



**SPP** *Southwest  
Power Pool*

*System Impact Study  
For Transmission Service  
Requested By  
Power Resource Group, Inc.*

*From AEPW to Entergy*

*For a Reserved Amount Of 670MW  
From 1/1/03  
To 1/1/06*

*SPP Transmission Planning*

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## **1. Executive Summary**

Power Resource Group, Inc. has requested a system impact study for long-term Firm Point-to-Point transmission service from AEPW to Entergy. The period of the transaction is from 1/1/03 to 1/1/06. The request is for one reservation (212202), totaling 670MW.

The principal objective of this study is to identify system problems and potential system modifications necessary to facilitate the additional 670MW transfer while maintaining system reliability. New overloads caused by the 670MW transfer were monitored along with any previously assigned facilities that were further overloaded by the transfer.

Due to the significant number of facility overloads caused by the 670MW transfer, SPP proposes the addition of a 500kV transmission line connecting from Pittsburg to NW Texarkana and then McNeil substations. Also proposed is a 345kV transmission line from Dolet Hills to tap the Mt. Olive - Hartburg 500kV line. The analysis performed in the study shows that the addition of these projects on the SPP transmission system will relieve the impacted facilities that were overloaded due to the AEPW-EES 670MW transfer.

The SPP and effected member companies shall use due diligence to coordinate the addition of necessary facilities or transmission system upgrades to provide the requested transmission service. Power Resource Group, Inc. is to compensate SPP for such costs pursuant to the terms of section 27 of the SPP Open Access Transmission Tariff. Expedited procedures for new facilities are available to Power Resource Group, Inc. per section 19.8 of the SPP Open Access Transmission Service Tariff.

Engineering and construction of any new facilities or modifications will not start until after a transmission service agreement and/or construction agreement is in place and effected member companies receives the appropriate authorization to proceed from the SPP after they receive authorization from the transmission customer.

## **2. Introduction**

Power Resource Group, Inc. has requested an impact study for transmission service from AEPW control area with a sink of EES.

The principal objective of this study is to identify the restraints on the SPP Regional Tariff System that may limit the transfer to less than 670MW and to propose additional transmission projects that will relieve the overloads caused by the transfer.

The impact of the 670MW transfer was initially studied for the system with no additional transmission projects included. After determining the numerous facilities that were impacted by the transfer, two transmission projects were proposed. These projects were then included in the models and the impact of the 670MW transfer was again studied. The results of these studies are given in the report.

This study includes a steady-state contingency analysis (PSS/E function ACCC which considers the impact of the 670MW 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**

A steady-state analysis of the impact of the 670MW on SPP and Non-SPP facilities 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.

An analysis was first conducted to determine the impact of the 670MW on SPP and Non-SPP facilities. Any new facilities that were overloaded or any previously assigned facilities further impacted by the transfer were documented in the report.

After the initial studies conducted on the 670MW transfer request, it was found that there were several limiting elements that restricted the AEPW to EES transfer. These overloaded facilities are listed in Table 1. Limited number of upgrades could be made each year because of reliability concerns during outages necessitated the need for new facilities. The addition of the Pittsburg-NW Texarkana-McNeil 500kV line was decided upon as an alternative to relieving each individual overload separately. This project was found to be the shortest path that provided the capability that was needed to allow the 670MW transfer. Further analysis of the Pittsburgh – NW Texarkana – McNeil 500kV line showed that with a single contingency of the Welsh to NW Texarkana 345kV line with the plant at Kiowa offline, the Welsh to Lydia 345kV line would become overloaded. To relieve this overload, the 345kV line addition from Dolet Hills to tap the Mt. Olive to Hartburg line was included in the study. The Dolet Hills tap relieves the Welsh to Lydia 345kV line with no need for reconductoring.

	<b>Branch</b>	<b>Length</b>	<b>R</b>	<b>X</b>	<b>B</b>	<b>Rate A</b>	<b>Rate B</b>
Pittsburg – NW Texarkana	PITTSB-8 500 to NWTXARK8 500	140 miles	0.00232	0.03170	3.06700	1732	1732
NW Texarkana - McNeil	NWTXARK8 500 to 8MCNEIL 500	65 miles	0.00108	0.01471	1.42400	1732	1732
Dolet Hills - Chousth	DOLHILL7 345 to CHOUSHT7 345	28 miles	0.00148	0.01352	0.23423	1011	1176

Analyses were then conducted on the addition of the two proposed projects to determine the new capability provided for the 670MW transfer. The new overloaded facilities and previously assigned facilities were monitored to determine which facilities, if any, were relieved due to the additional transmission lines. These results are documented in Tables 5a – 5d of the report.

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

SPP used three seasonal models to study the 670MW request. The SPP 2000 Series Cases 2001 Spring Peak, 2004 Summer Peak, and 2004/2005 Winter Peak were used to study the impact of the 670MW transfer on the SPP system during the transaction period of 1/1/03 to 1/1/06. The 2001 Spring Peak model is representative of the April Minimum throughout the length of the reservation.

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 2000 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.

## **4. Study Results**

### **A. Study Analysis Results**

Tables 1 thru 4 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 determined ATC value if calculated, any SPP identification or assignment of the event, and any solutions received from the transmission owners.

Tables 1 and 2 contain new facility overloads caused by the 670MW transfer. Table 1 contains the facility overloads on SPP Regional Tariff participants' transmission systems. Table 2 documents overloads on Non SPP Regional Tariff participants' transmission systems. These tables show the numerous facilities which must be relieved in order to provide the capability needed for the 670MW transfer. These facilities to be upgraded will almost all be eliminated by the addition of the two proposed transmission line projects.

Table 3 documents the 670MW transfer impact on previously assigned facilities. Several of these facilities that were previously assigned are further overloaded by the 670MW transaction. Many of these have been overloaded past the new limits provided by the previously assigned upgrades. The facilities must be further upgraded to allow the 670MW transfer from AEPW to EES.

Table 4 documents Non SPP Regional Tariff participants' transmission systems that are overloaded prior to the AEPW to EES 670MW transfer. These facilities are further overloaded to the 670MW transaction.

After determining the facility overloads that were caused by the 670MW transfer from AEPW to EES, the two proposed project additions were implemented into the models. The Pittsburg-NW Texarkana-McNeil 500kV and Dolet Hills 345kV projects were added to determine which overloaded facilities would be relieved by the addition of these lines. Tables 5a thru 5d contain the analysis results of the System Impact Study with the addition of the Pittsburg-NW Texarkana-McNeil 500kV transmission line and the 345kV transmission line from Dolet Hill tapping the Mt. Olive-Hartburg line. These tables show the overloaded facilities that were relieved by the transmission line additions

Tables 5a and 5b document the overloaded facilities that were relieved due to the new projects. Table 5a contains the relieved facilities on the SPP Regional Tariff participants' transmission systems. Table 5b contains the relieved facilities on the Non SPP Regional Tariff participants' transmission systems. These tables show that the majority of the new overloads caused by the transfer are relieved by the addition of the new transmission lines.

Some of the previously assigned SPP Facilities impacted by the 670MW transfer were also relieved due to the line additions. These relieved facilities are shown in Table 5c. The 670MW transfer initially caused many of these previously assigned facilities to be overloaded beyond the new limits provided due to the upgrades. The addition of the new transmission lines would relieve several of these previously assigned facilities that would otherwise have to be further upgraded to provide the needed capacity for the transfer.

Several of the Non SPP Facilities that were overloaded prior to the 670MW transfer were also relieved due to the transmission line additions. These relieved overloads are documented in Table 5d.

Though the addition of the two new transmission line projects relieved several of the overloads caused by the 670MW transfer, a few of the facilities still remain overloaded. These facilities, which are outlined in Table 6b, are also required to be upgraded prior to the approval of the 670MW transfer. The proposed transmission lines were added to both the cases without the 670MW transfer and the cases with the 670MW transfer. Table 6b documents the facilities that were overloaded by the 670MW transfer and were not relieved with the additional transmission lines included.



**Table 1** – SPP Facility Overloads caused by the 670MW AEPW to EES transfer.

Study Year	From Area To Area	Branch Over 100% Rate B	RATEB	No Transfer %Loading	Transfer Case %Loading	Outaged Branch That Caused Overload	Initial Limit, Available Solution and Cost, or Previous Assignment
01SR	OKGE-OKGE	<b>PECAN CREEK 345/161KV TRANSFORMER</b> 55235 PECAN7 345 to 55234 PECAN5 161 CKT 1	369	94.4	107.7	<b>MUSKOGEE TO FORT SMITH, 345KV</b> 55224 MSKGE7 345 to 55302 FTSMI7 345 CKT1	Add Second 369MVA 345/161KV Bus-Tie Transformer \$3,500,000
01SR	SWPA-SWPA	<b>ROBERT S. KERR TO VAN BUREN, 161KV</b> 52782 RS KERR5 161 to 52722 VAN BUR5 161 CKT 1	167	95.7	104.4	<b>BONZT5 TO AES COGEN, 161KV</b> 55261 BONZT5 161 to 55262 AES 5 161 CKT1	Replace 161-kV Disconnect Switches 31,33,35,&37 with 1200A Switches \$105,000
01SR	AEPW-OKGE	<b>PITTSBURGH TO SEMINOLE, 345KV</b> 54033 PITTSB-7 345 to 55045 SEMNL7 345 CKT 1	717	77.9	111	<b>PITTSBURGH TO SUNNYSIDE, 345KV</b> 54033 PITTSB-7 345 to 55136 SUNSD7 345 CKT1	OGE CT'S
01SR	AEPW-AEPW	<b>SABINE MINING CO. T TO PIRKEY, 138KV</b> 53602 SABMINT4 138 to 53592 PIRKEY 4 138 CKT 1	287	94.9	103.0	<b>LONGWOOD TO WILKES, 345KV</b> 53424 LONGWD 7 345 to 53620 WILKES 7 345 CKT1	Incorrect Ratings In Case New Spring Emergency Rating is 383MVA 33.5% Increase
01SR	AEPW-AEPW	<b>WILKES TO JEFFERSON SWITCHING, 138KV</b> 53619 WILKES 4 138 to 53551 JEFFRSN4 138 CKT 1	210	93.2	108.6	<b>LONGWOOD TO WILKES, 345KV</b> 53424 LONGWD 7 345 to 53620 WILKES 7 345 CKT1	Trap & Jumpers Being Replace Due To A Flowgate Problem 10/2000 New Spring Emergency Rating is 287MVA 36.7% Increase
01SR	AEPW-AEPW	<b>ASHDOWN REC (MILLWOOD) TO OKAY, 115KV</b> 53225 ASHDWNR3 115 to 53303 OKAY 3 115 CKT 1	158	92.8	107.6	<b>LONGWOOD TO ELDORADO-EHV, 345KV</b> 53424 LONGWD 7 345 to 17529 7ELDEHV 345 CKT1	500cu
01SR	AEPW-AEPW	<b>UMPIRE REC TO DIERKS, 69KV</b> 53241 UMPIRER269.0 to 53259 DIERKS 269.0 CKT 1	72	99.9	100.2	<b>WICKES REC TO DEQUEEN, 69KV</b> 53242 WICKES 269.0 to 53257 DEQUEEN269.0 CKT1	350cu Breaker
01SR	AEPW-AEPW	<b>PATTERSON TO SOUTH NASHVILLE 138KV</b> 53306 PATTERS4 138 to 53321 SNASHVL4 138 CKT 1	105	93.9	114.5	<b>LONGWOOD TO ELDORADO, 345KV OR ELDORADO 500/345KV XFRM</b> 53424 LONGWD 7 to 17529 7ELDEHV 1 OR 17529 7ELDEHV to 17530 8ELDEHV 1	Incorrect Ratings In Case New Spring Emergency Rating is 135MVA 28.6% Increase
01SR	AEPW-EES	<b>SOUTH NASHVILLE TO MURFREESBORO 138KV</b> 53321 SNASHVL4 138 to 17609 4MURFRE 138 CKT 1	96	86.0	108.1	<b>LONGWOOD TO ELDORADO, 345KV OR ELDORADO 500/345KV XFRM</b> 53424 LONGWD 7 to 17529 7ELDEHV 1 OR 17529 7ELDEHV to 17530 8ELDEHV 1	Incorrect Ratings In Case New Spring Emergency Rating is 105MVA 9.4% Increase
04SP	OKGE-OKGE	<b>FORT SMITH 345/161KV TRANSFORMER</b> 55302 FTSMI7 345 to 55300 FTSMI5 161 CKT 1	493	92.4	110.5	<b>FORT SMITH 500/345KV TRANSFORMER</b> 55302 FTSMI7 345 to 55305 FTSMI8 500 CKT1	Convert To Breaker-and-one-half Scheme, And Add Third 493MVA Transformer \$6,000,000
04SP	OKGE-OKGE	<b>HWY595 TO VAN BUREN INTERCONNECT, 161KV</b> 55347 HWY595 161 to 55339 VBI 5 161 CKT 1	167	85.0	105.0	<b>MUSKOGEE TO FORT SMITH, 345KV</b> 55224 MSKGE7 345 to 55302 FTSMI7 345 CKT1	.07mi 100% Owned by OKGE
04SP	OKGE-OKGE	<b>CONTINENTAL TAP TO CHILOCCO TAP, 69KV</b> 54745 CONTT269.0 to 54744 CHLOC269.0 CKT 1	111	98.0	103.0	<b>KILDARE TAP TO WHITE EAGLE, 138KV</b> 54760 KILDR4 138 to 54761 WHEGL4 138 CKT1	1.15mi
04SP	OKGE-OKGE	<b>CHILOCCO TAP TO CHIKASKIA, 69KV</b> 54744 CHLOC269.0 to 54756 CKSKI269.0 CKT 1	57	99.8	105.1	<b>KILDARE TAP TO WHITE EAGLE, 138KV</b> 54760 KILDR4 138 to 54761 WHEGL4 138 CKT1	Assigned To 2000-044 2004SP Rebuild And Reconductor 19.56 Miles \$3,287,572

**Table 1 – Continued** - SPP Facility Overloads caused by the 670MW AEPW to EES transfer.

Study Year	From Area To Area	Branch Over 100% Rate B	RATEB	No Transfer %Loading	Transfer Case %Loading	Outaged Branch That Caused Overload	Initial Limit, Available Solution and Cost, or Previous Assignment
04SP	OKGE-OKGE	<b>PANAMA TO OMPA SKULLYVILLE, 69KV</b> 55272 PANAM269.0 to 55270 SKULY269.0 CKT 1	39	96.4	100.3	<b>BONZT5 TO AES COGEN, 161KV</b> 55261 BONZT5 161 to 55262 AES 5 161 CKT1	7.77mi
04SP	OKGE-AEPW	<b>BONZT5 TO BONANZA, 161KV</b> 55261 BONZT5 161 to 53126 BONANZA5 161 CKT 1	177	91.8	104.6	<b>FORT SMITH TO ARKANSAS NUCLEAR ONE, 500KV</b> 55305 FTSMI8 500 to 17632 8ANO 500 CKT1	.06mi 100% Owned by AEPW
04SP	GRRD-OKGE	<b>TAHLEQUAH TO HWY595, 161KV</b> 54455 TAHLQH 5 161 to 55347 HWY595 161 CKT 1	167	88.7	108.7	<b>MUSKOGEE TO FORT SMITH, 345KV</b> 55224 MSKGE7 345 to 55302 FTSMI7 345 CKT1	48.58 Miles Entergy Owns 47.6 AEPW Owns 47.6 OKGE Owns 4.8
04SP	SWPA-SWPA	<b>BULL SHOALS TO NORFORK, 161KV</b> 52660 BULL SH5 161 to 52648 NORFORK5 161 CKT 1	167	88.3	100.4	<b>MIDWAY TO MOUNTAIN HOME, 161KV</b> 17875 5MIDWAY# 161 to 17877 5MT HOM 161 CKT1	26.19mi
04SP	SWPA-SWPA	<b>SALLISAW TO VAN BUREN, 161KV</b> 52750 SALISAW5 161 to 52722 VAN BUR5 161 CKT 1	167	83.7	107.4	<b>MUSKOGEE TO FORT SMITH, 345KV</b> 55224 MSKGE7 345 to 55302 FTSMI7 345 CKT1	Increase clearances of approximately 20 spans to allow operation of line at 100C. This will increase the line capacity to 223 MW. \$1,000,000
04SP	SWPA-SWPA	<b>GORE TO SALLISAW, 161KV</b> 52752 GORE 5 161 to 52750 SALISAW5 161 CKT 1	167	94.7	114.6	"	Increase clearances of approximately ten spans to allow operation of line at 100C. This will increase the line capacity to 223 MW. \$500,000
04SP	SWPA-SWPA	<b>MUSKOGEE TAP TO GORE, 161KV</b> 52758 MUSKTAP5 161 to 52752 GORE 5 161 CKT 1	206	91.3	104.9	"	
04SP	SWPA-OKGE	<b>VAN BUREN TO VAN BUREN INTERCONNECT, 161KV</b> 52722 VAN BUR5 161 to 55339 VBI 5 161 CKT 1	335	90.2	102.4	"	Reconductor 0.22 miles of line with 2 conductor bundled 795 MCM ACSR. Replace terminal equipment at both ends of line. This will increase the line capacity to 558 MW. \$500,000
04SP	AEPW-CELE	<b>WALLACE LAKE TO INTERNATIONAL PAPER, 138KV</b> 53461 WALLAKE4 138 to 50090 IPAPER 4 138 CKT 1	209	98.5	115.1	<b>DOLET HILLS 345/230KV TRANSFORMER</b> 50045 DOLHILL7 345 to 50046 DOLHILL6 230 CKT1	Dolet Hill Operating Guide
04SP	AEPW-AEPW	<b>LOWELL REC TO ROGERS, 69KV</b> 53200 LOWELLR269.0 to 53152 ROGERS 269.0 CKT 1	72	99.4	102.1	<b>FLINT CREEK TO GENTRY REC, 161KV</b> 53139 FLINTCR5 161 to 53187 GENTRYR5 161 CKT1	
04SP	AEPW-AEPW	<b>SOUTH SHREVEPORT TO FORBING TAP, 69KV</b> 53445 S SHV 269.0 to 53406 FORBNGT269.0 CKT 1	95	96.5	102.9	<b>SOUTH SHREVEPORT TO WALLACE LAKE, 138KV</b> 53446 S SHV 4 138 to 53461 WALLAKE4 138 CKT1	Assigned To 2000-043 2004SP Replace 500 CU jumpers @ S. Shreveport \$12,000
04SP	AEPW-AEPW	<b>WILBURTON TO LONE OAK, 69KV</b> 54031 WILBURT269.0 to 54021 LONEOAK269.0 CKT 1	48	95.7	102.0	<b>EUFULA TO STIGLER TAP, 138KV</b> 52774 EUFAULA4 138 to 54050 STIGLRT4 138 CKT1	14.3mi Line Switch
04SP	AECI-KACP	<b>CLINTON TO MONTROSE, 161KV</b> 96071 5CLINTN 161 to 57995 MONTROS5 161 CKT 1	370	97.9	100.9	<b>ARCHIE TO ADRIAN, 161KV</b> 59207 ARCHIE 5 161 to 59240 ADRIAN 5 161 CKT1	100.0% Owned by KACP 12.48mi

SPP IMPACT STUDY (#SPP-2000-108)

March 12, 2001

**Table 1 – Continued** - SPP Facility Overloads caused by the 670MW AEPW to EES transfer.

Study Year	From Area To Area	Branch Over 100% Rate B	RATEB	No Transfer %Loading	Transfer Case %Loading	Outaged Branch That Caused Overload	Initial Limit, Available Solution and Cost, or Previous Assignment
04SP	EMDE-EES	<b>OMAHA TO OZARK DAM, 161KV</b> 17879 5OMAHA * 161 to 59474 OZD312 5 161 CKT 1	162	96.5	105.3	<b>EUREKA SPRINGS TO OSAGE, 161KV</b> 53136 EUREKA 5 161 to 17880 5OSAGE # 161 CKT1	Entergy Owned Tie And Limit
04SP	AEPW-EES	<b>SOUTH NASHVILLE TO MURFREESBORO 138KV</b> 53321 SNASHVL4 to 17609 4MURFRE 1	96	93.8	114.2	<b>LONGWOOD TO ELDORADO, 345KV OR ELDORADO 500/345KV XFRM</b> 53424 LONGWD 7 to 17529 7ELDEHV 1 OR 17529 7ELDEHV to 17530 8ELDEHV 1	Incorrect Ratings In Case New Summer Emergency Rating is 105MVA 9.4% Increase
04SP	EES-AEPW	<b>OSAGE TO EUREKA,161KV</b> 17880 5OSAGE # to 53136 EUREKA 5 1	244	94.5	103.8	<b>MUSKOGEE TO FORT SMITH, 345KV</b> 55224 MSKGE7 345 to 55302 FTSMI7 345 CKT1	6.55mi 82%AEPW 18%Entergy
04WP	AEPW-AEPW	<b>BANN TO ALUMAX TAP, 138KV</b> 53250 BANN 4 138 to 53245 ALUMXT 4 138 CKT 1	287	97.6	102.5	<b>NW TEXARKANA-BANN T TO NORTHWEST TEXARKANA</b> 53299 NWT-BNT4 138 to 53300 NWTXARK4 138 CKT1	Reconductor 0.67 miles of 1024 ACAR with 1590 ACSR. \$233,000
04WP	AEPW-AEPW	<b>JACKSONVILLE (SWE-RC-ETEC) TO PINE GROVE (ETEC), 138KV</b> 53549 JACKSNV4 138 to 53675 PINEGRV4 138 CKT 1	158	88.8	103.2	<b>CROCKETT TO TENASKA, 345KV</b> 53526 CROCKET7 345 to 54061 TENASKA7 345 CKT1	Assigned To 2000-086 2001SR Reset 300/5 CTs at Jacksonville to 400/5 \$1,000
04WP	AEPW-AEPW	<b>SABINE MINING CO. T TO PIRKEY, 138KV</b> 53602 SABMINT4 138 to 53592 PIRKEY 4 138 CKT 1	287	97.5	104.3	<b>LONGWOOD TO WILKES, 345KV</b> 53424 LONGWD 7 345 to 53620 WILKES 7 345 CKT1	Incorrect Ratings In Case New Winter Emergency Rating is 383MVA 33.5% Increase
04WP	AEPW-AEPW	<b>SOUTHEAST MARSHALL TO SABINE MINING CO. T, 138KV</b> 53605 SEMRSHL4 138 to 53602 SABMINT4 138 CKT 1	287	94.4	101.3	<b>LONGWOOD TO WILKES, 345KV</b> 53424 LONGWD 7 345 to 53620 WILKES 7 345 CKT1	Assigned To 2000-044 2004SP Replace 2-1200A Circuit switchers & 1-1200A switch @ SE Marshall & 1-1200A switch @ Sabine Mining Tap \$195,404
04WP	OKGE-OKGE	<b>ETNA TO BRANCH, 69KV</b> 55318 ETNA 269.0 to 55313 BRNCH269.0 CKT 1	48	96.3	103.4	<b>BRANCH TO VAN BUREN INTERCONNECT, 161KV</b> 55316 BRNCH5 161 to 55339 VBI 5 161 CKT1	7.38mi
04WP	OKGE - OKGE	<b>LONE STAR SOUTH TO DIANA, 138KV</b> 53276 LSSOUTH4 138 53527 DIANA 4 138 1	287	99.5	100.6	<b>Multiple Outage Contingency</b> <b>WELSH TO WILKES, 345KV</b> 53615 WELSH 7345.00 to BUS 53620 WILKES 7345.00 CKT 1 <b>WELSH TO NWTEXARKANA, 345KV</b> 53615 WELSH 7345.00 to 53301 NWTXARK7345.00 CKT 1	
04WP	AEPW-AEPW	<b>CHEROKEE TO TATUM, 138KV</b> 53522 CHEROKE4 138 53611 TATUM 4 138 1	236	95.4	102.3	<b>Multiple Outage Contingency</b> <b>SW SHREVEPORT to DIANA 345KV</b> 53454 SW SHV 7 to 53528 DIANA 7 CKT1 <b>SW SHREVEPORT to LONGWOOD 345KV</b> 53454 SW SHV 7 to 53424 LONGWD 7 CKT1	Assigned To 2000-086 2001 SP Reconductor 6.25 miles of 666 ACSR with 1272 ACSR, \$1,300,000
04WP	AEPW-AEPW	<b>NORTH MARSHALL TO WOODLAWN , 69KV</b> 53579 NMARSHL269.0 53621 WOODLWN269.0 1	51	97.9	104.4	"	

**Table 2** – Non SPP Facility Overloads caused by the 670MW AEPW to EES transfer.

Study Year	From -To Area(s)	Branch Over 100% Rate B	Rate B <MVA>	No Transfer %Loading	Transfer Case %Loading	Outaged Branch That Caused Overload
01SR	EES-EES	16556 4GRIMES 138 to 16503 4WALDEN 138 CKT 1	206	92.6	104.3	53424 LONGWD 7 to 17529 7ELDEHV 1 OR 17529 7ELDEHV to 17530 8ELDEHV 1
01SR	EES-EES	17607 3MURF-S 115 to 17608 3MURF-E# 115 CKT 1	98	80.2	101.0	"
01SR	EES-EES	17608 3MURF-E# 115 to 17575 3AMITY * 115 CKT 1	98	79.2	100.1	"
01SR	EES-EES	16677 4TOLEDO 138 to 16657 4LEACH 138 CKT 1	144.6	98.7	107.1	16686 8HARTBRG 500 to 17445 8MTOLIV 500 CKT1
01SR	EES-EES	17530 8ELDEHV 500 to 17529 7ELDEHV 345 CKT 1	896	94.4	111.3	53526 CROCKET7 345 to 16555 7GRIMES 345 CKT1
01SR	EES-CELE	16677 4TOLEDO 138 to 50098 LEESV 4 138 CKT 1	148	94.8	102.7	50050 ELEESV 6 230 to 50177 RODEMR 6 230 CKT1
01SR	CELE-CELE	50023 CARROLL6 230 to 50126 MESSICK6 230 CKT 1	414	91.2	106.5	53424 LONGWD 7 to 17529 7ELDEHV 1 OR 17529 7ELDEHV to 17530 8ELDEHV 1
01SR	CELE-EES	50024 CARROLL4 138 to 17450 3RINGLD 115 CKT 1	125	97.7	108.0	53526 CROCKET7 345 to 16555 7GRIMES 345 CKT1
04SP	EES-EES	16555 7GRIMES 345 to 16556 4GRIMES 138 CKT 1	525	99.9	111.2	16555 7GRIMES 345 to 16556 4GRIMES 138 CKT2
04SP	EES-EES	17530 8ELDEHV 500 to 17529 7ELDEHV 345 CKT 1	896	88.4	102.5	53526 CROCKET7 345 to 16555 7GRIMES 345 CKT1
04SP	EES-EES	17607 3MURF-S 115 to 17608 3MURF-E# 115 CKT 1	98	87.7	106.8	53424 LONGWD 7 to 17529 7ELDEHV 1 OR 17529 7ELDEHV to 17530 8ELDEHV 1
04SP	EES-EES	17608 3MURF-E# 115 to 17575 3AMITY * 115 CKT 1	98	82.5	101.7	"
04SP	EES-EES	17861 5HARR-E 161 to 17879 5OMAHA * 161 CKT 1	162	91.6	100.3	53136 EUREKA 5 161 to 17880 5OSAGE # 161 CKT1
04SP	EES-EES	17875 5MIDWAY# 161 to 17877 5MT HOM 161 CKT 1	162	90.5	103.1	52648 NORFORK5 161 to 52660 BULL SH5 161 CKT1
04SP	CELE-CELE	50039 COUGH 4 138 to 50031 COCODR 6 230 CKT 1	386	95.9	101.3	50031 COCODR 6 230 to 50203 VILPLT 6 230 CKT1
04SP	CELE-CELE	50046 DOLHILL6 230 to 50045 DOLHILL7 345 CKT 1	700	97.4	110.8	53424 LONGWD 7 345 to 17529 7ELDEHV 345 CKT1
04WP	AECI-AECI	96154 1MOCTN2 100 to 96098 5MOCITY 161 CKT 2	34.38	98.2	100.19	96039 7FAIRPT 345 to 96076 5FAIRPT 161 CKT3
04WP	CELE-CELE	50046 DOLHILL6 230 to 50045 DOLHILL7 345 CKT 1	700	91.8	104.4	53424 LONGWD 7 345 to 17529 7ELDEHV 345 CKT1
04WP	EES-EES	17175 3PLUM PT 115 to 17174 3HN LAK 115 CKT 1	120	99.1	101.6	17181 6ROBNVL 230 to 17187 6TUNICA 230 CKT1
04WP	EES-EES	17516 3STEPHN 115 to 17544 3MCNEIL 115 CKT 1	96	98.9	101.1	17506 3MAG-W 115 to 17544 3MCNEIL 115 CKT1
04WP	EES-EES	17607 3MURF-S 115 to 17608 3MURF-E# 115 CKT 1	98	93.1	110.4	53424 LONGWD 7 345 to 17529 7ELDEHV 345 CKT1
04WP	EES-EES	17608 3MURF-E# 115 to 17575 3AMITY * 115 CKT 1	98	88.0	105.2	53424 LONGWD 7 345 to 17529 7ELDEHV 345 CKT1

**Table 3** – AEPW – EES 670MW transfer impact on previously assigned SPP Facilities with zero ATC. The upgrades and costs available are included.

Study Year	From -To Area(s)	Branch Over 100% Rate B	Rate B <MVA>	No Transfer %Loading	Transfer Case %Loading	Outaged Branch That Caused Overload	Upgrades And Costs Assigned to Previous Customers	New Rate B <MVA>	% Rate B Increase	Additional Upgrades and Costs Required
01SR	AEPW-AEPW	JEFFRSN SWITCHING TO IPC JEFFRSN 138KV 53551 JEFFRSN4 to 53548 IPCJEFF4 1	136	105.9	119.7	LONGWOOD to WILKES, 345 KV 53424 LONGWD 7 to 53620 WILKES 7 1	Assigned To 1999-014 2001SP Jefferson 138KV Line Rebuild, 1.49 miles, 795MCM \$380,000	268	97.1%	None
01SR	AEPW-AEPW	PATTERSON TO ASHDOWN REC 115KV 53305 PATTERS3 to 53225 ASHDWNR3 1	120	118.8	130.8	MCNEIL 500/115KV TRANSFORMER 17543 8MCNEIL to 17544 3MCNEIL 1	Assigned To 1999-014 2001SP Patterson Switch Replacement, 600A to 1200A \$20,000	149	24.2%	Yes, Not Available
01SR	AEPW-AEPW	JACKSONVILLE TO PINE GROVE 138KV 53549 JACKSNV4 to 53675 PINEGRV4 1	158	130.3	146.5	CROCKETT TO TENASKA, 345KV 53526 CROCKET7 to 54061 TENASKA7 1	Assigned To 2000-086 Reset 300/5 CTs at Jacksonville to 400/5 \$1,000	210	32.9%	Yes, Not Available
01SR	AEPW-AEPW	IPC JEFFERSON TO LIEBERMAN 138KV 53548 IPCJEFF4 to 53420 LIEBERM4 1	135	113.4	128.8	LONGWOOD TO WILKES, 345KV 53424 LONGWD 7 to 53620 WILKES 7 1	Assigned To 2000-086 2001SP Replace 4/0 jumpers to switches & Wavetrap at Lieberman. Reconductor 26.35 miles of 336 ACSR with 795 ACSR \$6,241,585 And Assigned To 2000-011 2001SP Replace switches @ Lieberman. Reconductor .65 miles of 397 ACSR with 795 ACSR \$153,967	179	32.6%	None
01SR	CELE-AEPW	INTERNATIONAL PAPER TO WALLACE LAKE 138KV 50090 IPAPER 4 to 53461 WALLAKE4 1	236	111.3	126.4	DOLET HILLS 345/230KV XFRM 50045 DOLHILL7 to 50046 DOLHILL6 1	Dolet Hills Operating Guide	N/A	N/A	None
01SR	AEPW-AEPW	SOUTH SHREVEPORT TO WALLACE LAKE 138KV 53446 S SHV 4 to 53461 WALLAKE4 1	236	109.6	122.9	DOLET HILLS 345/230KV XFRM 50045 DOLHILL7 to 50046 DOLHILL6 1	Dolet Hills Operating Guide	N/A	N/A	None
04SP	AEPW-WERE	SOUTH COFFEEVILLE TO DEARING 138KV 53972 SCOFVLE4 to 56832 DEARING4 1	143	135.8	147.2	DELAWARE TO NEOSHO 345KV 53929 DELWARE7 to 56756 NEOSHO 7 1	Assigned To 1999-010 2005WP Switch Replacements And Reset CTs \$48,065	210	46.9%	Yes, Not Available
04SP	AEPW-AEPW	JEFFRSN SWITCHING TO IPC JEFFRSN 138KV 53551 JEFFRSN4 to 53548 IPCJEFF4 1	136	125.7	140.7	LONGWOOD to WILKES, 345 KV 53424 LONGWD 7 to 53620 WILKES 7 1	Assigned To 1999-014 2001SP Jefferson 138KV Line Rebuild, 1.49 miles, 795MCM \$380,000	268	97.1%	None
04SP	AEPW-AEPW	JACKSONVILLE TO PINE GROVE 138KV 53549 JACKSNV4 to 53675 PINEGRV4 1	158	127.2	141.3	CROCKETT TO TENASKA, 345 KV 53526 CROCKET7 to 54061 TENASKA7 1	Assigned To 2000-086 2001AP Reset 300/5 CTs at Jacksonville to 400/5 \$1,000	210	32.9%	Yes, Not Available
04SP	AEPW-AEPW	IPC JEFFERSON TO LIEBERMAN 138KV 53548 IPCJEFF4 to 53420 LIEBERM4 1	115	140.1	157.5	LONGWOOD to WILKES, 345 KV 53424 LONGWD 7 to 53620 WILKES 7 1	Assigned To 2000-086 2001SP Replace 4/0 jumpers to switches & Wavetrap at Lieberman. Reconductor 26.35 miles of 336 ACSR with 795 ACSR \$6,241,585 And Assigned To 2000-011 2001SP Replace switches @ Lieberman. Reconductor .65 miles of 397 ACSR with 795 ACSR \$153,967	179	55.7%	Yes, Not Available
04SP	AEPW-AEPW	NORTHWEST HENDERSON TO POYNTER 69KV 53583 NWHENDR2 to 53595 POYNTER2 1	59	111.2	113.7	CHEROKEE REC TO KNOX LEE, 138 KV 53522 CHEROKE4 to 53557 KNOXLEE4 1	Assigned To 2000-011 2001SP Replace 4/0 jumpers and bus at Poynter \$45,700	72	22.0%	None
04SP	EMDE-EMDE	MONETT TO AURORA HT 161KV 59480 MON383 5 to 59468 AUR124 5 1	157	135.0	141.9	MONETT 161/69KV XFRM 59480 MON383 5 to 59591 MON383 2 1	For 1999-015 2005SP Taken Out By EMDE	N/A	N/A	None

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**Table 3** – Continued - AEPW – EES 670MW transfer impact on previously assigned SPP Facilities with zero ATC. The upgrades and costs available are included.

Study Year	From -To Area(s)	Branch Over 100% Rate B	Rate B <MVA>	No Transfer %Loading	Transfer Case %Loading	Outaged Branch That Caused Overload	Upgrades And Costs Assigned to Previous Customers	New Rate B <MVA>	% Rate B Increase	Additional Upgrades and Costs Required
04SP	EMDE-EMDE	<b>TIPTON FORD TO MONETT 161KV</b> 59472 TIP292 5 to 59480 MON383 5 1	157	111.6	117.2	<b>LARUSSEL TO MONETT, 161KV</b> 59479 LAR382 5 to 59480 MON383 5 1	Assigned To 2000-086 2001SP Reconductor 30 miles of 336 ACSR with 795 MCM, \$5,700,000	268	70.7%	None
04SP	KACP-KACP	<b>LA CYGNE TO STILWELL 345KV</b> 57981 LACYGNE7 to 57968 STILWEL7 1	1202	107.2	111.0	<b>WEST GARNER TO LA CYGNE, 345KV</b> 57965 W.GRDNR7 to 57981 LACYGNE7 1	SPP Flowgate With Operating Guide	N/A	N/A	Yes, Not Available
04SP	AEPW-SWPA	<b>EUREKA SPRINGS TO BEAVER 161KV</b> 53136 EUREKA 5 to 52680 BEAVER 5 1	274	102.5	112.0	<b>GORE TO WEBBER FALLS, 161KV</b> 52752 GORE 5-to 52754 WEBFALL5 1	Assigned To 2000-011 2004SP SWPA Upgrade-Reconnect CT's to 1000:5 Tap on Bkrs 42, 32, & half or 22. Replace metering & reset relays for Line 2 & Line 3 \$22,500 CSWS Upgrade-Reconductor 1.25 miles of 795 ACSR with 1590 ACSR (CSW owns 1.25 of 7.22 miles of the line) \$515,000	286	4.4%	Yes, SWPA Upgrade - Reconductor 5.98 miles of line with 1590 MCM ACSR. \$2,385,000
04SP	AEPW-AEPW	<b>HAWKINS REC TO HAWKINS, 69KV</b> 53544 HAWKREA2 to 53543 HAWKINS2 1	85	102.8	104.5	<b>PERDUE TO LAKE HAWKINS, 138KV</b> 53590 PERDUE 4 to 53666 LHAWKIN4 1	Assigned To 2000-011 2004SP Reconductor 1.00 mile of 477 ACSR with 795 ACSR \$375,000	90	5.9%	None
04SP	AEPW-AEPW	<b>WATERWORKS TO ARSENAL HILL 69KV</b> 53462 WATERWK2 to 53385 ARSHILL2 1	95	101.7	103.1	<b>FLOURNOY138/69KV TRANSFORMER</b> 53404 FLOURNY2 to 53405 FLOURNY4 1	Assigned To 2000-085 Replace Three sets of Switches \$60,000	105	10.5%	None
04SP	AEPW-AEPW	<b>GENTRY REC to EAST CENTERTON 161KV</b> 53187 GENTRYR5 to 53133 ECNTRTN5 1	335	101.3	103.3	<b>ELM SPRINGS REC TO FLINT CREEK, 161KV</b> 53194 ELMSPRR5 to 53139 FLINTCR5 1	Assigned To 1999-010 2008SP E.Centeron 161kV Breaker & Switch Replacements, Gentry Tap 161kV Line Switch Replacement \$167,960	353	5.4%	None
04SP	AEPW-AEPW	<b>WILKES TO JEFFERSON SWITCHING, 138KV</b> 53619 WILKES 4 to 53551 JEFFRSN4 1	210	104.6	119.6	<b>LONGWOOD to WILKES, 345 KV</b> 53424 LONGWD 7 to 53620 WILKES 7 1	Trap & Jumpers Being Replace Due To A Flowgate Problem 10/2000	261	24.3%	None
04SP	AEPW-EES	<b>HOPE TO PATMOS, 115KV</b> 53383 HOPE 3 to 17537 3PATMOS# 1	174	129.5	153.7	<b>LONGWOOD TO ELDORADO, 345KV OR ELDORADO 500/345KV XFRM</b> 53424 LONGWD 7 to 17529 7ELDEHV 1 OR 17529 7ELDEHV to 17530 8ELDEHV 1	Assigned To 2000-011 2004SP Reconductor 7.1 miles of 666 ACSR with 1272 ACSR \$1,576,468 And Assigned 2000-045 2004SP To Replace 1200A circuit switcher @ Hope with 2000A	258	48.3%	Yes, Not Available
04SP	AEPW-AEPW	<b>JACKSONVILLE TO OVERTON, 138KV</b> 53549 JACKSNV4 to 53588 OVERTON4 1	235	107.1	116.1	<b>CROCKETT TO TENASKA, 345 KV</b> 53526 CROCKET7 to 54061 TENASKA7 1	Third Party Line Owned By Rayburn Country Electric Co-op Upgrade 30.8 miles for bundle (2) 795 ACSR \$2,220,000	281	19.6%	None
04SP	AEPW-AEPW	<b>SOUTH SHREVEPORT TO WALLACE LAKE 138KV</b> 53446 S SHV 4 to 53461 WALLAKE4 1	236	104.9	119.5	<b>DOLET HILLS 345/230KV XFRM</b> 50045 DOLHILL7 to 50046 DOLHILL6 1	Dolet Hills Operating Guide	N/A	N/A	None

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**Table 3** – Continued - AEPW – EES 670MW transfer impact on previously assigned SPP Facilities with zero ATC. The upgrades and costs available are included.

Study Year	From -To Area(s)	Branch Over 100% Rate B	Rate B <MVA>	No Transfer %Loading	Transfer Case %Loading	Outaged Branch That Caused Overload	Upgrades And Costs Assigned to Previous Customers	New Rate B <MVA>	% Rate B Increase	Additional Upgrades and Costs Required
04SP	EMDE-EMDE	<b>DIAMOND JCT. TO SARCOXIE SOUTHWEST 69KV</b> 59538 DIA131 269.0 59582 SAR362T269.0 1	38	101.5	105.6	<b>MONETT 161/69KV XFMR</b> 59480 MON383 5 to 59591 MON383 2 1	Assigned To 2000-043 2004SP Reconductor existing 1/0 copper line with 336.4 MCM ACSR. \$700,000	65	71.1%	None
04SP	AEPW-AEPW	<b>BLOCKER TAP TO ROSBOROUGH 69KV</b> 53516 BLOCKRT2 to 53600 ROSBORO2 1	72	102.3	107.1	<b>CHEROKEE REC TO KNOX LEE 138KV</b> 53522 CHEROKE4 to 53557 KNOXLEE4 1	AEP project to replace 600A switches scheduled to be done 6/01	143	98.6%	None
04SP	AEPW-AEPW	<b>HALLSVILLE TO LONGVIEW HEIGHTS 69KV</b> 53541 HALLSVL2 to 53567 LONGVHT2 1	48	102.1	107.1	<b>MARSHALL TO MARSHALL 69KV</b> 53570 MARSHAL2 to 53623 MARAUTO2 1	Assigned To 2000-044 Rebuild 7.07 miles of 4/0 ACSR with 795 ACSR \$1,626,291	59	22.9%	None
04SP	AEPW-AEPW	<b>SABINE MINING CO. TO PIRKEY 138KV</b> 53602 SABMINT4 to 53592 PIRKEY 4 1	287	104.1	111.9	<b>LONGWOOD to WILKES, 345 KV</b> 53424 LONGWD 7 to 53620 WILKES 7 1	Incorrect Ratings In Case	340	18.5%	None
04SP	AEPW-AEPW	<b>SE MARSHALL TO SABINE MINING CO. 138KV</b> 53605 SEMRSHL4 to 53602 SABMINT4 1	287	101.0	108.8	<b>LONGWOOD to WILKES, 345 KV</b> 53424 LONGWD 7 to 53620 WILKES 7 1	Assigned To 2000-044 2004SP Replace 2-1200A Circuit switchers & 1-1200A switch @ SE Marshall & 1-1200A switch @ Sabine Mining Tap \$194,505	303	5.6%	Yes, Not Available
04SP	AEPW-AEPW	<b>PATTERSON TO SOUTH NASHVILLE 138KV</b> 53306 PATTERS4 to 53321 SNASHVL4 1	105	107.7	126.7	<b>LONGWOOD TO ELDORADO, 345KV OR ELDORADO 500/345KV XFMR</b> 53424 LONGWD 7 to 17529 7ELDEHV 1 OR 17529 7ELDEHV to 17530 8ELDEHV 1	Incorrect Ratings In Case New Summer Emergency Rating is 118MVA 12.4% Increase Upgrade Assigned To 2000-045 2004SP Rebuild 17.72 miles of 4/0 CU with 795 ACSR \$4,126,061	136	29.5%	None
04SP	GRRD-GRRD	<b>TAHLEQUAH TO MAID 161KV</b> 54455 TAHLQH 5 to 54448 MAID 5 1	148	125.2	131.6	<b>MUSKOGEE TO PECAN, 345KV</b> 55224 MSKGE7 to 55235 PECAN7 1	For 2000-003 2001SP Taken Out by GRDA Chouteau Operating Guide	N/A	N/A	None
04SP	AEPW-AEPW	<b>CHEROKEE REC TO KNOX LEE 138KV</b> 53522 CHEROKE4 to 53557 KNOXLEE4 1	209	140.3	149.7	<b>Multiple Outage Contingency</b> <b>SW SHREVEPORT to DIANA 345KV</b> 53454 SW SHV 7 to 53528 DIANA 7 CKT1 <b>SW SHREVEPORT to LONGWOOD 345KV</b> 53454 SW SHV 7 to 53424 LONGWD 7 CKT1	Assigned To 2000-086 2001SP Reconductor 3.25 miles of 666 ACSR with 1272 ACSR, \$720,000 Assigned To 2000-044 2004SP Replace 1200A switches @ Knox Lee & Cherokee Tap \$55,879	303	45.0%	Yes, Not Available
04SP	AEPW-AEPW	<b>TATUM TO CHEROKEE REC 138KV</b> 53611 TATUM 4 to 53522 CHEROKE4 1	209	133.4	142.9	<b>Multiple Outage Contingency</b> <b>SW SHREVEPORT to DIANA 345KV</b> 53454 SW SHV 7 to 53528 DIANA 7 CKT1 <b>SW SHREVEPORT to LONGWOOD 345KV</b> 53454 SW SHV 7 to 53424 LONGWD 7 CKT1	Assigned To 2000-086 2001 SP Reconductor 6.25 miles of 666 ACSR with 1272 ACSR, \$1,300,000	287	37.3%	Yes, Not Available

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**Table 3** – Continued - AEPW – EES 670MW transfer impact on previously assigned SPP Facilities with zero ATC. The upgrades and costs available are included.

Study Year	From -To Area(s)	Branch Over 100% Rate B	Rate B <MVA>	No Transfer %Loading	Transfer Case %Loading	Outaged Branch That Caused Overload	Upgrades And Costs Assigned to Previous Customers	New Rate B <MVA>	% Rate B Increase	Additional Upgrades and Costs Required
04SP	AEPW-AEPW	ROCK HILL TO TATUM 138KV 53598 ROKHILL4 to 53611 TATUM 4 1	209	131.7	141.1	Multiple Outage Contingency SW SHREVEPORT to DIANA 345KV 53454 SW SHV 7 to 53528 DIANA 7 CKT1 SW SHREVEPORT to LONGWOOD 345KV 53454 SW SHV 7 to 53424 LONGWD 7 CKT1	SPP-2000-086 01SP Reconductor 0.81 miles of 666 ACSR with 1272 ACSR. Replace 800A trap with new 2000A trap, \$190,000 Additional Upgrade SPP-2000-011 New Rate B 235MVA 106.5% Overloaded, Reconductor other 5.76 miles of 795 with 1272 ACSR Cost Not Available	287	37.3%	Yes, Not Available
04SP	AEPW-AEPW	NORTH MARSHALL TO WOODLAWN 69KV 53579 NMARSHL2 to 53621 WOODLWN2 1	51	108.8	117.2	Multiple Outage Contingency SW SHREVEPORT to DIANA 345KV 53454 SW SHV 7 to 53528 DIANA 7 CKT1 SW SHREVEPORT to LONGWOOD 345KV 53454 SW SHV 7 to 53424 LONGWD 7 CKT1	Assigned To 2000-011 2001SP Replace 3/0 CU jumpers @ North Marshall \$10,000	59	15.7%	Yes, Not Available
04SP	AEPW-AEPW	FLOURNOY TO LONGWOOD, 138KV 53405 FLOURNY4 to 53423 LONGWD 4	190	108.6	118.3	Multiple Outage Contingency SW SHREVEPORT to DIANA 345KV 53454 SW SHV 7 to 53528 DIANA 7 CKT1 SW SHREVEPORT to LONGWOOD 345KV 53454 SW SHV 7 to 53424 LONGWD 7 CKT1	Assigned To 2000-086 Replace 500 CU jumpers @ Longwood \$10,000	225	18.4%	None
04SP	AEPW-AEPW	LONGWOOD TO NORAM, 138KV 53423 LONGWD 4 to 53473 NORAM 4	234	113.6	120.6	Multiple Outage Contingency SW SHREVEPORT to DIANA 345KV 53454 SW SHV 7 to 53528 DIANA 7 CKT1 SW SHREVEPORT to LONGWOOD 345KV 53454 SW SHV 7 to 53424 LONGWD 7 CKT1	Assigned To 2000-011 2004SP Reconductor 4.66 miles of bundled 266 ACSR with 1590 ACSR \$1,274,374	262	12.0%	Yes, Not Available
04SP	AEPW-AEPW	RAINES TO NORAM 138KV 53439 RAINES 4 138 53473 NORAM 4 138 1	234	109.6	116.4	Multiple Outage Contingency SW SHREVEPORT to DIANA 345KV 53454 SW SHV 7 to 53528 DIANA 7 CKT1 SW SHREVEPORT to LONGWOOD 345KV 53454 SW SHV 7 to 53424 LONGWD 7 CKT1	Assigned To 2000-043 2004SP Rebuild 5.58 miles of 2-266 ACSR with 1590 ACSR \$1,447,081	268	14.5%	Yes, Not Available



**Table 3** – Continued - AEPW – EES 670MW transfer impact on previously assigned SPP Facilities with zero ATC. The upgrades and costs available are included.

Study Year	From -To Area(s)	Branch Over 100% Rate B	Rate B <MVA>	No Transfer %Loading	Transfer Case %Loading	Outaged Branch That Caused Overload	Upgrades And Costs Assigned to Previous Customers	New Rate B <MVA>	% Rate B Increase	Additional Upgrades and Costs Required
04SP	AEPW-AEPW	MARSHALL to NORTH MARSHALL 69KV 53570 MARSHAL269.0 53579 NMARSHL269.0 1	75	101.4	107.5	Multiple Outage Contingency SW SHREVEPORT to DIANA 345KV 53454 SW SHV 7 to 53528 DIANA 7 CKT1 SW SHREVEPORT to LONGWOOD 345KV 53454 SW SHV 7 to 53424 LONGWD 7 CKT1	Assigned To 2000-044 2004SP Replace 350 CU bus & jumpers @ North Marshall \$23,356	118	57.3%	None
04WP	AEPW-WERE	SOUTH COFFEEVILLE TO DEARING 138KV 53972 SCOFVLE4 to 56832 DEARING4 1	143	136.8	148	DELAWARE TO NEOSHO 345KV 53929 DELWARE7 to 56756 NEOSHO 7 1	Assigned To 1999-010 2005WP Switch Replacements And Reset CTs \$48,065	210	46.9%	Yes, Not Available
04WP	GRRD-GRRD	TAHLEQUAH TO MAID 161KV 54455 TAHLQH 5 to 54448 MAID 5 1	148	109.7	115.9	MUSKOGEE TO PECAN, 345KV 55224 MSKGE7 to 55235 PECAN7 1	For 2000-003 2001SP Taken Out by GRDA Chouteau Operating Guide	N/A	N/A	None
04WP	AEPW-AEPW	IPC JEFFERSON TO LIEBERMAN 138KV 53548 IPCJEFF4 to 53420 LIEBERM4 1	115	102.0	116.4	LONGWOOD to WILKES, 345 KV 53424 LONGWD 7 to 53620 WILKES 7 1	Assigned To 2000-086 2001SP Replace 4/0 jumpers to switches & Wavetrap at Lieberman. Reconductor 26.35 miles of 336 ACSR with 795 ACSR \$6,241,585 And Assigned To 2000-011 2001SP Replace switches @ Lieberman. Reconductor .65 miles of 397 ACSR with 795 ACSR \$153,967	179	55.7%	None
04WP	KACP-KACP	LA CYGNE TO STILWELL 345KV 57981 LACYGNE7 to 57968 STILWEL7 1	1315	101.7	105.1	WEST GARNER TO LA CYGNE, 345KV 57965 W.GRDNR7 to 57981 LACYGNE7 1	SPP Flowgate With Operating Guide	N/A	N/A	None
04WP	AEPW-SWPA	EUREKA SPRINGS TO BEAVER 161KV 53136 EUREKA 5 to 52680 BEAVER 5 1	274	102.2	114.6	MUSKOGEE TO FORT SMITH, 345KV 55224 MSKGE7345.00 to BUS 55302 FTSMI7345.00 1	Assigned To 2000-011 2004SP SWPA Upgrade-Reconnect CT's to 1000:5 Tap on Bkrs 42, 32, & half or 22. Replace metering & reset relays for Line 2 & Line 3 \$22,500 CSWS Upgrade-Reconductor 1.25 miles of 795 ACSR with 1590 ACSR (CSW owns 1.25 of 7.22 miles of the line) \$515,000	286	4.4%	Yes, SWPA Upgrade - Reconductor 5.98 miles of line with 1590 MCM ACSR. \$2,385,000

**Table 3** – Continued - AEPW – EES 670MW transfer impact on previously assigned SPP Facilities with zero ATC. The upgrades and costs available are included.

Study Year	From -To Area(s)	Branch Over 100% Rate B	Rate B <MVA>	No Transfer %Loading	Transfer Case %Loading	Outaged Branch That Caused Overload	Upgrades And Costs Assigned to Previous Customers	New Rate B <MVA>	% Rate B Increase	Additional Upgrades and Costs Required
04WP	AEPW-EES	HOPE TO PATMOS, 115KV 53383 HOPE 3 to 17537 3PATMOS# 1	174	117.9	137.2	LONGWOOD TO ELDORADO, 345KV OR ELDORADO 500/345KV XFRM 53424 LONGWD 7 to 17529 7ELDEHV 1 OR 17529 7ELDEHV to 17530 8ELDEHV 1	Assigned To 2000-011 2004SP Reconductor 7.1 miles of 666 ACSR with 1272 ACSR \$1,576,468 And Assigned 2000-045 2004SP To Replace 1200A circuit switcher @ Hope with 2000A	290	66.7%	None
04WP	AEPW-AEPW	CHEROKEE REC TO KNOX LEE, 138KV 53522 CHEROKEE4 to 53557 KNOXLEE4 1	236	100.3	107.2	Multiple Outage Contingency SW SHREVEPORT to DIANA 345KV 53454 SW SHV 7 to 53528 DIANA 7 CKT1 SW SHREVEPORT to LONGWOOD 345KV 53454 SW SHV 7 to 53424 LONGWD 7 CKT1	Assigned To 2000-086 2001SP Reconductor 3.25 miles of 666 ACSR with 1272 ACSR, \$720,000 Assigned To 2000-044 2004SP Replace 1200A switches @ Knox Lee & Cherokee Tap \$55,879	316	33.9%	None
04WP	AEPW-AEPW	ROCK HILL TO TATUM 138KV 53598 ROKHILL4 to 53611 TATUM 4 1	210	105.9	113.6	Multiple Outage Contingency SW SHREVEPORT to DIANA 345KV 53454 SW SHV 7 to 53528 DIANA 7 CKT1 SW SHREVEPORT to LONGWOOD 345KV 53454 SW SHV 7 to 53424 LONGWD 7 CKT1	Assigned To 2000-086 01SP Reconductor 0.81 miles of 666 ACSR with 1272 ACSR. Replace 800A trap with new 2000A trap, \$190,000 And Assigned To 2000-011 2001SP Reconductor other 5.76 miles of 795 ACSR with 1272 ACSR. Reset CTs @ Rock Hill \$1,090,000 And Assigned To 2000-044 2004SP Replace 1033 AAC jumpers to breaker. \$12,000	287	36.7%	None

**Table 4** – Non SPP Facilities Base Case Overloaded

Study Year	From -To Area(s)	Branch Over 100% Rate B	Rate B <MVA>	No Transfer %Loading	Transfer Case %Loading	Outaged Branch That Caused Overload
01SR	EES-EES	RINGGOLD to SAILES, 115 KV 17450 3RINGLD to 17451 3SAILES 1	115	124.7	139.1	LONGWOOD TO ELDORADO, 345KV OR ELDORADO 500/345KV XFRM LONGWOOD TO ELDORADO, 345KV OR ELDORADO 500/345KV XFRM
01SR	EES-EES	MURFREESBORO 138/115KV XFRM 17609 4MURFRE to 17607 3MURF-S 1	60	136.8	172.5	"
01SR	EES-EES	GRIMES TO MT ZION, 138KV 16556 4GRIMES to 16534 4MT.ZION 1	206	114.6	129.7	"
01SR	EES-EES	HLYSPG TO JASPER, 138KV 17917 4HLYSPG to 16668 4JASPER 1	112	114.0	120.5	CROCKETT TO TENASKA 345KV 53526 CROCKET7 to 54061 TENASKA7 1
01SR	CELE-EES	CARROLL TO RINGGOLD 138/115KV XFRM 50024 CARROLL4 to 17450 3RINGLD 1	125	121.0	134.3	LONGWOOD TO ELDORADO, 345KV OR ELDORADO 500/345KV XFRM 53424 LONGWD 7 to 17529 7ELDEHV 1 OR 17529 7ELDEHV to 17530 8ELDEHV 1
01SR	CELE-CELE	DOLET HILLS 345/230KV XFRM 50045 DOLHILL7 to 50046 DOLHILL6 1	700	112.5	126.7	"
01SR	CELE-CELE	INTERNATIONAL PAPER TO MANSFIELD 138KV 50090 IPAPER 4 to 50113 MANSFLD4 1	232	102.7	117.7	DOLET HILLS 345/230KV XFRM 50045 DOLHILL7 to 50046 DOLHILL6 1
04SP	EES-EES	RINGGOLD to SAILES, 115 KV 17450 3RINGLD to 17451 3SAILES 1	115	127.7	139.3	LONGWOOD TO ELDORADO, 345KV OR ELDORADO 500/345KV XFRM 53424 LONGWD 7 to 17529 7ELDEHV 1 OR 17529 7ELDEHV to 17530 8ELDEHV 1
04SP	EES-EES	MURFREESBORO 138/115KV XFRM 17609 4MURFRE to 17607 3MURF-S 1	60	149.6	182.4	"
04SP	EES-EES	LEWISVILLE TO COUCH, 115KV 17502 3LEWIS # to 17478 3COUCH 1	159	129.9	156.2	"
04SP	EES-EES	PATMOS-WEST SS TO LEWISVILLE, 115KV 17537 3PATMOS# to 17502 3LEWIS # 1	159	139.1	165.4	"
04SP	EES-EES	GRIMES TO MT ZION, 138KV 16556 4GRIMES to 16534 4MT.ZION 1	206	101.5	115.8	"
04SP	EES-EES	HLYSPG TO JASPER, 138KV 17917 4HLYSPG to 16668 4JASPER 1	112	126.9	133.0	CROCKETT TO TENASKA 345KV 53526 CROCKET7 to 54061 TENASKA7 1
04SP	CELE-EES	CARROLL TO RINGGOLD 138/115KV XFRM 50024 CARROLL4 to 17450 3RINGLD 1	125	127.0	137.7	LONGWOOD TO ELDORADO, 345KV OR ELDORADO 500/345KV XFRM 53424 LONGWD 7 to 17529 7ELDEHV 1 OR 17529 7ELDEHV to 17530 8ELDEHV 1
04SP	SWPA-AECI	CARTHAGE TO JASPER 69KV 52690 CARTHG 2 to 96649 2JASPER 1	36	124.6	128.7	ARCHIE TO ADRIAN, 161KV 59207 ARCHIE 5 to 59240 ADRIAN 5 1
04SP	SWPA-AECI	CARTHAGE TO REEDS 69KV 52690 CARTHG 2 to 96751 2REEDS 1	36	124.7	131.2	AURORA HT TO MONETT, 161KV 59468 AUR124 5 to 59480 MON383 5 1

**Table 4** – Continued - Non SPP Facilities Base Case Overloaded

Study Year	From -To Area(s)	Branch Over 100% Rate B	Rate B <MVA>	No Transfer %Loading	Transfer Case %Loading	Outaged Branch That Caused Overload
04SP	EES-SWPA	<b>MIDWAY TO BULL SHOALS 161KV</b> 17875 5MIDWAY# to 52660 BULL SH5 1	162	136.2	148.7	<b>NORFORK TO BULL SHOALS, 161KV</b> 52648 NORFORK5 to 52660 BULL SH5 1
04WP	EES-EES	<b>RINGGOLD to SAILES, 115 KV</b> 17450 3RINGLD to 17451 3SAILES 1	115	126.3	136.2	<b>LONGWOOD TO ELDORADO, 345KV OR ELDORADO 500/345KV XFRM</b> <b>LONGWOOD TO ELDORADO, 345KV OR ELDORADO 500/345KV XFRM</b>
04WP	EES-EES	<b>MURFREESBORO 138/115KV XFMR</b> 17609 4MURFRE to 17607 3MURF-S 1	60	158.7	188.5	“
04WP	EES-EES	<b>LEWISVILLE TO COUCH, 115KV</b> 17502 3LEWIS # to 17478 3COUCH 1	159	134.6	158.4	“
04WP	EES-EES	<b>PATMOS-WEST SS TO LEWISVILLE, 115KV</b> 17537 3PATMOS# to 17502 3LEWIS # 1	159	143.4	167.2	”
04WP	CELE-EES	<b>CARROLL TO RINGGOLD 138/115KV XFMR</b> 50024 CARROLL4 to 17450 3RINGLD 1	125	123.0	132.2	“
04WP	SWPA-AECI	<b>CARTHAGE TO JASPER 69KV</b> 52690 CARTHG 2 to 96649 2JASPER 1	36	112.1	115.6	<b>ARCHIE TO ADRIAN, 161KV</b> 59207 ARCHIE 5 to 59240 ADRIAN 5 1
04WP	SWPA-AECI	<b>CARTHAGE TO REEDS 69KV</b> 52690 CARTHG 2 to 96751 2REEDS 1	36	114.5	120.0	<b>AURORA HT TO MONETT, 161KV</b> 59468 AUR124 5 to 59480 MON383 5 1
04WP	EES-SWPA	<b>MIDWAY TO BULL SHOALS 161KV</b> 17875 5MIDWAY# to 52660 BULL SH5 1	162	116.2	128.6	<b>NORFORK TO BULL SHOALS, 161KV</b> 52648 NORFORK5 to 52660 BULL SH5 1

**Table 5a** - SPP Facility Overloads for 2004 Summer Peak found in Table 1 that are relieved due to the line additions.

Study Year	From Area To Area	Branch Over 100% Rate B	Outaged Branch That Caused Overload	RATEB	Transfer Case %Loading	With Line Additions %Loading
01SR	OKGE-OKGE	<b>PECAN CREEK 345/161KV TRANSFORMER</b> 55235 PECAN7 345 to 55234 PECAN5 161 CKT 1	<b>MUSKOGEE TO FORT SMITH, 345KV</b> 55224 MSKGE7 345 to 55302 FTSMI7 345 CKT1	369	107.7	94.7
01SR	SWPA-SWPA	<b>ROBERT S. KERR TO VAN BUREN, 161KV</b> 52782 RS KERR5 161 to 52722 VAN BUR5 161 CKT 1	<b>BONZT5 TO AES COGEN, 161KV</b> 55261 BONZT5 161 to 55262 AES 5 161 CKT1	167	104.4	95.2
01SR	CESW-OKGE	<b>PITTSBURGH TO SEMINOLE, 345KV</b> 54033 PITTSB-7 345 to 55045 SEMNL7 345 CKT 1	<b>PITTSBURGH TO SUNNYSIDE, 345KV</b> 54033 PITTSB-7 345 to 55136 SUNSD7 345 CKT1	717	111	84.7
01SR	CESW-CESW	<b>SABINE MINING CO. T TO PIRKEY, 138KV</b> 53602 SABMINT4 138 to 53592 PIRKEY 4 138 CKT 1	<b>LONGWOOD TO WILKES, 345KV</b> 53424 LONGWD 7 345 to 53620 WILKES 7 345 CKT1	287	103.0	88.9
01SR	CESW-CESW	<b>WILKES TO JEFFERSON SWITCHING, 138KV</b> 53619 WILKES 4 138 to 53551 JEFFRSN4 138 CKT 1	<b>LONGWOOD TO WILKES, 345KV</b> 53424 LONGWD 7 345 to 53620 WILKES 7 345 CKT1	210	108.6	80.5
01SR	CESW-CESW	<b>ASHDOWN REC (MILLWOOD) TO OKAY, 115KV</b> 53225 ASHDWNR3 115 to 53303 OKAY 3 115 CKT 1	<b>LONGWOOD TO ELDORADO-EHV, 345KV</b> 53424 LONGWD 7 345 to 17529 7ELDEHV 345 CKT1	158	107.6	44.2
01SR	CESW-CESW	<b>UMPIRE REC TO DIERKS, 69KV</b> 53241 UMPIRER269.0 to 53259 DIERKS 269.0 CKT 1	<b>WICKES REC TO DEQUEEN, 69KV</b> 53242 WICKES 269.0 to 53257 DEQUEEN269.0 CKT1	72	100.2	87.8
01SR	CESW-CESW	<b>PATTERSON TO SOUTH NASHVILLE 138KV</b> 53306 PATTERS4 138 to 53321 SNASHVL4 138 CKT 1	<b>LONGWOOD TO ELDORADO, 345KV OR ELDORADO 500/345KV XFRM</b> 53424 LONGWD 7 to 17529 7ELDEHV 1 OR 17529 7ELDEHV to 17530 8ELDEHV 1	105	114.5	40.7
01SR	CESW-EES	<b>SOUTH NASHVILLE TO MURFREESBORO 138KV</b> 53321 SNASHVL4 138 to 17609 4MURFRE 138 CKT 1	<b>LONGWOOD TO ELDORADO, 345KV OR ELDORADO 500/345KV XFRM</b> 53424 LONGWD 7 to 17529 7ELDEHV 1 OR 17529 7ELDEHV to 17530 8ELDEHV 1	96	108.1	28.2
04SP	OKGE-OKGE	<b>FORT SMITH 345/161KV TRANSFORMER</b> 55302 FTSMI7 345 to 55300 FTSMI5 161 CKT 1	<b>FORT SMITH 500/345KV TRANSFORMER</b> 55302 FTSMI7 345 to 55305 FTSMI8 500 CKT1	493	110.5	91.0
04SP	OKGE-OKGE	<b>HWY595 TO VAN BUREN INTERCONNECT, 161KV</b> 55347 HWY595 161 to 55339 VBI 5 161 CKT 1	<b>MUSKOGEE TO FORT SMITH, 345KV</b> 55224 MSKGE7 345 to 55302 FTSMI7 345 CKT1	167	105.0	80.2
04SP	OKGE-OKGE	<b>CONTINENTAL TAP TO CHILOCCO TAP, 69KV</b> 54745 CONTT269.0 to 54744 CHLOC269.0 CKT 1	<b>KILDARE TAP TO WHITE EAGLE, 138KV</b> 54760 KILDR4 138 to 54761 WHEGL4 138 CKT1	111	103.0	98.2
04SP	OKGE-OKGE	<b>CHILOCCO TAP TO CHIKASKIA, 69KV</b> 54744 CHLOC269.0 to 54756 CKSKI269.0 CKT 1	<b>KILDARE TAP TO WHITE EAGLE, 138KV</b> 54760 KILDR4 138 to 54761 WHEGL4 138 CKT1	57	105.1	100.0
04SP	OKGE-OKGE	<b>PANAMA TO OMPA SKULLYVILLE, 69KV</b> 55272 PANAM269.0 to 55270 SKULY269.0 CKT 1	<b>BONZT5 TO AES COGEN, 161KV</b> 55261 BONZT5 161 to 55262 AES 5 161 CKT1	39	100.3	95.7
04SP	OKGE-CESW	<b>BONZT5 TO BONANZA, 161KV</b> 55261 BONZT5 161 to 53126 BONANZA5 161 CKT 1	<b>FORT SMITH TO ARKANSAS NUCLEAR ONE, 500KV</b> 55305 FTSMI8 500 to 17632 8ANO 500 CKT1	177	104.6	90.1

**Table 5a** -Continued- SPP Facility Overloads for 2004 Summer Peak found in Table 1 that are relieved due to the line additions.

Study Year	From Area To Area	Branch Over 100% Rate B	Outaged Branch That Caused Overload	RATEB	Transfer Case %Loading	With Line Additions %Loading
04SP	GRRD-OKGE	<b>TAHLEQUAH TO HWY595, 161KV</b> 54455 TAHLQH 5 161 to 55347 HWY595 161 CKT 1	<b>MUSKOGEE TO FORT SMITH, 345KV</b> 55224 MSKGE7 345 to 55302 FTSMI7 345 CKT1	167	108.7	83.9
04SP	SWPA-SWPA	<b>BULL SHOALS TO NORFORK, 161KV</b> 52660 BULL SH5 161 to 52648 NORFORK5 161 CKT 1	<b>MIDWAY TO MOUNTAIN HOME, 161KV</b> 17875 5MIDWAY# 161 to 17877 5MT HOM 161 CKT1	167	100.4	89.5
04SP	SWPA-SWPA	<b>SALLISAW TO VAN BUREN, 161KV</b> 52750 SALLISAW5 161 to 52722 VAN BUR5 161 CKT 1	<b>MUSKOGEE TO FORT SMITH, 345KV</b> 55224 MSKGE7 345 to 55302 FTSMI7 345 CKT1	167	107.4	77.4
04SP	SWPA-SWPA	<b>GORE TO SALLISAW, 161KV</b> 52752 GORE 5 161 to 52750 SALLISAW5 161 CKT 1	"	167	114.6	89.3
04SP	SWPA-SWPA	<b>MUSKOGEE TAP TO GORE, 161KV</b> 52758 MUSKTAP5 161 to 52752 GORE 5 161 CKT 1	"	206	104.9	89.4
04SP	SWPA-OKGE	<b>VAN BUREN TO VAN BUREN INTERCONNECT, 161KV</b> 52722 VAN BUR5 161 to 55339 VBI 5 161 CKT 1	"	335	102.4	86.8
04SP	CESW-CELE	<b>WALLACE LAKE TO INTERNATIONAL PAPER, 138KV</b> 53461 WALLAKE4 138 to 50090 IPAPER 4 138 CKT 1	<b>DOLET HILLS 345/230KV TRANSFORMER</b> 50045 DOLHILL7 345 to 50046 DOLHILL6 230 CKT1	209	115.1	57.8
04SP	CESW-CESW	<b>LOWELL REC TO ROGERS, 69KV</b> 53200 LOWELLR269.0 to 53152 ROGERS 269.0 CKT 1	<b>FLINT CREEK TO GENTRY REC, 161KV</b> 53139 FLINTCR5 161 to 53187 GENTRYR5 161 CKT1	72	102.1	99.4
04SP	CESW-CESW	<b>SOUTH SHREVEPORT TO FORBING TAP, 69KV</b> 53445 S SHV 269.0 to 53406 FORBNGT269.0 CKT 1	<b>SOUTH SHREVEPORT TO WALLACE LAKE, 138KV</b> 53446 S SHV 4 138 to 53461 WALLAKE4 138 CKT1	95	102.9	92.5
04SP	CESW-CESW	<b>WILBURTON TO LONE OAK, 69KV</b> 54031 WILBURT269.0 to 54021 LONEOAK269.0 CKT 1	<b>EUFAULA TO STIGLER TAP, 138KV</b> 52774 EUFAULA4 138 to 54050 STIGLRT4 138 CKT1	48	102.0	92.4
04SP	AECI-KACP	<b>CLINTON TO MONTROSE, 161KV</b> 96071 5CLINTN 161 to 57995 MONTROS5 161 CKT 1	<b>ARCHIE TO ADRIAN, 161KV</b> 59207 ARCHIE 5 161 to 59240 ADRIAN 5 161 CKT1	370	100.9	98.0
04SP	EMDE-EES	<b>OMAHA TO OZARK DAM, 161KV</b> 17879 5OMAHA * 161 to 59474 OZD312 5 161 CKT 1	<b>EUREKA SPRINGS TO OSAGE, 161KV</b> 53136 EUREKA 5 161 to 17880 5OSAGE # 161 CKT1	162	105.3	95.9
04SP	CESW-EES	<b>SOUTH NASHVILLE TO MURFREESBORO 138KV</b> 53321 SNASHVL4 to 17609 4MURFRE 1	<b>LONGWOOD TO ELDORADO, 345KV OR ELDORADO 500/345KV XFRM</b> 53424 LONGWD 7 to 17529 7ELDEHV 1 OR 17529 7ELDEHV to 17530 8ELDEHV 1	96	114.2	39.2
04SP	EES-CESW	<b>OSAGE TO EUREKA,161KV</b> 17880 5OSAGE # to 53136 EUREKA 5 1	<b>MUSKOGEE TO FORT SMITH, 345KV</b> 55224 MSKGE7 345 to 55302 FTSMI7 345 CKT1	244	103.8	92.6
04WP	CESW-CESW	<b>BANN TO ALUMAX TAP, 138KV</b> 53250 BANN 4 138 to 53245 ALUMXT 4 138 CKT 1	<b>NW TEXARKANA-BANN T TO NORTHWEST TEXARKANA</b> 53299 NWT-BNT4 138 to 53300 NWTXARK4 138 CKT1	287	102.5	81.7

**Table 5a** -Continued- SPP Facility Overloads for 2004 Summer Peak found in Table 1 that are relieved due to the line additions.

Study Year	From Area To Area	Branch Over 100% Rate B	Outaged Branch That Caused Overload	RATEB	Transfer Case %Loading	With Line Additions %Loading
04WP	CESW-CESW	<b>JACKSONVILLE (SWE-RC-ETEC) TO PINE GROVE (ETEC), 138KV</b> 53549 JACKSNV4 138 to 53675 PINEGRV4 138 CKT 1	<b>CROCKETT TO TENASKA, 345KV</b> 53526 CROCKET7 345 to 54061 TENASKA7 345 CKT1	158	103.2	73.4
04WP	CESW-CESW	<b>SABINE MINING CO. T TO PIRKEY, 138KV</b> 53602 SABMINT4 138 to 53592 PIRKEY 4 138 CKT 1	<b>LONGWOOD TO WILKES, 345KV</b> 53424 LONGWD 7 345 to 53620 WILKES 7 345 CKT1	287	104.3	91.1
04WP	CESW-CESW	<b>SOUTHEAST MARSHALL TO SABINE MINING CO. T, 138KV</b> 53605 SEMRSHL4 138 to 53602 SABMINT4 138 CKT 1	<b>LONGWOOD TO WILKES, 345KV</b> 53424 LONGWD 7 345 to 53620 WILKES 7 345 CKT1	287	101.3	88.1
04WP	OKGE-OKGE	<b>ETNA TO BRANCH, 69KV</b> 55318 ETNA 269.0 to 55313 BRNCH269.0 CKT 1	<b>BRANCH TO VAN BUREN INTERCONNECT, 161KV</b> 55316 BRNCH5 161 to 55339 VBI 5 161 CKT1	48	103.4	95.6
04WP	OKGE-OKGE	<b>LONE STAR SOUTH TO DIANA, 138KV</b> 53276 LSSOUTH4 138 53527 DIANA 4 138 1	<b>Multiple Outage Contingency</b> <b>WELSH TO WILKES, 345KV</b> 53615 WELSH 7345.00 to BUS 53620 WILKES 7345.00 CKT 1 <b>WELSH TO NWTEXARKANA, 345KV</b> 53615 WELSH 7345.00 to 53301 NWTXARK7345.00 CKT 1	287	100.6	99.2
04WP	AEPW-AEPW	<b>CHEROKEE TO TATUM, 138KV</b> 53522 CHEROKE4 138 53611 TATUM 4 138 1	<b>Multiple Outage Contingency</b> <b>SW SHREVEPORT to DIANA 345KV</b> 53454 SW SHV 7 to 53528 DIANA 7 CKT1 <b>SW SHREVEPORT to LONGWOOD 345KV</b> 53454 SW SHV 7 to 53424 LONGWD 7 CKT1	236	102.3	97.8
04WP	AEPW-AEPW	<b>NORTH MARSHALL TO WOODLAWN , 69KV</b> 53579 NMARSHL269.0 53621 WOODLWN269.0 1	"	51	104.4	98.3

**Table 5b** – Non SPP Facility Overloads for 2004 Summer Peak found in Table 2 that are relieved due to the line additions.

Study Year	From Area To Area	Branch Over 100% Rate B	Outaged Branch That Caused Overload	Rate B <MVA>	Transfer Case %Loading	With Line Additions %Loading
01SR	EES-EES	16556 4GRIMES 138 to 16503 4WALDEN 138 CKT 1	53424 LONGWD 7 to 17529 7ELDEHV 1 OR 17529 7ELDEHV to 17530 8ELDEHV 1	206	104.3	69.9
01SR	EES-EES	17607 3MURF-S 115 to 17608 3MURF-E# 115 CKT 1	"	98	101.0	26.3
01SR	EES-EES	17608 3MURF-E# 115 to 17575 3AMITY * 115 CKT 1	"	98	100.1	25.3
01SR	EES-EES	17530 8ELDEHV 500 to 17529 7ELDEHV 345 CKT 1	53526 CROCKET7 345 to 16555 7GRIMES 345 CKT1	896	111.3	40.3
01SR	EES-CELE	16677 4TOLEDO 138 to 50098 LEESV 4 138 CKT 1	50050 ELEESV 6 230 to 50177 RODEMR 6 230 CKT1	148	102.7	76.1
01SR	CELE-CELE	50023 CARROLL6 230 to 50126 MESSICK6 230 CKT 1	53424 LONGWD 7 to 17529 7ELDEHV 1 OR 17529 7ELDEHV to 17530 8ELDEHV 1	414	106.5	39.2
01SR	CELE-EES	50024 CARROLL4 138 to 17450 3RINGLD 115 CKT 1	53526 CROCKET7 345 to 16555 7GRIMES 345 CKT1	125	108.0	35.2
04SP	EES-EES	16555 7GRIMES 345 to 16556 4GRIMES 138 CKT 1	16555 7GRIMES 345 to 16556 4GRIMES 138 CKT2	525	111.2	89.5
04SP	EES-EES	17530 8ELDEHV 500 to 17529 7ELDEHV 345 CKT 1	53526 CROCKET7 345 to 16555 7GRIMES 345 CKT1	896	102.5	41.0
04SP	EES-EES	17607 3MURF-S 115 to 17608 3MURF-E# 115 CKT 1	53424 LONGWD 7 to 17529 7ELDEHV 1 OR 17529 7ELDEHV to 17530 8ELDEHV 1	98	106.8	36.7
04SP	EES-EES	17608 3MURF-E# 115 to 17575 3AMITY * 115 CKT 1	"	98	101.7	31.4
04SP	EES-EES	17861 5HARR-E 161 to 17879 SOMAHA * 161 CKT 1	53136 EUREKA 5 161 to 17880 5OSAGE # 161 CKT1	162	100.3	90.9
04SP	EES-EES	17875 5MIDWAY# 161 to 17877 5MT HOM 161 CKT 1	52648 NORFORK5 161 to 52660 BULL SH5 161 CKT1	162	103.1	91.7
04SP	CELE-CELE	50039 COUGH 4 138 to 50031 COCODR 6 230 CKT 1	50031 COCODR 6 230 to 50203 VILPLT 6 230 CKT1	386	101.3	88.6
04SP	CELE-CELE	50046 DOLHILL6 230 to 50045 DOLHILL7 345 CKT 1	53424 LONGWD 7 345 to 17529 7ELDEHV 345 CKT1	700	110.8	48.0
04WP	AECI-AECI	96154 1MOCTN2 100 to 96098 5MOCITY 161 CKT 2	96039 7FAIRPT 345 to 96076 5FAIRPT 161 CKT3	34.38	100.1	98.4
04WP	CELE-CELE	50046 DOLHILL6 230 to 50045 DOLHILL7 345 CKT 1	53424 LONGWD 7 345 to 17529 7ELDEHV 345 CKT1	700	104.4	44.6
04WP	EES-EES	17607 3MURF-S 115 to 17608 3MURF-E# 115 CKT 1	53424 LONGWD 7 345 to 17529 7ELDEHV 345 CKT1	98	110.4	42.3
04WP	EES-EES	17608 3MURF-E# 115 to 17575 3AMITY * 115 CKT 1	53424 LONGWD 7 345 to 17529 7ELDEHV 345 CKT1	98	105.2	37.05



**Table 5c** – SPP previously assigned facilities impacted by transfer for 2004 Summer Peak found in Table 3 that are relieved due to line additions.

Study Year	From -To Area(s)	Branch Over 100% Rate B	Outaged Branch That Caused Overload	Rate B <MVA>	Transfer Case %Loading	With Line Additions %Loading
01SR	CESW-CESW	<b>JEFFRSN SWITCHING TO IPC JEFFRSN 138KV</b> 53551 JEFFRSN4 to 53548 IPCJEFF4 1	<b>LONGWOOD to WILKES, 345 KV</b> 53424 LONGWD 7 to 53620 WILKES 7 1	136	119.7	95.5
01SR	CESW-CESW	<b>PATTERSON TO ASHDOWN REC 115KV</b> 53305 PATTERS3 to 53225 ASHDWNR3 1	<b>MCNEIL 500/115KV TRANSFORMER</b> 17543 8MCNEIL to 17544 3MCNEIL 1	120	130.8	94.2
01SR	CELE-CESW	<b>INTERNATIONAL PAPER TO WALLACE LAKE 138KV</b> 50090 IPAPER 4 to 53461 WALLAKE4 1	<b>DOLET HILLS 345/230KV XFRM</b> 50045 DOLHILL7 to 50046 DOLHILL6 1	236	126.4	67.5
01SR	CESW-CESW	<b>SOUTH SHREVEPORT TO WALLACE LAKE 138KV</b> 53446 S SHV 4 to 53461 WALLAKE4 1	<b>DOLET HILLS 345/230KV XFRM</b> 50045 DOLHILL7 to 50046 DOLHILL6 1	236	122.9	71.1
04SP	CESW-CESW	<b>WILKES TO JEFFERSON SWITCHING, 138KV</b> 53619 WILKES 4 to 53551 JEFFRSN4 1	<b>LONGWOOD to WILKES, 345 KV</b> 53424 LONGWD 7 to 53620 WILKES 7 1	210	119.6	92.6
04SP	CESW-EES	<b>HOPE TO PATMOS, 115KV</b> 53383 HOPE 3 to 17537 3PATMOS# 1	<b>LONGWOOD TO ELDORADO, 345KV OR ELDORADO 500/345KV XFRM</b> 53424 LONGWD 7 to 17529 7ELDEHV 1 OR 17529 7ELDEHV to 17530 8ELDEHV 1	174	153.7	55.0
04SP	CESW-CESW	<b>JACKSONVILLE TO OVERTON, 138KV</b> 53549 JACKSNV4 to 53588 OVERTON4 1	<b>CROCKETT TO TENASKA, 345 KV</b> 53526 CROCKET7 to 54061 TENASKA7 1	235	116.1	96.1
04SP	CESW-CESW	<b>SOUTH SHREVEPORT TO WALLACE LAKE 138KV</b> 53446 S SHV 4 to 53461 WALLAKE4 1	<b>DOLET HILLS 345/230KV XFRM</b> 50045 DOLHILL7 to 50046 DOLHILL6 1	236	119.5	69.3
04SP	CESW-CESW	<b>SABINE MINING CO. TO PIRKEY 138KV</b> 53602 SABMINT4 to 53592 PIRKEY 4 1	<b>LONGWOOD to WILKES, 345 KV</b> 53424 LONGWD 7 to 53620 WILKES 7 1	287	111.9	97.4
04SP	CESW-CESW	<b>SE MARSHALL TO SABINE MINING CO. 138KV</b> 53605 SEMRSHL4 to 53602 SABMINT4 1	<b>LONGWOOD to WILKES, 345 KV</b> 53424 LONGWD 7 to 53620 WILKES 7 1	287	108.8	94.3

**Table 5c** – Continued - SPP previously assigned facilities impacted by transfer for 2004 Summer Peak found in Table 3 that are relieved due to line additions.

Study Year	From -To Area(s)	Branch Over 100% Rate B	Outaged Branch That Caused Overload	Rate B <MVA>	Transfer Case %Loading	With Line Additions %Loading
04SP	CESW-CESW	<b>PATTERSON TO SOUTH NASHVILLE 138KV</b> 53306 PATTERS4 to 53321 SNASHVL4 1	<b>LONGWOOD TO ELDORADO, 345KV OR ELDORADO 500/345KV XFRM</b> 53424 LONGWD 7 to 17529 7ELDEHV 1 OR 17529 7ELDEHV to 17530 8ELDEHV 1	105	126.7	57.2
04SP	GRRD-GRRD	<b>TAHLEQUAH TO MAID 161KV</b> 54455 TAHLQH 5 to 54448 MAID 5 1	<b>MUSKOGEE TO PECAN, 345KV</b> 55224 MSKGE7 to 55235 PECAN7 1	148	131.6	83.9
04WP	CESW-CESW	<b>IPC JEFFERSON TO LIEBERMAN 138KV</b> 53548 IPCJEFF4 to 53420 LIEBERM4 1	<b>LONGWOOD to WILKES, 345 KV</b> 53424 LONGWD 7 to 53620 WILKES 7 1	115	116.4	89.7
04WP	CESW-EES	<b>HOPE TO PATMOS, 115KV</b> 53383 HOPE 3 to 17537 3PATMOS# 1	<b>LONGWOOD TO ELDORADO, 345KV OR ELDORADO 500/345KV XFRM</b> 53424 LONGWD 7 to 17529 7ELDEHV 1 OR 17529 7ELDEHV to 17530 8ELDEHV 1	174	137.2	52.8

**Table 5d** – Non SPP Facilities overloaded prior to 670MW transfer for 2004 Summer Peak found in Table 4 that are relieved due to line additions.

Study Year	From -To Area(s)	Branch Over 100% Rate B	Outaged Branch That Caused Overload	Rate B <MVA>	Transfer Case %Loading	With Line Additions %Loading
01SR	EES-EES	<b>RINGGOLD to SAILES, 115 KV</b> 17450 3RINGLD to 17451 3SAILES 1	<b>LONGWOOD TO ELDORADO, 345KV OR ELDORADO 500/345KV XFRM</b> 53424 LONGWD 7 to 17529 7ELDEHV 1 OR 17529 7ELDEHV to 17530 8ELDEHV 1	115	139.1	38.2
01SR	EES-EES	<b>MURFREESBORO 138/115KV XFMR</b> 17609 4MURFRE to 17607 3MURF-S 1	"	60	172.5	44.8
01SR	EES-EES	<b>GRIMES TO MT ZION, 138KV</b> 16556 4GRIMES to 16534 4MT.ZION 1	"	206	129.7	85
01SR	EES-EES	<b>HLYSPG TO JASPER, 138KV</b> 17917 4HLYSPG to 16668 4JASPER 1	<b>CROCKETT TO TENASKA 345KV</b> 53526 CROCKET7 to 54061 TENASKA7 1	112	120.5	96.8
01SR	CELE-EES	<b>CARROLL TO RINGGOLD 138/115KV XFMR</b> 50024 CARROLL4 to 17450 3RINGLD 1	<b>LONGWOOD TO ELDORADO, 345KV OR ELDORADO 500/345KV XFRM</b> 53424 LONGWD 7 to 17529 7ELDEHV 1 OR 17529 7ELDEHV to 17530 8ELDEHV 1	125	134.3	41.3
01SR	CELE-CELE	<b>DOLET HILLS 345/230KV XFRM</b> 50045 DOLHILL7 to 50046 DOLHILL6 1	"	700	126.7	55.3
01SR	CELE-CELE	<b>INTERNATIONAL PAPER TO MANSFIELD 138KV</b> 50090 IPAPER 4 to 50113 MANSFLD4 1	<b>DOLET HILLS 345/230KV XFRM</b> 50045 DOLHILL7 to 50046 DOLHILL6 1	232	117.7	58.8
04SP	EES-EES	<b>RINGGOLD to SAILES, 115 KV</b> 17450 3RINGLD to 17451 3SAILES 1	<b>LONGWOOD TO ELDORADO, 345KV OR ELDORADO 500/345KV XFRM</b> 53424 LONGWD 7 to 17529 7ELDEHV 1 OR 17529 7ELDEHV to 17530 8ELDEHV 1	115	139.3	50.7
04SP	EES-EES	<b>MURFREESBORO 138/115KV XFMR</b> 17609 4MURFRE to 17607 3MURF-S 1	"	60	182.4	62.6
04SP	EES-EES	<b>LEWISVILLE TO COUCH, 115KV</b> 17502 3LEWIS # to 17478 3COUCH 1	"	159	156.2	48.5
04SP	EES-EES	<b>PATMOS-WEST SS TO LEWISVILLE, 115KV</b> 17537 3PATMOS# to 17502 3LEWIS # 1	"	159	165.4	57.5
04SP	EES-EES	<b>GRIMES TO MT ZION, 138KV</b> 16556 4GRIMES to 16534 4MT.ZION 1	"	206	115.8	77.2
04SP	CELE-EES	<b>CARROLL TO RINGGOLD 138/115KV XFMR</b> 50024 CARROLL4 to 17450 3RINGLD 1	<b>LONGWOOD TO ELDORADO, 345KV OR ELDORADO 500/345KV XFRM</b> 53424 LONGWD 7 to 17529 7ELDEHV 1 OR 17529 7ELDEHV to 17530 8ELDEHV 1	125	137.7	56.1
04WP	EES-EES	<b>RINGGOLD to SAILES, 115 KV</b> 17450 3RINGLD to 17451 3SAILES 1	<b>LONGWOOD TO ELDORADO, 345KV OR ELDORADO 500/345KV XFRM</b> 53424 LONGWD 7 to 17529 7ELDEHV 1 OR 17529 7ELDEHV to 17530 8ELDEHV 1	115	136.2	50.8
04WP	EES-EES	<b>MURFREESBORO 138/115KV XFMR</b> 17609 4MURFRE to 17607 3MURF-S 1	"	60	188.5	72.2

**Table 5d** – Continued - Non SPP Facilities overloaded prior to 670MW transfer for 2004 Summer Peak found in Table 4 that are relieved due to line additions.

Study Year	From -To Area(s)	Branch Over 100% Rate B	Outaged Branch That Caused Overload	Rate B <MVA>	Transfer Case %Loading	With Line Additions %Loading
04WP	EES-EES	<b>LEWISVILLE TO COUCH, 115KV</b> 17502 3LEWIS # to 17478 3COUCH 1	"	159	158.4	54
04WP	EES-EES	<b>PATMOS-WEST SS TO LEWISVILLE, 115KV</b> 17537 3PATMOS# to 17502 3LEWIS # 1	"	159	167.2	62.8
04WP	CELE-EES	<b>CARROLL TO RINGGOLD 138/115KV XFMR</b> 50024 CARROLL4 to 17450 3RINGLD 1	"	125	132.2	53.5

**Table 6a – Required Transmission Line Projects**

Project	Length	R	X	B	Rate A	Rate B
<b>Pittsburg to NW Texarkana, 500kV</b> PITTSB-8 500 TO NWTXARK8 500	140 miles	0.00232	0.0317	3.067	1732	1732
<b>NW Texarkana to McNeil, 500kV</b> NWTXARK8 500 TO NWXARK8 500	65 miles	0.00108	0.01471	1.424	1732	1732
<b>Dolet Hill to Choushta, 500kV</b> DOLHILL7 345 TO CHOUSHT7 345	28 miles	0.00148	0.01352	0.23423	1011	1176

**Table 6b – Additional Facility Upgrades Required**

Study Year	From Area To Area	Branch Over 100% Rate B	RATEB	With Lines No Transfer %Loading	With Lines Transfer Case %Loading	Outaged Branch That Caused Overload	Initial Limit, Available Solution and Cost, or Previous Assignment
04SP	OKGE-OKGE	<b>PECAN CREEK 345/161KV TRANSFORMER</b> 55235 PECAN7 345 to 55234 PECAN5 161 CKT 1	369	97.0	104.9	<b>MUSKOGEE TO FORT SMITH, 345KV</b> 55224 MSKGE7 345 to 55302 FTSMI7 345 CKT1	Add Second 369MVA 345/161KV Bus-Tie Transformer \$3,500,000
04SP	CESW-SWPA	<b>EUREKA SPRINGS TO BEAVER 161KV</b> 53136 EUREKA 5 to 52680 BEAVER 5 1	274	97.3	105.2	"	Assigned To 2000-011 2004SP SWPA Upgrade-Reconnect CT's to 1000:5 Tap on Bkrs 42, 32, & half or 22. Replace metering & reset relays for Line 2 & Line 3 \$22,500 CSWS Upgrade-Reconductor 1.25 miles of 795 ACSR with 1590 ACSR (CSW owns 1.25 of 7.22 miles of the line) \$515,000
04SP	EMDE-EMDE	<b>MONETT TO AURORA HT 161KV</b> 59480 MON383 5 to 59468 AUR124 5 1	157	98.4	103.5	<b>NW TEXARKANA TO MCNEIL, 500KV</b> 53125 NWTXARK8 500 to 17543 8MCNEIL 500 CKT1	For 1999-015 2005SP Taken Out By EMDE
04WP	CESW-SWPA	<b>EUREKA SPRINGS TO BEAVER 161KV</b> 53136 EUREKA 5 to 52680 BEAVER 5 1	274	93.3	100.3	"	Assigned To 2000-011 2004SP SWPA Upgrade-Reconnect CT's to 1000:5 Tap on Bkrs 42, 32, & half or 22. Replace metering & reset relays for Line 2 & Line 3 \$22,500 CSWS Upgrade-Reconductor 1.25 miles of 795 ACSR with 1590 ACSR (CSW owns 1.25 of 7.22 miles of the line) \$515,000

## **5. Conclusion**

The results of the study show that before the 670MW transfer can take place system improvements will need to be completed. The facility upgrades assigned to previous customers (Table 3), any additional facility upgrades, and facility upgrades of new overloads (Table 1) will be required before the 670MW transmission service request can take place.

The results of the initial analysis of the transfer show that the 670MW transfer from AEPW to EES creates many new overloads in the system. In order to relieve these overloads, the Pittsburg-NW Texarkana-McNeil 500kV line and Dolet Hill tap have been added to the transmission system. These projects are proposed as an effective means of providing the amount of capacity that is needed for the 670MW transfer. The 670MW transfer also causes further overloading of previously assigned facilities. Table 6b shows the facilities that are required for upgrading in addition to the two proposed transmission line projects.

The acceptance of the 670MW transfer from AEPW to EES requested by Power Resource Group, Inc. is dependant on the completion of the additions and upgrades that are listed in Tables 6a and 6b, along with any remaining facilities that have been previously assigned to other customers.

The final cost assignment of facilities and ATC to Power Resource Group, Inc. will be determined upon 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 immediately
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