	SHAMROCK (SHAMRCK2) 138/69/14.4KV TRANSFORMER CKT 1	69	158	0	TUCO INTERCHANGE (TUCO XX4) 345/230/13.2KV TRANSFORMER CKT 1
12WP	GRAPEVINE INTERCHANGE 230/115KV TRANSFORMER CKT 1	140	150	0	GRAPEVINE INTERCHANGE - NICHOLS STATION 230KV CKT 1
12WP	TUCO INTERCHANGE (TUCO XX4) 345/230/13.2KV TRANSFORMER CKT 1	560	146	0	(SPP-SWPS-04A): LAMAR - FINNEY SWITCHING STATION 345KV CKT 1, FINNEY SWITCHING STATION - POTTER COUNTY INTERCHANGE 345KV CKT 1
12WP	JERICHO (JERIC2WT) 115/69/14.4KV TRANSFORMER CKT 1	46	139	0	TUCO INTERCHANGE (TUCO XX4) 345/230/13.2KV TRANSFORMER CKT 1
12WP	DOUD SUB - SOUTH PLAINS REC-YUMA 115KV CKT 1	195	130	0	LUBBOCK SOUTH INTERCHANGE - WOLFFORTH INTERCHANGE 230KV CKT 1
12WP	LAKE PAULINE - RUSSELL 138KV CKT 1	72	130	0	TUCO INTERCHANGE (TUCO XX4) 345/230/13.2KV TRANSFORMER CKT 1
12WP	YOAKUM COUNTY INTERCHANGE 230/115KV TRANSFORMER CKT 1	150	129	0	2007-04 230.00 - AMOCO SWITCHING STATION 230KV CKT 1
12WP	KINGSMILL INTERCHANGE - MCCULLOUGH SUB 69KV CKT 1	117	123	0	GRAPEVINE INTERCHANGE - NICHOLS STATION 230KV CKT 1

TABLE 4: Contingency Analysis (continued)

SEASON	OVERLOADED ELEMENT	RATING (MVA)	LOADING (%)	ATC (MW)	CONTINGENCY
12WP	CARLISLE INTERCHANGE - DOUD SUB 115KV CKT 1	195	120	0	LUBBOCK SOUTH INTERCHANGE - WOLFFORTH INTERCHANGE 230KV CKT 1
12WP	KIRBY SWITCHING STATION - MCCLELLAN SUB 115KV CKT 1	107	119	0	TUCO INTERCHANGE (TUCO XX4) 345/230/13.2KV TRANSFORMER CKT 1
12WP	KINGSMILL INTERCHANGE 115/69KV TRANSFORMER CKT 1	94	113	7	GRAPEVINE INTERCHANGE - NICHOLS STATION 230KV CKT 1
12WP	MCCLELLAN SUB - MCLEAN RURAL SUB 115KV CKT 1	107	118	10	TUCO INTERCHANGE (TUCO XX4) 345/230/13.2KV TRANSFORMER CKT 1
12WP	SOUTH PLAINS REC-YUMA - WOLFFORTH INTERCHANGE 115KV CKT 1	235	112	22	LUBBOCK SOUTH INTERCHANGE - WOLFFORTH INTERCHANGE 230KV CKT 1
12WP	PLANT X STATION 230/115KV TRANSFORMER CKT 1	252	104	24	TOLK STATION EAST - TUCO INTERCHANGE 230KV CKT 1
12WP	ELK CITY 230KV (ELKCTY-4) 138/69/13.8KV TRANSFORMER CKT 1	72	112	33	TUCO INTERCHANGE (TUCO XX4) 345/230/13.2KV TRANSFORMER CKT 1
12WP	CONWAY SUB - YARNELL SUB 115KV CKT 1	218	111	36	GRAPEVINE INTERCHANGE - NICHOLS STATION 230KV CKT 1
12WP	NICHOLS STATION - YARNELL SUB 115KV CKT 1	218	111	37	GRAPEVINE INTERCHANGE - NICHOLS STATION 230KV CKT 1
12WP	ELK CITY 230KV - GRAPEVINE INTERCHANGE 230KV CKT 1	319	108	41	BASE CASE
12WP	BOWERS INTERCHANGE - MCCULLOUGH SUB 69KV CKT 1	117	110	54	GRAPEVINE INTERCHANGE - NICHOLS STATION 230KV CKT 1
12WP	GRAY COUNTY INTERCHANGE 115/69KV TRANSFORMER CKT 1	105	110	56	GRAPEVINE INTERCHANGE - NICHOLS STATION 230KV CKT 1
12WP	SHAMROCK - MCLEAN RURAL 115KV CKT 1	107	111	60	TUCO INTERCHANGE (TUCO XX4) 345/230/13.2KV TRANSFORMER CKT 1
12WP	CONWAY SUB - KIRBY SWITCHING STATION 115KV CKT 1	218	106	91	GRAPEVINE INTERCHANGE - NICHOLS STATION 230KV CKT 1
17SP	LUBBOCK POWER & LIGHT-SOUTHEAST 230/69KV TRANSFORMER CKT 1	100	204	0	LUBBOCK POWER & LIGHT-HOLLY PLANT 230/69KV TRANSFORMER CKT 1
17SP	LUBBOCK POWER & LIGHT-HOLLY PLANT 230/69KV TRANSFORMER CKT 1	100	201	0	LUBBOCK POWER & LIGHT-SOUTHEAST 230/69KV TRANSFORMER CKT 1
17SP	LUBBOCK POWER & LIGHT-WADSWORTH 230/69KV TRANSFORMER CKT 1	100	185	0	LUBBOCK POWER & LIGHT-HOLLY PLANT 230/69KV TRANSFORMER CKT 1
17SP	DOUD SUB - SOUTH PLAINS REC-YUMA 115KV CKT 1	161	176	0	LUBBOCK SOUTH INTERCHANGE - WOLFFORTH INTERCHANGE 230KV CKT 1
17SP	YOAKUM COUNTY INTERCHANGE 230/115KV TRANSFORMER CKT 1	150	163	0	2007-04 230.00 - AMOCO SWITCHING STATION 230KV CKT 1
17SP	CARLISLE INTERCHANGE - DOUD SUB 115KV CKT 1	161	156	0	LUBBOCK SOUTH INTERCHANGE - WOLFFORTH INTERCHANGE 230KV CKT 1
17SP	SOUTH PLAINS REC-YUMA - WOLFFORTH INTERCHANGE 115KV CKT 1	197	155	0	LUBBOCK SOUTH INTERCHANGE - WOLFFORTH INTERCHANGE 230KV CKT 1
17SP	ELK CITY 230KV (ELKCTY-6) 230/138/13.8KV TRANSFORMER CKT 1	287	145	0	FINNEY SWITCHING STATION - HOLCOMB 345KV CKT 1
17SP	GRAPEVINE INTERCHANGE 230/115KV TRANSFORMER CKT 1	129	138	0	GRAPEVINE INTERCHANGE - NICHOLS STATION 230KV CKT 1
17SP	PLANT X STATION 230/115KV TRANSFORMER CKT 1	252	134	0	TOLK STATION EAST - TUCO INTERCHANGE 230KV CKT 1
17SP	TUCO INTERCHANGE (TUCO XX4) 345/230/13.2KV TRANSFORMER CKT 1	560	127	0	FINNEY SWITCHING STATION - HOLCOMB 345KV CKT 1
17SP	TOLK STATION EAST - TUCO INTERCHANGE 230KV CKT 1	497	126	0	FINNEY SWITCHING STATION - HOLCOMB 345KV CKT 1
17SP	MOORE COUNTY INTERCHANGE 230/115KV TRANSFORMER CKT 1	252	119	0	SPEARMAN INTERCHANGE - SPEARMAN SUB 115KV CKT 1
17SP	DOUD SUB - SOUTH PLAINS REC-YUMA 115KV CKT 1	146	118	0	BASE CASE
17SP	SHAMROCK (SHAMRCK1) 115/69/14.4KV TRANSFORMER CKT 1	69	116	0	FINNEY SWITCHING STATION - HOLCOMB 345KV CKT 1
17SP	LAMB COUNTY REC-SOUTH OLTON - PLANT X STATION 115KV CKT 1	161	116	0	TOLK STATION EAST - TUCO INTERCHANGE 230KV CKT 1

TABLE 4: Contingency Analysis (continued)

SEASON	OVERLOADED ELEMENT	RATING (MVA)	LOADING (%)	ATC (MW)	CONTINGENCY
17SP	SOUTH PLAINS REC-YUMA - WOLFFORTH INTERCHANGE 115KV CKT 1	179	110	0	BASE CASE
17SP	TOLK STATION EAST - TUCO INTERCHANGE 230KV CKT 1	452	109	0	BASE CASE
17SP	LAMTON INTERCHANGE - LAMB COUNTY REC-SOUTH OLTON 115KV CKT 1	161	107	0	TOLK STATION EAST - TUCO INTERCHANGE 230KV CKT 1
17SP	HEREFORD INTERCHANGE - PNDAHFD3 115.00 115KV CKT 1	99	112	2	BUSHLAND INTERCHANGE - DEAF SMITH COUNTY INTERCHANGE 230KV CKT 1
17SP	DEAF SMITH COUNTY INTERCHANGE - PLANT X STATION 230KV CKT 1	497	112	14	2006-39 230.00 - POTTER COUNTY INTERCHANGE 230KV CKT 1
17SP	KIRBY SWITCHING STATION - MCCLELLAN SUB 115KV CKT 1	90	112	20	ELK CITY 230KV - GRAPEVINE INTERCHANGE 230KV CKT 1
17SP	LUBBOCK POWER & LIGHT-CO-OP - LUBBOCK POWER & LIGHT-WADSWORTH 69KV CKT 1	143	126	28	LUBBOCK POWER & LIGHT-MILWAUKEE 230/69KV TRANSFORMER CKT 1
17SP	LUBBOCK POWER & LIGHT-MILWAUKEE 230/69KV TRANSFORMER CKT 1	100	123	33	LUBBOCK POWER & LIGHT-SOUTHEAST - LUBBOCK SOUTH INTERCHANGE 230KV CKT 1
17SP	MCCLELLAN SUB - MCLEAN RURAL SUB 115KV CKT 1	90	110	41	ELK CITY 230KV - GRAPEVINE INTERCHANGE 230KV CKT 1
17SP	SUNDOWN INTERCHANGE - WOLFFORTH INTERCHANGE 230KV CKT 1	497	107	45	TOLK STATION EAST - TUCO INTERCHANGE 230KV CKT 1
17SP	PLANT X STATION - TOLK STATION WEST 230KV CKT 1	497	102	79	TOLK STATION EAST - TUCO INTERCHANGE 230KV CKT 1
17SP	LUBBOCK POWER & LIGHT-SLATON - LUBBOCK POWER & LIGHT-SOUTHEAST 69KV CKT 1	143	108	109	CARLISLE INTERCHANGE - LUBBOCK POWER & LIGHT-MILWAUKEE 230KV CKT 1
17SP	LUBBOCK POWER & LIGHT-ERSKINE - LUBBOCK POWER & LIGHT-MACKENZIE GEN 69KV CKT 1	107	106	118	CARLISLE INTERCHANGE - LUBBOCK POWER & LIGHT-MILWAUKEE 230KV CKT 1
17SP	LUBBOCK POWER & LIGHT-CO-OP - LUBBOCK POWER & LIGHT-MC CULLOUGH 69KV CKT 1	143	101	144	CARLISLE INTERCHANGE - LUBBOCK POWER & LIGHT-MILWAUKEE 230KV CKT 1
17SP	2007-04 230.00 - AMOCO SWITCHING STATION 230KV CKT 1	452	101	145	PLANT X STATION - SUNDOWN INTERCHANGE 230KV CKT 1
17SP	KINGSMILL INTERCHANGE - MCCULLOUGH SUB 69KV CKT 1	97	136	145	GRAPEVINE INTERCHANGE - NICHOLS STATION 230KV CKT 1
17SP	BAILEY COUNTY REC-EARTH INTERCHANGE - PLANT X STATION 115KV CKT 1	161	132	146	DEAF SMITH COUNTY INTERCHANGE - PLANT X STATION 230KV CKT 1
17SP	ELK CITY 230KV - GRAPEVINE INTERCHANGE 230KV CKT 1	351	129	146	TUCO INTERCHANGE (TUCO XX4) 345/230/13.2KV TRANSFORMER CKT 1
17SP	CONWAY SUB - YARNELL SUB 115KV CKT 1	180	126	147	GRAPEVINE INTERCHANGE - NICHOLS STATION 230KV CKT 1
17SP	NICHOLS STATION - YARNELL SUB 115KV CKT 1	180	126	147	GRAPEVINE INTERCHANGE - NICHOLS STATION 230KV CKT 1
17SP	TERRY COUNTY INTERCHANGE - WOLFFORTH INTERCHANGE 115KV CKT 1	197	124	147	SUNDOWN INTERCHANGE - WOLFFORTH INTERCHANGE 230KV CKT 1
17SP	CURRY COUNTY INTERCHANGE - DEAF SMITH REC-#20 115KV CKT 1	99	118	148	DEAF SMITH COUNTY INTERCHANGE - PLANT X STATION 230KV CKT 1
17SP	CONWAY SUB - KIRBY SWITCHING STATION 115KV CKT 1	180	116	148	GRAPEVINE INTERCHANGE - NICHOLS STATION 230KV CKT 1
17SP	BOWERS INTERCHANGE - MCCULLOUGH SUB 69KV CKT 1	97	113	148	GRAPEVINE INTERCHANGE - NICHOLS STATION 230KV CKT 1
17SP	BAILEY COUNTY REC-EARTH INTERCHANGE - CASTRO COUNTY INTERCHANGE 115KV CKT 1	161	111	149	DEAF SMITH COUNTY INTERCHANGE - PLANT X STATION 230KV CKT 1
17SP	DEAF SMITH REC-#20 - PARMER COUNTY SUB 115KV CKT 1	99	100	150	DEAF SMITH COUNTY INTERCHANGE - PLANT X STATION 230KV CKT 1

TABLE 4: Contingency Analysis (continued)

Conclusion

The minimum cost of interconnecting the Customer's interconnection request is estimated at \$3,000,000 for Direct Assignment Facilities and Network Upgrades. At this time, the cost estimates for other Direct Assignment Facilities, including those in Table 1, have not been defined by the Customer. In addition to the Customer's proposed interconnection facilities, the Customer will be responsible for installing a combined total of 34 Mvar of capacitor bank(s) in the Customer's substation for reactive support. As stated earlier, some but not all of the local projects that were previously queued are assumed to be in service in this Feasibility Study.

These interconnection costs do not include any cost that may be associated with short circuit or transient stability analysis. These studies will be performed if the Customer signs a System Impact Study Agreement. At the time of the System Impact Study, a better determination of the interconnection facilities may be available.

The required interconnection costs listed in Tables 1 and 2 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 through Southwest Power Pool's OASIS.

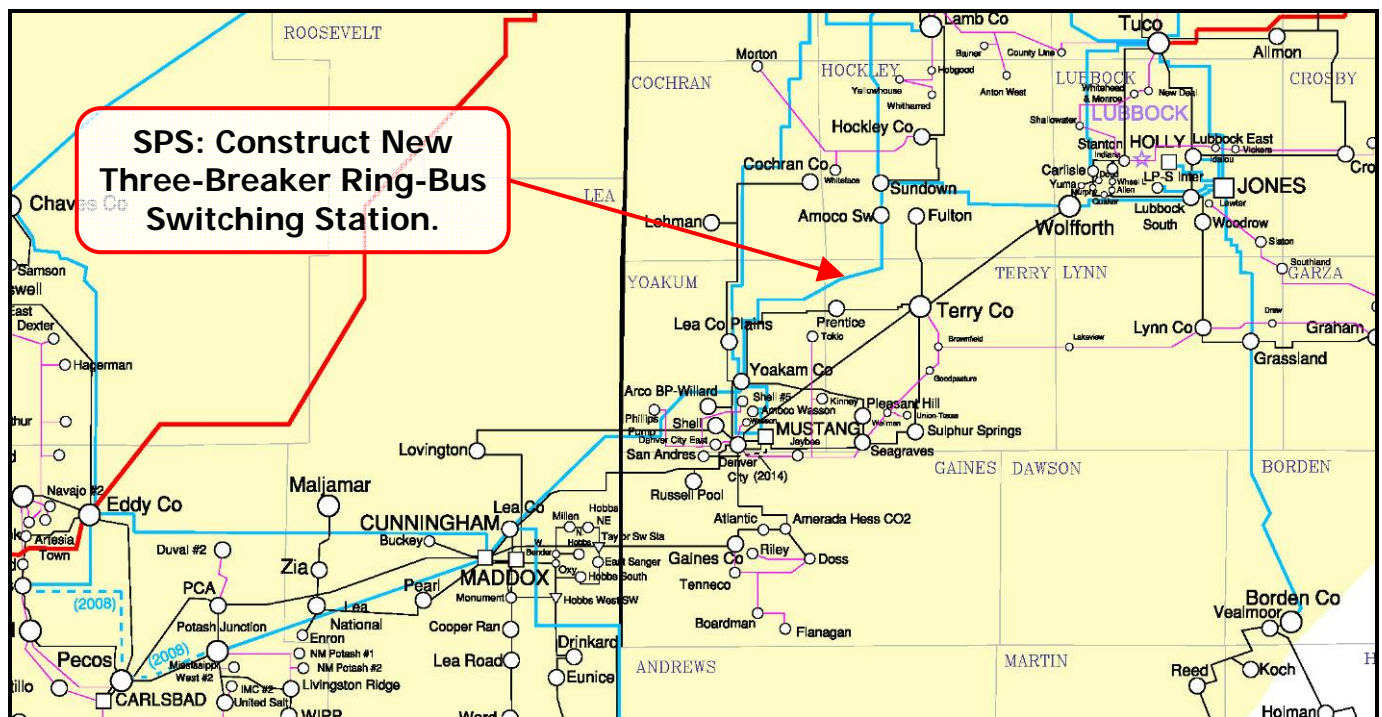


FIGURE 2. Point of Interconnection Area Map