



**SPP** *Southwest  
Power Pool*

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

*From AEPW to Ameren*

*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 Ameren in the amount of 670MW. The period of the transaction is from 1/1/03 to 1/1/06. The request is for OASIS Reservation number 212203.

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. The analysis in this document shows that to accommodate an additional 670MW transfer; upgrades will be required on the transmission system.

Initial analysis shows that there is no remaining firm contract path capacity between SPP and Ameren. To expand the firm contract path capacity between SPP and Ameren, a 345kV line from Callaway to Montrose to La Cygne is proposed and included in the analysis. With the addition of this transmission line, the firm contract path capacity is available to accept the 670MW transfer from AEPW to Ameren.

The previously requested Power Resource Group 670MW transfer from AEPW to Entergy, studied in SPP System Impact Study SPP-2000-108, is included in the models used for this study. In addition, the proposed Pittsburg to NW Texarkana to McNeil 500kV line and the 345kV line from Dolet Hills to tap the Mt. Olive to Hartburg line, detailed in the previous study, are also included in the models used to study the 670MW AEPW to Ameren 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 Ameren.

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 670MW transfer from AEPW to Ameren will require additional firm contract path capacity between SPP and Ameren. Currently, SPP has sold yearly firm point-to-point transmission service in the amount equal to the Firm Contract Path Capacity limit between SPP and Ameren of 1287MW. To provide the firm contract path capacity that is needed for the additional 670MW request, a new tie line must be built between a SPP OATT participant and Ameren. A 345kV transmission line that connects Ameren's Callaway Sub to Kansas City Power & Light's Montrose and La Cygne Subs is included in the study to provide the necessary firm contract path capacity. The addition of this line in the system provides the firm contract path capacity between SPP and Ameren that is needed for the 670MW transfer from AEPW to Ameren.

SPP has previously completed a System Impact Study for Power Resource Group, involving a 670MW transfer from AEPW to Entergy. It was determined in the study that a 500kV line from Pittsburg to NW Texarkana to McNeil and a 345kV line from Dolet Hills to tap the Mt Olive to Hartburg line would be required to accommodate the 670MW transfer from AEPW to Entergy. The 670MW transfer from AEPW to Entergy and proposed 500kV lines and 345kV line mentioned above, studied in SPP System Impact Study SPP-2000-108, are included in the analysis of the 670MW transfer from AEPW to Ameren.

This study includes a steady-state contingency analysis (PSS/E function ACCC which considers the impact of the 670MW transfer to Ameren on transmission line loading and transmission bus voltages for outages of single and selected multiple transmission lines and transformers on the SPP and Non-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.

The 670MW transfer is initially limited by the available firm contract path capacity between SPP and Ameren. Currently, SPP has sold yearly firm point-to-point transmission service in the amount equal to the Firm Contract Path Capacity limit between SPP and Ameren of 1287MW. To allow the 670MW transfer to take place, additional firm contract capacity between SPP and AMRN is required.

SPP requested the assistance of Ameren Transmission Services in proposing possible tie capacity expansion to accommodate the additional 670MW transfer. Thru discussions, SPP and Ameren agreed upon three options to consider in a joint study. SPP and Ameren looked at a Callaway to Brookline 345kV line, a Callaway to La Cygne 345kV line, and a Callaway to Montrose to La Cygne 345kV line. After reviewing the pros and cons of the options studied, it was determined that the Callaway to Montrose to La Cygne 345kV line would be the most beneficial to the transmission system in providing the needed firm contract path capacity and maintaining system reliability. The addition of the 345kV transmission line provides substantial relief on the La Cygne to Stillwell Flowgate, which is the most significant benefit of the line. It reduces the flow on the La Cygne to Stillwell Flowgate by about 26%. Therefore, the Callaway to Montrose to La Cygne 345kV transmission line was added to the system as a means of increasing the firm contract path capacity between SPP and Ameren while maintaining system reliability.

	Branch	Length	R	X	B	Rate A	Rate B
Callaway – Montrose	CALAWY 1 345 to MONTROS7 345	127 miles	0.00599	0.06208	1.08224	1060	1426
Montrose – La Cygne	MONTROS7 345 to LACYGNE7 345	43 miles	0.00203	0.02102	0.36643	1060	1426

The remaining analyses were done on the system after the addition of the 345kV line. An analysis was done to determine any new overloads that occur due to the 670MW transfer for both SPP and Non SPP facilities. In addition, the impact of the 670MW transfer on previously assigned facilities and identified overloads was studied. Any SPP facilities that are overloaded due to the 670MW transfer will be required to be upgraded before the transfer can take place.

#### **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. Included in the models for the study of the 670MW AEPW to Ameren request are the Pittsburg-NW Texarkana-McNeil 500kV transmission line and the 345kV line from Dolet Hill tapping the Mt. Olive to Hartburg 500kV line. These lines were studied in the previous System Impact Study for Oasis reservation 212202. It was determined that these lines were needed to provide the necessary capacity for the 670MW transfer from AEPW to Entergy, requested in reservation 212202. This 670 MW transfer is included in the models used to study the requested 670MW transfer from AEPW to Ameren. In addition, the Callaway to Montrose to La Cygne 345kV line is included.

### **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 facilities overloaded by the 670MW, which must be relieved in order to provide the capability needed for the 670MW transfer.

Table 3 documents the 670MW transfer impact on previously assigned facilities. Several of these facilities that were previously assigned are impacted and further overloaded by the 670MW transaction. The South Coffeerville to Dearing 138kV line for the outage of the Delaware to Neosho 345kV line will require additional upgrades. The loading on the line is at 110% of its upgraded summer emergency rating of 210MVA. Other facilities with loads exceeding their new emergency ratings include the Cherokee to Knox Lee 138kV line and the Cherokee to Tatum 138kV line. The facilities must be further upgraded to accept the 670MW transfer from AEPW to AMRN. Table 4 documents Non SPP Regional Tariff participants' transmission systems that are overloaded prior to the AEPW to AMRN 670MW transfer. These facilities are further overloaded by the 670MW transaction.

The models used to extract the data that is documented in the tables contain the Callaway-Montrose-La Cygne 345kV transmission line addition, along with the Pittsburg to NW Texarkana to McNeil 500kV line and the Dolet to Tap the Mt. Olive to Hartburg 345kV line additions from the previous study. The results show that without the expansion, there is no available capacity for the 670MW transfer from AEPW to AMRN.

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

Study Year	FrOviArea-ToOviArea	FrOviBus FrOviName to ToOviBus ToOviName CKT OviCkt	RATEB	BC % I Loading	TC % I Loading	FrEvBus FrEvName to ToEvBus ToEvName CKT EvCkt	Initial Limit, Available Solution and Cost, or Previous Assignment
01SR	AEPW-AEPW	<b>JEFFERSON SWITCHING TO IPC JEFFERSON, 138KV</b> 53551 JEFFRSN4 138 to 53548 IPCJEFF4 138 CKT 1	154	95.1	102.0	<b>LONGWOOD TO WILKES, 345KV</b> 53424 LONGWD 7 345 to 53620 WILKES 7 345 CKT1	Assigned To 1999-014 2001SP Jefferson 138KV Line Rebuild, 1.49 miles, 795MCM \$380,000
01SR	AEPW-AEPW	<b>PATTERSON TO ASHDOWN REC, 115KV</b> 53305 PATTERS3 115 to 53225 ASHDWNR3 115 CKT 1	120	88.3	101.8	<b>NW TEXARKANA TO MCNEIL, 500KV</b> 53125 NWTXARK8 500 to 17543 8MCNEIL 500 CKT1	Assigned To 1999-014 2001SP Patterson Switch Replacement, 600A to 1200A \$20,000
01SR	OKGE-OKGE	<b>PECAN CREEK 345/161KV TR</b> 55235 PECAN7 345 to 55234 PECAN5 161 CKT 1	369	94.0	100.7	<b>MUSKOGEE TO FORT SMITH, 345KV</b> 55224 MSKGE7 345 to 55302 FTSMI7 345 CKT1	Assigned to 2000-108 2004SP Add Second 369MVA 345/161KV Bus-Tie Transformer \$3,500,000
01SR	AEPW-AEPW	<b>TATUM TO CHEROKEE REC 138KV</b> 53611 TATUM 4 138 to 53522 CHEROKE4 138 CKT 1	209	97.8	101.6	<b>Double Contingency Outage</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 7 345 to 53424 LONGWD 7 345 CKT1	Assigned To 2000-086 2001 SP Reconductor 6.25 miles of 666 ACSR with 1272 ACSR, \$1,300,000
04SP	AEPW-AEPW	<b>LOWELL REC TO ROGERS, 69KV</b> 53200 LOWELLR269.0 to 53152 ROGERS 269.0 CKT 1	72	99.3	101.8	<b>FLINT CREEK TO GENTRY REC, 161KV</b> 53139 FLINTCR5 161 to 53187 GENTRYR5 161 CKT1	350cu Breaker
04SP	AEPW-AEPW	<b>ONETA TO BROKEN ARROW 101ST NORTH, 138KV</b> 53818 ONETA--4 138 to 53781 BA101-N4 138 CKT 1	210	99.3	100.1	<b>RIVERSIDE STATION AUTO TO RIVERSIDE STATION, 138KV</b> 53785 RSSAUTO4 138 to 53795 R.S.S.-4 138 CKT1	Replace Wavetraps
04SP	AEPW-AEPW	<b>RICE CREEK TO BARTLESVILLE SOUTHEAST</b> 53934 RICE CK4 138 to 53940 BV-SE--4 138 CKT 1	210	99.9	101.8	<b>WATOVA TO NOWATA, 138KV</b> 53933 WATOVA 4 138 to 53946 NOWATA-4 138 CKT1	Assigned to 2000-003 2004SP Replace Wave Trap & Jumpers \$15,000
04SP	AEPW-EES	<b>HOPE TO PATMOS WEST, 115KV</b> 53383 HOPE 3 115 to 17537 3PATMOS# 115 CKT 1	174	93.0	110.1	<b>NW TEXARKANA TO MCNEIL, 500</b> 53125 NWTXARK8 500 to 17543 8MCNEIL 500 CKT1	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
04SP	GRRD-GRRD	<b>KANSAS TO COLCORD TAP, 69KV</b> 54515 KANSAS 269.0 to 54629 COLCOTP269.0 CKT 1	41	99.7	103.0	<b>ZENA TAP TO JAY, 69KV</b> 54467 ZENA TP269.0 to 54520 JAY GR 269.0 CKT1	Solution Not Available
04SP	OKGE-OKGE	<b>CONTINENTAL TAP TO CHILOCCO, 69KV</b> 54745 CONTT269.0 to 54744 CHLOC269.0 CKT 1	111	100.0	106.0	<b>KILDARE TAP TO WHITE EAGLE, 138KV</b> 54760 KILDR4 138 to 54761 WHEGL4 138 CKT1	Solution Not Available
04SP	WERE-WERE	<b>CRESWEL TO PARIS, 69KV</b> 57143 CRESWEL269.0 to 57148 PARIS 269.0 CKT 1	80	98.6	100.8	<b>CRESWEL TO OAK, 69KV</b> 57143 CRESWEL269.0 to 57147 OAK 269.0 CKT1	Assigned to 2000-003 2004SP Rebuild Line \$1,120,000
04SP	AECI-KACP	<b>CLINTON TO MONTROSE, 161KV</b> 96071 5CLINTN 161 to 57995 MONTROS5 161 CKT 1	370	99.6	102.7	<b>WEST GARDNER TO LACYGNE, 345KV</b> 57965 W.GRDNR7 345 to 57981 LACYGNE7 345 CKT1	Terminal Equipment limited



**Table 2** – Continued - SPP Facility Overloads caused by the 670MW transfer from AEPW to AMRN.

Study Year	FrOvIArea-ToOvIArea	FrOvIBus FrOvIName to ToOvIBus ToOvIName CKT OvIckt	RATEB	BC % I Loading	TC % I Loading	FrEvBus FrEvName to ToEvBus ToEvName CKT EvCkt	Initial Limit, Available Solution and Cost, or Previous Assignment
04SP	EMDE-EMDE	<b>DIAMOND JCT TO SARCOXIE SOUTHEAST, 69KV</b> 59538 DIA131 269.0 to 59582 SAR362T269.0 CKT 1	38	99.9	103.1	<b>MONETT 161/69KV TR</b> 59480 MON383 5 161 to 59591 MON383 269.0 CKT1	Assigned To 2000-043 2004SP Reconductor existing 1/0 copper line with 336.4 MCM ACSR. \$700,000
04SP	SWPA-SWPA	<b>NORFORK 161/69KV TR</b> 52648 NORFORK5 161 to 52650 NORFORK269.0 CKT 1	25	99.8	103.7	<b>NORFORK TO WEST PLAINS, 161KV</b> 52648 NORFORK5 161 to 96123 5WPLAIN 161 CKT1	Solution Not Available
04WP	AEPW-AEPW	<b>ROGERS TO LOWELL REC, 69KV</b> 53152 ROGERS 269.0 to 53200 LOWELLR269.0 CKT 1	72	99.8	100.3	<b>DYESS TO EAST ROGERS, 161KV</b> 53131 DYESS 5 161 to 53135 EROGERS5 161 CKT1	350cu Breaker
04WP	AEPW-EES	<b>HOPE TO PATMOS WEST, 115KV</b> 53383 HOPE 3 115 to 17537 3PATMOS# 115 CKT 1	174	87.6	110.1	<b>NW TEXARKANA TO MCNEIL, 500KV</b> 53125 NWTXARK8 500 to 17543 8MCNEIL 500 CKT1	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
04WP	GRRD-GRRD	<b>AFTON 161/69KV TR</b> 54432 AFTON 5 161 to 54433 AFTON 269.0 CKT 1	50	96.6	123.1	<b>MIAMI TO AFTON, 161KV</b> 54431 MIAMI 5 161 to 54432 AFTON 5 161 CKT1	Solution Not Available
04WP	OKGE-OKGE	<b>PECAN CREEK 345/161KV TR</b> 55235 PECAN7 345 to 55234 PECAN5 161 CKT 1	369	99.4	111.2	<b>MUSKOGEE TO FORT SMITH, 345KV</b> 55224 MSKGE7 345 to 55302 FTSMI7 345 CKT1	Assigned to 2000-108 2004SP Add Second 369MVA 345/161KV Bus-Tie Transformer \$3,500,000
04WP	SWPA-SWPA	<b>NORFORK 161/69KV TR</b> 52648 NORFORK5 161 to 52650 NORFORK269.0 CKT 1	25	99.4	103.7	<b>NORFORK TO WEST PLAINS, 161KV</b> 52648 NORFORK5 161 to 96123 5WPLAIN 161 CKT1	Solution Not Available
04WP	AEPW-AEPW	<b>CHEROKEE REC TO TATUM TO 138KV</b> 53522 CHEROKE4 138 to 53611 TATUM 4 138 CKT 1	236	97.5	101.2	<b>Double Contingency Outage</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 7 345 to 53424 LONGWD 7 345 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 to 53621 WOODLWN269.0 CKT 1	51	98	101.7	<b>Double Contingency Outage</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 7 345 to 53424 LONGWD 7 345 CKT1	Assigned To 2000-011 2001SP Replace 3/0 CU jumpers @ North Marshall \$10,000
04WP	AEPW-SWPA	<b>EUREKA SPRINGS TO BEAVER 161KV</b> 53136 EUREKA 5 to 52680 BEAVER 5 1	274	98.2	104.8	<b>MUSKOGEE TO FORT SMITH, 345KV</b> 55224 MSKGE7 345 to 55302 FTSMI7 345 CKT1	Assigned to 2000-108 2004SP SWPA Upgrade - Reconductor 5.98 miles of line with 1590 MCM ACSR. \$2,385,000

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

Study Year	FrOvlArea-ToOvlArea	FrOvlBus FrOvlName to ToOvlBus ToOvlName CKT OvlCkt	RATEB	BC % I Loading	TC % I Loading	FrEvBus FrEvName to ToEvBus ToEvName CKT EvCkt
01SR	EES-EES	17609 4MURFRE 138 to 17607 3MURF-S 115 CKT 1	60	83.9	109.1	53125 NWTXARK8 500 to 17543 8MCNEIL 500 CKT1
01SR	EES-EES	17516 3STEPHN 115 to 17536 3CAMD-S# 115 CKT 1	96	94.4	103.9	17530 8ELDEHV 500 to 17543 8MCNEIL 500 CKT1
01SR	EES-EES	16534 4MT.ZION 138 to 16528 4L558T48 138 CKT 1	206	98.8	102.7	16518 4APRIL 138 to 16519 4LFOREST 138 CKT1
01SR	EES-EES	17582 3CARPE 115 to 17578 3ARKLA 115 CKT 1	159	99.6	101.6	17589 3HS-UC 115 to 17593 3HS-E * 115 CKT1
01SR	EES-EES	16556 4GRIMES 138 to 16534 4MT.ZION 138 CKT 1	206	97.5	101.2	16556 4GRIMES 138 to 16566 4MAG AND 138 CKT1
01SR	EES-EES	16556 4GRIMES 138 to 16534 4MT.ZION 138 CKT 1	206	97.4	101.0	16552 4SOTA 138 to 16566 4MAG AND 138 CKT1
01SR	EES-EES	16528 4L558T48 138 to 16532 4HUNTSVL 138 CKT 1	206	97.0	100.9	16503 4WALDEN 138 to 16556 4GRIMES 138 CKT1
01SR	EES-EES	16534 4MT.ZION 138 to 16528 4L558T48 138 CKT 1	206	96.9	100.8	16519 4LFOREST 138 to 16578 4WDHAVN 138 CKT1
01SR	EES-EES	17692 3LR-SPR* 115 to 17691 3LR-S 115 CKT 1	159	98.3	100.8	17690 3LR-ROK 115 to 17696 3LR-BOY 115 CKT1
01SR	EES-EES	16556 4GRIMES 138 to 16534 4MT.ZION 138 CKT 1	206	96.9	100.5	16551 4NAVSOTA 138 to 16552 4SOTA 138 CKT1
01SR	EES-EES	17582 3CARPE 115 to 17578 3ARKLA 115 CKT 1	159	98.2	100.3	17582 3CARPE 115 to 17593 3HS-E * 115 CKT1
01SR	EES-EES	17210 3GR-IND 115 to 17224 3ANDRUS 115 CKT 1	199	99.2	100.2	17215 3GRNVIL 115 to 17224 3ANDRUS 115 CKT1
01SR	EES-EES	17430 3STERL 115 to 17539 3MERIDN# 115 CKT 1	68	96.5	100.2	17430 3STERL 115 to 17480 3CROS-N 115 CKT1
04SP	MIPU-MIPU	59211 BLSPS 5 161 to 59206 PRALEE 5 161 CKT 1	245	99.9	103.3	59224 LNGVW 5 161 to 59245 KCSOUTH5 161 CKT1 52702 TRUMAN 5 161 to 96555 5GRAVOI 161 CKT 1 96057 5BARNET 161 to 96555 5GRAVOI 161
04SP	MIPU-AECI	59217 WINDSR 5 161 to 96071 5CLINTN 161 CKT 1	123	99.7	108.2	
04SP	SWPA-AECI	52690 CARTHG 269.0 to 96649 2JASPER 69.0 CKT 1	36	97.2	104.1	59470 JOP145 5 161 to 59498 STL439 5 161 CKT1
04SP	SWPA-AECI	52690 CARTHG 269.0 to 96751 2REEDS 69.0 CKT 1	36	96.7	102.4	59400 MON376J269.0 to 59591 MON383 269.0 CKT1
04SP	EES-EES	16556 4GRIMES 138 to 16534 4MT.ZION 138 CKT 1	206	97.0	101.0	16503 4WALDEN 138 to 16556 4GRIMES 138 CKT1
04SP	EES-EES	17215 3GRNVIL 115 to 17224 3ANDRUS 115 CKT 1	199	99.5	101.0	17223 6ANDRUS 230 to 17230 6INDOLA 230 CKT1
04SP	EES-EES	17278 3PELAHE 115 to 17288 3RANKIN 115 CKT 1	108	98.4	100.7	17260 6MCADAM 230 to 17261 6ATTALA 230 CKT1
04SP	EES-EES	17336 3VKSBN 115 to 17334 3VKSBN-W 115 CKT 1	161	99.7	101.7	17268 3SE-VKS 115 to 17339 3BOVINA 115 CKT1
04SP	EES-EES	17337 3WATERWY 115 to 17333 3VKSBRG 115 CKT 1	161	99.7	103.4	17323 8R.BRAS 500 to 17329 8B.WLSN 500 CKT1
04SP	EES-EES	17388 3VAUGHN 115 to 17362 3FRKLIN 115 CKT 1	161	99.8	100.1	17279 3ELTON 115 to 17280 3JAX-SW 115 CKT1
04SP	EES-EES	17430 3STERL 115 to 17480 3CROS-N 115 CKT 1	80	99.8	103.5	17323 8R.BRAS 500 to 17327 8LAKEOV 500 CKT1
04SP	EES-EES	17430 3STERL 115 to 17539 3MERIDN# 115 CKT 1	68	99.4	102.8	17519 3WARR-E 115 to 17533 3CARMEL* 115 CKT1
04SP	EES-EES	17502 3LEWIS # 115 to 17478 3COUCH 115 CKT 1	159	89.8	108.5	53125 NWTXARK8 500 to 17543 8MCNEIL 500 CKT1
04SP	EES-EES	17503 3MAG-DW 115 to 17478 3COUCH 115 CKT 1	108	99.6	101.0	17505 3MAG-ST 115 to 17548 3CALH-S* 115 CKT1
04SP	EES-EES	17516 3STEPHN 115 to 17536 3CAMD-S# 115 CKT 1	96	96.7	101.3	17514 3SMACKO 115 to 17515 3SMACKO* 115 CKT1
04SP	EES-EES	17537 3PATMOS# 115 to 17502 3LEWIS # 115 CKT 1	159	99.2	117.8	53125 NWTXARK8 500 to 17543 8MCNEIL 500 CKT1
04SP	EES-EES	17539 3MERIDN# 115 to 17521 3CROS-S* 115 CKT 1	68	98.9	102.3	17498 3HILO 115 to 17528 3ELDEHV 115 CKT1
04SP	EES-EES	17544 3MCNEIL 115 to 17516 3STEPHN 115 CKT 1	96	96.9	106.9	17530 8ELDEHV 500 to 17543 8MCNEIL 500 CKT1
04SP	EES-EES	17582 3CARPE 115 to 17578 3ARKLA 115 CKT 1	159	99.4	100.8	17589 3HS-UC 115 to 17593 3HS-E * 115 CKT1
04SP	EES-EES	17694 3LR-WAL 115 to 17687 3LR-PIN 115 CKT 1	159	99.9	100.2	17716 3NLR-LV 115 to 17717 3NLR-WG 115 CKT1
04SP	EES-EES	17708 3MCALMT 115 to 17698 3LYNCH 115 CKT 1	159	98.4	101.6	17674 3JAXV-N 115 to 17720 3SYLVN 115 CKT1
04SP	EES-EES	17810 5HRSBRG* 161 to 17819 5MTREE 161 CKT 1	148	99.4	102.5	17821 5NEW-IN 161 to 17822 5NEWPO 161 CKT1
04SP	IP-IP	32293 CAMBL TP 138 to 32320 STEELVIL 138 CKT 1	164	97.8	100.1	30666 GRAND TW 138 to 31489 PERRYVIL 138 CKT1

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

Study Year	FrOviArea-ToOviArea	FrOviBus FrOviName to ToOviBus ToOviName CKT OvIckt	RATEB	BC % I Loading	TC % I Loading	FrEvBus FrEvName to ToEvBus ToEvName CKT EvCkt
04WP	EES-EES	17033 3CHIKFM 115 to 17028 3AMITE 115 CKT 1	159	100.0	110.8	17035 6BOGALUS 230 to 17036 3BOGLSA 115 CKT1
04WP	EES-EES	17502 3LEWIS # 115 to 17478 3COUCH 115 CKT 1	159	96.9	108.5	53125 NWTXARK8 500 to 17543 8MCNEIL 500 CKT1
04WP	EES-EES	17288 3RANKIN 115 to 17278 3PELAHE 115 CKT 1	108	99.2	100.7	17260 6MCADAM 230 to 17261 6ATTALA 230 CKT1
04WP	EES-EES	17288 3RANKIN 115 to 17278 3PELAHE 115 CKT 1	108	99.2	100.7	17261 6ATTALA 230 to 17262 3ATTALA 115 CKT1
04WP	EES-EES	17516 3STEPHN 115 to 17544 3MCNEIL 115 CKT 1	36	99.9	104.5	101 CHOUSH7 345 to 50045 DOLHILL7 345 CKT1
04WP	SWPA-AECI	52690 CARTHG 269.0 to 96649 2JASPER 69.0 CKT 1	36	98.6	114.9	59479 LAR382 5 161 to 59480 MON383 5 161 CKT1
04WP	SWPA-AECI	52690 CARTHG 269.0 to 96751 2REEDS 69.0 CKT 1	36	97.9	114.7	59499 CPK446 5 161 to 59618 CPK446 269.0 CKT1

**Table 3** – AEPW – AMRN 670MW transfer impact on previously assigned SPP Facilities with zero ATC.

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	<b>JACKSONVILLE TO PINE GROVE 138KV</b> 53549 JACKSNV4 to 53675 PINEGRV4 1	158	106.9	110.8	<b>CROCKETT TO TENASKA, 345KV</b> 53526 CROCKET7 to 54061 TENASKA7 1	Assigned To 2000-086 Reset 300/5 CTs at Jacksonville to 400/5 \$1,000	210	32.9%	None
01SR	AEPW-AEPW	<b>IPC JEFFERSON TO LIEBERMAN 138KV</b> 53548 IPCJEFF4 to 53420 LIEBERM4 1	135	101.4	109.3	<b>LONGWOOD TO WILKES, 345KV</b> 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	AEPW-AEPW	<b>NORTH MARSHALL TO WOODLAWN, 69KV</b> 53579 NMARSHL269.0 to 53621 WOODLWN269.0 CKT 1	51	100.3	104.1	<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	Assigned To 2000-011 2001SP Replace 3/0 CU jumpers @ North Marshall \$10,000	66	29.4%	None
01SR	AEPW-AEPW	<b>NORAM TO LONGWOOD, 138KV</b> 53473 NORAM 4 138 to 53423 LONGWD 4 138 CKT 1	266	100	103.1	<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	Assigned To 2000-011 2004SP Reconductor 4.66 miles of bundled 266 ACSR with 1590 ACSR \$1,274,374	287	7.9%	None
01SR	AEPW-AEPW	<b>CHEROKEE REC TO KNOX LEE 138KV</b> 53522 CHEROKE4 138 to 53557 KNOXLEE4 138 CKT 1	236	102.3	106.2	<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	316	33.9%	None
01SR	AEPW-AEPW	<b>ROCK HILL TO TATUM 138KV</b> 53598 ROKHILL4 to 53611 TATUM 4 1	210	108.7	113.0	<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	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	36.7%	None
04SP	AEPW-WERE	<b>SOUTH COFFEEVILLE TO DEARING 138KV</b> 53972 SCOFVLE4 to 56832 DEARING4 1	143	143.5	161.8	<b>DELAWARE TO NEOSHO 345KV</b> 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

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**Table 3 – Continued - AEPW – AMRN 670MW transfer impact on previously assigned SPP Facilities with zero ATC.**

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	<b>JEFFRSN SWITCHING TO IPC JEFFRSN 138KV</b> 53551 JEFFRSN4 to 53548 IPCJEFF4 1	136	110.7	118.7	<b>LONGWOOD to WILKES, 345 KV</b> 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	<b>JACKSONVILLE TO PINE GROVE 138KV</b> 53549 JACKSNV4 to 53675 PINEGRV4 1	158	108.4	111.6	<b>CROCKETT TO TENASKA, 345 KV</b> 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%	None
04SP	AEPW-AEPW	<b>IPC JEFFERSON TO LIEBERMAN 138KV</b> 53548 IPCJEFF4 to 53420 LIEBERM4 1	115	122.8	132.2	<b>LONGWOOD to WILKES, 345 KV</b> 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
04SP	EMDE-EMDE	<b>MONETT TO AURORA HT 161KV</b> 59480 MON383 5 to 59468 AUR124 5 1	157	132.4	137.9	<b>MONETT 161/69KV XFMR</b> 59480 MON383 5 to 59591 MON383 2 1	For 1999-015 2005SP Taken Out By EMDE	N/A	N/A	None
04SP	EMDE-EMDE	<b>TIPTON FORD TO MONETT 161KV</b> 59472 TIP292 5 to 59480 MON383 5 1	157	109.6	114.3	<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	AEPW-SWPA	<b>EUREKA SPRINGS TO BEAVER 161KV</b> 53136 EUREKA 5 to 52680 BEAVER 5 1	274	103.4	110.7	<b>MUSKOGEE TO FORT SMITH, 345KV</b> 55224 MSKGE7 345 to 55302 FTSMI7 345 CKT1	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%	Assigned to 2000-108 2004SP SWPA Upgrade - Reconductor 5.98 miles of line with 1590 MCM ACSR. \$2,385,000
04SP	OKGE-OKGE	<b>CHILOCCO TAP TO CHIKASKIA, 69KV</b> 54744 CHLOC269.0 to 54756 CKSKI269.0 CKT 1	57	101.9	108.3	<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	N/A	N/A	None
04SP	WERE-WERE	<b>CRESWELL TO OAK, 69KV</b> 57143 CRESWEL269.0 to 57147 OAK 269.0 CKT 1	72	115.9	118.7	<b>CRESWELL TO PARIS, 69KV</b> 57143 CRESWEL269.0 to 57148 PARIS 269.0 CKT1	Assigned to 2000-004 2000SP Replacement of jumpers and resetting CT's and relaying	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

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**Table 3 – AEPW – AMRN 670MW transfer impact on previously assigned SPP Facilities with zero ATC.**

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	<b>TATUM TO CHEROKEE REC 138KV</b> 53611 TATUM 4 to 53522 CHEROKE4 1	209	141.1	145.7	<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 2001 SP Reconductor 6.25 miles of 666 ACSR with 1272 ACSR, \$1,300,000	287	37.3%	Yes, Not Available
04SP	AEPW-AEPW	<b>ROCK HILL TO TATUM 138KV</b> 53598 ROKHILL4 to 53611 TATUM 4 1	209	132.6	137.2	<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	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%	None
04SP	AEPW-AEPW	<b>NORTH MARSHALL TO WOODLAWN 69KV</b> 53579 NMARSHL2 to 53621 WOODLWN2 1	51	107.6	111.7	<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 2000-011 2001SP Replace 3/0 CU jumpers @ North Marshall \$10,000	59	15.7%	None
04SP	AEPW-AEPW	<b>MARSHALL to NORTH MARSHALL 69KV</b> 53570 MARSHAL269.0 53579 NMARSHL269.0 1	75	100.3	103.2	<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 2000-044 2004SP Replace 350 CU bus & jumpers @ North Marshall \$23,356	118	57.3%	None
04WP	AEPW-WERE	<b>SOUTH COFFEEVILLE TO DEARING 138KV</b> 53972 SCOFVLE4 to 56832 DEARING4 1	143	136.8	148.0	<b>DELAWARE TO NEOSHO 345KV</b> 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	AEPW-AEPW	<b>CHEROKEE REC TO KNOX LEE, 138KV</b> 53522 CHEROKE4 to 53557 KNOXLEE4 1	236	141.1	145.7	<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	316	33.9%	None

**Table 3 – AEPW – AMRN 670MW transfer impact on previously assigned SPP Facilities with zero ATC.**

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-AEPW	ROCK HILL TO TATUM 138KV 53598 ROKHILL4 to 53611 TATUM 4 1	210	132.6	137.2	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 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	AMRN-AECI	<b>MOBERLY TO THOMAS HILL, 161KV</b> 31221 MOBERLY 161 to 96120 5THMHIL 161 CKT 1	335	112.6	113.5	<b>MCCREDDIE TO THOMAS HILL, 345KV</b> 96044 7MCCRED 345 to 96049 7THOMHL 345 CKT1
04SP	SWPA-AECI	<b>CARTHAGE TO JASPER 69KV</b> 52690 CARTHG 2 to 96649 2JASPER 1	36	122.1	128.5	<b>ARCHIE TO ADRIAN, 161KV</b> 59207 ARCHIE 5 to 59240 ADRIAN 5 1
04SP	SWPA-AECI	<b>CARTHAGE TO REEDS 69KV</b> 52690 CARTHG 2 to 96751 2REEDS 1	36	121.7	128.7	<b>AURORA HT TO MONETT, 161KV</b> 59468 AUR124 5 to 59480 MON383 5 1
04SP	EES-SWPA	<b>MIDWAY TO BULL SHOALS 161KV</b> 17875 5MIDWAY# to 52660 BULL SH5 1	162	135.7	141.4	<b>NORFORK TO BULL SHOALS, 161KV</b> 52648 NORFORK5 to 52660 BULL SH5 1
04WP	SWPA-AECI	<b>CARTHAGE TO JASPER 69KV</b> 52690 CARTHG 2 to 96649 2JASPER 1	36	107.5	113.4	<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	110.2	116.5	<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	115.4	120.0	<b>NORFORK TO BULL SHOALS, 161KV</b> 52648 NORFORK5 to 52660 BULL SH5 1



**Table 5a** – 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 Hills to Coushatta, 500kV</b> DOLHILL7 345 TO CHOUSH7 345	28 miles	0.00148	0.01352	0.23423	1011	1176

Project	Length	R	X	B	Rate A	Rate B
<b>Callaway to Montrose, 345kV</b> CALAWY 1 345 TO MONTROS7 345	127 miles	0.00599	0.06208	1.08224	1060	1426
<b>Montrose to La Cygne, 345kV</b> MONTROS7 345 TO LACYGNE7 345	43 miles	0.00203	0.02102	0.36643	1060	1426

**Table 5b**– Additional Facility Upgrades Required

Study Year	FrOvIArea-ToOvIArea	FrOvIBus FrOvIName to ToOvIBus ToOvIName CKT OvICkt	RATEB	BC % I Loading	TC % I Loading	FrEvBus FrEvName to ToEvBus ToEvName CKT EvCkt	Initial Limit, Available Solution and Cost, or Previous Assignment
04SP	AEPW-AEPW	<b>LOWELL REC TO ROGERS, 69KV</b> 53200 LOWELLR269.0 to 53152 ROGERS 269.0 CKT 1	72	99.3	101.8	<b>FLINT CREEK TO GENTRY REC, 161KV</b> 53139 FLINTCR5 161 to 53187 GENTRYR5 161 CKT1	350cu Breaker
04SP	AEPW-AEPW	<b>ONETA TO BROKEN ARROW 101ST NORTH, 138KV</b> 53818 ONETA--4 138 to 53781 BA101-N4 138 CKT 1	210	99.3	100.1	<b>RIVERSIDE STATION AUTO TO RIVERSIDE STATION, 138KV</b> 53785 RSSAUTO4 138 to 53795 R.S.S.-4 138 CKT1	Replace Wavetraps
04SP	GRRD-GRRD	<b>KANSAS TO COLCORD TAP, 69KV</b> 54515 KANSAS 269.0 to 54629 COLCOTP269.0 CKT 1	41	99.7	103.0	<b>ZENA TAP TO JAY, 69KV</b> 54467 ZENA TP269.0 to 54520 JAY GR 269.0 CKT1	Solution Not Available
04SP	OKGE-OKGE	<b>CONTINENTAL TAP TO CHILOCCO, 69KV</b> 54745 CONTT269.0 to 54744 CHLOC269.0 CKT 1	111	100.0	106.0	<b>KILDARE TAP TO WHITE EAGLE, 138KV</b> 54760 KILDR4 138 to 54761 WHEGL4 138 CKT1	Solution Not Available
04SP	AECI-KACP	<b>CLINTON TO MONTROSE, 161KV</b> 96071 5CLINTN 161 to 57995 MONTROS5 161 CKT 1	370	99.6	102.7	<b>WEST GARDNER TO LACYGNE, 345KV</b> 57965 W.GRDNR7 345 to 57981 LACYGNE7 345 CKT1	Terminal Equipment Limited

**Table 5b**– Continued - Additional Facility Upgrades Required

Study Year	FrOviArea-ToOviArea	FrOviBus FrOviName to ToOviBus ToOviName CKT OviCkt	RATEB	BC % I Loading	TC % I Loading	FrEvBus FrEvName to ToEvBus ToEvName CKT EvCkt	Initial Limit, Available Solution and Cost, or Previous Assignment
04SP	SWPA-SWPA	<b>NORFORK 161/69KV TR</b> 52648 NORFORK5 161 to 52650 NORFORK269.0 CKT 1	25	99.8	103.7	<b>NORFORT TO WEST PLAINS, 161KV</b> 52648 NORFORK5 161 to 96123 5WPLAIN 161 CKT1	Solution Not Available
04WP	AEPW-AEPW	<b>ROGERS TO LOWELL REC, 69KV</b> 53152 ROGERS 269.0 to 53200 LOWELLR269.0 CKT 1	72	99.8	100.3	<b>DYESS TO EAST ROGERS, 161KV</b> 53131 DYESS 5 161 to 53135 EROGERS5 161 CKT1	350cu Breaker
04WP	GRRD-GRRD	<b>AFTON 161/69KV TR</b> 54432 AFTON 5 161 to 54433 AFTON 269.0 CKT 1	50	96.6	123.1	<b>MIAMI TO AFTON, 161KV</b> 54431 MIAMI 5 161 to 54432 AFTON 5 161 CKT1	Solution Not Available
04WP	SWPA-SWPA	<b>NORFORK 161/69KV TR</b> 52648 NORFORK5 161 to 52650 NORFORK269.0 CKT 1	25	99.4	103.7	<b>NORFORK TO WEST PLAINS, 161KV</b> 52648 NORFORK5 161 to 96123 5WPLAIN 161 CKT1	Solution Not Available
04SP	AEPW-WERE	<b>SOUTH COFFEEVILLE TO DEARING 138KV</b> 53972 SCOFVLE4 to 56832 DEARING4 1	210	97.7	110.2	<b>DELAWARE TO NEOSHO 345KV</b> 53929 DELWARE7 to 56756 NEOSHO 7 1	Solution Not Available
04SP	AEPW-AEPW	<b>CHEROKEE REC TO KNOX LEE 138KV</b> 53522 CHEROKE4 to 53557 KNOXLEE4 1	303	96.8	103.3	<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	Solution Not Available
04SP	AEPW-AEPW	<b>TATUM TO CHEROKEE REC 138KV</b> 53611 TATUM 4 to 53522 CHEROKE4 1	287	102.8	106.1	<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	Solution Not Available
04WP	AEPW-WERE	<b>SOUTH COFFEEVILLE TO DEAR ING 138KV</b> 53972 SCOFVLE4 to 56832 DEARING4 1	210	93.2	100.8	<b>DELAWARE TO NEOSHO 345KV</b> 53929 DELWARE7 to 56756 NEOSHO 7 1	Solution Not Available

## **5. Conclusion**

The results of the study show that before the 670MW transfer from AEPW to Ameren can take place system improvements will be needed.

1. The firm contract capacity between SPP and Ameren must be increased to accept the 670MW transfer to Ameren. With the help of Ameren Transmission Services, SPP proposes the Callaway to Montrose to La Cygne 345kV line to increase the SPP to Ameren Contract Path Capacity.
2. The study of the 670MW transfer from AEPW to Ameren assumes that the transfer capability provided by the Pittsburg to NW Texarkana to McNeil 500kV line and Dolet Hills to Coushatta 345kV line will exist. These initial projects were proposed as an effective means of providing the amount of capacity that is needed for the 670MW transfer from AEPW to Entergy. The lines not only provide capacity for the AEPW to Entergy transfer but also provide capacity for the 670MW from AEPW to Ameren and if removed greatly impact the impact study results.
3. The 670MW transfer from AEPW to Ameren causes overloads on facilities not already assigned to previous transmission customers. The overloaded facilities requiring upgrades are included in Table 5b.
4. The 670MW transfer from AEPW to Ameren transfer also causes further overloading of previously assigned facilities. Table 5b includes the facilities that require additional upgrades.

The 670MW transfer from AEPW to Ameren, requested by Power Resource Group, Inc. is dependant on the completion of the additions and upgrades that are listed in Tables 5a and 5b, 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