



***Feasibility Study  
For  
Generation Interconnection  
Request  
GEN-2006-036***

***SPP Tariff Studies  
(#GEN-2006-036)***

**March, 2007**

## **Executive Summary**

<OMITTED TEXT> (Customer) has requested a Feasibility Study for the purpose of interconnecting 85.5MW of wind generation within the control area of American Electric Power West (AEPW) in Gray and Donley Counties, Texas. The proposed point of interconnection is a new switching station at or near the existing Jericho substation, owned by AEPW. The proposed in-service date is July 1, 2007. This request is an alternate to the Customer's original request to interconnect at the nearby Kirby substation (GEN-2005-021).

Power flow analysis has indicated that for the powerflow cases studied, it is possible to interconnect the 85.5MW of generation with transmission system reinforcements within the local transmission system. In order to maintain acceptable reactive power compensation, the customer will need to install 12Mvars of 34.5kV capacitor banks in the Customer's collector substation on the 34.5kV bus. Dynamic Stability studies performed as part of the 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 85.5MW of generation near the existing Jericho substation consists of building a new 115kV three breaker ring bus switching station. Customer did not propose a specific 115kV line extending to serve its 115-34.5kV facilities. It is assumed that obtaining all necessary right-of-way for the new switching station will not be a significant expense.

The total minimum cost for building the required facilities for this 85.5MW of generation is \$2,300,000. These costs are shown in Table 2. Other Network Constraints in the AEPW, Southwestern Public Service Company (SPS), West Plains (WEPL), and Western Farmers Electric Cooperative (WFEC) transmission systems that may be verified with a transmission service request and associated studies are listed in Table 3. These 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 (TSR), this list of Network Constraints will be refined and expanded to account for all Network Upgrade requirements. This cost does not include building the 115kV line from the Customer substation into the new 115kV ring bus. This cost does not include the Customer's 115-34.5kV substation or the 34.5kV, 12Mvar 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 AEPW and SPS control areas 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.

## Introduction

<OMITTED TEXT> (Customer) has requested a feasibility study for the purpose of interconnecting 85.5MW of wind generation within the control area of American Electric Power West (AEPW) in Gray and Donley Counties, Texas. The proposed method of interconnection is to build a new three-breaker ring-bus switching station at or near the existing Jericho substation, which is owned by AEPW. The proposed in-service date is July 1, 2007.

## 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 85.5MW consist of adding a new 115kV three breaker ring bus station at or near the existing Jericho 115/69KV switching station owned by AEPW. This substation shall be constructed and maintained by AEPW. The Customer did not propose a route of its 115kV line to serve its 115/34.5kV facilities. It is assumed that obtaining all necessary right-of-way for the substation construction will not be a significant expense.

The total cost for building a new 115kV three breaker ring switching station and reconfiguring the required interconnection facilities, is estimated at \$2,300,000. Other Network Constraints in the AEPW, Southwestern Public Service Company (SPS), West Plains (WEPL), and Western Farmers Electric Cooperative (WFEC) transmission system that were identified are listed in Table 3. These estimates will be refined during the development of the impact study based on the final designs. This cost does not include building the 115kV facilities from the Customer substation into the new 115kV ring bus. The Customer is responsible for these 115kV facilities up to the point of interconnection. This cost also does not include the Customer's 115-34.5kV substation, which should be determined by the Customer.

The costs of interconnecting the facility to the AEPW transmission system are listed in Tables 1 & 2. **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 the interconnection and direct assigned facilities are shown in Figure 1.

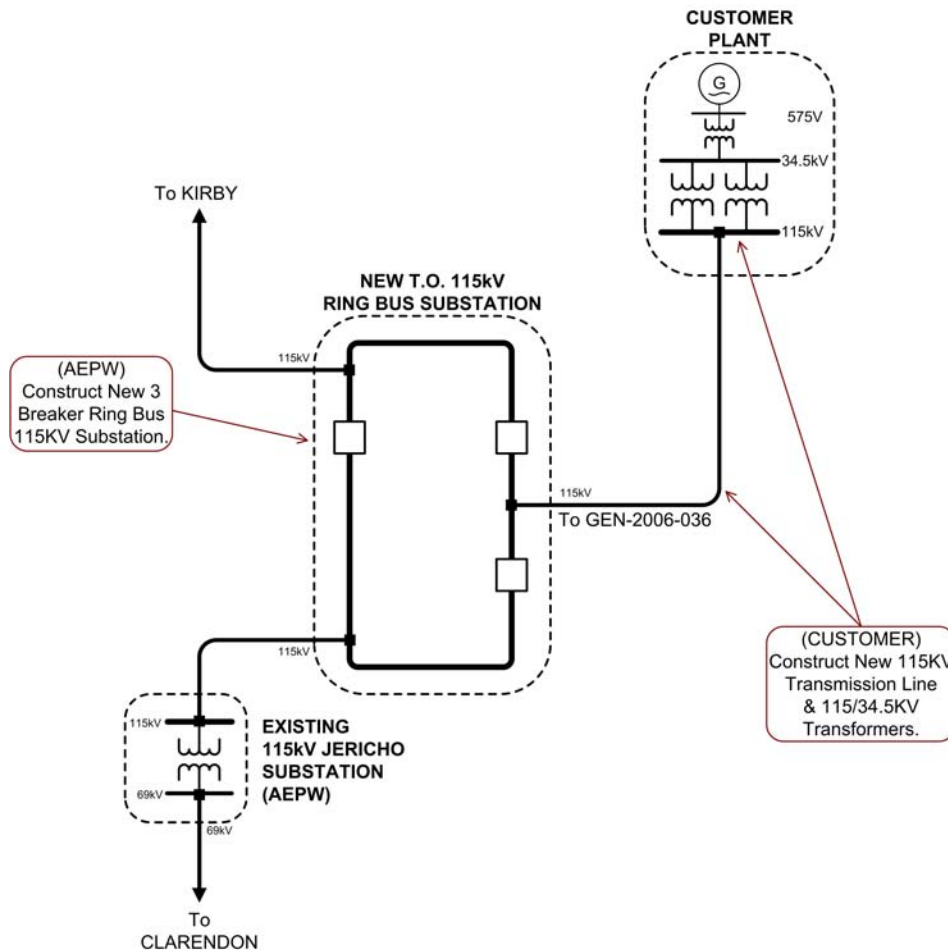
**Table 1: Direct Assignment Facilities**

<b>FACILITY</b>	<b>ESTIMATED COST (2006 DOLLARS)</b>
Customer – 115-34.5 kV Substation facilities.	*
Customer – 115kV transmission line facilities between Customer facilities and the new 115kV ring bus.	*
Customer - Right-of-Way for Customer facilities.	
Customer – 34.5kV, 12Mvar capacitor bank(s) in Customer substation.	*
<b>Total</b>	*

*Note: \* Estimates of cost to be determined by Customer.*

**Table 2: Required Interconnection Network Upgrade Facilities**

<b>FACILITY</b>	<b>ESTIMATED COST (2006 DOLLARS)</b>
AEPW – Build 115kV, 3 breaker ring bus switching station. Station to include breakers, switches, control relaying, high speed communications, metering and related equipment and all structures	<b>\$2,300,000</b>
<b>Total</b>	*



**Figure 1: Proposed Interconnection  
(Final substation design to be determined)**

## Powerflow Analysis

A powerflow analysis was conducted for the facility using modified versions of the 2007, 2008, and 2011 summer and winter peak, and 2016 summer peak models. 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 July 1, 2007. The available seasonal models used were through the 2016 Summer Peak of which is the end of the current SPP planning horizon.

The analysis of the Customer's project indicates that, given the requested generation level of 85.5MW and location, additional criteria violations will occur on the existing AEPW, SPS, WEPL, and WFEK transmission systems under steady state and contingency conditions in the peak seasons.

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 to determine 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. When a facility is overloaded for more than one contingency, only the highest loading on the facility for each season is included in the table.

In order to maintain a zero reactive power flow exchanged at the point of interconnection, additional reactive compensation is required at the point of interconnection. The Customer will be required to install 12Mvar of capacitor banks in their substation on the 34.5kV buses in the Customer substation. Dynamic Stability studies performed as part of the 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. Those local projects that were previously queued and have advanced to nearly complete phases were included in this Feasibility Study.

While several network constraints may be attributed to previous queued projects in the area, certain network constraints are critical to the interconnection of this generation interconnection request. Under "n-1" conditions, the entire plant output may only have one outlet to the transmission system. Under worst case conditions, this outlet may be the Jericho autotransformer, which is has an emergency rating of 46MVA. Beyond the Jericho autotransformer, the 69kV line traversing southwest from Jericho has an emergency rating of 67MVA. For the Customer to obtain firm transmission service for the output of the wind farm, another transmission path will be required from the Jericho substation. If this constraint does not limit the output of the wind farm due to stability analysis in the Impact Study, mitigation of this constraint will be analyzed as part of a transmission service request for this wind farm.

### **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.

**Table 3: Network Constraints**

AREA	ELEMENT
AEPW	2006-02T 230 - ELK CITY 230KV CKT 1
AEPW	AIRPORT2 - AMOCOTP2 69KV CKT 1
AEPW	AMOCOTP2 - CHLDR2WT 69KV CKT 1
AEPW	CAREY - AIRPORT2 69KV CKT 1
AEPW	CHILDRESS (CHILD4WT) 138/69/12.5 KV TRANSFORMER CKT 1
AEPW	CLARDON2 - CLARREC2 69KV CKT 1
AEPW	CLARDON2 - JERICHO 69KV CKT 1
AEPW	CLARREC2 - HEDLEY 69KV CKT 1
AEPW	CLINTO AIR FORCE BASE TAP - ELK CITY 138KV CKT 1
AEPW	CLINTO AIR FORCE BASE TAP - HOBART JUNCTION 138KV CKT 1
AEPW	CLINTON - ELK CITY 138KV CKT 1
AEPW	ELK CITY (ELKCTY-4) 138/69/13.8KV TRANSFORMER CKT 1
AEPW	ELK CITY (ELKCTY-6) 230/138/13.8KV TRANSFORMER CKT 1
AEPW	ESTELNE2 - CAREY 69KV CKT 1
AEPW	HEDLEY - NMEMREC2 69KV CKT 1
AEPW	JERICHO (JERIC2WT) 115/69/14.4KV TRANSFORMER CKT 1
AEPW	MEMPHIS2 - REDRIVR2 69KV CKT 1
AEPW	NWMEMPH2 - MEMPHIS2 69KV CKT 1
AEPW	NWMEMREC2 - NWMEMPH2 69KV CKT 1
AEPW	REDRIVR2 - ESTELNE2 69KV CKT 1
AEPW	SHAMROCK (SHAMRCK1) 115/69/14.4KV TRANSFORMER CKT 1
AEPW	SHAMROCK (SHAMRCK2) 138/69/14.4KV TRANSFORMER CKT 1
AEPW-ERCOT	O.K.U. - OKLAUNION 345KV CKT 1
AEPW-SPS	2006-02T 230 - GRAPEVINE 230KV CKT 1
AEPW-SPS	MCCLELLAN RURAL - SHAMROCK 115KV CKT 1
AEPW-WFEC	ELDORADO - LAKE PAULINE 69KV CKT 1
AEPW-WFEC	ELK CITY (AEPW-WFEC) TIE
AEPW-WFEC	LAKE PAULINE - RUSSELL 138KV CKT 1
AEPW-WFEC	RUSSELL - ALTUS TAP 138KV CKT 1
SPS	BOWERS INTERCHANGE 115/69KV TRANSFORMER CKT 1
SPS	CANYON EAST - CANYON WEST 115KV CKT 1
SPS	CANYON EAST - OSAGE SWITCHING STATION 115KV CKT 1
SPS	CANYON WEST - DAWN 115KV CKT 1
SPS	CHERRY - NICHOLS STATION 115KV CKT 1
SPS	CHERRY - NORTHWEST INTERCHANGE 115KV CKT 1
SPS	CONWAY - KIRBY 115KV CKT 1
SPS	CONWAY - YARNELL3 115KV CKT 1
SPS	DAWN - PNDAHFD3 115 115KV CKT 1
SPS	EAST PLANT INTERCHANGE - MANHATTAN 115KV CKT 1
SPS	EAST PLANT INTERCHANGE - PIERCE TAP 115KV CKT 1
SPS	EAST PLANT INTERCHANGE - WHITAKER 115KV CKT 1
SPS	GRAPEVINE INTERCHANGE - KIRBY 115KV CKT 1
SPS	HAPPY INTERCHANGE - PALO DURO 115KV CKT 1
SPS	HAPPY INTERCHANGE - TULIAT3 115KV CKT 1
SPS	HEREFORD INTERCHANGE - PNDAHFD3 115 115KV CKT 1
SPS	KIRBY - GRAPEVINE 115KV CKT 1
SPS	KIRBY - MCLELLN3 115KV CKT 1

**Table 3: Network Constraints (continued)**

<b>AREA</b>	<b>ELEMENT</b>
SPS	KRESS INTERCHANGE - TULIAT3 115KV CKT 1
SPS	MANHATTAN - MANHTP3 115KV CKT 1
SPS	MANHTP3 - OSAGE SWITCHING STATION 115KV CKT 1
SPS	MCCLELLAN RURAL - MCLELLN3 115KV CKT 1
SPS	NICHOLS STATION - WHITAKER 115KV CKT 1
SPS	NICHOLS STATION - YARNELL3 115KV CKT 1
SPS	OSAGE SWITCHING STATION - PIERCE TAP 115KV CKT 1
SPS	PALODU - RANDALL COUNTY INTERCHANGE 115KV CKT 1
SPS	SWISHER COUNTY INTERCHANGE 230/115KV TRANSFORMER CKT 1
WEPL	GREENSBURG - JUDSON LARGE 115KV CKT 1
WEPL	MEDICINE LODGE - SUN CITY 115KV CKT 1
WFEC	DILL JCT - ELK CITY 69KV CKT 1
WFEC	ELDORADO - ELDORADO JCT 69KV CKT 1
WFEC	ELDORADO JCT - GYPSUM 69KV CKT 1
WFEC	GYPSUM - RUSSELL 69KV CKT 1
WFEC	HAMON BUTLER - MOREWOOD 69KV CKT 1



**Table 4: Contingency Analysis**

ELEMENT	SEASON	RATE (MVA)	LOADING (%)	ATC (MW)	CONTINGENCY
<b>2007 Summer Peak Model</b>					
JERICHO (JERIC2WT) 115/69/14.4KV TRANSFORMER CKT 1	07SP	46	212	0	JERICHO - KIRBY 115KV CKT 1
ELK CITY (ELKCTY-6) 230/138/13.8KV TRANSFORMER CKT 1	07SP	287	196	0	FINNEY STATION - HOLCOMB 345KV CKT 1
ELK CITY (AEPW-WFEC) TIE	07SP	39	170	0	ELK CITY - MOREWOOD SW 138KV CKT 1
ELDORADO - LAKE PAULINE 69KV CKT 1	07SP	20	168	0	LAKE PAULINE - RUSSELL 138KV CKT 1
SHAMROCK (SHAMRCK1) 115/69/14.4KV TRANSFORMER CKT 1	07SP	69	165	0	2006-02T 230 - ELK CITY 230KV CKT 1
2006-02T 230 - ELK CITY 230KV CKT 1	07SP	351	160	0	FINNEY STATION - HOLCOMB 345KV CKT 1
SHAMROCK (SHAMRCK2) 138/69/14.4KV TRANSFORMER CKT 1	07SP	69	147	0	2006-02T 230 - ELK CITY 230KV CKT 1
2006-02T 230 - ELK CITY 230KV CKT 1	07SP	319	147	0	BASE CASE
CLINTON - ELK CITY 138KV CKT 1	07SP	143	140	0	CLINTO AIR FORCE BASE TAP - ELK CITY 138KV CKT 1
GREENSBURG - JUDSON LARGE 115KV CKT 1	07SP	80	137	0	MULLERGREN - SPEARVILLE 230KV CKT 1
PALODU - RANDALL COUNTY INTERCHANGE 115KV CKT 1	07SP	99	136	0	AMARILLO S INTERCHANGE - SWISHER COUNTY INTERCHANGE 230KV CKT 1
KIRBY - MCLELLN3 115KV CKT 1	07SP	90	134	0	2006-02T 230 - ELK CITY 230KV CKT 1
HAPPY INTERCHANGE - PALODU 115KV CKT 1	07SP	99	134	0	AMARILLO S INTERCHANGE - SWISHER COUNTY INTERCHANGE 230KV CKT 1
MCCLELLAN RURAL - MCLELLN3 115KV CKT 1	07SP	90	132	0	2006-02T 230 - ELK CITY 230KV CKT 1
MCCLELLAN RURAL - SHAMROCK 115KV CKT 1	07SP	90	127	0	2006-02T 230 - ELK CITY 230KV CKT 1
CANYON EAST - OSAGE SWITCHING STATION 115KV CKT 1	07SP	99	127	0	BUSHLAND INTERCHANGE - DEAF SMITH INTERCHANGE 230KV CKT 1
CONWAY - KIRBY 115KV CKT 1	07SP	180	126	0	NICHOLS STATION - YARNELL 115KV CKT 1
ELK CITY (ELKCTY-4) 138/69/13.8KV TRANSFORMER CKT 1	07SP	72	118	0	ELK CITY - MOREWOOD SW 138KV CKT 1
LAKE PAULINE - RUSSELL 138KV CKT 1	07SP	72	117	0	2006-02T 230 - ELK CITY 230KV CKT 1
MEDICINE LODGE - SUN CITY 115KV CKT 1	07SP	80	117	0	MULLERGREN - SPEARVILLE 230KV CKT 1
EAST PLANT INTERCHANGE - PIERCE TAP 115KV CKT 1	07SP	161	116	0	EAST PLANT INTERCHANGE - MANHATTAN 115KV CKT 1
EAST PLANT INTERCHANGE - MANHATTAN 115KV CKT 1	07SP	161	115	0	EAST PLANT INTERCHANGE - PIERCE TAP 115KV CKT 1
CANYON EAST - CANYON WEST 115KV CKT 1	07SP	99	114	0	BUSHLAND INTERCHANGE - DEAF SMITH INTERCHANGE 230KV CKT 1
NICHOLS STATION - WHITAKER 115KV CKT 1	07SP	249	112	0	CHERRY - NICHOLS STATION 115KV CKT 1
2006-02T 230 - GRAPEVINE 230KV CKT 1	07SP	351	111	0	ELK CITY (ELKCTY-6) 230/138/13.8KV TRANSFORMER CKT 1
HAPPY INTERCHANGE - TULIAT3 115KV CKT 1	07SP	99	110	0	AMARILLO S INTERCHANGE - SWISHER COUNTY INTERCHANGE 230KV CKT 1
CHERRY - NICHOLS STATION 115KV CKT 1	07SP	161	110	0	NICHOLS STATION - WHITAKER 115KV CKT 1
MANHTP3 - OSAGE SWITCHING STATION 115KV CKT 1	07SP	161	109	0	EAST PLANT INTERCHANGE - PIERCE TAP 115KV CKT 1
EAST PLANT INTERCHANGE - WHITAKER 115KV CKT 1	07SP	249	105	0	CHERRY - NICHOLS STATION 115KV CKT 1
OSAGE SWITCHING STATION - PIERCE TAP 115KV CKT 1	07SP	161	104	0	EAST PLANT INTERCHANGE - MANHATTAN 115KV CKT 1
KRESS INTERCHANGE - TULIAT3 115KV CKT 1	07SP	99	104	11	AMARILLO S INTERCHANGE - SWISHER COUNTY INTERCHANGE 230KV CKT 1
ELDORADO - ELDORADO JCT 69KV CKT 1	07SP	26	124	14	LAKE PAULINE - RUSSELL 138KV CKT 1
AMOCOTP2 - CHLDR2WT 69KV CKT 1	07SP	44	165	34	JERICHO - KIRBY 115KV CKT 1
ELDORADO JCT - GYPSUM 69KV CKT 1	07SP	26	114	43	LAKE PAULINE - RUSSELL 138KV CKT 1
AIRPORT2 - AMOCOTP2 69KV CKT 1	07SP	55	149	45	JERICHO - KIRBY 115KV CKT 1
CAREY - AIRPORT2 69KV CKT 1	07SP	55	148	46	JERICHO - KIRBY 115KV CKT 1
ESTELNE2 - CAREY 69KV CKT 1	07SP	55	149	46	JERICHO - KIRBY 115KV CKT 1
CHILDRESS (CHILD4WT) 138/69/12.5 KV TRANSFORMER CKT 1	07SP	55	127	55	JERICHO - KIRBY 115KV CKT 1

**Table 4: Contingency Analysis (continued)**

ELEMENT	SEASON	RATE (MVA)	LOADING (%)	ATC (MW)	CONTINGENCY
<b>2007 Summer Peak Model (continued)</b>					
MANHATTAN - MANHTP3 115KV CKT 1	07SP	161	101	55	EAST PLANT INTERCHANGE - PIERCE TAP 115KV CKT 1
2006-02 230 230/34.5KV TRANSFORMER CKT 1	07SP	158	101	56	BINGER NIJECT - SICKLES 138KV CKT 1
CHERRY - NORTHWEST INTERCHANGE 115KV CKT 1	07SP	161	101	57	NICHOLS STATION - WHITAKER 115KV CKT 1
CLARDON2 - JERICHO 69KV CKT 1	07SP	67	141	60	JERICHO - KIRBY 115KV CKT 1
CLARDON2 - CLARREC2 69KV CKT 1	07SP	67	131	64	JERICHO - KIRBY 115KV CKT 1
CONWAY - YARNELL3 115KV CKT 1	07SP	180	109	65	GRAPEVINE INTERCHANGE - KIRBY 115KV CKT 1
CLARREC2 - HEDLEY 69KV CKT 1	07SP	67	126	66	JERICHO - KIRBY 115KV CKT 1
NICHOLS STATION - YARNELL3 115KV CKT 1	07SP	180	108	66	GRAPEVINE INTERCHANGE - KIRBY 115KV CKT 1
HEDLEY - NMEMREC2 69KV CKT 1	07SP	67	123	67	JERICHO - KIRBY 115KV CKT 1
NWMEMREC2 - NWMEMPH2 69KV CKT 1	07SP	67	120	69	JERICHO - KIRBY 115KV CKT 1
NWMEMPH2 - MEMPHIS2 69KV CKT 1	07SP	67	116	73	JERICHO - KIRBY 115KV CKT 1
CLINTO AIR FORCE BASE TAP - ELK CITY 138KV CKT 1	07SP	170	101	75	CLINTON - ELK CITY 138KV CKT 1
MEMPHIS2 - REDRIVR2 69KV CKT 1	07SP	67	108	77	JERICHO - KIRBY 115KV CKT 1
REDRIVR2 - ESTELNE2 69KV CKT 1	07SP	67	107	78	JERICHO - KIRBY 115KV CKT 1
KIRBY - GRAPEVINE 115KV CKT 1	07SP	161	102	81	NICHOLS STATION - YARNELL 115KV CKT 1
<b>2007 Winter Peak Model</b>					
ELDORADO - LAKE PAULINE 69KV CKT 1	07WP	20	183	0	LAKE PAULINE - RUSSELL 138KV CKT 1
ELK CITY (ELKCTY-6) 230/138/13.8KV TRANSFORMER CKT 1	07WP	287	178	0	FINNEY STATION - HOLCOMB 345KV CKT 1
ELK CITY (AEPW-WFEC) TIE	07WP	39	176	0	CLINTO AIR FORCE BASE TAP - ELK CITY 138KV CKT 1
SHAMROCK (SHAMRCK1) 115/69/14.4KV TRANSFORMER CKT 1	07WP	69	173	0	2006-02T 230 - ELK CITY 230KV CKT 1
SHAMROCK (SHAMRCK2) 138/69/14.4KV TRANSFORMER CKT 1	07WP	69	160	0	2006-02T 230 - ELK CITY 230KV CKT 1
2006-02T 230 - ELK CITY 230KV CKT 1	07WP	319	151	0	BASE CASE
CLINTON - ELK CITY 138KV CKT 1	07WP	143	151	0	CLINTO AIR FORCE BASE TAP - ELK CITY 138KV CKT 1
2006-02T 230 - ELK CITY 230KV CKT 1	07WP	351	147	0	CHILDRESS - LAKE PAULINE 138KV CKT 1
ELDORADO - ELDORADO JCT 69KV CKT 1	07WP	26	136	0	LAKE PAULINE - RUSSELL 138KV CKT 1
LAKE PAULINE - RUSSELL 138KV CKT 1	07WP	72	133	0	2006-02T 230 - ELK CITY 230KV CKT 1
HAMON BUTLER - MOREWOOD 69KV CKT 1	07WP	26	121	0	MOORELAND - MOREWOOD SW 138KV CKT 1
2006-02T 230 - GRAPEVINE 230KV CKT 1	07WP	351	118	0	ELK CITY (ELKCTY-6) 230/138/13.8KV TRANSFORMER CKT 1
KIRBY - MCLELLN3 115KV CKT 1	07WP	107	117	0	2006-02T 230 - ELK CITY 230KV CKT 1
MCCLELLAN RURAL - MCLELLN3 115KV CKT 1	07WP	107	115	0	2006-02T 230 - ELK CITY 230KV CKT 1
ELK CITY (ELKCTY-4) 138/69/13.8KV TRANSFORMER CKT 1	07WP	72	111	0	ELK CITY - MOREWOOD SW 138KV CKT 1
CONWAY - KIRBY 115KV CKT 1	07WP	180	106	0	CONWAY - YARNELL3 115KV CKT 1
ELDORADO JCT - GYPSUM 69KV CKT 1	07WP	26	127	2	LAKE PAULINE - RUSSELL 138KV CKT 1
MCCLELLAN RURAL - SHAMROCK 115KV CKT 1	07WP	107	112	10	2006-02T 230 - ELK CITY 230KV CKT 1
O.K.U. - OKLAUNION 345KV CKT 1	07WP	250	104	11	2006-02T 230 - ELK CITY 230KV CKT 1
AMOCOTP2 - CHLDR2WT 69KV CKT 1	07WP	44	172	29	JERICHO - KIRBY 115KV CKT 1
GYPSUM - RUSSELL 69KV CKT 1	07WP	26	117	35	LAKE PAULINE - RUSSELL 138KV CKT 1
JERICHO (JERIC2WT) 115/69/14.4KV TRANSFORMER CKT 1	07WP	46	217	37	JERICHO - KIRBY 115KV CKT 1
DILL JCT - ELK CITY 69KV CKT 1	07WP	61	102	44	CLINTO AIR FORCE BASE TAP - ELK CITY 138KV CKT 1
CHILDRESS (CHILD4WT) 138/69/12.5 KV TRANSFORMER CKT 1	07WP	55	133	49	JERICHO - KIRBY 115KV CKT 1
RUSSELL - ALTUS TAP 138KV CKT 1	07WP	72	112	50	ELK CITY (ELKCTY-6) 230/138/13.8KV TRANSFORMER CKT 1

**Table 4: Contingency Analysis (continued)**

ELEMENT	SEASON	RATE (MVA)	LOADING (%)	ATC (MW)	CONTINGENCY
<b>2007 Winter Peak Model (continued)</b>					
AIRPORT2 - AMOCOTP2 69KV CKT 1	07WP	55	134	53	JERICHO - KIRBY 115KV CKT 1
CAREY - AIRPORT2 69KV CKT 1	07WP	55	134	54	JERICHO - KIRBY 115KV CKT 1
ESTELNE2 - CAREY 69KV CKT 1	07WP	55	133	54	JERICHO - KIRBY 115KV CKT 1
CLARDON2 - JERICHO 69KV CKT 1	07WP	75	129	65	JERICHO - KIRBY 115KV CKT 1
CLARDON2 - CLARREC2 69KV CKT 1	07WP	75	121	69	JERICHO - KIRBY 115KV CKT 1
CLARREC2 - HEDLEY 69KV CKT 1	07WP	75	117	72	JERICHO - KIRBY 115KV CKT 1
HEDLEY - NMEMREC2 69KV CKT 1	07WP	75	114	74	JERICHO - KIRBY 115KV CKT 1
NWMEMREC2 - NWMEMPH2 69KV CKT 1	07WP	75	111	75	JERICHO - KIRBY 115KV CKT 1
CONWAY - YARNELL3 115KV CKT 1	07WP	218	104	76	ELK CITY (ELKCTY-6) 230/138/13.8KV TRANSFORMER CKT 1
NICHOLS STATION - YARNELL3 115KV CKT 1	07WP	218	104	77	ELK CITY (ELKCTY-6) 230/138/13.8KV TRANSFORMER CKT 1
NWMEMPH2 - MEMPHIS2 69KV CKT 1	07WP	75	108	78	JERICHO - KIRBY 115KV CKT 1
<b>2008 Summer Peak Model</b>					
ELK CITY (ELKCTY-6) 230/138/13.8KV TRANSFORMER CKT 1	08SP	287	196	0	FINNEY STATION - HOLCOMB 345KV CKT 1
ELK CITY (AEPW-WFEC) TIE	08SP	39	171	0	ELK CITY - MOREWOOD SW 138KV CKT 1
ELDORADO - LAKE PAULINE 69KV CKT 1	08SP	20	168	0	LAKE PAULINE - RUSSELL 138KV CKT 1
SHAMROCK (SHAMRCK1) 115/69/14.4KV TRANSFORMER CKT 1	08SP	69	166	0	ELK CITY (ELKCTY-6) 230/138/13.8KV TRANSFORMER CKT 1
2006-02T 230 - ELK CITY 230KV CKT 1	08SP	351	160	0	FINNEY STATION - HOLCOMB 345KV CKT 1
SHAMROCK (SHAMRCK2) 138/69/14.4KV TRANSFORMER CKT 1	08SP	69	150	0	ELK CITY (ELKCTY-6) 230/138/13.8KV TRANSFORMER CKT 1
2006-02T 230 - ELK CITY 230KV CKT 1	08SP	319	147	0	BASE CASE
CLINTON - ELK CITY 138KV CKT 1	08SP	143	142	0	CLINTO AIR FORCE BASE TAP - ELK CITY 138KV CKT 1
GREENSBURG - JUDSON LARGE 115KV CKT 1	08SP	80	137	0	MULLERGREN - SPEARVILLE 230KV CKT 1
PALODU - RANDALL COUNTY INTERCHANGE 115KV CKT 1	08SP	99	137	0	AMARILLO S INTERCHANGE - SWISHER COUNTY INTERCHANGE 230KV CKT 1
HAPPY INTERCHANGE - PALODU 115KV CKT 1	08SP	99	135	0	AMARILLO S INTERCHANGE - SWISHER COUNTY INTERCHANGE 230KV CKT 1
KIRBY - MCLELLN3 115KV CKT 1	08SP	90	134	0	ELK CITY (ELKCTY-6) 230/138/13.8KV TRANSFORMER CKT 1
MCCLELLAN RURAL - MCLELLN3 115KV CKT 1	08SP	90	132	0	ELK CITY (ELKCTY-6) 230/138/13.8KV TRANSFORMER CKT 1
MCCLELLAN RURAL - SHAMROCK 115KV CKT 1	08SP	90	127	0	ELK CITY (ELKCTY-6) 230/138/13.8KV TRANSFORMER CKT 1
CANYON EAST - OSAGE SWITCHING STATION 115KV CKT 1	08SP	99	126	0	BUSHLAND INTERCHANGE - DEAF SMITH INTERCHANGE 230KV CKT 1
LAKE PAULINE - RUSSELL 138KV CKT 1	08SP	72	122	0	ELK CITY (ELKCTY-6) 230/138/13.8KV TRANSFORMER CKT 1
ELK CITY (ELKCTY-4) 138/69/13.8KV TRANSFORMER CKT 1	08SP	72	119	0	ELK CITY - MOREWOOD SW 138KV CKT 1
MEDICINE LODGE - SUN CITY 115KV CKT 1	08SP	80	117	0	MULLERGREN - SPEARVILLE 230KV CKT 1
EAST PLANT INTERCHANGE - PIERCE TAP 115KV CKT 1	08SP	161	116	0	EAST PLANT INTERCHANGE - MANHATTAN 115KV CKT 1
EAST PLANT INTERCHANGE - MANHATTAN 115KV CKT 1	08SP	161	115	0	EAST PLANT INTERCHANGE - PIERCE TAP 115KV CKT 1
CANYON EAST - CANYON WEST 115KV CKT 1	08SP	99	113	0	BUSHLAND INTERCHANGE - DEAF SMITH INTERCHANGE 230KV CKT 1
NICHOLS STATION - WHITAKER 115KV CKT 1	08SP	249	112	0	CHERRY - NICHOLS STATION 115KV CKT 1
2006-02T 230 - GRAPEVINE 230KV CKT 1	08SP	351	111	0	ELK CITY (ELKCTY-6) 230/138/13.8KV TRANSFORMER CKT 1
HAPPY INTERCHANGE - TULIAT3 115KV CKT 1	08SP	99	110	0	AMARILLO S INTERCHANGE - SWISHER COUNTY INTERCHANGE 230KV CKT 1
CHERRY - NICHOLS STATION 115KV CKT 1	08SP	161	110	0	NICHOLS STATION - WHITAKER 115KV CKT 1
MANHTP3 - OSAGE SWITCHING STATION 115KV CKT 1	08SP	161	109	0	EAST PLANT INTERCHANGE - PIERCE TAP 115KV CKT 1
OSAGE SWITCHING STATION - PIERCE TAP 115KV CKT 1	08SP	161	104	0	EAST PLANT INTERCHANGE - MANHATTAN 115KV CKT 1

**Table 4: Contingency Analysis (continued)**

ELEMENT	SEASON	RATE (MVA)	LOADING (%)	ATC (MW)	CONTINGENCY
<b>2008 Summer Peak Model (continued)</b>					
JERICHO (JERIC2WT) 115/69/14.4KV TRANSFORMER CKT 1	08SP	46	211	9	FINNEY STATION - HOLCOMB 345KV CKT 1
ELDORADO - ELDORADO JCT 69KV CKT 1	08SP	26	124	13	LAKE PAULINE - RUSSELL 138KV CKT 1
KRESS INTERCHANGE - TULIAT3 115KV CKT 1	08SP	99	104	14	AMARILLO S INTERCHANGE - SWISHER COUNTY INTERCHANGE 230KV CKT 1
AMOCOTP2 - CHLDR2WT 69KV CKT 1	08SP	44	165	34	JERICHO - KIRBY 115KV CKT 1
2006-02 230 230/34.5KV TRANSFORMER CKT 1	08SP	158	101	35	BINGER NIJECT - ONEY 138KV CKT 1
ELDORADO JCT - GYPSUM 69KV CKT 1	08SP	26	114	43	LAKE PAULINE - RUSSELL 138KV CKT 1
AIRPORT2 - AMOCOTP2 69KV CKT 1	08SP	48	148	45	JERICHO - KIRBY 115KV CKT 1
CAREY - AIRPORT2 69KV CKT 1	08SP	48	148	46	JERICHO - KIRBY 115KV CKT 1
ESTELNE2 - CAREY 69KV CKT 1	08SP	48	148	46	JERICHO - KIRBY 115KV CKT 1
CLINTO AIR FORCE BASE TAP - ELK CITY 138KV CKT 1	08SP	170	103	46	CLINTON - ELK CITY 138KV CKT 1
CHERRY - NORTHWEST INTERCHANGE 115KV CKT 1	08SP	161	101	55	NICHOLS STATION - WHITAKER 115KV CKT 1
CHILDRESS (CHILD4WT) 138/69/12.5 KV TRANSFORMER CKT 1	08SP	55	127	55	JERICHO - KIRBY 115KV CKT 1
MANHATTAN - MANHTP3 115KV CKT 1	08SP	161	101	59	EAST PLANT INTERCHANGE - PIERCE TAP 115KV CKT 1
CLARDON2 - JERICHO 69KV CKT 1	08SP	67	141	60	JERICHO - KIRBY 115KV CKT 1
KIRBY - MCLELLN3 115KV CKT 1	08SP	90	104	62	JERICHO (JERIC2WT) 115/69/14.4KV TRANSFORMER CKT 1
CLARDON2 - CLARREC2 69KV CKT 1	08SP	67	131	64	JERICHO - KIRBY 115KV CKT 1
EAST PLANT INTERCHANGE - WHITAKER 115KV CKT 1	08SP	249	106	65	ELK CITY (ELKCTY-6) 230/138/13.8KV TRANSFORMER CKT 1
CLARREC2 - HEDLEY 69KV CKT 1	08SP	67	125	66	JERICHO - KIRBY 115KV CKT 1
HEDLEY - NMEMREC2 69KV CKT 1	08SP	67	123	67	JERICHO - KIRBY 115KV CKT 1
NWMEMREC2 - NWMEMPH2 69KV CKT 1	08SP	67	120	69	JERICHO - KIRBY 115KV CKT 1
CONWAY - YARNELL3 115KV CKT 1	08SP	180	107	69	GRAPEVINE INTERCHANGE - KIRBY 115KV CKT 1
NICHOLS STATION - YARNELL3 115KV CKT 1	08SP	180	106	71	GRAPEVINE INTERCHANGE - KIRBY 115KV CKT 1
NWMEMPH2 - MEMPHIS2 69KV CKT 1	08SP	67	116	71	JERICHO - KIRBY 115KV CKT 1
MEMPHIS2 - REDRIVR2 69KV CKT 1	08SP	67	107	77	JERICHO - KIRBY 115KV CKT 1
SWISHER COUNTY INTERCHANGE 230/115KV TRANSFORMER CKT 1	08SP	150	100	78	SWISHER COUNTY INTERCHANGE - TUCO INTERCHANGE 230KV CKT 1
REDRIVR2 - ESTELNE2 69KV CKT 1	08SP	67	107	78	JERICHO - KIRBY 115KV CKT 1
CLINTO AIR FORCE BASE TAP - HOBART JUNCTION 138KV CKT 1	08SP	170	100	80	CLINTON - ELK CITY 138KV CKT 1
<b>2008 Winter Peak Model</b>					
ELK CITY (ELKCTY-6) 230/138/13.8KV TRANSFORMER CKT 1	08WP	287	201	0	OKLAUNION - TUCO INTERCHANGE 345KV CKT 1
ELDORADO - LAKE PAULINE 69KV CKT 1	08WP	20	183	0	LAKE PAULINE - RUSSELL 138KV CKT 1
ELK CITY (AEPW-WFEC) TIE	08WP	39	175	0	CLINTO AIR FORCE BASE TAP - ELK CITY 138KV CKT 1
SHAMROCK (SHAMRCK1) 115/69/14.4KV TRANSFORMER CKT 1	08WP	69	168	0	2006-02T 230 - ELK CITY 230KV CKT 1
2006-02T 230 - ELK CITY 230KV CKT 1	08WP	351	164	0	OKLAUNION - TUCO INTERCHANGE 345KV CKT 1
SHAMROCK (SHAMRCK2) 138/69/14.4KV TRANSFORMER CKT 1	08WP	69	156	0	2006-02T 230 - ELK CITY 230KV CKT 1
2006-02T 230 - ELK CITY 230KV CKT 1	08WP	319	150	0	BASE CASE
CLINTON - ELK CITY 138KV CKT 1	08WP	143	150	0	CLINTO AIR FORCE BASE TAP - ELK CITY 138KV CKT 1
ELDORADO - ELDORADO JCT 69KV CKT 1	08WP	26	136	0	LAKE PAULINE - RUSSELL 138KV CKT 1
LAKE PAULINE - RUSSELL 138KV CKT 1	08WP	72	128	0	ELK CITY (ELKCTY-6) 230/138/13.8KV TRANSFORMER CKT 1
KIRBY - MCLELLN3 115KV CKT 1	08WP	107	113	0	2006-02T 230 - ELK CITY 230KV CKT 1
MCCLELLAN RURAL - MCLELLN3 115KV CKT 1	08WP	107	111	0	2006-02T 230 - ELK CITY 230KV CKT 1

**Table 4: Contingency Analysis (continued)**

ELEMENT	SEASON	RATE (MVA)	LOADING (%)	ATC (MW)	CONTINGENCY
<b>2008 Winter Peak Model (continued)</b>					
2006-02T 230 - GRAPEVINE 230KV CKT 1	08WP	351	111	0	ELK CITY (ELKCTY-6) 230/138/13.8KV TRANSFORMER CKT 1
CONWAY - KIRBY 115KV CKT 1	08WP	218	106	0	CONWAY - YARNELL3 115KV CKT 1
ELDORADO JCT - GYPSUM 69KV CKT 1	08WP	26	126	6	LAKE PAULINE - RUSSELL 138KV CKT 1
MCCLELLAN RURAL - SHAMROCK 115KV CKT 1	08WP	107	108	22	2006-02T 230 - ELK CITY 230KV CKT 1
AMOCOTP2 - CHLDR2WT 69KV CKT 1	08WP	44	188	27	JERICO - KIRBY 115KV CKT 1
JERICO (JERIC2WT) 115/69/14.4KV TRANSFORMER CKT 1	08WP	46	233	36	JERICO - KIRBY 115KV CKT 1
GYPSUM - RUSSELL 69KV CKT 1	08WP	26	117	37	LAKE PAULINE - RUSSELL 138KV CKT 1
CHILDRESS (CHILD4WT) 138/69/12.5 KV TRANSFORMER CKT 1	08WP	55	146	43	JERICO - KIRBY 115KV CKT 1
AIRPORT2 - AMOCOTP2 69KV CKT 1	08WP	55	146	48	JERICO - KIRBY 115KV CKT 1
CAREY - AIRPORT2 69KV CKT 1	08WP	55	145	49	JERICO - KIRBY 115KV CKT 1
ESTELNE2 - CAREY 69KV CKT 1	08WP	55	144	49	JERICO - KIRBY 115KV CKT 1
DILL JCT - ELK CITY 69KV CKT 1	08WP	61	102	56	CLINTO AIR FORCE BASE TAP - ELK CITY 138KV CKT 1
ELK CITY (ELKCTY-4) 138/69/13.8KV TRANSFORMER CKT 1	08WP	72	101	56	OKLAUNION - TUCO INTERCHANGE 345KV CKT 1
O.K.U. - OKLAUNION 345KV CKT 1	08WP	250	101	57	2006-02T 230 - ELK CITY 230KV CKT 1
RUSSELL - ALTUS TAP 138KV CKT 1	08WP	72	106	61	2006-02T 230 - ELK CITY 230KV CKT 1
CLARDON2 - JERICO 69KV CKT 1	08WP	75	137	62	JERICO - KIRBY 115KV CKT 1
CLARDON2 - CLARREC2 69KV CKT 1	08WP	75	128	66	JERICO - KIRBY 115KV CKT 1
CLARREC2 - HEDLEY 69KV CKT 1	08WP	75	123	68	JERICO - KIRBY 115KV CKT 1
HEDLEY - NMEMREC2 69KV CKT 1	08WP	75	120	70	JERICO - KIRBY 115KV CKT 1
NWMEMREC2 - NWMEMPH2 69KV CKT 1	08WP	75	118	71	JERICO - KIRBY 115KV CKT 1
NWMEMPH2 - MEMPHIS2 69KV CKT 1	08WP	75	115	72	JERICO - KIRBY 115KV CKT 1
REDRIVR2 - ESTELNE2 69KV CKT 1	08WP	75	106	79	JERICO - KIRBY 115KV CKT 1
MEMPHIS2 - REDRIVR2 69KV CKT 1	08WP	75	105	80	JERICO - KIRBY 115KV CKT 1
SHAMROCK (SHAMRCK1) 115/69/14.4KV TRANSFORMER CKT 1	08WP	63	100	82	BASE CASE
<b>2011 Summer Peak Model</b>					
ELK CITY (ELKCTY-6) 230/138/13.8KV TRANSFORMER CKT 1	11SP	287	147	0	FINNEY STATION - HOLCOMB 345KV CKT 1
SHAMROCK (SHAMRCK1) 115/69/14.4KV TRANSFORMER CKT 1	11SP	69	139	0	ELK CITY (ELKCTY-6) 230/138/13.8KV TRANSFORMER CKT 1
ELK CITY (AEPW-WFEC) TIE	11SP	39	138	0	NICHOLS STATION - YARNELL3 115KV CKT 1
2006-02T 230 - ELK CITY 230KV CKT 1	11SP	351	137	0	FINNEY STATION - HOLCOMB 345KV CKT 1
CANYON EAST - OSAGE SWITCHING STATION 115KV CKT 1	11SP	99	134	0	BUSHLAND INTERCHANGE - DEAF SMITH INTERCHANGE 230KV CKT 1
PALODU - RANDALL COUNTY INTERCHANGE 115KV CKT 1	11SP	99	134	0	AMARILLO S INTERCHANGE - SWISHER COUNTY INTERCHANGE 230KV CKT 1
HAPPY INTERCHANGE - PALODU 115KV CKT 1	11SP	99	131	0	AMARILLO S INTERCHANGE - SWISHER COUNTY INTERCHANGE 230KV CKT 1
CONWAY - KIRBY 115KV CKT 1	11SP	180	125	0	NICHOLS STATION - YARNELL3 115KV CKT 1
SHAMROCK (SHAMRCK2) 138/69/14.4KV TRANSFORMER CKT 1	11SP	69	124	0	ELK CITY (ELKCTY-6) 230/138/13.8KV TRANSFORMER CKT 1
2006-02T 230 - ELK CITY 230KV CKT 1	11SP	319	123	0	BASE CASE
CANYON EAST - CANYON WEST 115KV CKT 1	11SP	99	120	0	BUSHLAND INTERCHANGE - DEAF SMITH INTERCHANGE 230KV CKT 1
EAST PLANT INTERCHANGE - PIERCE TAP 115KV CKT 1	11SP	161	119	0	EAST PLANT INTERCHANGE - MANHATTAN 115KV CKT 1
EAST PLANT INTERCHANGE - MANHATTAN 115KV CKT 1	11SP	161	118	0	EAST PLANT INTERCHANGE - PIERCE TAP 115KV CKT 1
KIRBY - MCLELLN3 115KV CKT 1	11SP	90	114	0	ELK CITY (ELKCTY-6) 230/138/13.8KV TRANSFORMER CKT 1

**Table 4: Contingency Analysis (continued)**

ELEMENT	SEASON	RATE (MVA)	LOADING (%)	ATC (MW)	CONTINGENCY
<b>2011 Summer Peak Model (continued)</b>					
CLINTON - ELK CITY 138KV CKT 1	11SP	143	114	0	CLINTO AIR FORCE BASE TAP - ELK CITY 138KV CKT 1
NICHOLS STATION - WHITAKER 115KV CKT 1	11SP	249	113	0	CHERRY - NICHOLS STATION 115KV CKT 1
MANHTP3 - OSAGE SWITCHING STATION 115KV CKT 1	11SP	161	113	0	EAST PLANT INTERCHANGE - PIERCE TAP 115KV CKT 1
CHERRY - NICHOLS STATION 115KV CKT 1	11SP	161	112	0	NICHOLS STATION - WHITAKER 115KV CKT 1
2006-02T 230 - GRAPEVINE 230KV CKT 1	11SP	351	111	0	ELK CITY (ELKCTY-6) 230/138/13.8KV TRANSFORMER CKT 1
HAPPY INTERCHANGE - TULIAT3 115KV CKT 1	11SP	99	106	0	AMARILLO S INTERCHANGE - SWISHER COUNTY INTERCHANGE 230KV CKT 1
EAST PLANT INTERCHANGE - WHITAKER 115KV CKT 1	11SP	249	106	0	CHERRY - NICHOLS STATION 115KV CKT 1
OSAGE SWITCHING STATION - PIERCE TAP 115KV CKT 1	11SP	161	106	0	EAST PLANT INTERCHANGE - MANHATTAN 115KV CKT 1
MCCLELLAN RURAL - MCELELLN3 115KV CKT 1	11SP	90	112	1	ELK CITY (ELKCTY-6) 230/138/13.8KV TRANSFORMER CKT 1
CHERRY - NORTHWEST INTERCHANGE 115KV CKT 1	11SP	161	104	8	NICHOLS STATION - WHITAKER 115KV CKT 1
ELDORADO - LAKE PAULINE 69KV CKT 1	11SP	20	128	16	LAKE PAULINE - RUSSELL 138KV CKT 1
MANHATTAN - MANHTP3 115KV CKT 1	11SP	161	103	29	EAST PLANT INTERCHANGE - PIERCE TAP 115KV CKT 1
AMOCOTP2 - CHLDR2WT 69KV CKT 1	11SP	44	165	34	JERICO - KIRBY 115KV CKT 1
MCCLELLAN RURAL - SHAMROCK 115KV CKT 1	11SP	90	107	37	ELK CITY (ELKCTY-6) 230/138/13.8KV TRANSFORMER CKT 1
JERICO (JERIC2WT) 115/69/14.4KV TRANSFORMER CKT 1	11SP	46	212	39	JERICO - KIRBY 115KV CKT 1
SWISHER COUNTY INTERCHANGE 230/115KV TRANSFORMER CKT 1	11SP	150	101	44	SWISHER COUNTY INTERCHANGE - TUCO INTERCHANGE 230KV CKT 1
AIRPORT2 - AMOCOTP2 69KV CKT 1	11SP	48	149	45	JERICO - KIRBY 115KV CKT 1
CAREY - AIRPORT2 69KV CKT 1	11SP	48	149	45	JERICO - KIRBY 115KV CKT 1
ESTELNE2 - CAREY 69KV CKT 1	11SP	48	149	45	JERICO - KIRBY 115KV CKT 1
ELK CITY (ELKCTY-4) 138/69/13.8KV TRANSFORMER CKT 1	11SP	72	101	54	NICHOLS STATION - YARNELL3 115KV CKT 1
CHILDRESS (CHILD4WT) 138/69/12.5 KV TRANSFORMER CKT 1	11SP	55	128	55	JERICO - KIRBY 115KV CKT 1
CONWAY - YARNELL3 115KV CKT 1	11SP	180	110	59	GRAPEVINE INTERCHANGE - KIRBY 115KV CKT 1
CLARDON2 - JERICO 69KV CKT 1	11SP	67	142	60	JERICO - KIRBY 115KV CKT 1
NICHOLS STATION - YARNELL3 115KV CKT 1	11SP	180	110	61	GRAPEVINE INTERCHANGE - KIRBY 115KV CKT 1
CLARDON2 - CLARREC2 69KV CKT 1	11SP	67	132	63	JERICO - KIRBY 115KV CKT 1
CLARREC2 - HEDLEY 69KV CKT 1	11SP	67	126	66	JERICO - KIRBY 115KV CKT 1
HEDLEY - NMEMREC2 69KV CKT 1	11SP	67	124	67	JERICO - KIRBY 115KV CKT 1
NWMEMREC2 - NWMEMPH2 69KV CKT 1	11SP	67	120	68	JERICO - KIRBY 115KV CKT 1
NWMEMPH2 - MEMPHIS2 69KV CKT 1	11SP	67	116	71	JERICO - KIRBY 115KV CKT 1
MEMPHIS2 - REDRIVR2 69KV CKT 1	11SP	67	108	77	JERICO - KIRBY 115KV CKT 1
GRAPEVINE INTERCHANGE - KIRBY 115KV CKT 1	11SP	161	104	77	NICHOLS STATION - YARNELL3 115KV CKT 1
KRESS INTERCHANGE - TULIAT3 115KV CKT 1	11SP	99	100	78	AMARILLO S INTERCHANGE - SWISHER COUNTY INTERCHANGE 230KV CKT 1
REDRIVR2 - ESTELNE2 69KV CKT 1	11SP	67	107	78	JERICO - KIRBY 115KV CKT 1
<b>2011 Winter Peak Model</b>					
ELK CITY (ELKCTY-6) 230/138/13.8KV TRANSFORMER CKT 1	11WP	287	197	0	OKLAUNION - TUCO INTERCHANGE 345KV CKT 1
ELDORADO - LAKE PAULINE 69KV CKT 1	11WP	20	176	0	LAKE PAULINE - RUSSELL 138KV CKT 1
ELK CITY (AEPW-WFEC) TIE	11WP	39	164	0	OKLAUNION - TUCO INTERCHANGE 345KV CKT 1
SHAMROCK (SHAMRCK1) 115/69/14.4KV TRANSFORMER CKT 1	11WP	69	161	0	ELK CITY (ELKCTY-6) 230/138/13.8KV TRANSFORMER CKT 1
2006-02T 230 - ELK CITY 230KV CKT 1	11WP	351	161	0	OKLAUNION - TUCO INTERCHANGE 345KV CKT 1

**Table 4: Contingency Analysis (continued)**

ELEMENT	SEASON	RATE (MVA)	LOADING (%)	ATC (MW)	CONTINGENCY
<b>2011 Winter Peak Model (continued)</b>					
SHAMROCK (SHAMRCK2) 138/69/14.4KV TRANSFORMER CKT 1	11WP	69	150	0	ELK CITY (ELKCTY-6) 230/138/13.8KV TRANSFORMER CKT 1
2006-02T 230 - ELK CITY 230KV CKT 1	11WP	319	147	0	BASE CASE
CLINTON - ELK CITY 138KV CKT 1	11WP	143	144	0	CLINTO AIR FORCE BASE TAP - ELK CITY 138KV CKT 1
ELDORADO - ELDORADO JCT 69KV CKT 1	11WP	26	131	0	LAKE PAULINE - RUSSELL 138KV CKT 1
LAKE PAULINE - RUSSELL 138KV CKT 1	11WP	72	122	0	ELK CITY (ELKCTY-6) 230/138/13.8KV TRANSFORMER CKT 1
2006-02T 230 - GRAPEVINE 230KV CKT 1	11WP	351	110	0	ELK CITY (ELKCTY-6) 230/138/13.8KV TRANSFORMER CKT 1
ELK CITY (ELKCTY-4) 138/69/13.8KV TRANSFORMER CKT 1	11WP	72	108	0	OKLAUNION - TUCO INTERCHANGE 345KV CKT 1
CONWAY - KIRBY 115KV CKT 1	11WP	218	104	0	ELK CITY (ELKCTY-6) 230/138/13.8KV TRANSFORMER CKT 1
KIRBY - MCLELLN3 115KV CKT 1	11WP	107	109	15	ELK CITY (ELKCTY-6) 230/138/13.8KV TRANSFORMER CKT 1
ELDORADO JCT - GYPSUM 69KV CKT 1	11WP	26	121	22	LAKE PAULINE - RUSSELL 138KV CKT 1
MCCLELLAN RURAL - MCLELLN3 115KV CKT 1	11WP	107	107	27	ELK CITY (ELKCTY-6) 230/138/13.8KV TRANSFORMER CKT 1
AMOCOTP2 - CHLDR2WT 69KV CKT 1	11WP	44	169	32	JERICO - KIRBY 115KV CKT 1
JERICO (JERIC2WT) 115/69/14.4KV TRANSFORMER CKT 1	11WP	46	214	39	JERICO - KIRBY 115KV CKT 1
CHILDRESS (CHILD4WT) 138/69/12.5 KV TRANSFORMER CKT 1	11WP	55	131	52	JERICO - KIRBY 115KV CKT 1
GYPSUM - RUSSELL 69KV CKT 1	11WP	26	111	54	LAKE PAULINE - RUSSELL 138KV CKT 1
MCCLELLAN RURAL - SHAMROCK 115KV CKT 1	11WP	107	104	54	ELK CITY (ELKCTY-6) 230/138/13.8KV TRANSFORMER CKT 1
AIRPORT2 - AMOCOTP2 69KV CKT 1	11WP	55	132	55	JERICO - KIRBY 115KV CKT 1
CAREY - AIRPORT2 69KV CKT 1	11WP	55	132	56	JERICO - KIRBY 115KV CKT 1
ESTELNE2 - CAREY 69KV CKT 1	11WP	55	132	56	JERICO - KIRBY 115KV CKT 1
CLARDON2 - JERICO 69KV CKT 1	11WP	75	127	67	JERICO - KIRBY 115KV CKT 1
CLARDON2 - CLARREC2 69KV CKT 1	11WP	75	119	71	JERICO - KIRBY 115KV CKT 1
CLARREC2 - HEDLEY 69KV CKT 1	11WP	75	116	73	JERICO - KIRBY 115KV CKT 1
HEDLEY - NMEMREC2 69KV CKT 1	11WP	75	112	75	JERICO - KIRBY 115KV CKT 1
NWMEMREC2 - NWMEMPH2 69KV CKT 1	11WP	75	110	76	JERICO - KIRBY 115KV CKT 1
NWMEMPH2 - MEMPHIS2 69KV CKT 1	11WP	75	107	79	JERICO - KIRBY 115KV CKT 1
<b>2016 Summer Peak Model</b>					
CANYON EAST - OSAGE SWITCHING STATION 115KV CKT 1	16SP	99	156	0	BUSHLAND INTERCHANGE - DEAF SMITH INTERCHANGE 230KV CKT 1
CANYON EAST - CANYON WEST 115KV CKT 1	16SP	99	141	0	BUSHLAND INTERCHANGE - DEAF SMITH INTERCHANGE 230KV CKT 1
ELK CITY (AEPW-WFEC) TIE	16SP	39	139	0	2006-02T 230 - GRAPEVINE INTERCHANGE 230KV CKT 1
PALODU - RANDALL COUNTY INTERCHANGE 115KV CKT 1	16SP	99	139	0	AMARILLO S INTERCHANGE - SWISHER COUNTY INTERCHANGE 230KV CKT 1
HAPPY INTERCHANGE - PALO DURO 115KV CKT 1	16SP	99	136	0	AMARILLO S INTERCHANGE - SWISHER COUNTY INTERCHANGE 230KV CKT 1
ELK CITY (ELKCTY-6) 230/138/13.8KV TRANSFORMER CKT 1	16SP	287	129	0	2006-02T 230 - GRAPEVINE INTERCHANGE 230KV CKT 1
EAST PLANT INTERCHANGE - PIERCE TAP 115KV CKT 1	16SP	161	127	0	EAST PLANT INTERCHANGE - MANHATTAN 115KV CKT 1
EAST PLANT INTERCHANGE - MANHATTAN 115KV CKT 1	16SP	161	126	0	EAST PLANT INTERCHANGE - PIERCE TAP 115KV CKT 1
BOWERS INTERCHANGE 115/69KV TRANSFORMER CKT 1	16SP	97	125	0	CONWAY - YARNELL3 115KV CKT 1
CONWAY - KIRBY 115KV CKT 1	16SP	180	125	0	CONWAY - YARNELL3 115KV CKT 1
MANHTP3 - OSAGE SWITCHING STATION 115KV CKT 1	16SP	161	123	0	EAST PLANT INTERCHANGE - PIERCE TAP 115KV CKT 1
CHERRY - NICHOLS STATION 115KV CKT 1	16SP	161	120	0	NICHOLS STATION - WHITAKER 115KV CKT 1
NICHOLS STATION - WHITAKER 115KV CKT 1	16SP	249	120	0	CHERRY - NICHOLS STATION 115KV CKT 1

**Table 4: Contingency Analysis (continued)**

ELEMENT	SEASON	RATE (MVA)	LOADING (%)	ATC (MW)	CONTINGENCY
<b>2016 Summer Peak Model (continued)</b>					
CANYON WEST - DAWN 115KV CKT 1	16SP	99	116	0	BUSHLAND INTERCHANGE - DEAF SMITH INTERCHANGE 230KV CKT 1
OSAGE SWITCHING STATION - PIERCE TAP 115KV CKT 1	16SP	161	113	0	EAST PLANT INTERCHANGE - MANHATTAN 115KV CKT 1
EAST PLANT INTERCHANGE - WHITAKER 115KV CKT 1	16SP	249	112	0	CHERRY - NICHOLS STATION 115KV CKT 1
HAPPY INTERCHANGE - TULIAT3 115KV CKT 1	16SP	99	112	0	AMARILLO S INTERCHANGE - SWISHER COUNTY INTERCHANGE 230KV CKT 1
DAWN - PNDAHFD3 115 115KV CKT 1	16SP	99	111	0	BUSHLAND INTERCHANGE - DEAF SMITH INTERCHANGE 230KV CKT 1
CHERRY - NORTHWEST INTERCHANGE 115KV CKT 1	16SP	161	110	0	NICHOLS STATION - WHITAKER 115KV CKT 1
MANHATTAN - MANHTP3 115KV CKT 1	16SP	161	110	0	EAST PLANT INTERCHANGE - PIERCE TAP 115KV CKT 1
2006-02T 230 - GRAPEVINE 230KV CKT 1	16SP	351	110	0	ELK CITY (ELKCTY-6) 230/138/13.8KV TRANSFORMER CKT 1
SWISHER COUNTY INTERCHANGE 230/115KV TRANSFORMER CKT 1	16SP	150	109	0	SWISHER COUNTY INTERCHANGE - TUCO INTERCHANGE 230KV CKT 1
KRESS INTERCHANGE - TULIAT3 115KV CKT 1	16SP	99	105	0	AMARILLO S INTERCHANGE - SWISHER COUNTY INTERCHANGE 230KV CKT 1
2006-02T 230 - ELK CITY 230KV CKT 1	16SP	351	105	0	2006-02T 230 - GRAPEVINE INTERCHANGE 230KV CKT 1
ELK CITY (ELKCTY-4) 138/69/13.8KV TRANSFORMER CKT 1	16SP	72	104	0	2006-02T 230 - GRAPEVINE INTERCHANGE 230KV CKT 1
HEREFORD INTERCHANGE - PNDAHFD3 115 115KV CKT 1	16SP	99	103	12	BUSHLAND INTERCHANGE - DEAF SMITH INTERCHANGE 230KV CKT 1
CONWAY - YARNELL3 115KV CKT 1	16SP	180	121	28	GRAPEVINE INTERCHANGE - KIRBY 115KV CKT 1
NICHOLS STATION - YARNELL3 115KV CKT 1	16SP	180	120	30	GRAPEVINE INTERCHANGE - KIRBY 115KV CKT 1
AMOCOTP2 - CHLDR2WT 69KV CKT 1	16SP	44	166	33	JERICHO - KIRBY 115KV CKT 1
JERICHO (JERIC2WT) 115/69/14.4KV TRANSFORMER CKT 1	16SP	46	213	39	JERICHO - KIRBY 115KV CKT 1
AIRPORT2 - AMOCOTP2 69KV CKT 1	16SP	48	149	45	JERICHO - KIRBY 115KV CKT 1
CAREY - AIRPORT2 69KV CKT 1	16SP	48	149	45	JERICHO - KIRBY 115KV CKT 1
ESTELNE2 - CAREY 69KV CKT 1	16SP	48	149	45	JERICHO - KIRBY 115KV CKT 1
GRAPEVINE INTERCHANGE - KIRBY 115KV CKT 1	16SP	161	117	48	CONWAY - YARNELL3 115KV CKT 1
CHILDRESS (CHILD4WT) 138/69/12.5 KV TRANSFORMER CKT 1	16SP	55	128	54	JERICHO - KIRBY 115KV CKT 1
BOWERS INTERCHANGE 115/69KV TRANSFORMER CKT 1	16SP	84	103	55	BASE CASE
CLARDON2 - JERICHO 69KV CKT 1	16SP	67	142	60	JERICHO - KIRBY 115KV CKT 1
CLARDON2 - CLARREC2 69KV CKT 1	16SP	67	132	63	JERICHO - KIRBY 115KV CKT 1
CLARREC2 - HEDLEY 69KV CKT 1	16SP	67	126	66	JERICHO - KIRBY 115KV CKT 1
HEDLEY - NMEMREC2 69KV CKT 1	16SP	67	124	67	JERICHO - KIRBY 115KV CKT 1
NWMEMREC2 - NWMEMPH2 69KV CKT 1	16SP	67	120	68	JERICHO - KIRBY 115KV CKT 1
NWMEMPH2 - MEMPHIS2 69KV CKT 1	16SP	67	116	71	JERICHO - KIRBY 115KV CKT 1
REDRIVR2 - ESTELNE2 69KV CKT 1	16SP	67	108	77	JERICHO - KIRBY 115KV CKT 1
MEMPHIS2 - REDRIVR2 69KV CKT 1	16SP	67	108	77	JERICHO - KIRBY 115KV CKT 1
CONWAY - YARNELL3 115KV CKT 1	16SP	164	100	83	BASE CASE

*Note: 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.*



