



**SPP**

*Southwest  
Power Pool*

***System Impact Study SPP-2002-169r-2  
For Transmission Service  
Requested By  
Power Resource Group, Inc***

***From AEPW To Entergy for 620 MW  
From 4/1/03 To 4/1/13  
With Annulment of ERCOTE to EES Confirmed Service***

***SPP Transmission Planning***

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**SPP-2002-169r-2 Revised August 30, 2002 to include revision of the ATC and Determined Solutions as given in the completed SPP-2002-169-1 Facility Study. The results include the additional facility upgrades required due to the addition of the facility upgrades assigned to the 620MW transfer.**

## **1. Executive Summary**

Power Resource Group, Inc. has requested an impact study for transmission service from AEPW to EES. The transfer is for the amount of 620 MW from 4/1/2003 to 4/1/2013.

Previously confirmed service from ERCOTE to EES results in a decrease in ATC on some facilities identified for the AEPW to EES transfer. The objective of this study is to evaluate the impact of annulling up to 465MW of the previously confirmed service from ERCOTE to EES to provide for additional ATC on those facilities which have been identified as limitations for the 620 MW AEPW to EES request.

This study determines any upgrades that may be excluded by annulling the ERCOTE to EES transfer for the period of 4/1/2003 to 4/1/2013.

## **2. Introduction**

Power Resource Group, Inc. requested an impact study for transmission service from AEPW to EES.

The principal objective of this study was to identify the restraints on the SPP Regional Tariff System that may limit the transfer to less than 620MW and to propose additional transmission projects that will relieve the overloads caused by the transfer. This study determines any benefit that may be provided by annulling up to 465MW of previously confirmed service from ERCOTE to EES.

The study includes steady-state contingency analyses (PSS/E function ACCC) which considers the impact of the 620MW transfer on transmission line loading and transmission bus voltages for outages of single and selected multiple transmission lines and transformers on the SPP system.

### 3. Study Methodology

#### **A. Description**

Two analyses were conducted to determine the impact of the 620MW transfer on the system. The first analysis was conducted to identify any new overloads caused by the 620MW transfer. The second analysis was done to ensure that available capacity exists on previously identified circuits.

The first analysis was to study the steady-state analysis impact of the 620MW transfer on the system. The second step was to determine the Available Transfer Capability (ATC) of the facilities identified in the steady-state analysis impact. The steady-state analysis was done to ensure current SPP Criteria and NERC Planning Standards requirements are fulfilled. The Southwest Power Pool (SPP) conforms to the NERC Planning Standards, which provide the strictest requirements, related to thermal overloads with a contingency. It requires that all facilities be within emergency ratings after a contingency.

The second analysis was done to determine the impact of the transfer on previously assigned and identified facilities. Any previously assigned and identified facilities further impacted by the transfer are documented in the report.

#### **B. Model Updates**

SPP used eight seasonal models to study the 620MW request with the annulment of the ERCOTE to EES transfer. The SPP 2002 Series Cases 2003 Summer Peak, 2003 Fall, 2003/2004 Winter Peak, 2004 Spring, 2005 Summer Peak, 2005/2006 Winter Peak, 2008 Summer Peak, and 2008/2009 Winter Peak were used to study the impact of the 620MW transfer on the SPP system during the transaction period of 4/1/2003 to 4/1/2013.

The chosen base case models were modified to reflect the most current modeling information. The cases were modified to reflect future firm transfers during the request period that were not already included in the January 2002 base case series models.

#### **C. Transfer Analysis**

Using the created models and the ACCC function of PSS/E, single and select double contingency outages were analyzed. Then full AC solution was used to obtain the most accurate results possible. Any facility overloaded, using MVA ratings, in the transfer case and not overloaded in the base case was flagged. The PSS/E options chosen to conduct the Impact Study analysis can be found in Appendix A.

## **2. Results**

Tables 1 thru 8 contain the analysis results of the System Impact Study. The tables identify the seasonal case in which the event occurred; the emergency rating of the overloaded circuit (Rate B), the contingent loading percentage of circuit with and without the studied transfer, the estimated ATC value using interpolation if calculated, any SPP identification or assignment of the event, and any solutions received from the transmission owners.

Table 1 documents the new facility overloads caused by the 620MW AEPW to EES transfer for the period of 4/1/2003 to 4/1/2013.

Table 2 documents the overloads on the Non SPP Regional Tariff participants' transmission systems caused by the 620MW transfer.

Table 3 documents the new upgrades required due to the addition of the facility upgrades assigned to the 620MW for the period of 4/1/2003 to 4/1/2013.

Table 4 documents the facility overloads caused by the 620MW AEPW to EES transfer with the annulment of 465MW of service from ERCOTE to EES for the period of 4/1/2003 to 4/1/2013.

Table 5 documents the overloads on the Non SPP Regional Tariff participants' transmission systems caused by the 620MW transfer with the annulment of 465MW of service from ERCOTE to EES for the period of 4/1/2003 to 4/1/2013.

Table 6 documents the new upgrades required due to the addition of the facility upgrades assigned to the 620MW with the annulment of 465MW of service from ERCOTE to EES for the period of 4/1/2003 to 4/1/2013.

Table 7 documents the facility overloads caused by the 620MW AEPW to EES transfer with the annulment of 300MW of service from ERCOTE to EES for the period of 4/1/2003 to 4/1/2013.

Table 8 documents the overloads on the Non SPP Regional Tariff participants' transmission systems caused by the 620MW transfer with the annulment of 300MW of service from ERCOTE to EES for the period of 4/1/2003 to 4/1/2013.

Table 9 documents the new upgrades required due to the addition of the facility upgrades assigned to the 620MW with the annulment of 300MW of service from ERCOTE to EES for the period of 4/1/2003 to 4/1/2013.

**Table 1**– Facility Overloads Caused by AEPW to EES 620MW Transfer from 4/1/2003 to 4/1/2013

Study Year	From Area - To Area	Branch Over 100% RateB	RATE B	BC %Loading	TC %Loading	Outaged Branch That Caused Overload	ATC	Comments	Cost
03AP	WERE-WERE	GREEN TO COFFEY COUNTY 4, 69KV 57636 GREEN 269.0 to 57631 CC4VERN269.0 CKT 1	45	100.2	102.9	WOLF CREEK TO LA CYGNE, 345KV 56797 WOLFCRK7 345 to 57981 LACYGNE7 345 CKT1	620	Westar Transmission Operating Directive 1304.	\$ -
03AP	WERE-WERE	COFFEY CNTY #4 VERNON TO ATHENS SW. STA., 69KV 57631 CC4VERN269.0 to 57623 ATHENS 269.0 CKT 1	45	99.7	102.3	WOLF CREEK TO LA CYGNE, 345KV 56797 WOLFCRK7 345 to 57981 LACYGNE7 345 CKT1	620	"	\$ -
03G	OKGE-OKGE	PECAN CREEK 345/161KV TRANSFORMER 55235 PECANCK7 345 to 55234 PECANCK5 161 CKT 1	369	91.5	103.3	MUSKOGEE TO FORT SMITH, 345KV 55224 MUSKOGEE7 345 to 55302 FTSMITH7 345 CKT1	448	Add 2nd 345/161 kV 369MVA unit Upgrade Causes Muskogee Tap-Gore-Salisaw 161kV, Tahlequah-Highway 59 161kV, & Pecan Creek-Muskogee 345kV lines to Overload in 08SP	\$ 3,000,000
03G	WERE-WERE	GREEN TO COFFEY COUNTY 4, 69KV 57636 GREEN 269.0 to 57631 CC4VERN269.0 CKT 1	45	104.3	107.0	WOLF CREEK TO LA CYGNE, 345KV 56797 WOLFCRK7 345 to 57981 LACYGNE7 345 CKT1	620	Westar Transmission Operating Directive 1304.	\$ -
03G	WERE-WERE	COFFEY CNTY #4 VERNON TO ATHENS SW. STA., 69KV 57631 CC4VERN269.0 to 57623 ATHENS 269.0 CKT 1	45	102.9	105.7	WOLF CREEK TO LA CYGNE, 345KV 56797 WOLFCRK7 345 to 57981 LACYGNE7 345 CKT1	620	"	\$ -
03SP	KACP-KACP	LA CYGNE TO STILWELL, 345KV 57981 LACYGNE7 345 to 57968 STILWEL7 345 CKT 1	1251	107.1	110.4	WEST GARDNER TO LA CYGNE, 345KV 57965 W.GRDNR7 345 to 57981 LACYGNE7 345 CKT1	0	Linn County Project Relieves Facility	\$ 6,945,000
03SP	OKGE-OKGE	DRAPER 345/138KV TRANSFORMER 2 54934 DRAPER 7 345 to 54933 DRAPER 4 138 CKT 2	493	102.3	107.5	DRAPER 345/138KV TRANSFORMER 1 54934 DRAPER 7 345 to 54933 DRAPER 4 138 CKT1	0	Flowgate: OKGE Mitigation Plan to Increase Rating to 591 MVA by 2004	\$ -
03SP	OKGE-OKGE	DRAPER 345/138KV TRANSFORMER 1 54934 DRAPER 7 345 to 54933 DRAPER 4 138 CKT 1	493	102.3	107.5	DRAPER 345/138KV TRANSFORMER 2 54933 DRAPER 4 138 to 54934 DRAPER 7 345 CKT2	0	"	\$ -
03SP	WERE-WERE	CRESWELL TO PARIS, 69KV 57543 CRESWLN269.0 to 57548 PARIS 269.0 CKT 1	80	100.2	101.9	CRESWELL TO OAK, 69KV 57543 CRESWLN269.0 to 57547 OAK 269.0 CKT1	0	Expedite Rebuild 5.7mile line assigned to SPP-2000-003 Scheduled In Service Date 6/1/04	\$ -
03SP	AEPW-AEPW	CHEROKEE REC TO KNOX LEE, 138KV 53522 CHEROKE4 138 to 53557 KNOXLEE4 138 CKT 1	209	107.5	114.7	Multiple Outage Contingency SOUTHWEST SHREVEPORT TO LONGWOOD, 345KV 53454 SW SHV 7 345 to 53424 LONGWD 7 345 CKT 1 SOUTHWEST SHREVEPORT TO DIANA, 345KV 53454 SW SHV 7 345 to 53528 DIANA 7 345 CKT 1	0	Reconductor 3.25 miles of 666 ACSR with 1272 ACSR	\$ 981,000

**Table 1 - continued** – Facility Overloads Caused by AEPW to EES 620MW Transfer from 4/1/2003 to 4/1/2013

Study Year	From Area - To Area	Branch Over 100% RateB	RATE B	BC %Loading	TC %Loading	Outaged Branch That Caused Overload	ATC	Comments	Cost
03SP	AEPW-AEPW	CHEROKEE REC TO TATUM, 138KV 53611 TATUM 4 138 to 53522 CHEROKE4 138 CKT 1	209	101.6	108.8	Multiple Outage Contingency SOUTHWEST SHREVEPORT TO LONGWOOD, 345KV 53454 SW SHV 7 345 to 53424 LONGWD 7 345 CKT 1 SOUTHWEST SHREVEPORT TO DIANA, 345KV 53454 SW SHV 7 345 to 53528 DIANA 7 345 CKT 1	0	Reconductor 6.25 miles of 666 ACSR with 1272 ACSR	\$ 1,641,000
03SP	AEPW-AEPW	TATUM TO ROCKHILL, 138KV 53611 TATUM 4 138 to 53598 ROKHILL4 138 CKT 1	209	100.0	107.1	Multiple Outage Contingency SOUTHWEST SHREVEPORT TO LONGWOOD, 345KV 53454 SW SHV 7 345 to 53424 LONGWD 7 345 CKT 1 SOUTHWEST SHREVEPORT TO DIANA, 345KV 53454 SW SHV 7 345 to 53528 DIANA 7 345 CKT 1	0	Reconductor 0.81 miles 666MCM to 1272 ACSR	\$ 342,970
03SP	AEPW-AEPW	LONGWOOD TO NORAM, 138KV 53423 LONGWD 4 138 to 53473 NORAM 4 138 CKT 1	234	99.8	105.0	Multiple Outage Contingency SOUTHWEST SHREVEPORT TO LONGWOOD, 345KV 53454 SW SHV 7 345 to 53424 LONGWD 7 345 CKT 1 SOUTHWEST SHREVEPORT TO DIANA, 345KV 53454 SW SHV 7 345 to 53528 DIANA 7 345 CKT 1	25	Reconductor 4.66 miles of bundled 266 ACSR with 1590 ACSR & replace jumpers	\$ 1,577,000
03SP	AEPW-AEPW	GENTRY REC TO FLINT CREEK, 161KV 53187 GENTRYR5 161 to 53139 FLINTCR5 161 CKT 1	353	99.8	102.9	DYESS TO EAST ROGERS, 161KV 53131 DYESS 5 161 to 53135 EROGERS5 161 CKT1	37	Relieved by AEP Tontitown Project - Estimated In-Service Date 6/1/2004	\$ -
03SP	AEPW-AEPW	DYESS TO EAST ROGERS, 161KV 53131 DYESS 5 161 to 53135 EROGERS5 161 CKT 1	244	99.1	103.9	GENTRY REC TO FLINT CREEK, 161KV 53139 FLINTCR5 161 to 53187 GENTRYR5 161 CKT1	120	"	\$ -
03SP	EMDE-EMDE	REPUBLIC EAST TO BILLINGS NORTHEAST, 69KV 59580 REP359 269.0 to 59546 BIL221 269.0 CKT 1	38	99.8	100.6	BLACKHAWK JCT TO JAMESV, 69KV 59604 BHJ415 269.0 to 96673 2JAMESV 69.0 CKT1	144	In-house plans to reconductor in 2004 for own needs due to outage of Black Hawk JCT - Jamesville.	\$ -



**Table 1 - continued** – Facility Overloads Caused by AEPW to EES 620MW Transfer from 4/1/2003 to 4/1/2013

Study Year	From Area - To Area	Branch Over 100% RateB	RATE B	BC %Loading	TC %Loading	Outaged Branch That Caused Overload	ATC	Comments	Cost
03SP	AEPW-AEPW	NORAM TO RAINES, 138KV 53473 NORAM 4 138 to 53439 RAINES 4 138 CKT 1	234	98.6	103.8	Multiple Outage Contingency SOUTHWEST SHREVEPORT TO LONGWOOD, 345KV 53454 SW SHV 7 345 to 53424 LONGWD 7 345 CKT 1 SOUTHWEST SHREVEPORT TO DIANA, 345KV 53454 SW SHV 7 345 to 53528 DIANA 7 345 CKT 1	163	Rebuild 5.58 miles of 2-266 ACSR with 1590 ACSR	\$ 2,000,000
03SP	AEPW-AEPW	IPC JEFFERSON TO LIEBERMAN, 138KV 53548 IPCJEFF4 138 to 53420 LIEBERM4 138 CKT 1	136	96.4	109.3	LONGWOOD TO WILKES, 345KV 53424 LONGWD 7 345 to 53620 WILKES 7 345 CKT1	171	Reconductor 26.35 miles of 336 ACSR with 795 ACSR, Replace Switches @ Lieberman, Reset Relays @ Jefferson IPC, & Reconductor 0.65 miles 397MCM to 795MCM	\$ 7,411,000
03SP	AEPW-AEPW	PITTSBURG TO LONE STAR SOUTH, 138KV 53311 PITTSB_4 138 to 53276 LSSOUTH4 138 CKT 1	197	99.8	100.1	CHAPEL HILL REC TO WELSH REC, 138KV 53521 CHAPELH4 138 to 53622 WELSHRE4 138 CKT1	316	Reset CT @ Pittsburg	\$ 10,000
03SP	EMDE-EMDE	ORONOGO JCT. TO JOPLIN OAKLAND NORTH, 161KV 59467 ORO110 5 161 to 59494 OAK432 5 161 CKT 1	214	98.3	101.5	TIPTON FORD TO JOPLIN SOUTHWEST, 161KV 59472 TIP292 5 161 to 59483 JOP389 5 161 CKT1	327	Reconstruct and replace 1.4 miles of 556 ACSR with Bundled 556 ACSR	\$ 800,000
03SP	AEPW-AEPW	DYESS TO EAST ROGERS, 161KV 53131 DYESS 5 161 to 53135 EROGERS5 161 CKT 1	244	97.2	102.0	EAST CENTERTON TO GENTRY REC, 161KV 53133 ECNTRTN5 161 to 53187 GENTRYR5 161 CKT1	363	Relieved by AEP Tontitown Project - Estimated In-Service Date 6/1/2004	\$ -
03SP	AEPW-AEPW	EAST CENTERTON TO GENTRY REC, 161KV 53187 GENTRYR5 161 to 53133 ECNTRTN5 161 CKT 1	353	97.5	100.6	DYESS TO EAST ROGERS, 161KV 53131 DYESS 5 161 to 53135 EROGERS5 161 CKT1	494	"	\$ -
03SP	OKGE-OKGE	PECAN CREEK 345/161KV TRANSFORMER 55235 PECANCK7 345 to 55234 PECANCK5 161 CKT 1	369	90.5	102.4	MUSKOGEE TO FORT SMITH, 345KV 55224 MUSKOGEE7 345 to 55302 FTSMITH7 345 CKT1	494	See Previous	\$ -
03SP	AEPW-AEPW	FLINT CREEK TO ELM SPRINGS REC, 161KV 53194 ELMSPRR5 161 to 53139 FLINTCR5 161 CKT 1	312	99.5	100.1	CHAMBER SPRINGS TO FARMINGTON AECC, 161KV 53154 CHAMSPR5 161 to 53195 FARMGTN5 161 CKT1	537	Relieved by AEP Tontitown Project - Estimated In-Service Date 6/1/2004	\$ -
03SP	EMDE-EMDE	AURORA H.T. 161/69/12.5KV TRANSFORMER 59468* AUR124 5 161 544 WND 1 AURORA3 3	41.7	97.9	100.2	MONETT 161/69/12.5KV TRANSFORMER 59480 MON383 5161 to 59591 MON383 269.0 to 59712 MON383 112.5	620	Replace 3 transformers with one 150MVA unit at EDE expense by 6/1/2003.	\$ -
03SP	SWPA-AECI	CARTHAGE TO REEDS SPRING, 69KV 52690 CARTHG 269.0 to 96751 2REEDS 69.0 CKT 1	36	117.8	123.6	AURORA TO MONETT, 161KV 59468 AUR124 5 161 to 59480 MON383 5 161 CKT1	N/A	Third Party Facility	\$ -

**Table 1 - continued** – Facility Overloads Caused by AEPW to EES 620MW Transfer from 4/1/2003 to 4/1/2013

Study Year	From Area - To Area	Branch Over 100% RateB	RATE B	BC %Loading	TC %Loading	Outaged Branch That Caused Overload	ATC	Comments	Cost
03SP	EES-SWPA	MIDWAY TO BULL SHOALS, 161KV 99825 5MIDWAY# 161 to 52660 BULL SH5 161 CKT 1	162	112.1	123.4	BUFORD TAP TO BULL SHOALS, 161KV 52661 BUFRDTP5 161 to 52660 BULL SH5 161 CKT1	N/A	Third Party Facility with SWPA Terminal Equip Limitations Replace disconnect switches, metering CTs and wave trap at Bull Shoals by SPA.	\$ 150,000
03SP	AEPW-AEPW	JACKSONVILLE TO OVERTON, 138KV 53549 JACKSNV4 138 to 53588 OVERTON4 138 CKT 1	235	92.8	100.3	CROCKETT TO TENASKA RUSK COUNTY 53526 CROCKET7 345 to 53637 TENRUSK7 345 CKT1	N/A	Third Party Facility	\$ -
03FA	WERE-WERE	GREEN TO COFFEY COUNTY 4, 69KV 57636 GREEN 269.0 to 57631 CC4VERN269.0 CKT 1	45	99.0	101.7	WOLF CREEK TO LA CYGNE, 345KV 56797 WOLFCKR7 345 to 57981 LACYGNE7 345 CKT1	620	Westar Transmission Operating Directive 1304.	\$ -
03FA	WERE-WERE	COFFEY CNTY #4 VERNON TO ATHENS SW. STA., 69KV 57631 CC4VERN269.0 to 57623 ATHENS 269.0 CKT 1	45	97.6	100.3	WOLF CREEK TO LA CYGNE, 345KV 56797 WOLFCKR7 345 to 57981 LACYGNE7 345 CKT1	620	"	\$ -
03FA	SWPA-EES	MIDWAY TO BULL SHOALS, 161KV 52660 BULL SH5 161 to 99825 5MIDWAY# 161 CKT 1	162	98.4	110.2	BUFORD TAP TO BULL SHOALS, 161KV 52661 BUFRDTP5 161 to 52660 BULL SH5 161 CKT1	N/A	See Previous	\$ -
03WP	AEPW-AEPW	PERDUE TO DIANA, 138KV 53590 PERDUE 4 138 to 53527 DIANA 4 138 CKT 1	237	99.9	101.1	LIBERTY CITY TAP TO NEW GLADEWATER, 138KV 53561 LIBCYTP4 138 to 53576 NEWGLAD4 138 CKT1	42	Replace Breaker 10070 @ Perdue	\$ 150,000
03WP	OKGE-OKGE	PECAN CREEK 345/161KV TRANSFORMER 55235 PECANCK7 345 to 55234 PECANCK5 161 CKT 1	369	93.0	104.9	MUSKOGEE TO FORT SMITH, 345KV 55224 MUSKOGEE7 345 to 55302 FTSMITH7 345 CKT1	363	See Previous	\$ -
03WP	OKGE-OKGE	DRAPER 345/138KV TRANSFORMER 1 54934 DRAPER 7 345 to 54933 DRAPER 4 138 CKT 1	493	95.6	100.7	DRAPER 345/138KV TRANSFORMER 2 54933 DRAPER 4 138 to 54934 DRAPER 7 345 CKT2	529	Flowgate: OKGE Mitigation Plan to Increase Rating to 591 MVA by 2004	\$ -
03WP	OKGE-OKGE	DRAPER 345/138KV TRANSFORMER 2 54934 DRAPER 7 345 to 54933 DRAPER 4 138 CKT 2	493	95.6	100.7	DRAPER 345/138KV TRANSFORMER 1 54933 DRAPER 4 138 to 54934 DRAPER 7 345 CKT1	529	Flowgate: OKGE Mitigation Plan to Increase Rating to 591 MVA by 2004	\$ -
03WP	SWPA-AECI	CARTHAGE TO REEDS SPRING, 69KV 52690 CARTHG 269.0 to 96751 2REEDS 69.0 CKT 1	43	100.6	105.4	AURORA TO MONETT, 161KV 59468 AUR124 5 161 to 59480 MON383 5 161 CKT1	N/A	Third Party Facility	\$ -
04G	OKGE-OKGE	PECAN CREEK 345/161KV TRANSFORMER 55235 PECANCK7 345 to 55234 PECANCK5 161 CKT 1	369	92.7	104.7	MUSKOGEE TO FORT SMITH, 345KV 55224 MUSKOGEE7 345 to 55302 FTSMITH7 345 CKT1	378	See Previous	\$ -
04G	SWPA-SWPA	GLENCOE TO NORFORK, 161KV 52646 GLENCOE5 161 to 52648 NORFORK5 161 CKT 1	112	99.3	104.2	NEW-IN TO NEWPO, 161KV 99763 5NEW-IN 161 to 99764 5NEWPO 161 CKT1	620	Remove wave trap. Switch relaying channel to fiber optic shield wire. To be completed by SWPA for own needs.	\$ -

**Table 1 - continued** – Facility Overloads Caused by AEPW to EES 620MW Transfer from 4/1/2003 to 4/1/2013

Study Year	From Area - To Area	Branch Over 100% RateB	RATE B	BC %Loading	TC %Loading	Outaged Branch That Caused Overload	ATC	Comments	Cost
04G	SWPA-SWPA	<b>GLENCOE TO NORFORK, 161KV</b> 52646 GLENCOE5 161 to 52648 NORFORK5 161 CKT 1	112	98.7	103.6	<b>NEW-AB TO NEW-IN, 161KV</b> 99762 5NEW-AB 161 to 99763 5NEW-IN 161 CKT1	620	"	\$ -
04G	SWPA-SWPA	<b>GLENCOE TO NORFORK, 161KV</b> 52646 GLENCOE5 161 to 52648 NORFORK5 161 CKT 1	112	98.0	103.0	<b>CASH TO NEW-AB, 161KV</b> 99736 5CASH 1 161 to 99762 5NEW-AB 161 CKT1	620	"	\$ -
04G	SWPA-SWPA	<b>GLENCOE TO NORFORK, 161KV</b> 52646 GLENCOE5 161 to 52648 NORFORK5 161 CKT 1	112	97.6	102.8	<b>DELL TO ISES, 500KV</b> 99742 8DELL 5 500 to 99818 8ISES 5 500 CKT1	620	"	\$ -
04G	SWPA-SWPA	<b>GLENCOE TO NORFORK, 161KV</b> 52646 GLENCOE5 161 to 52648 NORFORK5 161 CKT 1	112	97.4	102.4	<b>CASH TO JONES, 161KV</b> 99736 5CASH 1 161 to 99755 5JONES 161 CKT1	620	"	\$ -
04G	AEPW-AEPW	<b>SOUTH SHREVEPORT TO WALLACE LAKE, 138KV</b> 53446 S SHV 4 138 to 53461 WALLAKE4 138 CKT 1	210	90.0	103.8	<b>DOLET HILLS 345/230KV TRANSFORMER</b> 50045 DOLHILL7 345 to 50046 DOLHILL6 230 CKT1	620	Dolet Hills Operating Guide Monitor Line at 260 MVA	\$ -
04G	WERE-WERE	<b>TECUMSEH HILL 230/115/13.8KV TRANSFORMER</b> 57182* TECHILE3 115 536 WND 2 1	69	99.8	100.5	<b>KELLY TO KING HILL N.M. COOP, 115KV</b> 57217 KELLY 3115 to 57331 KING HL3115 CKT1	620	Transmission Operating Directive for the overload of the Tecumseh Hill 161/115/13.8kV xfrm.	\$ -
04G	SWPA-EES	<b>MIDWAY TO BULL SHOALS, 161KV</b> 52660 BULL SH5 161 to 99825 5MIDWAY# 161 CKT 1	162	92.4	104.3	<b>BUFORD TAP TO BULL SHOALS, 161KV</b> 52661 BUFDRTP5 161 to 52660 BULL SH5 161 CKT1	N/A	See Previous	\$ -
05SP	KACP-KACP	<b>LA CYGNE TO STILWELL, 345KV</b> 57981 LACYGNE7 345 to 57968 STILWEL7 345 CKT 1	1251	104.9	108.3	<b>WEST GARDNER TO LA CYGNE, 345KV</b> 57981 LACYGNE7 345 to 57965 W.GRDNR7 345 CKT1	0	See Previous	\$ -
05SP	WERE-WERE	<b>CRESWELL TO PARIS, 69KV</b> 57543 CRESWLN269.0 to 57548 PARIS 269.0 CKT 1	80	106.8	108.5	<b>CRESWELL TO OAK, 69KV</b> 57543 CRESWLN269.0 to 57547 OAK 269.0 CKT1	0	See Previous	\$ -
05SP	AEPW-AEPW	<b>PITTSBURG TO LONE STAR SOUTH, 138KV</b> 53311 PITTSB_4 138 to 53276 LSSOUTH4 138 CKT 1	197	106.2	106.9	<b>PETTY TO CHAPEL HILL REC, 138KV</b> 53308 PETTY 4 138 to 53521 CHAPELH4 138 CKT1	0	See Previous	\$ -
05SP	AEPW-AEPW	<b>CHEROKEE REC TO KNOX LEE, 138KV</b> 53522 CHEROKE4 138 to 53557 KNOXLEE4 138 CKT 1	209	116.2	124.0	<b>Multiple Outage Contingency</b> <b>SOUTHWEST SHREVEPORT TO LONGWOOD, 345KV</b> 53454 SW SHV 7 345 to 53424 LONGWD 7 345 CKT 1 <b>SOUTHWEST SHREVEPORT TO DIANA, 345KV</b> 53454 SW SHV 7 345 to 53528 DIANA 7 345 CKT 1	0	See Previous	\$ -

**Table 1 - continued** – Facility Overloads Caused by AEPW to EES 620MW Transfer from 4/1/2003 to 4/1/2013

Study Year	From Area - To Area	Branch Over 100% RateB	RATE B	BC %Loading	TC %Loading	Outaged Branch That Caused Overload	ATC	Comments	Cost
05SP	AEPW-AEPW	CHEROKEE REC TO TATUM, 138KV 53611 TATUM 4 138 to 53522 CHEROKE4 138 CKT 1	209	110.0	117.8	Multiple Outage Contingency SOUTHWEST SHREVEPORT TO LONGWOOD, 345KV 53454 SW SHV 7 345 to 53424 LONGWD 7 345 CKT 1 SOUTHWEST SHREVEPORT TO DIANA, 345KV 53454 SW SHV 7 345 to 53528 DIANA 7 345 CKT 1	0	See Previous	\$ -
05SP	AEPW-AEPW	TATUM TO ROCKHILL, 138KV 53611 TATUM 4 138 to 53598 ROKHILL4 138 CKT 1	209	108.2	116.0	Multiple Outage Contingency SOUTHWEST SHREVEPORT TO LONGWOOD, 345KV 53454 SW SHV 7 345 to 53424 LONGWD 7 345 CKT 1 SOUTHWEST SHREVEPORT TO DIANA, 345KV 53454 SW SHV 7 345 to 53528 DIANA 7 345 CKT 1	0	See Previous & Reconductor other 5.76 miles of 795 ACSR with 1272 ACSR. Reset CTs and relay settings @ Rock Hill	\$ 1,800,000
05SP	AEPW-AEPW	LONGWOOD TO NORAM, 138KV 53423 LONGWD 4 138 to 53473 NORAM 4 138 CKT 1	234	102.6	107.9	Multiple Outage Contingency SOUTHWEST SHREVEPORT TO LONGWOOD, 345KV 53454 SW SHV 7 345 to 53424 LONGWD 7 345 CKT 1 SOUTHWEST SHREVEPORT TO DIANA, 345KV 53454 SW SHV 7 345 to 53528 DIANA 7 345 CKT 1	0	See Previous	\$ -
05SP	AEPW-AEPW	NORAM TO RAINES, 138KV 53473 NORAM 4 138 to 53439 RAINES 4 138 CKT 1	234	101.3	106.7	Multiple Outage Contingency SOUTHWEST SHREVEPORT TO LONGWOOD, 345KV 53454 SW SHV 7 345 to 53424 LONGWD 7 345 CKT 1 SOUTHWEST SHREVEPORT TO DIANA, 345KV 53454 SW SHV 7 345 to 53528 DIANA 7 345 CKT 1	0	See Previous	\$ -
05SP	SPRM-SPRM	CLAY TO LOGAN, 161KV 97161 5LOGAN 161 to 59970 CLAY 5 161 CKT 1	185	99.6	113.7	Multiple Outage Contingency FRANKS TO HUBEN, 345KV 96041 7FRANKS 345 to 96042 7HUBEN 345 CKT1 HUBEN TO MORGAN, 345KV 96042 7HUBEN 345 to 96045 7MORGAN 345 CKT1	18	Replace transmission line structures to allow operation at 100C	\$ 250,000

**Table 1 - continued** – Facility Overloads Caused by AEPW to EES 620MW Transfer from 4/1/2003 to 4/1/2013

Study Year	From Area - To Area	Branch Over 100% RateB	RATE B	BC %Loading	TC %Loading	Outaged Branch That Caused Overload	ATC	Comments	Cost
05SP	EMDE-EMDE	<b>ORONOGO JCT. TO JOPLIN OAKLAND NORTH, 161KV</b> 59467 ORO110 5 161 to 59494 OAK432 5 161 CKT 1	214	99.6	102.9	<b>TIPTON FORD TO JOPLIN SOUTHWEST, 161KV</b> 59472 TIP292 5 161 to 59483 JOP389 5 161 CKT1	77	See Previous	\$ -
05SP	AEPW-AEPW	<b>IPC JEFFERSON TO LIEBERMAN, 138KV</b> 53548 IPCJEFF4 138 to 53420 LIEBERM4 138 CKT 1	136	97.4	110.1	<b>LONGWOOD TO WILKES, 345KV</b> 53424 LONGWD 7 345 to 53620 WILKES 7 345 CKT1	127	See Previous	\$ -
05SP	AEPW-AEPW	<b>FARMINGTON AECC TO CHAMBER SPRINGS, 161KV</b> 53195 FARMGTN5 161 to 53154 CHAMSPR5 161 CKT 1	335	99.7	100.9	<b>DYESS TO SOUTH SPRINGDALE, 161KV</b> 53131 DYESS 5 161 to 53159 SOSPRDL5 161 CKT1	145	Replace Switch	\$ 60,000
05SP	AEPW-AEPW	<b>CHAMBER SPRINGS TO TONTITOWN, 161KV</b> 53154 CHAMSPR5 161 to 53170 TONTITN5 161 CKT 1	244	98.8	103.7	<b>FLINT CREEK TO GRDA, 345KV</b> 53140 FLINTCR7 345 to 54450 GRDA1 7 345 CKT1	151	Rebuild 12 miles with 2156ACSR	\$ 7,200,000
05SP	OKGE-OKGE	<b>PECAN CREEK 345/161KV TRANSFORMER</b> 55235 PECANCK7 345 to 55234 PECANCK5 161 CKT 1	369	96.9	108.8	<b>MUSKOGEE TO FORT SMITH, 345KV</b> 55224 MUSKOGEE7 345 to 55302 FTSMITH7 345 CKT1	163	See Previous	\$ -
05SP	OKGE-OKGE	<b>FACTORY TO 3RD ST, 69KV</b> 55292 FACTORY269.0 to 55307 3RDST 269.0 CKT 1	96	99.9	100.3	<b>VAN BUREN AVEC TO VBI, 69KV</b> 55298 VBAVEC 269.0 to 55336 VBI 269.0 CKT1	191	Replace 800A Trap & Increase CT Ratio to 1200-5A.	\$ 30,000
05SP	AEPW-AEPW	<b>MARSHALL TO NORTH MARSHALL, 69KV</b> 53570 MARSHAL269.0 to 53579 NMARSHL269.0 CKT 1	72	97.6	102.3	<b>Multiple Outage Contingency</b> <b>SOUTHWEST SHREVEPORT TO LONGWOOD, 345KV</b> 53454 SW SHV 7 345 to 53424 LONGWD 7 345 CKT 1 <b>SOUTHWEST SHREVEPORT TO DIANA, 345KV</b> 53454 SW SHV 7 345 to 53528 DIANA 7 345 CKT 1	316	Replace 350 CU bus & jumpers @ North Marshall	\$ 23,356
05SP	AEPW-WFEC	<b>SOUTHWEST STATION TO ANADARKO, 138KV</b> 54140 S.W.S.-4 138 to 55814 ANADARK4 138 CKT 1	203	99.3	100.6	<b>CORNVILLE TO NORTH 29TH CHICKASHA, 138KV</b> 54112 CORNVIL4 138 to 54165 N29CHIC4 138 CKT1	336	Replace bus, jumpers, switches, supports and foundations at Anadarko Switch Station	\$ 450,000
05SP	AEPW-AEPW	<b>MARSHALL TO NORTH MARSHALL, 69KV</b> 53570 MARSHAL269.0 to 53579 NMARSHL269.0 CKT 1	72	97.0	101.5	<b>LONGWOOD TO WILKES, 345KV</b> 53424 LONGWD 7 345 to 53620 WILKES 7 345 CKT1	412	See Previous	\$ -
05SP	WERE-WERE	<b>GILL ENERGY CENTER EAST TO OATVILLE, 69KV</b> 57795 GILL E 269.0 to 57825 OATVILL269.0 CKT 1	72	99.7	100.1	<b>HOOVER SOUTH TO SHERIDEN, 69KV</b> 57806 HOOVERS269.0 to 57841 SHERIDN269.0 CKT1	443	Replace disconnect switches at Gill 69 kV (use 800 A.), Replace line switch at Oatville 69 kV (use 800 A.)	\$ 45,000
05SP	AEPW-AEPW	<b>TONTITOWN TO FLINT CREEK, 161KV</b> 53170 TONTITN5 161 to 53139 FLINTCR5 161 CKT 1	312	99.6	100.1	<b>EAST CENTERTON TO BENTONVILLE J STREET, 161KV</b> 53133 ECNTRTN5 161 to 53185 BENTVJ_5 161 CKT1	498	No Upgrade Required As Assigned Upgrades for 620 MW Relieves Facility	\$ -

**Table 1 - continued** – Facility Overloads Caused by AEPW to EES 620MW Transfer from 4/1/2003 to 4/1/2013

Study Year	From Area - To Area	Branch Over 100% RateB	RATE B	BC %Loading	TC %Loading	Outaged Branch That Caused Overload	ATC	Comments	Cost
05SP	SPRM-AECI	<b>LOGAN TO CLAY, 161KV</b> 59970 CLAY 5 161 to 97161 5LOGAN 161 CKT 1	185	86.6	103.1	<b>HUBEN TO MORGAN, 345KV</b> 96042 7HUBEN 345 to 96045 7MORGAN 345 CKT1	504	See Previous	\$ -
05SP	AEPW-AEPW	<b>NORTH MARSHALL TO WOODLAWN, 69KV</b> 53579 NMARSHL269.0 to 53621 WOODLWN269.0 CKT 1	51	94.7	101.1	<b>Multiple Outage Contingency</b> <b>SOUTHWEST SHREVEPORT TO LONGWOOD, 345KV</b> 53454 SW SHV 7 345 to 53424 LONGWD 7 345 CKT 1 <b>SOUTHWEST SHREVEPORT TO DIANA, 345KV</b> 53454 SW SHV 7 345 to 53528 DIANA 7 345 CKT 1	511	No Upgrade Required As Assigned Upgrades for 620 MW Relieves Facility	\$ -
05SP	AEPW-WFEC	<b>SOUTHWEST STATION TO ANADARKO, 138KV</b> 54140 S.W.S.-4 138 to 55814 ANADARK4 138 CKT 1	203	98.4	100.3	<b>CORNVILLE TO CORN TAP, 138KV</b> 54112 CORNVIL4 138 to 55867 CORN TP4 138 CKT1	526	See Previous	\$ -
05SP	AEPW-AEPW	<b>GENTRY REC TO FLINT CREEK, 161KV</b> 53187 GENTRYR5 161 to 53139 FLINTCR5 161 CKT 1	353	98.5	100.2	<b>CHAMBER SPRINGS TO FARMINGTON AECC, 161KV</b> 53154 CHAMSPR5 161 to 53195 FARMGTN5 161 CKT1	534	No Upgrade Required As Assigned Upgrades for 620 MW Relieves Facility	\$ -
05SP	AEPW-AEPW	<b>CHAMBER SPRINGS TO TONTITOWN, 161KV</b> 53154 CHAMSPR5 161 to 53170 TONTITN5 161 CKT 1	244	95.8	100.4	<b>HYLAND TO EAST FAYETTEVILLE REC, 161KV</b> 53143 HYLAND 5 161 to 53193 EFAYTVL5 161 CKT1	563	See Previous	\$ -
05SP	GRRD-GRRD	<b>AFTON 161/69KV TRANSFORMER</b> 54432 AFTON 5 161 to 54433 AFTON 269.0 CKT 1	50	96.9	100.1	<b>MIAMI TO AFTON, 161KV</b> 54431 MIAMI 5 161 to 54432 AFTON 5 161 CKT1	603	No Upgrade Required As Assigned Upgrades for 620 MW Relieves Facility	\$ -
05SP	EMDE-EMDE	<b>AURORA H.T. 161/69/12.5KV TRANSFORMER</b> 59537* AUR124 269.0 544 WND 2 AURORA3 3	41.7	99.1	100.3	<b>MONETT 161/69/12.5KV TRANSFORMER</b> 59480 MON383 5161 to 59591 MON383 269.0 to 59712 MON383 112.5	620	Replace 3 transformers with one 150MVA unit at EDE expense by 6/1/2003.	\$ -
05SP	EMDE-EMDE	<b>AURORA H.T. 161/69/12.5KV TRANSFORMER</b> 59468* AUR124 5 161 544 WND 1 AURORA3 3	41.7	100.1	101.0	<b>MONETT 161/69/12.5KV TRANSFORMER</b> 59480 MON383 5161 to 59591 MON383 269.0 to 59712 MON383 112.5	620	"	\$ -
05SP	AEPW-AEPW	<b>CHAMBER SPRINGS TO DYESS, 161KV</b> 53131 DYESS 5 161 to 53154 CHAMSPR5 161 CKT 1	247	98.8	102.2	<b>GENTRY REC TO FLINT CREEK, 161KV</b> 53139 FLINTCR5 161 to 53187 GENTRYR5 161 CKT1	620	Relieved by AEP Tontitown Project - Estimated In-Service Date 6/1/2004	\$ -
05SP	WERE-WERE	<b>COUNTY LINE 115/69/34/5KV TRANSFORMER</b> 57456* COLINE 269.0 536 WND 2 COLINE5X 1	66	99.3	101.0	<b>HOYT TO STRANGER,345KV</b> 56765 HOYT 7345 to 56772 STRANGR7345 CKT1	620	Westar Transmission Operating Directive 803	\$ -
05SP	WERE-WERE	<b>CRESWELL TO OAK, 69KV</b> 57543 CRESWLN269.0 to 57547 OAK 269.0 CKT 1	90	101.2	102.9	<b>CRESWELL TO PARIS, 69KV</b> 57543 CRESWLN269.0 to 57548 PARIS 269.0 CKT1	620	Previous upgrade assignment of "Replacement of jumpers and resetting CTs and relaying" to KMEA in SPP-2000-004	\$ -

**Table 1 - continued** – Facility Overloads Caused by AEPW to EES 620MW Transfer from 4/1/2003 to 4/1/2013

Study Year	From Area - To Area	Branch Over 100% RateB	RATE B	BC %Loading	TC %Loading	Outaged Branch That Caused Overload	ATC	Comments	Cost
05SP	OKGE-OKGE	DRAPER 345/138KV TRANSFORMER 2 54934 DRAPER 7 345 to 54933 DRAPER 4 138 CKT 2	493	104.0	109.1	DRAPER 345/138KV TRANSFORMER 1 54934 DRAPER 7 345 to 54933 DRAPER 4 138 CKT1	620	Flowgate: OKGE Mitigation Plan to Increase Rating to 591 MVA by 2004	\$ -
05SP	OKGE-OKGE	DRAPER 345/138KV TRANSFORMER 1 54934 DRAPER 7 345 to 54933 DRAPER 4 138 CKT 1	493	104.0	109.1	DRAPER 345/138KV TRANSFORMER 2 54933 DRAPER 4 138 to 54934 DRAPER 7 345 CKT2	620	"	\$ -
05SP	AEPW-AEPW	DYESS TO CHAMBER SPRINGS, 161KV 53131 DYESS 5 161 to 53154 CHAMSPR5 161 CKT 1	247	98.0	101.3	EAST CENTERTON TO GENTRY REC, 161KV 53133 ECNTRTN5 161 to 53187 GENTRYR5 161 CKT1	620	Relieved by AEP Tontitown Project - Estimated In-Service Date 6/1/2004	\$ -
05SP	AEPW-AEPW	DYESS TO EAST ROGERS, 161KV 53131 DYESS 5 161 to 53135 EROGERS5 161 CKT 1	244	111.2	116.1	GENTRY REC TO FLINT CREEK, 161KV 53139 FLINTCR5 161 to 53187 GENTRYR5 161 CKT1	620	Relieved by AEP Tontitown Project - Estimated In-Service Date 6/1/2004	\$ -
05SP	AEPW-AEPW	DYESS TO EAST ROGERS, 161KV 53131 DYESS 5 161 to 53135 EROGERS5 161 CKT 1	244	108.9	113.6	EAST CENTERTON TO GENTRY REC, 161KV 53133 ECNTRTN5 161 to 53187 GENTRYR5 161 CKT1	620	"	\$ -
05SP	AEPW-AEPW	EAST CENTERTON TO GENTRY REC, 161KV 53133 ECNTRTN5 161 to 53187 GENTRYR5 161 CKT 1	353	97.9	100.1	CHAMBER SPRINGS ROAD 345/161KV 53154 CHAMSPR5 161 to 53155 CHAMSPR7 345 CKT1	620	Relieved by AEP Tontitown Project - Estimated In-Service Date 6/1/2004	\$ -
05SP	AEPW-AEPW	EAST CENTERTON TO GENTRY REC, 161KV 53133 ECNTRTN5 161 to 53187 GENTRYR5 161 CKT 1	353	98.4	100.6	DELAWARE TO NEOSHO, 345KV 53929 DELWARE7 345 to 53955 N.E.S.-7 345 CKT1	620	"	\$ -
05SP	AEPW-AEPW	EAST CENTERTON TO GENTRY REC, 161KV 53133 ECNTRTN5 161 to 53187 GENTRYR5 161 CKT 1	353	99.8	101.9	FLINT CREEK TO DECATUR SOUTH, 161KV 53139 FLINTCR5 161 to 59484 DEC392 5 161 CKT1	620	"	\$ -
05SP	AEPW-AEPW	EAST CENTERTON TO GENTRY REC, 161KV 53133 ECNTRTN5 161 to 53187 GENTRYR5 161 CKT 1	353	98.8	101.0	ROGERS TO LOWELL REC, 161KV 53152 ROGERS 269.0 to 53200 LOWELLR269.0 CKT1	620	"	\$ -
05SP	AEPW-AEPW	EAST CENTERTON TO GENTRY REC, 161KV 53133 ECNTRTN5 161 to 53187 GENTRYR5 161 CKT 1	353	98.8	101.0	LOWELL TO LOWELLR, 69KV 53144 LOWELL 269.0 to 53200 LOWELLR269.0 CKT1	620	"	\$ -
05SP	AEPW-AEPW	GENTRY REC TO FLINT CREEK, 161KV 53187 GENTRYR5 161 to 53139 FLINTCR5 161 CKT 1	353	99.9	101.7	BULL SHOALS TO BULLSH, 161KV 52660 BULL SH5 161 to 99802 5BULLSH* 161 CKT1	620	Relieved by AEP Tontitown Project - Estimated In-Service Date 6/1/2004	\$ -
05SP	AEPW-AEPW	GENTRY REC TO FLINT CREEK, 161KV 53187 GENTRYR5 161 to 53139 FLINTCR5 161 CKT 1	353	100.0	102.0	SILOAM SPRINGS 161/69KV TRANSFORMER 53158 SILOAM 5 161 to 53204 SILOAM 269.0 CKT1	620	"	\$ -

**Table 1 - continued** – Facility Overloads Caused by AEPW to EES 620MW Transfer from 4/1/2003 to 4/1/2013

Study Year	From Area - To Area	Branch Over 100% RateB	RATE B	BC %Loading	TC %Loading	Outaged Branch That Caused Overload	ATC	Comments	Cost
05SP	AEPW-AEPW	GENTRY REC TO FLINT CREEK, 161KV 53187 GENTRYR5 161 to 53139 FLINTCR5 161 CKT 1	353	99.8	101.5	BULL SH TO FLIPN, 161KV 99802 5BULLSH* 161 to 99809 5FLIPN 161 CKT1	620	"	\$ -
05SP	AEPW-AEPW	GENTRY REC TO FLINT CREEK, 161KV 53187 GENTRYR5 161 to 53139 FLINTCR5 161 CKT 1	353	99.6	101.6	HYLAND TO EAST FAYETTEVILLE, 161KV 53143 HYLAND 5 161 to 53193 EFAYTVL5 161 CKT1	620	"	\$ -
05SP	AEPW-AEPW	GENTRY REC TO FLINT CREEK, 161KV 53187 GENTRYR5 161 to 53139 FLINTCR5 161 CKT 1	353	99.6	101.6	TIPTON FORD TO JOPLIN SOUTHWEST, 161KV 59472 TIP292 5 161 to 59483 JOP389 5 161 CKT1	620	"	\$ -
05SP	SWPA-AECI	CARTHAGE TO REEDS SPRING, 69KV 52690 CARTHG 269.0 to 96751 2REEDS 69.0 CKT 1	36	119.6	125.4	AURORA TO MONETT, 161KV 59468 AUR124 5 161 to 59480 MON383 5 161 CKT1	N/A	Third Party Facility	\$ -
05SP	EES-SWPA	MIDWAY TO BULL SHOALS, 161KV 99825 5MIDWAY# 161 to 52660 BULL SH5 161 CKT 1	162	113.1	124.1	BUFORD TAP TO BULL SHOALS, 161KV 52661 BUFRDTP5 161 to 52660 BULL SH5 161 CKT1	N/A	See Previous	\$ -
05SP	AEPW-AEPW	JACKSONVILLE TO OVERTON, 138KV 53549 JACKSNV4 138 to 53588 OVERTON4 138 CKT 1	235	97.0	104.5	CROCKETT TO TENASKA RUSK COUNTY 53526 CROCKET7 345 to 53637 TENRUSK7 345 CKT1	N/A	Third Party Facility	\$ -
05SP	SWPA-AECI	CARTHAGE TO JASPER, 69KV 52690 CARTHG 269.0 to 96649 2JASPER 69.0 CKT 1	47	98.0	100.8	ARCHIE TO ADRIAN, 161KV 59207 ARCHIE 5 161 to 59240 ADRIAN 5 161 CKT1	N/A	Third Party Facility	\$ -
05WP	SPRM-SPRM	LOGAN TO CLAY, 161KV 97161 5LOGAN 161 to 59970 CLAY 5 161 CKT 1	232	98.4	109.3	Multiple Outage Contingency FRANKS TO HUBEN, 345KV 96041 7FRANKS 345 to 96042 7HUBEN 345 CKT1 HUBEN TO MORGAN, 345KV 96042 7HUBEN 345 to 96045 7MORGAN 345 CKT1	91	See Previous	\$ -
05WP	SPRM-SPRM	CLAY TO SPRINGFIELD, 161KV 59970 CLAY 5 161 to 52692 SPRGFLD5 161 CKT 1	167	98.7	106.3	Multiple Outage Contingency FRANKS TO HUBEN, 345KV 96041 7FRANKS 345 to 96042 7HUBEN 345 CKT1 HUBEN TO MORGAN, 345KV 96042 7HUBEN 345 to 96045 7MORGAN 345 CKT1	106	Replace disconnect switches at Springfield	\$ 200,000



**Table 1 - continued** – Facility Overloads Caused by AEPW to EES 620MW Transfer from 4/1/2003 to 4/1/2013

Study Year	From Area - To Area	Branch Over 100% RateB	RATE B	BC %Loading	TC %Loading	Outaged Branch That Caused Overload	ATC	Comments	Cost
05WP	SWPA-SWPA	SPRINGFIELD 161/69KV TRANSFORMER 3 52692 SPRGFLD5 161 to 52694 SPRGFLD269.0 CKT 3	25	94.5	104.7	SPRINGFIELD 161/69KV TRANSFORMER 1 52692 SPRGFLD5 161 to 52694 SPRGFLD269.0 CKT1	336	Replace 25MVA transformer #3 with 80MVA transformer	\$ 1,300,000
05WP	OKGE-OKGE	PECAN CREEK 345/161KV TRANSFORMER 55235 PECANCK7 345 to 55234 PECANCK5 161 CKT 1	369	91.7	103.6	MUSKOGEE TO FORT SMITH, 345KV 55224 MUSKOGEE7 345 to 55302 FTSMITH7 345 CKT1	433	See Previous	\$ -
05WP	AECI-SPRM	LOGAN TO CLAY, 161KV 97161 5LOGAN 161 to 59970 CLAY 5 161 CKT 1	232	89.4	102.1	HUBEN TO MORGAN, 345KV 96042 7HUBEN 345 to 96045 7MORGAN 345 CKT1	519	See Previous	\$ -
05WP	SPRM-SWPA	CLAY TO SPRINGFIELD, 161KV 59970 CLAY 5 161 to 52692 SPRGFLD5 161 CKT 1	167	91.3	100.9	HUBEN TO MORGAN, 345KV 96042 7HUBEN 345 to 96045 7MORGAN 345 CKT1	564	See Previous	\$ -
05WP	AEPW-AEPW	SOUTH SHREVEPORT TO WALLACE LAKE, 138KV 53446 S SHV 4 138 to 53461 WALLAKE4 138 CKT 1	210	91.7	105.2	DOLET HILLS 345/230KV TRANSFORMER 50045 DOLHILL7 345 to 50046 DOLHILL6 230 CKT1	620	Dolet Hills Operating Guide Monitor Line at 260 MVA	\$ -
05WP	SWPA-AECI	CARTHAGE TO REEDS SPRING, 69KV 52690 CARTHG 269.0 to 96751 2REEDS 69.0 CKT 1	43	103.6	108.4	AURORA TO MONETT, 161KV 59468 AUR124 5 161 to 59480 MON383 5 161 CKT1	N/A	Third Party Facility	\$ -
08SP	OKGE-OKGE	PECAN CREEK 345/161KV TRANSFORMER 55235 PECANCK7 345 to 55234 PECANCK5 161 CKT 1	369	109.6	121.1	MUSKOGEE TO FORT SMITH, 345KV 55224 MUSKOGEE7 345 to 55302 FTSMITH7 345 CKT1	0	See Previous	\$ -
08SP	AEPW-AEPW	MARSHALL TO NORTH MARSHALL, 69KV 53570 MARSHAL269.0 to 53579 NMARSHL269.0 CKT 1	72	101.1	106.1	Multiple Outage Contingency SOUTHWEST SHREVEPORT TO LONGWOOD, 345KV 53454 SW SHV 7 345 to 53424 LONGWD 7 345 CKT 1 SOUTHWEST SHREVEPORT TO DIANA, 345KV 53454 SW SHV 7 345 to 53528 DIANA 7 345 CKT 1	0	See Previous	\$ -
08SP	WERE-WERE	GILL ENERGY CENTER EAST TO MACARTHUR, 69KV 57795 GILL E 269.0 to 57813 MACARTH269.0 CKT 1	68	106.7	107.0	MACARTHUR TO OATVILLE, 69KV 57813 MACARTH269.0 to 57825 OATVILL269.0 CKT1	0	Replace sub bus and jumpers at MacArthur 69 kV	\$ 22,000
08SP	AEPW-AEPW	PITTSBURG TO LONE STAR SOUTH, 138KV 53311 PITTSB_4 138 to 53276 LSSOUTH4 138 CKT 1	197	115.0	115.8	PETTY TO CHAPEL HILL REC, 138KV 53308 PETTY 4 138 to 53521 CHAPELH4 138 CKT1	0	See Previous	\$ -

**Table 1 - continued** – Facility Overloads Caused by AEPW to EES 620MW Transfer from 4/1/2003 to 4/1/2013

Study Year	From Area - To Area	Branch Over 100% RateB	RATE B	BC %Loading	TC %Loading	Outaged Branch That Caused Overload	ATC	Comments	Cost
08SP	WFEC-SWPA	PHAROAH TO WELEETKA, 138KV 56026 PHAROAH4 138 to 52792 WELEETK4 138 CKT 1	191	103.2	104.7	FRANKLIN TO FRANKLIN SWITCH, 138KV 55913 FRANKLN4 138 to 55917 FRNKLNS4 138 CKT1	0	Replace wavetrap at Weleetka and replace jumpers	\$ 75,000
08SP	SWPA-SWPA	SPRINGFIELD 161/69KV TRANSFORMER 1 52692 SPRGFLD5 161 to 52694 SPRGFLD269.0 CKT 1	80	100.5	101.9	NICHOLS 161/69KV TRANSFORMER 59925 NICHOLS269.0 to 59956 NICHOLS5 161 CKT1	0	No Upgrade Required As Springfield 161/69kV Transformer #3 Replacement Relieves Facility	\$ -
08SP	WFEC-WFEC	CYRIL TO ANADARKO, 69KV 55870 CYRIL 269.0 to 55810 ANADARK269.0 CKT 1	61	100.0	100.3	ANADARKO TO GEORGIA, 138KV 55814 ANADARK4 138 to 55923 GEORGIA4 138 CKT1	0	Expedite new Payne Sw. Station with a 70MVA autotransformer scheduled for 2010. This alternative includes expediting WFEC Lindsey - Lindsey Sw. 69kVs upgrade.	\$ -
08SP	KACP-KACP	LA CYGNE TO STILWELL, 345KV 57968 STILWEL7 345 to 57981 LACYGNE7 345 CKT 1	1251	103.3	106.5	WEST GARDNER TO LA CYGNE, 345KV 57965 W.GRDNR7 345 to 57981 LACYGNE7 345 CKT1	0	See Previous	\$ -
08SP	GRRD-GRRD	KERR TO 412SUB, 161KV 54435 KERR GR5 161 to 54437 412SUB 5 161 CKT 1	338	103.0	106.4	FLINT CREEK TO GRDA1, 345KV 53140 FLINTCR7 345 to 54450 GRDA1 7 345 CKT1	0	Reconductor 12.5 miles with 1590MCM ACSR	\$ 1,918,000
08SP	GRRD-GRRD	412SUB TO KANSAS TAP, 161KV 54437 412SUB 5 161 to 54514 KANSATP5 161 CKT 1	338	102.2	105.7	FLINT CREEK TO GRDA1, 345KV 53140 FLINTCR7 345 to 54450 GRDA1 7 345 CKT1	0	Reconductor 9.7 miles with 1590MCM ACSR	\$ 1,488,000
08SP	AEPW-AEPW	HALLSVILLE TO LONGVIEW HEIGHTS, 69KV 53541 HALLSVL269.0 to 53567 LONGVHT269.0 CKT 1	48	101.2	103.1	MARSHALL TO MARSHALL AUTO, 69KV 53570 MARSHAL269.0 to 53623 MARAUTO269.0 CKT1	0	Rebuild 7.07 miles of 4/0 ACSR with 795 ACSR	\$ 3,000,000
08SP	AEPW-AEPW	MARSHALL TO NORTH MARSHALL, 69KV 53570 MARSHAL269.0 to 53579 NMARSHL269.0 CKT 1	72	101.0	103.1	FLOURNOY 138/69KV TRANSFORMER 53404 FLOURNY269.0 to 53405 FLOURNY4 138 CKT1	0	See Previous	\$ -
08SP	SWPA-SWPA	SPRINGFIELD 161/69KV TRANSFORMER 1 52692 SPRGFLD5 161 to 52694 SPRGFLD269.0 CKT 1	80	100.6	102.6	PLAINVIEW TO COX, 69KV 59905 PLAINV1269.0 to 59910 COX 269.0 CKT1	0	No Upgrade Required As Springfield 161/69kV Transformer #3 Replacement Relieves Facility	\$ -
08SP	EMDE-EMDE	ORONOGO JCT. TO JOPLIN OAKLAND NORTH, 161KV 59467 ORO110 5 161 to 59494 OAK432 5 161 CKT 1	214	100.5	103.7	TIPTON FORD TO JOPLIN SOUTHWEST, 161KV 59472 TIP292 5 161 to 59483 JOP389 5 161 CKT1	0	See Previous	\$ -
08SP	AEPW-AEPW	BROKEN ARROW NORTH TO ONETA, 138KV 53798 BA.N-ST4 138 to 53818 ONETA--4 138 CKT 1	235	100.6	106.9	CHAMBER SPRINGS ROAD 345/161KV 53154 CHAMSPR5 161 to 53155 CHAMSPR7 345 CKT1	0	Rebuild 4.31 miles of 795 ACSR with 1590 ACSR	\$ 2,370,500
08SP	AEPW-AEPW	BROKEN ARROW NORTH TO ONETA, 138KV 53798 BA.N-ST4 138 to 53818 ONETA--4 138 CKT 1	235	100.6	106.9	CHAMBER SPRINGS TO CLARKSVILLE, 345KV 53155 CHAMSPR7 345 to 53756 CLARKSV7 345 CKT1	0	See Previous	\$ -

**Table 1 - continued** – Facility Overloads Caused by AEPW to EES 620MW Transfer from 4/1/2003 to 4/1/2013

Study Year	From Area - To Area	Branch Over 100% RateB	RATE B	BC %Loading	TC %Loading	Outaged Branch That Caused Overload	ATC	Comments	Cost
08SP	AEPW-EES	FULTON TO PATMOS, 115KV 53374 FULTON 3 115 to 99303 3PATMOS# 115 CKT 1	174	123.8	147.5	LONGWOOD TO ELDEHV, 345KV 53424 LONGWD 7 345 to 99294 7ELDEHV 345 CKT1	0	Recond. 7.1 miles with 1590 ACSR	\$ 2,300,000
08SP	AEPW-EES	FULTON TO PATMOS, 115KV 53374 FULTON 3 115 to 99303 3PATMOS# 115 CKT 1	174	123.8	147.3	ELDEHV 500/345KV TRANSFORMER 99294 7ELDEHV 345 to 99295 8ELDEHV 500 CKT1	0	See Previous	\$ -
08SP	AEPW-AEPW	IPC JEFFERSON TO LIEBERMAN, 138KV 53548 IPCJEFF4 138 to 53420 LIEBERM4 138 CKT 1	136	102.7	115.1	LONGWOOD TO WILKES, 345KV 53620 WILKES 7 345 to 53424 LONGWD 7 345 CKT1	0	See Previous	\$ -
08SP	KACP-KACP	LA CYGNE TO STILWELL, 345KV 57981 LACYGNE7 345 to 57968 STILWEL7 345 CKT 1	1251	103.3	106.5	WEST GARDNER TO LA CYGNE, 345KV 57981 LACYGNE7 345 to 57965 W.GRDNR7 345 CKT1	0	See Previous	\$ -
08SP	WERE-WERE	HOYT HTI SW. JCT. TO CIRCLEVILLE, 115KV 57165 HTI JCT3 115 to 57152 CIRCLVL3 115 CKT 1	92	101.3	104.0	IATAN TO ST JOE, 345KV 57982 IATAN 7 345 to 59199 ST JOE 3 345 CKT1	0	Replace 82 structures	\$ 742,000
08SP	AEPW-AEPW	CHEROKEE REC TO KNOX LEE, 138KV 53522 CHEROKE4 138 to 53557 KNOXLEE4 138 CKT 1	209	119.6	127.5	Multiple Outage Contingency SOUTHWEST SHREVEPORT TO LONGWOOD, 345KV 53454 SW SHV 7 345 to 53424 LONGWD 7 345 CKT 1 SOUTHWEST SHREVEPORT TO DIANA, 345KV 53454 SW SHV 7 345 to 53528 DIANA 7 345 CKT 1	0	See Previous	\$ -
08SP	AEPW-AEPW	CHEROKEE REC TO TATUM, 138KV 53611 TATUM 4 138 to 53522 CHEROKE4 138 CKT 1	209	113.0	120.9	Multiple Outage Contingency SOUTHWEST SHREVEPORT TO LONGWOOD, 345KV 53454 SW SHV 7 345 to 53424 LONGWD 7 345 CKT 1 SOUTHWEST SHREVEPORT TO DIANA, 345KV 53454 SW SHV 7 345 to 53528 DIANA 7 345 CKT 1	0	See Previous	\$ -
08SP	AEPW-AEPW	TATUM TO ROCKHILL, 138KV 53611 TATUM 4 138 to 53598 ROKHILL4 138 CKT 1	209	111.1	119.0	Multiple Outage Contingency SOUTHWEST SHREVEPORT TO LONGWOOD, 345KV 53454 SW SHV 7 345 to 53424 LONGWD 7 345 CKT 1 SOUTHWEST SHREVEPORT TO DIANA, 345KV 53454 SW SHV 7 345 to 53528 DIANA 7 345 CKT 1	0	See Previous	\$ -

**Table 1 - continued** – Facility Overloads Caused by AEPW to EES 620MW Transfer from 4/1/2003 to 4/1/2013

Study Year	From Area - To Area	Branch Over 100% RateB	RATE B	BC %Loading	TC %Loading	Outaged Branch That Caused Overload	ATC	Comments	Cost
08SP	AEPW-AEPW	LONGWOOD TO NORAM, 138KV 53423 LONGWD 4 138 to 53473 NORAM 4 138 CKT 1	234	111.2	116.7	Multiple Outage Contingency SOUTHWEST SHREVEPORT TO LONGWOOD, 345KV 53454 SW SHV 7 345 to 53424 LONGWD 7 345 CKT 1 SOUTHWEST SHREVEPORT TO DIANA, 345KV 53454 SW SHV 7 345 to 53528 DIANA 7 345 CKT 1	0	See Previous	\$ -
08SP	AEPW-AEPW	NORAM TO RAINES, 138KV 53473 NORAM 4 138 to 53439 RAINES 4 138 CKT 1	234	109.9	115.4	Multiple Outage Contingency SOUTHWEST SHREVEPORT TO LONGWOOD, 345KV 53454 SW SHV 7 345 to 53424 LONGWD 7 345 CKT 1 SOUTHWEST SHREVEPORT TO DIANA, 345KV 53454 SW SHV 7 345 to 53528 DIANA 7 345 CKT 1	0	See Previous	\$ -
08SP	SWPA-SWPA	SPRINGFIELD 161/69KV TRANSFORMER 3 52692 SPRGFLD5 161 to 52694 SPRGFLD269.0 CKT 3	25	100.0	103.4	JUNCTION TO BROOKLINE, 161KV 59955 JUNCTN 5 161 to 59969 BRKLINE 5 161 CKT1	0	See Previous	\$ -
08SP	AEPW-EES	FULTON TO PATMOS, 115KV 53374 FULTON 3 115 to 99303 3PATMOS# 115 CKT 1	174	99.6	118.3	SOUTH NASHVILLE TO MURFREESBORO, 138KV 53321 SNASHVL4 138 to 99389 4MURFRE 138 CKT1	14	See Previous	\$ -
08SP	AEPW-EES	FULTON TO PATMOS, 115KV 53374 FULTON 3 115 to 99303 3PATMOS# 115 CKT 1	174	99.6	118.3	MURFREESBORO 138/115KV TRANSFORMER 99387 3MURF-S 115 to 99389 4MURFRE 138 CKT1	15	See Previous	\$ -
08SP	AEPW-AEPW	MARSHALL TO NORTH MARSHALL, 69KV 53570 MARSHAL269.0 to 53579 NMARSHL269.0 CKT 1	72	99.8	104.3	LONGWOOD TO WILKES, 345KV 53424 LONGWD 7 345 to 53620 WILKES 7 345 CKT1	22	See Previous	\$ -
08SP	AEPW-EES	FULTON TO PATMOS, 115KV 53374 FULTON 3 115 to 99303 3PATMOS# 115 CKT 1	174	98.9	117.9	FORT SMITH 500/345KV TRANSFORMER 55302 FTSMITH7 345 to 55305 FTSMITH8 500 CKT1	37	See Previous	\$ -
08SP	SWPA-SWPA	SPRINGFIELD 161/69KV TRANSFORMER 3 52692 SPRGFLD5 161 to 52694 SPRGFLD269.0 CKT 3	25	99.7	103.7	JAMES RIVER TO TWIN OAK, 69KV 59904 JRPS 269.0 to 59933 TWINOAK269.0 CKT1	43	See Previous	\$ -

**Table 1 - continued** – Facility Overloads Caused by AEPW to EES 620MW Transfer from 4/1/2003 to 4/1/2013

Study Year	From Area - To Area	Branch Over 100% RateB	RATE B	BC %Loading	TC %Loading	Outaged Branch That Caused Overload	ATC	Comments	Cost
08SP	AEPW-AEPW	<b>RAINES TO ARSENAL HILL, 138KV</b> 53439 RAINES 4 138 to 53386 ARSHILL4 138 CKT 1	234	99.3	104.7	<b>Multiple Outage Contingency</b> <b>SOUTHWEST SHREVEPORT TO LONGWOOD, 345KV</b> 53454 SW SHV 7 345 to 53424 LONGWD 7 345 CKT 1 <b>SOUTHWEST SHREVEPORT TO DIANA, 345KV</b> 53454 SW SHV 7 345 to 53528 DIANA 7 345 CKT 1	83	Rebuild 5.32 miles 2-266MCM ACSR with 1590MCM ACSR	\$ 3,731,000
08SP	AEPW-AEPW	<b>CHAMBER SPRINGS 345/161KV TRANSFORMER</b> 53155 CHAMSPR7 345 to 53154 CHAMSPR5 161 CKT 1	660	98.6	103.7	<b>FLINT CREEK TO GRDA1, 345KV</b> 53140 FLINTCR7 345 to 54450 GRDA1 7 345 CKT1	167	Install 2nd 345/161 kV unit	\$ 4,000,000
08SP	EMDE-EMDE	<b>REINMILLER 161/69KV TRANSFORMER</b> 59500* RNM393 5 161 544 WND 1 REINMILL 1	75	99.7	100.8	<b>TIPTON FORD TO JOPLIN SOUTHWEST, 161KV</b> 59472 TIP292 5 161 TO 59483 JOP389 5 161 CKT 1	169	Replace with a 150 MVA unit	\$ 1,730,000
08SP	WFEC-OKGE	<b>FRANKLIN TO MIDWEST, 138KV</b> 55917 FRNKLNS4 138 to 54946 MIDWEST4 138 CKT 1	215	98.7	103.0	<b>SUNSHINE CANYON TO TUTTLE, 138KV</b> 56059 SUNSHIN4 138 to 56072 TUTTLE 4 138 CKT1	192	Replace 600A metering CTs with 1200A	\$ 55,000
08SP	AEPW-AEPW	<b>SOUTH TEXARKANA REC TO TEXARKANA PLANT, 69KV</b> 53189 STEXREC269.0 to 53329 TEXARK 269.0 CKT 1	59	98.5	103.3	<b>ATLANTA TO WEST ATLANTA, 69KV</b> 53248 ATLANTA269.0 to 53333 WATLANT269.0 CKT1	197	Rebuild 5.92 miles of 266 ACSR with 795 ACSR. Replace 4/0 CU jumpers @ Texarkana Plant	\$ 2,400,000
08SP	AEPW-AEPW	<b>OAK PAN-HARR REC TO LONGWOOD, 138KV</b> 53457 OAKPH 4 138 to 53423 LONGWD 4 138 CKT 1	209	97.4	105.0	<b>Multiple Outage Contingency</b> <b>SOUTHWEST SHREVEPORT TO LONGWOOD, 345KV</b> 53454 SW SHV 7 345 to 53424 LONGWD 7 345 CKT 1 <b>SOUTHWEST SHREVEPORT TO DIANA, 345KV</b> 53454 SW SHV 7 345 to 53528 DIANA 7 345 CKT 1	211	Rebuild 1.8 miles of 666 ACSR with 1590 ACSR	\$ 750,000
08SP	AEPW-AEPW	<b>CHAMBER SPRINGS TO TONTITOWN, 161KV</b> 53154 CHAMSPR5 161 to 53170 TONTITN5 161 CKT 1	244	98.5	102.4	<b>FAYETTEVILLE TO SOUTH FAYETTEVILLE, 161KV</b> 53138 FAYETVL5 161 to 53157 SFAYTVL5 161 CKT1	236	See Previous Note: Adding Second Chamber Springs 345/161kV Unit Reduces ATC Shown	
08SP	KACP-KACP	<b>STILWELL 345/161KV TRANSFORMER #1</b> 57968 STILWEL7 345 to 57969 STILWEL5 161 CKT 11	605	99.3	100.9	<b>STILWELL 345/161KV TRANSFORMER #2</b> 57968 STILWEL7 345 to 57969 STILWEL5 161 CKT22	265	Linn County Project Relieves Facility	\$ -
08SP	SPRM-AECI	<b>CLAY TO LOGAN, 161KV</b> 59970 CLAY 5 161 to 97161 5LOGAN 161 CKT 1	185	93.0	109.3	<b>HUBEN TO MORGAN, 345KV</b> 96042 7HUBEN 345 to 96045 7MORGAN 345 CKT1	267	See Previous	\$ -

**Table 1 - continued** – Facility Overloads Caused by AEPW to EES 620MW Transfer from 4/1/2003 to 4/1/2013

Study Year	From Area - To Area	Branch Over 100% RateB	RATE B	BC %Loading	TC %Loading	Outaged Branch That Caused Overload	ATC	Comments	Cost
08SP	OKGE-AEPW	BONANZA TAP TO BONANZA, 161KV 55261 BONANZT5 161 to 53126 BONANZA5 161 CKT 1	177	99.3	100.7	AES TO TARBY, 161KV 55262 AES 5 161 to 55264 TARBY 5 161 CKT1	305	Rebuild 0.06 miles of 397.5 ACSR with 795MCM ACSR	\$ 50,000
08SP	SWPA-SWPA	NORFORK TO BUFORD TAP, 161KV 52648 NORFORK5 161 to 52661 BUFDRTP5 161 CKT 1	189	95.4	104.7	MIDWAY TO BULL SHOALS, 161KV 52660 BULL SH5 161 to 99825 5MIDWAY# 161 CKT1	306	Resag conductor and replace structures as necessary	\$ 250,000
08SP	EMDE-EMDE	JOPLIN SOUTHWEST 161/69KV TRANSFORMER 59483* JOP389 5 161 544 WND 1 JOPLINSW 1	75	99.9	100.1	TIPTON FORD TO JOPLIN SOUTHWEST, 161KV 59472 TIP292 5 161 TO 59483 JOP389 5 161 CKT 1	310	No Upgrade Required As Reinmiller 161/69kV Transformer Replacement Relieves Facility	\$ -
08SP	AEPW-AEPW	CHAMBER SPRINGS TO TONTITOWN, 161KV 53154 CHAMSPR5 161 to 53170 TONTITN5 161 CKT 1	244	98.1	101.9	HYLAND TO SE FAYETTEVILLE, 161KV 53143 HYLAND 5 161 to 53153 SEFAYTV5 161 CKT1	312	See Previous Note: Adding Second Chamber Springs 345/161kV Unit Reduces ATC Shown	
08SP	AEPW-AEPW	MARSHALL TO NORTH MARSHALL, 69KV 53570 MARSHAL269.0 to 53579 NMARSHL269.0 CKT 1	72	97.7	102.0	CROCKETT TO GRIMES, 345KV 53526 CROCKET7 345 to 97513 7GRIMES 345 CKT1	333	See Previous	\$ -
08SP	AEPW-AEPW	NORTH MARSHALL TO WOODLAWN, 69KV 53579 NMARSHL269.0 to 53621 WOODLWN269.0 CKT 1	51	96.3	102.8	Multiple Outage Contingency SOUTHWEST SHREVEPORT TO LONGWOOD, 345KV 53454 SW SHV 7 345 to 53424 LONGWD 7 345 CKT 1 SOUTHWEST SHREVEPORT TO DIANA, 345KV 53454 SW SHV 7 345 to 53528 DIANA 7 345 CKT 1	351	No Upgrade Required As Assigned Upgrades for 620 MW Relieves Facility	\$ -
08SP	AEPW-WERE	SOUTH COFFEYVILLE TO DEARING, 138 KV 53972 COFFEYT4 138 to 57002 DEARING4 138 CKT 1	210	95.8	102.8	DELAWARE TO NEOSHO, 345KV 53929 DELWARE7 345 to 56793 NEOSHO 7 345 CKT1	373	Replace wave trap to increase rating to conductor rating (2000 A) by WR.	\$ 20,000
08SP	OKGE-OKGE	PECAN CREEK 345/161KV TRANSFORMER 55235 PECANCK7 345 to 55234 PECANCK5 161 CKT 1	369	96.0	102.6	CLARKSVILLE TO MUSKOGEE, 345KV 53756 CLARKSV7 345 to 55224 MUSKOGEE7 345 CKT1	374	See Previous	\$ -
08SP	AEPW-AEPW	OAK HILL TO KNOX LEE, 138KV 53586 OAK2HIL4 138 to 53557 KNOXLEE4 138 CKT 1	210	99.1	100.5	KILGORE REC TO LEVERETTS CHAPEL, 138KV 53555 KILGORRA 138 to 53560 LEVERET4 138 CKT1	393	Replace wavetrap @ Knoxlee	\$ 20,000
08SP	AEPW-AEPW	CHAMBER SPRINGS TO TONTITOWN, 161KV 53154 CHAMSPR5 161 to 53170 TONTITN5 161 CKT 1	244	97.0	100.8	FLINT CREEK TO GENTRY, 161KV 53139 FLINTCR5 161 to 53187 GENTRYR5 161 CKT1	489	See Previous Note: Adding Second Chamber Springs 345/161kV Unit Reduces ATC Shown	\$ -

**Table 1 - continued** – Facility Overloads Caused by AEPW to EES 620MW Transfer from 4/1/2003 to 4/1/2013

Study Year	From Area - To Area	Branch Over 100% RateB	RATE B	BC %Loading	TC %Loading	Outaged Branch That Caused Overload	ATC	Comments	Cost
08SP	SWPA-AEPW	BEAVER TO EUREKA SPRINGS, 161KV 52680 BEAVER 5 161 to 53136 EUREKA 5 161 CKT 1	274	91.9	102.1	MONETT TO BROOKLINE, 345KV 59481 MON383 7 345 to 59984 BRKLINE 7 345 CKT1	493	AEPW Reconductor 1.25 miles with 1590ACSR SWPA Reconnect CT's; Replace metering & reset relays	\$ 537,500
08SP	SWPA-AEPW	BEAVER TO EUREKA SPRINGS, 161KV 52680 BEAVER 5 161 to 53136 EUREKA 5 161 CKT 1	274	91.8	102.0	Multiple Outage Contingency MONETT TO BROOKLINE, 345KV 59481 MON383 7 345 to 59984 BRKLINE 7 345 CKT1 FLINT CREEK TO MONETT, 345KV 53140 FLINTCR7 345 to 59481 MON383 7 345 CKT1	496	See Previous	\$ -
08SP	SWPA-AEPW	BEAVER TO EUREKA SPRINGS, 161KV 52680 BEAVER 5 161 to 53136 EUREKA 5 161 CKT 1	274	91.7	101.9	FLINT CREEK TO MONETT, 345KV 53140 FLINTCR7 345 to 59481 MON383 7 345 CKT1	505	See Previous	\$ -
08SP	SPRM-SPRM	SPRINGFIELD 161/69KV TRANSFORMER 3 52692 SPRGFLD5 161 to 52694 SPRGFLD269.0 CKT 3	25	95.0	101.0	Multiple Outage Contingency FRANKS TO HUBEN, 345KV 96041 7FRANKS 345 to 96042 7HUBEN 345 CKT1 HUBEN TO MORGAN, 345KV 96042 7HUBEN 345 to 96045 7MORGAN 345 CKT1	517	See Previous	\$ -
08SP	AEPW-AEPW	BROKEN ARROW TO LYNN LANE TAP 138KV 53798 BA.N-ST4 138 to 53816 LLANETP4 138 CKT 1	235	95.8	100.7	TULSA NORTH TO NORTHEAST STATION, 345KV 53866 T.NO.--7 345 to 53955 N.E.S.-7 345 CKT1	535	No Upgrade Required As Assigned Upgrades for 620 MW Relieves Facility	\$ -
08SP	AEPW-AEPW	CHAMBER SPRINGS TO TONTITOWN, 161KV 53154 CHAMSPR5 161 to 53170 TONTITN5 161 CKT 1	244	96.7	100.5	EAST CENTERTON TO GENTRY REC, 161KV 53133 ECNTRT5 161 to 53187 GENTRYR5 161 CKT1	538	See Previous Note: Adding Second Chamber Springs 345/161kV Unit Reduces ATC Shown	\$ -
08SP	OKGE-AEPW	BONANZA TAP TO BONANZA, 161KV 55261 BONANZT5 161 to 53126 BONANZA5 161 CKT 1	177	89.3	101.0	FORT SMITH TO ARKANSAS NUCLEAR ONE, 500KV 55305 FTSMITH8 500 to 99486 8ANO 50 500 CKT1	569	See Previous	\$ -
08SP	OKGE-OKGE	FORT SMITH 345/161KV TRANSFORMER 55302 FTSMITH7 345 to 55300 FTSMITH5 161 CKT 1	493	86.7	100.9	FORT SMITH 500/345KV TRANSFORMER 55302 FTSMITH7 345 to 55305 FTSMITH8 500 CKT1	579	No Upgrade Required As Assigned Upgrades for 620 MW Relieves Facility	\$ -
08SP	AECI-GRRD	TITANTP TO TAHLEQUAH, 69KV 96986 2TITANTP69.0 to 54447 TAHLQH 269.0 CKT 1	47	97.5	100.2	KANSAS TO WATTS, 69KV 54515 KANSAS 269.0 to 96987 2WATTS 69.0 CKT1	579	Reconductor 9.4 miles with 795MCM ACSR	\$ 1,551,000

**Table 1 - continued** – Facility Overloads Caused by AEPW to EES 620MW Transfer from 4/1/2003 to 4/1/2013

Study Year	From Area - To Area	Branch Over 100% RateB	RATE B	BC %Loading	TC %Loading	Outaged Branch That Caused Overload	ATC	Comments	Cost
08SP	SWPA-OKGE	VAN BUREN TO VBI, 161KV 52722 VAN BUR5 161 to 55339 VBI 5 161 CKT 1	335	89.4	100.7	MUSKOGEE TO FORT SMITH, 345KV 55224 MUSKOGEE7 345 to 55302 FTSMITH7 345 CKT1	583	SPA: Replace metering CTs, disconnect switches, breakers, and bus differential relaying at Van Buren. OG&E Replace Switch and reconnect CT ratio at VBI.	\$ 1,050,000
08SP	AEPW-AEPW	NORTH MARSHALL TO WOODLAWN, 69KV 53579 NMARSHL269.0 to 53621 WOODLWN269.0 CKT 1	51	94.4	100.3	LONGWOOD TO WILKES, 345KV 53424 LONGWD 7 345 to 53620 WILKES 7 345 CKT1	586	No Upgrade Required As Assigned Upgrades for 620 MW Relieves Facility	\$ -
08SP	SWPA-SWPA	NORFORK 161/69KV TRANSFORMER 52648 NORFORK5 161 to 52650 NORFORK269.0 CKT 1	25	105.0	106.6	NORFORK TO WEST PLAINS, 161KV 52648 NORFORK5 161 to 96123 5WPLAIN 161 CKT1	620	Norfork transformer to be replaced by SWPA 6/1/06	\$ -
08SP	AEPW-AEPW	CHAMBER SPRINGS TO LAKE ELMDALE, 161KV 53154 CHAMSPR5 161 to 53175 LELMDAL5 161 CKT 1	244	96.0	101.0	MUSKOGEE TO FORT SMITH, 345KV 55224 MUSKOGEE7 345 to 55302 FTSMITH7 345 CKT1	620	Relieved by AEP Tontitown Project - Estimated In-Service Date 6/1/2004	\$ -
08SP	AEPW-AEPW	CHAMBER SPRINGS TO LAKE ELMDALE, 161KV 53154 CHAMSPR5 161 to 53175 LELMDAL5 161 CKT 1	244	96.6	100.1	SOUTHEAST FAYETTEVILLE TO S. FAYETTEVILLE, 161KV 53153 SEFAYTV5 161 to 53157 SFAYTVL5 161 CKT1	620	"	\$ -
08SP	AEPW-AEPW	CHAMBER SPRINGS TO LAKE ELMDALE, 161KV 53154 CHAMSPR5 161 to 53175 LELMDAL5 161 CKT 1	244	99.1	102.8	EAST ROGERS TO ROGERS WEST REC 53135 EROGERS5 161 to 53207 WROGERS5 161 CKT1	620	"	\$ -
08SP	WERE-WERE	CIRCLEVILLE TO KING HILL, 115KV 57152 CIRCLVL3 115 to 57331 KING HL3 115 CKT 1	92	99.7	102.4	HOYT TO STRANGER,345KV 56765 HOYT 7 345 to 56772 STRANGR7 345 CKT1	620	Westar Transmission Operating Directive 803	\$ -
08SP	OKGE-OKGE	DRAPER 345/138KV TRANSFORMER 1 54934 DRAPER 7 345 to 54933 DRAPER 4 138 CKT 1	493	106.0	111.1	DRAPER 345/138KV TRANSFORMER 2 54933 DRAPER 4 138 to 54934 DRAPER 7 345 CKT2	620	Flowgate: OKGE Mitigation Plan to Increase Rating to 591 MVA by 2004	\$ -
08SP	OKGE-OKGE	DRAPER 345/138KV TRANSFORMER 2 54934 DRAPER 7 345 to 54933 DRAPER 4 138 CKT 2	493	106.0	111.1	DRAPER 345/138KV TRANSFORMER 1 54934 DRAPER 7 345 to 54933 DRAPER 4 138 CKT1	620	"	\$ -
08SP	AEPW-AEPW	FLINT CREEK TO ELM SPRINGS REC, 161KV 53139 FLINTCR5 161 to 53194 ELMSPRR5 161 CKT 1	312	99.9	100.4	SOUTH FAYETTEVILLE TO FARMINGTON AECC, 161KV 53157 SFAYTVL5 161 to 53195 FARMGTN5 161 CKT1	620	Relieved by AEP Tontitown Project - Estimated In-Service Date 6/1/2004	\$ -
08SP	SWPA-SWPA	GLENCOE TO NORFORK, 161KV 52646 GLENCOE5 161 to 52648 NORFORK5 161 CKT 1	112	97.4	102.0	NEW-IN TO NEWPO, 161KV 99763 5NEW-IN 161 to 99764 5NEWPO 161 CKT1	620	Remove wave trap. Switch relaying channel to fiber optic shield wire. To be completed by SWPA for own needs.	\$ -
08SP	SWPA-SWPA	GLENCOE TO NORFORK, 161KV 52646 GLENCOE5 161 to 52648 NORFORK5 161 CKT 1	112	96.0	100.6	NEW-AB TO NEW-IN, 161KV 99762 5NEW-AB 161 to 99763 5NEW-IN 161 CKT1	620	"	\$ -



**Table 1 - continued** – Facility Overloads Caused by AEPW to EES 620MW Transfer from 4/1/2003 to 4/1/2013

Study Year	From Area - To Area	Branch Over 100% RateB	RATE B	BC %Loading	TC %Loading	Outaged Branch That Caused Overload	ATC	Comments	Cost
08SP	OKGE-OKGE	<b>HARDEN CITY TO AHLOSO, 69KV</b> 55186 HARDEN 269.0 to 55187 AHLOSTP269.0 CKT 1	52	95.7	102.3	<b>VALLEY VIEW TAP TO VALLEY VIEW, 69KV</b> 55181 VALYVUT269.0 to 55182 VALLYVU269.0 CKT1	620	Excluded as operating guide in effect using switch at Ahloso.	\$ -
08SP	WERE-WERE	<b>MOCKINGBIRD HILLSW. STA TO STULL SW. STA, 115KV</b> 57253 MOCKBRD3 115 to 57270 STULL T3 115 CKT 1	92	99.4	101.1	<b>LAWRENCE HILL 230/115/13.8KV TRANSFORMER</b> 56853 LAWHILL6230 to 57250 LWRNCHL3115 to 56882 LAWHILL113.8	620	Westar mitigation planned in 2005.	\$ -
08SP	OKGE-OKGE	<b>TINKER #4 TO TINKER #2, 138KV</b> 54990 TINKER24 138 to 54988 TINKER44 138 CKT 1	100	99.1	105.3	<b>DRAPER TO MIDWEST, 138KV</b> 54933 DRAPER 4 138 to 54946 MIDWEST4 138 CKT1	620	Excluded Per OKGE	\$ -
08SP	OKGE-OKGE	<b>TINKER #4 TO TINKER #2, 138KV</b> 54990 TINKER24 138 to 54988 TINKER44 138 CKT 1	100	96.8	102.0	<b>SE 15TH 138/69KV TRANSFORMER</b> 54992 SE15TH 269.0 to 54993 SE15TH 4 138 CKT1	620	"	\$ -
08SP	OKGE-OKGE	<b>TINKER #4 TO TINKER #2, 138KV</b> 54990 TINKER24 138 to 54988 TINKER44 138 CKT 1	100	95.9	100.5	<b>HORSESHOE LAKE TO RENO, 138KV</b> 54941 HSL 4 138 to 54973 RENO 4 138 CKT1	620	"	\$ -
08SP	EES-SWPA	<b>MIDWAY TO BULL SHOALS, 161KV</b> 99825 5MIDWAY# 161 to 52660 BULL SH5 161 CKT 1	162	124.3	135.3	<b>BUFORD TAP TO BULL SHOALS, 161KV</b> 52661 BUFRDTP5 161 to 52660 BULL SH5 161 CKT1	N/A	See Previous	\$ -
08SP	SWPA-AECI	<b>CARTHAGE TO REEDS SPRING, 69KV</b> 52690 CARTHG 269.0 to 96751 2REEDS 69.0 CKT 1	36	125.5	131.2	<b>AURORA TO MONETT, 161KV</b> 59468 AUR124 5 161 to 59480 MON383 5 161 CKT1	N/A	Third Party Facility	\$ -
08SP	AEPW-AEPW	<b>JACKSONVILLE TO OVERTON, 138KV</b> 53549 JACKSNV4 138 to 53588 OVERTON4 138 CKT 1	235	112.6	120.8	<b>CROCKETT TO TENASKA RUSK COUNTY</b> 53526 CROCKET7 345 to 53637 TENRUSK7 345 CKT1	N/A	Third Party Facility With AEPW Limitation Reset relays at Jacksonville & Overton	\$ 15,000
08SP	SWPA-AECI	<b>CARTHAGE TO JASPER, 69KV</b> 52690 CARTHG 269.0 to 96649 2JASPER 69.0 CKT 1	47	100.5	102.9	<b>ARCHIE TO ADRIAN, 161KV</b> 59207 ARCHIE 5 161 to 59240 ADRIAN 5 161 CKT1	N/A	Third Party Facility	\$ -
08WP	WERE-WERE	<b>HOYT HTI SW. JCT. TO CIRCLEVILLE, 115KV</b> 57165 HTI JCT3 115 to 57152 CIRCLVL3 115 CKT 1	92	99.9	102.5	<b>IATAN TO ST JOE, 345KV</b> 57982 IATAN 7 345 to 59199 ST JOE 3 345 CKT1	16	See Previous	\$ -
08WP	SPRM-SPRM	<b>CLAY TO SPRINGFIELD, 161KV</b> 59970 CLAY 5 161 to 52692 SPRGFLD5 161 CKT 1	167	99.6	107.4	<b>Multiple Outage Contingency</b> <b>FRANKS TO HUBEN, 345KV</b> 96041 7FRANKS 345 to 96042 7HUBEN 345 CKT1 <b>HUBEN TO MORGAN, 345KV</b> 96042 7HUBEN 345 to 96045 7MORGAN 345 CKT1	32	See Previous	\$ -

**Table 1 - continued** – Facility Overloads Caused by AEPW to EES 620MW Transfer from 4/1/2003 to 4/1/2013

Study Year	From Area - To Area	Branch Over 100% RateB	RATE B	BC %Loading	TC %Loading	Outaged Branch That Caused Overload	ATC	Comments	Cost
08WP	AEPW-AEPW	MARSHALL 138/69KV TRANSFORMER CKT1 53571 MARSHL-4 138 to 53623 MARAUTO269.0 CKT 1	121	99.7	101.2	MARSHALL 138/69KV TRANSFORMER CKT2 53571 MARSHL-4 138 to 53623 MARAUTO269.0 CKT2	116	Replace 755 ACAR Strain Bus	\$ 25,000
08WP	AEPW-AEPW	MARSHALL 138/69KV TRANSFORMER CKT2 53571 MARSHL-4 138 to 53623 MARAUTO269.0 CKT 2	121	99.7	101.2	MARSHALL 138/69KV TRANSFORMER CKT1 53571 MARSHL-4 138 to 53623 MARAUTO269.0 CKT1	116	Replace 755 ACAR Strain Bus	\$ 25,000
08WP	OKGE-OKGE	PECAN CREEK 345/161KV TRANSFORMER 55235 PECANCK7 345 to 55234 PECANCK5 161 CKT 1	369	96.2	108.0	MUSKOGEE TO FORT SMITH, 345KV 55224 MUSKOGEE7 345 to 55302 FTSMITH7 345 CKT1	200	See Previous	\$ -
08WP	AEPW-EES	CROCKETT TO GRIMES, 345KV 53526 CROCKET7 345 to 97513 7GRIMES 345 CKT 1	789	97.4	104.6	WEBRE TO RICHARD, 500KV 98107 8RICHARD 500 to 98430 8WEBRE 500 CKT1	225	Expedite resetting of CTs assigned to SPP-2001-365	\$ -
08WP	AEPW-EES	CROCKETT TO GRIMES, 345KV 53526 CROCKET7 345 to 97513 7GRIMES 345 CKT 1	789	96.4	105.0	HARTBURG TO MT OLIVE, 500KV 97717 8HARTBRG 500 to 99162 8MTOLIV 500 CKT1	259	See Previous	\$ -
08WP	EMDE-EMDE	POWERSITE 161/69/12.5KV TRANSFORMER 59562*OZD312 269.0 OZKDAM 1	41.7	99.8	100.2	OZARK NORTHWEST TO BLACKHAWK JCT. 59570 OZK330 269.0 to 59604 BHJ415 269.0 CKT 1	310	Replace with 75MVA transformer.	\$ 1,250,000
08WP	AEPW-AEPW	OAK HILL TO KNOX LEE, 138KV 53586 OAK2HIL4 138 to 53557 KNOXLEE4 138 CKT 1	210	98.9	100.4	KNOXLEE TO MONROE CORNERS REC, 138KV 53557 KNOXLEE4 138 to 53574 MONROCR4 138 CKT1	440	See Previous	\$ -
08WP	AECI-SPRM	LOGAN TO CLAY, 161KV 97161 5LOGAN 161 to 59970 CLAY 5 161 CKT 1	232	91.1	103.5	HUBEN TO MORGAN, 345KV 96042 7HUBEN 345 to 96045 7MORGAN 345 CKT1	444	See Previous	\$ -
08WP	AEPW-EES	CROCKETT TO GRIMES, 345KV 53526 CROCKET7 345 to 97513 7GRIMES 345 CKT 1	789	94.7	102.0	CYPRESS TO HARTBURG, 500KV 97691 8CYPRESS 500 to 97717 8HARTBRG 500 CKT1	449	See Previous	\$ -
08WP	AEPW-EES	CROCKETT TO GRIMES, 345KV 53526 CROCKET7 345 to 97513 7GRIMES 345 CKT 1	789	93.9	102.3	DOLET HILLS 345/230KV TRANSFORMER 50045 DOLHILL7 345 to 50046 DOLHILL6 230 CKT1	453	See Previous	\$ -
08WP	AEPW-EES	CROCKETT TO GRIMES, 345KV 53526 CROCKET7 345 to 97513 7GRIMES 345 CKT 1	789	92.1	101.0	LONGWOOD TO ELDEHV, 345KV 53424 LONGWD 7 345 to 99294 7ELDEHV 345 CKT1	553	See Previous	\$ -
08WP	SPRM-SWPA	CLAY TO SPRINGFIELD, 161KV 59970 CLAY 5 161 to 52692 SPRGFLD5 161 CKT 1	167	91.4	100.8	HUBEN TO MORGAN, 345KV 96042 7HUBEN 345 to 96045 7MORGAN 345 CKT1	566	See Previous	\$ -

**Table 1 - continued** – Facility Overloads Caused by AEPW to EES 620MW Transfer from 4/1/2003 to 4/1/2013

Study Year	From Area - To Area	Branch Over 100% RateB	RATE B	BC %Loading	TC %Loading	Outaged Branch That Caused Overload	ATC	Comments	Cost
08WP	OKGE-OKGE	PECAN CREEK 345/161KV TRANSFORMER 55235 PECANCK7 345 to 55234 PECANCK5 161 CKT 1	369	93.7	100.1	CLARKSVILLE TO MUSKOGEE, 345KV 53756 CLARKSV7 345 to 55224 MUSKOGEE7 345 CKT1	607	See Previous	\$ -
08WP	SWPA-SWPA	NORFORK 161/69KV TRANSFORMER 52648 NORFORK5 161 to 52650 NORFORK269.0 CKT 1	25	107.6	108.6	NORFORK TO WEST PLAINS, 161KV 52648 NORFORK5 161 to 96123 5WPLAIN 161 CKT1	620	Norfork transformer to be replaced by SWPA 6/1/06	\$ -
08WP	WERE-WERE	KING HILL TO KELLY, 115KV 57331 KING HL3 115 to 57217 KELLY 3 115 CKT 1	92	98.9	101.6	HOYT TO STRANGER,345KV 56765 HOYT 7 345 to 56772 STRANGR7 345 CKT1	620	Westar Transmission Operating Directive 803	\$ -
08WP	WERE-WERE	LAWRENCE HILL 230/115/13.8KV 56853* LAWHILL6 230 536 WND 1 LAWHL29X 1	308	98.8	100.2	LAWRENCE HILL TO MIDLAND JCT., 230KV 56853 LAWHILL6230 to 56855 MIDLAND6230 CKT1	620	Transmission Operating Directive 625.	\$ -
08WP	AEPW-AEPW	WALLACE LAKE TO S. SHREVEPORT, 138KV 53461 WALLAKE4 138 to 53446 S SHV 4 138 CKT 1	210	93.7	107.2	DOLET HILLS 345/230KV TRANSFORMER 50045 DOLHILL7 345 to 50046 DOLHILL6 230 CKT1	620	Dolet Hills Operating Guide Monitor Line at 260 MVA	\$ -
08WP	AEPW-AEPW	JACKSONVILLE TO OVERTON, 138KV 53549 JACKSNV4 138 to 53588 OVERTON4 138 CKT 1	265	115.1	122.3	CROCKETT TO TENASKA RUSK COUNTY 53526 CROCKET7 345 to 53637 TENRUSK7 345 CKT1	N/A	See Previous	\$ -
08WP	SWPA-AECI	CARTHAGE TO REEDS SPRING, 69KV 52690 CARTHG 269.0 to 96751 2REEDS 69.0 CKT 1	43	110.2	115.0	AURORA TO MONETT, 161KV 59468 AUR124 5 161 to 59480 MON383 5 161 CKT1	N/A	Third Party Facility	\$ -

Total Cost \$ 65,741,326

**Table 2** - Non - SPP facility overloads caused by the AEPW to EES 620MW transfer from 4/1/2003 to 4/1/2013

Study Year	From Area - To Area	Branch Over 100% Rate B	Rate B	BC %Loading	TC %Loading	Outaged Branch That Caused Overload
03AP	CELE-EES	50024 CARROLL4 138 to 99167 3RINGLD 115 CKT 1	125	96.2	105.3	50023 CARROLL6 230 to 50126 MESSICK6 230 CKT1
03AP	CELE-EES	50024 CARROLL4 138 to 99167 3RINGLD 115 CKT 1	125	95.0	103.9	99294 7ELDEHV 345 to 99295 8ELDEHV 500 CKT1
03AP	EES-CELE	99167 3RINGLD 115 to 50024 CARROLL4 138 CKT 1	125	94.9	103.8	53424 LONGWD 7 345 to 99294 7ELDEHV 345 CKT1
03AP	EES-EES	99167 3RINGLD 115 to 99168 3SAILES 115 CKT 1	115	92.3	102.2	50023 CARROLL6 230 to 50126 MESSICK6 230 CKT1
03AP	EES-EES	99167 3RINGLD 115 to 99168 3SAILES 115 CKT 1	115	91.8	102.0	99294 7ELDEHV 345 to 99295 8ELDEHV 500 CKT1
03AP	EES-EES	99167 3RINGLD 115 to 99168 3SAILES 115 CKT 1	115	91.8	101.9	53424 LONGWD 7 345 to 99294 7ELDEHV 345 CKT1
03AP	EES-EES	99387 3MURF-S 115 to 99389 4MURFRE 138 CKT 1	60	88.3	114.4	99294 7ELDEHV 345 to 99295 8ELDEHV 500 CKT1
03AP	EES-EES	99389 4MURFRE 138 to 99387 3MURF-S 115 CKT 1	60	88.3	114.4	53424 LONGWD 7 345 to 99294 7ELDEHV 345 CKT1
03G	CELE-EES	50024 CARROLL4 138 to 99167 3RINGLD 115 CKT 1	125	92.9	101.4	99294 7ELDEHV 345 to 99295 8ELDEHV 500 CKT1
03G	CELE-EES	50024 CARROLL4 138 to 99167 3RINGLD 115 CKT 1	125	92.6	101.2	53424 LONGWD 7 345 to 99294 7ELDEHV 345 CKT1
03G	EES-EES	97708 4TOLEDO 138 to 97686 4LEACH 138 CKT 1	144.6	92.3	100.6	50037 COOPER 4 138 to 50098 LEESV 4 138 CKT1
03G	EES-EES	99387 3MURF-S 115 to 99389 4MURFRE 138 CKT 1	60	83.5	111.6	53424 LONGWD 7 345 to 99294 7ELDEHV 345 CKT1
03G	EES-EES	99387 3MURF-S 115 to 99389 4MURFRE 138 CKT 1	60	83.4	111.4	99294 7ELDEHV 345 to 99295 8ELDEHV 500 CKT1
03G	EES-EES	99387 3MURF-S 115 to 99389 4MURFRE 138 CKT 1	60	81.0	107.3	53424 LONGWD 7 345 to 99294 7ELDEHV 345 CKT1
03SP	CELE-CELE	50039 COUGH 4 138 to 50031 COCODR 6 230 CKT 1	386	98.3	103.5	50031 COCODR 6 230 to 50203 VILPLT 6 230 CKT1
03SP	CELE-CELE	50154 PINEV 4 138 to 50179 SHOAKS 4 138 CKT 1	148	99.3	103.1	50154 PINEV 4 138 to 50158 PVKFTAP4 138 CKT1
03SP	SWPA-AECI	52690 CARTHG 269.0 to 96751 2REEDS 69.0 CKT 1	36	99.6	105.4	55224 MUSKOGEE7 345 to 55302 FTSMITH7 345 CKT1
03SP	SWPA-AECI	52690 CARTHG 269.0 to 96751 2REEDS 69.0 CKT 1	36	99.8	104.4	59577 MTV351 269.0 to 59606 MTV420 269.0 CKT1
03SP	SWPA-AECI	52690 CARTHG 269.0 to 96751 2REEDS 69.0 CKT 1	36	99.6	104.3	96042 7HUBEN 345 to 96088 5HUBEN 161 CKT1
03SP	MIPU-AECI	59217 WINDSR 5 161 to 96071 5CLINTN 161 CKT 1	123	95.6	100.8	59228 WBURGE 5 161 to 59229 ODESSA 5 161 CKT1
03SP	EES-EES	97514 4GRIMES 138 to 97487 4MT.ZION 138 CKT 1	206	88.7	100.4	97454 4WALDEN 138 to 97514 4GRIMES 138 CKT1
03SP	EES-EES	97686 4LEACH 138 to 97618 4NEWTONB 138 CKT 1	144.6	95.3	104.9	53526 CROCKET7 345 to 97513 7GRIMES 345 CKT1
03SP	EES-EES	97686 4LEACH 138 to 97618 4NEWTONB 138 CKT 1	144.6	90.6	100.2	50037 COOPER 4 138 to 50098 LEESV 4 138 CKT1
03SP	EES-EES	97708 4TOLEDO 138 to 97686 4LEACH 138 CKT 1	144.6	96.4	106.0	53526 CROCKET7 345 to 97513 7GRIMES 345 CKT1
03SP	EES-EES	97708 4TOLEDO 138 to 97686 4LEACH 138 CKT 1	144.6	91.8	101.3	50037 COOPER 4 138 to 50098 LEESV 4 138 CKT1
03SP	EES-EES	99167 3RINGLD 115 to 99168 3SAILES 115 CKT 1	115	98.1	108.8	99294 7ELDEHV 345 to 99295 8ELDEHV 500 CKT1
03SP	EES-EES	99167 3RINGLD 115 to 99168 3SAILES 115 CKT 1	115	98.1	108.7	53424 LONGWD 7 345 to 99294 7ELDEHV 345 CKT1
03SP	EES-EES	99389 4MURFRE 138 to 99387 3MURF-S 115 CKT 1	60	89.2	114.5	53424 LONGWD 7 345 to 99294 7ELDEHV 345 CKT1
03SP	EES-EES	99389 4MURFRE 138 to 99387 3MURF-S 115 CKT 1	60	89.2	114.4	99294 7ELDEHV 345 to 99295 8ELDEHV 500 CKT1
03SP	EES-EES	99389 4MURFRE 138 to 99387 3MURF-S 115 CKT 1	60	83.1	106.0	53526 CROCKET7 345 to 97513 7GRIMES 345 CKT1
03FA	CELE-CELE	50031 COCODR 6 230 to 50039 COUGH 4 138 CKT 1	386	96.0	100.7	50203 VILPLT 6 230 to 50214 WSTFORK6 230 CKT1
03FA	SWPA-EES	52660 BULL SH5 161 to 99825 5MIDWAY# 161 CKT 1	162	98.4	110.2	52660 BULL SH5 161 to 52661 BUFRDTP5 161 CKT1
03FA	SWPA-EES	52660 BULL SH5 161 to 99825 5MIDWAY# 161 CKT 1	162	97.8	109.5	52648 NORFORK5 161 to 52661 BUFRDTP5 161 CKT1
03FA	EES-EES	97454 4WALDEN 138 to 97469 4APRIL 138 CKT 1	206	98.9	109.5	97480 L558T485 138 to 97484 4HUNTSVL 138 CKT1
03FA	EES-EES	97469 4APRIL 138 to 97470 4LFOREST 138 CKT 1	206	99.0	109.6	97487 4MT.ZION 138 to 97514 4GRIMES 138 CKT1
03FA	EES-EES	97469 4APRIL 138 to 97470 4LFOREST 138 CKT 1	206	97.9	108.6	97480 L558T485 138 to 97487 4MT.ZION 138 CKT1
03FA	EES-EES	97469 4APRIL 138 to 97470 4LFOREST 138 CKT 1	206	96.7	107.4	97480 L558T485 138 to 97484 4HUNTSVL 138 CKT1
03FA	EES-EES	97470 4LFOREST 138 to 97539 4WDHAVN 138 CKT 1	206	93.0	103.8	97487 4MT.ZION 138 to 97514 4GRIMES 138 CKT1
03FA	EES-EES	97470 4LFOREST 138 to 97539 4WDHAVN 138 CKT 1	206	92.0	102.8	97480 L558T485 138 to 97487 4MT.ZION 138 CKT1
03FA	EES-EES	97470 4LFOREST 138 to 97539 4WDHAVN 138 CKT 1	206	90.8	101.6	97480 L558T485 138 to 97484 4HUNTSVL 138 CKT1
03FA	EES-EES	97480 L558T485 138 to 97484 4HUNTSVL 138 CKT 1	206	99.4	112.3	97454 4WALDEN 138 to 97514 4GRIMES 138 CKT1
03FA	EES-EES	97480 L558T485 138 to 97484 4HUNTSVL 138 CKT 1	206	97.9	110.8	97454 4WALDEN 138 to 97469 4APRIL 138 CKT1
03FA	EES-EES	97480 L558T485 138 to 97484 4HUNTSVL 138 CKT 1	206	96.9	109.8	97469 4APRIL 138 to 97470 4LFOREST 138 CKT1
03FA	EES-EES	97487 4MT.ZION 138 to 97480 L558T485 138 CKT 1	206	97.9	110.7	97470 4LFOREST 138 to 97539 4WDHAVN 138 CKT1
03FA	EES-EES	97487 4MT.ZION 138 to 97480 L558T485 138 CKT 1	206	97.5	110.2	97459 4CONROE 138 to 97539 4WDHAVN 138 CKT1
03FA	EES-EES	97513 7GRIMES 345 to 97514 4GRIMES 138 CKT 1	525	99.7	107.7	97513 7GRIMES 345 to 97514 4GRIMES 138 CKT2
03FA	EES-EES	97513 7GRIMES 345 to 97514 4GRIMES 138 CKT 2	525	99.7	107.7	97513 7GRIMES 345 to 97514 4GRIMES 138 CKT1
03FA	EES-EES	97514 4GRIMES 138 to 97454 4WALDEN 138 CKT 1	206	92.5	101.5	97508 4NAVSOA 138 to 97522 4TUBULAR 138 CKT1
03FA	EES-EES	97514 4GRIMES 138 to 97454 4WALDEN 138 CKT 1	206	93.0	100.4	97458 4CONAIR 138 to 97461 4LEWIS 138 CKT1
03FA	EES-EES	97514 4GRIMES 138 to 97454 4WALDEN 138 CKT 1	206	91.3	100.3	97453 4DOBBIN 138 to 97522 4TUBULAR 138 CKT1
03FA	EES-EES	97522 4TUBULAR 138 to 97453 4DOBBIN 138 CKT 1	112	91.4	102.3	97454 4WALDEN 138 to 97514 4GRIMES 138 CKT1
03FA	EES-EES	97522 4TUBULAR 138 to 97453 4DOBBIN 138 CKT 1	112	89.8	100.7	97454 4WALDEN 138 to 97469 4APRIL 138 CKT1
03FA	EES-EES	97539 4WDHAVN 138 to 97459 4CONROE 138 CKT 1	206	91.9	102.7	97487 4MT.ZION 138 to 97514 4GRIMES 138 CKT1
03FA	EES-EES	97539 4WDHAVN 138 to 97459 4CONROE 138 CKT 1	206	90.9	101.7	97480 L558T485 138 to 97487 4MT.ZION 138 CKT1
03FA	EES-EES	97539 4WDHAVN 138 to 97459 4CONROE 138 CKT 1	206	89.7	100.5	97480 L558T485 138 to 97484 4HUNTSVL 138 CKT1

**Table 2 - continued** - Non - SPP facility overloads caused by the AEPW to EES 620MW transfer from 4/1/2003 to 4/1/2013

Study Year	From Area - To Area	Branch Over 100% Rate B	Rate B	BC %Loading	TC %Loading	Outaged Branch That Caused Overload
03FA	EES-EES	97686 4LEACH 138 to 97618 4NEWTONB 138 CKT 1	144.6	92.1	102.0	50098 LEESV 4 138 to 97708 4TOLEDO 138 CKT1
03FA	EES-EES	97708 4TOLEDO 138 to 97686 4LEACH 138 CKT 1	144.6	92.8	102.7	50098 LEESV 4 138 to 97708 4TOLEDO 138 CKT1
03FA	EES-EES	97708 4TOLEDO 138 to 97686 4LEACH 138 CKT 1	144.6	91.8	100.4	97691 8CYPRESS 500 to 97717 8HARTBRG 500 CKT1
03FA	EES-EES	97920 6PPG 23 230 to 98051 2PPC NO 69.0 CKT 1	160	98.3	108.1	97920 6PPG 23 230 to 98052 2PPC SO 69.0 CKT1
03FA	EES-EES	97920 6PPG 23 230 to 98052 2PPC SO 69.0 CKT 1	160	98.4	108.3	97920 6PPG 23 230 to 98051 2PPC NO 69.0 CKT1
03WP	AMRN-AMRN	30026 APCH FLT 161 to 30027 APCH FLT69.0 CKT 1	84	99.3	100.4	31195 MILLER S 138 to 31196 MILLER 138 CKT1
03WP	AMRN-AMRN	31408 OVERTON 345 to 31409 OVERTON 161 CKT 1	300	99.8	100.2	31230 MONTGMRY 345 to 31231 MONTGMRY 161 CKT1
03WP	CELE-EES	50024 CARROLL4 138 to 99167 3RINGLD 115 CKT 1	125	95.7	105.4	53424 LONGWD 7 345 to 99294 7ELDEHV 345 CKT1
03WP	CELE-CELE	50031 COCODR 6 230 to 50039 COUGH 4 138 CKT 1	386	95.8	100.6	50203 VILPLT 6 230 to 50214 WSTFORK6 230 CKT1
03WP	SWPA-AECI	52690 CARTHG 269.0 to 96751 2REEDS 69.0 CKT 1	43	97.4	102.3	52688 CARTHAG5 161 to 59479 LAR382 5 161 CKT1
03WP	AECI-AECI	96090 5KINGDM 161 to 96517 2KINGDM 69.0 CKT 2	29	99.5	100.1	96090 5KINGDM 161 to 96517 2KINGDM 69.0 CKT3
03WP	AECI-AMRN	96096 5MARIES 161 to 31024 MARIES 138 CKT 1	100	98.2	101.3	30532 ELDON 161 to 96057 5BARNET 161 CKT1
03WP	EES-EES	97920 6PPG 23 230 to 98051 2PPC NO 69.0 CKT 1	160	92.8	102.7	97920 6PPG 23 230 to 98052 2PPC SO 69.0 CKT1
03WP	EES-EES	97920 6PPG 23 230 to 98052 2PPC SO 69.0 CKT 1	160	92.9	102.8	97920 6PPG 23 230 to 98051 2PPC NO 69.0 CKT1
03WP	EES-EES	99146 3STERL 115 to 99137 3WALGRV 115 CKT 2	238	99.4	101.4	99137 3WALGRV 115 to 99146 3STERL 115 CKT1
03WP	EES-CELE	99167 3RINGLD 115 to 50024 CARROLL4 138 CKT 1	125	95.8	105.7	99294 7ELDEHV 345 to 99295 8ELDEHV 500 CKT1
03WP	EES-EES	99167 3RINGLD 115 to 99168 3SAILES 115 CKT 1	115	93.6	105.1	99294 7ELDEHV 345 to 99295 8ELDEHV 500 CKT1
03WP	EES-EES	99167 3RINGLD 115 to 99168 3SAILES 115 CKT 1	115	93.5	105.0	53424 LONGWD 7 345 to 99294 7ELDEHV 345 CKT1
03WP	EES-EES	99389 4MURFRE 138 to 99387 3MURF-S 115 CKT 1	60	77.2	102.8	53424 LONGWD 7 345 to 99294 7ELDEHV 345 CKT1
03WP	EES-EES	99389 4MURFRE 138 to 99387 3MURF-S 115 CKT 1	60	77.2	102.7	99294 7ELDEHV 345 to 99295 8ELDEHV 500 CKT1
04G	SWPA-EES	52660 BULL SH5 161 to 99825 5MIDWAY# 161 CKT 1	162	92.4	104.3	52660 BULL SH5 161 to 52661 BUFRDTP5 161 CKT1
04G	SWPA-EES	52660 BULL SH5 161 to 99825 5MIDWAY# 161 CKT 1	162	91.8	103.6	52648 NORFORK5 161 to 52661 BUFRDTP5 161 CKT1
04G	MIPU-MIPU	59288 RGAFB 2 69.0 to 59284 GRDVTWP269.0 CKT 1	53	99.8	100.6	59225 PHILL 5 161 to 59280 PHILL 2 69.0 CKT1
04G	OPPD-OPPD	65390 S1263T1T 161 to 65627 W BROCK869.0 CKT 1	53	99.6	100.2	64863 HUMBOLT5 161 to 65391 S975T4 T 161 CKT1
04G	OPPD-OPPD	65390 S1263T1T 161 to 65627 W BROCK869.0 CKT 1	53	99.6	100.2	65391 S975T4 T 161 to 65575 S975 869.0 CKT1
04G	EES-EES	97454 4WALDEN 138 to 97469 4APRIL 138 CKT 1	206	94.4	103.7	97508 4NAVSOTA 138 to 97522 4TUBULAR 138 CKT1
04G	EES-EES	97454 4WALDEN 138 to 97469 4APRIL 138 CKT 1	206	93.0	102.6	50045 DOLHILL7 345 to 50046 DOLHILL6 230 CKT1
04G	EES-EES	97454 4WALDEN 138 to 97469 4APRIL 138 CKT 1	206	93.3	102.5	97453 4DOBBIN 138 to 97522 4TUBULAR 138 CKT1
04G	EES-EES	97469 4APRIL 138 to 97470 4LFOREST 138 CKT 1	206	92.3	101.6	97508 4NAVSOTA 138 to 97522 4TUBULAR 138 CKT1
04G	EES-EES	97469 4APRIL 138 to 97470 4LFOREST 138 CKT 1	206	90.9	100.6	50045 DOLHILL7 345 to 50046 DOLHILL6 230 CKT1
04G	EES-EES	97469 4APRIL 138 to 97470 4LFOREST 138 CKT 1	206	91.2	100.4	97453 4DOBBIN 138 to 97522 4TUBULAR 138 CKT1
04G	EES-EES	97470 4LFOREST 138 to 97539 4WDHAVN 138 CKT 1	206	99.3	110.3	97480 L558T485 138 to 97487 4MT.ZION 138 CKT1
04G	EES-EES	97470 4LFOREST 138 to 97539 4WDHAVN 138 CKT 1	206	98.1	109.1	97480 L558T485 138 to 97484 4HUNTSVL 138 CKT1
04G	EES-EES	97480 L558T485 138 to 97484 4HUNTSVL 138 CKT 1	206	88.7	101.3	50045 DOLHILL7 345 to 50046 DOLHILL6 230 CKT1
04G	EES-EES	97480 L558T485 138 to 97484 4HUNTSVL 138 CKT 1	206	89.9	101.0	97507 4COLSTTA 138 to 97514 4GRIMES 138 CKT1
04G	EES-EES	97480 L558T485 138 to 97484 4HUNTSVL 138 CKT 1	206	89.8	100.8	97506 4BRYAN 138 to 97507 4COLSTTA 138 CKT1
04G	EES-EES	97487 4MT.ZION 138 to 97480 L558T485 138 CKT 1	206	92.0	104.5	50045 DOLHILL7 345 to 50046 DOLHILL6 230 CKT1
04G	EES-EES	97487 4MT.ZION 138 to 97480 L558T485 138 CKT 1	206	93.2	104.2	97507 4COLSTTA 138 to 97514 4GRIMES 138 CKT1
04G	EES-EES	97487 4MT.ZION 138 to 97480 L558T485 138 CKT 1	206	93.1	104.1	97506 4BRYAN 138 to 97507 4COLSTTA 138 CKT1
04G	EES-EES	97514 4GRIMES 138 to 97454 4WALDEN 138 CKT 1	206	98.1	107.3	97508 4NAVSOTA 138 to 97522 4TUBULAR 138 CKT1
04G	EES-EES	97514 4GRIMES 138 to 97454 4WALDEN 138 CKT 1	206	96.7	106.2	50045 DOLHILL7 345 to 50046 DOLHILL6 230 CKT1
04G	EES-EES	97514 4GRIMES 138 to 97454 4WALDEN 138 CKT 1	206	96.9	106.1	97453 4DOBBIN 138 to 97522 4TUBULAR 138 CKT1
04G	EES-EES	97514 4GRIMES 138 to 97487 4MT.ZION 138 CKT 1	206	95.1	107.5	50045 DOLHILL7 345 to 50046 DOLHILL6 230 CKT1
04G	EES-EES	97514 4GRIMES 138 to 97487 4MT.ZION 138 CKT 1	206	96.3	107.2	97507 4COLSTTA 138 to 97514 4GRIMES 138 CKT1
04G	EES-EES	97514 4GRIMES 138 to 97487 4MT.ZION 138 CKT 1	206	96.1	107.1	97506 4BRYAN 138 to 97507 4COLSTTA 138 CKT1
04G	EES-EES	97522 4TUBULAR 138 to 97453 4DOBBIN 138 CKT 1	112	98.6	109.8	97454 4WALDEN 138 to 97514 4GRIMES 138 CKT1
04G	EES-EES	97522 4TUBULAR 138 to 97453 4DOBBIN 138 CKT 1	112	97.0	108.1	97454 4WALDEN 138 to 97469 4APRIL 138 CKT1
04G	EES-EES	97522 4TUBULAR 138 to 97453 4DOBBIN 138 CKT 1	112	96.0	107.1	97469 4APRIL 138 to 97470 4LFOREST 138 CKT1
04G	EES-EES	97539 4WDHAVN 138 to 97459 4CONROE 138 CKT 1	206	99.2	109.5	97487 4MT.ZION 138 to 97514 4GRIMES 138 CKT1
04G	EES-EES	97539 4WDHAVN 138 to 97459 4CONROE 138 CKT 1	206	98.2	109.2	97480 L558T485 138 to 97487 4MT.ZION 138 CKT1
04G	EES-EES	97539 4WDHAVN 138 to 97459 4CONROE 138 CKT 1	206	97.0	108.0	97480 L558T485 138 to 97484 4HUNTSVL 138 CKT1
04G	EES-EES	97686 4LEACH 138 to 97618 4NEWTONB 138 CKT 1	144.6	95.7	107.4	50098 LEESV 4 138 to 97708 4TOLEDO 138 CKT1
04G	EES-EES	97708 4TOLEDO 138 to 97686 4LEACH 138 CKT 1	144.6	96.5	108.2	50098 LEESV 4 138 to 97708 4TOLEDO 138 CKT1
04G	EES-EES	97708 4TOLEDO 138 to 97686 4LEACH 138 CKT 1	144.6	91.0	100.2	97717 8HARTBRG 500 to 99162 8MTOLIV 500 CKT1
04G	EES-EES	97920 6PPG 23 230 to 98051 2PPC NO 69.0 CKT 1	160	99.4	109.3	97920 6PPG 23 230 to 98052 2PPC SO 69.0 CKT1
04G	EES-EES	97920 6PPG 23 230 to 98052 2PPC NO 69.0 CKT 1	160	99.6	109.5	97920 6PPG 23 230 to 98051 2PPC NO 69.0 CKT1

**Table 2 - continued** - Non - SPP facility overloads caused by the AEPW to EES 620MW transfer from 4/1/2003 to 4/1/2013

Study Year	From Area - To Area	Branch Over 100% Rate B	Rate B	BC %Loading	TC %Loading	Outaged Branch That Caused Overload
05SP	ALTW-MEC	34060 WNTRST 5 161 to 64068 GRENFLD5 161 CKT 1	112	98.6	101.3	63800 CBLUFFS3 345 to 64056 MADISON3 345 CKT1
05SP	CELE-EES	50024 CARROLL4 138 to 99167 3RINGLD 115 CKT 1	125	96.9	101.7	99112 3WINFLD 115 to 99113 6WINFLD 230 CKT1
05SP	CELE-EES	50024 CARROLL4 138 to 99167 3RINGLD 115 CKT 1	125	96.8	101.7	99113 6WINFLD 230 to 99116 6MONTGY 230 CKT1
05SP	CELE-CELE	50039 COUGH 4 138 to 50031 COCODR 6 230 CKT 1	386	95.3	100.5	50203 VILPLT 6 230 to 50214 WSTFORK6 230 CKT1
05SP	CELE-CELE	50154 PINEV 4 138 to 50179 SHOAKS 4 138 CKT 1	148	97.9	101.8	50158 PVKFTAP4 138 to 50179 SHOAKS 4 138 CKT1
05SP	SWPA-AECI	52690 CARTHG 269.0 to 96649 2JASPER 69.0 CKT 1	47	98.0	100.8	59207 ARCHIE 5 161 to 59240 ADRIAN 5 161 CKT1
05SP	SWPA-AECI	52690 CARTHG 269.0 to 96751 2REEDS 69.0 CKT 1	36	99.5	105.4	52688 CARTHAG5 161 to 59479 LAR382 5 161 CKT1
05SP	SWPA-AECI	52690 CARTHG 269.0 to 96751 2REEDS 69.0 CKT 1	36	100.0	104.4	59208 NEVADA 5 161 to 59216 BUTLER 5 161 CKT1
05SP	SWPA-AECI	52690 CARTHG 269.0 to 96751 2REEDS 69.0 CKT 1	36	99.9	104.3	96101 5MORGAN 161 to 96782 2MORGAN 69.0 CKT1
05SP	MIPU-AECI	59217 WINDSR 5 161 to 96071 5CLINTN 161 CKT 1	123	97.2	101.2	59242 CLINTON5 161 to 96071 5CLINTN 161 CKT1
05SP	MIPU-AECI	59217 WINDSR 5 161 to 96071 5CLINTN 161 CKT 1	123	96.6	100.1	58064 NORTON-5 161 to 96105 5NORTON 161 CKT1
05SP	AECI-AECI	96071 5CLINTN 161 to 96692 2CLINTN 69.0 CKT 3	56	99.9	100.5	96071 5CLINTN 161 to 96692 2CLINTN 69.0 CKT1
05SP	EES-EES	97487 4MT.ZION 138 to 97480 L558T485 138 CKT 1	206	88.4	101.5	97454 4WALDEN 138 to 97514 4GRIMES 138 CKT1
05SP	EES-EES	97514 4GRIMES 138 to 97454 4WALDEN 138 CKT 1	206	90.1	100.6	97487 4MT.ZION 138 to 97514 4GRIMES 138 CKT1
05SP	EES-EES	97514 4GRIMES 138 to 97487 4MT.ZION 138 CKT 1	206	93.1	106.2	97454 4WALDEN 138 to 97514 4GRIMES 138 CKT1
05SP	EES-EES	97514 4GRIMES 138 to 97487 4MT.ZION 138 CKT 1	206	90.9	103.2	97454 4WALDEN 138 to 97469 4APRIL 138 CKT1
05SP	EES-EES	97514 4GRIMES 138 to 97487 4MT.ZION 138 CKT 1	206	89.5	101.8	97469 4APRIL 138 to 97470 4LFOREST 138 CKT1
05SP	EES-EES	97686 4LEACH 138 to 97618 4NEWTONB 138 CKT 1	144.6	97.7	107.3	53526 CROCKET7 345 to 97513 7GRIMES 345 CKT1
05SP	EES-EES	97686 4LEACH 138 to 97618 4NEWTONB 138 CKT 1	144.6	93.8	103.7	50037 COOPER 4 138 to 50098 LEESV 4 138 CKT1
05SP	EES-EES	97686 4LEACH 138 to 97618 4NEWTONB 138 CKT 1	144.6	92.0	101.0	53526 CROCKET7 345 to 53637 TENRUSK7 345 CKT1
05SP	EES-EES	97708 4TOLEDO 138 to 97686 4LEACH 138 CKT 1	144.6	98.8	108.4	53526 CROCKET7 345 to 97513 7GRIMES 345 CKT1
05SP	EES-EES	97708 4TOLEDO 138 to 97686 4LEACH 138 CKT 1	144.6	94.9	104.9	50037 COOPER 4 138 to 50098 LEESV 4 138 CKT1
05SP	EES-EES	97708 4TOLEDO 138 to 97686 4LEACH 138 CKT 1	144.6	93.1	102.1	53526 CROCKET7 345 to 53637 TENRUSK7 345 CKT1
05SP	EES-EES	99389 4MURFRE 138 to 99387 3MURF-S 115 CKT 1	60	91.9	116.9	53424 LONGWD 7 345 to 99294 7ELDEHV 345 CKT1
05SP	EES-EES	99389 4MURFRE 138 to 99387 3MURF-S 115 CKT 1	60	91.9	116.8	99294 7ELDEHV 345 to 99295 8ELDEHV 500 CKT1
05SP	EES-EES	99389 4MURFRE 138 to 99387 3MURF-S 115 CKT 1	60	84.7	108.0	53526 CROCKET7 345 to 97513 7GRIMES 345 CKT1
05WP	CELE-EES	50024 CARROLL4 138 to 99167 3RINGLD 115 CKT 1	125	93.6	103.4	50027 CLARN 6 230 to 50126 MESSICK6 230 CKT1
05WP	CELE-CELE	50031 COCODR 6 230 to 50039 COUGH 4 138 CKT 1	386	97.8	102.5	50203 VILPLT 6 230 to 50214 WSTFORK6 230 CKT1
05WP	CELE-CELE	50039 COUGH 4 138 to 50031 COCODR 6 230 CKT 1	386	95.8	100.5	50214 WSTFORK6 230 to 50310 PMOUTON6 230 CKT1
05WP	SWPA-AECI	52690 CARTHG 269.0 to 96751 2REEDS 69.0 CKT 1	43	97.7	102.6	52688 CARTHAG5 161 to 59479 LAR382 5 161 CKT1
05WP	EES-EES	97920 6PPG 23 230 to 98051 2PPC NO 69.0 CKT 1	160	94.7	104.6	97920 6PPG 23 230 to 98052 2PPC SO 69.0 CKT1
05WP	EES-EES	97920 6PPG 23 230 to 98052 2PPC NO 69.0 CKT 1	160	94.7	104.7	97920 6PPG 23 230 to 98051 2PPC NO 69.0 CKT1
05WP	EES-EES	99146 3STERL 115 to 99137 3WALGRV 115 CKT 2	238	99.7	101.7	99137 3WALGRV 115 to 99146 3STERL 115 CKT1
05WP	EES-CELE	99167 3RINGLD 115 to 50024 CARROLL4 138 CKT 1	125	98.9	108.7	50023 CARROLL6 230 to 50126 MESSICK6 230 CKT1
05WP	EES-EES	99167 3RINGLD 115 to 99168 3SAILES 115 CKT 1	115	96.4	107.3	50023 CARROLL6 230 to 50126 MESSICK6 230 CKT1
05WP	EES-EES	99167 3RINGLD 115 to 99168 3SAILES 115 CKT 1	115	91.4	102.4	50027 CLARN 6 230 to 50126 MESSICK6 230 CKT1
05WP	EES-EES	99389 4MURFRE 138 to 99387 3MURF-S 115 CKT 1	60	95.5	120.7	53424 LONGWD 7 345 to 99294 7ELDEHV 345 CKT1
05WP	EES-EES	99389 4MURFRE 138 to 99387 3MURF-S 115 CKT 1	60	95.4	120.5	99294 7ELDEHV 345 to 99295 8ELDEHV 500 CKT1
05WP	EES-EES	99389 4MURFRE 138 to 99387 3MURF-S 115 CKT 1	60	80.3	104.2	53526 CROCKET7 345 to 97513 7GRIMES 345 CKT1
08SP	CELE-EES	50024 CARROLL4 138 to 99167 3RINGLD 115 CKT 1	125	98.8	107.1	99294 7ELDEHV 345 to 99295 8ELDEHV 500 CKT1
08SP	CELE-EES	50024 CARROLL4 138 to 99167 3RINGLD 115 CKT 1	125	98.6	106.7	53424 LONGWD 7 345 to 99294 7ELDEHV 345 CKT1
08SP	SWPA-AECI	52690 CARTHG 269.0 to 96649 2JASPER 69.0 CKT 1	47	99.6	102.0	96070 5CLARK 161 to 96802 2CLARK 69.0 CKT1
08SP	SWPA-AECI	52690 CARTHG 269.0 to 96649 2JASPER 69.0 CKT 1	47	98.6	101.4	59216 BUTLER 5 161 to 59240 ADRIAN 5 161 CKT1
08SP	SWPA-AECI	52690 CARTHG 269.0 to 96751 2REEDS 69.0 CKT 1	36	97.7	101.8	59473 RDS295 5 161 to 59492 RDS424 5 161 CKT1
08SP	SWPA-AECI	52690 CARTHG 269.0 to 96751 2REEDS 69.0 CKT 1	36	97.4	101.6	59468 AUR124 5 161 to 59473 RDS295 5 161 CKT1
08SP	SWPA-AECI	52690 CARTHG 269.0 to 96751 2REEDS 69.0 CKT 1	36	97.2	101.6	59536 ASH121 269.0 to 59586 WIL445 269.0 CKT1
08SP	MIPU-AECI	59217 WINDSR 5 161 to 96071 5CLINTN 161 CKT 1	123	99.4	103.5	59307 NEVPLT 269.0 to 59308 NEVADA 269.0 CKT1
08SP	MIPU-AECI	59217 WINDSR 5 161 to 96071 5CLINTN 161 CKT 1	123	99.4	103.4	96126 5MOBTAP 161 to 96499 5HINTON 161 CKT1
08SP	MIPU-AECI	59217 WINDSR 5 161 to 96071 5CLINTN 161 CKT 1	123	99.3	103.4	96064 5CAMDEN 161 to 97077 5WHISPR 161 CKT1
08SP	AECI-AECI	96081 5GAINES 161 to 97090 2GNSVL2 69.0 CKT 1	56	99.2	101.0	52660 BULL SH5 161 to 99825 5MIDWAY# 161 CKT1
08SP	AECI-AECI	96110 5PITTSV 161 to 96331 2PITTSV 69.0 CKT 1	50	99.7	100.5	96124 5HOLDEN 161 to 96336 2HOLDEN 69.0 CKT1
08SP	EES-EES	97454 4WALDEN 138 to 97469 4APRIL 138 CKT 1	206	94.5	104.6	97487 4MT.ZION 138 to 97514 4GRIMES 138 CKT1
08SP	EES-EES	97454 4WALDEN 138 to 97469 4APRIL 138 CKT 1	206	92.5	102.6	97480 L558T485 138 to 97487 4MT.ZION 138 CKT1
08SP	EES-EES	97454 4WALDEN 138 to 97469 4APRIL 138 CKT 1	206	90.2	100.3	97480 L558T485 138 to 97484 4HUNTSVL 138 CKT1
08SP	EES-EES	97469 4APRIL 138 to 97470 4LFOREST 138 CKT 1	206	90.3	100.5	97487 4MT.ZION 138 to 97514 4GRIMES 138 CKT1
08SP	EES-EES	97480 L558T485 138 to 97484 4HUNTSVL 138 CKT 1	206	93.0	105.2	97454 4WALDEN 138 to 97514 4GRIMES 138 CKT1

**Table 2 - continued** - Non - SPP facility overloads caused by the AEPW to EES 620MW transfer from 4/1/2003 to 4/1/2013

Study Year	From Area - To Area	Branch Over 100% Rate B	Rate B	BC %Loading	TC %Loading	Outaged Branch That Caused Overload
08SP	EES-EES	97480 L558T485 138 to 97484 4HUNTSVL 138 CKT 1	206	90.1	102.3	97454 4WALDEN 138 to 97469 4APRIL 138 CKT1
08SP	EES-EES	97480 L558T485 138 to 97484 4HUNTSVL 138 CKT 1	206	88.3	100.6	97469 4APRIL 138 to 97470 4LFOREST 138 CKT1
08SP	EES-EES	97487 4MT.ZION 138 to 97480 L558T485 138 CKT 1	206	99.7	111.8	97454 4WALDEN 138 to 97514 4GRIMES 138 CKT1
08SP	EES-EES	97487 4MT.ZION 138 to 97480 L558T485 138 CKT 1	206	96.8	108.9	97454 4WALDEN 138 to 97469 4APRIL 138 CKT1
08SP	EES-EES	97487 4MT.ZION 138 to 97480 L558T485 138 CKT 1	206	95.0	107.1	97469 4APRIL 138 to 97470 4LFOREST 138 CKT1
08SP	EES-EES	97513 7GRIMES 345 to 97514 4GRIMES 138 CKT 1	525	99.8	108.4	97513 7GRIMES 345 to 97514 4GRIMES 138 CKT2
08SP	EES-EES	97513 7GRIMES 345 to 97514 4GRIMES 138 CKT 2	525	99.8	108.4	97513 7GRIMES 345 to 97514 4GRIMES 138 CKT1
08SP	EES-EES	97514 4GRIMES 138 to 97454 4WALDEN 138 CKT 1	206	99.5	109.5	97480 L558T485 138 to 97487 4MT.ZION 138 CKT1
08SP	EES-EES	97514 4GRIMES 138 to 97454 4WALDEN 138 CKT 1	206	97.1	107.2	97480 L558T485 138 to 97484 4HUNTSVL 138 CKT1
08SP	EES-EES	97514 4GRIMES 138 to 97454 4WALDEN 138 CKT 1	206	95.9	104.4	97514 4GRIMES 138 to 97526 4MAG AND 138 CKT1
08SP	EES-EES	97514 4GRIMES 138 to 97487 4MT.ZION 138 CKT 1	206	98.4	110.4	97470 4LFOREST 138 to 97539 4WDHAVN 138 CKT1
08SP	EES-EES	97514 4GRIMES 138 to 97487 4MT.ZION 138 CKT 1	206	97.5	109.5	97459 4CONROE 138 to 97539 4WDHAVN 138 CKT1
08SP	EES-EES	97514 4GRIMES 138 to 97487 4MT.ZION 138 CKT 1	206	97.1	108.0	97514 4GRIMES 138 to 97526 4MAG AND 138 CKT1
08SP	EES-EES	97686 4LEACH 138 to 97618 4NEWTOMB 138 CKT 1	144.6	98.0	105.2	97691 8CYPRESS 500 to 97717 8HARTBRG 500 CKT1
08SP	EES-EES	97698 4JASPER 138 to 97704 4RAYBURN 138 CKT 1	112	94.8	102.3	53526 CROCKET7 345 to 97513 7GRIMES 345 CKT1
08SP	EES-EES	97708 4TOLEDO 138 to 97686 4LEACH 138 CKT 1	144.6	99.3	106.6	97691 8CYPRESS 500 to 97717 8HARTBRG 500 CKT1
08SP	EES-EES	97920 6PPG 23 230 to 98051 2PPC NO 69.0 CKT 1	160	94.6	100.3	97920 6PPG 23 230 to 98052 2PPC SO 69.0 CKT1
08SP	EES-EES	97920 6PPG 23 230 to 98052 2PPC SO 69.0 CKT 1	160	94.7	100.4	97920 6PPG 23 230 to 98051 2PPC NO 69.0 CKT1
08SP	EES-EES	99167 3RINGLD 115 to 99168 3SAILES 115 CKT 1	115	94.7	104.4	99294 7ELDEHV 345 to 99295 8ELDEHV 500 CKT1
08SP	EES-EES	99167 3RINGLD 115 to 99168 3SAILES 115 CKT 1	115	94.7	104.2	53424 LONGWD 7 345 to 99294 7ELDEHV 345 CKT1
08SP	EES-EES	99230 3COUCH 115 to 99310 3MCNEIL 115 CKT 1	167	87.4	100.5	99230 3COUCH 115 to 99280 3TAYLOR 115 CKT99
08SP	EES-EES	99263 3LEWIS # 115 to 99230 3COUCH 115 CKT 1	159	98.6	119.1	53615 WELSH 7 345 to 53620 WILKES 7 345 CKT1
08SP	EES-EES	99263 3LEWIS # 115 to 99230 3COUCH 115 CKT 1	159	98.5	119.0	53454 SW SHV 7 345 to 53528 DIANA 7 345 CKT1
08SP	EES-EES	99263 3LEWIS # 115 to 99230 3COUCH 115 CKT 1	159	97.2	118.4	53609 LEBROCK7 345 to 53637 TENRUSK7 345 CKT1
08SP	EES-EES	99303 3PATMOS# 115 to 99263 3LEWIS # 115 CKT 1	159	99.0	118.4	99627 8KEO 50 500 to 99788 8WV-EHV 500 CKT1
08SP	EES-EES	99303 3PATMOS# 115 to 99263 3LEWIS # 115 CKT 1	159	99.8	118.3	99162 8MTOLIV 500 to 99295 8ELDEHV 500 CKT1
08SP	EES-EES	99303 3PATMOS# 115 to 99263 3LEWIS # 115 CKT 1	159	97.7	117.0	97691 8CYPRESS 500 to 97717 8HARTBRG 500 CKT1
08SP	EES-EES	99389 4MURFRE 138 to 99387 3MURF-S 115 CKT 1	60	99.9	122.9	53526 CROCKET7 345 to 97513 7GRIMES 345 CKT1
08SP	EES-EES	99389 4MURFRE 138 to 99387 3MURF-S 115 CKT 1	60	96.1	118.9	53526 CROCKET7 345 to 53637 TENRUSK7 345 CKT1
08SP	EES-EES	99389 4MURFRE 138 to 99387 3MURF-S 115 CKT 1	60	89.8	112.7	53374 FULTON 3 115 to 99303 3PATMOS# 115 CKT1
08SP	EES-SWPA	99825 5MIDWAY# 161 to 52660 BULL SH5 161 CKT 1	162	96.4	102.9	31798 SWEETWTR 161 to 96077 5FLETCH 161 CKT1
08SP	EES-SWPA	99825 5MIDWAY# 161 to 52660 BULL SH5 161 CKT 1	162	96.4	102.3	52660 BULL SH5 161 to 99802 5BULLSH* 161 CKT1
08SP	EES-SWPA	99825 5MIDWAY# 161 to 52660 BULL SH5 161 CKT 1	162	96.3	102.2	52660 BULL SH5 161 to 96081 5GAINES 161 CKT1
08SP	EES-EES	99825 5MIDWAY# 161 to 99827 5MT HOM 161 CKT 1	162	90.9	102.3	52660 BULL SH5 161 to 52661 BUFRDTP5 161 CKT1
08SP	EES-EES	99825 5MIDWAY# 161 to 99827 5MT HOM 161 CKT 1	162	89.9	101.2	52648 NORFORK5 161 to 52661 BUFRDTP5 161 CKT1
08WP	AMRN-AMRN	31408 OVERTON 345 to 31409 OVERTON 161 CKT 1	300	99.7	100.6	59209 SEDALIA5 161 to 59217 WINDSR 5 161 CKT1
08WP	AMRN-AMRN	31408 OVERTON 345 to 31409 OVERTON 161 CKT 1	300	99.6	100.2	96552 2EDMONS 161 to 96555 5GRAVOI 161 CKT1
08WP	IP-MEC	32415 GALESBRG 138 to 64411 GALESBR5 161 CKT 2	100	98.0	101.0	64411 GALESBR5 161 to 32415 GALESBRG 138 CKT1
08WP	CELE-CELE	50045 DOLHILL7 345 to 50046 DOLHILL6 230 CKT 1	700	92.6	100.8	53526 CROCKET7 345 to 97513 7GRIMES 345 CKT1
08WP	SWPA-AECI	52690 CARTHG 269.0 to 96751 2REEDS 69.0 CKT 1	43	99.6	104.1	59481 MON383 7 345 to 59984 BRKLINE 7 345 CKT1
08WP	SWPA-AECI	52690 CARTHG 269.0 to 96751 2REEDS 69.0 CKT 1	43	99.4	103.9	53140 FLINTCR7 345 to 59481 MON383 7 345 CKT1
08WP	SWPA-AECI	52690 CARTHG 269.0 to 96751 2REEDS 69.0 CKT 1	43	98.5	103.3	52688 CARTHAG5 161 to 59479 LAR382 5 161 CKT1
08WP	AECI-AMRN	96096 5MARIES 161 to 31024 MARIES 138 CKT 1	100	99.5	100.1	96088 5HUBEN 161 to 97077 5WHISPR 161 CKT1
08WP	EES-EES	97453 4DOBBIN 138 to 97457 4LONGMIR 138 CKT 1	112	92.9	105.1	97454 4WALDEN 138 to 97514 4GRIMES 138 CKT1
08WP	EES-EES	97453 4DOBBIN 138 to 97457 4LONGMIR 138 CKT 1	112	91.1	103.2	97454 4WALDEN 138 to 97469 4APRIL 138 CKT1
08WP	EES-EES	97453 4DOBBIN 138 to 97457 4LONGMIR 138 CKT 1	112	90.0	102.1	97469 4APRIL 138 to 97470 4LFOREST 138 CKT1
08WP	EES-EES	97454 4WALDEN 138 to 97469 4APRIL 138 CKT 1	206	100.0	107.2	97458 4CONAIR 138 to 97462 L523T587 138 CKT1
08WP	EES-EES	97454 4WALDEN 138 to 97469 4APRIL 138 CKT 1	206	100.0	107.2	97459 4CONROE 138 to 97462 L523T587 138 CKT1
08WP	EES-EES	97454 4WALDEN 138 to 97469 4APRIL 138 CKT 1	206	99.7	107.2	97531 4APOLLO 138 to 97534 4SPLENDR 138 CKT1
08WP	EES-EES	97469 4APRIL 138 to 97470 4LFOREST 138 CKT 1	206	100.0	109.3	53424 LONGWD 7 345 to 99294 7ELDEHV 345 CKT1
08WP	EES-EES	97469 4APRIL 138 to 97470 4LFOREST 138 CKT 1	206	100.0	109.2	99294 7ELDEHV 345 to 99295 8ELDEHV 500 CKT1
08WP	EES-EES	97469 4APRIL 138 to 97470 4LFOREST 138 CKT 1	206	99.5	108.1	97488 4TEMCO 138 to 97519 4GEORGIA 138 CKT1
08WP	EES-EES	97470 4LFOREST 138 to 97539 4WDHAVN 138 CKT 1	206	98.7	108.4	97717 8HARTBRG 500 to 99162 8MTOLIV 500 CKT1
08WP	EES-EES	97470 4LFOREST 138 to 97539 4WDHAVN 138 CKT 1	206	99.9	108.2	98107 8RICHARD 500 to 98430 8WVBR 500 CKT1
08WP	EES-EES	97470 4LFOREST 138 to 97539 4WDHAVN 138 CKT 1	206	98.2	107.1	97508 4NAVSOTA 138 to 97522 4TUBULAR 138 CKT1
08WP	EES-EES	97480 L558T485 138 to 97484 4HUNTSVL 138 CKT 1	206	99.2	111.3	50045 DOLHILL7 345 to 50046 DOLHILL6 230 CKT1

**Table 2 - continued** - Non - SPP facility overloads caused by the AEPW to EES 620MW transfer from 4/1/2003 to 4/1/2013

Study Year	From Area - To Area	Branch Over 100% Rate B	Rate B	BC %Loading	TC %Loading	Outaged Branch That Caused Overload
08WP	EES-EES	97480 L558T485 138 to 97484 4HUNTSVL 138 CKT 1	206	99.3	110.5	97453 4DOBBIN 138 to 97522 4TUBULAR 138 CKT1
08WP	EES-EES	97480 L558T485 138 to 97484 4HUNTSVL 138 CKT 1	206	97.2	109.3	53424 LONGWD 7 345 to 99294 7ELDEHV 345 CKT1
08WP	EES-EES	97487 4MT.ZION 138 to 97480 L558T485 138 CKT 1	206	99.0	110.0	97453 4DOBBIN 138 to 97457 4LONGMIR 138 CKT1
08WP	EES-EES	97487 4MT.ZION 138 to 97480 L558T485 138 CKT 1	206	98.0	107.5	97481 4CEDAR 138 to 97512 4PEE DEE 138 CKT1
08WP	EES-EES	97487 4MT.ZION 138 to 97480 L558T485 138 CKT 1	206	97.3	106.9	97481 4CEDAR 138 to 97482 4CINCINT 138 CKT1
08WP	EES-EES	97510 4SOTA 1 138 to 97508 4NAVSOTA 138 CKT 1	206	98.5	105.2	97454 4WALDEN 138 to 97514 4GRIMES 138 CKT1
08WP	EES-EES	97510 4SOTA 1 138 to 97508 4NAVSOTA 138 CKT 1	206	97.5	104.1	97454 4WALDEN 138 to 97469 4APRIL 138 CKT1
08WP	EES-EES	97510 4SOTA 1 138 to 97508 4NAVSOTA 138 CKT 1	206	97.0	103.6	97487 4MT.ZION 138 to 97514 4GRIMES 138 CKT1
08WP	EES-EES	97514 4GRIMES 138 to 97454 4WALDEN 138 CKT 1	206	99.9	108.0	50027 CLARN 6 230 to 50126 MESSICK6 230 CKT1
08WP	EES-EES	97514 4GRIMES 138 to 97454 4WALDEN 138 CKT 1	206	99.8	107.9	99230 3COUCH 115 to 99263 3LEWIS # 115 CKT1
08WP	EES-EES	97514 4GRIMES 138 to 97454 4WALDEN 138 CKT 1	206	99.6	107.8	55224 MUSKOGEE7 345 to 55302 FTSMITH7 345 CKT1
08WP	EES-EES	97514 4GRIMES 138 to 97487 4MT.ZION 138 CKT 1	206	98.8	108.9	97482 4CINCINT 138 to 97530 4WALKER 138 CKT1
08WP	EES-EES	97514 4GRIMES 138 to 97487 4MT.ZION 138 CKT 1	206	98.5	108.0	97690 4CYPRESS 138 to 97697 4HONEY 138 CKT1
08WP	EES-EES	97514 4GRIMES 138 to 97487 4MT.ZION 138 CKT 1	206	97.6	108.0	53424 LONGWD 7 345 to 53620 WILKES 7 345 CKT1
08WP	EES-EES	97514 4GRIMES 138 to 97526 4MAG AND 138 CKT 1	206	99.2	105.8	97454 4WALDEN 138 to 97469 4APRIL 138 CKT1
08WP	EES-EES	97514 4GRIMES 138 to 97526 4MAG AND 138 CKT 1	206	98.8	105.3	97487 4MT.ZION 138 to 97514 4GRIMES 138 CKT1
08WP	EES-EES	97514 4GRIMES 138 to 97526 4MAG AND 138 CKT 1	206	98.6	105.2	97469 4APRIL 138 to 97470 4LFOREST 138 CKT1
08WP	EES-EES	97526 4MAG AND 138 to 97510 4SOTA 1 138 CKT 1	206	99.6	106.3	97454 4WALDEN 138 to 97514 4GRIMES 138 CKT1
08WP	EES-EES	97526 4MAG AND 138 to 97510 4SOTA 1 138 CKT 1	206	98.6	105.2	97454 4WALDEN 138 to 97469 4APRIL 138 CKT1
08WP	EES-EES	97526 4MAG AND 138 to 97510 4SOTA 1 138 CKT 1	206	98.1	104.7	97487 4MT.ZION 138 to 97514 4GRIMES 138 CKT1
08WP	EES-EES	97539 4WDHAVN 138 to 97459 4CONROE 138 CKT 1	206	97.5	107.2	97717 8HARTBRG 500 to 99162 8MTOLIV 500 CKT1
08WP	EES-EES	97539 4WDHAVN 138 to 97459 4CONROE 138 CKT 1	206	98.7	107.0	98107 8RICHARD 500 to 98430 8WEBRE 500 CKT1
08WP	EES-EES	97539 4WDHAVN 138 to 97459 4CONROE 138 CKT 1	206	97.0	105.9	97508 4NAVSOTA 138 to 97522 4TUBULAR 138 CKT1
08WP	EES-EES	97686 4LEACH 138 to 97618 4NEWTONB 138 CKT 1	144.6	97.8	107.9	99294 7ELDEHV 345 to 99295 8ELDEHV 500 CKT1
08WP	EES-EES	97686 4LEACH 138 to 97618 4NEWTONB 138 CKT 1	144.6	97.8	107.9	53424 LONGWD 7 345 to 99294 7ELDEHV 345 CKT1
08WP	EES-EES	97686 4LEACH 138 to 97618 4NEWTONB 138 CKT 1	144.6	98.4	107.3	99162 8MTOLIV 500 to 99295 8ELDEHV 500 CKT1
08WP	EES-EES	97708 4TOLEDO 138 to 97686 4LEACH 138 CKT 1	144.6	98.5	108.7	99294 7ELDEHV 345 to 99295 8ELDEHV 500 CKT1
08WP	EES-EES	97708 4TOLEDO 138 to 97686 4LEACH 138 CKT 1	144.6	98.5	108.6	53424 LONGWD 7 345 to 99294 7ELDEHV 345 CKT1
08WP	EES-EES	97708 4TOLEDO 138 to 97686 4LEACH 138 CKT 1	144.6	99.1	108.0	99162 8MTOLIV 500 to 99295 8ELDEHV 500 CKT1
08WP	EES-EES	97920 6PPG 23 230 to 97919 6VERDINE 230 CKT 1	470	99.2	101.8	97917 6NLSO 230 to 97921 6CARLYSS 230 CKT1
08WP	EES-EES	99263 3LEWIS # 115 to 99230 3COUCH 115 CKT 1	159	99.3	125.4	53424 LONGWD 7 345 to 99294 7ELDEHV 345 CKT1
08WP	EES-EES	99263 3LEWIS # 115 to 99230 3COUCH 115 CKT 1	159	99.2	125.2	99294 7ELDEHV 345 to 99295 8ELDEHV 500 CKT1
08WP	EES-EES	99263 3LEWIS # 115 to 99230 3COUCH 115 CKT 1	159	92.0	114.7	50045 DOLHILL7 345 to 50046 DOLHILL6 230 CKT1
08WP	EES-EES	99303 3PATMOS# 115 to 99263 3LEWIS # 115 CKT 1	159	95.8	117.5	53424 LONGWD 7 345 to 53620 WILKES 7 345 CKT1
08WP	EES-EES	99303 3PATMOS# 115 to 99263 3LEWIS # 115 CKT 1	159	88.3	110.6	55224 MUSKOGEE7 345 to 55302 FTSMITH7 345 CKT1
08WP	EES-EES	99303 3PATMOS# 115 to 99263 3LEWIS # 115 CKT 1	159	89.3	110.2	53609 LEBROCK7 345 to 53637 TENRUSK7 345 CKT1
08WP	EES-EES	99389 4MURFRE 138 to 99387 3MURF-S 115 CKT 1	60	82.6	107.0	53526 CROCKET7 345 to 97513 7GRIMES 345 CKT1
08WP	EES-EES	99389 4MURFRE 138 to 99387 3MURF-S 115 CKT 1	60	77.3	104.3	53424 LONGWD 7 345 to 99294 7ELDEHV 345 CKT1
08WP	EES-EES	99389 4MURFRE 138 to 99387 3MURF-S 115 CKT 1	60	77.1	104.1	99294 7ELDEHV 345 to 99295 8ELDEHV 500 CKT1



**Table 3** – Facility Upgrades Required Due to Addition of Upgrades Assigned to 620MW Transfer

Study Year	Branch Over 100% Rate B	Rate B	BC % Loading Without Upgrades	BC % Loading With Upgrades	TC % Loading Without Upgrades	TC % Loading With Upgrades	Outaged Branch Causing Overload	ATC (MW)	Comment	Assignment	Cost
03SP	STILWELL TO BUCYRUS, 161KV 57969 STILWEL5 161 58057 BUCYRUS5 161 CKT1	224	19.9	91.8	22.1	96.0	LACYGNE TO STILWELL, 345KV 57981 LACYGNE7 345 to 57968 STILWEL7 345 CKT 1	620	Upgrade needed due to Linn County Substation included to relieve La Cygne to Stilwell overload at OMW ATC	Rebuild Bucyrus line terminal - Upgrade may not be needed	\$ 6,000
05SP	TONTITOWN TO ELM SPRINGS, 161KV 53170 TONTITN5 161 53194 ELMSPRR5 161 1	306	106.3	107.6	107.1	108.5	DYESS TO TONTITOWN, 161KV 53131 DYESS 5161 TO 53170 TONTITN5161 CKT 1	0	Upgrade Needed due to upgrade of Tontitown to Chamber Springs at 151MW ATC	Replace Switch and Elm Springs Strain Bus	\$ 100,000
05SP	PAOLA TO CENTENNIAL, 161KV 58067 CENTENL5 161 58069 PAOLA 5 161 1	174	51.8	146.3	54.8	151.4	STILWELL TO LA CYGNE, 345KV 57968 STILWEL7345 TO 57981 LACYGNE7345 CKT 1	620	Upgrade needed due to Linn County Substation included to relieve La Cygne to Stilwell overload at OMW ATC	Rebuild Paola substation by KCPL	\$ -
05WP	PAOLA TO CENTENNIAL, 161KV 58067 CENTENL5 161 58069 PAOLA 5 161 1	192	31.7	112.6	34.2	117.0	STILWELL TO LA CYGNE, 345KV 57968 STILWEL7345 TO 57981 LACYGNE7345 CKT 1	620	Upgrade needed due to Linn County Substation included to relieve La Cygne to Stilwell overload at OMW ATC	Rebuild Paola substation by KCPL	\$ -
08SP	BROKEN ARROW 101ST NORTH TO ONETA, 138KV 53781 BA101-N4 138 53818 ONETA--4 138 1	210	104.7	103.1	104.8	103.2	MUSKOGEE TAP TO MUSKOGEE 52758 MUSKTAP5161 TO BUS 55222 MUSKOGEE5161 CKT 1	0	Upgrade Needed due to upgrade of Broken Arrow to Oneta at OMW ATC	Replace Wavetrapp	\$ 30,000
08SP	GORE TO SALISAW, 161KV 52750 SALISAW5 161 52752 GORE 5 161 1	189	82.7	84.5	98.3	100.4	MUSKOGEE TO FORT SMITH, 345KV 55224 MUSKOGEE7345 TO 55302 FTSMITH7345 CKT 1	604	Upgrade needed due to upgrade of Muskogee Tap to Gore at 317MW ATC	Increase clearances of approximately ten spans	\$ 500,000
08SP	LINDSAY TO LINDSAY SW, 69KV 55977 LINDSAY269.0 55979 LNDYSW269.0 1	26	31.9	102.1	31.9	101.7	FLETCHER TO MARLOW JCT, 69KV 55911 FLETCHR269 TO 55990 MARLOWJ269 CKT 1	0	Upgrade needed due to addition of Payne Switching Station included to relieve the Cyril to Anadarko overload at OMW ATC	Expedite WFEC Reconductor 8.0 miles with 556 ACSR.	\$ -
08SP	MUSKOGEE TAP TO GORE, 161KV 52752 GORE 5 161 52758 MUSKTAP5 161 1	206	85.5	93	98.3	106.7	MUSKOGEE TO FORT SMITH, 345KV 55224 MUSKOGEE7345 TO 55302 FTSMITH7345 CKT 1	317	Upgrade needed due to addition of 2nd Pecan Creek transformer included to relieve the Pecan Creek 345/161kV transformer overload at OMW ATC	Reconductor 16 miles with 795ACSR	\$ 4,000,000
08SP	OSAGE TO CONTINENTAL BLACKS, 69KV 54742 OSAGE 269.0 54763 CONBLKS269.0 1	111	94.8	95.5	99.4	100.3	KILDARE TO WHITE EAGLE, 138KV 54760 KILDARE4138 TO 54761 WHEAGLE4138 CKT 1	581	Upgrade needed due to assigned upgrades for 620 MW transfer	Rebuild 0.57 miles with 795ACSR, Replace Wavetrapp, & Reset CTs	\$ 255,000
08SP	PECAN CREEK TO MUSKOGEE, 345KV 55224 MUSKOGEE7 345 55235 PECANCK7 345 1	478	84.8	98.1	93.9	108.8	MUSKOGEE TO FORT SMITH, 345KV 55224 MUSKOGEE7345 TO 55302 FTSMITH7345 CKT 1	110	Upgrade needed due to addition of 2nd Pecan Creek transformer included to relieve the Pecan Creek 345/161kV transformer overload at OMW ATC	Change CT Ratio @ Pecan Creek.	\$ 2,500
08SP	ROCK HILL 138/69KV TRANSFORMER CKT1 53597 ROKHILL269.0 53598 ROKHILL4 138 1	46	99.3	101.2	98.9	100.8	BLOCKER TAP TO MARSHALL, 69KV 53516 BLOCKRT269 TO 53570 MARSHAL269 CKT 1	0	Upgrade needed due to upgrade of Cherokee to Tatum and Tatum to Rockhill at OMW ATC	Add 3rd Rock Hill 138/69KV 46MVA Unit	\$ 1,400,000
08SP	ROCK HILL 138/69KV TRANSFORMER CKT2 53597 ROKHILL269.0 53598 ROKHILL4 138 2	46	99.8	101.6	99.4	101.3	BLOCKER TAP TO MARSHALL, 69KV 53516 BLOCKRT269 TO 53570 MARSHAL269 CKT 1	0	Upgrade needed due to upgrade of Cherokee to Tatum and Tatum to Rockhill at OMW ATC	See Previous Upgrade for Rock Hill 138/69KV Ckt 1	\$ -
08SP	TAHLEQUAH TO HWY 59, 161KV 54455 TAHLQH 5 161 55347 HWY59 5 161 1	167	81.6	83.9	99.6	102.1	MUSKOGEE TO FORT SMITH, 345KV 55224 MUSKOGEE7345 TO 55302 FTSMITH7345 CKT 1	548	Upgrade needed due to addition of 2nd Pecan Creek transformer included to relieve the Pecan Creek 345/161kV transformer overload at OMW ATC	Remove switches & replace structures.	\$ 30,000

**Table 3-continued** – Facility Upgrades Required Due to Addition of Upgrades Assigned to 620MW Transfer

Study Year	Branch Over 100% Rate B	Rate B	BC % Loading Without Upgrades	BC % Loading With Upgrades	TC % Loading Without Upgrades	TC % Loading With Upgrades	Outaged Branch Causing Overload	ATC (MW)	Comment	Assignment	Cost
08SP	TONTITOWN TO ELM SPRINGS, 161KV 53170 TONTITN5 161 53194 ELMSPRR5 161 1	306	114.6	115.9	115.2	116.5	DYESS TO TONTITOWN, 161KV 53131 DYESS 5161 TO 53170 TONTITN5161 CKT 1	0	Upgrade Needed due to upgrade of Tontitown to Chamber Springs at 236MW ATC and Chamber Springs transformer at 167MW ATC	See Previous	\$ -
08SP	EUREKA SPRINGS TO BEAVER DAM, 161KV 52680 BEAVER 5 161 53136 EUREKA 5 161 1	286	N/A	90.8	N/A	100.8	Multiple Outage Contingency MONETT TO BROOKLINE, 345KV 59481 MON383 7 345 to 59984 BRKLINE 7 345 CKT1 FLINT CREEK TO MONETT, 345KV 53140 FLINTCR7 345 to 59481 MON383 7 345 CKT1	570	Upgrade needed due to assigned upgrades for 620 MW transfer	AEPW SWPA Reconductor 6 miles with 1590ACSR.	\$ 1,860,000

Total Cost \$ 8,177,500

**Table 4** – Facility Overloads Caused by AEPW to EES 620MW Transfer from 4/1/2003 to 4/1/2013 with 465MW ERCOTE to EES Annulment

Study Year	From Area - To Area	Branch Over 100% RateB	Rate B	BC %Loading	TC %Loading	Outaged Branch That Caused Overload	ATC	Comments	Cost
03AP	WERE-WERE	GREEN TO COFFEY COUNTY 4, 69KV 57636 GREEN 269.0 to 57631 CC4VERN269.0 CKT 1	45	99.4	102.0	WOLF CREEK TO LA CYGNE, 345KV 56797 WOLFCKR7 345 to 57981 LACYGNE7 345 CKT1	620	Westar Transmission Operating Directive 1304.	\$ -
03AP	WERE-WERE	COFFEY CNTY #4 VERNON TO ATHENS SW. STA., 69KV 57631 CC4VERN269.0 to 57623 ATHENS 269.0 CKT 1	45	98.8	101.4	WOLF CREEK TO LA CYGNE, 345KV 56797 WOLFCKR7 345 to 57981 LACYGNE7 345 CKT1	620	"	\$ -
03G	OKGE-OKGE	PECAN CREEK 345/161KV TRANSFORMER 55235 PECANCK7 345 to 55234 PECANCK5 161 CKT 1	369	88.3	100.1	MUSKOGEE TO FORT SMITH, 345KV 55224 MUSKOGEE7 345 to 55302 FTSMITH7 345 CKT1	616	Add 2nd 345/161 kV 369MVA unit Upgrade Causes Muskogee Tap-Gore-Salisaw 161kV, Tahlequah-Highway 59 161kV, &Pecan Creek-Muskogee 345kV lines to Overload in 08SP	\$ 3,000,000
03G	WERE-WERE	GREEN TO COFFEY COUNTY 4, 69KV 57636 GREEN 269.0 to 57631 CC4VERN269.0 CKT 1	45	103.5	106.2	WOLF CREEK TO LA CYGNE, 345KV 56797 WOLFCKR7 345 to 57981 LACYGNE7 345 CKT1	620	Westar Transmission Operating Directive 1304.	\$ -
03G	WERE-WERE	COFFEY CNTY #4 VERNON TO ATHENS SW. STA., 69KV 57631 CC4VERN269.0 to 57623 ATHENS 269.0 CKT 1	45	102.1	104.9	WOLF CREEK TO LA CYGNE, 345KV 56797 WOLFCKR7 345 to 57981 LACYGNE7 345 CKT1	620	"	\$ -
03SP	OKGE-OKGE	DRAPER 345/138KV TRANSFORMER 1 54934 DRAPER 7 345 to 54933 DRAPER 4 138 CKT 1	493	101.2	106.3	DRAPER 345/138KV TRANSFORMER 2 54933 DRAPER 4 138 to 54934 DRAPER 7 345 CKT2	0	Flowgate: OKGE Mitigation Plan to Increase Rating to 591 MVA by 2004	\$ -
03SP	OKGE-OKGE	DRAPER 345/138KV TRANSFORMER 2 54934 DRAPER 7 345 to 54933 DRAPER 4 138 CKT 2	493	101.2	106.3	DRAPER 345/138KV TRANSFORMER 1 54934 DRAPER 7 345 to 54933 DRAPER 4 138 CKT1	0	Flowgate: OKGE Mitigation Plan to Increase Rating to 591 MVA by 2004	\$ -
03SP	KACP-KACP	LA CYGNE TO STILWELL, 345KV 57981 LACYGNE7 345 to 57968 STILWEL7 345 CKT 1	1251	106.0	109.3	WEST GARDNER TO LA CYGNE, 345KV 57965 W.GRDNR7 345 to 57981 LACYGNE7 345 CKT1	0	Linn County Project Relieves Facility	\$ 6,945,000
03SP	AEPW-AEPW	CHAMBER SPRINGS TO DYESS, 161KV 53154 CHAMSPR5 161 to 53131 DYESS 5 161 CKT 1	247	99.8	102.6	FLINT CREEK TO ELM SPRINGS REC, 161KV 53139 FLINTCR5 161 to 53194 ELMSPRR5 161 CKT1	48	Relieved by AEP Tontitown Project - Estimated In-Service Date 6/1/2004	\$ -
03SP	WERE-WERE	CRESWELL TO PARIS, 69KV 57543 CRESWLN269.0 to 57548 PARIS 269.0 CKT 1	80	99.6	101.4	CRESWELL TO OAK, 69KV 57543 CRESWLN269.0 to 57547 OAK 269.0 CKT1	132	Expedite Rebuild 5.7mile line assigned to SPP-2000-003 Scheduled In Service Date 6/1/04	\$ -
03SP	AEPW-AEPW	GENTRY REC TO FLINT CREEK, 161KV 53187 GENTRYR5 161 to 53139 FLINTCR5 161 CKT 1	353	98.8	101.9	DYESS TO EAST ROGERS, 161KV 53131 DYESS 5 161 to 53135 EROGERS5 161 CKT1	242	Relieved by AEP Tontitown Project - Estimated In-Service Date 6/1/2004	\$ -

**Table 4 - continued** – Facility Overloads Caused by AEPW to EES 620MW Transfer from 4/1/2003 to 4/1/2013 with 465MW ERCOTE to EES Annulment

Study Year	From Area - To Area	Branch Over 100% RateB	Rate B	BC %Loading	TC %Loading	Outaged Branch That Caused Overload	ATC	Comments	Cost
03SP	AEPW-AEPW	CHEROKEE REC TO KNOX LEE, 138KV 53522 CHEROKE4 138 to 53557 KNOXLEE4 138 CKT 1	209	96.9	103.5	Multiple Outage Contingency SOUTHWEST SHREVEPORT TO LONGWOOD, 345KV 53454 SW SHV 7 345 to 53424 LONGWD 7 345 CKT 1 SOUTHWEST SHREVEPORT TO DIANA, 345KV 53454 SW SHV 7 345 to 53528 DIANA 7 345 CKT 1	293	Reconductor 3.25 miles of 666 ACSR with 1272 ACSR	\$ 981,000
03SP	AEPW-AEPW	DYESS TO EAST ROGERS, 161KV 53131 DYESS 5 161 to 53135 EROGERS5 161 CKT 1	244	97.5	102.3	GENTRY REC TO FLINT CREEK, 161KV 53139 FLINTCR5 161 to 53187 GENTRYR5 161 CKT1	323	Relieved by AEP Tontitown Project - Estimated In-Service Date 6/1/2004	\$ -
03SP	EMDE-EMDE	REPUBLIC EAST TO BILLINGS NORTHEAST, 69KV 59580 REP359 269.0 to 59546 BIL221 269.0 CKT 1	38	99.5	100.4	BLACKHAWK JCT TO JAMESV, 69KV 59604 BHJ415 269.0 to 96673 2JAMESV 69.0 CKT1	350	In-house plans to reconductor in 2004 for own needs due to outage of Black Hawk JCT - Jamesville.	\$ -
03SP	EMDE-EMDE	ORONOGO JCT. TO JOPLIN OAKLAND NORTH, 161KV 59467 ORO110 5 161 to 59494 OAK432 5 161 CKT 1	214	97.3	100.5	TIPTON FORD TO JOPLIN SOUTHWEST, 161KV 59472 TIP292 5 161 to 59483 JOP389 5 161 CKT1	531	Reconstruct and replace 1.4 miles of 556 ACSR with Bundled 556 ACSR	\$ 800,000
03SP	AEPW-AEPW	DYESS TO EAST ROGERS, 161KV 53131 DYESS 5 161 to 53135 EROGERS5 161 CKT 1	244	95.6	100.4	EAST CENTERTON TO GENTRY REC, 161KV 53133 ECNTRTN5 161 to 53187 GENTRYR5 161 CKT1	568	Relieved by AEP Tontitown Project - Estimated In-Service Date 6/1/2004	\$ -
03SP	SWPA-AECI	CARTHAGE TO REEDS SPRING, 69KV 52690 CARTHG 269.0 to 96751 2REEDS 69.0 CKT 1	36	115.9	121.7	AURORA TO MONETT, 161KV 59468 AUR124 5 161 to 59480 MON383 5 161 CKT1	N/A	Third Party	\$ -
03SP	EES-SWPA	MIDWAY TO BULL SHOALS, 161KV 99825 5MIDWAY# 161 to 52660 BULL SH5 161 CKT 1	162	108.3	119.4	BUFORD TAP TO BULL SHOALS, 161KV 52661 BUFDRTP5 161 to 52660 BULL SH5 161 CKT1	N/A	Third Party Facility with SWPA Terminal Equip Limitations Replace disconnect switches, metering CTs and wave trap at Bull Shoals by SPA.	\$ 150,000
03FA	SWPA-AEPW	BROKEN BOW TO CRAIG JCT, 138KV 52814 BRKN BW4 138 to 54015 CRAIGJT4 138 CKT 1	122	97.8	107.3	BBDAMTP TO MOUNTAIN RIVER, 138KV 55823 BBDAMTP4 138 to 56004 MTRIVER4 138 CKT1	144	SWPA: Reconnect metering CTs to 800/5 ratio. AEPW: Rebuild 7.66 miles of 3/0 CW CU with 795 ACSR	\$ 2,700,000
03FA	SWPA-AEPW	BROKEN BOW TO CRAIG JCT, 138KV 52814 BRKN BW4 138 to 54015 CRAIGJT4 138 CKT 1	122	95.4	105.0	CRAIG JCT TO MOUNTAIN RIVER, 138KV 54015 CRAIGJT4 138 to 56004 MTRIVER4 138 CKT1	296	See Previous	\$ -
03FA	WERE-WERE	GREEN TO COFFEY COUNTY 4, 69KV 57636 GREEN 269.0 to 57631 CC4VERN269.0 CKT 1	45	98.1	100.9	WOLF CREEK TO LA CYGNE, 345KV 56797 WOLFCKR7 345 to 57981 LACYGNE7 345 CKT1	620	Westar Transmission Operating Directive 1304.	\$ -

**Table 4 - continued** – Facility Overloads Caused by AEPW to EES 620MW Transfer from 4/1/2003 to 4/1/2013 with 465MW ERCOTE to EES Annulment

Study Year	From Area - To Area	Branch Over 100% RateB	Rate B	BC %Loading	TC %Loading	Outaged Branch That Caused Overload	ATC	Comments	Cost
03FA	SWPA-EES	MIDWAY TO BULL SHOALS, 161KV 52660 BULL SH5 161 to 99825 5MIDWAY# 161 CKT 1	162	94.3	106.0	BUFORD TAP TO BULL SHOALS, 161KV 52661 BUFRDTP5 161 to 52660 BULL SH5 161 CKT1	N/A	See Previous	\$ -
03WP	AEPW-AEPW	PERDUE TO DIANA, 138KV 53590 PERDUE 4 138 to 53527 DIANA 4 138 CKT 1	237	99.2	100.2	HARRISON ROAD TO LIBERTY CITY TAP, 138KV 53542 HARRISN4 138 to 53561 LIBCYTP4 138 CKT1	491	Replace Breaker 10070 @ Perdue	\$ 150,000
03WP	OKGE-OKGE	PECAN CREEK 345/161KV TRANSFORMER 55235 PECANCK7 345 to 55234 PECANCK5 161 CKT 1	369	89.7	101.7	MUSKOGEE TO FORT SMITH, 345KV 55224 MUSKOGEE7 345 to 55302 FTSMITH7 345 CKT1	533	See Previous	\$ -
03WP	SWPA-AECI	CARTHAGE TO REEDS SPRING, 69KV 52690 CARTHG 269.0 to 96751 2REEDS 69.0 CKT 1	43	99.0	103.8	AURORA TO MONETT, 161KV 59468 AUR124 5 161 to 59480 MON383 5 161 CKT1	N/A	Third Party	\$ -
04G	OKGE-OKGE	PECAN CREEK 345/161KV TRANSFORMER 55235 PECANCK7 345 to 55234 PECANCK5 161 CKT 1	369	89.4	101.3	MUSKOGEE TO FORT SMITH, 345KV 55224 MUSKOGEE7 345 to 55302 FTSMITH7 345 CKT1	550	See Previous	\$ -
04G	WERE-WERE	TECUMSEH HILL 230/115/13.8KV TRANSFORMER 57182* TECHILE3 115 536 WND 2 1	69	99.6	100.3	KELLY TO KING HILL N.M. COOP, 115KV 57217 KELLY 3115 to 57331 KING HL3115 CKT1	620	Transmission Operating Directive for the overload of the Tecumseh Hill 161/115/13.8kV xfrm.	\$ -
04G	SWPA-SWPA	LENCOE TO NORFORK, 161KV 52646 GLENCOE5 161 to 52648 NORFORK5 161 CKT 1	112	97.8	102.7	NEW-IN TO NEWPO, 161KV 99763 5NEW-IN 161 to 99764 5NEWPO 161 CKT1	620	Remove wave trap. Switch relaying channel to fiber optic shield wire. To be completed by SWPA for own needs.	\$ -
04G	SWPA-SWPA	LENCOE TO NORFORK, 161KV 52646 GLENCOE5 161 to 52648 NORFORK5 161 CKT 1	112	97.2	102.1	NEW-AB TO NEW-IN, 161KV 99762 5NEW-AB 161 to 99763 5NEW-IN 161 CKT1	620	"	\$ -
04G	SWPA-SWPA	LENCOE TO NORFORK, 161KV 52646 GLENCOE5 161 to 52648 NORFORK5 161 CKT 1	112	96.5	101.4	CASH TO NEW-AB, 161KV 99736 5CASH 1 161 to 99762 5NEW-AB 161 CKT1	620	"	\$ -
04G	SWPA-EES	MIDWAY TO BULL SHOALS, 161KV 52660 BULL SH5 161 to 99825 5MIDWAY# 161 CKT 1	162	88.3	100.1	BUFORD TAP TO BULL SHOALS, 161KV 52661 BUFRDTP5 161 to 52660 BULL SH5 161 CKT1	N/A	See Previous	\$ -
05SP	AEPW-AEPW	PITTSBURG TO LONE STAR SOUTH, 138KV 53311 PITTSB_4 138 to 53276 LSSOUTH4 138 CKT 1	197	104.9	105.6	PETTY TO CHAPEL HILL REC, 138KV 53308 PETTY 4 138 to 53521 CHAPELH4 138 CKT1	0	Reset CT @ Pittsburg	\$ 10,000

**Table 4 - continued** – Facility Overloads Caused by AEPW to EES 620MW Transfer from 4/1/2003 to 4/1/2013 with 465MW ERCOTE to EES Annulment

Study Year	From Area - To Area	Branch Over 100% RateB	Rate B	BC %Loading	TC %Loading	Outaged Branch That Caused Overload	ATC	Comments	Cost
05SP	AEPW-AEPW	CHEROKEE REC TO KNOX LEE, 138KV 53522 CHEROKE4 138 to 53557 KNOXLEE4 138 CKT 1	209	104.9	111.9	Multiple Outage Contingency SOUTHWEST SHREVEPORT TO LONGWOOD, 345KV 53454 SW SHV 7 345 to 53424 LONGWD 7 345 CKT 1 SOUTHWEST SHREVEPORT TO DIANA, 345KV 53454 SW SHV 7 345 to 53528 DIANA 7 345 CKT 1	0	See Previous	\$ -
05SP	WERE-WERE	CRESWELL TO PARIS, 69KV 57543 CRESWLN269.0 to 57548 PARIS 269.0 CKT 1	80	106.3	108.0	CRESWELL TO OAK, 69KV 57543 CRESWLN269.0 to 57547 OAK 269.0 CKT1	0	See Previous	\$ -
05SP	KACP-KACP	LA CYGNE TO STILWELL, 345KV 57981 LACYGNE7 345 to 57968 STILWEL7 345 CKT 1	1251	103.8	107.1	WEST GARDNER TO LA CYGNE, 345KV 57981 LACYGNE7 345 to 57965 W.GRDNR7 345 CKT1	0	See Previous	\$ -
05SP	AEPW-AEPW	CHEROKEE REC TO TATUM, 138KV 53611 TATUM 4 138 to 53522 CHEROKE4 138 CKT 1	209	98.7	105.7	Multiple Outage Contingency SOUTHWEST SHREVEPORT TO LONGWOOD, 345KV 53454 SW SHV 7 345 to 53424 LONGWD 7 345 CKT 1 SOUTHWEST SHREVEPORT TO DIANA, 345KV 53454 SW SHV 7 345 to 53528 DIANA 7 345 CKT 1	113	Reconductor 6.25 miles of 666 ACSR with 1272 ACSR	\$ 1,641,000
05SP	AEPW-AEPW	CHAMBER SPRINGS TO TONTITOWN, 161KV 53154 CHAMSPR5 161 to 53170 TONTITN5 161 CKT 1	244	99.1	103.7	HYLAND TO SE FAYETTEVILLE, 161KV 53143 HYLAND 5 161 to 53153 SEFAYTV5 161 CKT1	116	Rebuild 12 miles with 2156ACSR	\$ 7,200,000
05SP	AEPW-AEPW	GENTRY REC TO FLINT CREEK, 161KV 53187 GENTRYR5 161 to 53139 FLINTCR5 161 CKT 1	353	99.6	101.7	LOWELL TO ROGERS, 161KV 53144 LOWELL 5 161 to 53152 ROGERS 5 161 CKT1	120	Rebuild 1.09 miles of 2-397.5 ACSR with 2156 ACSR.	\$ 400,000
05SP	AEPW-AEPW	CHEROKEE REC TO KNOX LEE, 138KV 53522 CHEROKE4 138 to 53557 KNOXLEE4 138 CKT 1	209	99.4	101.5	KEATCHIE TO GEORGIA-PACIFIC, 138KV 53418 KEATCHI4 138 to 53536 GEORPAC4 138 CKT1	181	See Previous	\$ -
05SP	AEPW-AEPW	GENTRY REC TO EAST CENTERTON, 161KV 53187 GENTRYR5 161 to 53133 ECNTRTN5 161 CKT 1	353	99.4	101.5	LOWELL TO TONTITOWN, 161KV 53144 LOWELL 5 161 to 53170 TONTITN5 161 CKT1	182	Rebuild 19.16 miles of 2-397.5 ACSR with 2156 ACSR.	\$ 8,000,000
05SP	SPRM-SPRM	LOGAN TO CLAY, 161KV 97161 5LOGAN 161 to 59970 CLAY 5 161 CKT 1	185	95.0	108.9	Multiple Outage Contingency FRANKS TO HUBEN, 345KV 96041 7FRANKS 345 to 96042 7HUBEN 345 CKT1 HUBEN TO MORGAN, 345KV 96042 7HUBEN 345 to 96045 7MORGAN 345 CKT1	223	Replace transmission line structures to allow operation at 100C	\$ 250,000

**Table 4 - continued** – Facility Overloads Caused by AEPW to EES 620MW Transfer from 4/1/2003 to 4/1/2013 with 465MW ERCOTE to EES Annulment

Study Year	From Area - To Area	Branch Over 100% RateB	Rate B	BC %Loading	TC %Loading	Outaged Branch That Caused Overload	ATC	Comments	Cost
05SP	AEPW-AEPW	TATUM TO ROCKHILL, 138KV 53611 TATUM 4 138 to 53598 ROKHILL4 138 CKT 1	209	97.0	104.0	Multiple Outage Contingency SOUTHWEST SHREVEPORT TO LONGWOOD, 345KV 53454 SW SHV 7 345 to 53424 LONGWD 7 345 CKT 1 SOUTHWEST SHREVEPORT TO DIANA, 345KV 53454 SW SHV 7 345 to 53528 DIANA 7 345 CKT 1	266	Reconductor 0.81 miles 666MCM to 1272 ACSR	\$ 342,970
05SP	EMDE-EMDE	ORONOJO JCT. TO JOPLIN OAKLAND NORTH, 161KV 59467 ORO110 5 161 to 59494 OAK432 5 161 CKT 1	214	98.5	101.9	TIPTON FORD TO JOPLIN SOUTHWEST, 161KV 59472 TIP292 5 161 to 59483 JOP389 5 161 CKT1	276	See Previous	\$ -
05SP	AEPW-AEPW	CHEROKEE REC TO KNOX LEE, 138KV 53522 CHEROKE4 138 to 53557 KNOXLEE4 138 CKT 1	209	97.5	103.0	LONGWOOD TO WILKES, 345KV 53424 LONGWD 7 345 to 53620 WILKES 7 345 CKT1	278	See Previous	\$ -
05SP	AEPW-WFEC	SOUTHWEST STATION TO ANADARKO, 138KV 54140 S.W.S.-4 138 to 55814 ANADARK4 138 CKT 1	203	99.4	100.7	CORNVILLE TO NORTH 29TH CHICKASHA, 138KV 54112 CORNVIL4 138 to 54165 N29CHIC4 138 CKT1	280	Replace bus, jumpers, switches, supports and foundations at Anadarko Switch Station	\$ 450,000
05SP	AEPW-AEPW	FARMINGTON AECC TO CHAMBER SPRINGS, 161KV 53195 FARMGTN5 161 to 53154 CHAMSPR5 161 CKT 1	335	99.4	100.5	DYESS TO SOUTH SPRINGDALE, 161KV 53131 DYESS 5 161 to 53159 SOSPRDL5 161 CKT1	328	Replace Switch	\$ 60,000
05SP	OKGE-OKGE	PECAN CREEK 345/161KV TRANSFORMER 55235 PECANCK7 345 to 55234 PECANCK5 161 CKT 1	369	93.7	105.5	MUSKOGEE TO FORT SMITH, 345KV 55224 MUSKOGEE7 345 to 55302 FTSMITH7 345 CKT1	330	See Previous	\$ -
05SP	AEPW-AEPW	CHAMBER SPRINGS TO TONTITOWN, 161KV 53154 CHAMSPR5 161 to 53170 TONTITN5 161 CKT 1	244	97.3	102.1	FLINT CREEK TO GRDA, 345KV 53140 FLINTCR7 345 to 54450 GRDA1 7 345 CKT1	346	See Previous	\$ -
05SP	AEPW-AEPW	BANN TO ALUMAX TAP, 138KV 53250 BANN 4 138 to 53245 ALUMXT 4 138 CKT 1	261	97.2	101.9	NW TEXARKANA - BANN TO NW TEXARKANA, 138KV 53299 NWT-BNT4 138 to 53300 NWTXARK4 138 CKT1	369	Replace six (6) 138 kV switches, five at Bann & one at Alumax Tap. Rebuild 0.67 miles of 1024 ACAR with 2156 ACSR. Replace wavetrap jumpers @ Bann. Replace breaker 3300 @ Bann	\$ 630,000
05SP	AEPW-WFEC	SOUTHWEST STATION TO ANADARKO, 138KV 54140 S.W.S.-4 138 to 55814 ANADARK4 138 CKT 1	203	98.9	100.7	CORNVILLE TO CORN TAP, 138KV 54112 CORNVIL4 138 to 55867 CORN TP4 138 CKT1	376	See Previous	\$ -
05SP	OKGE-OKGE	FACTORY TO 3RD ST, 69KV 55292 FACTORY269.0 to 55307 3RDST 269.0 CKT 1	96	99.7	100.2	VAN BUREN AVEC TO VBI, 69KV 55298 VBAVEC 269.0 to 55336 VBI 269.0 CKT1	390	Replace 800A Trap & Increase CT Ratio to 1200-5A.	\$ 30,000
05SP	AEPW-AEPW	CHEROKEE REC TO KNOX LEE, 138KV 53522 CHEROKE4 138 to 53557 KNOXLEE4 138 CKT 1	209	97.8	101.0	BLOCKER TAP TO MARSHALL, 69KV 53516 BLOCKRT269.0 to 53570 MARSHAL269.0 CKT1	429	See Previous	\$ -

**Table 4 - continued** – Facility Overloads Caused by AEPW to EES 620MW Transfer from 4/1/2003 to 4/1/2013 with 465MW ERCOTE to EES Annulment

Study Year	From Area - To Area	Branch Over 100% RateB	Rate B	BC %Loading	TC %Loading	Outaged Branch That Caused Overload	ATC	Comments	Cost
05SP	AEPW-AEPW	LONGWOOD TO NORAM, 138KV 53423 LONGWD 4 138 to 53473 NORAM 4 138 CKT 1	234	96.1	100.9	Multiple Outage Contingency SOUTHWEST SHREVEPORT TO LONGWOOD, 345KV 53454 SW SHV 7 345 to 53424 LONGWD 7 345 CKT 1 SOUTHWEST SHREVEPORT TO DIANA, 345KV 53454 SW SHV 7 345 to 53528 DIANA 7 345 CKT 1	502	Reconductor 4.66 miles of bundled 266 ACSR with 1590 ACSR & replace jumpers	\$ 1,577,000
05SP	WERE-WERE	CRESWELL TO OAK, 69KV 57543 CRESWLN269.0 to 57547 OAK 269.0 CKT 1	90	100.6	102.3	CRESWELL TO PARIS, 69KV 57543 CRESWLN269.0 to 57548 PARIS 269.0 CKT1	620	Previous upgrade assignment of "Replacement of jumpers and resetting CTs and relaying" to KMEA in SPP-2000-004	\$ -
05SP	OKGE-OKGE	GLASSES TO RUSSETT, 138KV 55147 GLASSES4 138 to 55120 RUSSETT4 138 CKT 1	96	98.8	100.3	BROWN TO BROWN, 138KV 52802 S BROWN4 138 to 55157 BROWN 4 138 CKT1	620	Replace 400Amp Wave Trap at Russett in 2003 at OKGE's expense.	\$ -
05SP	EMDE-EMDE	AURORA H.T. 161/69/12.5KV TRANSFORMER 59468* AUR124 5 161 544 WND 1 AURORA3 3	41.7	100.2	101.1	MONETT 161/69/12.5KV TRANSFORMER 59480 MON383 5161 to 59591 MON383 269.0 to 59712 MON383 112.5 CKT1	620	Replace 3 transformers with one 150MVA unit at EDE expense by 6/1/2003.	\$ -
05SP	EMDE-EMDE	AURORA H.T. 161/69/12.5KV TRANSFORMER 59537* AUR124 269.0 544 WND 2 AURORA3 3	41.7	99.1	100.4	MONETT 161/69/12.5KV TRANSFORMER 59480 MON383 5161 to 59591 MON383 269.0 to 59712 MON383 112.5 CKT1	620	"	\$ -
05SP	WERE-WERE	COUNTY LINE 115/69/34/5KV TRANSFORMER 57456* COLINE 269.0 536 WND 2 COLINE5X 1	66	98.7	100.4	HOYT TO STRANGER,345KV 56765 HOYT 7345 to 56772 STRANGR7345 CKT1	620	Westar Transmission Operating Directive 803	\$ -
05SP	OKGE-OKGE	DRAPER 345/138KV TRANSFORMER 1 54934 DRAPER 7 345 to 54933 DRAPER 4 138 CKT 1	493	102.8	108.0	DRAPER 345/138KV TRANSFORMER 2 54933 DRAPER 4 138 to 54934 DRAPER 7 345 CKT2	620	Flowgate: OKGE Mitigation Plan to Increase Rating to 591 MVA by 2004	\$ -
05SP	OKGE-OKGE	DRAPER 345/138KV TRANSFORMER 2 54934 DRAPER 7 345 to 54933 DRAPER 4 138 CKT 2	493	102.8	108.0	DRAPER 345/138KV TRANSFORMER 1 54934 DRAPER 7 345 to 54933 DRAPER 4 138 CKT1	620	Flowgate: OKGE Mitigation Plan to Increase Rating to 591 MVA by 2004	\$ -
05SP	AEPW-AEPW	DYESS TO CHAMBER SPRINGS, 161KV 53131 DYESS 5 161 to 53154 CHAMSPR5 161 CKT 1	247	97.8	101.1	GENTRY REC TO FLINT CREEK, 161KV 53139 FLINTCR5 161 to 53187 GENTRYR5 161 CKT1	620	Relieved by AEP Tontitown Project - Estimated In-Service Date 6/1/2004	\$ -
05SP	AEPW-AEPW	DYESS TO CHAMBER SPRINGS, 161KV 53131 DYESS 5 161 to 53154 CHAMSPR5 161 CKT 1	247	97.0	100.2	EAST CENTERTON TO GENTRY REC, 161KV 53133 ECNTRTN5 161 to 53187 GENTRYR5 161 CKT1	620	"	\$ -



**Table 4 - continued** – Facility Overloads Caused by AEPW to EES 620MW Transfer from 4/1/2003 to 4/1/2013 with 465MW ERCOTE to EES Annulment

Study Year	From Area - To Area	Branch Over 100% RateB	Rate B	BC %Loading	TC %Loading	Outaged Branch That Caused Overload	ATC	Comments	Cost
05SP	AEPW-AEPW	DYESS TO EAST ROGERS, 161KV 53131 DYESS 5 161 to 53135 EROGERS5 161 CKT 1	244	109.6	114.3	GENTRY REC TO FLINT CREEK, 161KV 53139 FLINTCR5 161 to 53187 GENTRYR5 161 CKT1	620	Relieved by AEP Tontitown Project - Estimated In-Service Date 6/1/2004	\$ -
05SP	AEPW-AEPW	DYESS TO EAST ROGERS, 161KV 53131 DYESS 5 161 to 53135 EROGERS5 161 CKT 1	244	107.2	112.0	EAST CENTERTON TO GENTRY REC, 161KV 53133 ECNTRTN5 161 to 53187 GENTRYR5 161 CKT1	620	"	\$ -
05SP	AEPW-AEPW	EAST CENTERTON TO GENTRY REC, 161KV 53133 ECNTRTN5 161 to 53187 GENTRYR5 161 CKT 1	353	99.0	101.2	FLINT CREEK TO DECATUR SOUTH, 161KV 53139 FLINTCR5 161 to 59484 DEC392 5 161 CKT1	620	Relieved by AEP Tontitown Project - Estimated In-Service Date 6/1/2004	\$ -
05SP	AEPW-AEPW	EAST CENTERTON TO GENTRY REC, 161KV 53133 ECNTRTN5 161 to 53187 GENTRYR5 161 CKT 1	353	98.1	100.3	ROGERS TO LOWELL REC, 161KV 53152 ROGERS 269.0 to 53200 LOWELLR269.0 CKT1	620	"	\$ -
05SP	AEPW-AEPW	EAST CENTERTON TO GENTRY REC, 161KV 53133 ECNTRTN5 161 to 53187 GENTRYR5 161 CKT 1	353	98.1	100.3	LOWELL TO LOWELLR, 69KV 53144 LOWELL 269.0 to 53200 LOWELLR269.0 CKT1	620	"	\$ -
05SP	AEPW-AEPW	GENTRY REC TO FLINT CREEK, 161KV 53187 GENTRYR5 161 to 53139 FLINTCR5 161 CKT 1	353	99.8	102.0	CHAMBER SPRINGS ROAD 345/161KV 53154 CHAMSPR5 161 to 53155 CHAMSPR7 345 CKT1	620	Relieved by AEP Tontitown Project - Estimated In-Service Date 6/1/2004	\$ -
05SP	AEPW-AEPW	GENTRY REC TO FLINT CREEK, 161KV 53187 GENTRYR5 161 to 53139 FLINTCR5 161 CKT 1	353	99.8	102.0	CHAMBER SPRINGS TO CLARKSVILLE, 345KV 53155 CHAMSPR7 345 to 53756 CLARKSV7 345 CKT1	620	"	\$ -
05SP	AEPW-AEPW	GENTRY REC TO FLINT CREEK, 161KV 53187 GENTRYR5 161 to 53139 FLINTCR5 161 CKT 1	353	99.8	101.9	DECATUR SOUTH TO NOEL SOUTHWEST, 161KV 59484 DEC392 5 161 to 59496 NOL435 5 161 CKT1	620	"	\$ -
05SP	AEPW-AEPW	GENTRY REC TO FLINT CREEK, 161KV 53187 GENTRYR5 161 to 53139 FLINTCR5 161 CKT 1	353	99.8	102.0	NEOSHO SOUTH JCT TO NOEL SOUTHWEST, 161KV 59471 NEO184 5 161 to 59496 NOL435 5 161 CKT1	620	"	\$ -
05SP	AEPW-AEPW	LOWELL TO SPRINGDALE T, 69KV 53144 LOWELL 269.0 to 53161 SPRDALT269.0 CKT 1	107	99.5	102.0	EAST CENTERTON TO GENTRY REC, 161KV 53133 ECNTRTN5 161 to 53187 GENTRYR5 161 CKT1	620	Relieved by AEP Tontitown Project - Estimated In-Service Date 6/1/2004	\$ -
05SP	SWPA-AECI	CARTHAGE TO REEDS SPRING, 69KV 52690 CARTHG 269.0 to 96751 2REEDS 69.0 CKT 1	36	117.6	123.4	AURORA TO MONETT, 161KV 59468 AUR124 5 161 to 59480 MON383 5 161 CKT1	N/A	Third Party	\$ -
05SP	EES-SWPA	MIDWAY TO BULL SHOALS, 161KV 99825 5MIDWAY# 161 to 52660 BULL SH5 161 CKT 1	162	109.4	120.3	BUFORD TAP TO BULL SHOALS, 161KV 52661 BUFDRTP5 161 to 52660 BULL SH5 161 CKT1	N/A	See Previous	\$ -

**Table 4 - continued** – Facility Overloads Caused by AEPW to EES 620MW Transfer from 4/1/2003 to 4/1/2013 with 465MW ERCOTE to EES Annulment

Study Year	From Area - To Area	Branch Over 100% RateB	Rate B	BC %Loading	TC %Loading	Outaged Branch That Caused Overload	ATC	Comments	Cost
05WP	SPRM-SPRM	LOGAN TO CLAY, 161KV 97161 5LOGAN 161 to 59970 CLAY 5 161 CKT 1	232	95.2	105.7	Multiple Outage Contingency FRANKS TO HUBEN, 345KV 96041 7FRANKS 345 to 96042 7HUBEN 345 CKT1 HUBEN TO MORGAN, 345KV 96042 7HUBEN 345 to 96045 7MORGAN 345 CKT1	283	See Previous	\$ -
05WP	SPRM-SPRM	CLAY TO SPRINGFIELD, 161KV 59970 CLAY 5 161 to 52692 SPRGFLD5 161 CKT 1	167	95.8	103.7	Multiple Outage Contingency FRANKS TO HUBEN, 345KV 96041 7FRANKS 345 to 96042 7HUBEN 345 CKT1 HUBEN TO MORGAN, 345KV 96042 7HUBEN 345 to 96045 7MORGAN 345 CKT1	330	Replace disconnect switches at Springfield	\$ 200,000
05WP	SWPA-SWPA	SPRINGFIELD 161/69KV TRANSFORMER 3 52692 SPRGFLD5 161 to 52694 SPRGFLD269.0 CKT 3	25	91.0	101.2	SPRINGFIELD 161/69KV TRANSFORMER 1 52692 SPRGFLD5 161 to 52694 SPRGFLD269.0 CKT1	546	Replace 25MVA transformer #3 with 80MVA transformer	\$ 1,300,000
05WP	SWPA-AECI	CARTHAGE TO REEDS SPRING, 69KV 52690 CARTHG 269.0 to 96751 2REEDS 69.0 CKT 1	43	102.1	106.8	AURORA TO MONETT, 161KV 59468 AUR124 5 161 to 59480 MON383 5 161 CKT1	N/A	Third Party Facility	\$ -
08SP	WERE-WERE	HOYT HTI SW. JCT. TO CIRCLEVILLE, 115KV 57165 HTI JCT3 115 to 57152 CIRCLVL3 115 CKT 1	92	100.5	103.1	IATAN TO ST JOE, 345KV 57982 IATAN 7 345 to 59199 ST JOE 3 345 CKT1	0	Replace 82 structures	\$ 742,000
08SP	SWPA-SWPA	SPRINGFIELD 161/69KV TRANSFORMER 3 52692 SPRGFLD5 161 to 52694 SPRGFLD269.0 CKT 3	25	100.1	101.6	JUNCTION TO BROOKLINE, 161KV 59955 JUNCTN 5 161 to 59969 BRKLINE 5 161 CKT1	0	See Previous	\$ -
08SP	AEPW-AEPW	PITTSBURG TO LONE STAR SOUTH, 138KV 53311 PITTSB_4 138 to 53276 LSSOUTH4 138 CKT 1	197	113.8	114.6	PETTY TO CHAPEL HILL REC, 138KV 53308 PETTY 4 138 to 53521 CHAPELH4 138 CKT1	0	See Previous	\$ -
08SP	AEPW-AEPW	LONGWOOD TO NORAM, 138KV 53423 LONGWD 4 138 to 53473 NORAM 4 138 CKT 1	234	104.8	109.6	Multiple Outage Contingency SOUTHWEST SHREVEPORT TO LONGWOOD, 345KV 53454 SW SHV 7 345 to 53424 LONGWD 7 345 CKT 1 SOUTHWEST SHREVEPORT TO DIANA, 345KV 53454 SW SHV 7 345 to 53528 DIANA 7 345 CKT 1	0	See Previous	\$ -

**Table 4 - continued** – Facility Overloads Caused by AEPW to EES 620MW Transfer from 4/1/2003 to 4/1/2013 with 465MW ERCOTE to EES Annulment

Study Year	From Area - To Area	Branch Over 100% RateB	Rate B	BC %Loading	TC %Loading	Outaged Branch That Caused Overload	ATC	Comments	Cost
08SP	AEPW-AEPW	NORAM TO RAINES, 138KV 53473 NORAM 4 138 to 53439 RAINES 4 138 CKT 1	234	103.5	108.3	Multiple Outage Contingency SOUTHWEST SHREVEPORT TO LONGWOOD, 345KV 53454 SW SHV 7 345 to 53424 LONGWD 7 345 CKT 1 SOUTHWEST SHREVEPORT TO DIANA, 345KV 53454 SW SHV 7 345 to 53528 DIANA 7 345 CKT 1	0	Rebuild 5.58 miles of 2-266 ACSR with 1590 ACSR.	\$ 2,000,000
08SP	AEPW-AEPW	CHEROKEE REC TO KNOX LEE, 138KV 53522 CHEROKE4 138 to 53557 KNOXLEE4 138 CKT 1	209	108.5	115.5	Multiple Outage Contingency SOUTHWEST SHREVEPORT TO LONGWOOD, 345KV 53454 SW SHV 7 345 to 53424 LONGWD 7 345 CKT 1 SOUTHWEST SHREVEPORT TO DIANA, 345KV 53454 SW SHV 7 345 to 53528 DIANA 7 345 CKT 1	0	See Previous	\$ -
08SP	AEPW-AEPW	OAK HILL TO KNOX LEE, 138KV 53586 OAK2HIL4 138 to 53557 KNOXLEE4 138 CKT 1	210	100.0	101.3	KILGORE REC TO MONROE CORNERS REC, 138KV 53555 KILGORR4 138 to 53574 MONROCR4 138 CKT1	0	Replace wavetrap @ Knoxlee	\$ 20,000
08SP	AEPW-AEPW	CHEROKEE REC TO TATUM, 138KV 53611 TATUM 4 138 to 53522 CHEROKE4 138 CKT 1	209	101.9	108.9	Multiple Outage Contingency SOUTHWEST SHREVEPORT TO LONGWOOD, 345KV 53454 SW SHV 7 345 to 53424 LONGWD 7 345 CKT 1 SOUTHWEST SHREVEPORT TO DIANA, 345KV 53454 SW SHV 7 345 to 53528 DIANA 7 345 CKT 1	0	See Previous	\$ -
08SP	AEPW-AEPW	TATUM TO ROCKHILL, 138KV 53611 TATUM 4 138 to 53598 ROKHILL4 138 CKT 1	209	100.0	107.0	Multiple Outage Contingency SOUTHWEST SHREVEPORT TO LONGWOOD, 345KV 53454 SW SHV 7 345 to 53424 LONGWD 7 345 CKT 1 SOUTHWEST SHREVEPORT TO DIANA, 345KV 53454 SW SHV 7 345 to 53528 DIANA 7 345 CKT 1	0	See Previous	\$ -

**Table 4 - continued** – Facility Overloads Caused by AEPW to EES 620MW Transfer from 4/1/2003 to 4/1/2013 with 465MW ERCOTE to EES Annulment

Study Year	From Area - To Area	Branch Over 100% RateB	Rate B	BC %Loading	TC %Loading	Outaged Branch That Caused Overload	ATC	Comments	Cost
08SP	GRRD-GRRD	KERR TO 412SUB, 161KV 54435 KERR GR5 161 to 54437 412SUB 5 161 CKT 1	338	101.8	105.2	FLINT CREEK TO GRDA1, 345KV 53140 FLINTCR7 345 to 54450 GRDA1 7 345 CKT1	0	Reconductor 12.5 miles with 1590MCM ACSR	\$ 1,918,000
08SP	GRRD-GRRD	412SUB TO KANSAS TAP, 161KV 54437 412SUB 5 161 to 54514 KANSATP5 161 CKT 1	338	101.1	104.5	FLINT CREEK TO GRDA1, 345KV 53140 FLINTCR7 345 to 54450 GRDA1 7 345 CKT1	0	Reconductor 9.7 miles with 1590MCM ACSR	\$ 1,488,000
08SP	OKGE-OKGE	PECAN CREEK 345/161KV TRANSFORMER 55235 PECANCK7 345 to 55234 PECANCK5 161 CKT 1	369	106.8	118.5	MUSKOGEE TO FORT SMITH, 345KV 55224 MUSKOGEE7 345 to 55302 FTSMITH7 345 CKT1	0	See Previous	\$ -
08SP	WFEC-WFEC	CYRIL TO ANADARKO, 69KV 55870 CYRIL 269.0 to 55810 ANADARK269.0 CKT 1	61	100.9	101.2	ANADARKO TO GEORGIA, 138KV 55814 ANADARK4 138 to 55923 GEORGIA4 138 CKT1	0	Expedite new Payne Sw. Station with a 70MVA autotransformer scheduled for 2010. This alternative includes expediting WFEC Lindsey - Lindsey Sw. 69kVs upgrade.	\$ -
08SP	WFEC-SWPA	PHAROAH TO WELEETKA, 138KV 56026 PHAROAH4 138 to 52792 WELEETK4 138 CKT 1	191	103.4	104.9	FRANKLIN TO FRANKLIN SWITCH, 138KV 55913 FRANKLN4 138 to 55917 FRNKLN54 138 CKT1	0	Replace wavetrap at Weleetka and replace jumpers	\$ 75,000
08SP	WERE-WERE	GILL ENERGY CENTER EAST TO MACARTHUR, 69KV 57795 GILL E 269.0 to 57813 MACARTH269.0 CKT 1	68	106.6	106.9	MACARTHUR TO OATVILLE, 69KV 57813 MACARTH269.0 to 57825 OATVILL269.0 CKT1	0	Replace sub bus and jumpers at MacArthur 69 kV	\$ 22,000
08SP	KACP-KACP	LA CYGNE TO STILWELL, 345KV 57968 STILWEL7 345 to 57981 LACYGNE7 345 CKT 1	1251	102.2	105.5	WEST GARDNER TO LA CYGNE, 345KV 57965 W.GRDNR7 345 to 57981 LACYGNE7 345 CKT1	0	See Previous	\$ -
08SP	AEPW-AEPW	CHEROKEE REC TO KNOX LEE, 138KV 53522 CHEROKE4 138 to 53557 KNOXLEE4 138 CKT 1	209	99.6	105.1	LONGWOOD TO WILKES, 345KV 53424 LONGWD 7 345 to 53620 WILKES 7 345 CKT1	43	See Previous	\$ -
08SP	AEPW-AEPW	CHEROKEE REC TO KNOX LEE, 138KV 53522 CHEROKE4 138 to 53557 KNOXLEE4 138 CKT 1	209	99.8	102.8	MARSHALL TO MARSHALL AUTO, 69KV 53570 MARSHAL269.0 to 53623 MARAUTO269.0 CKT1	51	See Previous	\$ -
08SP	GRRD-GRRD	OKAY 161/69KV TRANSFORMER 54440 OKAYGR 5 161 to 54446 OKAYGR 269.0 CKT 1	112	99.9	101.3	WAGONER 161/69KV TRANSFORMER 54497 WAGNOR 269.0 to 54500 WAGNOR 5 161 CKT1	54	Add Second 84MVA transformer @ Wagoner.	\$ 1,340,000
08SP	SWPA-SWPA	SPRINGFIELD 161/69KV TRANSFORMER 3 52692 SPRGFLD5 161 to 52694 SPRGFLD269.0 CKT 3	25	99.8	101.6	JAMES RIVER TO TWIN OAK, 69KV 59904 JRPS 269.0 to 59933 TWINOAK269.0 CKT1	63	See Previous	\$ -
08SP	AEPW-AEPW	CHAMBER SPRINGS TO TONTITOWN, 161KV 53154 CHAMSPR5 161 to 53170 TONTITN5 161 CKT 1	244	99.5	103.3	SE FAYETTEVILLE TO SOUTH FAYETTEVILLE, 161KV 53153 SEFAYTV5 161 to 53157 SFAYTVL5 161 CKT1	87	See Previous	\$ -

**Table 4 - continued** – Facility Overloads Caused by AEPW to EES 620MW Transfer from 4/1/2003 to 4/1/2013 with 465MW ERCOTE to EES Annulment

Study Year	From Area - To Area	Branch Over 100% RateB	Rate B	BC %Loading	TC %Loading	Outaged Branch That Caused Overload	ATC	Comments	Cost
08SP	EMDE-EMDE	ORONOGO JCT. TO JOPLIN OAKLAND NORTH, 161KV 59467 ORO110 5 161 to 59494 OAK432 5 161 CKT 1	214	99.5	102.7	TIPTON FORD TO JOPLIN SOUTHWEST, 161KV 59472 TIP292 5 161 to 59483 JOP389 5 161 CKT1	96	See Previous	\$ -
08SP	AEPW-EES	FULTON TO PATMOS, 115KV 53374 FULTON 3 115 to 99303 3PATMOS# 115 CKT 1	174	96.6	116.8	CROCKETT TO GRIMES, 345KV 53526 CROCKET7 345 to 97513 7GRIMES 345 CKT1	104	Recond. 7.1 miles with 1272 ACSR	\$ 2,100,000
08SP	AEPW-AEPW	BROKEN ARROW NORTH TO ONETA, 138KV 53798 BA.N-ST4 138 to 53818 ONETA--4 138 CKT 1	235	98.8	105.0	CHAMBER SPRINGS ROAD 345/161KV 53154 CHAMSPR5 161 to 53155 CHAMSPR7 345 CKT1	116	Rebuild 4.31 miles of 795 ACSR with 1590 ACSR	\$ 2,370,500
08SP	AEPW-AEPW	BROKEN ARROW NORTH TO ONETA, 138KV 53798 BA.N-ST4 138 to 53818 ONETA--4 138 CKT 1	235	98.8	105.0	CHAMBER SPRINGS TO CLARKSVILLE, 345KV 53155 CHAMSPR7 345 to 53756 CLARKSV7 345 CKT1	116	See Previous	\$ -
08SP	AEPW-AEPW	CHEROKEE REC TO KNOX LEE, 138KV 53522 CHEROKE4 138 to 53557 KNOXLEE4 138 CKT 1	209	98.6	103.3	CROCKETT TO GRIMES, 345KV 53526 CROCKET7 345 to 97513 7GRIMES 345 CKT1	183	See Previous	\$ -
08SP	AEPW-EES	FULTON TO PATMOS, 115KV 53374 FULTON 3 115 to 99303 3PATMOS# 115 CKT 1	174	93.3	113.0	CROCKETT TO TENASKA RUSK COUNTY 53526 CROCKET7 345 to 53637 TENRUSK7 345 CKT1	211	See Previous	\$ -
08SP	AEPW-EES	FULTON TO PATMOS, 115KV 53374 FULTON 3 115 to 99303 3PATMOS# 115 CKT 1	174	91.0	114.0	LONGWOOD TO ELDEHV, 345KV 53424 LONGWD 7 345 to 99294 7ELDEHV 345 CKT1	244	See Previous	\$ -
08SP	AEPW-EES	FULTON TO PATMOS, 115KV 53374 FULTON 3 115 to 99303 3PATMOS# 115 CKT 1	174	90.9	113.9	ELDEHV 500/345KV TRANSFORMER 99294 7ELDEHV 345 to 99295 8ELDEHV 500 CKT1	244	See Previous	\$ -
08SP	WFEC-OKGE	FRANKLIN TO MIDWEST, 138KV 55917 FRNKLNS4 138 to 54946 MIDWEST4 138 CKT 1	215	98.2	102.5	SUNSHINE CANYON TO TUTTLE, 138KV 56059 SUNSHIN4 138 to 56072 TUTTLE 4 138 CKT1	256	Replace 600A metering CTs with 1200A	\$ 55,000
08SP	EMDE-EMDE	REINMILLER 161/69KV TRANSFORMER 59500* RNM393 5 161 544 WND 1 REINMILL 1	75	99.4	100.5	TIPTON FORD TO JOPLIN SOUTHWEST, 161KV 59472 TIP292 5 161 TO 59483 JOP389 5 161 CKT 1	338	Replace with a 150 MVA unit	\$ 1,730,000
08SP	AEPW-AEPW	TATUM TO ROCKHILL, 138KV 53598 ROKHILL4 138 to 53611 TATUM 4 138 CKT 1	209	98.9	100.8	STONEWALL TO WESTERN ELECTRIC, 138KV 53450 STONWAL4 138 to 53464 WESTELT4 138 CKT1	353	See Previous	\$ -
08SP	AEPW-AEPW	CHAMBER SPRINGS 345/161KV TRANSFORMER 53155 CHAMSPR7 345 to 53154 CHAMSPR5 161 CKT 1	660	97.1	102.1	FLINT CREEK TO GRDA1, 345KV 53140 FLINTCR7 345 to 54450 GRDA1 7 345 CKT1	359	Install 2nd 345/161 kV unit. Note: Reconductoring Chamber Springs to Tontitown 161kV Reduces ATC	\$ 4,000,000

**Table 4 - continued** – Facility Overloads Caused by AEPW to EES 620MW Transfer from 4/1/2003 to 4/1/2013 with 465MW ERCOTE to EES Annulment

Study Year	From Area - To Area	Branch Over 100% RateB	Rate B	BC %Loading	TC %Loading	Outaged Branch That Caused Overload	ATC	Comments	Cost
08SP	OKGE-AEPW	<b>BONANZA TAP TO BONANZA, 161KV</b> 55261 BONANZT5 161 to 53126 BONANZA5 161 CKT 1	177	99.0	100.6	<b>AES TO TARBY, 161KV</b> 55262 AES 5 161 to 55264 TARBY 5 161 CKT1	389	Rebuild 0.06 miles of 397.5 ACSR with 795MCM ACSR	\$ 50,000
08SP	AEPW-AEPW	<b>CHAMBER SPRINGS TO TONTITOWN, 161KV</b> 53154 CHAMSPR5 161 to 53170 TONTITN5 161 CKT 1	244	97.3	101.2	<b>FAYETTEVILLE TO SOUTH FAYETTEVILLE, 161KV</b> 53138 FAYETVL5 161 to 53157 SFAYTVL5 161 CKT1	427	See Previous Note: Adding Second Chamber Springs 345/161KV Unit Reduces ATC Shown	\$ -
08SP	KACP-KACP	<b>STILWELL 345/161KV TRANSFORMER #1</b> 57968 STILWEL7 345 to 57969 STILWEL5 161 CKT 11	605	98.8	100.4	<b>STILWELL 345/161KV TRANSFORMER #2</b> 57968 STILWEL7 345 to 57969 STILWEL5 161 CKT22	466	Linn County Project Relieves Facility	\$ -
08SP	SPRM-AECI	<b>CLAY TO LOGAN, 161KV</b> 59970 CLAY 5 161 to 97161 5LOGAN 161 CKT 1	185	87.7	103.9	<b>HUBEN TO MORGAN, 345KV</b> 96042 7HUBEN 345 to 96045 7MORGAN 345 CKT1	472	See Previous	\$ -
08SP	AEPW-AEPW	<b>SOUTH TEXARKANA REC TO TEXARKANA PLANT, 69KV</b> 53189 STEXREC269.0 to 53329 TEXARK 269.0 CKT 1	59	96.6	101.1	<b>ATLANTA TO WEST ATLANTA, 69KV</b> 53248 ATLANTA269.0 to 53333 WATLANT269.0 CKT1	473	Rebuild 5.92 miles of 266 ACSR with 795 ACSR. Replace 4/0 CU jumpers @ Texarkana Plant	\$ 2,400,000
08SP	SWPA-SWPA	<b>SPRINGFIELD 161/69KV TRANSFORMER 1</b> 52692 SPRGFLD5 161 to 52694 SPRGFLD269.0 CKT 1	80	98.9	100.3	<b>NICHOLS 161/69KV TRANSFORMER</b> 59925 NICHOLS269.0 to 59956 NICHOLS5 161 CKT1	474	See Upgrade for Springfield #3 Transformer	\$ -
08SP	AEPW-AEPW	<b>CHAMBER SPRINGS TO TONTITOWN, 161KV</b> 53154 CHAMSPR5 161 to 53170 TONTITN5 161 CKT 1	244	96.9	100.7	<b>HYLAND TO SE FAYETTEVILLE, 161KV</b> 53143 HYLAND 5 161 to 53153 SEFAYTV5 161 CKT1	503	See Previous Note: Adding Second Chamber Springs 345/161KV Unit Reduces ATC Shown	\$ -
08SP	OKGE-OKGE	<b>PECAN CREEK 345/161KV TRANSFORMER</b> 55235 PECANCK7 345 to 55234 PECANCK5 161 CKT 1	369	94.5	101.1	<b>CLARKSVILLE TO MUSKOGEE, 345KV</b> 53756 CLARKSV7 345 to 55224 MUSKOG7 345 CKT1	519	See Previous	\$ -
08SP	SWPA-SWPA	<b>NORFORK TO BUFORD TAP, 161KV</b> 52648 NORFORK5 161 to 52661 BUFDRTP5 161 CKT 1	189	92.4	101.4	<b>MIDWAY TO BULL SHOALS, 161KV</b> 52660 BULL SH5 161 to 99825 5MIDWAY# 161 CKT1	521	Resag conductor and replace structures as necessary	\$ 250,000
08SP	SPRM-SPRM	<b>SPRINGFIELD 161/69KV TRANSFORMER 3</b> 52692 SPRGFLD5 161 to 52694 SPRGFLD269.0 CKT 3	25	93.0	101.0	<b>Multiple Outage Contingency</b> <b>FRANKS TO HUBEN, 345KV</b> 96041 7FRANKS 345 to 96042 7HUBEN 345 CKT1 <b>HUBEN TO MORGAN, 345KV</b> 96042 7HUBEN 345 to 96045 7MORGAN 345 CKT1	543	See Previous	\$ -
08SP	SWPA-SWPA	<b>GLENCOE TO NORFORK, 161KV</b> 52646 GLENCOE5 161 to 52648 NORFORK5 161 CKT 1	112	95.9	100.5	<b>NEW-IN TO NEWPO, 161KV</b> 99763 5NEW-IN 161 to 99764 5NEWPO 161 CKT1	620	See Previous	\$ -

**Table 4 - continued** – Facility Overloads Caused by AEPW to EES 620MW Transfer from 4/1/2003 to 4/1/2013 with 465MW ERCOTE to EES Annulment

Study Year	From Area - To Area	Branch Over 100% RateB	Rate B	BC %Loading	TC %Loading	Outaged Branch That Caused Overload	ATC	Comments	Cost
08SP	AEPW-WERE	<b>SOUTH COFFEYVILLE TO DEARING, 138 KV</b> 53972 COFFEYT4 138 to 57002 DEARING4 138 CKT 1	210	93.6	100.4	<b>DELAWARE TO NEOSHO, 345KV</b> 53929 DELWARE7 345 to 56793 NEOSHO 7 345 CKT1	586	Replace wave trap to increase rating to conductor rating (2000 A) by WR.	\$ 20,000
08SP	AEPW-AEPW	<b>CHAMBER SPRINGS TO LAKE ELMDALE, 161KV</b> 53154 CHAMSPR5 161 to 53175 LELMDAL5 161 CKT 1	244	98.0	101.6	<b>EAST ROGERS TO ROGERS WEST REC</b> 53135 EROGERS5 161 to 53207 WROGERS5 161 CKT1	620	Relieved by AEP Tontitown Project - Estimated In-Service Date 6/1/2004	\$ -
08SP	WERE-WERE	<b>MOCKINGBIRD HILLSW. STA TO STULL SW. STA, 115KV</b> 57253 MOCKBRD3 115 to 57270 STULL T3 115 CKT 1	92	98.9	100.6	<b>LAWRENCE HILL 230/115/13.8KV TRANSFORMER</b> 56853 LAWHILL6230 to 57250 LWRNCHL3115 to 56882 LAWHILL113.8 CKT 1	620	Westar mitigation planned in 2005	\$ -
08SP	AEPW-AEPW	<b>NORTHWEST HENDERSON TO OAK HILL, 138KV</b> 53584 NWHENDR4 138 to 53585 OAK1HIL4 138 CKT 1	210	98.9	100.3	<b>KNOXLEE TO MONROE CORNERS REC, 138KV</b> 53557 KNOXLEE4 138 to 53574 MONROCR4 138 CKT1	620	Wavetrap to be Replaced by AEP 6/1/2008	\$ -
08SP	OKGE-OKGE	<b>ADA OC PUMP TAP TO ADA OC PUMP, 69KV</b> 55190 AOCPT 269.0 to 55189 AOCPA 269.0 CKT 1	52	93.1	100.8	<b>PARK LANE TO AHLOSO, 69KV</b> 55177 PARKLN 269.0 to 55187 AHLOSTP269.0 CKT1	620	No Upgrade Assigned	\$ -
08SP	OKGE-OKGE	<b>AVEC OZARK TO HELBERG, 69KV</b> 55324 AVECOZK269.0 to 55325 HELBERG269.0 CKT 1	72	100.0	100.8	<b>FITZHUGH TO ALTUS, 69KV</b> 53203 FITZHUG269.0 to 55330 ALTUS 269.0 CKT1	620	No Upgrade Assigned	\$ -
08SP	WERE-WERE	<b>CIRCLEVILLE TO KING HILL, 115KV</b> 57152 CIRCLVL3 115 to 57331 KING HL3 115 CKT 1	92	98.7	101.5	<b>HOYT TO STRANGER,345KV</b> 56765 HOYT 7 345 to 56772 STRANGR7 345 CKT1	620	Westar Transmission Operating Directive 803	\$ -
08SP	OKGE-OKGE	<b>DRAPER 345/138KV TRANSFORMER 1</b> 54934 DRAPER 7 345 to 54933 DRAPER 4 138 CKT 1	493	105.0	110.0	<b>DRAPER 345/138KV TRANSFORMER 2</b> 54933 DRAPER 4 138 to 54934 DRAPER 7 345 CKT2	620	Flowgate: OKGE Mitigation Plan to Increase Rating to 591 MVA by 2004	\$ -
08SP	OKGE-OKGE	<b>DRAPER 345/138KV TRANSFORMER 2</b> 54934 DRAPER 7 345 to 54933 DRAPER 4 138 CKT 2	493	105.0	110.0	<b>DRAPER 345/138KV TRANSFORMER 1</b> 54934 DRAPER 7 345 to 54933 DRAPER 4 138 CKT1	620	Flowgate: OKGE Mitigation Plan to Increase Rating to 591 MVA by 2004	\$ -
08SP	AEPW-AEPW	<b>FLINT CREEK TO ELM SPRINGS REC, 161KV</b> 53139 FLINTCR5 161 to 53194 ELMSPRR5 161 CKT 1	312	99.8	100.2	<b>SOUTH FAYETTEVILLE TO FARMINGTON AECC, 161KV</b> 53157 SFAYTVL5 161 to 53195 FARMGTN5 161 CKT1	620	Relieved by AEP Tontitown Project - Estimated In-Service Date 6/1/2004	\$ -
08SP	OKGE-OKGE	<b>HARDEN CITY TO AHLOSO, 69KV</b> 55186 HARDEN 269.0 to 55187 AHLOSTP269.0 CKT 1	52	96.8	103.5	<b>VALLEY VIEW TAP TO VALLEY VIEW, 69KV</b> 55181 VALYVUT269.0 to 55182 VALLYVU269.0 CKT1	620	Excluded as operating guide in effect using switch at Ahloso.	\$ -
08SP	WERE-WERE	<b>JARBALO JCT SW. STA. TO 166TH STREET, 115KV</b> 57244 JARBALO3 115 to 57233 166TH 3 115 CKT 1	97	99.7	101.0	<b>IATAN TO ST JOE, 345KV</b> 57982 IATAN 7 345 to 59199 ST JOE 3 345 CKT1	620	Transmission Operating Directive 1202	\$ -

**Table 4 - continued** – Facility Overloads Caused by AEPW to EES 620MW Transfer from 4/1/2003 to 4/1/2013 with 465MW ERCOTE to EES Annulment

Study Year	From Area - To Area	Branch Over 100% RateB	Rate B	BC %Loading	TC %Loading	Outaged Branch That Caused Overload	ATC	Comments	Cost
08SP	EMDE-EMDE	<b>JOPLIN SOUTHWEST 161/69KV TRANSFORMER</b> 59483* JOP389 5 161 544 WND 1 JOPLINSW 1	75	99.8	100.0	<b>TIPTON FORD TO JOPLIN SOUTHWEST, 161KV</b> 59472 TIP292 5 161 TO 59483 JOP389 5 161 CKT 1	620	No Upgrade Required As Reinmiller 161/69KV Transformer Replacement Relieves Facility	\$ -
08SP	OKGE-OKGE	<b>TINKER #4 TO TINKER #2, 138KV</b> 54990 TINKER24 138 to 54988 TINKER44 138 CKT 1	100	97.5	103.6	<b>DRAPER TO MIDWEST, 138KV</b> 54933 DRAPER 4 138 to 54946 MIDWEST4 138 CKT1	620	Excluded Per OKGE	\$ -
08SP	OKGE-OKGE	<b>TINKER #4 TO TINKER #2, 138KV</b> 54990 TINKER24 138 to 54988 TINKER44 138 CKT 1	100	95.4	100.5	<b>SE 15TH 138/69KV TRANSFORMER</b> 54992 SE15TH 269.0 to 54993 SE15TH 4 138 CKT1	620	Excluded Per OKGE	\$ -
08SP	SWPA-SWPA	<b>NORFORK 161/69KV TRANSFORMER</b> 52648 NORFORK5 161 to 52650 NORFORK269.0 CKT 1	25	104.5	105.6	<b>NORFORK TO WEST PLAINS, 161KV</b> 52648 NORFORK5 161 to 96123 5WPLAIN 161 CKT1	620	Norfork Transformer to be Replace by SWPA 6/1/06	\$ -
08SP	SWPA-AECI	<b>CARTHAGE TO REEDS SPRING, 69KV</b> 52690 CARTHG 269.0 to 96751 2REEDS 69.0 CKT 1	36	123.8	129.4	<b>AURORA TO MONETT, 161KV</b> 59468 AUR124 5 161 to 59480 MON383 5 161 CKT1	N/A	Third Party Facility	\$ -
08SP	SWPA-AECI	<b>CARTHAGE TO JASPER, 69KV</b> 52690 CARTHG 269.0 to 96649 2JASPER 69.0 CKT 1	47	99.6	101.9	<b>ARCHIE TO ADRIAN, 161KV</b> 59207 ARCHIE 5 161 to 59240 ADRIAN 5 161 CKT1	N/A	Third Party Facility	\$ -
08SP	SWPA-AECI	<b>WASHBURN 161/69KV TRANSFORMER</b> 52681 5WSHBRN 161 to 96763 2WSHBRN 69.0 CKT 1	56	101.5	105.7	<b>BEAVER TO EUREKA SPRINGS, 161KV</b> 52680 BEAVER 5 161 to 53136 EUREKA 5 161 CKT1	N/A	Third Party Facility	\$ -
08SP	AEPW-AEPW	<b>JACKSONVILLE TO OVERTON, 138KV</b> 53549 JACKSNV4 138 to 53588 OVERTON4 138 CKT 1	235	103.2	110.6	<b>CROCKETT TO TENASKA RUSK COUNTY</b> 53526 CROCKET7 345 to 53637 TENRUSK7 345 CKT1	N/A	Third Party Facility With AEPW Limitation Reset relays at Jacksonville & Overton	\$ 15,000
08SP	EES-SWPA	<b>MIDWAY TO BULL SHOALS, 161KV</b> 99825 5MIDWAY# 161 to 52660 BULL SH5 161 CKT 1	162	120.7	131.5	<b>BUFORD TAP TO BULL SHOALS, 161KV</b> 52661 BUFDRTP5 161 to 52660 BULL SH5 161 CKT1	N/A	See Previous	\$ -
08WP	AEPW-AEPW	<b>PERDUE TO DIANA, 138KV</b> 53590 PERDUE 4 138 to 53527 DIANA 4 138 CKT 1	237	99.8	100.6	<b>HARRISON ROAD TO LIBERTY CITY TAP, 138KV</b> 53542 HARRISN4 138 to 53561 LIBCYTP4 138 CKT1	135	See Previous	\$ -
08WP	SPRM-SPRM	<b>CLAY TO SPRINGFIELD, 161KV</b> 59970 CLAY 5 161 to 52692 SPRGFLD5 161 CKT 1	167	98.3	104.8	<b>Multiple Outage Contingency</b> <b>FRANKS TO HUBEN, 345KV</b> 96041 7FRANKS 345 to 96042 7HUBEN 345 CKT1 <b>HUBEN TO MORGAN, 345KV</b> 96042 7HUBEN 345 to 96045 7MORGAN 345 CKT1	162	See Previous	\$ -



**Table 4 - continued** – Facility Overloads Caused by AEPW to EES 620MW Transfer from 4/1/2003 to 4/1/2013 with 465MW ERCOTE to EES Annulment

Study Year	From Area - To Area	Branch Over 100% RateB	Rate B	BC %Loading	TC %Loading	Outaged Branch That Caused Overload	ATC	Comments	Cost
08WP	WERE-WERE	HOYT HTI SW. JCT. TO CIRCLEVILLE, 115KV 57165 HTI JCT3 115 to 57152 CIRCLVL3 115 CKT 1	92	99.1	101.7	IATAN TO ST JOE, 345KV 57982 IATAN 7 345 to 59199 ST JOE 3 345 CKT1	215	See Previous	\$ -
08WP	OKGE-OKGE	PECAN CREEK 345/161KV TRANSFORMER 55235 PECANCK7 345 to 55234 PECANCK5 161 CKT 1	369	93.1	104.9	MUSKOGEE TO FORT SMITH, 345KV 55224 MUSKOGEE7 345 to 55302 FTSMITH7 345 CKT1	364	See Previous	\$ -
08WP	EMDE-EMDE	POWERSITE 161/69/12.5KV TRANSFORMER 59562*OZD312 269.0 OZKDAM 1	41.7	99.8	100.1	OZARK NORTHWEST TO BLACKHAWK JCT. 59570 OZK330 269.0 to 59604 BHJ415 269.0 CKT 1	413	Replace with 75MVA transformer.	\$ 1,250,000
08WP	SWPA-SWPA	NORFORK 161/69KV TRANSFORMER 52648 NORFORK5 161 to 52650 NORFORK269.0 CKT 1	25	107.3	108.3	NORFORK TO WEST PLAINS, 161KV 52648 NORFORK5 161 to 96123 5WPLAIN 161 CKT1	620	Norfork Transformer to be Replaced by SWPA 6/1/06	\$ -
08WP	WERE-WERE	TECUMSEH HILL TO STULL SW. STA, 115KV 57182 TECHILE3 115 to 57270 STULL T3 115 CKT 1	92	99.0	102.2	HOYT TO STRANGER,345KV 56765 HOYT 7 345 to 56772 STRANGR7 345 CKT1	620	WERE Transmission Op Directive 803	\$ -
08WP	WERE-WERE	KING HILL TO KELLY, 115KV 57331 KING HL3 115 to 57217 KELLY 3 115 CKT 1	92	98.1	100.7	HOYT TO STRANGER,345KV 56765 HOYT 7 345 to 56772 STRANGR7 345 CKT1	620	Westar Transmission Operating Directive 803	\$ -
08WP	SWPA-AECI	CARTHAGE TO REEDS SPRING, 69KV 52690 CARTHG 269.0 to 96751 2REEDS 69.0 CKT 1	43	108.8	113.4	AURORA TO MONETT, 161KV 59468 AUR124 5 161 to 59480 MON383 5 161 CKT1	N/A	Third Party Facility	\$ -
08WP	AEPW-AEPW	JACKSONVILLE TO OVERTON, 138KV 53549 JACKSNV4 138 to 53588 OVERTON4 138 CKT 1	265	107.1	113.4	CROCKETT TO TENASKA RUSK COUNTY 53526 CROCKET7 345 to 53637 TENRUSK7 345 CKT1	N/A	See Previous	\$ -

Total Cost \$ 58,662,470

**Table 5 - Non - SPP facility overloads caused by the AEPW to EES 620MW transfer from 4/1/2003 to 4/1/2013 with 465MW ERCOTE to EES annulled**

Study Year	From Area - To Area	Branch Over 100% RateB	Rate B	BC %Loading	TC %Loading	Outaged Branch That Caused Overload
03AP		NONE				
03G		NONE				
03SP	EES-EES	97920 6PPG 23 230 to 97919 6VERDINE 230 CKT 1	470	99.6	101.2	97917 6NLSO 230 to 97921 6CARLYSS 230 CKT1
03SP	SWPA-AECI	52690 CARTHG 269.0 to 96751 2REEDS 69.0 CKT 1	36	99.3	105.3	52688 CARTHAG5 161 to 59479 LAR382 5 161 CKT1
03SP	SWPA-AECI	52690 CARTHG 269.0 to 96751 2REEDS 69.0 CKT 1	36	99.4	103.8	59969 BRKLINE 5 161 to 96101 5MORGAN 161 CKT1
03SP	SWPA-AECI	52690 CARTHG 269.0 to 96751 2REEDS 69.0 CKT 1	36	99.3	103.8	59207 ARCHIE 5 161 to 59240 ADRIAN 5 161 CKT1
03SP	EES-SWPA	99825 5MIDWAY# 161 to 52660 BULL SH5 161 CKT 1	162	103.9	108.5	99817 5ISES 1 161 to 99826 5MORFLD 161 CKT1
03FA	EES-EES	97514 4GRIMES 138 to 97454 4WALDEN 138 CKT 1	206	92.3	101.6	97487 4MT.ZION 138 to 97514 4GRIMES 138 CKT1
03FA	EES-EES	97514 4GRIMES 138 to 97454 4WALDEN 138 CKT 1	206	91.3	100.6	97480 L558T485 138 to 97487 4MT.ZION 138 CKT1
03FA	EES-EES	97514 4GRIMES 138 to 97487 4MT.ZION 138 CKT 1	206	91.5	102.3	97454 4WALDEN 138 to 97514 4GRIMES 138 CKT1
03FA	EES-EES	97514 4GRIMES 138 to 97487 4MT.ZION 138 CKT 1	206	90.0	100.8	97454 4WALDEN 138 to 97469 4APRIL 138 CKT1
03FA	EES-EES	97686 4LEACH 138 to 97618 4NEWTONB 138 CKT 1	144.6	97.5	108.2	53526 CROCKET7 345 to 97513 7GRIMES 345 CKT1
03FA	EES-EES	97686 4LEACH 138 to 97618 4NEWTONB 138 CKT 1	144.6	97.0	106.1	50037 COOPER 4 138 to 50098 LEESV 4 138 CKT1
03FA	EES-EES	97708 4TOLEDO 138 to 97686 4LEACH 138 CKT 1	144.6	98.2	109.0	53526 CROCKET7 345 to 97513 7GRIMES 345 CKT1
03FA	EES-EES	97708 4TOLEDO 138 to 97686 4LEACH 138 CKT 1	144.6	97.7	106.9	50037 COOPER 4 138 to 50098 LEESV 4 138 CKT1
03FA	EES-EES	97708 4TOLEDO 138 to 97686 4LEACH 138 CKT 1	144.6	92.4	100.6	53526 CROCKET7 345 to 53637 TENRUSK7 345 CKT1
03FA	EES-EES	97920 6PPG 23 230 to 98051 2PPC NO 69.0 CKT 1	160	91.2	100.8	97920 6PPG 23 230 to 98052 2PPC SO 69.0 CKT1
03FA	EES-EES	97920 6PPG 23 230 to 98052 2PPC SO 69.0 CKT 1	160	91.3	100.9	97920 6PPG 23 230 to 98051 2PPC NO 69.0 CKT1
03FA	SWPA-EES	52660 BULL SH5 161 to 99825 5MIDWAY# 161 CKT 1	162	93.7	105.4	52648 NORFORK5 161 to 52661 BUFRDTP5 161 CKT1
03WP	AMRN-AMRN	30026 APCH FLT 161 to 30027 APCH FLT69.0 CKT 1	84	99.1	100.1	31195 MILLER S 138 to 31196 MILLER 138 CKT1
03WP	AMRN-AMRN	31408 OVERTON 345 to 31409 OVERTON 161 CKT 1	300	99.7	100.1	31230 MONTGMRY 345 to 31231 MONTGMRY 161 CKT1
03WP	AECI-AMRN	96096 5MARIES 161 to 31024 MARIES 138 CKT 1	100	97.3	100.3	30532 ELDON 161 to 96057 5BARNET 161 CKT1
03WP	EES-EES	99146 3STERL 115 to 99137 3WALGRV 115 CKT 2	238	98.6	100.5	99137 3WALGRV 115 to 99146 3STERL 115 CKT1
03WP	SWPA-AECI	52690 CARTHG 269.0 to 96751 2REEDS 69.0 CKT 1	43	99.5	103.5	52690 CARTHG 269.0 to 96649 2JASPER 69.0 CKT1
03WP	SWPA-AECI	52690 CARTHG 269.0 to 96751 2REEDS 69.0 CKT 1	43	95.7	100.7	52688 CARTHAG5 161 to 59479 LAR382 5 161 CKT1
04G	AMRN-AMRN	31221 MOBERLY 161 to 31222 MOBERLY 69.0 CKT 1	75	100.0	100.7	96049 7THOMHL 345 to 96120 5THMHIL 161 CKT1
04G	MIPU-MIPU	59288 RGAFB 2 69.0 to 59284 GRDWWTP269.0 CKT 1	53	99.5	100.3	59225 PHILL 5 161 to 59280 PHILL 2 69.0 CKT1
04G	EES-EES	97454 4WALDEN 138 to 97469 4APRIL 138 CKT 1	206	94.4	104.8	97487 4MT.ZION 138 to 97514 4GRIMES 138 CKT1
04G	EES-EES	97454 4WALDEN 138 to 97469 4APRIL 138 CKT 1	206	93.4	103.8	97480 L558T485 138 to 97487 4MT.ZION 138 CKT1
04G	EES-EES	97454 4WALDEN 138 to 97469 4APRIL 138 CKT 1	206	92.2	102.6	97480 L558T485 138 to 97484 4HUNTSVL 138 CKT1
04G	EES-EES	97469 4APRIL 138 to 97470 4LFOREST 138 CKT 1	206	92.2	102.7	97487 4MT.ZION 138 to 97514 4GRIMES 138 CKT1
04G	EES-EES	97469 4APRIL 138 to 97470 4LFOREST 138 CKT 1	206	91.2	101.6	97480 L558T485 138 to 97487 4MT.ZION 138 CKT1
04G	EES-EES	97469 4APRIL 138 to 97470 4LFOREST 138 CKT 1	206	90.1	100.4	97480 L558T485 138 to 97484 4HUNTSVL 138 CKT1
04G	EES-EES	97480 L558T485 138 to 97484 4HUNTSVL 138 CKT 1	206	91.6	103.7	97454 4WALDEN 138 to 97514 4GRIMES 138 CKT1
04G	EES-EES	97480 L558T485 138 to 97484 4HUNTSVL 138 CKT 1	206	90.1	102.2	97454 4WALDEN 138 to 97469 4APRIL 138 CKT1
04G	EES-EES	97480 L558T485 138 to 97484 4HUNTSVL 138 CKT 1	206	89.2	101.2	97469 4APRIL 138 to 97470 4LFOREST 138 CKT1
04G	EES-EES	97487 4MT.ZION 138 to 97480 L558T485 138 CKT 1	206	95.2	107.3	97454 4WALDEN 138 to 97514 4GRIMES 138 CKT1
04G	EES-EES	97487 4MT.ZION 138 to 97480 L558T485 138 CKT 1	206	93.7	105.7	97454 4WALDEN 138 to 97469 4APRIL 138 CKT1
04G	EES-EES	97487 4MT.ZION 138 to 97480 L558T485 138 CKT 1	206	92.8	104.8	97469 4APRIL 138 to 97470 4LFOREST 138 CKT1
04G	EES-EES	97513 7GRIMES 345 to 97514 4GRIMES 138 CKT 1	525	94.5	102.7	97513 7GRIMES 345 to 97514 4GRIMES 138 CKT2
04G	EES-EES	97513 7GRIMES 345 to 97514 4GRIMES 138 CKT 2	525	94.5	102.7	97513 7GRIMES 345 to 97514 4GRIMES 138 CKT1
04G	EES-EES	97514 4GRIMES 138 to 97454 4WALDEN 138 CKT 1	206	98.0	108.5	97487 4MT.ZION 138 to 97514 4GRIMES 138 CKT1
04G	EES-EES	97514 4GRIMES 138 to 97454 4WALDEN 138 CKT 1	206	97.1	107.4	97480 L558T485 138 to 97487 4MT.ZION 138 CKT1
04G	EES-EES	97514 4GRIMES 138 to 97454 4WALDEN 138 CKT 1	206	95.9	106.2	97480 L558T485 138 to 97484 4HUNTSVL 138 CKT1
04G	EES-EES	97514 4GRIMES 138 to 97487 4MT.ZION 138 CKT 1	206	98.3	110.4	97454 4WALDEN 138 to 97514 4GRIMES 138 CKT1
04G	EES-EES	97514 4GRIMES 138 to 97487 4MT.ZION 138 CKT 1	206	96.8	108.8	97454 4WALDEN 138 to 97469 4APRIL 138 CKT1
04G	EES-EES	97514 4GRIMES 138 to 97487 4MT.ZION 138 CKT 1	206	95.9	107.9	97469 4APRIL 138 to 97470 4LFOREST 138 CKT1
04G	EES-EES	97686 4LEACH 138 to 97618 4NEWTONB 138 CKT 1	144.6	99.6	109.9	53526 CROCKET7 345 to 97513 7GRIMES 345 CKT1
04G	EES-EES	97686 4LEACH 138 to 97618 4NEWTONB 138 CKT 1	144.6	96.5	107.7	50037 COOPER 4 138 to 50098 LEESV 4 138 CKT1
04G	EES-EES	97686 4LEACH 138 to 97618 4NEWTONB 138 CKT 1	144.6	92.7	100.7	53526 CROCKET7 345 to 53637 TENRUSK7 345 CKT1
04G	EES-EES	97708 4TOLEDO 138 to 97686 4LEACH 138 CKT 1	144.6	97.2	108.5	50037 COOPER 4 138 to 50098 LEESV 4 138 CKT1
04G	EES-EES	97708 4TOLEDO 138 to 97686 4LEACH 138 CKT 1	144.6	93.4	101.4	53526 CROCKET7 345 to 53637 TENRUSK7 345 CKT1
04G	EES-EES	97920 6PPG 23 230 to 98051 2PPC NO 69.0 CKT 1	160	92.3	101.9	97920 6PPG 23 230 to 98052 2PPC SO 69.0 CKT1
04G	EES-EES	97920 6PPG 23 230 to 98052 2PPC SO 69.0 CKT 1	160	92.5	102.0	97920 6PPG 23 230 to 98051 2PPC NO 69.0 CKT1
05SP	ALTW-MEC	34060 WNTRST 5 161 to 64068 GRENFLD5 161 CKT 1	112	97.6	100.4	63800 CBLUFFS3 345 to 64056 MADISON3 345 CKT1
05SP	CELE-CELE	50031 COCODR 6 230 to 50039 COUGH 4 138 CKT 1	386	96.0	101.3	50031 COCODR 6 230 to 50203 VILPLT 6 230 CKT1

**Table 5 - continued** - Non - SPP facility overloads caused by the AEPW to EES 620MW transfer from 4/1/2003 to 4/1/2013 with 465MW ERCOTE to EES annulled

Study Year	From Area - To Area	Branch Over 100% RateB	Rate B	BC %Loading	TC %Loading	Outaged Branch That Caused Overload
05SP	CELE-CELE	50154 PINEV 4 138 to 50179 SHOAKS 4 138 CKT 1	148	97.9	101.8	50154 PINEV 4 138 to 50158 PVKFTAP4 138 CKT1
05SP	MIPU-AECI	59217 WINDSR 5 161 to 96071 5CLINTN 161 CKT 1	123	98.8	103.8	52702 TRUMAN 5 161 to 96555 5GRAVOI 161 CKT1
05SP	MIPU-MIPU	59253 ST JOE 5 161 to 59252 MIDWAY 5 161 CKT 1	164	99.6	102.3	96097 5MARYVL 161 to 96104 5NODWAY 161 CKT1
05SP	AECI-AECI	96002 1THLHG2 22.0 to 96120 5THMHIL 161 CKT 1	325	98.9	101.5	96044 7MCCRED 345 to 96049 7THOMHL 345 CKT1
05SP	AECI-AECI	96071 5CLINTN 161 to 96692 2CLINTN 69.0 CKT 3	56	99.7	100.3	96071 5CLINTN 161 to 96692 2CLINTN 69.0 CKT1
05SP	EES-EES	97920 6PPG 23 230 to 97919 6VERDINE 230 CKT 1	470	99.4	101.1	97917 6NLSO 230 to 97921 6CARLYSS 230 CKT1
05SP	SWPA-AECI	52690 CARTHG 269.0 to 96751 2REEDS 69.0 CKT 1	36	98.9	104.5	55224 MUSKOGEE 345 to 55302 FTSMITH7 345 CKT1
05SP	SWPA-AECI	52690 CARTHG 269.0 to 96751 2REEDS 69.0 CKT 1	36	99.5	103.9	59577 MTV351 269.0 to 59606 MTV420 269.0 CKT1
05SP	SWPA-AECI	52690 CARTHG 269.0 to 96751 2REEDS 69.0 CKT 1	36	99.3	103.6	59553 ALB262 269.0 to 96677 2MTVRN 69.0 CKT1
05SP	EES-SWPA	99825 5MIDWAY# 161 to 52660 BULL SH5 161 CKT 1	162	105.4	110.1	99817 5ISES 1 161 to 99826 5MORFLD 161 CKT1
05SP	SWPA-AECI	52690 CARTHG 269.0 to 96751 2REEDS 69.0 CKT 1	36	99.5	103.8	59969 BRKLINE 5 161 to 96101 5MORGAN 161 CKT1
05WP	CELE-CELE	50039 COUGH 4 138 to 50031 COCODR 6 230 CKT 1	386	97.4	102.2	50031 COCODR 6 230 to 50203 VILPLT 6 230 CKT1
05WP	EES-EES	99146 3STERL 115 to 99137 3WALGRV 115 CKT 2	238	98.9	100.8	99137 3WALGRV 115 to 99146 3STERL 115 CKT1
05WP	SWPA-AECI	52690 CARTHG 269.0 to 96751 2REEDS 69.0 CKT 1	43	96.1	100.9	52688 CARTHAG5 161 to 59479 LAR382 5 161 CKT1
08SP	SUNC-SUNC	56448 HOLCOMB3 115 to 56447 HOLCGEN122.0 CKT 1	380	100.0	100.2	58779 MULGREN6 230 to 58795 SPEARVL6 230 CKT1
08SP	SUNC-SUNC	56448 HOLCOMB3 115 to 56447 HOLCGEN122.0 CKT 1	380	100.0	100.1	56601 HEIZER 3 115 to 58779 MULGREN6 230 CKT1
08SP	SUNC-SUNC	56448 HOLCOMB3 115 to 56447 HOLCGEN122.0 CKT 1	380	99.9	100.1	58794 SPEARVL3 115 to 58795 SPEARVL6 230 CKT1
08SP	MIPU-AECI	59217 WINDSR 5 161 to 96071 5CLINTN 161 CKT 1	123	99.4	104.6	55305 FTSMITH8 500 to 99486 8ANO 50 500 CKT1
08SP	MIPU-AECI	59217 WINDSR 5 161 to 96071 5CLINTN 161 CKT 1	123	100.0	104.1	53526 CROCKET7 345 to 53637 TENRUSK7 345 CKT1
08SP	MIPU-AECI	59217 WINDSR 5 161 to 96071 5CLINTN 161 CKT 1	123	99.7	104.1	55302 FTSMITH7 345 to 55305 FTSMITH8 500 CKT1
08SP	AECI-AECI	96081 5GAINES 161 to 97090 2GNSVL2 69.0 CKT 1	56	97.9	100.4	52660 BULL SH5 161 to 99825 5MIDWAY# 161 CKT1
08SP	AECI-AECI	96110 5PITTSV 161 to 96331 2PITTSV 69.0 CKT 1	50	99.7	100.5	96124 5HOLDEN 161 to 96336 2HOLDEN 69.0 CKT1
08SP	EES-EES	97514 4GRIMES 138 to 97487 4MT.ZION 138 CKT 1	206	90.2	102.2	97454 4WALDEN 138 to 97514 4GRIMES 138 CKT1
08SP	EES-EES	97686 4LEACH 138 to 97618 4NEWTONB 138 CKT 1	144.6	96.2	105.0	53526 CROCKET7 345 to 53637 TENRUSK7 345 CKT1
08SP	EES-EES	97686 4LEACH 138 to 97618 4NEWTONB 138 CKT 1	144.6	95.2	104.6	50037 COOPER 4 138 to 50098 LEESV 4 138 CKT1
08SP	EES-EES	97686 4LEACH 138 to 97618 4NEWTONB 138 CKT 1	144.6	96.5	102.6	97916 8NELSON 500 to 98107 8RICHARD 500 CKT1
08SP	EES-EES	97708 4TOLEDO 138 to 97686 4LEACH 138 CKT 1	144.6	97.5	106.3	53526 CROCKET7 345 to 53637 TENRUSK7 345 CKT1
08SP	EES-EES	97708 4TOLEDO 138 to 97686 4LEACH 138 CKT 1	144.6	96.5	105.9	50037 COOPER 4 138 to 50098 LEESV 4 138 CKT1
08SP	EES-EES	97708 4TOLEDO 138 to 97686 4LEACH 138 CKT 1	144.6	97.8	103.9	97916 8NELSON 500 to 98107 8RICHARD 500 CKT1
08SP	EES-EES	99263 3LEWIS # 115 to 99230 3COUCH 115 CKT 1	159	91.8	113.9	53526 CROCKET7 345 to 97513 7GRIMES 345 CKT1
08SP	EES-EES	99263 3LEWIS # 115 to 99230 3COUCH 115 CKT 1	159	85.6	110.8	53424 LONGWD 7 345 to 99294 7ELDEHV 345 CKT1
08SP	EES-EES	99263 3LEWIS # 115 to 99230 3COUCH 115 CKT 1	159	85.5	110.7	99294 7ELDEHV 345 to 99295 8ELDEHV 500 CKT1
08SP	EES-EES	99303 3PATMOS# 115 to 99263 3LEWIS # 115 CKT 1	159	97.1	122.2	53424 LONGWD 7 345 to 99294 7ELDEHV 345 CKT1
08SP	EES-EES	99303 3PATMOS# 115 to 99263 3LEWIS # 115 CKT 1	159	97.0	122.2	99294 7ELDEHV 345 to 99295 8ELDEHV 500 CKT1
08SP	EES-EES	99303 3PATMOS# 115 to 99263 3LEWIS # 115 CKT 1	159	99.6	121.2	53526 CROCKET7 345 to 53637 TENRUSK7 345 CKT1
08SP	EES-SWPA	99825 5MIDWAY# 161 to 52660 BULL SH5 161 CKT 1	162	120.2	125.0	99817 5ISES 1 161 to 99826 5MORFLD 161 CKT1
08SP	SWPA-AECI	52690 CARTHG 269.0 to 96649 2JASPER 69.0 CKT 1	47	98.9	101.1	96070 5CLARK 161 to 96802 2CLARK 69.0 CKT1
08SP	SWPA-AECI	52690 CARTHG 269.0 to 96649 2JASPER 69.0 CKT 1	47	97.7	100.5	59216 BUTLER 5 161 to 59240 ADRIAN 5 161 CKT1
08SP	SWPA-AECI	52690 CARTHG 269.0 to 96751 2REEDS 69.0 CKT 1	36	96.2	100.2	59468 AUR124 5 161 to 59473 RDS295 5 161 CKT1
08SP	SWPA-AECI	52690 CARTHG 269.0 to 96751 2REEDS 69.0 CKT 1	36	95.9	100.1	59536 ASH121 269.0 to 59586 WIL445 269.0 CKT1
08SP	EES-SWPA	99825 5MIDWAY# 161 to 52660 BULL SH5 161 CKT 1	162	94.3	100.6	31798 SWEETWTR 161 to 96077 5FLETCH 161 CKT1
08SP	EES-SWPA	99825 5MIDWAY# 161 to 52660 BULL SH5 161 CKT 1	162	94.4	100.3	52660 BULL SH5 161 to 99802 5BULLSH* 161 CKT1
08SP	EES-SWPA	99825 5MIDWAY# 161 to 52660 BULL SH5 161 CKT 1	162	94.2	100.1	52660 BULL SH5 161 to 96081 5GAINES 161 CKT1
08WP	AMRN-AMRN	31408 OVERTON 345 to 31409 OVERTON 161 CKT 1	300	99.8	100.6	59217 WINDSR 5 161 to 96071 5CLINTN 161 CKT1
08WP	AMRN-AMRN	31408 OVERTON 345 to 31409 OVERTON 161 CKT 1	300	99.8	100.5	52702 TRUMAN 5 161 to 96552 2EDMONS 161 CKT1
08WP	AMRN-AMRN	31408 OVERTON 345 to 31409 OVERTON 161 CKT 1	300	99.4	100.4	59209 SEDALIA5 161 to 59217 WINDSR 5 161 CKT1
08WP	CELE-CELE	50039 COUGH 4 138 to 50031 COCODR 6 230 CKT 1	386	98.5	103.0	50214 WSTFORK6 230 to 50310 PMOUTON6 230 CKT1
08WP	EES-EES	97454 4WALDEN 138 to 97469 4APRIL 138 CKT 1	206	98.4	105.9	98107 8RICHARD 500 to 98430 8WEBRE 500 CKT1
08WP	EES-EES	97454 4WALDEN 138 to 97469 4APRIL 138 CKT 1	206	96.6	105.4	97717 8HARTBRG 500 to 99162 8MTOLIV 500 CKT1
08WP	EES-EES	97454 4WALDEN 138 to 97469 4APRIL 138 CKT 1	206	96.1	104.6	97508 4NAVSOTA 138 to 97522 4TUBULAR 138 CKT1
08WP	EES-EES	97469 4APRIL 138 to 97470 4LFOREST 138 CKT 1	206	96.0	103.5	98107 8RICHARD 500 to 98430 8WEBRE 500 CKT1
08WP	EES-EES	97469 4APRIL 138 to 97470 4LFOREST 138 CKT 1	206	94.2	103.0	97717 8HARTBRG 500 to 99162 8MTOLIV 500 CKT1
08WP	EES-EES	97469 4APRIL 138 to 97470 4LFOREST 138 CKT 1	206	93.6	102.1	97508 4NAVSOTA 138 to 97522 4TUBULAR 138 CKT1
08WP	EES-EES	97470 4LFOREST 138 to 97539 4WDHAVN 138 CKT 1	206	100.0	109.5	97480 L558T485 138 to 97487 4MT.ZION 138 CKT1
08WP	EES-EES	97470 4LFOREST 138 to 97539 4WDHAVN 138 CKT 1	206	98.6	108.1	97480 L558T485 138 to 97484 4HUNTSVL 138 CKT1
08WP	EES-EES	97470 4LFOREST 138 to 97539 4WDHAVN 138 CKT 1	206	97.0	105.0	97514 4GRIMES 138 to 97526 4MAG AND 138 CKT1

**Table 5 - continued** - Non - SPP facility overloads caused by the AEPW to EES 620MW transfer from 4/1/2003 to 4/1/2013 with 465MW ERCOTE to EES annulled

Study Year	From Area - To Area	Branch Over 100% RateB	Rate B	BC %Loading	TC %Loading	Outaged Branch That Caused Overload
08WP	EES-EES	97480 L558T485 138 to 97484 4HUNTSVL 138 CKT 1	206	98.7	109.1	97514 4GRIMES 138 to 97526 4MAG AND 138 CKT1
08WP	EES-EES	97480 L558T485 138 to 97484 4HUNTSVL 138 CKT 1	206	98.5	108.9	97510 4SOTA 1 138 to 97526 4MAG AND 138 CKT1
08WP	EES-EES	97480 L558T485 138 to 97484 4HUNTSVL 138 CKT 1	206	98.1	108.5	97508 4NAVSOTA 138 to 97510 4SOTA 1 138 CKT1
08WP	EES-EES	97487 4MT.ZION 138 to 97480 L558T485 138 CKT 1	206	95.4	104.9	98107 8RICHARD 500 to 98430 8WEBRE 500 CKT1
08WP	EES-EES	97487 4MT.ZION 138 to 97480 L558T485 138 CKT 1	206	92.8	104.6	97717 8HARTBRG 500 to 99162 8MTOLIV 500 CKT1
08WP	EES-EES	97487 4MT.ZION 138 to 97480 L558T485 138 CKT 1	206	92.8	102.2	97691 8CYPRESS 500 to 97717 8HARTBRG 500 CKT1
08WP	EES-EES	97514 4GRIMES 138 to 97454 4WALDEN 138 CKT 1	206	99.0	107.5	97453 4DOBBIN 138 to 97522 4TUBULAR 138 CKT1
08WP	EES-EES	97514 4GRIMES 138 to 97454 4WALDEN 138 CKT 1	206	97.2	105.4	50045 DOLHILL7 345 to 50046 DOLHILL6 230 CKT1
08WP	EES-EES	97514 4GRIMES 138 to 97454 4WALDEN 138 CKT 1	206	98.2	105.3	97691 8CYPRESS 500 to 97717 8HARTBRG 500 CKT1
08WP	EES-EES	97514 4GRIMES 138 to 97487 4MT.ZION 138 CKT 1	206	98.8	108.3	98107 8RICHARD 500 to 98430 8WEBRE 500 CKT1
08WP	EES-EES	97514 4GRIMES 138 to 97487 4MT.ZION 138 CKT 1	206	96.2	108.0	97717 8HARTBRG 500 to 99162 8MTOLIV 500 CKT1
08WP	EES-EES	97514 4GRIMES 138 to 97487 4MT.ZION 138 CKT 1	206	96.2	105.6	97691 8CYPRESS 500 to 97717 8HARTBRG 500 CKT1
08WP	EES-EES	97522 4TUBULAR 138 to 97453 4DOBBIN 138 CKT 1	112	98.2	108.2	97454 4WALDEN 138 to 97514 4GRIMES 138 CKT1
08WP	EES-EES	97522 4TUBULAR 138 to 97453 4DOBBIN 138 CKT 1	112	96.5	106.3	97454 4WALDEN 138 to 97469 4APRIL 138 CKT1
08WP	EES-EES	97522 4TUBULAR 138 to 97453 4DOBBIN 138 CKT 1	112	95.3	105.2	97469 4APRIL 138 to 97470 4LFOREST 138 CKT1
08WP	EES-EES	97539 4WDHAVN 138 to 97459 4CONROE 138 CKT 1	206	99.9	109.4	97487 4MT.ZION 138 to 97514 4GRIMES 138 CKT1
08WP	EES-EES	97539 4WDHAVN 138 to 97459 4CONROE 138 CKT 1	206	98.8	108.2	97480 L558T485 138 to 97487 4MT.ZION 138 CKT1
08WP	EES-EES	97539 4WDHAVN 138 to 97459 4CONROE 138 CKT 1	206	97.4	106.9	97480 L558T485 138 to 97484 4HUNTSVL 138 CKT1
08WP	EES-EES	97686 4LEACH 138 to 97618 4NEWTONB 138 CKT 1	144.6	98.1	109.1	50098 LEESV 4 138 to 97708 4TOLEDO 138 CKT1
08WP	EES-EES	97686 4LEACH 138 to 97618 4NEWTONB 138 CKT 1	144.6	93.9	102.3	97690 4CYPRESS 138 to 97700 4KOUNTZE 138 CKT1
08WP	EES-EES	97698 4JASPER 138 to 97704 4RAYBURN 138 CKT 1	112	98.3	104.2	97691 8CYPRESS 500 to 97717 8HARTBRG 500 CKT1
08WP	EES-EES	97698 4JASPER 138 to 97704 4RAYBURN 138 CKT 1	112	94.8	103.6	53526 CROCKET7 345 to 53637 TENRUSK7 345 CKT1
08WP	EES-EES	97708 4TOLEDO 138 to 97686 4LEACH 138 CKT 1	144.6	98.9	109.9	50098 LEESV 4 138 to 97708 4TOLEDO 138 CKT1
08WP	EES-EES	97708 4TOLEDO 138 to 97686 4LEACH 138 CKT 1	144.6	94.7	103.1	97690 4CYPRESS 138 to 97700 4KOUNTZE 138 CKT1
08WP	EES-EES	97920 6PPG 23 230 to 97919 6VERDINE 230 CKT 1	470	97.8	100.3	97917 6NLSON 230 to 97921 6CARLYSS 230 CKT1
08WP	EES-EES	99303 3PATMOS# 115 to 99263 3LEWIS # 115 CKT 1	159	81.1	102.6	53526 CROCKET7 345 to 53637 TENRUSK7 345 CKT1
08WP	SWPA-AECI	52690 CARTHG 269.0 to 96751 2REEDS 69.0 CKT 1	43	99.8	103.4	59537 AUR124 269.0 to 59578 AUR355 269.0 CKT1
08WP	SWPA-AECI	52690 CARTHG 269.0 to 96751 2REEDS 69.0 CKT 1	43	98.6	103.1	56793 NEOSHO 7 345 to 96045 7MORGAN 345 CKT1
08WP	SWPA-AECI	52690 CARTHG 269.0 to 96751 2REEDS 69.0 CKT 1	43	98.2	102.6	59481 MON383 7 345 to 59984 BRKLINE 7 345 CKT1

**Table 6** – Facility Upgrades Required Due to Addition of Upgrades Assigned to 620MW Transfer with 465MW ERCOTE to EES Annulment

Study Year	Branch Over 100% Rate B	Rate B	BC % Loading Without Upgrades	BC % Loading With Upgrades	TC % Loading Without Upgrades	TC % Loading With Upgrades	Outaged Branch Causing Overload	ATC (MW)	Comment	Assignment	Cost
03SP	STILWELL TO BUCYRUS, 161KV 57969 STILWEL5 161 58057 BUCYRUS5 161 CKT1	224	19.1	90.4	21.3	94.5	LACYGNE TO STILWELL, 345KV 57981 LACYGNE7 345 to 57968 STILWEL7 345 CKT 1	620	Upgrade needed due to Linn County Substation included to relieve La Cygne to Stilwell overload at 0MW ATC	Rebuild Bucyrus line terminal - Upgrade may not be needed	\$ 6,000
05SP	GILL ENERGY CENTER EAST TO OATVILLE, 69KV 57795 GILL E 269.0 57825 OATVILL269.0 1	72	99.6	99.8	100	100.2	HOOVER SOUTH TO SHERIDEN, 69KV 57806 HOOVERS269.0 to 57841 SHERIDN269.0 CKT1	310	Upgrade needed due to assigned upgrades for 620 MW transfer	Replace disconnect switches @ Gill & Replace line switch @ Oatville.	\$ 45,000
05SP	FLINT CREEK TO TONTITOWN, 161KV 53139 FLINTCR5 161 53170 TONTITN5 161 1	312	97.8	99.6	98.8	100.5	FLINT CREEK TO MONET, 345KV 53140 FLINTCR7 345 to 59481 MON383 7 345 CKT1	276	Upgrade needed due to upgrade of East Centerton to Gentry at 182MW ATC	Replace Jumpers	\$ 45,000
05SP	TONTITOWN TO ELM SPRINGS, 161KV 53170 TONTITN5 161 53194 ELMSPRR5 161 1	306	106	107.3	106.8	108.2	DYESS TO TONTITOWN, 161KV 53131 DYESS 5161 TO 53170 TONTITN5161 CKT 1	0	Upgrade Needed due to upgrade of Tontitown to Chamber Springs at 116MW ATC	Replace Switch and Elm Springs Strain Bus	\$ 100,000
05SP	PAOLA TO CENTENNIAL, 161KV 58067 CENTENL5 161 58069 PAOLA 5 161 1	174	50.8	144.5	53.7	149.6	STILWELL TO LA CYGNE, 345KV 57968 STILWEL7345 TO 57981 LACYGNE7345 CKT 1	620	Upgrade needed due to Linn County Substation included to relieve La Cygne to Stilwell overload at 0MW ATC	Rebuild Paola substation by KCPL	\$ -
05WP	PAOLA TO CENTENNIAL, 161KV 58067 CENTENL5 161 58069 PAOLA 5 161 1	192	30.9	111.2	33.4	115.5	STILWELL TO LA CYGNE, 345KV 57968 STILWEL7345 TO 57981 LACYGNE7345 CKT 1	620	Upgrade needed due to Linn County Substation included to relieve La Cygne to Stilwell overload at 0MW ATC	Rebuild Paola substation by KCPL	\$ -
08SP	BROKEN ARROW 101ST NORTH TO ONETA, 138KV 53781 BA101-N4 138 53818 ONETA--4 138 1	210	104.8	103.3	105	103.4	MUSKOGEE TAP TO MUSKOGEE 52758 MUSKTAP5161 TO BUS 55222 MUSKOGEE5161 CKT 1	0	Upgrade Needed due to upgrade of Broken Arrow to Oneta at 116MW ATC	Replace Wavetrap	\$ 30,000
08SP	LINDSAY TO LINDSAY SW, 69KV 55977 LINDSAY269.0 55979 LNDYSW269.0 1	26	31.9	102.5	31.9	102.1	FLETCHER TO MARLOW JCT, 69KV 55911 FLETCHR269 TO 55990 MARLOWJ269 CKT 1	0	Upgrade needed due to addition of Payne Switching Station included to relieve the Cyril to Anadarko overload at 0MW ATC	Expedite WFEC Reconductor 8.0 miles with 556 ACSR.	\$ -
08SP	MUSKOGEE TAP TO GORE, 161KV 52752 GORE 5 161 52758 MUSKTAP5 161 1	206	82.6	90.2	95.4	103.8	MUSKOGEE TO FORT SMITH, 345KV 55224 MUSKOGEE7345 TO 55302 FTSMITH7345 CKT 1	447	Upgraded needed due to addition of 2nd Pecan Creek transformer included to relieve the Pecan Creek 345/161kV transformer overload at 0MW ATC	Reconductor 16 miles with 795ACSR	\$ 4,000,000
08SP	PECAN CREEK TO MUSKOGEE, 345KV 55224 MUSKOGEE7 345 55235 PECANCK7 345 1	478	82.4	95.4	91.5	105.9	MUSKOGEE TO FORT SMITH, 345KV 55224 MUSKOGEE7345 TO 55302 FTSMITH7345 CKT 1	272	Upgraded needed due to addition of 2nd Pecan Creek transformer included to relieve the Pecan Creek 345/161kV transformer overload at 0MW ATC	Change CT Ratio @ Pecan Creek.	\$ 2,500
08SP	ROCK HILL 138/69KV TRANSFORMER CKT1 53597 ROKHILL269.0 53598 ROKHILL4 138 1	46	100	101.2	100.1	100.9	BLOCKER TAP TO MARSHALL, 69KV 53516 BLOCKRT269 TO 53570 MARSHAL269 CKT 1	0	Upgraded needed due to upgrade of Cherokee to Tatum and Tatum to Rockhill at 0MW ATC	Add 3rd Rock Hill 138/69kV 46MVA Unit	\$ 1,400,000

**Table 6 - continued** – Facility Upgrades Required Due to Addition of Upgrades Assigned to 620MW Transfer with 465MW ERCOTE to EES Annulment

Study Year	Branch Over 100% Rate B	Rate B	BC % Loading Without Upgrades	BC % Loading With Upgrades	TC % Loading Without Upgrades	TC % Loading With Upgrades	Outaged Branch Causing Overload	ATC (MW)	Comment	Assignment	Cost
08SP	TONTITOWN TO ELM SPRINGS, 161KV 53170 TONTITN5 161 53194 ELMSPRR5 161 1	306	114.4	115.7	115.1	116.3	DYESS TO TONTITOWN, 161KV 53131 DYESS 5161 TO 53170 TONTITN5161 CKT 1	0	Upgrade Needed due to upgrade of Tontitown to Chamber Springs at 87MW ATC and Chamber Springs transformer at 359MW ATC	See Previous	\$ -
08SP	TITAN TAP TO TAHLEQUAH, 69KV 54447 TAHLQH 269.0 96986 2TITANTP69.0 1	47	96.9	79.0	99.6	100.8	KANSAS TO WATTS, 69KV 54515 KANSAS 269.0 TO 96987 2WATTS 69.0 CKT 1	597	Upgrade needed due to assigned upgrades for 620 MW transfer	Reconductor 9.4 miles with 795ACSR.	\$ 1,551,000
08SP	EUREKA SPRINGS TO BEAVER DAM, 161KV 52680 BEAVER 5 161 53136 EUREKA 5 161 1	274	88.5	91.4	98.6	101.5	FLINT CREEK TO MONET, 345KV 53140 FLINTCR7 345 to 59481 MON383 7 345 CKT1	528	Upgrade needed due to assigned upgrades for 620 MW transfer	AEPW Reconductor 1.25 miles with 1590ACSR SWPA Reconnect CT's; Replace metering & reset relays	\$ 537,500

Total Cost \$ 7,711,000

**Table 7** – Facility Overloads Caused by AEPW to EES 620MW Transfer from 4/1/2003 to 4/1/2013 with 300MW ERCOTE to EES Annulment

Study Year	From Area To Area	Branch Over 100% RateB	RATE B	BC %Loading	TC %Loading	Outaged Branch That Caused Overload	ATC	Comments	Cost
03AP	WERE-WERE	GREEN TO COFFEY COUNTY 4, 69KV 57636 GREEN 269.0 to 57631 CC4VERN269.0 CKT 1	45	99.7	102.3	WOLF CREEK TO LA CYGNE, 345KV 56797 WOLFCKR7 345 to 57981 LACYGNE7 345 CKT1	620	Westar Transmission Operating Directive 1304.	\$ -
03AP	WERE-WERE	COFFEY CNTY #4 VERNON TO ATHENS SW. STA., 69KV 57631 CC4VERN269.0 to 57623 ATHENS 269.0 CKT 1	45	99.1	101.7	WOLF CREEK TO LA CYGNE, 345KV 56797 WOLFCKR7 345 to 57981 LACYGNE7 345 CKT1	620	"	\$ -
03G	OKGE-OKGE	PECAN CREEK 345/161KV TRANSFORMER 55235 PECANCK7 345 to 55234 PECANCK5 161 CKT 1	369	89.4	101.2	MUSKOGEE TO FORT SMITH, 345KV 55224 MUSKOGEE7 345 to 55302 FTSMITH7 345 CKT1	556	Add 2nd 345/161 kV 369MVA unit Upgrade Causes Muskogee Tap-Gore-Salisaw 161kV, Tahlequah-Highway 59 161KV, &Pecan Creek-Muskogee 345kV lines to Overload in 08SP	\$ 3,000,000
03G	WERE-WERE	GREEN TO COFFEY COUNTY 4, 69KV 57636 GREEN 269.0 to 57631 CC4VERN269.0 CKT 1	45	103.8	106.5	WOLF CREEK TO LA CYGNE, 345KV 56797 WOLFCKR7 345 to 57981 LACYGNE7 345 CKT1	620	Westar Transmission Operating Directive 1304.	\$ -
03G	WERE-WERE	COFFEY CNTY #4 VERNON TO ATHENS SW. STA., 69KV 57631 CC4VERN269.0 to 57623 ATHENS 269.0 CKT 1	45	102.4	105.2	WOLF CREEK TO LA CYGNE, 345KV 56797 WOLFCKR7 345 to 57981 LACYGNE7 345 CKT1	620	"	\$ -
03SP	AEPW-AEPW	CHAMBER SPRINGS TO DYESS, 161KV 53154 CHAMSPR5 161 to 53131 DYESS 5 161 CKT 1	247	100.1	102.9	FLINT CREEK TO ELM SPRINGS REC, 161KV 53139 FLINTCR5 161 to 53194 ELMSPRR5 161 CKT1	0	Relieved by AEP Tontitown Project - Estimated In-Servec Date 6/1/2004	\$ -
03SP	OKGE-OKGE	DRAPER 345/138KV TRANSFORMER 1 54934 DRAPER 7 345 to 54933 DRAPER 4 138 CKT 1	493	101.7	106.9	DRAPER 345/138KV TRANSFORMER 2 54933 DRAPER 4 138 to 54934 DRAPER 7 345 CKT2	0	Flowgate: OKGE Mitigation Plan to Increase Rating to 591 MVA by 2004	\$ -
03SP	OKGE-OKGE	DRAPER 345/138KV TRANSFORMER 2 54934 DRAPER 7 345 to 54933 DRAPER 4 138 CKT 2	493	101.7	106.9	DRAPER 345/138KV TRANSFORMER 1 54934 DRAPER 7 345 to 54933 DRAPER 4 138 CKT1	0	"	\$ -
03SP	KACP-KACP	LA CYGNE TO STILWELL, 345KV 57981 LACYGNE7 345 to 57968 STILWEL7 345 CKT 1	1251	106.4	109.7	WEST GARDNER TO LA CYGNE, 345KV 57965 W.GRDNR7 345 to 57981 LACYGNE7 345 CKT1	0	Linn County Project Relieves Facility	\$ 6,945,000
03SP	AEPW-AEPW	CHEROKEE REC TO KNOX LEE, 138KV 53522 CHEROKE4 138 to 53557 KNOXLEE4 138 CKT 1	209	100.5	107.2	Multiple Outage Contingency SOUTHWEST SHREVEPORT TO LONGWOOD, 345KV 53454 SW SHV 7 345 to 53424 LONGWD 7 345 CKT 1 SOUTHWEST SHREVEPORT TO DIANA, 345KV 53454 SW SHV 7 345 to 53528 DIANA 7 345 CKT 1	0	Reconductor 3.25 miles of 666 ACSR with 1272 ACSR	\$ 981,000
03SP	WERE-WERE	CRESWELL TO PARIS, 69KV 57543 CRESWLN269.0 to 57548 PARIS 269.0 CKT 1	80	99.8	101.6	CRESWELL TO OAK, 69KV 57543 CRESWLN269.0 to 57547 OAK 269.0 CKT1	60	Expedite Rebuild 5.7mile line assigned to SPP-2000-003 Scheduled In Service Date 6/1/04	\$ -

**Table 7 - continued** – Facility Overloads Caused by AEPW to EES 620MW Transfer from 4/1/2003 to 4/1/2013 with 300MW ERCOTE to EES Annulment

Study Year	From Area To Area	Branch Over 100% RateB	RATE B	BC %Loading	TC %Loading	Outaged Branch That Caused Overload	ATC	Comments	Cost
03SP	AEPW-AEPW	GENTRY REC TO FLINT CREEK, 161KV 53187 GENTRYR5 161 to 53139 FLINTCR5 161 CKT 1	353	99.1	102.3	DYESS TO EAST ROGERS, 161KV 53131 DYESS 5 161 to 53135 EROGERS5 161 CKT1	169	Relieved by AEP Tontitown Project - Estimated In-Service Date 6/1/2004	\$ -
03SP	AEPW-AEPW	DYESS TO EAST ROGERS, 161KV 53131 DYESS 5 161 to 53135 EROGERS5 161 CKT 1	244	98.0	102.9	GENTRY REC TO FLINT CREEK, 161KV 53139 FLINTCR5 161 to 53187 GENTRYR5 161 CKT1	251	Relieved by AEP Tontitown Project - Estimated In-Service Date 6/1/2004	\$ -
03SP	EMDE-EMDE	REPUBLIC EAST TO BILLINGS NORTHEAST, 69KV 59580 REP359 269.0 to 59546 BIL221 269.0 CKT 1	38	99.6	100.5	BLACKHAWK JCT TO JAMESV, 69KV 59604 BHJ415 269.0 to 96673 2JAMESV 69.0 CKT1	283	In-house plans to reconductor in 2004 for own needs due to outage of Black Hawk JCT - Jamesville.	\$ -
03SP	AEPW-AEPW	PERDUE TO DIANA, 138KV 53590 PERDUE 4 138 to 53527 DIANA 4 138 CKT 1	237	99.4	100.7	JACKSONVILLE TO COFFEE, 138KV 53549 JACKSNV4 138 to 53689 COFFEE 4 138 CKT1	299	Replace Breaker 10070 @ Perdue	\$ 150,000
03SP	EMDE-EMDE	ORONOGO JCT. TO JOPLIN OAKLAND NORTH, 161KV 59467 ORO110 5 161 to 59494 OAK432 5 161 CKT 1	214	97.6	100.8	TIPTON FORD TO JOPLIN SOUTHWEST, 161KV 59472 TIP292 5 161 to 59483 JOP389 5 161 CKT1	458	Reconstruct and replace 1.4 miles of 556 ACSR with Bundled 556 ACSR	\$ 800,000
03SP	AEPW-AEPW	DYESS TO EAST ROGERS, 161KV 53131 DYESS 5 161 to 53135 EROGERS5 161 CKT 1	244	96.2	101.0	EAST CENTERTON TO GENTRY REC, 161KV 53133 ECNTRTN5 161 to 53187 GENTRYR5 161 CKT1	495	Relieved by AEP Tontitown Project - Estimated In-Service Date 6/1/2004	\$ -
03SP	AEPW-AEPW	CHEROKEE REC TO TATUM, 138KV 53611 TATUM 4 138 to 53522 CHEROKE4 138 CKT 1	209	94.6	101.3	Multiple Outage Contingency SOUTHWEST SHREVEPORT TO LONGWOOD, 345KV 53454 SW SHV 7 345 to 53424 LONGWD 7 345 CKT 1 SOUTHWEST SHREVEPORT TO DIANA, 345KV 53454 SW SHV 7 345 to 53528 DIANA 7 345 CKT 1	498	Reconductor 6.25 miles of 666 ACSR with 1272 ACSR	\$ 1,641,000
03SP	AEPW-AEPW	LONGWOOD TO NORAM, 138KV 53423 LONGWD 4 138 to 53473 NORAM 4 138 CKT 1	234	95.7	100.5	Multiple Outage Contingency SOUTHWEST SHREVEPORT TO LONGWOOD, 345KV 53454 SW SHV 7 345 to 53424 LONGWD 7 345 CKT 1 SOUTHWEST SHREVEPORT TO DIANA, 345KV 53454 SW SHV 7 345 to 53528 DIANA 7 345 CKT 1	559	Reconductor 4.66 miles of bundled 266 ACSR with 1590 ACSR & replace jumpers	\$ 1,577,000
03SP	AEPW-AEPW	CHEROKEE REC TO KNOX LEE, 138KV 53522 CHEROKE4 138 to 53557 KNOXLEE4 138 CKT 1	209	98.3	100.2	STONEWALL TO WESTERN ELECTRIC T, 138KV 53450 STONWAL4 138 to 53464 WESTELT4 138 CKT1	559	See Previous	\$ -
03SP	OKGE-OKGE	PECAN CREEK 345/161KV TRANSFORMER 55235 PECANCK7 345 to 55234 PECANCK5 161 CKT 1	369	88.4	100.3	MUSKOGEE TO FORT SMITH, 345KV 55224 MUSKOGEE7 345 to 55302 FTSMITH7 345 CKT1	604	See Previous	\$ -



**Table 7 - continued** – Facility Overloads Caused by AEPW to EES 620MW Transfer from 4/1/2003 to 4/1/2013 with 300MW ERCOTE to EES Annulment

Study Year	From Area To Area	Branch Over 100% RateB	RATE B	BC %Loading	TC %Loading	Outaged Branch That Caused Overload	ATC	Comments	Cost
03SP	SWPA-AECI	<b>CARTHAGE TO REEDS SPRING, 69KV</b> 52690 CARTHG 269.0 to 96751 2REEDS 69.0 CKT 1	36	116.6	122.4	<b>AURORA TO MONETT, 161KV</b> 59468 AUR124 5 161 to 59480 MON383 5 161 CKT1	N/A	Third Party Facility	\$ -
03SP	EES-SWPA	<b>MIDWAY TO BULL SHOALS, 161KV</b> 99825 5MIDWAY# 161 to 52660 BULL SH5 161 CKT 1	162	109.6	120.8	<b>BUFORD TAP TO BULL SHOALS, 161KV</b> 52661 BUFDRTP5 161 to 52660 BULL SH5 161 CKT1	N/A	Third Party Facility with SWPA Terminal Equip Limitations Replace disconnect switches, metering CTs and wave trap at Bull Shoals by SPA.	\$ 150,000
03FA	SWPA-AEPW	<b>BROKEN BOW TO CRAIG JCT, 138KV</b> 52814 BRKN BW4 138 to 54015 CRAIGJT4 138 CKT 1	122	94.7	104.1	<b>BBDAMTP TO MOUNTAIN RIVER, 138KV</b> 55823 BBDAMTP4 138 to 56004 MTRIVER4 138 CKT1	349	SWPA: Reconnect metering CTs to 800/5 ratio. AEPW: Rebuild 7.66 miles of 3/0 CW CU with 795 ACSR	\$ 2,700,000
03FA	SWPA-AEPW	<b>BROKEN BOW TO CRAIG JCT, 138KV</b> 52814 BRKN BW4 138 to 54015 CRAIGJT4 138 CKT 1	122	92.3	101.8	<b>CRAIG JCT TO MOUNTAIN RIVER, 138KV</b> 54015 CRAIGJT4 138 to 56004 MTRIVER4 138 CKT1	504	"	\$ -
03FA	WERE-WERE	<b>GREEN TO COFFEY COUNTY 4, 69KV</b> 57636 GREEN 269.0 to 57631 CC4VERN269.0 CKT 1	45	98.4	101.1	<b>WOLF CREEK TO LA CYGNE, 345KV</b> 56797 WOLFCKR7 345 to 57981 LACYGNE7 345 CKT1	620	Westar Transmission Operating Directive 1304.	\$ -
03FA	SWPA-EES	<b>MIDWAY TO BULL SHOALS, 161KV</b> 52660 BULL SH5 161 to 99825 5MIDWAY# 161 CKT 1	162	95.8	107.4	<b>BUFORD TAP TO BULL SHOALS, 161KV</b> 52661 BUFDRTP5 161 to 52660 BULL SH5 161 CKT1	N/A	See Previous	\$ -
03WP	AEPW-AEPW	<b>PERDUE TO DIANA, 138KV</b> 53590 PERDUE 4 138 to 53527 DIANA 4 138 CKT 1	237	99.8	100.9	<b>HARRISON ROAD TO LIBERTY CITY TAP, 138KV</b> 53542 HARRISN4 138 to 53561 LIBCYTP4 138 CKT1	115	See Previous	\$ -
03WP	OKGE-OKGE	<b>PECAN CREEK 345/161KV TRANSFORMER</b> 55235 PECANCK7 345 to 55234 PECANCK5 161 CKT 1	369	90.9	102.8	<b>MUSKOGEE TO FORT SMITH, 345KV</b> 55224 MUSKOGEE7 345 to 55302 FTSMITH7 345 CKT1	473	See Previous	\$ -
04G	OKGE-OKGE	<b>PECAN CREEK 345/161KV TRANSFORMER</b> 55235 PECANCK7 345 to 55234 PECANCK5 161 CKT 1	369	90.6	102.5	<b>MUSKOGEE TO FORT SMITH, 345KV</b> 55224 MUSKOGEE7 345 to 55302 FTSMITH7 345 CKT1	489	See Previous	\$ -
04G	SWPA-SWPA	<b>GLENCOE TO NORFORK, 161KV</b> 52646 GLENCOE5 161 to 52648 NORFORK5 161 CKT 1	112	98.3	103.2	<b>NEW-IN TO NEWPO, 161KV</b> 99763 5NEW-IN 161 to 99764 5NEWPO 161 CKT1	620	Remove wave trap. Switch relaying channel to fiber optic shield wire. To be completed by SWPA for own needs.	\$ -
04G	SWPA-SWPA	<b>GLENCOE TO NORFORK, 161KV</b> 52646 GLENCOE5 161 to 52648 NORFORK5 161 CKT 1	112	97.7	102.6	<b>NEW-AB TO NEW-IN, 161KV</b> 99762 5NEW-AB 161 to 99763 5NEW-IN 161 CKT1	620	"	\$ -
04G	SWPA-SWPA	<b>GLENCOE TO NORFORK, 161KV</b> 52646 GLENCOE5 161 to 52648 NORFORK5 161 CKT 1	112	97.0	101.9	<b>CASH TO NEW-AB, 161KV</b> 99736 5CASH 1 161 to 99762 5NEW-AB 161 CKT1	620	"	\$ -
04G	SWPA-SWPA	<b>GLENCOE TO NORFORK, 161KV</b> 52646 GLENCOE5 161 to 52648 NORFORK5 161 CKT 1	112	96.6	101.7	<b>DELL TO ISES, 500KV</b> 99742 8DELL 5 500 to 99818 8ISES 5 500 CKT1	620	"	\$ -

**Table 7 - continued** – Facility Overloads Caused by AEPW to EES 620MW Transfer from 4/1/2003 to 4/1/2013 with 300MW ERCOTE to EES Annulment

Study Year	From Area To Area	Branch Over 100% RateB	RATE B	BC %Loading	TC %Loading	Outaged Branch That Caused Overload	ATC	Comments	Cost
04G	WERE-WERE	TECUMSEH HILL 161/115/13.8KV TRANSFORMER 57182* TECHILE3 115 536 WND 2 1	69	99.6	100.4	KELLY TO KING HILL N.M. COOP, 115KV 57217 KELLY 3115 to 57331 KING HL3115 CKT1	620	Transmission Operating Directive for the overload of the Tecumseh Hill 161/115/13.8kV xfrm.	\$ -
03WP	SWPA-AECI	CARTHAGE TO REEDS SPRING, 69KV 52690 CARTHG 269.0 to 96751 2REEDS 69.0 CKT 1	43	99.6	104.3	AURORA TO MONETT, 161KV 59468 AUR124 5 161 to 59480 MON383 5 161 CKT1	N/A	Third Party Facility	\$ -
04G	SWPA-EES	MIDWAY TO BULL SHOALS, 161KV 52660 BULL SH5 161 to 99825 5MIDWAY# 161 CKT 1	162	89.7	101.5	BUFORD TAP TO BULL SHOALS, 161KV 52661 BUFDRTP5 161 to 52660 BULL SH5 161 CKT1	N/A	See Previous	\$ -
05SP	AEPW-AEPW	PITTSBURG TO LONE STAR SOUTH, 138KV 53311 PITTSB_4 138 to 53276 LSSOUTH4 138 CKT 1	197	105.3	106.1	PETTY TO CHAPEL HILL REC, 138KV 53308 PETTY 4 138 to 53521 CHAPELH4 138 CKT1	0	Reset CT @ Pittsburg	\$ 10,000
05SP	AEPW-AEPW	CHEROKEE REC TO KNOX LEE, 138KV 53522 CHEROKE4 138 to 53557 KNOXLEE4 138 CKT 1	209	108.8	116.0	Multiple Outage Contingency SOUTHWEST SHREVEPORT TO LONGWOOD, 345KV 53454 SW SHV 7 345 to 53424 LONGWD 7 345 CKT 1 SOUTHWEST SHREVEPORT TO DIANA, 345KV 53454 SW SHV 7 345 to 53528 DIANA 7 345 CKT 1	0	See Previous	\$ -
05SP	AEPW-AEPW	CHEROKEE REC TO KNOX LEE, 138KV 53522 CHEROKE4 138 to 53557 KNOXLEE4 138 CKT 1	209	100.6	102.7	KEATCHIE TO GEORGIA-PACIFIC, 138KV 53418 KEATCHI4 138 to 53536 GEORPAC4 138 CKT1	0	See Previous	\$ -
05SP	AEPW-AEPW	CHEROKEE REC TO KNOX LEE, 138KV 53522 CHEROKE4 138 to 53557 KNOXLEE4 138 CKT 1	209	100.8	106.5	LONGWOOD TO WILKES, 345KV 53424 LONGWD 7 345 to 53620 WILKES 7 345 CKT1	0	See Previous	\$ -
05SP	AEPW-AEPW	CHEROKEE REC TO TATUM, 138KV 53611 TATUM 4 138 to 53522 CHEROKE4 138 CKT 1	209	102.7	109.8	Multiple Outage Contingency SOUTHWEST SHREVEPORT TO LONGWOOD, 345KV 53454 SW SHV 7 345 to 53424 LONGWD 7 345 CKT 1 SOUTHWEST SHREVEPORT TO DIANA, 345KV 53454 SW SHV 7 345 to 53528 DIANA 7 345 CKT 1	0	See Previous	\$ -
05SP	AEPW-AEPW	TATUM TO ROCKHILL, 138KV 53611 TATUM 4 138 to 53598 ROKHILL4 138 CKT 1	209	100.9	108.0	Multiple Outage Contingency SOUTHWEST SHREVEPORT TO LONGWOOD, 345KV 53454 SW SHV 7 345 to 53424 LONGWD 7 345 CKT 1 SOUTHWEST SHREVEPORT TO DIANA, 345KV 53454 SW SHV 7 345 to 53528 DIANA 7 345 CKT 1	0	Reconductor 0.81 miles 666MCM to 1272 ACSR	\$ 342,970

**Table 7 - continued** – Facility Overloads Caused by AEPW to EES 620MW Transfer from 4/1/2003 to 4/1/2013 with 300MW ERCOTE to EES Annulment

Study Year	From Area To Area	Branch Over 100% RateB	RATE B	BC %Loading	TC %Loading	Outaged Branch That Caused Overload	ATC	Comments	Cost
05SP	WERE-WERE	<b>CRESWELL TO PARIS, 69KV</b> 57543 CRESWLN269.0 to 57548 PARIS 269.0 CKT 1	80	106.5	108.2	<b>CRESWELL TO OAK, 69KV</b> 57543 CRESWLN269.0 to 57547 OAK 269.0 CKT1	0	See Previous	\$ -
05SP	KACP-KACP	<b>LA CYGNE TO STILWELL, 345KV</b> 57981 LACYGNE7 345 to 57968 STILWEL7 345 CKT 1	1251	104.2	107.5	<b>WEST GARDNER TO LA CYGNE, 345KV</b> 57981 LACYGNE7 345 to 57965 W.GRDNR7 345 CKT1	0	See Previous	\$ -
05SP	AEPW-AEPW	<b>GENTRY REC TO EAST CENTERTON, 161KV</b> 53187 GENTRYR5 161 to 53139 FLINTCR5 161 CKT 1	353	99.9	102.0	<b>LOWELL TO ROGERS, 161KV</b> 53144 LOWELL 5 161 to 53152 ROGERS 5 161 CKT1	38	Rebuild 1.09 miles of 2-397.5 ACSR with 2156 ACSR.	\$ 400,000
05SP	AEPW-AEPW	<b>CHAMBER SPRINGS TO TONTITOWN, 161KV</b> 53154 CHAMSPR5 161 to 53170 TONTITN5 161 CKT 1	244	99.7	104.2	<b>HYLAND TO SE FAYETTEVILLE, 161KV</b> 53143 HYLAND 5 161 to 53153 SEFAYTV5 161 CKT1	45	Rebuild 12 miles with 2156ACSR	\$ 7,200,000
05SP	AEPW-AEPW	<b>CHEROKEE REC TO KNOX LEE, 138KV</b> 53522 CHEROKE4 138 to 53557 KNOXLEE4 138 CKT 1	209	99.7	102.7	<b>BLOCKER TAP TO MARSHALL, 69KV</b> 53516 BLOCKRT269.0 to 53570 MARSHAL269.0 CKT1	64	See Previous	\$ -
05SP	AEPW-AEPW	<b>GENTRY REC TO EAST CENTERTON, 161KV</b> 53187 GENTRYR5 161 to 53133 ECNTRTN5 161 CKT 1	353	99.6	101.8	<b>LOWELL TO TONTITOWN, 161KV</b> 53144 LOWELL 5 161 to 53170 TONTITN5 161 CKT1	107	Rebuild 19.16 miles of 2-397.5 ACSR with 2156 ACSR.	\$ 8,000,000
05SP	AEPW-AEPW	<b>CHEROKEE REC TO KNOX LEE, 138KV</b> 53522 CHEROKE4 138 to 53557 KNOXLEE4 138 CKT 1	209	99.4	102.4	<b>MARSHALL TO MARSHALL AUTO, 69KV</b> 53570 MARSHAL269.0 to 53623 MARAUTO269.0 CKT1	126	See Previous	\$ -
05SP	SPRM-SPRM	<b>LOGAN TO CLAY, 161KV</b> 97161 5LOGAN 161 to 59970 CLAY 5 161 CKT 1	185	96.6	110.5	<b>Multiple Outage Contingency</b> <b>FRANKS TO HUBEN, 345KV</b> 96041 7FRANKS 345 to 96042 7HUBEN 345 CKT1 <b>HUBEN TO MORGAN, 345KV</b> 96042 7HUBEN 345 to 96045 7MORGAN 345 CKT1	152	Replace transmission line structures to allow operation at 100C	\$ 250,000
05SP	AEPW-AEPW	<b>BANN TO ALUMAX TAP, 138KV</b> 53250 BANN 4 138 to 53245 ALUMXT 4 138 CKT 1	261	98.4	103.2	<b>NW TEXARKANA - BANN TO NW TEXARKANA, 138KV</b> 53299 NWT-BNT4 138 to 53300 NWTXARK4 138 CKT1	204	Replace six (6) 138 kV switches, five at Bann & one at Alumax Tap. Rebuild 0.67 miles of 1024 ACAR with 2156 ACSR. Replace wavetrap jumpers @ Bann. Replace breaker 3300 @ Bann.	\$ 630,000
05SP	EMDE-EMDE	<b>ORONOGO JCT. TO JOPLIN OAKLAND NORTH, 161KV</b> 59467 ORO110 5 161 to 59494 OAK432 5 161 CKT 1	214	98.9	102.2	<b>TIPTON FORD TO JOPLIN SOUTHWEST, 161KV</b> 59472 TIP292 5 161 to 59483 JOP389 5 161 CKT1	205	See Previous	\$ -
05SP	AEPW-AEPW	<b>LONGWOOD TO NORAM, 138KV</b> 53423 LONGWD 4 138 to 53473 NORAM 4 138 CKT 1	234	98.3	103.3	<b>Multiple Outage Contingency</b> <b>SOUTHWEST SHREVEPORT TO LONGWOOD, 345KV</b> 53454 SW SHV 7 345 to 53424 LONGWD 7 345 CKT 1 <b>SOUTHWEST SHREVEPORT TO DIANA, 345KV</b> 53454 SW SHV 7 345 to 53528 DIANA 7 345 CKT 1	210	See Previous	\$ -

**Table 7 - continued** – Facility Overloads Caused by AEPW to EES 620MW Transfer from 4/1/2003 to 4/1/2013 with 300MW ERCOTE to EES Annulment

Study Year	From Area To Area	Branch Over 100% RateB	RATE B	BC %Loading	TC %Loading	Outaged Branch That Caused Overload	ATC	Comments	Cost
05SP	AEPW-AEPW	FARMINGTON AECC TO CHAMBER SPRINGS, 161KV 53195 FARMGTN5 161 to 53154 CHAMSPR5 161 CKT 1	335	99.5	100.7	DYESS TO SOUTH SPRINGDALE, 161KV 53131 DYESS 5 161 to 53159 SOSPRDL5 161 CKT1	263	Replace Switch	\$ 60,000
05SP	OKGE-OKGE	PECAN CREEK 345/161KV TRANSFORMER 55235 PECANCK7 345 to 55234 PECANCK5 161 CKT 1	369	94.8	106.7	MUSKOGEE TO FORT SMITH, 345KV 55224 MUSKOGEE7 345 to 55302 FTSMITH7 345 CKT1	271	See Previous	\$ -
05SP	AEPW-AEPW	CHAMBER SPRINGS TO TONTITOWN, 161KV 53154 CHAMSPR5 161 to 53170 TONTITN5 161 CKT 1	244	97.8	102.7	FLINT CREEK TO GRDA, 345KV 53140 FLINTCR7 345 to 54450 GRDA1 7 345 CKT1	277	See Previous	\$ -
05SP	AEPW-WFEC	SOUTHWEST STATION TO ANADARKO, 138KV 54140 S.W.S.-4 138 to 55814 ANADARK4 138 CKT 1	203	99.4	100.7	CORNVILLE TO NORTH 29TH CHICKASHA, 138KV 54112 CORNVIL4 138 to 54165 N29CHIC4 138 CKT1	294	Replace bus, jumpers, switches, supports and foundations at Anadarko Switch Station	\$ 450,000
05SP	OKGE-OKGE	FACTORY TO 3RD ST, 69KV 55292 FACTORY269.0 to 55307 3RDST 269.0 CKT 1	96	99.8	100.2	VAN BUREN AVEC TO VBI, 69KV 55298 VBAVEC 269.0 to 55336 VBI 269.0 CKT1	319	Replace 800A Trap & Increase CT Ratio to 1200-5A.	\$ 30,000
05SP	AEPW-AEPW	NORAM TO RAINES, 138KV 53473 NORAM 4 138 to 53439 RAINES 4 138 CKT 1	234	97.1	102.1	Multiple Outage Contingency SOUTHWEST SHREVEPORT TO LONGWOOD, 345KV 53454 SW SHV 7 345 to 53424 LONGWD 7 345 CKT 1 SOUTHWEST SHREVEPORT TO DIANA, 345KV 53454 SW SHV 7 345 to 53528 DIANA 7 345 CKT 1	361	Reconductor 4.66 miles of bundled 266 ACSR with 1590 ACSR and replace jumpers & Bus Riser jumpers.	\$ 2,000,000
05SP	AEPW-WFEC	SOUTHWEST STATION TO ANADARKO, 138KV 54140 S.W.S.-4 138 to 55814 ANADARK4 138 CKT 1	203	98.7	100.6	CORNVILLE TO CORN TAP, 138KV 54112 CORNVIL4 138 to 55867 CORN TP4 138 CKT1	427	See Previous	\$ -
05SP	AEPW-AEPW	CHEROKEE REC TO TATUM, 138KV 53611 TATUM 4 138 to 53522 CHEROKE4 138 CKT 1	209	94.6	100.3	LONGWOOD TO WILKES, 345KV 53424 LONGWD 7 345 to 53620 WILKES 7 345 CKT1	586	See Previous	\$ -
05SP	WERE-WERE	GILL ENERGY CENTER EAST TO OATVILLE, 69KV 57795 GILL E 269.0 to 57825 OATVILL269.0 CKT 1	72	99.7	100.0	HOOVER SOUTH TO SHERIDEN, 69KV 57806 HOOVERS269.0 to 57841 SHERIDN269.0 CKT1	620	Facility Loading Requires No Upgrades	\$ -
05SP	EMDE-EMDE	AURORA H.T. 161/69/12.5KV TRANSFORMER 59468* AUR124 5 161 544 WND 1 AURORA3 3	41.7	100.1	101.0	MONETT 161/69/12.5KV TRANSFORMER 59480 MON383 5161 to 59591 MON383 269.0 to 59712 MON383 112.5 CKT1	620	Replace 3 transformers with one 150MVA unit at EDE expense by 6/1/2003.	\$ -
05SP	EMDE-EMDE	AURORA H.T. 161/69/12.5KV TRANSFORMER 59537* AUR124 269.0 544 WND 2 AURORA3 3	41.7	99.1	100.3	MONETT 161/69/12.5KV TRANSFORMER 59480 MON383 5161 to 59591 MON383 269.0 to 59712 MON383 112.5 CKT1	620	"	\$ -

**Table 7 - continued** – Facility Overloads Caused by AEPW to EES 620MW Transfer from 4/1/2003 to 4/1/2013 with 300MW ERCOTE to EES Annulment

Study Year	From Area To Area	Branch Over 100% RateB	RATE B	BC %Loading	TC %Loading	Outaged Branch That Caused Overload	ATC	Comments	Cost
05SP	WERE-WERE	COUNTY LINE 115/69/34/5KV TRANSFORMER 57456* COLINE 269.0 536 WND 2 COLINE5X 1	66	98.9	100.6	HOYT TO STRANGER,345KV 56765 HOYT 7345 to 56772 STRANGR7345 CKT1	620	Westar Transmission Operating Directive 803	\$ -
05SP	WERE-WERE	CRESWELL TO OAK, 69KV 57543 CRESWLN269.0 to 57547 OAK 269.0 CKT 1	90	100.8	102.5	CRESWELL TO PARIS, 69KV 57543 CRESWLN269.0 to 57548 PARIS 269.0 CKT1	620	Previous upgrade assignment of "Replacment of jumpers and resetting CTs and relaying" to KMEA in SPP-2000-004	\$ -
05SP	OKGE-OKGE	DRAPER 345/138KV TRANSFORMER 1 54934 DRAPER 7 345 to 54933 DRAPER 4 138 CKT 1	493	103.2	108.4	DRAPER 345/138KV TRANSFORMER 2 54933 DRAPER 4 138 to 54934 DRAPER 7 345 CKT2	620	Flowgate: OKGE Mitigation Plan to Increase Rating to 591 MVA by 2004	\$ -
05SP	OKGE-OKGE	DRAPER 345/138KV TRANSFORMER 2 54934 DRAPER 7 345 to 54933 DRAPER 4 138 CKT 2	493	103.2	108.4	DRAPER 345/138KV TRANSFORMER 1 54934 DRAPER 7 345 to 54933 DRAPER 4 138 CKT1	620	"	\$ -
05SP	AEPW-AEPW	DYESS TO CHAMBER SPRINGS, 161KV 53131 DYESS 5 161 to 53154 CHAMSPR5 161 CKT 1	247	97.3	100.6	EAST CENTERTON TO GENTRY REC, 161KV 53133 ECNTRTN5 161 to 53187 GENTRYR5 161 CKT1	620	Relieved by AEP Tontitown Project - Estimated In-Service Date 6/1/2004	\$ -
05SP	AEPW-AEPW	DYESS TO CHAMBER SPRINGS, 161KV 53131 DYESS 5 161 to 53154 CHAMSPR5 161 CKT 1	247	98.2	101.4	GENTRY REC TO FLINT CREEK, 161KV 53139 FLINTCR5 161 to 53187 GENTRYR5 161 CKT1	620	"	\$ -
05SP	AEPW-AEPW	DYESS TO EAST ROGERS, 161KV 53131 DYESS 5 161 to 53135 EROGERS5 161 CKT 1	244	110.2	114.9	GENTRY REC TO FLINT CREEK, 161KV 53139 FLINTCR5 161 to 53187 GENTRYR5 161 CKT1	620	Relieved by AEP Tontitown Project - Estimated In-Service Date 6/1/2004	\$ -
05SP	AEPW-AEPW	DYESS TO EAST ROGERS, 161KV 53131 DYESS 5 161 to 53135 EROGERS5 161 CKT 1	244	107.8	112.6	EAST CENTERTON TO GENTRY REC, 161KV 53133 ECNTRTN5 161 to 53187 GENTRYR5 161 CKT1	620	"	\$ -
05SP	AEPW-AEPW	EAST CENTERTON TO GENTRY REC, 161KV 53133 ECNTRTN5 161 to 53187 GENTRYR5 161 CKT 1	353	98.4	100.5	ROGERS TO LOWELL REC, 161KV 53152 ROGERS 269.0 to 53200 LOWELLR269.0 CKT1	620	Relieved by AEP Tontitown Project - Estimated In-Service Date 6/1/2004	\$ -
05SP	AEPW-AEPW	EAST CENTERTON TO GENTRY REC, 161KV 53133 ECNTRTN5 161 to 53187 GENTRYR5 161 CKT 1	353	98.4	100.5	LOWELL TO LOWELLR, 69KV 53144 LOWELL 269.0 to 53200 LOWELLR269.0 CKT1	620	"	\$ -
05SP	AEPW-AEPW	EAST CENTERTON TO GENTRY REC, 161KV 53133 ECNTRTN5 161 to 53187 GENTRYR5 161 CKT 1	353	98.9	100.3	FLINT CREEK TO CHAMBER SPRINGS, 161KV 53139 FLINTCR5 161 to 53154 CHAMSPR5 161 CKT1	620	"	\$ -
05SP	AEPW-AEPW	EAST CENTERTON TO GENTRY REC, 161KV 53133 ECNTRTN5 161 to 53187 GENTRYR5 161 CKT 1	353	99.3	101.5	FLINT CREEK TO DECATUR SOUTH, 161KV 53139 FLINTCR5 161 to 59484 DEC392 5 161 CKT1	620	"	\$ -
05SP	AEPW-AEPW	GENTRY REC TO FLINT CREEK, 161KV 53187 GENTRYR5 161 to 53139 FLINTCR5 161 CKT 1	353	99.9	102.1	DELAWARE TO NEOSHO, 345KV 53929 DELWARE7 345 to 56793 NEOSHO 7 345 CKT1	620	Relieved by AEP Tontitown Project - Estimated In-Service Date 6/1/2004	\$ -

**Table 7 - continued** – Facility Overloads Caused by AEPW to EES 620MW Transfer from 4/1/2003 to 4/1/2013 with 300MW ERCOTE to EES Annulment

Study Year	From Area To Area	Branch Over 100% RateB	RATE B	BC %Loading	TC %Loading	Outaged Branch That Caused Overload	ATC	Comments	Cost
05SP	AEPW-AEPW	<b>GENTRY REC TO FLINT CREEK, 161KV</b> 53187 GENTRYR5 161 to 53139 FLINTCR5 161 CKT 1	353	100.0	102.2	<b>NEOSHO SOUTH JCT TO NOEL SOUTHWEST, 161KV</b> 59471 NEO184 5 161 to 59496 NOL435 5 161 CKT1	620	"	\$ -
05SP	AEPW-AEPW	<b>GENTRY REC TO FLINT CREEK, 161KV</b> 53187 GENTRYR5 161 to 53139 FLINTCR5 161 CKT 1	353	100.1	102.2	<b>CHAMBER SPRINGS ROAD 345/161KV</b> 53154 CHAMSPR5 161 to 53155 CHAMSPR7 345 CKT1	620	"	\$ -
05SP	AEPW-AEPW	<b>GENTRY REC TO FLINT CREEK, 161KV</b> 53187 GENTRYR5 161 to 53139 FLINTCR5 161 CKT 1	353	100.1	102.2	<b>CHAMBER SPRINGS TO CLARKSVILLE, 345KV</b> 53155 CHAMSPR7 345 to 53756 CLARKSV7 345 CKT1	620	"	\$ -
05SP	AEPW-AEPW	<b>GENTRY REC TO FLINT CREEK, 161KV</b> 53187 GENTRYR5 161 to 53139 FLINTCR5 161 CKT 1	353	100.0	102.1	<b>DECATUR SOUTH TO NOEL SOUTHWEST, 161KV</b> 59484 DEC392 5 161 to 59496 NOL435 5 161 CKT1	620	"	\$ -
05SP	OKGE-OKGE	<b>GLASSES TO RUSSETT, 138KV</b> 55147 GLASSES4 138 to 55120 RUSSETT4 138 CKT 1	96	99.2	100.7	<b>BROWN TO BROWN, 138KV</b> 52802 S BROWN4 138 to 55157 BROWN 4 138 CKT1	620	Replace 400Amp Wave Trap at Russett in 2003 at OKGE's expense.	\$ -
05SP	AEPW-AEPW	<b>LOWELL TO SPRINGDALE T, 69KV</b> 53144 LOWELL 269.0 to 53161 SPRDALT269.0 CKT 1	107	99.8	102.3	<b>EAST CENTERTON TO GENTRY REC, 161KV</b> 53133 ECNTRTN5 161 to 53187 GENTRYR5 161 CKT1	620	Relieved by AEP Tontitown Project - Estimated In-Service Date 6/1/2004	\$ -
05SP	EES-SWPA	<b>MIDWAY TO BULL SHOALS, 161KV</b> 99825 5MIDWAY# 161 to 52660 BULL SH5 161 CKT 1	162	110.7	121.6	<b>BUFORD TAP TO BULL SHOALS, 161KV</b> 52661 BUFDRTP5 161 to 52660 BULL SH5 161 CKT1	N/A	See Previous	\$ -
05SP	SWPA-AECI	<b>CARTHAGE TO JASPER, 69KV</b> 52690 CARTHG 269.0 to 96649 2JASPER 69.0 CKT 1	47	97.4	100.2	<b>ARCHIE TO ADRIAN, 161KV</b> 59207 ARCHIE 5 161 to 59240 ADRIAN 5 161 CKT1	N/A	Third Party Facility	\$ -
05SP	SWPA-AECI	<b>CARTHAGE TO REEDS SPRING, 69KV</b> 52690 CARTHG 269.0 to 96751 2REEDS 69.0 CKT 1	36	118.4	124.2	<b>AURORA TO MONETT, 161KV</b> 59468 AUR124 5 161 to 59480 MON383 5 161 CKT1	N/A	Third Party Facility	\$ -
05WP	SPRM-SPRM	<b>LOGAN TO CLAY, 161KV</b> 97161 5LOGAN 161 to 59970 CLAY 5 161 CKT 1	232	96.4	107.0	<b>Multiple Outage Contingency</b> <b>FRANKS TO HUBEN, 345KV</b> 96041 7FRANKS 345 to 96042 7HUBEN 345 CKT1 <b>HUBEN TO MORGAN, 345KV</b> 96042 7HUBEN 345 to 96045 7MORGAN 345 CKT1	211	See Previous	\$ -
05WP	SPRM-SPRM	<b>CLAY TO SPRINGFIELD, 161KV</b> 59970 CLAY 5 161 to 52692 SPRGFLD5 161 CKT 1	167	96.7	104.6	<b>Multiple Outage Contingency</b> <b>FRANKS TO HUBEN, 345KV</b> 96041 7FRANKS 345 to 96042 7HUBEN 345 CKT1 <b>HUBEN TO MORGAN, 345KV</b> 96042 7HUBEN 345 to 96045 7MORGAN 345 CKT1	259	Replace disconnect switches at Springfield	\$ 200,000

**Table 7 - continued** – Facility Overloads Caused by AEPW to EES 620MW Transfer from 4/1/2003 to 4/1/2013 with 300MW ERCOTE to EES Annulment

Study Year	From Area To Area	Branch Over 100% RateB	RATE B	BC %Loading	TC %Loading	Outaged Branch That Caused Overload	ATC	Comments	Cost
05WP	OKGE-OKGE	PECAN CREEK 345/161KV TRANSFORMER 55235 PECANCK7 345 to 55234 PECANCK5 161 CKT 1	369	89.6	101.5	MUSKOGEE TO FORT SMITH, 345KV 55224 MUSKOGEE7 345 to 55302 FTSMITH7 345 CKT1	544	See Previous	\$ -
05WP	SWPA-SWPA	SPRINGFIELD 161/69KV TRANSFORMER 3 52692 SPRGFLD5 161 to 52694 SPRGFLD269.0 CKT 3	25	90.9	101.1	SPRINGFIELD 161/69KV TRANSFORMER 1 52692 SPRGFLD5 161 to 52694 SPRGFLD269.0 CKT1	552	Replace 25MVA transformer #3 with 80MVA transformer	\$ 1,300,000
05WP	SWPA-AECI	CARTHAGE TO REEDS SPRING, 69KV 52690 CARTHG 269.0 to 96751 2REEDS 69.0 CKT 1	43	102.6	107.4	AURORA TO MONETT, 161KV 59468 AUR124 5 161 to 59480 MON383 5 161 CKT1	N/A	Third Party Facility	\$ -
08SP	WERE-WERE	HOYT HTI SW. JCT. TO CIRCLEVILLE, 115KV 57165 HTI JCT3 115 to 57152 CIRCLVL3 115 CKT 1	92	100.8	103.4	IATAN TO ST JOE, 345KV 57982 IATAN 7 345 to 59199 ST JOE 3 345 CKT1	0	Replace 82 structures	\$ 742,000
08SP	SWPA-SWPA	SPRINGFIELD 161/69KV TRANSFORMER 1 52692 SPRGFLD5 161 to 52694 SPRGFLD269.0 CKT 1	80	100.6	102.6	PLAINVIEW TO COX, 69KV 59905 PLAINVI269.0 to 59910 COX 269.0 CKT1	0	No Upgrade Required As Springfield 161/69kV Transformer #3 Replacement Relieves Facility	\$ -
08SP	SWPA-SWPA	SPRINGFIELD 161/69KV TRANSFORMER 1 52692 SPRGFLD5 161 to 52694 SPRGFLD269.0 CKT 1	80	100.6	101.9	NICHOLS 161/69KV TRANSFORMER 59925 NICHOLS269.0 to 59956 NICHOLS5 161 CKT1	0	No Upgrade Required As Springfield 161/69kV Transformer #3 Replacement Relieves Facility	\$ -
08SP	SWPA-SWPA	SPRINGFIELD 161/69KV TRANSFORMER 3 52692 SPRGFLD5 161 to 52694 SPRGFLD269.0 CKT 3	25	102.8	105.0	JAMES RIVER TO TWIN OAK, 69KV 59904 JRPS 269.0 to 59933 TWINOAK269.0 CKT1	0	See Previous	\$ -
08SP	SWPA-SWPA	SPRINGFIELD 161/69KV TRANSFORMER 3 52692 SPRGFLD5 161 to 52694 SPRGFLD269.0 CKT 3	25	100.1	101.6	JUNCTION TO BROOKLINE, 161KV 59955 JUNCTN 5 161 to 59969 BRKLINE 5 161 CKT1	0	See Previous	\$ -
08SP	AEPW-AEPW	PITTSBURG TO LONE STAR SOUTH, 138KV 53311 PITTSB_4 138 to 53276 LSSOUTH4 138 CKT 1	197	114.2	115.0	PETTY TO CHAPEL HILL REC, 138KV 53308 PETTY 4 138 to 53521 CHAPELH4 138 CKT1	0	See Previous	\$ -
08SP	AEPW-EES	FULTON TO PATMOS, 115KV 53374 FULTON 3 115 to 99303 3PATMOS# 115 CKT 1	174	102.5	125.7	LONGWOOD TO ELDEHV, 345KV 53424 LONGWD 7 345 to 99294 7ELDEHV 345 CKT1	0	Recond. 7.1 miles with 1272 ACSR	\$ 2,100,000
08SP	AEPW-EES	FULTON TO PATMOS, 115KV 53374 FULTON 3 115 to 99303 3PATMOS# 115 CKT 1	174	102.5	125.7	ELDEHV 500/345KV TRANSFORMER 99294 7ELDEHV 345 to 99295 8ELDEHV 500 CKT1	0	See Previous	\$ -
08SP	AEPW-EES	FULTON TO PATMOS, 115KV 53374 FULTON 3 115 to 99303 3PATMOS# 115 CKT 1	174	105.9	126.6	CROCKETT TO GRIMES, 345KV 53526 CROCKET7 345 to 97513 7GRIMES 345 CKT1	0	See Previous	\$ -

**Table 7 - continued** – Facility Overloads Caused by AEPW to EES 620MW Transfer from 4/1/2003 to 4/1/2013 with 300MW ERCOTE to EES Annulment

Study Year	From Area To Area	Branch Over 100% RateB	RATE B	BC %Loading	TC %Loading	Outaged Branch That Caused Overload	ATC	Comments	Cost
08SP	AEPW-EES	FULTON TO PATMOS, 115KV 53374 FULTON 3 115 to 99303 3PATMOS# 115 CKT 1	174	102.4	122.6	CROCKETT TO TENASKA RUSK COUNTY 53526 CROCKET7 345 to 53637 TENRUSK7 345 CKT1	0	See Previous	\$ -
08SP	AEPW-AEPW	LONGWOOD TO NORAM, 138KV 53423 LONGWD 4 138 to 53473 NORAM 4 138 CKT 1	234	107.0	112.0	Multiple Outage Contingency SOUTHWEST SHREVEPORT TO LONGWOOD, 345KV 53454 SW SHV 7 345 to 53424 LONGWD 7 345 CKT 1 SOUTHWEST SHREVEPORT TO DIANA, 345KV 53454 SW SHV 7 345 to 53528 DIANA 7 345 CKT 1	0	See Previous	\$ -
08SP	AEPW-AEPW	NORAM TO RAINES, 138KV 53473 NORAM 4 138 to 53439 RAINES 4 138 CKT 1	234	105.7	110.7	Multiple Outage Contingency SOUTHWEST SHREVEPORT TO LONGWOOD, 345KV 53454 SW SHV 7 345 to 53424 LONGWD 7 345 CKT 1 SOUTHWEST SHREVEPORT TO DIANA, 345KV 53454 SW SHV 7 345 to 53528 DIANA 7 345 CKT 1	0	See Previous	\$ -
08SP	AEPW-AEPW	CHEROKEE REC TO KNOX LEE, 138KV 53522 CHEROKE4 138 to 53557 KNOXLEE4 138 CKT 1	209	112.3	119.6	Multiple Outage Contingency SOUTHWEST SHREVEPORT TO LONGWOOD, 345KV 53454 SW SHV 7 345 to 53424 LONGWD 7 345 CKT 1 SOUTHWEST SHREVEPORT TO DIANA, 345KV 53454 SW SHV 7 345 to 53528 DIANA 7 345 CKT 1	0	See Previous	\$ -
08SP	AEPW-AEPW	CHEROKEE REC TO KNOX LEE, 138KV 53522 CHEROKE4 138 to 53557 KNOXLEE4 138 CKT 1	209	102.7	108.4	LONGWOOD TO WILKES, 345KV 53424 LONGWD 7 345 to 53620 WILKES 7 345 CKT1	0	See Previous	\$ -
08SP	AEPW-AEPW	CHEROKEE REC TO KNOX LEE, 138KV 53522 CHEROKE4 138 to 53557 KNOXLEE4 138 CKT 1	209	101.5	104.6	MARSHALL TO MARSHALL AUTO, 69KV 53570 MARSHAL269.0 to 53623 MARAUTO269.0 CKT1	0	See Previous	\$ -
08SP	AEPW-AEPW	CHEROKEE REC TO KNOX LEE, 138KV 53522 CHEROKE4 138 to 53557 KNOXLEE4 138 CKT 1	209	101.0	106.2	CROCKETT TO GRIMES, 345KV 53526 CROCKET7 345 to 97513 7GRIMES 345 CKT1	0	See Previous	\$ -
08SP	AEPW-AEPW	TATUM TO ROCKHILL, 138KV 53598 ROKHILL4 138 to 53611 TATUM 4 138 CKT 1	209	100.1	102.1	STONEWALL TO WESTERN ELECTRIC, 138KV 53450 STONWAL4 138 to 53464 WESTELT4 138 CKT1	0	See Previous	\$ -



**Table 7 - continued** – Facility Overloads Caused by AEPW to EES 620MW Transfer from 4/1/2003 to 4/1/2013 with 300MW ERCOTE to EES Annulment

Study Year	From Area To Area	Branch Over 100% RateB	RATE B	BC %Loading	TC %Loading	Outaged Branch That Caused Overload	ATC	Comments	Cost
08SP	AEPW-AEPW	JACKSONVILLE TO OVERTON, 138KV 53549 JACKSNV4 138 to 53588 OVERTON4 138 CKT 1	235	106.4	114.0	CROCKETT TO TENASKA RUSK COUNTY 53526 CROCKET7 345 to 53637 TENRUSK7 345 CKT1	0	See Previous	\$ 15,000
08SP	AEPW-AEPW	OAK HILL TO KNOX LEE, 138KV 53586 OAK2HIL4 138 to 53557 KNOXLEE4 138 CKT 1	210	100.6	102.0	KILGORE REC TO MONROE CORNERS REC, 138KV 53555 KILGORR4 138 to 53574 MONROCR4 138 CKT1	0	Replace wavetrapp @ Knoxlee	\$ 20,000
08SP	AEPW-AEPW	CHEROKEE REC TO TATUM, 138KV 53611 TATUM 4 138 to 53522 CHEROKE4 138 CKT 1	209	105.7	113.0	Multiple Outage Contingency SOUTHWEST SHREVEPORT TO LONGWOOD, 345KV 53454 SW SHV 7 345 to 53424 LONGWD 7 345 CKT 1 SOUTHWEST SHREVEPORT TO DIANA, 345KV 53454 SW SHV 7 345 to 53528 DIANA 7 345 CKT 1	0	See Previous	\$ -
08SP	AEPW-AEPW	TATUM TO ROCKHILL, 138KV 53611 TATUM 4 138 to 53598 ROKHILL4 138 CKT 1	209	103.8	111.1	Multiple Outage Contingency SOUTHWEST SHREVEPORT TO LONGWOOD, 345KV 53454 SW SHV 7 345 to 53424 LONGWD 7 345 CKT 1 SOUTHWEST SHREVEPORT TO DIANA, 345KV 53454 SW SHV 7 345 to 53528 DIANA 7 345 CKT 1	0	See Previous & Reconductor other 5.76 miles of 795 ACSR with 1272 ACSR. Reset CTs and relay settings @ Rock Hill	\$ 1,800,000
08SP	GRRD-GRRD	KERR TO 412SUB, 161KV 54435 KERR GR5 161 to 54437 412SUB 5 161 CKT 1	338	102.2	105.7	FLINT CREEK TO GRDA1, 345KV 53140 FLINTCR7 345 to 54450 GRDA1 7 345 CKT1	0	Reconductor 12.5 miles with 1590MCM ACSR	\$ 1,918,000
08SP	GRRD-GRRD	412SUB TO KANSAS TAP, 161KV 54437 412SUB 5 161 to 54514 KANSATP5 161 CKT 1	338	101.5	104.9	FLINT CREEK TO GRDA1, 345KV 53140 FLINTCR7 345 to 54450 GRDA1 7 345 CKT1	0	Reconductor 9.7 miles with 1590MCM ACSR	\$ 1,488,000
08SP	GRRD-GRRD	OKAY 161/69KV TRANSFORMER 54440 OKAYGR 5 161 to 54446 OKAYGR 269.0 CKT 1	112	100.0	101.4	WAGONER 161/69KV TRANSFORMER 54497 WAGNOR 269.0 to 54500 WAGNOR 5 161 CKT1	0	Add Second Wagoner 84MVA transformer.	\$ 1,340,000
08SP	OKGE-OKGE	PECAN CREEK 345/161KV TRANSFORMER 55235 PECANCK7 345 to 55234 PECANCK5 161 CKT 1	369	107.8	119.7	MUSKOGEE TO FORT SMITH, 345KV 55224 MUSKOGEE7 345 to 55302 FTSMITH7 345 CKT1	0	See Previous	\$ -
08SP	WFEC-WFEC	CYRIL TO ANADARKO, 69KV 55870 CYRIL 269.0 to 55810 ANADARK269.0 CKT 1	61	100.7	100.8	ANADARKO TO GEORGIA, 138KV 55814 ANADARK4 138 to 55923 GEORGIA4 138 CKT1	0	Expedite new Payne Sw. Station with a 70MVA autotransformer scheduled for 2010. This alternative includes expediting WFEC Lindsey - Lindsey Sw. 69kVs upgrade.	\$ -
08SP	WFEC-SWPA	PHAROAH TO WELEETKA, 138KV 56026 PHAROA4 138 to 52792 WELEETK4 138 CKT 1	191	103.3	104.8	FRANKLIN TO FRANKLIN SWITCH, 138KV 55913 FRANKLN4 138 to 55917 FRNKLNS4 138 CKT1	0	Replace wavetrapp at Weleetka and replace jumpers	\$ 75,000

**Table 7 - continued** – Facility Overloads Caused by AEPW to EES 620MW Transfer from 4/1/2003 to 4/1/2013 with 300MW ERCOTE to EES Annulment

Study Year	From Area To Area	Branch Over 100% RateB	RATE B	BC %Loading	TC %Loading	Outaged Branch That Caused Overload	ATC	Comments	Cost
08SP	WERE-WERE	GILL ENERGY CENTER EAST TO MACARTHUR, 69KV 57795 GILL E 269.0 to 57813 MACARTH269.0 CKT 1	68	106.6	107.0	MACARTHUR TO OATVILLE, 69KV 57813 MACARTH269.0 to 57825 OATVILL269.0 CKT1	0	Replace sub bus and jumpers at MacArthur 69 kV	\$ 22,000
08SP	KACP-KACP	LA CYGNE TO STILWELL, 345KV 57968 STILWEL7 345 to 57981 LACYGNE7 345 CKT 1	1251	102.6	105.8	WEST GARDNER TO LA CYGNE, 345KV 57965 W.GRDNR7 345 to 57981 LACYGNE7 345 CKT1	0	See Previous	\$ -
08SP	AEPW-AEPW	CHAMBER SPRINGS TO TONTITOWN, 161KV 53154 CHAMSPR5 161 to 53170 TONTITN5 161 CKT 1	244	99.9	103.7	SE FAYETTEVILLE TO SOUTH FAYETTEVILLE, 161KV 53153 SEFAYTV5 161 to 53157 SFAYTVL5 161 CKT1	20	See Previous	\$ -
08SP	EMDE-EMDE	ORONOGO JCT. TO JOPLIN OAKLAND NORTH, 161KV 59467 ORO110 5 161 to 59494 OAK432 5 161 CKT 1	214	99.9	103.1	TIPTON FORD TO JOPLIN SOUTHWEST, 161KV 59472 TIP292 5 161 to 59483 JOP389 5 161 CKT1	28	See Previous	\$ -
08SP	AEPW-AEPW	BROKEN ARROW NORTH TO ONETA, 138KV 53798 BA.N-ST4 138 to 53818 ONETA--4 138 CKT 1	235	99.5	105.7	CHAMBER SPRINGS ROAD 345/161KV 53154 CHAMSPR5 161 to 53155 CHAMSPR7 345 CKT1	53	Rebuild 4.31 miles of 795 ACSR with 1590 ACSR	\$ 2,370,500
08SP	AEPW-AEPW	BROKEN ARROW NORTH TO ONETA, 138KV 53798 BA.N-ST4 138 to 53818 ONETA--4 138 CKT 1	235	99.5	105.7	CHAMBER SPRINGS TO CLARKSVILLE, 345KV 53155 CHAMSPR7 345 to 53756 CLARKSV7 345 CKT1	54	See Previous	\$ -
08SP	WFEC-OKGE	FRANKLIN TO MIDWEST, 138KV 55917 FRNKLNS4 138 to 54946 MIDWEST4 138 CKT 1	215	98.4	102.7	SUNSHINE CANYON TO TUTTLE, 138KV 56059 SUNSHIN4 138 to 56072 TUTTLE 4 138 CKT1	234	Replace 600A metering CTs with 1200A	\$ 55,000
08SP	EMDE-EMDE	REINMILLER 161/69KV TRANSFORMER 59500* RNM393 5 161 544 WND 1 REINMILL 1	75	99.5	100.6	TIPTON FORD TO JOPLIN SOUTHWEST, 161KV 59472 TIP292 5 161 TO 59483 JOP389 5 161 CKT 1	282	Replace with a 150 MVA unit	\$ 1,730,000
08SP	AEPW-AEPW	CHAMBER SPRINGS ROAD 345/161KV TRANSFORMER 53155 CHAMSPR7 345 to 53154 CHAMSPR5 161 CKT 1	660	97.6	102.7	FLINT CREEK TO GRDA1, 345KV 53140 FLINTCR7 345 to 54450 GRDA1 7 345 CKT1	292	Install 2nd 345/161 kV unit. Note: Reconductoring Chamber Springs to Tontitown 161kV Reduces ATC	\$ 4,000,000
08SP	EMDE-EMDE	JOPLIN SOUTHWEST 161/69KV TRANSFORMER 59483* JOP389 5 161 544 WND 1 JOPLINSW 1	75	99.9	100.1	TIPTON FORD TO JOPLIN SOUTHWEST, 161KV 59472 TIP292 5 161 TO 59483 JOP389 5 161 CKT 1	310	No Upgrade Required As Reinmiller 161/69kV Transformer Replacement Relieves Facility	\$ -
08SP	AEPW-AEPW	HALLSVILLE TO LONGVIEW HEIGHTS, 69KV 53541 HALLSVL269.0 to 53567 LONGVHT269.0 CKT 1	48	98.9	100.9	MARSHALL TO MARSHALL AUTO, 69KV 53570 MARSHAL269.0 to 53623 MARAUTO269.0 CKT1	334	Rebuild 7.07 miles of 4/0 ACSR with 795 ACSR	\$ 3,000,000
08SP	AEPW-AEPW	CHAMBER SPRINGS TO TONTITOWN, 161KV 53154 CHAMSPR5 161 to 53170 TONTITN5 161 CKT 1	244	97.7	101.6	FAYETTEVILLE TO SOUTH FAYETTEVILLE, 161KV 53138 FAYETVL5 161 to 53157 SFAYTVL5 161 CKT1	359	See Previous Note: Adding Second Chamber Springs 345/161kV Unit Reduces ATC Shown	\$ -
08SP	AEPW-AEPW	SOUTH TEXARKANA REC TO TEXARKANA PLANT, 69KV 53189 STEXREC269.0 to 53329 TEXARK 269.0 CKT 1	59	97.2	101.8	ATLANTA TO WEST ATLANTA, 69KV 53248 ATLANTA269.0 to 53333 WATLANT269.0 CKT1	375	Rebuild 5.92 miles of 266 ACSR with 795 ACSR. Replace 4/0 CU jumpers @ Texarkana Plant	\$ 2,400,000

**Table 7 - continued** – Facility Overloads Caused by AEPW to EES 620MW Transfer from 4/1/2003 to 4/1/2013 with 300MW ERCOTE to EES Annulment

Study Year	From Area To Area	Branch Over 100% RateB	RATE B	BC %Loading	TC %Loading	Outaged Branch That Caused Overload	ATC	Comments	Cost
08SP	AEPW-AEPW	PERDUE TO DIANA, 138KV 53590 PERDUE 4 138 to 53527 DIANA 4 138 CKT 1	237	99.5	100.3	NEW GLADEWATER TO PERDUE, 138KV 53576 NEWGLAD4 138 to 53590 PERDUE 4 138 CKT1	385	See Previous	\$ -
08SP	OKGE-AEPW	BONANZA TAP TO BONANZA, 161KV 55261 BONANZT5 161 to 53126 BONANZA5 161 CKT 1	177	99.1	100.5	AES TO TARBY, 161KV 55262 AES 5 161 to 55264 TARBY 5 161 CKT1	392	Rebuild 0.06 miles of 397.5 ACSR with 795MCM ACSR	\$ 50,000
08SP	KACP-KACP	STILWELL 345/161KV TRANSFORMER #1 57968 STILWEL7 345 to 57969 STILWEL5 161 CKT 11	605	99.0	100.6	STILWELL 345/161KV TRANSFORMER #2 57968 STILWEL7 345 to 57969 STILWEL5 161 CKT22	395	Linn County Project Relieves Facility	\$ -
08SP	SPRM-AECI	CLAY TO LOGAN, 161KV 59970 CLAY 5 161 to 97161 5LOGAN 161 CKT 1	185	89.6	105.8	HUBEN TO MORGAN, 345KV 96042 7HUBEN 345 to 96045 7MORGAN 345 CKT1	399	See Previous	\$ -
08SP	AEPW-AEPW	CHAMBER SPRINGS TO TONTITOWN, 161KV 53154 CHAMSPR5 161 to 53170 TONTITN5 161 CKT 1	244	97.3	101.1	HYLAND TO SE FAYETTEVILLE, 161KV 53143 HYLAND 5 161 to 53153 SEFAYTV5 161 CKT1	435	See Previous Note: Adding Second Chamber Springs 345/161kV Unit Reduces ATC Shown	\$ -
08SP	SWPA-SWPA	NORFORK TO BUFORD TAP, 161KV 52648 NORFORK5 161 to 52661 BUFRDTP5 161 CKT 1	189	93.4	102.6	MIDWAY TO BULL SHOALS, 161KV 52660 BULL SH5 161 to 99825 5MIDWAY# 161 CKT1	446	Resag conductor and replace structures as necessary	\$ 250,000
08SP	AEPW-AEPW	IPC JEFFERSON TO LIEBERMAN, 138KV 53548 IPCJEFF4 138 to 53420 LIEBERM4 138 CKT 1	136	90.8	103.1	LONGWOOD TO WILKES, 345KV 53620 WILKES 7 345 to 53424 LONGWD 7 345 CKT1	465	Reconductor 26.35 miles of 336 ACSR with 795 ACSR, Replace Switches @ Lieberman	\$ 7,232,000
08SP	AEPW-AEPW	MARSHALL TO NORTH MARSHALL, 69KV 53570 MARSHAL269.0 to 53579 NMARSHL269.0 CKT 1	72	98.7	100.4	FLOURNOY 138/69KV TRANSFORMER 53404 FLOURNY269.0 to 53405 FLOURNY4 138 CKT1	465	Replace 350 CU bus & jumpers @ North Marshall	\$ 23,356
08SP	OKGE-OKGE	PECAN CREEK 345/161KV TRANSFORMER 55235 PECANCK7 345 to 55234 PECANCK5 161 CKT 1	369	95.0	101.6	CLARKSVILLE TO MUSKOGEE, 345KV 53756 CLARKSV7 345 to 55224 MUSKOGEE7 345 CKT1	468	See Previous	\$ -
08SP	AEPW-WERE	SOUTH COFFEYVILLE TO DEARING, 138 KV 53972 COFFEYT4 138 to 57002 DEARING4 138 CKT 1	210	94.4	101.2	DELAWARE TO NEOSHO, 345KV 53929 DELWARE7 345 to 56793 NEOSHO 7 345 CKT1	509	Replace wave trap to increase rating to conductor rating (2000 A) by WR.	\$ 20,000
08SP	AEPW-AEPW	MARSHALL TO NORTH MARSHALL, 69KV 53570 MARSHAL269.0 to 53579 NMARSHL269.0 CKT 1	72	96.2	100.7	Multiple Outage Contingency SOUTHWEST SHREVEPORT TO LONGWOOD, 345KV 53454 SW SHV 7 345 to 53424 LONGWD 7 345 CKT 1 SOUTHWEST SHREVEPORT TO DIANA, 345KV 53454 SW SHV 7 345 to 53528 DIANA 7 345 CKT 1	528	See Previous	\$ -

**Table 7 - continued** – Facility Overloads Caused by AEPW to EES 620MW Transfer from 4/1/2003 to 4/1/2013 with 300MW ERCOTE to EES Annulment

Study Year	From Area To Area	Branch Over 100% RateB	RATE B	BC %Loading	TC %Loading	Outaged Branch That Caused Overload	ATC	Comments	Cost
08SP	SPRM-SPRM	SPRINGFIELD 161/69KV TRANSFORMER 3 52692 SPRGFLD5 161 to 52694 SPRGFLD269.0 CKT 3	25	93.0	101.0	FRANKS TO HUBEN, 345KV 96041 7FRANKS 345 to 96042 7HUBEN 345 CKT1 HUBEN TO MORGAN, 345KV 96042 7HUBEN 345 to 96045 7MORGAN 345 CKT1	543	See Previous	\$ -
08SP	AEPW-AEPW	RAINES TO ARSENAL HILL, 138KV 53439 RAINES 4 138 to 53386 ARSHILL4 138 CKT 1	234	95.2	100.1	Multiple Outage Contingency SOUTHWEST SHREVEPORT TO LONGWOOD, 345KV 53454 SW SHV 7 345 to 53424 LONGWD 7 345 CKT 1 SOUTHWEST SHREVEPORT TO DIANA, 345KV 53454 SW SHV 7 345 to 53528 DIANA 7 345 CKT 1	611	No Upgrade Required As Assigned Upgrades for 620 MW Relieves Facility	\$ -
08SP	WERE-WERE	MOCKINGBIRD HILLSW. STA TO STULL SW. STA, 115KV 57253 MOCKBRD3 115 to 57270 STULL T3 115 CKT 1	92	99.1	100.7	LAWRENCE HILL 230/115/13.8KV TRANSFORMER 56853 LAWHILL6230 to 57250 LWRNCHL3115 to 56882 LAWHILL113.8 CKT 1	620	Westar mitigation planned in 2005	\$ -
08SP	AEPW-AEPW	NORTHWEST HENDERSON TO OAK HILL, 138KV 53584 NWHENDR4 138 to 53585 OAK1HIL4 138 CKT 1	210	99.5	100.9	KNOXLEE TO MONROE CORNERS REC, 138KV 53557 KNOXLEE4 138 to 53574 MONROCR4 138 CKT1	620	Wavetrap to be Replaced by AEP 6/1/2008	\$ -
08SP	WERE-WERE	JARBALO JCT SW. STA. TO 166TH STREET, 115KV 57244 JARBALO3 115 to 57233 166TH 3 115 CKT 1	97	99.8	101.2	IATAN TO ST JOE, 345KV 57982 IATAN 7 345 to 59199 ST JOE 3 345 CKT1	620	Transmission Operating Directive 1202	\$ -
08SP	SWPA-SWPA	NORFORK 161/69KV TRANSFORMER 52648 NORFORK5 161 to 52650 NORFORK269.0 CKT 1	25	104.7	106.6	NORFORK TO WEST PLAINS, 161KV 52648 NORFORK5 161 to 96123 5WPLAIN 161 CKT1	620	Norfork transformer to be replaced by SWPA 6/1/06	\$ -
08SP	OKGE-OKGE	ADA OC PUMP TAP TO ADA OC PUMP, 69KV 55190 AOCP T 269.0 to 55189 AOCPA 269.0 CKT 1	52	92.6	100.3	PARK LANE TO AHLOSO, 69KV 55177 PARKLN 269.0 to 55187 AHLOSTP269.0 CKT1	620	No Upgrade Assigned	\$ -
08SP	OKGE-OKGE	AVEC OZARK TO HELBERG, 69KV 55324 AVECOZK269.0 to 55325 HELBERG269.0 CKT 1	72	100.0	100.9	FITZHUGH TO ALTUS, 69KV 53203 FITZHUG269.0 to 55330 ALTUS 269.0 CKT1	620	No Upgrade Assigned	\$ -
08SP	AEPW-AEPW	CHAMBER SPRINGS TO LAKE ELMDALE, 161KV 53154 CHAMSPR5 161 to 53175 LELMDAL5 161 CKT 1	244	98.4	102.0	EAST ROGERS TO ROGERS WEST REC 53135 EROGERS5 161 to 53207 WROGERS5 161 CKT1	620	Relieved by AEP Tontitown Project - Estimated In-Service Date 6/1/2004	\$ -
08SP	WERE-WERE	CIRCLEVILLE TO KING HILL, 115KV 57152 CIRCLVL3 115 to 57331 KING HL3 115 CKT 1	92	99.1	101.8	HOYT TO STRANGER,345KV 56765 HOYT 7 345 to 56772 STRANGR7 345 CKT1	620	Westar Transmission Operating Directive 803	\$ -

**Table 7 - continued** – Facility Overloads Caused by AEPW to EES 620MW Transfer from 4/1/2003 to 4/1/2013 with 300MW ERCOTE to EES Annulment

Study Year	From Area To Area	Branch Over 100% RateB	RATE B	BC %Loading	TC %Loading	Outaged Branch That Caused Overload	ATC	Comments	Cost
08SP	OKGE-OKGE	<b>DRAPER 345/138KV TRANSFORMER 1</b> 54934 DRAPER 7 345 to 54933 DRAPER 4 138 CKT 1	493	105.3	110.4	<b>DRAPER 345/138KV TRANSFORMER 2</b> 54933 DRAPER 4 138 to 54934 DRAPER 7 345 CKT2	620	Flowgate: OKGE Mitigation Plan to Increase Rating to 591 MVA by 2004	\$ -
08SP	OKGE-OKGE	<b>DRAPER 345/138KV TRANSFORMER 2</b> 54934 DRAPER 7 345 to 54933 DRAPER 4 138 CKT 2	493	105.3	110.4	<b>DRAPER 345/138KV TRANSFORMER 1</b> 54934 DRAPER 7 345 to 54933 DRAPER 4 138 CKT1	620	"	\$ -
08SP	AEPW-AEPW	<b>FLINT CREEK TO ELM SPRINGS REC, 161KV</b> 53139 FLINTCR5 161 to 53194 ELMSPRR5 161 CKT 1	312	99.8	100.3	<b>SOUTH FAYETTEVILLE TO FARMINGTON AECC, 161KV</b> 53157 SFAYTVL5 161 to 53195 FARMGTN5 161 CKT1	620	Relieved by AEP Tontitown Project - Estimated In-Service Date 6/1/2004	\$ -
08SP	SWPA-SWPA	<b>GLENCOE TO NORFORK, 161KV</b> 52646 GLENCOE5 161 to 52648 NORFORK5 161 CKT 1	112	96.5	101.0	<b>NEW-IN TO NEWPO, 161KV</b> 99763 5NEW-IN 161 to 99764 5NEWPO 161 CKT1	620	Remove wave trap. Switch relaying channel to fiber optic shield wire. To be completed by SWPA for own needs.	\$ -
08SP	OKGE-OKGE	<b>HARDEN CITY TO AHLOSO, 69KV</b> 55186 HARDEN 269.0 to 55187 AHLOSTP269.0 CKT 1	52	96.4	103.0	<b>VALLEY VIEW TAP TO VALLEY VIEW, 69KV</b> 55181 VALYVUT269.0 to 55182 VALLYVU269.0 CKT1	620	Excluded as operating guide in effect using switch at Ahloso.	\$ -
08SP	OKGE-OKGE	<b>TINKER #4 TO TINKER #2, 138KV</b> 54990 TINKER24 138 to 54988 TINKER44 138 CKT 1	100	95.9	101.0	<b>SE 15TH 138/69KV TRANSFORMER</b> 54992 SE15TH 269.0 to 54993 SE15TH 4 138 CKT1	620	Excluded Per OKGE	\$ -
08SP	OKGE-OKGE	<b>TINKER #4 TO TINKER #2, 138KV</b> 54990 TINKER24 138 to 54988 TINKER44 138 CKT 1	100	98.0	104.2	<b>DRAPER TO MIDWEST, 138KV</b> 54933 DRAPER 4 138 to 54946 MIDWEST4 138 CKT1	620	Excluded Per OKGE	\$ -
08SP	SWPA-AECI	<b>CARTHAGE TO JASPER, 69KV</b> 52690 CARTHG 269.0 to 96649 2JASPER 69.0 CKT 1	47	99.9	102.2	<b>ARCHIE TO ADRIAN, 161KV</b> 59207 ARCHIE 5 161 to 59240 ADRIAN 5 161 CKT1	N/A	Third Party Facility	\$ -
08SP	SWPA-AECI	<b>WASHBURN 161/69KV TRANSFORMER</b> 52681 5WSHBRN 161 to 96763 2WSHBRN 69.0 CKT 1	56	100.7	104.6	<b>BEAVER TO EUREKA SPRINGS, 161KV</b> 52680 BEAVER 5 161 to 53136 EUREKA 5 161 CKT1	N/A	Third Party Facility	\$ -
08SP	SWPA-AECI	<b>CARTHAGE TO REEDS SPRING, 69KV</b> 52690 CARTHG 269.0 to 96751 2REEDS 69.0 CKT 1	36	124.3	130.0	<b>AURORA TO MONETT, 161KV</b> 59468 AUR124 5 161 to 59480 MON383 5 161 CKT1	N/A	Third Party Facility	\$ -
08SP	EES-SWPA	<b>MIDWAY TO BULL SHOALS, 161KV</b> 99825 5MIDWAY# 161 to 52660 BULL SH5 161 CKT 1	162	122.0	132.8	<b>BUFORD TAP TO BULL SHOALS, 161KV</b> 52661 BUFDRTP5 161 to 52660 BULL SH5 161 CKT1	N/A	See Previous	\$ -
08WP	AEPW-AEPW	<b>PERDUE TO DIANA, 138KV</b> 53590 PERDUE 4 138 to 53527 DIANA 4 138 CKT 1	237	100.4	101.1	<b>HARRISON ROAD TO LIBERTY CITY TAP, 138KV</b> 53542 HARRISN4 138 to 53561 LIBCYTP4 138 CKT1	0	See Previous	\$ -

**Table 7 - continued** – Facility Overloads Caused by AEPW to EES 620MW Transfer from 4/1/2003 to 4/1/2013 with 300MW ERCOTE to EES Annulment

Study Year	From Area To Area	Branch Over 100% RateB	RATE B	BC %Loading	TC %Loading	Outaged Branch That Caused Overload	ATC	Comments	Cost
08WP	SPRM-SPRM	CLAY TO LOGAN, 161KV 97161 5LOGAN 161 to 59970 CLAY 5 161 CKT 1	167	99.5	110.0	FRANKS TO HUBEN, 345KV 96041 7FRANKS 345 to 96042 7HUBEN 345 CKT1 HUBEN TO MORGAN, 345KV 96042 7HUBEN 345 to 96045 7MORGAN 345 CKT1	30	See Previous	\$ -
08WP	WERE-WERE	HOYT HTI SW. JCT. TO CIRCLEVILLE, 115KV 57165 HTI JCT3 115 to 57152 CIRCLVL3 115 CKT 1	92	99.5	102.0	IATAN TO ST JOE, 345KV 57982 IATAN 7 345 to 59199 ST JOE 3 345 CKT1	124	See Previous	\$ -
08WP	SPRM-SPRM	CLAY TO SPRINGFIELD, 161KV 59970 CLAY 5 161 to 52692 SPRGFLD5 161 CKT 1	167	98.0	105.8	FRANKS TO HUBEN, 345KV 96041 7FRANKS 345 to 96042 7HUBEN 345 CKT1 HUBEN TO MORGAN, 345KV 96042 7HUBEN 345 to 96045 7MORGAN 345 CKT1	159	See Previous	\$ -
08WP	OKGE-OKGE	PECAN CREEK 345/161KV TRANSFORMER 55235 PECANCK7 345 to 55234 PECANCK5 161 CKT 1	369	94.2	106.0	MUSKOGEE TO FORT SMITH, 345KV 55224 MUSKOGEE7 345 to 55302 FTSMITH7 345 CKT1	306	See Previous	\$ -
08WP	AEPW-AEPW	PERDUE TO DIANA, 138KV 53590 PERDUE 4 138 to 53527 DIANA 4 138 CKT 1	237	99.4	100.1	LIBERTY CITY TAP TO NEW GLADEWATER, 138KV 53561 LIBCYTP4 138 to 53576 NEWGLAD4 138 CKT1	542	See Previous	\$ -
08WP	AECI-SPRM	CLAY TO LOGAN, 161KV 97161 5LOGAN 161 to 59970 CLAY 5 161 CKT 1	232	88.5	100.9	HUBEN TO MORGAN, 345KV 96042 7HUBEN 345 to 96045 7MORGAN 345 CKT1	576	See Previous	\$ -
08WP	SWPA-SWPA	NORFORK 161/69KV TRANSFORMER 52648 NORFORK5 161 to 52650 NORFORK269.0 CKT 1	25	104.5	105.4	NORFORK TO WEST PLAINS, 161KV 52648 NORFORK5 161 to 96123 5WPLAIN 161 CKT1	620	Norfork transformer to be replaced by SWPA 6/1/06	\$ -
08WP	WERE-WERE	KING HILL TO KELLY, 115KV 57331 KING HL3 115 to 57217 KELLY 3 115 CKT 1	92	98.4	101.0	HOYT TO STRANGER, 345KV 56765 HOYT 7 345 to 56772 STRANGR7 345 CKT1	620	Westar Transmission Operating Directive 803	\$ -
08WP	WERE-WERE	TECUMSEH HILL TO STULL SW. STA, 115KV 57182 TECHILE3 115 to 57270 STULL T3 115 CKT 1	92	99.4	102.5	HOYT TO STRANGER, 345KV 56765 HOYT 7 345 to 56772 STRANGR7 345 CKT1	620	WERE Transmission Op Directive 803	\$ -

**Table 7 - continued** – Facility Overloads Caused by AEPW to EES 620MW Transfer from 4/1/2003 to 4/1/2013 with 300MW ERCOTE to EES Annulment

Study Year	From Area To Area	Branch Over 100% RateB	RATE B	BC %Loading	TC %Loading	Outaged Branch That Caused Overload	ATC	Comments	Cost
08WP	SWPA-AECI	CARTHAGE TO REEDS SPRING, 69KV 52690 CARTHG 269.0 to 96751 2REEDS 69.0 CKT 1	43	109.3	113.9	AURORA TO MONETT, 161KV 59468 AUR124 5 161 to 59480 MON383 5 161 CKT1	N/A	Third Party Facility	\$ -
08WP	AEPW-AEPW	JACKSONVILLE TO OVERTON, 138KV 53549 JACKSNV4 138 to 53588 OVERTON4 138 CKT 1	265	109.9	116.4	CROCKETT TO TENASKA RUSK COUNTY 53526 CROCKET7 345 to 53637 TENRUSK7 345 CKT1	N/A	See Previous	\$ -

**Total Cost** \$ 69,467,826

**Table 8** - Non - SPP facility overloads caused by the AEPW to EES 620MW transfer from 4/1/2003 to 4/1/2013 with 300MW ERCOTE to EES annulled

Study Year	From Area - To Area	Branch Over 100% RateB	Rate B	BC %Loading	TC %Loading	Outaged Branch That Caused Overload
03AP		NONE				
03G		NONE				
03SP	EES-EES	97920 6PPG 23 230 to 97919 6VERDINE 230 CKT 1	470	99.9	101.5	97917 6NLSO 230 to 97921 6CARLYSS 230 CKT1
03SP	SWPA-AECI	52690 CARTHG 269.0 to 96751 2REEDS 69.0 CKT 1	36	99.9	104.1	59478 DAD368 5 161 to 96101 5MORGAN 161 CKT1
03SP	SWPA-AECI	52690 CARTHG 269.0 to 96751 2REEDS 69.0 CKT 1	36	99.9	104.4	59969 BRKLINE 5 161 to 96101 5MORGAN 161 CKT1
03SP	SWPA-AECI	52690 CARTHG 269.0 to 96751 2REEDS 69.0 CKT 1	36	99.8	104.3	59207 ARCHIE 5 161 to 59240 ADRIAN 5 161 CKT1
03FA	CELE-CELE	50031 COCODR 6 230 to 50039 COUGH 4 138 CKT 1	386	97.4	102.0	50031 COCODR 6 230 to 50203 VILPLT 6 230 CKT1
03FA	EES-EES	97454 4WALDEN 138 to 97469 4APRIL 138 CKT 1	206	92.4	102.8	97487 4MT.ZION 138 to 97514 4GRIMES 138 CKT1
03FA	EES-EES	97454 4WALDEN 138 to 97469 4APRIL 138 CKT 1	206	91.4	101.7	97480 L558T485 138 to 97487 4MT.ZION 138 CKT1
03FA	EES-EES	97454 4WALDEN 138 to 97469 4APRIL 138 CKT 1	206	90.3	100.6	97480 L558T485 138 to 97484 4HUNTSVL 138 CKT1
03FA	EES-EES	97469 4APRIL 138 to 97470 4LFOREST 138 CKT 1	206	90.2	100.6	97487 4MT.ZION 138 to 97514 4GRIMES 138 CKT1
03FA	EES-EES	97480 L558T485 138 to 97484 4HUNTSVL 138 CKT 1	206	89.2	101.7	97454 4WALDEN 138 to 97514 4GRIMES 138 CKT1
03FA	EES-EES	97487 4MT.ZION 138 to 97480 L558T485 138 CKT 1	206	92.8	105.2	97454 4WALDEN 138 to 97514 4GRIMES 138 CKT1
03FA	EES-EES	97487 4MT.ZION 138 to 97480 L558T485 138 CKT 1	206	91.3	103.2	97454 4WALDEN 138 to 97469 4APRIL 138 CKT1
03FA	EES-EES	97487 4MT.ZION 138 to 97480 L558T485 138 CKT 1	206	90.4	102.3	97469 4APRIL 138 to 97470 4LFOREST 138 CKT1
03FA	EES-EES	97513 7GRIMES 345 to 97514 4GRIMES 138 CKT 1	525	92.0	101.6	97513 7GRIMES 345 to 97514 4GRIMES 138 CKT2
03FA	EES-EES	97513 7GRIMES 345 to 97514 4GRIMES 138 CKT 1	525	92.7	100.7	97513 7GRIMES 345 to 97514 4GRIMES 138 CKT2
03FA	EES-EES	97513 7GRIMES 345 to 97514 4GRIMES 138 CKT 2	525	92.0	101.6	97513 7GRIMES 345 to 97514 4GRIMES 138 CKT1
03FA	EES-EES	97513 7GRIMES 345 to 97514 4GRIMES 138 CKT 2	525	92.7	100.7	97513 7GRIMES 345 to 97514 4GRIMES 138 CKT1
03FA	EES-EES	97514 4GRIMES 138 to 97454 4WALDEN 138 CKT 1	206	96.1	106.4	97487 4MT.ZION 138 to 97514 4GRIMES 138 CKT1
03FA	EES-EES	97514 4GRIMES 138 to 97454 4WALDEN 138 CKT 1	206	95.1	105.4	97480 L558T485 138 to 97487 4MT.ZION 138 CKT1
03FA	EES-EES	97514 4GRIMES 138 to 97454 4WALDEN 138 CKT 1	206	93.9	104.2	97480 L558T485 138 to 97484 4HUNTSVL 138 CKT1
03FA	EES-EES	97514 4GRIMES 138 to 97487 4MT.ZION 138 CKT 1	206	95.9	108.3	97454 4WALDEN 138 to 97514 4GRIMES 138 CKT1
03FA	EES-EES	97514 4GRIMES 138 to 97487 4MT.ZION 138 CKT 1	206	94.4	106.4	97454 4WALDEN 138 to 97469 4APRIL 138 CKT1
03FA	EES-EES	97514 4GRIMES 138 to 97487 4MT.ZION 138 CKT 1	206	93.5	105.4	97469 4APRIL 138 to 97470 4LFOREST 138 CKT1
03FA	EES-EES	97686 4LEACH 138 to 97618 4NEWTONB 138 CKT 1	144.6	96.5	105.6	53526 CROCKET7 345 to 53637 TENRUSK7 345 CKT1
03FA	EES-EES	97708 4TOLEDO 138 to 97686 4LEACH 138 CKT 1	144.6	97.2	106.4	53526 CROCKET7 345 to 53637 TENRUSK7 345 CKT1
03FA	EES-EES	97920 6PPG 23 230 to 98051 2PPC NO 69.0 CKT 1	160	92.8	102.5	97920 6PPG 23 230 to 98052 2PPC SO 69.0 CKT1
03FA	EES-EES	97920 6PPG 23 230 to 98051 2PPC NO 69.0 CKT 1	160	93.7	103.4	97920 6PPG 23 230 to 98052 2PPC SO 69.0 CKT1
03FA	EES-EES	97920 6PPG 23 230 to 98052 2PPC SO 69.0 CKT 1	160	93.0	102.6	97920 6PPG 23 230 to 98051 2PPC NO 69.0 CKT1
03FA	EES-EES	97920 6PPG 23 230 to 98052 2PPC SO 69.0 CKT 1	160	93.8	103.5	97920 6PPG 23 230 to 98051 2PPC NO 69.0 CKT1
03FA	SWPA-EES	52660 BULL SH5 161 to 99825 5MIDWAY# 161 CKT 1	162	95.2	106.8	52648 NORFORK5 161 to 52661 BUFRDTP5 161 CKT1
03WP	AMRN-AMRN	30026 APCH FLT 161 to 30027 APCH FLT69.0 CKT 1	84	99.2	100.2	31195 MILLER S 138 to 31196 MILLER 138 CKT1
03WP	AMRN-AMRN	31408 OVERTON 345 to 31409 OVERTON 161 CKT 1	300	99.7	100.1	31230 MONTGMRY 345 to 31231 MONTGMRY 161 CKT1
03WP	CELE-CELE	50031 COCODR 6 230 to 50039 COUGH 4 138 CKT 1	386	97.3	102.1	50031 COCODR 6 230 to 50203 VILPLT 6 230 CKT1
03WP	AECI-AMRN	96096 5MARIES 161 to 31024 MARIES 138 CKT 1	100	97.7	100.7	30532 ELDON 161 to 96057 5BARNET 161 CKT1
03WP	EES-EES	99146 3STERL 115 to 99137 3WALGRV 115 CKT 2	238	98.9	100.8	99137 3WALGRV 115 to 99146 3STERL 115 CKT1
03WP	SWPA-AECI	52690 CARTHG 269.0 to 96751 2REEDS 69.0 CKT 1	43	96.3	101.2	52688 CARTHAG5 161 to 59479 LAR382 5 161 CKT1
04G	SWPA-EES	52660 BULL SH5 161 to 99825 5MIDWAY# 161 CKT 1	162	89.1	100.9	52648 NORFORK5 161 to 52661 BUFRDTP5 161 CKT1
04G	MIPU-MIPU	59288 RGAFB 2 69.0 to 59284 GRDVWTP269.0 CKT 1	53	99.6	100.4	59225 PHILL 5 161 to 59280 PHILL 2 69.0 CKT1
04G	NPPD-NPPD	64711 GENTLM2G23.4 to 64831 GENTLMN3 345 CKT 1	710	99.4	100.1	64733 AXTELL 3 345 to 64933 PAULINE3 345 CKT1
04G	OPPD-OPPD	65390 S1263T1T 161 to 65627 W BROCK869.0 CKT 1	53	99.5	100.1	64863 HUMBOLT5 161 to 65391 S975T4 T 161 CKT1
04G	OPPD-OPPD	65390 S1263T1T 161 to 65627 W BROCK869.0 CKT 1	53	99.4	100.1	65391 S975T4 T 161 to 65575 S975 869.0 CKT1
04G	EES-EES	97454 4WALDEN 138 to 97469 4APRIL 138 CKT 1	206	99.2	109.8	97487 4MT.ZION 138 to 97514 4GRIMES 138 CKT1
04G	EES-EES	97454 4WALDEN 138 to 97469 4APRIL 138 CKT 1	206	98.2	108.7	97480 L558T485 138 to 97487 4MT.ZION 138 CKT1
04G	EES-EES	97454 4WALDEN 138 to 97469 4APRIL 138 CKT 1	206	97.0	107.5	97480 L558T485 138 to 97484 4HUNTSVL 138 CKT1
04G	EES-EES	97469 4APRIL 138 to 97470 4LFOREST 138 CKT 1	206	97.0	107.6	97487 4MT.ZION 138 to 97514 4GRIMES 138 CKT1
04G	EES-EES	97469 4APRIL 138 to 97470 4LFOREST 138 CKT 1	206	96.0	106.6	97480 L558T485 138 to 97487 4MT.ZION 138 CKT1
04G	EES-EES	97469 4APRIL 138 to 97470 4LFOREST 138 CKT 1	206	94.8	105.4	97480 L558T485 138 to 97484 4HUNTSVL 138 CKT1
04G	EES-EES	97470 4LFOREST 138 to 97539 4WDHAVN 138 CKT 1	206	91.0	101.8	97487 4MT.ZION 138 to 97514 4GRIMES 138 CKT1
04G	EES-EES	97470 4LFOREST 138 to 97539 4WDHAVN 138 CKT 1	206	90.0	100.7	97480 L558T485 138 to 97487 4MT.ZION 138 CKT1
04G	EES-EES	97480 L558T485 138 to 97484 4HUNTSVL 138 CKT 1	206	97.2	109.9	97454 4WALDEN 138 to 97514 4GRIMES 138 CKT1
04G	EES-EES	97480 L558T485 138 to 97484 4HUNTSVL 138 CKT 1	206	95.7	107.9	97454 4WALDEN 138 to 97469 4APRIL 138 CKT1
04G	EES-EES	97480 L558T485 138 to 97484 4HUNTSVL 138 CKT 1	206	94.8	107.0	97469 4APRIL 138 to 97470 4LFOREST 138 CKT1
04G	EES-EES	97480 L558T485 138 to 97484 4HUNTSVL 138 CKT 1	206	92.2	105.0	97470 4LFOREST 138 to 97539 4WDHAVN 138 CKT1
04G	EES-EES	97487 4MT.ZION 138 to 97480 L558T485 138 CKT 1	206	99.3	111.4	97454 4WALDEN 138 to 97469 4APRIL 138 CKT1



**Table 8 - continued** - Non - SPP facility overloads caused by the AEPW to EES 620MW transfer from 4/1/2003 to 4/1/2013 with 300MW ERCOTE to EES annulled

Study Year	From Area - To Area	Branch Over 100% RateB	Rate B	BC %Loading	TC %Loading	Outaged Branch That Caused Overload
04G	EES-EES	97487 4MT.ZION 138 to 97480 L558T485 138 CKT 1	206	98.3	110.5	97469 4APRIL 138 to 97470 4LFOREST 138 CKT1
04G	EES-EES	97487 4MT.ZION 138 to 97480 L558T485 138 CKT 1	206	95.8	108.4	97470 4LFOREST 138 to 97539 4WDHAVN 138 CKT1
04G	EES-EES	97487 4MT.ZION 138 to 97480 L558T485 138 CKT 1	206	95.3	107.9	97459 4CONROE 138 to 97539 4WDHAVN 138 CKT1
04G	EES-EES	97513 7GRIMES 345 to 97514 4GRIMES 138 CKT 1	525	98.3	108.0	97513 7GRIMES 345 to 97514 4GRIMES 138 CKT2
04G	EES-EES	97513 7GRIMES 345 to 97514 4GRIMES 138 CKT 1	525	98.3	106.4	97513 7GRIMES 345 to 97514 4GRIMES 138 CKT2
04G	EES-EES	97513 7GRIMES 345 to 97514 4GRIMES 138 CKT 2	525	98.3	108.0	97513 7GRIMES 345 to 97514 4GRIMES 138 CKT1
04G	EES-EES	97513 7GRIMES 345 to 97514 4GRIMES 138 CKT 2	525	98.3	106.4	97513 7GRIMES 345 to 97514 4GRIMES 138 CKT1
04G	EES-EES	97514 4GRIMES 138 to 97487 4MT.ZION 138 CKT 1	206	98.9	111.5	97470 4LFOREST 138 to 97539 4WDHAVN 138 CKT1
04G	EES-EES	97514 4GRIMES 138 to 97487 4MT.ZION 138 CKT 1	206	98.5	111.0	97459 4CONROE 138 to 97539 4WDHAVN 138 CKT1
04G	EES-EES	97539 4WDHAVN 138 to 97459 4CONROE 138 CKT 1	206	89.9	100.6	97487 4MT.ZION 138 to 97514 4GRIMES 138 CKT1
04G	EES-EES	97686 4LEACH 138 to 97618 4NEWTONB 138 CKT 1	144.6	95.8	105.4	53526 CROCKET7 345 to 53637 TENRUSK7 345 CKT1
04G	EES-EES	97708 4TOLEDO 138 to 97686 4LEACH 138 CKT 1	144.6	96.5	106.1	53526 CROCKET7 345 to 53637 TENRUSK7 345 CKT1
04G	EES-EES	97920 6PPG 23 230 to 98051 2PPC NO 69.0 CKT 1	160	94.0	103.7	97920 6PPG 23 230 to 98052 2PPC SO 69.0 CKT1
04G	EES-EES	97920 6PPG 23 230 to 98051 2PPC NO 69.0 CKT 1	160	94.9	104.6	97920 6PPG 23 230 to 98052 2PPC SO 69.0 CKT1
04G	EES-EES	97920 6PPG 23 230 to 98052 2PPC SO 69.0 CKT 1	160	94.1	103.7	97920 6PPG 23 230 to 98051 2PPC NO 69.0 CKT1
04G	EES-EES	97920 6PPG 23 230 to 98052 2PPC SO 69.0 CKT 1	160	95.0	104.6	97920 6PPG 23 230 to 98051 2PPC NO 69.0 CKT1
05SP	ALTW-MEC	34060 WINTRST 5 161 to 64068 GRENFLD5 161 CKT 1	112	98.0	100.7	63800 CBLUFFS3 345 to 64056 MADISON3 345 CKT1
05SP	CELE-EES	50024 CARROLL4 138 to 99167 3RINGLD 115 CKT 1	125	95.1	104.8	53424 LONGWD 7 345 to 99294 7ELDEHV 345 CKT1
05SP	CELE-EES	50024 CARROLL4 138 to 99167 3RINGLD 115 CKT 1	125	95.3	104.6	53424 LONGWD 7 345 to 99294 7ELDEHV 345 CKT1
05SP	CELE-CELE	50031 COCODR 6 230 to 50039 COUGH 4 138 CKT 1	386	98.3	103.4	50031 COCODR 6 230 to 50203 VILPLT 6 230 CKT1
05SP	CELE-CELE	50154 PINEV 4 138 to 50179 SHOAKS 4 138 CKT 1	148	99.8	103.6	50154 PINEV 4 138 to 50158 PVKFTAP4 138 CKT1
05SP	MIPU-AECI	59217 WINDSR 5 161 to 96071 5CLINTN 161 CKT 1	123	99.4	104.4	52702 TRUMAN 5 161 to 96555 5GRAVOI 161 CKT1
05SP	MIPU-AECI	59217 WINDSR 5 161 to 96071 5CLINTN 161 CKT 1	123	96.4	100.3	59242 CLINTON5 161 to 96071 5CLINTN 161 CKT1
05SP	MIPU-MIPU	59253 ST JOE 5 161 to 59252 MIDWAY 5 161 CKT 1	164	99.9	102.6	96097 5MARYVL 161 to 96104 5NODWAY 161 CKT1
05SP	AECI-AECI	96071 5CLINTN 161 to 96692 2CLINTN 69.0 CKT 3	56	99.8	100.4	96071 5CLINTN 161 to 96692 2CLINTN 69.0 CKT1
05SP	EES-EES	97708 4TOLEDO 138 to 97686 4LEACH 138 CKT 1	144.6	91.4	101.0	53526 CROCKET7 345 to 97513 7GRIMES 345 CKT1
05SP	EES-EES	97920 6PPG 23 230 to 97919 6VERDINE 230 CKT 1	470	99.7	101.3	97917 6NLSO 230 to 97921 6CARLYSS 230 CKT1
05SP	EES-CELE	99167 3RINGLD 115 to 50024 CARROLL4 138 CKT 1	125	95.1	104.9	99294 7ELDEHV 345 to 99295 8ELDEHV 500 CKT1
05SP	EES-CELE	99167 3RINGLD 115 to 50024 CARROLL4 138 CKT 1	125	95.3	104.7	99294 7ELDEHV 345 to 99295 8ELDEHV 500 CKT1
05SP	EES-EES	99167 3RINGLD 115 to 99168 3SAILES 115 CKT 1	115	90.1	100.7	99294 7ELDEHV 345 to 99295 8ELDEHV 500 CKT1
05SP	EES-EES	99167 3RINGLD 115 to 99168 3SAILES 115 CKT 1	115	90.1	100.7	53424 LONGWD 7 345 to 99294 7ELDEHV 345 CKT1
05SP	SWPA-AECI	52690 CARTHG 269.0 to 96751 2REEDS 69.0 CKT 1	36	100.0	104.5	59577 MTV351 269.0 to 59606 MTV420 269.0 CKT1
05SP	SWPA-AECI	52690 CARTHG 269.0 to 96751 2REEDS 69.0 CKT 1	36	99.9	104.2	59969 BRKLINE 5 161 to 96101 5MORGAN 161 CKT1
05SP	SWPA-AECI	52690 CARTHG 269.0 to 96751 2REEDS 69.0 CKT 1	36	99.8	104.1	59553 ALB262 269.0 to 96677 2MTVRN 69.0 CKT1
05SP	SWPA-AECI	52690 CARTHG 269.0 to 96751 2REEDS 69.0 CKT 1	36	99.5	105.2	55224 MUSKOG7 345 to 55302 FTSMITH7 345 CKT1
05WP	CELE-EES	50024 CARROLL4 138 to 99167 3RINGLD 115 CKT 1	125	94.3	104.3	99294 7ELDEHV 345 to 99295 8ELDEHV 500 CKT1
05WP	CELE-EES	50024 CARROLL4 138 to 99167 3RINGLD 115 CKT 1	125	94.2	104.3	53424 LONGWD 7 345 to 99294 7ELDEHV 345 CKT1
05WP	CELE-EES	50024 CARROLL4 138 to 99167 3RINGLD 115 CKT 1	125	94.7	104.3	99294 7ELDEHV 345 to 99295 8ELDEHV 500 CKT1
05WP	CELE-EES	50024 CARROLL4 138 to 99167 3RINGLD 115 CKT 1	125	94.6	104.3	53424 LONGWD 7 345 to 99294 7ELDEHV 345 CKT1
05WP	CELE-CELE	50039 COUGH 4 138 to 50031 COCODR 6 230 CKT 1	386	96.1	100.8	50031 COCODR 6 230 to 50203 VILPLT 6 230 CKT1
05WP	CELE-CELE	50039 COUGH 4 138 to 50031 COCODR 6 230 CKT 1	386	99.5	104.3	50031 COCODR 6 230 to 50203 VILPLT 6 230 CKT1
05WP	EES-EES	99146 3STERL 115 to 99137 3WALGRV 115 CKT 2	238	99.1	101.1	99137 3WALGRV 115 to 99146 3STERL 115 CKT1
05WP	EES-EES	99167 3RINGLD 115 to 99168 3SAILES 115 CKT 1	115	92.3	103.4	99294 7ELDEHV 345 to 99295 8ELDEHV 500 CKT1
05WP	EES-EES	99167 3RINGLD 115 to 99168 3SAILES 115 CKT 1	115	92.3	103.4	53424 LONGWD 7 345 to 99294 7ELDEHV 345 CKT1
05WP	SWPA-AECI	52690 CARTHG 269.0 to 96751 2REEDS 69.0 CKT 1	43	96.7	101.5	52688 CARTHAG5 161 to 59479 LAR382 5 161 CKT1
08SP	MIPU-AECI	59217 WINDSR 5 161 to 96071 5CLINTN 161 CKT 1	123	100.0	105.2	55305 FTSMITH8 500 to 99486 8ANO 50 500 CKT1
08SP	MIPU-AECI	59217 WINDSR 5 161 to 96071 5CLINTN 161 CKT 1	123	99.5	104.6	96041 7FRANKS 345 to 96042 7HUBEN 345 CKT1
08SP	MIPU-AECI	59217 WINDSR 5 161 to 96071 5CLINTN 161 CKT 1	123	98.9	104.3	54033 PITTSB-7 345 to 54037 VALIANT7 345 CKT1
08SP	MIPU-AECI	59217 WINDSR 5 161 to 96071 5CLINTN 161 CKT 1	123	99.4	101.6	59209 SEDALIA5 161 to 59241 SEDEAST5 161 CKT1
08SP	MIPU-AECI	59217 WINDSR 5 161 to 96071 5CLINTN 161 CKT 1	123	98.6	102.6	59307 NEVPLT 269.0 to 59308 NEVADA 269.0 CKT1
08SP	SPRM-AECI	59970 CLAY 5 161 to 97161 5LOGAN 161 CKT 1	185	89.6	105.8	96042 7HUBEN 345 to 96045 7MORGAN 345 CKT1
08SP	AECI-AECI	96081 5GAINES 161 to 97090 2GNSVL2 69.0 CKT 1	56	98.8	100.6	52660 BULL SH5 161 to 99825 5MIDWAY# 161 CKT1
08SP	AECI-AECI	96110 5PITTSV 161 to 96331 2PITTSV 69.0 CKT 1	50	99.7	100.5	96124 5HOLDEN 161 to 96336 2HOLDEN 69.0 CKT1
08SP	EES-EES	97487 4MT.ZION 138 to 97480 L558T485 138 CKT 1	206	89.6	101.8	97454 4WALDEN 138 to 97514 4GRIMES 138 CKT1
08SP	EES-EES	97513 7GRIMES 345 to 97514 4GRIMES 138 CKT 1	525	93.1	102.8	97513 7GRIMES 345 to 97514 4GRIMES 138 CKT2
08SP	EES-EES	97513 7GRIMES 345 to 97514 4GRIMES 138 CKT 1	525	93.0	101.2	97513 7GRIMES 345 to 97514 4GRIMES 138 CKT2

**Table 8 - continued** - Non - SPP facility overloads caused by the AEPW to EES 620MW transfer from 4/1/2003 to 4/1/2013 with 300MW ERCOTE to EES annulled

Study Year	From Area - To Area	Branch Over 100% RateB	Rate B	BC %Loading	TC %Loading	Outaged Branch That Caused Overload
08SP	EES-EES	97513 7GRIMES 345 to 97514 4GRIMES 138 CKT 2	525	93.1	102.8	97513 7GRIMES 345 to 97514 4GRIMES 138 CKT1
08SP	EES-EES	97513 7GRIMES 345 to 97514 4GRIMES 138 CKT 2	525	93.0	101.2	97513 7GRIMES 345 to 97514 4GRIMES 138 CKT1
08SP	EES-EES	97514 4GRIMES 138 to 97454 4WALDEN 138 CKT 1	206	92.9	103.4	97487 4MT.ZION 138 to 97514 4GRIMES 138 CKT1
08SP	EES-EES	97514 4GRIMES 138 to 97454 4WALDEN 138 CKT 1	206	90.9	101.4	97480 L558T485 138 to 97487 4MT.ZION 138 CKT1
08SP	EES-EES	97514 4GRIMES 138 to 97487 4MT.ZION 138 CKT 1	206	95.6	107.8	97454 4WALDEN 138 to 97514 4GRIMES 138 CKT1
08SP	EES-EES	97514 4GRIMES 138 to 97487 4MT.ZION 138 CKT 1	206	92.7	104.9	97454 4WALDEN 138 to 97469 4APRIL 138 CKT1
08SP	EES-EES	97514 4GRIMES 138 to 97487 4MT.ZION 138 CKT 1	206	90.9	103.1	97469 4APRIL 138 to 97470 4LFOREST 138 CKT1
08SP	EES-EES	97514 4GRIMES 138 to 97487 4MT.ZION 138 CKT 1	206	88.3	100.5	97470 4LFOREST 138 to 97539 4WDHAVN 138 CKT1
08SP	EES-EES	97686 4LEACH 138 to 97618 4NEWTONB 138 CKT 1	144.6	99.8	108.6	53526 CROCKET7 345 to 53637 TENRUSK7 345 CKT1
08SP	EES-EES	97686 4LEACH 138 to 97618 4NEWTONB 138 CKT 1	144.6	99.0	108.5	50037 COOPER 4 138 to 50098 LEESV 4 138 CKT1
08SP	EES-EES	97686 4LEACH 138 to 97618 4NEWTONB 138 CKT 1	144.6	98.9	105.0	97916 8NELSON 500 to 98107 8RICHARD 500 CKT1
08SP	EES-EES	97686 4LEACH 138 to 97618 4NEWTONB 138 CKT 1	144.6	93.3	100.2	97691 8CYPRESS 500 to 97717 8HARTBRG 500 CKT1
08SP	EES-EES	97708 4TOLEDO 138 to 97686 4LEACH 138 CKT 1	144.6	94.6	101.5	97691 8CYPRESS 500 to 97717 8HARTBRG 500 CKT1
08SP	EES-EES	99263 3LEWIS # 115 to 99230 3COUCH 115 CKT 1	159	98.2	123.7	53424 LONGWD 7 345 to 99294 7ELDEHV 345 CKT1
08SP	EES-EES	99263 3LEWIS # 115 to 99230 3COUCH 115 CKT 1	159	98.2	123.6	99294 7ELDEHV 345 to 99295 8ELDEHV 500 CKT1
08SP	EES-EES	99263 3LEWIS # 115 to 99230 3COUCH 115 CKT 1	159	98.1	120.3	53526 CROCKET7 345 to 53637 TENRUSK7 345 CKT1
08SP	EES-EES	99263 3LEWIS # 115 to 99230 3COUCH 115 CKT 1	159	96.1	112.7	99309 8MCNEIL 500 to 99310 3MCNEIL 115 CKT1
08SP	EES-EES	99303 3PATMOS# 115 to 99263 3LEWIS # 115 CKT 1	159	97.9	120.0	55224 MUSKOGEE 345 to 55302 FTSMITH7 345 CKT1
08SP	EES-EES	99303 3PATMOS# 115 to 99263 3LEWIS # 115 CKT 1	159	97.2	112.9	53372 FULTON 7 345 to 53374 FULTON 3 115 CKT1
08SP	EES-EES	99303 3PATMOS# 115 to 99263 3LEWIS # 115 CKT 1	159	97.2	112.9	53301 NWTXARK7 345 to 53372 FULTON 7 345 CKT1
08SP	EES-EES	99303 3PATMOS# 115 to 99263 3LEWIS # 115 CKT 1	159	93.5	111.9	99148 8STERL 500 to 99203 8PERYVIL 500 CKT1
08SP	EES-EES	99387 3MURF-S 115 to 99389 4MURFRE 138 CKT 1	60	83.6	111.2	53424 LONGWD 7 345 to 99294 7ELDEHV 345 CKT1
08SP	EES-EES	99387 3MURF-S 115 to 99389 4MURFRE 138 CKT 1	60	83.5	111.2	99294 7ELDEHV 345 to 99295 8ELDEHV 500 CKT1
08SP	EES-EES	99387 3MURF-S 115 to 99389 4MURFRE 138 CKT 1	60	79.2	104.6	99294 7ELDEHV 345 to 99295 8ELDEHV 500 CKT1
08SP	EES-EES	99387 3MURF-S 115 to 99389 4MURFRE 138 CKT 1	60	79.3	104.6	53424 LONGWD 7 345 to 99294 7ELDEHV 345 CKT1
08SP	EES-EES	99389 4MURFRE 138 to 99387 3MURF-S 115 CKT 1	60	86.0	110.7	53526 CROCKET7 345 to 97513 7GRIMES 345 CKT1
08SP	EES-EES	99389 4MURFRE 138 to 99387 3MURF-S 115 CKT 1	60	82.3	106.5	53526 CROCKET7 345 to 53637 TENRUSK7 345 CKT1
08SP	EES-EES	99389 4MURFRE 138 to 99387 3MURF-S 115 CKT 1	60	78.0	100.2	53526 CROCKET7 345 to 53637 TENRUSK7 345 CKT1
08SP	EES-EES	99389 4MURFRE 138 to 99387 3MURF-S 115 CKT 1	60	81.5	104.0	53526 CROCKET7 345 to 97513 7GRIMES 345 CKT1
08SP	SWPA-AECI	52690 CARTHG 269.0 to 96649 2JASPER 69.0 CKT 1	47	99.2	101.4	96070 5CLARK 161 to 96802 2CLARK 69.0 CKT1
08SP	SWPA-AECI	52690 CARTHG 269.0 to 96649 2JASPER 69.0 CKT 1	47	98.0	100.7	59216 BUTLER 5 161 to 59240 ADRIAN 5 161 CKT1
08SP	SWPA-AECI	52690 CARTHG 269.0 to 96751 2REEDS 69.0 CKT 1	36	96.8	100.9	59473 RDS295 5 161 to 59492 RDS424 5 161 CKT1
08SP	SWPA-AECI	52690 CARTHG 269.0 to 96751 2REEDS 69.0 CKT 1	36	96.6	100.7	59468 AUR124 5 161 to 59473 RDS295 5 161 CKT1
08SP	SWPA-AECI	52690 CARTHG 269.0 to 96751 2REEDS 69.0 CKT 1	36	96.3	100.7	59536 ASH121 269.0 to 59586 WIL445 269.0 CKT1
08SP	SWPA-AECI	52690 CARTHG 269.0 to 96751 2REEDS 69.0 CKT 1	36	96.2	100.4	54432 AFTON 5 161 to 54454 PENSA 5 161 CKT1
08SP	EES-SWPA	99825 5MIDWAY# 161 to 52660 BULL SH5 161 CKT 1	162	95.1	101.4	31798 SWEETWTR 161 to 96077 5FLETCH 161 CKT1
08SP	EES-SWPA	99825 5MIDWAY# 161 to 52660 BULL SH5 161 CKT 1	162	95.1	101.0	52660 BULL SH5 161 to 99802 5BULLSH* 161 CKT1
08SP	EES-SWPA	99825 5MIDWAY# 161 to 52660 BULL SH5 161 CKT 1	162	94.9	100.8	52660 BULL SH5 161 to 96081 5GAINES 161 CKT1
08SP	EES-SWPA	99825 5MIDWAY# 161 to 52660 BULL SH5 161 CKT 1	162	94.3	100.7	31798 SWEETWTR 161 to 96122 5WILSPG 161 CKT1
08WP	AMRN-AMRN	31408 OVERTON 345 to 31409 OVERTON 161 CKT 1	300	99.5	100.5	59209 SEDALIA5 161 to 59217 WINDSR 5 161 CKT1
08WP	AMRN-AMRN	31408 OVERTON 345 to 31409 OVERTON 161 CKT 1	300	99.4	100.1	96552 2EDMONS 161 to 96555 5GRAVOI 161 CKT1
08WP	AMRN-AMRN	31408 OVERTON 345 to 31409 OVERTON 161 CKT 1	300	99.9	100.6	52702 TRUMAN 5 161 to 96552 2EDMONS 161 CKT1
08WP	AMRN-AMRN	31408 OVERTON 345 to 31409 OVERTON 161 CKT 1	300	99.9	100.7	59217 WINDSR 5 161 to 96071 5CLINTN 161 CKT1
08WP	IP-MEC	32415 GALESBRG 138 to 64411 GALESBR5 161 CKT 2	100	97.4	100.3	64411 GALESBR5 161 to 32415 GALESBRG 138 CKT1
08WP	CELE-CELE	50031 COCODR 6 230 to 50039 COUGH 4 138 CKT 1	386	97.2	101.7	50303 BONIN 6 230 to 50310 PMOUTON6 230 CKT1
08WP	EES-EES	97454 4WALDEN 138 to 97469 4APRIL 138 CKT 1	206	100.0	107.9	97508 4NAVSOTA 138 to 97522 4TUBULAR 138 CKT1
08WP	EES-EES	97454 4WALDEN 138 to 97469 4APRIL 138 CKT 1	206	99.3	105.9	97458 4CONAIR 138 to 97461 4LEWIS 138 CKT1
08WP	EES-EES	97454 4WALDEN 138 to 97469 4APRIL 138 CKT 1	206	98.8	106.7	97453 4DOBBIN 138 to 97522 4TUBULAR 138 CKT1
08WP	EES-EES	97454 4WALDEN 138 to 97469 4APRIL 138 CKT 1	206	97.4	104.7	97691 8CYPRESS 500 to 97717 8HARTBRG 500 CKT1
08WP	EES-EES	97469 4APRIL 138 to 97470 4LFOREST 138 CKT 1	206	99.1	107.0	98107 8RICHARD 500 to 98430 8WEBRE 500 CKT1
08WP	EES-EES	97469 4APRIL 138 to 97470 4LFOREST 138 CKT 1	206	97.8	106.3	97717 8HARTBRG 500 to 99162 8MTOLIV 500 CKT1
08WP	EES-EES	97469 4APRIL 138 to 97470 4LFOREST 138 CKT 1	206	97.5	105.5	97508 4NAVSOTA 138 to 97522 4TUBULAR 138 CKT1
08WP	EES-EES	97469 4APRIL 138 to 97470 4LFOREST 138 CKT 1	206	96.3	104.3	97453 4DOBBIN 138 to 97522 4TUBULAR 138 CKT1
08WP	EES-EES	97470 4LFOREST 138 to 97539 4WDHAVN 138 CKT 1	206	99.8	108.5	97508 4NAVSOTA 138 to 97510 4SOTA 1 138 CKT1
08WP	EES-EES	97470 4LFOREST 138 to 97539 4WDHAVN 138 CKT 1	206	93.4	101.4	98107 8RICHARD 500 to 98430 8WEBRE 500 CKT1
08WP	EES-EES	97470 4LFOREST 138 to 97539 4WDHAVN 138 CKT 1	206	92.1	100.7	97717 8HARTBRG 500 to 99162 8MTOLIV 500 CKT1

**Table 8 - continued** - Non - SPP facility overloads caused by the AEPW to EES 620MW transfer from 4/1/2003 to 4/1/2013 with 300MW ERCOTE to EES annulled

Study Year	From Area - To Area	Branch Over 100% RateB	Rate B	BC %Loading	TC %Loading	Outaged Branch That Caused Overload
08WP	EES-EES	97480 L558T485 138 to 97484 4HUNTSVL 138 CKT 1	206	95.8	105.7	98107 8RICHARD 500 to 98430 8WEBRE 500 CKT1
08WP	EES-EES	97480 L558T485 138 to 97484 4HUNTSVL 138 CKT 1	206	94.3	105.4	97717 8HARTBRG 500 to 99162 8MTOLIV 500 CKT1
08WP	EES-EES	97480 L558T485 138 to 97484 4HUNTSVL 138 CKT 1	206	93.8	103.1	97691 8CYPRESS 500 to 97717 8HARTBRG 500 CKT1
08WP	EES-EES	97480 L558T485 138 to 97484 4HUNTSVL 138 CKT 1	206	92.6	103.2	97507 4COLSTTA 138 to 97514 4GRIMES 138 CKT1
08WP	EES-EES	97487 4MT.ZION 138 to 97480 L558T485 138 CKT 1	206	99.5	109.3	98107 8RICHARD 500 to 98430 8WEBRE 500 CKT1
08WP	EES-EES	97487 4MT.ZION 138 to 97480 L558T485 138 CKT 1	206	97.9	109.0	97717 8HARTBRG 500 to 99162 8MTOLIV 500 CKT1
08WP	EES-EES	97487 4MT.ZION 138 to 97480 L558T485 138 CKT 1	206	97.4	106.7	97691 8CYPRESS 500 to 97717 8HARTBRG 500 CKT1
08WP	EES-EES	97487 4MT.ZION 138 to 97480 L558T485 138 CKT 1	206	96.3	106.9	97507 4COLSTTA 138 to 97514 4GRIMES 138 CKT1
08WP	EES-EES	97514 4GRIMES 138 to 97454 4WALDEN 138 CKT 1	206	99.9	107.4	97488 4TEMCO 138 to 97519 4GEORGIA 138 CKT1
08WP	EES-EES	97514 4GRIMES 138 to 97454 4WALDEN 138 CKT 1	206	99.7	106.4	97478 6JACINTO 230 to 97714 6CHINA 230 CKT1
08WP	EES-EES	97514 4GRIMES 138 to 97454 4WALDEN 138 CKT 1	206	99.7	106.3	97476 4JACINTO 138 to 97478 6JACINTO 230 CKT1
08WP	EES-EES	97514 4GRIMES 138 to 97454 4WALDEN 138 CKT 1	206	99.5	107.1	97488 4TEMCO 138 to 97538 8LNG 413 138 CKT1
08WP	EES-EES	97514 4GRIMES 138 to 97487 4MT.ZION 138 CKT 1	206	99.7	110.3	97507 4COLSTTA 138 to 97514 4GRIMES 138 CKT1
08WP	EES-EES	97514 4GRIMES 138 to 97487 4MT.ZION 138 CKT 1	206	99.5	110.1	97506 4BRYAN 138 to 97507 4COLSTTA 138 CKT1
08WP	EES-EES	97514 4GRIMES 138 to 97487 4MT.ZION 138 CKT 1	206	99.1	109.4	97508 4NAVSOTA 138 to 97522 4TUBULAR 138 CKT1
08WP	EES-EES	97514 4GRIMES 138 to 97487 4MT.ZION 138 CKT 1	206	97.8	108.1	97453 4DOBBIN 138 to 97522 4TUBULAR 138 CKT1
08WP	EES-EES	97514 4GRIMES 138 to 97526 4MAG AND 138 CKT 1	206	95.5	101.5	97454 4WALDEN 138 to 97514 4GRIMES 138 CKT1
08WP	EES-EES	97514 4GRIMES 138 to 97526 4MAG AND 138 CKT 1	206	94.5	100.4	97454 4WALDEN 138 to 97469 4APRIL 138 CKT1
08WP	EES-EES	97522 4TUBULAR 138 to 97453 4DOBBIN 138 CKT 1	112	98.2	109.0	97487 4MT.ZION 138 to 97514 4GRIMES 138 CKT1
08WP	EES-EES	97522 4TUBULAR 138 to 97453 4DOBBIN 138 CKT 1	112	97.2	107.2	97470 4LFOREST 138 to 97539 4WDHAVN 138 CKT1
08WP	EES-EES	97522 4TUBULAR 138 to 97453 4DOBBIN 138 CKT 1	112	96.7	107.5	97480 L558T485 138 to 97487 4MT.ZION 138 CKT1
08WP	EES-EES	97522 4TUBULAR 138 to 97453 4DOBBIN 138 CKT 1	112	96.6	106.6	97459 4CONROE 138 to 97539 4WDHAVN 138 CKT1
08WP	EES-EES	97526 4MAG AND 138 to 97510 4SOTA 1 138 CKT 1	206	94.9	100.8	97454 4WALDEN 138 to 97514 4GRIMES 138 CKT1
08WP	EES-EES	97539 4WDHAVN 138 to 97459 4CONROE 138 CKT 1	206	99.0	107.8	97514 4GRIMES 138 to 97526 4MAG AND 138 CKT1
08WP	EES-EES	97539 4WDHAVN 138 to 97459 4CONROE 138 CKT 1	206	98.8	107.6	97510 4SOTA 1 138 to 97526 4MAG AND 138 CKT1
08WP	EES-EES	97539 4WDHAVN 138 to 97459 4CONROE 138 CKT 1	206	98.5	107.3	97508 4NAVSOTA 138 to 97510 4SOTA 1 138 CKT1
08WP	EES-EES	97539 4WDHAVN 138 to 97459 4CONROE 138 CKT 1	206	92.2	100.2	98107 8RICHARD 500 to 98430 8WEBRE 500 CKT1
08WP	EES-EES	97686 4LEACH 138 to 97618 4NEWTONB 138 CKT 1	144.6	97.6	104.8	97690 4CYPRESS 138 to 97700 4KOUNTZE 138 CKT1
08WP	EES-EES	97686 4LEACH 138 to 97618 4NEWTONB 138 CKT 1	144.6	96.3	101.2	50045 DOLHILL7 345 to 53454 SW SHV 7 345 CKT1
08WP	EES-EES	97686 4LEACH 138 to 97618 4NEWTONB 138 CKT 1	144.6	93.2	102.1	99162 8MTOLIV 500 to 99295 8ELDEHV 500 CKT1
08WP	EES-EES	97686 4LEACH 138 to 97618 4NEWTONB 138 CKT 1	144.6	92.4	101.3	53609 LEBROCK7 345 to 53637 TENRUSK7 345 CKT1
08WP	EES-EES	97698 4JASPER 138 to 97704 4RAYBURN 138 CKT 1	112	98.5	106.4	53526 CROCKET7 345 to 53637 TENRUSK7 345 CKT1
08WP	EES-EES	97708 4TOLEDO 138 to 97686 4LEACH 138 CKT 1	144.6	98.3	105.6	97690 4CYPRESS 138 to 97700 4KOUNTZE 138 CKT1
08WP	EES-EES	97708 4TOLEDO 138 to 97686 4LEACH 138 CKT 1	144.6	97.1	101.9	50045 DOLHILL7 345 to 53454 SW SHV 7 345 CKT1
08WP	EES-EES	97708 4TOLEDO 138 to 97686 4LEACH 138 CKT 1	144.6	93.9	102.8	99162 8MTOLIV 500 to 99295 8ELDEHV 500 CKT1
08WP	EES-EES	97708 4TOLEDO 138 to 97686 4LEACH 138 CKT 1	144.6	93.2	102.0	53609 LEBROCK7 345 to 53637 TENRUSK7 345 CKT1
08WP	EES-EES	97920 6PPG 23 230 to 97919 6VERDINE 230 CKT 1	470	98.4	100.7	97917 6NLSON 230 to 97921 6CARLYSS 230 CKT1
08WP	EES-EES	99263 3LEWIS # 115 to 99230 3COUCH 115 CKT 1	159	87.4	110.0	53526 CROCKET7 345 to 97513 7GRIMES 345 CKT1
08WP	EES-EES	99263 3LEWIS # 115 to 99230 3COUCH 115 CKT 1	159	82.5	104.7	53526 CROCKET7 345 to 53637 TENRUSK7 345 CKT1
08WP	EES-EES	99263 3LEWIS # 115 to 99230 3COUCH 115 CKT 1	159	76.2	101.6	53424 LONGWD 7 345 to 99294 7ELDEHV 345 CKT1
08WP	EES-EES	99263 3LEWIS # 115 to 99230 3COUCH 115 CKT 1	159	76.2	101.5	99294 7ELDEHV 345 to 99295 8ELDEHV 500 CKT1
08WP	EES-EES	99303 3PATMOS# 115 to 99263 3LEWIS # 115 CKT 1	159	95.9	118.4	53526 CROCKET7 345 to 97513 7GRIMES 345 CKT1
08WP	EES-EES	99303 3PATMOS# 115 to 99263 3LEWIS # 115 CKT 1	159	91.0	113.1	53526 CROCKET7 345 to 53637 TENRUSK7 345 CKT1
08WP	EES-EES	99303 3PATMOS# 115 to 99263 3LEWIS # 115 CKT 1	159	84.7	110.1	53424 LONGWD 7 345 to 99294 7ELDEHV 345 CKT1
08WP	EES-EES	99303 3PATMOS# 115 to 99263 3LEWIS # 115 CKT 1	159	84.7	109.9	99294 7ELDEHV 345 to 99295 8ELDEHV 500 CKT1
08WP	SWPA-AECI	52690 CARTHG 269.0 to 96751 2REEDS 69.0 CKT 1	43	99.1	103.6	56793 NEOSHO 7 345 to 96045 7MORGAN 345 CKT1
08WP	SWPA-AECI	52690 CARTHG 269.0 to 96751 2REEDS 69.0 CKT 1	43	98.7	103.2	59481 MON383 7 345 to 59984 BRKLINE 7 345 CKT1
08WP	SWPA-AECI	52690 CARTHG 269.0 to 96751 2REEDS 69.0 CKT 1	43	98.5	102.9	53140 FLINCR7 345 to 59481 MON383 7 345 CKT1
08WP	SWPA-AECI	52690 CARTHG 269.0 to 96751 2REEDS 69.0 CKT 1	43	97.5	102.2	52688 CARTHAG5 161 to 59479 LAR382 5 161 CKT1

**Table 9** – Facility Upgrades Required Due to Addition of Upgrades Assigned to 620MW Transfer with 300MW ERCOTE to EES Annulment

Study Year	Branch Over 100% Rate B	Rate B	BC % Loading Without Upgrades	BC % Loading With Upgrades	TC % Loading Without Upgrades	TC % Loading With Upgrades	Outaged Branch Causing Overload	ATC (MW)	Comment	Assignment	Cost
03SP	STILWELL TO BUCYRUS, 161KV 57969 STILWEL5 161 58057 BUCYRUS5 161 CKT1	224	19.4	90.9	21.5	95.0	LACYGNE TO STILWELL, 345KV 57981 LACYGNE7 345 to 57968 STILWEL7 345 CKT 1	620	Upgrade needed due to Linn County Substation included to relieve La Cygne to Stilwell overload at 0MW ATC	Rebuild Bucyrus line terminal - Upgrade may not be needed	\$ 6,000
05SP	GILL ENERGY CENTER EAST TO OATVILLE, 69KV 57795 GILL E 269.0 57825 OATVILL269.0 1		99.7	99.9	100	100.2	HOOVER SOUTH TO SHERIDEN, 69KV 57806 HOOVERS269.0 to 57841 SHERIDN269.0 CKT1	207	Upgrade needed due to assigned upgrades for 620 MW transfer	Replace disconnect switches @ Gill & Replace line switch @ Oatville.	\$ 45,000
05SP	FLINT CREEK TO TONTITOWN, 161KV 53139 FLINTCR5 161 53170 TONTITN5 161 1	312	98	99.7	99	100.6	FLINT CREEK TO MONET, 345KV 53140 FLINTCR7 345 to 59481 MON383 7 345 CKT1	207	Upgrade needed due to upgrade of East Centerton to Gentry at 38MW ATC	Replace Jumpers	\$ 45,000
05SP	TONTITOWN TO ELM SPRINGS, 161KV 53170 TONTITN5 161 53194 ELMSPRR5 161 1	306	106.1	107.4	106.9	108.3	DYESS TO TONTITOWN, 161KV 53131 DYESS 5161 TO 53170 TONTITN5161 CKT 1	0	Upgrade needed due to upgrade of Tontitown to Chamber Springs at 45MW ATC	Replace Switch and Elm Springs Strain Bus	\$ 100,000
05SP	PAOLA TO CENTENNIAL, 161KV 58067 CENTENL5 161 58069 PAOLA 5 161 1	174	51.1	145.1	54.1	150.2	STILWELL TO LA CYGNE, 345KV 57968 STILWEL7345 TO 57981 LACYGNE7345 CKT 1	620	Upgrade needed due to Linn County Substation included to relieve La Cygne to Stilwell overload at 0MW ATC	Rebuild Paola substation by KCPL	\$ -
05WP	PAOLA TO CENTENNIAL, 161KV 58067 CENTENL5 161 58069 PAOLA 5 161 1	192	31.2	111.7	33.7	116.1	STILWELL TO LA CYGNE, 345KV 57968 STILWEL7345 TO 57981 LACYGNE7345 CKT 1	620	Upgrade needed due to Linn County Substation included to relieve La Cygne to Stilwell overload at 0MW ATC	Rebuild Paola substation by KCPL	\$ -
08SP	BROKEN ARROW 101ST NORTH TO ONETA, 138KV 53781 BA101-N4 138 53818 ONETA--4 138 1	210	104.8	103.2	104.9	103.3	MUSKOGEE TAP TO MUSKOGEE 52758 MUSKTAP5161 TO 55222 MUSKOGEE5161 CKT 1	0	Upgrade Needed due to upgrade of Broken Arrow to Oneta at 53MW ATC	Replace Wavetrap	\$ 30,000
08SP	LINDSAY TO LINDSAY SW, 69KV 55977 LINDSAY269.0 55979 LNDYSW269.0 1	26	31.9	102.4	31.9	102	FLETCHER TO MARLOW JCT, 69KV 55911 FLETCHR269 TO 55990 MARLOWJ269 CKT 1	0	Upgrade needed due to addition of Payne Switching Station included to relieve the Cyril to Anadarko overload at 0MW ATC	Expedite WFEC Reconductor 8.0 miles with 556 ACSR.	\$ -
08SP	MUSKOGEE TAP TO GORE, 161KV 52752 GORE 5 161 52758 MUSKTAP5 161 1	206	83.6	91.3	96.4	104.9	MUSKOGEE TO FORT SMITH, 345KV 55224 MUSKOGEE7345 TO 55302 FTSMITH7345 CKT 1	397	Upgraded needed due to addition of 2nd Pecan Creek transformer included to relieve the Pecan Creek 345/161kV transformer overload at 0MW ATC	Reconductor 16 miles with 795ACSR	\$ 4,000,000
08SP	PECAN CREEK TO MUSKOGEE, 345KV 55224 MUSKOGEE7 345 55235 PECANCK7 345 1	478	83.2	96.3	92.4	106.9	MUSKOGEE TO FORT SMITH, 345KV 55224 MUSKOGEE7345 TO 55302 FTSMITH7345 CKT 1	216	Upgraded needed due to addition of 2nd Pecan Creek transformer included to relieve the Pecan Creek 345/161kV transformer overload at 0MW ATC	Change CT Ratio @ Pecan Creek.	\$ 2,500
08SP	ROCK HILL 138/69KV TRANSFORMER CKT1 53597 ROKHILL269.0 53598 ROKHILL4 138 1	46	99.8	101.6	99.4	101.3	BLOCKER TAP TO MARSHALL, 69KV 53516 BLOCKRT269 TO 53570 MARSHAL269 CKT 1	0	Upgraded needed due to upgrade of Cherokee to Tatum and Tatum to Rockhill at 0MW ATC	Add 3rd Rock Hill 138/69kV 46MVA Unit	\$ 1,400,000
08SP	ROCK HILL 138/69KV TRANSFORMER CKT2 53597 ROKHILL269.0 53598 ROKHILL4 138 2	46	100.2	102.1	99.9	101.7	BLOCKER TAP TO MARSHALL, 69KV 53516 BLOCKRT269 TO 53570 MARSHAL269 CKT 1	0	Upgraded needed due to upgrade of Cherokee to Tatum and Tatum to Rockhill at 0MW ATC	See Previous Upgrade for Rock Hill 138/69kV Ckt 1	\$ -

**Table 9 - continued** – Facility Upgrades Required Due to Addition of Upgrades Assigned to 620MW Transfer with 300MW ERCOTE to EES Annulment

Study Year	Branch Over 100% Rate B	Rate B	BC % Loading Without Upgrades	BC % Loading With Upgrades	TC % Loading Without Upgrades	TC % Loading With Upgrades	Outaged Branch Causing Overload	ATC (MW)	Comment	Assignment	Cost
08SP	TONTITOWN TO ELM SPRINGS, 161KV 53170 TONTITN5 161 53194 ELMSPRR5 161 1	306	114.5	115.7	115.1	116.4	DYESS TO TONTITOWN, 161KV 53131 DYESS 5161 TO 53170 TONTITN5161 CKT 1	0	Upgrade Needed due to upgrade of Tontitown to Chamber Springs at 20MW ATC and Chamber Springs transformer at 292MW ATC	See Previous	\$ -
08SP	TITAN TAP TO TAHLEQUAH, 69KV 54447 TAHLQH 269.0 96986 2TITANTP69.0 1	47	97.1	98	99.8	101	KANSAS TO WATTS, 69KV 54515 KANSAS 269.0 TO 96987 2WATTS 69.0 CKT 1	413	Upgrade needed due to assigned upgrades for 620 MW transfer	Reconductor 9.4 miles with 795ACSR.	\$ 1,551,000
08SP	EUREKA SPRINGS TO BEAVER DAM, 161KV 52680 BEAVER 5 161 53136 EUREKA 5 161 1	274	89.6	92.4	99.7	102.6	FLINT CREEK TO MONET, 345KV 53140 FLINTCR7 345 to 59481 MON383 7 345 CKT 1	462	Upgrade needed due to assigned upgrades for 620 MW transfer	AEPW Reconductor 1.25 miles with 1590ACSR SWPA Reconnect CT's; Replace metering & reset relays	\$ 537,500
08WP	POWERSITE 161/69/12.5KV TRANSFORMER 59562*OZD312 269.0 OZKDAM 1	41.7	99.8	99.8	99.9	100.2	OZARK NORTHWEST TO BLACKHAWK JCT. 59570 OZK330 269.0 to 59604 BHJ415 269.0 CKT 1	413	Upgrade needed due to assigned upgrades for 620 MW transfer	Replace with 75MVA transformer.	\$ 1,250,000
Total Cost \$											8,961,000

### **3. Conclusion**

Previously confirmed service in the amount of 465MW from ERCOTE to EES decreases the ATC on facilities identified for the 620MW AEPW to EES transfer. The annulment of the ERCOTE to EES transfer was studied as an option to providing additional capacity on those identified facilities. The 620MW transfer was studied with 300MW of ERCOTE to EES service annulled for a period of 4/1/2003 to 4/1/2013. The transfer was also studied with 465MW of ERCOTE to EES service annulled for a period of 4/1/2003 to 4/1/2013.

The annulment of the ERCOTE to EES transfer relieves some facilities that were previously assigned to the 620MW transfer. The annulment of the ERCOTE to EES transfer also increases the loading on some facilities that result in new overloads caused by the AEPW to EES transfer.

The final costs associated with the annulment of the ERCOTE to EES service and the resulting facility upgrades required will be determined through the completion of a facility study.

## Appendix A

### PSS/E CHOICES IN RUNNING LOAD FLOW PROGRAM AND ACCC

#### BASE CASES:

Solutions - Fixed slope decoupled Newton-Raphson solution (FDNS)

1. Tap adjustment – Stepping
2. Area interchange control – Tie lines only
3. Var limits – Apply automatically
4. Solution options -  Phase shift adjustment
  - Flat start
  - Lock DC taps
  - Lock switched shunts

#### ACCC CASES:

Solutions – AC contingency checking (ACCC)

1. MW mismatch tolerance – 1.0
2. Contingency case rating – Rate B
3. Percent of rating – 100
4. Output code – Summary
5. Min flow change in overload report – 1mw
6. Excl'd cases w/ no overloads form report – YES
7. Exclude interfaces from report – NO
8. Perform voltage limit check – YES
9. Elements in available capacity table – 60000
10. Cutoff threshold for available capacity table – 99999.0
11. Min. contng. case Vltg chng for report – 0.02
12. Sorted output – None

#### Newton Solution:

1. Tap adjustment – Stepping
2. Area interchange control – Tie lines only
3. Var limits - Apply automatically
4. Solution options -  Phase shift adjustment
  - Flat start
  - Lock DC taps
  - Lock switched shunts