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

Supplemental Study

SPP Transmission Planning

Table of Contents

Revised September 19, 2001 to include revision of Tables 1, 2 and 3, and the addition of Tables 4, 5, 6, and 7

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 one reservation (212202), totaling 670MW.

The principle 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 and identified facilities that were further overloaded by the transfer.

The AEPW to EES transfer overloads new facilities as well as impacts facilities that have been identified as limiting constraints for previously studied transfers. Tables 1 and 2 list the new overloads caused by the 670MW transfer. Table 3 lists the previously assigned and identified facilities impacted by the 670MW transfer. Facilities found in Table 3 limit the ATC to zero.

Due to the significant number of facility overloads caused by the 670MW transfer, SPP proposes the addition of a 500kV transmission line from AEPW's Pittsburg 345kV substation to AEPW's NW Texarkana 345kV substation and to Entergy's McNeil 500kV substation. Steady-state analyses were conducted to determine the facility overloads caused by the line addition and the facility overloads caused by the transfer with the line addition included. A preliminary cost evaluation was conducted, and it was determined that the cost associated with the proposed lines is not justified for this request alone.

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 studied with and without proposed Pittsburgh–NW Texarkana–McNeil 500kV line included in the models. The study includes steady-state contingency analyses (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.

A preliminary evaluation of network facility upgrade costs, with and without the proposed line, is included using previously received information.

3. Study Methodology

A. Description

Two initial analyses were conducted to determine the impact of the 670MW transfer on the system. The first analysis was conducted to identify any new overloads caused by the 670MW transfer. The second analysis was done to ensure that available capacity exists on previously identified circuits.

The first analysis was to study the steady-state analysis impact of the 670MW transfer on the system. The second step was to determine the Available Transfer Capability (ATC) of the facilities identified in the steady-state analysis impact. The steady-state analysis was done to ensure current SPP Criteria and NERC Planning Standards requirements are fulfilled. The Southwest Power Pool (SPP) conforms to the NERC Planning Standards, which provide the strictest requirements, related to thermal overloads with a contingency. It requires that all facilities be within emergency ratings after a contingency.

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

Looking at the revised analysis of 670MW transfer request, there are still several limiting elements that restrict the AEPW to EES transfer. These overloaded facilities are listed in Tables 1, 2, and 3. Due to the limited number of upgrades that can be made each year because of reliability concerns during outages, the SPP proposed and still proposes the Pittsburg-NW Texarkana-McNeil 500kV line as a way to relieve some of the identified overloaded facilities. This project was found to be the shortest and most reasonable path that provides the capability needed to reliably transfer 670MW from AEPW to EES.

In the initial System Impact Study which included now withdrawn requests, analysis of the Pittsburgh–NW Texarkana–McNeil 500kV line showed that with the single outage of the Welsh to NW Texarkana 345kV line with the Kiowa plant offline, the Welsh to Lydia 345kV line overloads. The overload is even more extensive for the double outage of the Welsh to NW Texarkana 345kV line and Welsh to Wilkes 345kV line. To relieve this overload, the 345kV line addition from Dolet Hills to tap the Mt. Olive to Hartburg 500kV line was also proposed. The Dolet Hills tap relieved the Welsh to Lydia 345kV line for the single outage of the Welsh to NW Texarkana 345kV line with no need for reconductoring. But due to the 740MW of transmission requests withdrawn from the queue and not included in the present models, the Welsh to Lydia 345kV overload is no longer a problem and the line from Dolet Hills is not proposed in this revision.

Branches		Length	R	X	B	Rate A	Rate 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

Transformers		R	X	Rate A	Rate B
Pittsburg 500/345kV #1	PITTSB-8 500 to PITTSB-8 345 1	0.00019	0.01836	750	750
Pittsburg 500/345kV #2	PITTSB-8 500 to PITTSB-8 345 2	0.00020	0.01866	750	750
NW Texarkana 500/345kV #1	NWTXARK8 500 to NWTXARK8 345 1	0.00019	0.01836	750	750
NW Texarkana 500/345kV #2	NWTXARK8 500 to NWTXARK8 345 1	0.00020	0.01866	750	750

Three analyses were then conducted to determine the impact of the proposed lines on the SPP transmission system. The first analysis was conducted to identify any new overloads caused by the line addition, and the other two analyses are identical to the two initial analyses except that the proposed line was included in the models.

B. Model Updates

SPP used four seasonal models to study the 670MW request. The SPP 2001 Series Cases 2003 Spring Peak, 2004 Summer Peak, 2004/2005 Winter Peak, and 2006 Summer Peak were used to study the impact of the 670MW transfer on the SPP system during the requested transaction period of 1/1/03 to 1/1/06 and a deferred transaction period ending 10/1/06. The 2003 Spring Peak model is representative of the Spring Seasons 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 2001 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, 2, and 3 contain the initial analysis results of the System Impact Study. The tables identify the seasonal case in which the event occurred; the emergency rating of the overloaded circuit (Rate B), the contingent loading percentage of circuit with and without the studied transfer, the estimated ATC value using interpolation if calculated, any SPP identification or assignment of the event, and any solutions received from the transmission owners.

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 addressed and relieved in order to provide the capability needed for the 670MW transfer.

Table 3 documents the 670MW transfer impact on previously assigned and identified facilities. The facilities that were previously assigned or identified are further overloaded by the 670MW transaction. Some 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.

Again due to the limited number of upgrades that can be made each year because of reliability concerns during outages, the SPP proposes the Pittsburg-NW Texarkana-McNeil 500kV line as a way to relieve some of the identified overloaded facilities. Additional analyses were performed to determine the facility overloads caused by the addition of the line and the facility overloads caused by the transfer with the line addition. The results of these analyses are documented in Tables 4, 5, 6, and 7.

Tables 4, 5, and 6 are identical to Tables 1, 2, and 3, respectively, except that the analysis of the transfer was conducted with the proposed line in the model.

Table 7 lists the facility overloads that are caused by the line addition. The table shows the contingent loading percentage of circuit with and without the proposed line.

B. Preliminary Cost Analysis

The preliminary cost analysis is included to try to justify the proposed 500kV line on a cost basis for the 670MW request alone. Tables 1 through 7 include any solutions previously received from the transmission owners, and the estimated engineering and construction costs associated with those upgrades. Any solutions and costs previously received from the transmission owners are subject to change. Any solutions not currently known are described as undetermined and are numbered.

The rough cost estimate of upgrading the facilities associated with the overloads of Tables 1 and 3 is $83,414,000 and was determined as follows.

Option 1

Table 1 – 17 Known Solutions	$45,485,000
Table 3 – 4 Known Solutions	$4,929,000
33 Undetermined Solutions estimated @ $1,000,000 per solution	$33,000,000
Total:	**$83,414,000**

For the alternative of building the proposed 500kV lines and upgrading the remaining facilities associated with the overloads of Tables 4, 6, and 7, the rough cost estimate is $262,634,000 and was determined as follows.

Option 2

Table 4 – 8 Known Solutions	$20,705,000
Table 6 – 2 Known Solutions	$2,929,000
21 Undetermined Solutions @ $1,000,000 per solution	$21,000,000
Pittsburg to NW Texarkana 500kV line	$123,000,000
NW Texarkana to McNeil 500kV line	$60,000,000
Pittsburg Substation	$17,000,000
NW Texarkana Substation	$18,000,000
Total:	**$262,634,000**

Comparing the rough estimates of the two alternatives, the proposed 500kV line does not appear to be justified for the 670MW request alone. The rough estimates determined above are solely for the purpose of comparing the two options and are not to be considered exact.

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

Study Year	From Area To Area	Branch Over 100% Rate B	Rate B	BC %Loading	TC %Loading	Outaged Branch That Caused Overload	ATC (MW)	Solution	Estimated Cost
		DRAPER 345/138KV TRANSFORMER 1				**DRAPER 345/138KV TRANSFORMER 2**			
03G	OKGE-OKGE	54934 DRAPER 7 345 to 54933 DRAPER 4 138 CKT 1	493	99.9	104.1	54933 DRAPER 4 138 to 54934 DRAPER 7 345 CKT2	12	#1 Add Third Transformer	8,000,000
		DRAPER 345/138KV TRANSFORMER 2				**DRAPER 345/138KV TRANSFORMER 1**			
* 03G	OKGE-OKGE	54934 DRAPER 7 345 to 54933 DRAPER 4 138 CKT 2	493	99.9	104.1	54933 DRAPER 4 138 to 54934 DRAPER 7 345 CKT1	12	See Previous	
		HOYT HTI SWITCHING JCT TO CIRCLEVILLE, 115KV				**IATAN TO ST JOE, 345KV**			
* 03G	WERE-WERE	57165 HTI JCT3 115 to 57152 CIRCLVL3 115 CKT 1	92	99.4	102.5	57982 IATAN 7 345 to 69702 ST JOE 3 345 CKT1	129	Solution Undetermined #1	
		PECAN CREEK 345/161KV TRANSFORMER				**MUSKOGEE TO FORT SMITH, 345KV**			
03G	OKGE-OKGE	55235 PECANCK7 345 to 55234 PECANCK5 161 CKT 1	369	90.1	102.8	55224 MUSKOGE7 345 to 55302 FTSMITH7 345 CKT1	525	#2 Add Second Transformer	3,500,000
		LAWRENCE HILL 230/115KV TRANSFORMER				**MIDLAND 230/115KV TRANSFORMER**			
* 03G	WERE-WERE	56853 LAWHILL6 230 to 57250 LWRNCHL3 115 CKT 1	308	98.8	100.1	56855 MIDLAND6 230 to 57252 MIDLAND3 115 CKT1	613	Solution Undetermined #2	
		CARTHAGE TO JASPER, 69KV				**MARATON TO CENTERVILLE, 161KV**			
* 04SP	SWPA-AECI	52690 CARTHG 269.0 to 96649 2JASPER 69.0 CKT 1	47	100.0	103.1	56934 MARMTNE5 161 to 58065 CNTRVIL5 161 CKT1	0	Solution Undetermined #3	
		SOUTHWEST STATION TO ANADARKO, 138KV				**CORNVILLE TO CORN TAP, 138KV**			
04SP	AEPW-WFEC	54140 S.W.S.-4 138 to 55814 ANADARK4 138 CKT 1	203	99.9	102.0	54112 CORNVIL4 138 to 55867 CORN TP4 138 CKT1	18	Solution Undetermined #4	
		HOYT HTI SWITCHING JCT TO CIRCLEVILLE, 115KV				**MIDLAND 230/115KV TRANSFORMER**			
* 04SP	WERE-WERE	57165 HTI JCT3 115 to 57152 CIRCLVL3 115 CKT 1	92	99.9	102.2	56915 MIDLAND5 161 to 57252 MIDLAND3 115 CKT1	18	See Previous	
		FULTON TO PATMOS, 115KV				**PATTERSON TO SOUTH NASHVILLE, 138KV**		#3 Reconductor 7.1 miles of	
04SP	AEPW-EES	53374 FULTON 3 115 to 99303 3PATMOS# 115 CKT 1	174	99.2	119.2	53306 PATTERS4 138 to 53321 SNASHVL4 138 CKT1	25	666 ACSR with 1272 ACSR	2,100,000
		PECAN CREEK 345/161KV TRANSFORMER				**MUSKOGEE TO FORT SMITH, 345KV**			
04SP	OKGE-OKGE	55235 PECANCK7 345 to 55234 PECANCK5 161 CKT 1	369	98.7	111.3	55224 MUSKOGE7 345 to 55302 FTSMITH7 345 CKT1	68	See Previous	
		MONETT TO AURORA HT, 161KV				**AURORA HT TO MONETT HT, 69KV**			
04SP	EMDE-EMDE	59480 MON383 5 161 to 59468 AUR124 5 161 CKT 1	157	99.3	105.8	59537 AUR124 269.0 to 59540 MON152 269.0 CKT1	69	Solution Undetermined #5	
		COUNTY LINE 230/115/69KV TRANSFORMER				**HOYT TO STRANGER,345KV**			
* 04SP	WERE-WERE	57201 COLINE3X1.00 to 57456 COLINE 269.0 CKT 1	66	99.7	101.7	56765 HOYT 7 345 to 56772 STRANGR7 345 CKT1	93	Solution Undetermined #6	
		LONE STAR SOUTH TO WILKES, 138KV				**WILKES TO WELSH REC, 138KV**			
04SP	AEPW-AEPW	53276 LSSOUTH4 138 to 53619 WILKES 4 138 CKT 1	316	99.6	100.9	53619 WILKES 4 138 to 53622 WELSHRE4 138 CKT1	195	#4 Change CT's	45,000
		PENSACOLA TO GRAY TAP, 69KV				**MIAMI TO AFTON, 161KV**			
* 04SP	GRRD-GRRD	54428 PENSA 269.0 to 54465 GRAY TP269.0 CKT 1	47	99.4	101.5	54431 MIAMI 5 161 to 54432 AFTON 5 161 CKT1	198	#5 Rebuild 4/0 to 795MCM	1,000,000
		EUREKA SPRINGS TO BEAVER DAM, 161KV				**MUSKOGEE TO FORT SMITH, 345KV**		#6 Reconductor & Reset	
04SP	AEPW-SWPA	53136 EUREKA 5 161 to 52680 BEAVER 5 161 CKT 1	274	96.0	108.4	55224 MUSKOGE7 345 to 55302 FTSMITH7 345 CKT1	218	Equipment @ Beaver	3,000,000
		NEOSHO 161/69KV TRANSFORMER				**BEAVER TO EUREKA SPRINGS, 161KV**			
* 04SP	EMDE-AECI	59471 NEO184 5 161 to 96748 2NEOSAC 69.0 CKT 1	56	98.4	102.0	52680 BEAVER 5 161 to 53136 EUREKA 5 161 CKT1	298	Solution Undetermined #7	
		MIDWAY TO BULL SHOALS, 161KV				**SWEET WATER TO FLETCHER, 161KV**		#7 SWPA Replace Wavetrap	
* 04SP	EES-SWPA	99825 5MIDWAY# 161 to 52660 BULL SH5 161 CKT 1	162	96.9	103.8	31798 SWEETWTR 161 to 96077 5FLETCH 161 CKT1	299	& Reset CT's @ Bull Shoals	30,000
		CARTHAGE TO REEDS SPRING, 69KV				**MIAMI TO AFTON, 161KV**			
* 04SP	SWPA-AECI	52690 CARTHG 269.0 to 96751 2REEDS 69.0 CKT 1	36	97.8	102.6	54431 MIAMI 5 161 to 54432 AFTON 5 161 CKT1	308	Solution Undetermined #8	
		SOUTH COFFEYVILLE TO DEARING, 138 KV				**DELWARE TO NEOSHO, 345KV**			
04SP	AEPW-WERE	53972 COFFEYT4 138 to 57002 DEARING4 138 CKT 1	210	96.4	104.0	53929 DELWARE7 345 to 56793 NEOSHO 7 345 CKT1	313	#8 Replace WR Wavetrap	25,000
		JOPLIN SOUTHWEST 161/69KV TRANSFORMER				**TIPTON FORD TO JOPLIN SOUTHWEST, 161KV**			
04SP	EMDE-EMDE	59483 JOP389 5 161 to 59592 JOP389 269.0 CKT 1	75	99.7	100.3	59472 TIP292 5 161 to 59483 JOP389 5 161 CKT1	334	Solution Undetermined #9	
		REINMILLER 161/69KV TRANSFORMER				**TIPTON FORD TO JOPLIN SOUTHWEST, 161KV**			
* 04SP	EMDE-EMDE	59595 RNM393 269.0 to 59500 RNM393 5 161 CKT 1	75	99.4	100.5	59472 TIP292 5 161 to 59483 JOP389 5 161 CKT1	377	Solution Undetermined #10	
		GORE TO SALLISAW, 161KV				**MUSKOGEE TO FORT SMITH, 345KV**			
* 04SP	SWPA-SWPA	52752 GORE 5 161 to 52750 SALISAW5 161 CKT 1	167	88.9	108.1	55224 MUSKOGE7 345 to 55302 FTSMITH7 345 CKT1	388	#9 Increase Clearances	500,000

* Facility Not Included In Table 1 of Previous 108c Supplemental Study

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	Rate B	BC %Loading	TC %Loading	Outaged Branch That Caused Overload	ATC (MW)	Solution	Estimated Cost
		TINKER #4 TO TINKER #2, 138KV				**NE 10TH TO MIDWAY, 138KV**		#10 Replace one mile 138kV	
04SP	OKGE-OKGE	54988 TINKER44 138 to 54990 TINKER24 138 CKT 1	100	97.7	101.7	54964 NE10TH 4 138 to 54966 MIDWAY 4 138 CKT1	389	UG Cable	1,000,000
		MUSKOGEE 161/69KV TRANSFORMER 1				**MUSKOGEE 161/69KV TRANSFORMER 3**			
04SP	OKGE-OKGE	55222 MUSKOGE5 161 to 55221 MUSKOGE269.0 CKT 1	41	98.9	100.8	55221 MUSKOGE269.0 to 55222 MUSKOGE5 161 CKT3	392	Solution Undetermined #11	
		WALLACE LAKE TO SOUTH SHREVEPORT, 138KV				**DOLET HILLS 345/230KV TRANSFORMER**		Dolet Hills Operating Guide	
04SP	AEPW-AEPW	53461 WALLAKE4 138 to 53446 S SHV 4 138 CKT 1	209	91.7	105.3	50045 DOLHILL7 345 to 50046 DOLHILL6 230 CKT1	409	Monitor Line at 260MVA	
		GILL ENERGY CENTER EAST TO MACARTHUR, 69KV				**MACARTHUR TO OATVILLE, 69KV**			
* 04SP	WERE-WERE	57795 GILL E 269.0 to 57813 MACARTH269.0 CKT 1	68	99.8	100.1	57813 MACARTH269.0 to 57825 OATVILL269.0 CKT1	441	Solution Undetermined #12	
		DIAMOND JCT. TO SARCOXIE SOUTHWEST TAP, 69KV				**MONETT 161/69KV TRANSFORMER**			
04SP	EMDE-EMDE	59538 DIA131 269.0 to 59582 SAR362T269.0 CKT 1	38	97.5	101.3	59480 MON383 5 161 to 59591 MON383 269.0 CKT1	447	#11 Reconductor Line	700,000
		NORFORK 161/69KV TRANSFORMER				**NORFORK TO WEST PLAINS, 161KV**			
04SP	SWPA-SWPA	52648 NORFORK5 161 to 52650 NORFORK269.0 CKT 1	25	99.2	100.4	52648 NORFORK5 161 to 96123 5WPLAIN 161 CKT1	469	Solution Undetermined #13	
		CHESTNUT TO ENID, 69KV				**CHESTNUT TO SOUTH 4TH ST, 69KV**			
04SP	OKGE-OKGE	54726 CHSTNUT269.0 to 54727 ENID 269.0 CKT 1	66	98.9	100.4	54726 CHSTNUT269.0 to 54730 SO4TH2 269.0 CKT1	495	Solution Undetermined #14	
		SOUTH GAGE TO AUBURN, 115KV CKT 1				**SOUTH GAGE TO AUBURN, 115KV CKT 2**			
* 04SP	WERE-WERE	57179 S GAGEW3 115 to 57151 AUBURN 3 115 CKT 1	91	99.3	100.2	57151 AUBURN 3 115 to 57179 S GAGEW3 115 CKT2	505	Solution Undetermined #15	
		WILBURTON TO LONE OAK, 69KV				**EUFAULA TO STIGLER TAP, 138KV**			
04SP	AEPW-AEPW	54031 WILBURT269.0 to 54021 LONEOAK269.0 CKT 1	48	95.6	101.3	52774 EUFAULA4 138 to 54050 STIGLRT4 138 CKT1	517	#12 Replace Switch	40,000
		WALLACE LAKE TO INTERNATIONAL PAPER, 138KV				**DOLET HILLS 345/230KV TRANSFORMER**		Dolet Hills Operating Guide	
04SP	AEPW-CELE	53461 WALLAKE4 138 to 50090 IPAPER 4 138 CKT 1	209	84.4	100.1	50045 DOLHILL7 345 to 50046 DOLHILL6 230 CKT1	667	Monitor Line at 260MVA	
		CARTHAGE TO REEDS SPRING, 69KV				**MONET 161/69KV TRANSFORMER**			
* 04WP	SWPA-AECI	52690 CARTHG 269.0 to 96751 2REEDS 69.0 CKT 1	43	100.0	104.2	59480 MON383 5 161 to 59591 MON383 269.0 CKT1	0	See Previous	
		FERNDALE LAKE TAP TO PITTSBURG, 69KV				**PERDUE TO LAKE HAWKINS, 138KV**			
04WP	AEPW-AEPW	53531 FERNDTP269.0 to 53310 PITTSB_269.0 CKT 1	72	100.0	100.8	53590 PERDUE 4 138 to 53666 LHAWKIN4 138 CKT1	0	Solution Undetermined #16	
		FULTON TO PATMOS, 115KV				**MUSKOGEE TO FORT SMITH, 345KV**			
04WP	AEPW-EES	53374 FULTON 3 115 to 99303 3PATMOS# 115 CKT 1	197	99.1	116.7	55224 MUSKOGE7 345 to 55302 FTSMITH7 345 CKT1	32	See Previous	
		HOYT HTI SWITCHING JCT TO CIRCLEVILLE, 115KV				**EAST MANHATTAN TO CONCORD, 230KV**			
* 04WP	WERE-WERE	57165 HTI JCT3 115 to 57152 CIRCLVL3 115 CKT 1	92	99.7	101.8	56861 EMANHAT6 230 to 58758 CONCORD6 230 CKT1	97	See Previous	
		PECAN CREEK 345/161KV TRANSFORMER				**MUSKOGEE TO FORT SMITH, 345KV**			
04WP	OKGE-OKGE	55235 PECANCK7 345 to 55234 PECANCK5 161 CKT 1	369	93.7	106.0	55224 MUSKOGE7 345 to 55302 FTSMITH7 345 CKT1	343	See Previous	
		EUREKA SPRINGS TO BEAVER DAM, 161KV				**MONETT TO BROOKLINE, 345KV**			
04WP	AEPW-SWPA	53136 EUREKA 5 161 to 52680 BEAVER 5 161 CKT 1	287	94.3	104.6	59481 MON383 7 345 to 59984 BRKLNE 7 345 CKT1	370	See Previous	
		CARTHAGE TO JASPER, 69KV				**CARTHAGE TO LARUSSELL, 161KV**			
* 04WP	SWPA-AECI	52690 CARTHG 269.0 to 96649 2JASPER 69.0 CKT 1	52	97.6	100.9	52688 CARTHAG5 161 to 59479 LAR382 5 161 CKT1	487	See Previous	
		MIDLAND 230/115KV TRANSFORMER				**LAWRENCE HILL 230/115KV TRANSFORMER**			
* 04WP	WERE-WERE	56855 MIDLAND6 230 to 57252 MIDLAND3 115 CKT 1	308	98.8	100.1	56853 LAWHILL6 230 to 57250 LWRNCHL3 115 CKT1	599	See Previous	
		CHIKASKIA TAP TO BRAMAN, 69KV				**KILDARE TO WHITE EAGLE, 138KV**			
04WP	OKGE-OKGE	54751 CHIKSTP269.0 to 54750 BRAMAN 269.0 CKT 1	38	92.7	100.6	54760 KILDARE4 138 to 54761 WHEAGLE4 138 CKT1	621	Solution Undetermined #17	
		LELMDALE TO DYESS, 161KV CKT 2				**LELMDALE TO DYESS, 161KV CKT 1**		#13 Rebuild & Replace	
* 06SP	AEPW-AEPW	53175 LELMDAL5 161 to 53131 DYESS 5 161 CKT 2	354	100.0	101.6	53131 DYESS 5 161 to 53175 LELMDAL5 161 CKT1	0	switches & breaker @ Dyess	2,000,000
		FULTON TO PATMOS, 115KV				**FORT SMITH TO ANO, 500KV**			
06SP	AEPW-EES	53374 FULTON 3 115 to 99303 3PATMOS# 115 CKT 1	174	99.5	121.8	55305 FTSMITH8 500 to 99486 8ANO 500 CKT1	15	See Previous	
		S FAYETTEVILLE TO GREENLAND, 69KV				**SILOAM SPRINGS, 161/69KV TRANSFORMER**			
* 06SP	AEPW-AEPW	53156 SFAYTVL269.0 to 53141 GREENLD269.0 CKT 1	59	99.7	105.8	53158 SILOAM 5 161 to 53204 SILOAM 269.0 CKT1	31	Solution Undetermined #18	

* Facility Not Included In Table 1 of Previous 108c Supplemental Study

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	Rate B	BC %Loading	TC %Loading	Outaged Branch That Caused Overload	ATC (MW)	Solution	Estimated Cost
		CARTHAGE TO REEDS SPRING, 69KV				**CARTHAGE TO LARUSSELL, 161KV**			
* 06SP	SWPA-AECI	52690 CARTHG 269.0 to 96751 2REEDS 69.0 CKT 1	36	99.7	106.3	52688 CARTHAG5 161 to 59479 LAR382 5 161 CKT1	35	See Previous	
		EAST CENTERTON TO GENTRY REC, 161KV				**LOWELL TO LELMDAL, 161KV**			
06SP	AEPW-AEPW	53133 ECNTRTN5 161 to 53187 GENTRYR5 161 CKT 1	353	99.8	101.8	53144 LOWELL 5 161 to 53175 LELMDAL5 161 CKT1	79	Solution Undetermined #19	
		KERR TO KANSAS TAP, 161KV				**FLINT CREEK TO GRDA ONE, 345KV**			
06SP	GRRD-GRRD	54435 KERR GR5 161 to 54514 KANSATP5 161 CKT 1	328	99.6	102.7	53140 FLINTCR7 345 to 54450 GRDA1 7 345 CKT1	80	Solution Undetermined #20	
		MIDWAY TO BULL SHOALS, 161KV				**HUBEN TO MORGAN, 345KV**			
* 06SP	EES-SWPA	99825 5MIDWAY# 161 to 52660 BULL SH5 161 CKT 1	162	98.8	107.1	96042 7HUBEN 345 to 96045 7MORGAN 345 CKT1	100	See Previous	
		FARMINGTON AECC TO CHAMBER SPRINGS RD, 161KV				**CHAMBER SPRINGS RD TO LELMDAL, 345KV**			
06SP	AEPW-AEPW	53195 FARMGTN5 161 to 53154 CHAMSPR5 161 CKT 1	335	99.6	102.0	53155 CHAMSPR7 345 to 53176 LELMDAL7 345 CKT1	105	Solution Undetermined #21	
		PHAROAH TO WELEETKA, 138KV				**FRANKLIN TO FRANKLIN SWITCH, 138KV**			
* 06SP	WFEC-SWPA	56026 PHAROAH4 138 to 52792 WELEETK4 138 CKT 1	191	99.6	101.1	55913 FRANKLN4 138 to 55917 FRNKLNS4 138 CKT1	183	Solution Undetermined #22	
		COUNTY LINE 115/69 KV TRANSFORMER				**ARNOLD TO STRANGER CREEK, 115KV**			
06SP	WERE-WERE	57456 COLINE 269.0 to 57201 COLINE3X1.00 CKT 1	66	99.8	100.5	57211 ARNOLD 3 115 to 57268 STRANGR3 115 CKT1	201	See Previous	
		FERNDALE LAKE TAP TO PITTSBURG, 69KV				**MOBIL-TEXOMA T TO NEW HOPE, 69KV**			
* 06SP	AEPW-AEPW	53531 FERNDTP269.0 to 53310 PITTSB_269.0 CKT 1	72	99.6	100.8	53282 MOBLTXT269.0 to 53296 NEWHOPE269.0 CKT1	217	See Previous	
		GENTRY REC TO FLINT CREEK, 161KV				**ROGERS TO LOWELL REC, 161KV**			
06SP	AEPW-AEPW	53187 GENTRYR5 161 to 53139 FLINTCR5 161 CKT 1	353	99.3	101.3	53152 ROGERS 5 161 to 53200 LOWELLR5 161 CKT1	227	Solution Undetermined #23	
		EUREKA SPRINGS TO BEAVER DAM, 161KV				**FLINT CREEK TO MONETT, 345KV**			
06SP	AEPW-SWPA	53136 EUREKA 5 161 to 52680 BEAVER 5 161 CKT 1	274	96.1	107.0	53140 FLINTCR7 345 to 59481 MON383 7 345 CKT1	238	See Previous	
		SNYDER TO FREDERICK JCT, 69KV				**ANADARKO TO PARADISE, 138KV**			
06SP	AEPW-AEPW	54138 SNYDER-269.0 to 54123 FREDJC-269.0 CKT 1	26	99.7	100.5	55814 ANADARK4 138 to 56024 PARADSE4 138 CKT1	271	#14 Replace CT's	45,000
		GORE TO SALLISAW, 161KV				**MUSKOGEE TO FORT SMITH, 345KV**			
* 06SP	SWPA-SWPA	52752 GORE 5 161 to 52750 SALISAW5 161 CKT 1	167	91.9	111.0	55224 MUSKOGE7 345 to 55302 FTSMITH7 345 CKT1	285	See Previous	
		LELMDAL TO CHAMBER SPRINGS RD, 161KV				**CHAMBER SPRINGS RD TO LELMDAL, 345KV**			
06SP	AEPW-AEPW	53175 LELMDAL5 161 to 53154 CHAMSPR5 161 CKT 1	244	98.5	101.7	53155 CHAMSPR7 345 to 53176 LELMDAL7 345 CKT1	314	Solution Undetermined #24	
		WALLACE LAKE TO SOUTH SHREVEPORT, 138KV				**DOLET HILLS 345/230KV TRANSFORMER**			
* 06SP	AEPW-AEPW	53461 WALLAKE4 138 to 53446 S SHV 4 138 CKT 1	209	92.4	106.4	50045 DOLHILL7 345 to 50046 DOLHILL6 230 CKT1	363	See Previous	
		SCROGNS TO FERNDALE LAKE TAP, 69KV				**NORTH MINEOLA TO LAKE HAWKINS, 138KV**			
06SP	AEPW-AEPW	53316 SCROGNS269.0 to 53531 FERNDTP269.0 CKT 1	85	99.3	100.5	53581 NMINEOL4 138 to 53666 LHAWKIN4 138 CKT1	387	Solution Undetermined #25	
		LARUSSEL TO SPRINGFIELD, 161KV				**LARUSSELL TO MONETT, 161KV**			
06SP	EMDE-SWPA	59479 LAR382 5 161 to 52692 SPRGFLD5 161 CKT 1	167	97.3	101.9	59479 LAR382 5 161 to 59480 MON383 5 161 CKT1	397	Solution Undetermined #26	
		PENSACOLA TO GRAY TAP, 69KV				**COWSKIN 138/69KV TRANSFORMER**			
* 06SP	GRRD-GRRD	54428 PENSA 269.0 to 54465 GRAY TP269.0 CKT 1	47	99.2	100.5	54517 COWSKIN 69.0 to 54519 COWSKIN 138 CKT1	399	See Previous	
		MONETT TO AURORA HT, 161KV				**LARUSSELL TO MONETT, 161KV**			
06SP	EMDE-EMDE	59480 MON383 5 161 to 59468 AUR124 5 161 CKT 1	157	96.1	102.1	59479 LAR382 5 161 to 59480 MON383 5 161 CKT1	436	See Previous	
		TINKER #4 TO TINKER #2, 138KV				**OAK CREEK TO GM, 138KV**			
* 06SP	OKGE-OKGE	54990 TINKER24 138 to 54988 TINKER44 138 CKT 1	100	95.9	102.1	54960 OAKCRK 4 138 to 54961 GM 4 138 CKT1	445	See Previous	
		HELBERG 161/69KV TRANSFORMER				**CLARKSVILLE TO OZARK, 161KV**			
* 06SP	OKGE-OKGE	55325 HELBERG269.0 to 55327 HELBERG5 161 CKT 1	134	96.1	101.8	52714 CLARKSV5 161 to 52716 OZARK H5 161 CKT1	456	Solution Undetermined #27	
		GILL ENERGY CENTER EAST TO OATVILLE, 69KV				**CANAL TO RUTAN, 69KV**			
* 06SP	WERE-WERE	57795 GILL E 269.0 to 57825 OATVILL269.0 CKT 1	72	99.7	100.1	57784 CANAL 269.0 to 57838 RUTAN 269.0 CKT1	460	Solution Undetermined #28	
		WINNSBORO TO SCROGNS, 69KV				**PERDUE TO LAKE HAWKINS, 138KV**			
06SP	AEPW-AEPW	53336 WINNSBO269.0 to 53316 SCROGNS269.0 CKT 1	72	98.3	100.5	53590 PERDUE 4 138 to 53666 LHAWKIN4 138 CKT1	526	Solution Undetermined #29	

* Facility Not Included In Table 1 of Previous 108c Supplemental Study

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	Rate B	BC %Loading	TC %Loading	Outaged Branch That Caused Overload	ATC (MW)	Solution	Estimated Cost
		FRANKLIN SWITCH TO MIDWEST TAP, 138KV				**WELEETKA TO PHAROAH, 138KV**			
* 06SP	WFEC-OKGE	55917 FRNKLNS4 138 to 54946 MIDWEST4 138 CKT 1	215	96.9	100.8	52792 WELEETK4 138 to 56026 PHAROAH4 138 CKT1	530	Solution Undetermined #30	
		PECAN CREEK 345/161KV TRANSFORMER				**CLARKSVILLE TO MUSKOGEE, 345KV**			
06SP	OKGE-OKGE	55235 PECANCK7 345 to 55234 PECANCK5 161 CKT 1	369	94.3	101.3	53756 CLARKSV7 345 to 55224 MUSKOGE7 345 CKT1	544	See Previous	
		PARK LANE TO SEMINOLE, 138KV				**SUNNYSIDE 345/138KV TRANSFORMER**			
* 06SP	OKGE-OKGE	55178 PARKLN 4 138 to 55044 SEMINOL4 138 CKT 1	287	97.5	100.5	55135 SUNNYSD4 138 to 55136 SUNNYSD7 345 CKT1	552	#15 Replace relays & 1200A CTs @ Park Lane & Seminole	100,000
		MUSKOGEE TAP TO GORE, 161KV				**MUSKOGEE TO FORT SMITH, 345KV**			
* 06SP	SWPA-SWPA	52758 MUSKTAP5 161 to 52752 GORE 5 161 CKT 1	206	87.0	100.9	55224 MUSKOGE7 345 to 55302 FTSMITH7 345 CKT1	627	#16 Reconductor 16 miles and replace wavetrap	5,600,000
		S TEXARKANA REC TO TEXARKANA PLANT,69KV				**ATLANTA TO WEST ATLANTA, 69KV**			
* 06SP	AEPW-AEPW	53189 STEXREC269.0 to 53329 TEXARK 269.0 CKT 1	59	95.4	100.3	53248 ATLANTA269.0 to 53333 WATLANT269.0 CKT1	634	Solution Undetermined #31	
		WALLACE LAKE TO INTERNATIONAL PAPER, 138KV				**DOLET HILLS 345/230KV TRANSFORMER**			
06SP	AEPW-CELE	53461 WALLAKE4 138 to 50090 IPAPER 4 138 CKT 1	209	84.5	100.7	50045 DOLHILL7 345 to 50046 DOLHILL6 230 CKT1	640	See Previous	
		TAHLEQUAH TO HIGHWAY 59, 161KV				**MUSKOGEE TO FORT SMITH, 345KV**			
06SP	GRRD-OKGE	54455 TAHLQH 5 161 to 55347 HWY59 5 161 CKT 1	167	80.7	100.6	55224 MUSKOGE7 345 to 55302 FTSMITH7 345 CKT1	650	#17 Rebuild 47.5 miles	17,800,000
								Total Estimated Cost of Known Solutions	45,485,000

* Facility Not Included In Table 1 of Previous 108c Supplemental Study

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

Study Year	From Area To Area	Branch Over 100% Rate B	Rate B	BC %Loading	TC %Loading	Outaged Branch That Caused Overload
03G	CELE-EES	50024 CARROLL4 138 to 99167 3RINGLD 115 CKT 1	125	94.6	104.0	50023 CARROLL6 230 to 50126 MESSICK6 230 CKT1
03G	CELE-EES	50024 CARROLL4 138 to 99167 3RINGLD 115 CKT 1	125	94.7	103.4	99294 7ELDEHV 345 to 99295 8ELDEHV 500 CKT1
03G	CELE-EES	50024 CARROLL4 138 to 99167 3RINGLD 115 CKT 1	125	94.6	102.9	53424 LONGWD 7 345 to 99294 7ELDEHV 345 CKT1
03G	EES-EES	97480 L558T485 138 to 97484 4HUNTSVL 138 CKT 1	206	90.8	102.7	97454 4WALDEN 138 to 97514 4GRIMES 138 CKT1
03G	EES-EES	97480 L558T485 138 to 97484 4HUNTSVL 138 CKT 1	206	89.2	101.0	97454 4WALDEN 138 to 97469 4APRIL 138 CKT1
03G	EES-EES	97480 L558T485 138 to 97484 4HUNTSVL 138 CKT 1	206	88.2	100.1	97469 4APRIL 138 to 97470 4LFOREST 138 CKT1
03G	EES-EES	97487 4MT.ZION 138 to 97480 L558T485 138 CKT 1	206	94.5	106.4	97454 4WALDEN 138 to 97514 4GRIMES 138 CKT1
03G	EES-EES	97487 4MT.ZION 138 to 97480 L558T485 138 CKT 1	206	92.9	104.8	97454 4WALDEN 138 to 97469 4APRIL 138 CKT1
03G	EES-EES	97487 4MT.ZION 138 to 97480 L558T485 138 CKT 1	206	91.9	103.8	97469 4APRIL 138 to 97470 4LFOREST 138 CKT1
03G	EES-EES	97514 4GRIMES 138 to 97487 4MT.ZION 138 CKT 1	206	97.8	109.8	97454 4WALDEN 138 to 97514 4GRIMES 138 CKT1
03G	EES-EES	97514 4GRIMES 138 to 97487 4MT.ZION 138 CKT 1	206	96.3	108.2	97454 4WALDEN 138 to 97469 4APRIL 138 CKT1
03G	EES-EES	97514 4GRIMES 138 to 97487 4MT.ZION 138 CKT 1	206	95.3	107.2	97469 4APRIL 138 to 97470 4LFOREST 138 CKT1
03G	EES-EES	99167 3RINGLD 115 to 99168 3SAILES 115 CKT 1	115	97.5	108.3	99294 7ELDEHV 345 to 99295 8ELDEHV 500 CKT1
03G	EES-EES	99167 3RINGLD 115 to 99168 3SAILES 115 CKT 1	115	97.4	108.1	53424 LONGWD 7 345 to 99294 7ELDEHV 345 CKT1
03G	EES-EES	99167 3RINGLD 115 to 99168 3SAILES 115 CKT 1	115	96.5	107.1	50023 CARROLL6 230 to 50126 MESSICK6 230 CKT1
04SP	CELE-EES	50024 CARROLL4 138 to 99167 3RINGLD 115 CKT 1	125	94.9	103.6	50027 CLARN 6 230 to 50126 MESSICK6 230 CKT1
04SP	CELE-EES	50024 CARROLL4 138 to 99167 3RINGLD 115 CKT 1	125	97.4	103.3	53374 FULTON 3 115 to 99303 3PATMOS# 115 CKT1
04SP	CELE-EES	50024 CARROLL4 138 to 99167 3RINGLD 115 CKT 1	125	97.2	103.0	99263 3LEWIS # 115 to 99303 3PATMOS# 115 CKT1
04SP	EES-CELE	99167 3RINGLD 115 to 50024 CARROLL4 138 CKT 1	125	97.6	101.3	99309 8MCNEIL 500 to 99310 3MCNEIL 115 CKT1
04SP	EES-CELE	99167 3RINGLD 115 to 50024 CARROLL4 138 CKT 1	125	97.1	100.5	99169 6DANVLL 230 to 99181 6GRAMBL 230 CKT1
04SP	EES-CELE	99167 3RINGLD 115 to 50024 CARROLL4 138 CKT 1	125	97.1	100.5	99169 6DANVLL 230 to 99182 3DANVLL 115 CKT1
04SP	EES-EES	97768 4HLYSPG# 138 to 97698 4JASPER 138 CKT 1	112	98.9	105.6	53526 CROCKET7 345 to 97513 7GRIMES 345 CKT1
04SP	EES-EES	97919 6VERDINE 230 to 97917 6NELSN 230 CKT 1	470	99.0	100.5	97917 6NELSN 230 to 97921 6CARLYSS 230 CKT1
04SP	EES-EES	98229 4PT HUD 138 to 98230 2PT.HUD 69.0 CKT 2	100	99.6	100.1	97301 CAJUN2 8 500 to 98430 8WEBRE 500 CKT1
04SP	EES-EES	98273 4OAKGROV 138 to 98283 T300/331 138 CKT 1	135	99.9	102.1	98235 8MCKNT 500 to 15035 8DANIEL 500 CKT1
04SP	EES-EES	99167 3RINGLD 115 to 99168 3SAILES 115 CKT 1	115	97.5	107.3	50023 CARROLL6 230 to 50126 MESSICK6 230 CKT1
04SP	EES-EES	99167 3RINGLD 115 to 99168 3SAILES 115 CKT 1	115	99.0	103.1	99163 6MTOLIV 230 to 99181 6GRAMBL 230 CKT1
04SP	EES-EES	99167 3RINGLD 115 to 99168 3SAILES 115 CKT 1	115	92.1	101.9	50027 CLARN 6 230 to 50126 MESSICK6 230 CKT1
04SP	EES-EES	99171 3SPRINGH 115 to 99280 3TAYLOR 115 CKT 1	120	95.5	103.2	99230 3COUCH 115 to 99310 3MCNEIL 115 CKT1
04SP	EES-EES	99173 3HAYNVL 115 to 99249 3EMERSN 115 CKT 1	114	99.9	100.5	99171 3SPRINGH 115 to 99280 3TAYLOR 115 CKT1
04SP	EES-EES	99230 3COUCH 115 to 99310 3MCNEIL 115 CKT 1	167	95.8	109.3	99171 3SPRINGH 115 to 99172 3SAREPT 115 CKT1
04SP	EES-EES	99230 3COUCH 115 to 99310 3MCNEIL 115 CKT 1	167	89.2	108.5	53424 LONGWD 7 345 to 99294 7ELDEHV 345 CKT1
04SP	EES-EES	99230 3COUCH 115 to 99310 3MCNEIL 115 CKT 1	167	89.2	108.4	99294 7ELDEHV 345 to 99295 8ELDEHV 500 CKT1
04SP	EES-EES	99263 3LEWIS # 115 to 99230 3COUCH 115 CKT 1	159	97.4	119.1	53615 WELSH 7 345 to 53620 WILKES 7 345 CKT1
04SP	EES-EES	99263 3LEWIS # 115 to 99230 3COUCH 115 CKT 1	159	97.0	118.9	53454 SW SHV 7 345 to 53528 DIANA 7 345 CKT1
04SP	EES-EES	99263 3LEWIS # 115 to 99230 3COUCH 115 CKT 1	159	97.2	118.4	50023 CARROLL6 230 to 50046 DOLHILL6 230 CKT1
04SP	EES-EES	99303 3PATMOS# 115 to 99263 3LEWIS # 115 CKT 1	159	99.8	121.6	99396 3ALPINE# 115 to 99397 3BISMRK 115 CKT1
04SP	EES-EES	99303 3PATMOS# 115 to 99263 3LEWIS # 115 CKT 1	159	99.3	119.9	99163 6MTOLIV 230 to 99181 6GRAMBL 230 CKT1
04SP	EES-EES	99303 3PATMOS# 115 to 99263 3LEWIS # 115 CKT 1	159	99.0	119.9	97714 6CHINA 230 to 97716 6SABINE 230 CKT1
04SP	EES-EES	99310 3MCNEIL 115 to 99230 3COUCH 115 CKT 1	167	95.8	105.1	99309 8MCNEIL 500 to 99310 3MCNEIL 115 CKT1
04SP	EES-EES	99380 3HOPE E# 115 to 99230 3COUCH 115 CKT 1	120	98.9	100.5	99349 3ARKA-N 115 to 99407 3FRIEND 115 CKT1
04SP	EES-EES	99389 4MURFRE 138 to 99387 3MURF-S 115 CKT 1	60	94.5	119.7	53526 CROCKET7 345 to 97513 7GRIMES 345 CKT1
04SP	EES-EES	99389 4MURFRE 138 to 99387 3MURF-S 115 CKT 1	60	91.3	116.0	53526 CROCKET7 345 to 53637 TENRUSK7 345 CKT1
04SP	EES-EES	99389 4MURFRE 138 to 99387 3MURF-S 115 CKT 1	60	88.4	113.4	53374 FULTON 3 115 to 99303 3PATMOS# 115 CKT1

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

Study Year	From Area To Area	Branch Over 100% Rate B	Rate B	BC %Loading	TC %Loading	Outaged Branch That Caused Overload
04SP	MIPU-AECI	59217 WINDSR 5 161 to 96071 5CLINTN 161 CKT 1	123	99.1	104.2	59228 WBURGE 5 161 to 59229 ODESSA 5 161 CKT1
04SP	MIPU-AECI	59217 WINDSR 5 161 to 96071 5CLINTN 161 CKT 1	123	96.2	101.5	52702 TRUMAN 5 161 to 96555 5GRAVOI 161 CKT1
04SP	NPPD-NPPD	64181 MAXWELL7 115 to 64039 CALAWAY7 115 CKT 1	105	99.4	100.5	64102 GENTLMN3 345 to 64282 SWEET W3 345 CKT2
04SP	NPPD-NPPD	64265 ST.LIB 7 115 to 64173 LOUPCTY7 115 CKT 1	92	99.7	100.5	64181 MAXWELL7 115 to 64204 N.PLATT7 115 CKT1
04SP	SJLP-SJLP	69703 ST JOE 5 161 to 69701 MIDWAY 5 161 CKT 1	164	98.5	101.7	96039 7FAIRPT 345 to 96076 5FAIRPT 161 CKT3
04WP	AECI-AECI	96082 5GEORGE 161 to 96531 2GEORGE 69.0 CKT 1	56	99.2	100.1	96057 5BARNET 161 to 96618 2BARNET 69.0 CKT1
04WP	AECI-AECI	96098 5MOCITY 161 to 96153 1MOCTN1 100 CKT 1	34	99.8	101.1	96091 5LATHRP 161 to 96302 2LATHRP 69.0 CKT1
04WP	AECI-AECI	96153 1MOCTN1 100 to 96304 2MOCITY 69.0 CKT 1	34	99.8	101.1	96091 5LATHRP 161 to 96302 2LATHRP 69.0 CKT1
04WP	AECI-AECI	96154 1MOCTN2 100 to 96098 5MOCITY 161 CKT 2	34	99.9	101.1	96091 5LATHRP 161 to 96302 2LATHRP 69.0 CKT1
04WP	AECI-AECI	96154 1MOCTN2 100 to 96304 2MOCITY 69.0 CKT 2	34	99.9	101.1	96091 5LATHRP 161 to 96302 2LATHRP 69.0 CKT1
04WP	AMRN-AECI	31221 MOBERLY 161 to 96120 5THMHIL 161 CKT 1	386	99.5	100.9	96044 7MCCRED 345 to 96049 7THOMHL 345 CKT1
04WP	CELE-EES	50024 CARROLL4 138 to 99167 3RINGLD 115 CKT 1	125	96.1	104.7	50027 CLARN 6 230 to 50126 MESSICK6 230 CKT1
04WP	CELE-EES	50024 CARROLL4 138 to 99167 3RINGLD 115 CKT 1	125	98.2	103.7	53374 FULTON 3 115 to 99303 3PATMOS# 115 CKT1
04WP	CELE-EES	50024 CARROLL4 138 to 99167 3RINGLD 115 CKT 1	125	97.9	103.5	99263 3LEWIS # 115 to 99303 3PATMOS# 115 CKT1
04WP	EES-CELE	99167 3RINGLD 115 to 50024 CARROLL4 138 CKT 1	125	99.1	103.3	99230 3COUCH 115 to 99264 3MAG-DW 115 CKT1
04WP	EES-CELE	99167 3RINGLD 115 to 50024 CARROLL4 138 CKT 1	125	97.4	101.0	99266 3MAG-ST 115 to 99308 3MAG-E 115 CKT1
04WP	EES-CELE	99167 3RINGLD 115 to 50024 CARROLL4 138 CKT 1	125	97.0	100.6	99266 3MAG-ST 115 to 99288 3KERLIN* 115 CKT1
04WP	EES-EES	99167 3RINGLD 115 to 99168 3SAILES 115 CKT 1	115	97.2	106.7	50027 CLARN 6 230 to 50126 MESSICK6 230 CKT1
04WP	EES-EES	99167 3RINGLD 115 to 99168 3SAILES 115 CKT 1	115	98.9	105.2	53374 FULTON 3 115 to 99303 3PATMOS# 115 CKT1
04WP	EES-EES	99167 3RINGLD 115 to 99168 3SAILES 115 CKT 1	115	98.6	105.0	99263 3LEWIS # 115 to 99303 3PATMOS# 115 CKT1
04WP	EES-EES	99230 3COUCH 115 to 99310 3MCNEIL 115 CKT 1	167	81.7	102.2	53424 LONGWD 7 345 to 99294 7ELDEHV 345 CKT1
04WP	EES-EES	99230 3COUCH 115 to 99310 3MCNEIL 115 CKT 1	167	81.7	102.1	99294 7ELDEHV 345 to 99295 8ELDEHV 500 CKT1
04WP	EES-EES	99263 3LEWIS # 115 to 99230 3COUCH 115 CKT 1	159	99.7	118.3	99230 3COUCH 115 to 99264 3MAG-DW 115 CKT1
04WP	EES-EES	99263 3LEWIS # 115 to 99230 3COUCH 115 CKT 1	159	99.0	118.2	98107 8RICHARD 500 to 98430 8WEBRE 500 CKT1
04WP	EES-EES	99263 3LEWIS # 115 to 99230 3COUCH 115 CKT 1	159	96.6	117.9	53277 LYDIA 7 345 to 53615 WELSH 7 345 CKT1
04WP	EES-EES	99264 3MAG-DW 115 to 99230 3COUCH 115 CKT 1	108	98.6	100.3	99308 3MAG-E 115 to 99310 3MCNEIL 115 CKT1
04WP	EES-EES	99303 3PATMOS# 115 to 99263 3LEWIS # 115 CKT 1	159	93.6	105.2	99230 3COUCH 115 to 99310 3MCNEIL 115 CKT1
04WP	EES-EES	99389 4MURFRE 138 to 99387 3MURF-S 115 CKT 1	60	96.9	121.6	55224 MUSKOGE7 345 to 55302 FTSMITH7 345 CKT1
04WP	EES-EES	99389 4MURFRE 138 to 99387 3MURF-S 115 CKT 1	60	93.9	115.4	99333 8SHERID 500 to 99402 8HSEHV 500 CKT1
04WP	EES-EES	99389 4MURFRE 138 to 99387 3MURF-S 115 CKT 1	60	89.0	115.4	55305 FTSMITH8 500 to 99486 8ANO 500 CKT1
06SP	AECI-AECI	96120 5THMHIL 161 to 96172 2TMHILL 69.0 CKT 2	84	99.8	101.2	96044 7MCCRED 345 to 96049 7THOMHL 345 CKT1
06SP	AECI-AECI	96153 1MOCTN1 100 to 96304 2MOCITY 69.0 CKT 1	34	99.5	101.1	96154 1MOCTN2 100 to 96304 2MOCITY 69.0 CKT2
06SP	AECI-AECI	96154 1MOCTN2 100 to 96304 2MOCITY 69.0 CKT 2	34	98.6	100.2	96153 1MOCTN1 100 to 96304 2MOCITY 69.0 CKT1
06SP	AMRN-AECI	31221 MOBERLY 161 to 96120 5THMHIL 161 CKT 1	372	100.0	101.5	96044 7MCCRED 345 to 96049 7THOMHL 345 CKT1
06SP	CELE-EES	50024 CARROLL4 138 to 99167 3RINGLD 115 CKT 1	125	94.2	102.9	50023 CARROLL6 230 to 50126 MESSICK6 230 CKT1
06SP	EES-CELE	99115 3FISHER 115 to 50057 FISHER 4 138 CKT 1	83	97.1	101.0	99112 3WINFLD 115 to 99113 6WINFLD 230 CKT1
06SP	EES-CELE	99115 3FISHER 115 to 50057 FISHER 4 138 CKT 1	83	97.1	101.0	99113 6WINFLD 230 to 99116 6MONTGY 230 CKT1
06SP	EES-CELE	99167 3RINGLD 115 to 50024 CARROLL4 138 CKT 1	125	97.9	102.1	99171 3SPRINGH 115 to 99280 3TAYLOR 115 CKT1
06SP	EES-CELE	99167 3RINGLD 115 to 50024 CARROLL4 138 CKT 1	125	97.6	101.6	99266 3MAG-ST 115 to 99308 3MAG-E 115 CKT1
06SP	EES-CELE	99167 3RINGLD 115 to 50024 CARROLL4 138 CKT 1	125	96.7	100.7	99266 3MAG-ST 115 to 99288 3KERLIN* 115 CKT1
06SP	EES-EES	97514 4GRIMES 138 to 97487 4MT.ZION 138 CKT 1	206	92.2	104.2	97454 4WALDEN 138 to 97514 4GRIMES 138 CKT1
06SP	EES-EES	97514 4GRIMES 138 to 97487 4MT.ZION 138 CKT 1	206	89.0	101.0	97454 4WALDEN 138 to 97469 4APRIL 138 CKT1
06SP	EES-EES	97618 4NEWTONB 138 to 97768 4HLYSPG# 138 CKT 1	112	98.4	102.0	97691 8CYPRESS 500 to 97717 8HARTBRG 500 CKT1
06SP	EES-EES	97618 4NEWTONB 138 to 97768 4HLYSPG# 138 CKT 1	112	98.3	102.0	97690 4CYPRESS 138 to 97691 8CYPRESS 500 CKT1
06SP	EES-EES	97618 4NEWTONB 138 to 97768 4HLYSPG# 138 CKT 1	112	99.7	100.6	97700 4KOUNTZE 138 to 97710 4WARREN 138 CKT1

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

Study Year	From Area To Area	Branch Over 100% Rate B	Rate B	BC %Loading	TC %Loading	Outaged Branch That Caused Overload
06SP	EES-EES	97708 4TOLEDO 138 to 97686 4LEACH 138 CKT 1	144.6	91.2	100.4	53526 CROCKET7 345 to 97513 7GRIMES 345 CKT1
06SP	EES-EES	97768 4HLYSPG# 138 to 97698 4JASPER 138 CKT 1	112	96.3	101.8	53526 CROCKET7 345 to 53637 TENRUSK7 345 CKT1
06SP	EES-EES	98273 4OAKGROV 138 to 98283 T300/331 138 CKT 1	135	95.0	100.3	98246 8WGLEN 500 to 98539 8WATERFO 500 CKT1
06SP	EES-EES	98273 4OAKGROV 138 to 98283 T300/331 138 CKT 1	135	94.9	100.3	98537 6WATFRD 230 to 98539 8WATERFO 500 CKT1
06SP	EES-EES	98569 6BGATEL 230 to 98259 6CONWY 230 CKT 1	436	99.6	100.7	97333 VIGNES 6 230 to 98544 6SORR 2 230 CKT1
06SP	EES-EES	99122 3ALTO 1 115 to 99123 3SWARTZ 115 CKT 1	114	98.1	100.2	98938 3B.WLSN 115 to 98950 3VKSB-S 115 CKT1
06SP	EES-EES	99167 3RINGLD 115 to 99168 3SAILES 115 CKT 1	115	99.9	109.9	53424 LONGWD 7 345 to 99294 7ELDEHV 345 CKT1
06SP	EES-EES	99167 3RINGLD 115 to 99168 3SAILES 115 CKT 1	115	92.4	102.3	50023 CARROLL6 230 to 50126 MESSICK6 230 CKT1
06SP	EES-EES	99168 3SAILES 115 to 99167 3RINGLD 115 CKT 1	115	98.0	102.8	99264 3MAG-DW 115 to 99280 3TAYLOR 115 CKT1
06SP	EES-EES	99168 3SAILES 115 to 99167 3RINGLD 115 CKT 1	115	96.9	101.9	99171 3SPRINGH 115 to 99280 3TAYLOR 115 CKT1
06SP	EES-EES	99168 3SAILES 115 to 99167 3RINGLD 115 CKT 1	115	96.7	101.5	99266 3MAG-ST 115 to 99308 3MAG-E 115 CKT1
06SP	EES-EES	99171 3SPRINGH 115 to 99280 3TAYLOR 115 CKT 1	120	99.8	101.2	99249 3EMERSN 115 to 99288 3KERLIN* 115 CKT1
06SP	EES-EES	99263 3LEWIS # 115 to 99230 3COUCH 115 CKT 1	159	97.1	121.4	55305 FTSMITH8 500 to 99486 8ANO 500 CKT1
06SP	EES-EES	99263 3LEWIS # 115 to 99230 3COUCH 115 CKT 1	159	97.9	120.5	53593 PIRKEY 7 345 to 53637 TENRUSK7 345 CKT1
06SP	EES-EES	99263 3LEWIS # 115 to 99230 3COUCH 115 CKT 1	159	98.5	120.1	53321 SNASHVL4 138 to 99389 4MURFRE 138 CKT1
06SP	EES-EES	99264 3MAG-DW 115 to 99230 3COUCH 115 CKT 1	108	98.5	107.5	99230 3COUCH 115 to 99310 3MCNEIL 115 CKT1
06SP	EES-EES	99264 3MAG-DW 115 to 99230 3COUCH 115 CKT 1	108	99.4	102.2	50024 CARROLL4 138 to 99167 3RINGLD 115 CKT1
06SP	EES-EES	99278 3STEPHN 115 to 99302 3CAMD-S# 115 CKT 1	96	97.6	101.0	99293 3ELDEHV 115 to 99295 8ELDEHV 500 CKT1
06SP	EES-EES	99303 3PATMOS# 115 to 99263 3LEWIS # 115 CKT 1	159	99.9	120.4	99170 3MINDEN 115 to 99172 3SAREPT 115 CKT1
06SP	EES-EES	99303 3PATMOS# 115 to 99263 3LEWIS # 115 CKT 1	159	97.5	120.3	53277 LYDIA 7 345 to 53615 WELSH 7 345 CKT1
06SP	EES-EES	99303 3PATMOS# 115 to 99263 3LEWIS # 115 CKT 1	159	99.7	120.0	99379 3EMMET * 115 to 99380 3HOPE E# 115 CKT1
06SP	EES-EES	99389 4MURFRE 138 to 99387 3MURF-S 115 CKT 1	60	95.3	123.6	53424 LONGWD 7 345 to 99294 7ELDEHV 345 CKT1
06SP	EES-EES	99389 4MURFRE 138 to 99387 3MURF-S 115 CKT 1	60	95.4	123.4	99294 7ELDEHV 345 to 99295 8ELDEHV 500 CKT1
06SP	EES-EES	99389 4MURFRE 138 to 99387 3MURF-S 115 CKT 1	60	91.0	116.3	53526 CROCKET7 345 to 97513 7GRIMES 345 CKT1
06SP	MIPU-AECI	59216 BUTLER_5 161 to 96689 2BUTLER 69.0 CKT 1	56	99.0	100.9	57995 MONTROS5 161 to 96071 5CLINTN 161 CKT1
06SP	MIPU-AECI	59217 WINDSR 5 161 to 96071 5CLINTN 161 CKT 1	123	99.8	105.5	59228 WBURGE 5 161 to 59234 WAFB 5 161 CKT1
06SP	MIPU-AECI	59217 WINDSR 5 161 to 96071 5CLINTN 161 CKT 1	123	99.9	104.1	96071 5CLINTN 161 to 96108 5OSCEOL 161 CKT1
06SP	MIPU-AECI	59217 WINDSR 5 161 to 96071 5CLINTN 161 CKT 1	123	99.8	103.7	96049 7THOMHL 345 to 96120 5THMHIL 161 CKT1
06SP	NPPD-NPPD	64181 MAXWELL7 115 to 64039 CALAWAY7 115 CKT 1	105	99.9	101.2	64102 GENTLMN3 345 to 64282 SWEET W3 345 CKT2
06SP	NPPD-NPPD	64181 MAXWELL7 115 to 64039 CALAWAY7 115 CKT 1	105	99.3	100.5	64037 C.CREEK4 230 to 64203 N.PLATT4 230 CKT1
06SP	RCEC-RCEC	53549 JACKSNV4 138 to 53588 OVERTON4 138 CKT 1	235	99.6	107.7	53526 CROCKET7 345 to 53637 TENRUSK7 345 CKT1

Table 3 – AEPW – EES 670MW transfer impact on previously assigned and identified SPP Facilities.

Study Year	From Area To Area	Branch Over 100% Rate B	Rate B	BC %Loading	TC %Loading	Outaged Branch That Caused Overload	ATC (MW)	Assignment	Solution	Estimated Cost
03G	AEPW-AEPW	**IPC JEFFERSON TO LIEBERMAN, 138KV** 53548 IPCJEFF4 138 to 53420 LIEBERM4 138 CKT 1	143	87.4	101.9	**LONGWOOD TO WILKES, 345KV** 53424 LONGWD 7 345 to 53620 WILKES 7 345 CKT1	581	Upgrade Modeled is Assigned to SPP-2000-086 150680 Est. In-Service Date 2/1/2004 Additional Upgrades Required	#1 0.65 miles 397MCM to 795MCM. Replace switches @ Lieberman	200,000
04SP	KACP-KACP	**LA CYGNE TO STILWELL, 345KV** 57981 LACYGNE7 to 57968 STILWEL7 CKT 1	1251	110.2	113.8	**WEST GARDNER TO LA CYGNE, 345KV** 57965 W.GRDNR7 345 to 57981 LACYGNE7 345 CKT1	0	SPP Flowgate		
04SP	AEPW-AEPW	**LONGWOOD TO NORAM, 138KV** 53423 LONGWD 4 to 53473 NORAM 4	234	101.1	106.0	**Multiple Outage Contingency** **SOUTHWEST SHREVEPORT TO LONGWOOD, 345KV** 53454 SW SHV 7 345 to 53424 LONGWD 7 345 CKT 1 **SOUTHWEST SHREVEPORT TO DIANA, 345KV** 53454 SW SHV 7 345 to 53528 DIANA 7 345 CKT 1	0		#2 Reconductor 4.66 miles of bundled 266 ACSR with 1590 ACSR	1,333,000
* 04SP	SWPA-SWPA	**BUFORD TAP TO BULL SHOALS, 161KV** 52661 BUFRDTP5 161 to 52660 BULL SH5 161 CKT 1	167	103.3	114.7	**BULL SHOALS TO MIDWAY, 161KV** 52660 BULL SH5 161 to 99825 5MIDWAY# 161 CKT1	0		Solution Undetermined #1	
04SP	AEPW-AEPW	**NORAM TO RAINES, 138KV** 53473 NORAM 4 to 53439 RAINES 4 1	234	99.5	104.4	**Multiple Outage Contingency** **SOUTHWEST SHREVEPORT TO LONGWOOD, 345KV** 53454 SW SHV 7 345 to 53424 LONGWD 7 345 CKT 1 **SOUTHWEST SHREVEPORT TO DIANA, 345KV** 53454 SW SHV 7 345 to 53528 DIANA 7 345 CKT 1	68		#3 Rebuild 5.58 miles of 2-266 ACSR with 1590 ACSR	1,596,000
04SP	AEPW-AEPW	**IPC JEFFERSON TO LIEBERMAN, 138KV** 53548 IPCJEFF4 138 to 53420 LIEBERM4 138 CKT 1	143	92.9	106.1	**LONGWOOD TO WILKES, 345KV** 53424 LONGWD 7 345 to 53620 WILKES 7 345 CKT1	360	Upgrade Modeled is Assigned to SPP-2000-086 150680 Est. In-Service Date 2/1/2004 Additional Upgrades Required	See Previous	
* 04SP	KACP-KACP	**WEST GARDNER TO LA CYGNE, 345KV** 57965 W.GRDNR7 345 to 57981 LACYGNE7 345 CKT1	1251	98.3	101.5	**LA CYGNE TO STILWELL, 345KV** 57981 LACYGNE7 to 57968 STILWEL7 CKT 1	361			
* 04SP	SWPA-SWPA	**NORFORK TO BUFORD TAP, 161KV** 52648 NORFORK5 161 to 52661 BUFRDTP5 161 CKT 1	189	90.2	100.3	**BULL SHOALS TO MIDWAY, 161KV** 52660 BULL SH5 161 to 99825 5MIDWAY# 161 CKT1	652		Solution Undetermined #2	
04SP	AEPW-AEPW	**TATUM TO ROCKHILL, 138KV** 53611 TATUM 4 138 to 53598 ROKHILL4 138 CKT 1	235	92.7	99.1	**Multiple Outage Contingency** **SOUTHWEST SHREVEPORT TO LONGWOOD, 345KV** 53454 SW SHV 7 345 to 53424 LONGWD 7 345 CKT 1 **SOUTHWEST SHREVEPORT TO DIANA, 345KV** 53454 SW SHV 7 345 to 53528 DIANA 7 345 CKT 1	670	Upgrade Modeled is Assigned to SPP-2000-086 150680 Est. In-Service Date 4/1/2002		

* Facility Not Included In Table 3 of Previous 108c Supplemental Study

Table 3 continued – AEPW – EES 670MW transfer impact on previously assigned and identified SPP Facilities.

Study Year	From Area To Area	Branch Over 100% Rate B	Rate B	BC %Loading	TC %Loading	Outaged Branch That Caused Overload	ATC (MW)	Assignment	Solution	Estimated Cost
04SP	AEPW-AEPW	**CHEROKEE REC TO KNOX LEE, 138KV** 53522 CHEROKE4 138 to 53557 KNOXLEE4 138 CKT 1	287	81.5	86.7	**Multiple Outage Contingency** **SOUTHWEST SHREVEPORT TO LONGWOOD, 345KV** 53454 SW SHV 7 345 to 53424 LONGWD 7 345 CKT 1 **SOUTHWEST SHREVEPORT TO DIANA, 345KV** 53454 SW SHV 7 345 to 53528 DIANA 7 345 CKT 1	670	Upgrade Modeled is Assigned to SPP-2000-086 150680 Est. In-Service Date 4/1/2002		
04SP	AEPW-AEPW	**CHEROKEE REC TO TATUM, 138KV** 53522 CHEROKE4 138 to 53611 TATUM 4 138 CKT 1	287	77.2	82.4	**Multiple Outage Contingency** **SOUTHWEST SHREVEPORT TO LONGWOOD, 345KV** 53454 SW SHV 7 345 to 53424 LONGWD 7 345 CKT 1 **SOUTHWEST SHREVEPORT TO DIANA, 345KV** 53454 SW SHV 7 345 to 53528 DIANA 7 345 CKT 1	670	Upgrade Modeled is Assigned to SPP-2000-086 150680 Est. In-Service Date 2/1/2003		
04WP	KACP-KACP	**LA CYGNE TO STILWELL, 345KV** 57981 LACYGNE7 to 57968 STILWEL7 CKT 1	1315	98.9	102.3	**WEST GARDNER TO LA CYGNE, 345KV** 57965 W.GRDNR7 345 to 57981 LACYGNE7 345 CKT1	216	SPP Flowgate		
06SP	KACP-KACP	**LA CYGNE TO STILWELL, 345KV** 57981 LACYGNE7 to 57968 STILWEL7 CKT 1	1251	105.5	109.0	**WEST GARDNER TO LA CYGNE, 345KV** 57965 W.GRDNR7 345 to 57981 LACYGNE7 345 CKT1	0	SPP Flowgate		
06SP	AEPW-AEPW	**LONGWOOD TO NORAM, 138KV** 53423 LONGWD 4 to 53473 NORAM 4	234	105.3	110.3	**Multiple Outage Contingency** **SOUTHWEST SHREVEPORT TO LONGWOOD, 345KV** 53454 SW SHV 7 345 to 53424 LONGWD 7 345 CKT 1 **SOUTHWEST SHREVEPORT TO DIANA, 345KV** 53454 SW SHV 7 345 to 53528 DIANA 7 345 CKT 1	0		See Previous	
06SP	AEPW-AEPW	**NORAM TO RAINES, 138KV** 53473 NORAM 4 to 53439 RAINES 4 1	234	103.7	108.7	**Multiple Outage Contingency** **SOUTHWEST SHREVEPORT TO LONGWOOD, 345KV** 53454 SW SHV 7 345 to 53424 LONGWD 7 345 CKT 1 **SOUTHWEST SHREVEPORT TO DIANA, 345KV** 53454 SW SHV 7 345 to 53528 DIANA 7 345 CKT 1	0		See Previous	
* 06SP	SWPA-SWPA	**BUFORD TAP TO BULL SHOALS, 161KV** 52661 BUFRDTP5 161 to 52660 BULL SH5 161 CKT 1	167	110.9	122.4	**BULL SHOALS TO MIDWAY, 161KV** 52660 BULL SH5 161 to 99825 5MIDWAY# 161 CKT1	0		See Previous	
* 06SP	SWPA-SWPA	**NORFORK TO BUFORD TAP, 161KV** 52648 NORFORK5 161 to 52661 BUFRDTP5 161 CKT 1	189	96.9	107.0	**BULL SHOALS TO MIDWAY, 161KV** 52660 BULL SH5 161 to 99825 5MIDWAY# 161 CKT1	205		See Previous	

* Facility Not Included In Table 3 of Previous 108c Supplemental Study

Table 3 continued – AEPW – EES 670MW transfer impact on previously assigned and identified SPP Facilities.

Study Year	From Area To Area	Branch Over 100% Rate B	Rate B	BC %Loading	TC %Loading	Outaged Branch That Caused Overload	ATC (MW)	Assignment	Solution	Estimated Cost
06SP	AEPW-AEPW	**IPC JEFFERSON TO LIEBERMAN, 138KV** 53548 IPCJEFF4 138 to 53420 LIEBERM4 138 CKT 1	143	95.6	108.9	**LONGWOOD TO WILKES, 345KV** 53424 LONGWD 7 345 to 53620 WILKES 7 345 CKT1	222	Upgrade Modeled is Assigned to SPP-2000-086 150680 Est. In-Service Date 2/1/2004 Additional Upgrades Required	See Previous	
06SP	AEPW-AEPW	**TATUM TO ROCKHILL, 138KV** 53611 TATUM 4 138 to 53598 ROKHILL4 138 CKT 1	235	94.3	101.0	**Multiple Outage Contingency** **SOUTHWEST SHREVEPORT TO LONGWOOD, 345KV** 53454 SW SHV 7 345 to 53424 LONGWD 7 345 CKT 1 **SOUTHWEST SHREVEPORT TO DIANA, 345KV** 53454 SW SHV 7 345 to 53528 DIANA 7 345 CKT 1	571	Upgrade Modeled is Assigned to SPP-2000-086 150680 Est. In-Service Date 4/1/2002 Additional Upgrades Required	#4 Reconductor other 5.76 miles of 795 ACSR with 1272 ACSR. Reset CTs @ Rock Hill	1,800,000
06SP	AEPW-AEPW	**CHEROKEE REC TO KNOX LEE, 138KV** 53522 CHEROKE4 138 to 53557 KNOXLEE4 138 CKT 1	287	83.0	88.4	**Multiple Outage Contingency** **SOUTHWEST SHREVEPORT TO LONGWOOD, 345KV** 53454 SW SHV 7 345 to 53424 LONGWD 7 345 CKT 1 **SOUTHWEST SHREVEPORT TO DIANA, 345KV** 53454 SW SHV 7 345 to 53528 DIANA 7 345 CKT 1	670	Upgrade Modeled is Assigned to SPP-2000-086 150680 Est. In-Service Date 4/1/2002		
06SP	AEPW-AEPW	**CHEROKEE REC TO TATUM, 138KV** 53522 CHEROKE4 138 to 53611 TATUM 4 138 CKT 1	287	78.6	84.0	**Multiple Outage Contingency** **SOUTHWEST SHREVEPORT TO LONGWOOD, 345KV** 53454 SW SHV 7 345 to 53424 LONGWD 7 345 CKT 1 **SOUTHWEST SHREVEPORT TO DIANA, 345KV** 53454 SW SHV 7 345 to 53528 DIANA 7 345 CKT 1	670	Upgrade Modeled is Assigned to SPP-2000-086 150680 Est. In-Service Date 2/1/2003		
									Total Estimated Costs of Known Solutions	4,929,000

* Facility Not Included In Table 3 of Previous 108c Supplemental Study

Table 4 – SPP Facility Overloads caused by the 670MW AEPW to EES transfer with 500kV line additions.

Study Year	From Area To Area	Branch Over 100% Rate B	Rate B	BC %Loading	TC %Loading	Outaged Branch That Caused Overload	ATC (MW)	Solution	Estimated Cost
		STULL SS TO MOCKINGBIRD HILL SS, 115KV				**HOYT TO STRANGER CREEK, 345KV**			
03G	WERE-WERE	57270 STULL T3 115 to 57253 MOCKBRD3 115 CKT 1	92	99.4	101.6	56765 HOYT 7 345 to 56772 STRANGR7 345 CKT1	174	Solution Undetermined #1	
		DRAPER 345/138KV TRANSFORMER 1				**DRAPER 345/138KV TRANSFORMER 2**			
03G	OKGE-OKGE	54934 DRAPER 7 345 to 54933 DRAPER 4 138 CKT 1	493	98.8	101.7	54933 DRAPER 4 138 to 54934 DRAPER 7 345 CKT2	286	#1 Add Third Transformer	8,000,000
		DRAPER 345/138KV TRANSFORMER 2				**DRAPER 345/138KV TRANSFORMER 1**			
03G	OKGE-OKGE	54934 DRAPER 7 345 to 54933 DRAPER 4 138 CKT 2	493	98.8	101.7	54933 DRAPER 4 138 to 54934 DRAPER 7 345 CKT1	286	See Previous	
		HOYT HTI SWITCHING JCT TO CIRCLEVILLE, 115KV				**IATAN TO ST JOE, 345KV**			
03G	WERE-WERE	57165 HTI JCT3 115 to 57152 CIRCLVL3 115 CKT 1	92	98.5	100.4	57982 IATAN 7 345 to 69702 ST JOE 3 345 CKT1	519	Solution Undetermined #2	
		MONETT TO AURORA HT, 161KV				**LITCHFIELD TO ASBURY, 161KV**			
04SP	EMDE-EMDE	59480 MON383 5 161 to 59468 AUR124 5 161 CKT 1	157	99.8	103.5	56932 LITCH 5 161 to 59476 ASB349 5 161 CKT1	38	Solution Undetermined #3	
		CARTHAGE TO JASPER, 69KV				**MORGAN 161/69KV TRANSFORMER**			
04SP	SWPA-AECI	52690 CARTHG 269.0 to 96649 2JASPER 69.0 CKT 1	47	99.9	101.9	96101 5MORGAN 161 to 96782 2MORGAN 69.0 CKT1	38	Solution Undetermined #4	
		MIDWAY TO BULL SHOALS, 161KV				**CALICO ROCK TO MELBOURNE, 161KV**			
04SP	EES-SWPA	99825 5MIDWAY# 161 to 52660 BULL SH5 161 CKT 1	162	98.9	102.3	99803 5CALCR 161 to 99824 5MELBRN 161 CKT1	222	SWPA Limitation @ 167MVA	
		SOUTHWEST STATION TO ANADARKO, 138KV				**SUNNYSIDE 345/138KV TRANSFORMER**			
04SP	AEPW-WFEC	54140 S.W.S.-4 138 to 55814 ANADARK4 138 CKT 1	203	99.6	100.7	55135 SUNNYSD4 138 to 55136 SUNNYSD7 345 CKT1	249	Solution Undetermined #5	
		EUREKA SPRINGS TO BEAVER DAM, 161KV				**MONETT TO BROOKLINE, 345KV**		#2 Reconductor & Reset	
04SP	AEPW-SWPA	53136 EUREKA 5 161 to 52680 BEAVER 5 161 CKT 1	274	97.1	104.1	59481 MON383 7 345 to 59984 BRKLNE 7 345 CKT1	274	Equipment @ Beaver	3,000,000
		PENSACOLA TO GRAY TAP, 69KV				**PRYOR JCT TO JAY, 138KV**			
04SP	GRRD-GRRD	54428 PENSA 269.0 to 54465 GRAY TP269.0 CKT 1	47	99.5	100.7	53968 PRY-JCT4 138 to 53971 JAY 4 138 CKT1	276	#3 Rebuild 4/0 to 795MCM	1,000,000
		FULTON TO PATMOS, 115KV				**NW TEXARKANA TO MCNEIL, 500KV**		#4 Reconductor 7.1 miles of 666	
04SP	AEPW-EES	53374 FULTON 3 115 to 99303 3PATMOS# 115 CKT 1	174	88.2	113.6	54351 NWTXARK8 500 to 99309 8MCNEIL 500 CKT1	311	ACSR with 1272 ACSR	2,100,000
		HOYT HTI SWITCHING JCT TO CIRCLEVILLE, 115KV				**MIDLAND 230/115KV TRANSFORMER**			
04SP	WERE-WERE	57165 HTI JCT3 115 to 57152 CIRCLVL3 115 CKT 1	92	99.1	100.7	56915 MIDLAND5 161 to 57252 MIDLAND3 115 CKT1	365	See Previous	
		MONETT 161/69KV TRANSFORMER				**MONETT TO AURORA HT, 161KV**			
04SP	EMDE-EMDE	59480 MON383 5 161 to 59591 MON383 269.0 CKT 1	150	99.2	100.6	59468 AUR124 5 161 to 59480 MON383 5 161 CKT1	385	Solution Undetermined #6	
		COUNTY LINE 230/115/69KV TRANSFORMER				**HOYT TO STRANGER CREEK,345KV**			
04SP	WERE-WERE	57456 COLINE 269.0 to 57201 COLINE3X1.00 CKT 1	66	99.0	100.3	56765 HOYT 7 345 to 56772 STRANGR7 345 CKT1	533	Solution Undetermined #7	
		NEOSHO 161/69KV TRANSFORMER				**MIAMI TO SENECA, 69KV**			
04SP	EMDE-AECI	59471 NEO184 5 161 to 96748 2NEOSAC 69.0 CKT 1	56	98.1	100.4	54430 MIAMI 269.0 to 96830 2SENECA 69.0 CKT1	564	Solution Undetermined #8	
		GLASSES TO RUSSETT, 138KV				**BROWN TO BROWN, 138KV**			
04SP	OKGE-OKGE	55147 GLASSES4 138 to 55120 RUSSETT4 138 CKT 1	96	99.1	100.2	52802 S BROWN4 138 to 55157 BROWN 4 138 CKT1	565	Solution Undetermined #9	
		PECAN CREEK 345/161KV TRANSFORMER				**MUSKOGEE TO FORT SMITH, 345KV**			
04SP	OKGE-OKGE	55235 PECANCK7 345 to 55234 PECANCK5 161 CKT 1	369	92.4	100.1	55224 MUSKOGE7 345 to 55302 FTSMITH7 345 CKT1	660	#5 Add Second Transformer	3,500,000
		CARTHAGE TO REEDS SPRING, 69KV				**STILWELL TO LA CYGNE, 345KV**			
04WP	SWPA-AECI	52690 CARTHG 269.0 to 96751 2REEDS 69.0 CKT 1	43	99.6	102.5	57968 STILWEL7 345 to 57981 LACYGNE7 345 CKT1	96	Solution Undetermined #10	
		CARTHAGE TO JASPER, 69KV				**STILWELL TO LA CYGNE, 345KV**			
04WP	SWPA-AECI	52690 CARTHG 269.0 to 96649 2JASPER 69.0 CKT 1	52	99.3	101.4	57968 STILWEL7 345 to 57981 LACYGNE7 345 CKT1	224	See Previous	
		PENSACOLA TO GRAY TAP, 69KV				**KANSAS TAP TO KANSAS, 161KV**			
04WP	GRRD-GRRD	54428 PENSA 269.0 to 54465 GRAY TP269.0 CKT 1	47	99.5	100.9	54514 KANSATP5 161 to 54516 KANSAS 5 161 CKT1	236	See Previous	
		FULTON TO PATMOS, 115KV				**NW TEXARKANA TO MCNEIL, 500KV**			
04WP	AEPW-EES	53374 FULTON 3 115 to 99303 3PATMOS# 115 CKT 1	197	86.6	107.4	54351 NWTXARK8 500 to 99309 8MCNEIL 500 CKT1	430	See Previous	
		HOYT HTI SWITCHING JCT TO CIRCLEVILLE, 115KV				**EAST MANHATTAN TO CONCORD, 230KV**			
04WP	WERE-WERE	57165 HTI JCT3 115 to 57152 CIRCLVL3 115 CKT 1	92	99.0	100.4	56861 EMANHAT6 230 to 58758 CONCORD6 230 CKT1	489	See Previous	
		RS KERR TO VAN BUREN, 161KV				**BONANZA TAP TO AES, 161KV**			
06SP	SWPA-SWPA	52782 RS KERR5 161 to 52722 VAN BUR5 161 CKT 1	167	99.8	105.0	55261 BONANZT5 161 to 55262 AES 5 161 CKT1	31	#6 Replace Switches	105,000

Table 4 continued – SPP Facility Overloads caused by the 670MW AEPW to EES transfer with 500kV line additions.

Study Year	From Area To Area	Branch Over 100% Rate B	Rate B	BC %Loading	TC %Loading	Outaged Branch That Caused Overload	ATC (MW)	Solution	Estimated Cost
		FRANKLIN SW TO MIDWEST, 138KV				**MIDWEST TO HOLLYWOOD, 138KV**			
06SP	WFEC-OKGE	55917 FRNKLNS4 138 to 54946 MIDWEST4 138 CKT 1	215	99.6	102.9	54946 MIDWEST4 138 to 54953 HOLLYWD4 138 CKT1	81	Solution Undetermined #11	
		CARTHAGE TO JASPER, 69KV				**MUSKOGEE TO FORT SMITH, 345KV**			
06SP	SWPA-AECI	52690 CARTHG 269.0 to 96649 2JASPER 69.0 CKT 1	47	99.6	102.1	55224 MUSKOGE7 345 to 55302 FTSMITH7 345 CKT1	97	See Previous	
		CARTHAGE TO REEDS SPRING, 69KV				**DECATUR SOUTH TO NOEL SW, 161KV**			
06SP	SWPA-AECI	52690 CARTHG 269.0 to 96751 2REEDS 69.0 CKT 1	36	99.5	102.7	59484 DEC392 5 161 to 59496 NOL435 5 161 CKT1	103	See Previous	
		FULTON TO PATMOS, 115KV				**NW TEXARKANA TO MCNEIL, 500KV**			
06SP	AEPW-EES	53374 FULTON 3 115 to 99303 3PATMOS# 115 CKT 1	174	94.5	119.7	54351 NWTXARK8 500 to 99309 8MCNEIL 500 CKT1	146	See Previous	
		FERNDALE LAKE TAP TO PITTSBURG, 69KV				**HOPEWELL REC TO MT VERNON TAP, 69KV**			
06SP	AEPW-AEPW	53531 FERNDTP269.0 to 53310 PITTSB_269.0 CKT 1	72	99.8	100.6	53262 HOPEWEL269.0 to 53353 MTVERNT269.0 CKT1	160	Solution Undetermined #12	
		PECAN CREEK 345/161KV TRANSFORMER				**MUSKOGEE TO FORT SMITH, 345KV**			
06SP	OKGE-OKGE	55235 PECANCK7 345 to 55234 PECANCK5 161 CKT 1	369	97.7	105.5	55224 MUSKOGE7 345 to 55302 FTSMITH7 345 CKT1	195	See Previous	
		PHAROAH TO WELEETKA, 138KV				**FRANKLIN TO FRANKLIN SWITCH, 138KV**			
06SP	WFEC-SWPA	56026 PHAROAH4 138 to 52792 WELEETK4 138 CKT 1	191	99.7	100.6	55913 FRANKLN4 138 to 55917 FRNKLNS4 138 CKT1	233	Solution Undetermined #13	
		MIDWAY TO BULL SHOALS, 161KV				**BULL SHOALS TO GAINESVILLE, 161KV**			
06SP	EES-SWPA	99825 5MIDWAY# 161 to 52660 BULL SH5 161 CKT 1	162	98.2	102.8	52660 BULL SH5 161 to 96081 5GAINES 161 CKT1	262	See Previous	
		TINKER #4 TO TINKER #2, 138KV				**DRAPER TO GM, 138KV**		#7 Replace one mile 138kV UG	
06SP	OKGE-OKGE	54990 TINKER24 138 to 54988 TINKER44 138 CKT 1	100	97.4	101.3	54933 DRAPER 4 138 to 54961 GM 4 138 CKT1	445	Cable	1,000,000
		WINFIELD TO ADORA REC, 69KV				**PERDUE TO LAKE HAWKINS, 138KV**			
06SP	AEPW-AEPW	53335 WINFIEL269.0 to 53243 ADORA 269.0 CKT 1	85	98.3	100.7	53590 PERDUE 4 138 to 53666 LHAWKIN4 138 CKT1	473	Solution Undetermined #14	
		WILBURTON TO LONE OAK, 69KV				**EUFAULA TO STIGLER TAP, 138KV**			
06SP	AEPW-AEPW	54031 WILBURT269.0 to 54021 LONEOAK269.0 CKT 1	48	98.4	100.6	52774 EUFAULA4 138 to 54050 STIGLRT4 138 CKT1	491	Solution Undetermined #15	
		LELMDALE TO DYESS, 161KV CKT 2				**LELMDALE TO DYESS, 161KV CKT 1**		#8 Rebuild & Replace switches	
06SP	AEPW-AEPW	53175 LELMDAL5 161 to 53131 DYESS 5 161 CKT 2	354	99.2	100.2	53131 DYESS 5 161 to 53175 LELMDAL5 161 CKT1	517	& breaker @Dyess	2,000,000
		GLASSES TO RUSSETT, 138KV				**BROWN TO BROWN, 138KV**			
06SP	OKGE-OKGE	55147 GLASSES4 138 to 55120 RUSSETT4 138 CKT 1	96	99.2	100.2	52802 S BROWN4 138 to 55157 BROWN 4 138 CKT1	559	See Previous	
		EAST CENTERTON TO GENTRY REC, 161KV				**LOWELL TO LELMDAL, 161KV**			
06SP	AEPW-AEPW	53133 ECNTRTN5 161 to 53187 GENTRYR5 161 CKT 1	353	98.7	100.1	53144 LOWELL 5 161 to 53175 LELMDAL5 161 CKT1	632	Solution Undetermined #16	
		KERR TO KANSAS TAP, 161KV				**FLINT CREEK TO GRDA ONE, 345KV**			
06SP	GRRD-GRRD	54435 KERR GR5 161 to 54514 KANSATP5 161 CKT 1	328	98.1	100.1	53140 FLINTCR7 345 to 54450 GRDA1 7 345 CKT1	648	Solution Undetermined #17	
								Total Estimated Costs of Known Solutions	20,705,000

Table 5 – Non SPP Facility Overloads caused by the 670MW AEPW to EES transfer with 500kV line additions.

Study Year	From Area To Area	Branch Over 100% Rate B	Rate B	BC %Loading	TC %Loading	Outaged Branch That Caused Overload
03G	AMRN-AMRN	31221 MOBERLY 161 to 31409 OVERTON 161 CKT 1	142	99.7	100.9	96044 7MCCRED 345 to 96049 7THOMHL 345 CKT1
03G	EES-EES	99302 3CAMD-S# 115 to 99278 3STEPHN 115 CKT 1	96	98.9	101.7	99277 3SMACKO* 115 to 99312 3ELD-DO* 115 CKT1
03G	EES-EES	99302 3CAMD-S# 115 to 99278 3STEPHN 115 CKT 1	96	98.7	101.5	99293 3ELDEHV 115 to 99312 3ELD-DO* 115 CKT1
04SP	MIPU-AECI	59217 WINDSR 5 161 to 96071 5CLINTN 161 CKT 1	123	97.2	100.7	59228 WBURGE 5 161 to 59229 ODESSA 5 161 CKT1
04SP	AECI-AECI	96137 4BRISTOW 138 to 96889 2BRISTOW69.0 CKT 1	56	99.2	100.7	96137 4BRISTOW 138 to 96889 2BRISTOW69.0 CKT2
04SP	AECI-AECI	96137 4BRISTOW 138 to 96889 2BRISTOW69.0 CKT 2	56	99.2	100.7	96137 4BRISTOW 138 to 96889 2BRISTOW69.0 CKT1
04SP	EES-EES	97618 4NEWTONB 138 to 97768 4HLYSPG# 138 CKT 1	112	96.7	101.2	53526 CROCKET7 345 to 53637 TENRUSK7 345 CKT1
04SP	EES-EES	97618 4NEWTONB 138 to 97768 4HLYSPG# 138 CKT 1	112	99.9	100.8	97700 4KOUNTZE 138 to 97710 4WARREN 138 CKT1
04SP	EES-EES	97919 6VERDINE 230 to 97917 6NELSN 230 CKT 1	470	99.6	101.2	97917 6NELSN 230 to 97921 6CARLYSS 230 CKT1
04SP	EES-EES	98229 4PT HUD 138 to 98230 2PT.HUD 69.0 CKT 2	100	99.7	100.2	97301 CAJUN2 8 500 to 98430 8WEBRE 500 CKT1
04SP	EES-EES	98273 4OAKGROV 138 to 98283 T300/331 138 CKT 1	135	99.8	102.1	98235 8MCKNT 500 to 15035 8DANIEL 500 CKT1
04SP	EES-EES	99263 3LEWIS # 115 to 99230 3COUCH 115 CKT 1	159	84.0	111.8	54351 NWTXARK8 500 to 99309 8MCNEIL 500 CKT1
04SP	EES-EES	99264 3MAG-DW 115 to 99230 3COUCH 115 CKT 1	108	97.9	101.8	50045 DOLHILL7 345 to 50046 DOLHILL6 230 CKT1
04SP	EES-EES	99266 3MAG-ST 115 to 99308 3MAG-E 115 CKT 1	159	99.2	100.7	99230 3COUCH 115 to 99264 3MAG-DW 115 CKT1
04SP	EES-EES	99275 3SHULER 115 to 99265 3MAG-S 115 CKT 1	120	96.0	100.5	99293 3ELDEHV 115 to 99295 8ELDEHV 500 CKT1
04SP	EES-EES	99280 3TAYLOR 115 to 99264 3MAG-DW 115 CKT 1	159	99.3	101.4	99266 3MAG-ST 115 to 99288 3KERLIN* 115 CKT1
04SP	EES-EES	99303 3PATMOS# 115 to 99263 3LEWIS # 115 CKT 1	159	93.7	121.5	54351 NWTXARK8 500 to 99309 8MCNEIL 500 CKT1
04SP	EES-EES	99554 3LR-SPR* 115 to 99552 3LR-S 1 115 CKT 1	159	99.8	100.6	99533 5GRAVEL# 161 to 99588 5SYLVN 161 CKT1
04SP	EES-EES	99554 3LR-SPR* 115 to 99552 3LR-S 1 115 CKT 1	159	99.8	100.6	99587 3SYLVN 115 to 99588 5SYLVN 161 CKT1
04SP	EES-EES	99554 3LR-SPR* 115 to 99552 3LR-S 1 115 CKT 1	159	99.8	100.1	99518 5GREENB* 161 to 99519 5QUITMN 161 CKT1
04WP	AECI-AECI	96090 5KINGDM 161 to 96517 2KINGDM 69.0 CKT 1	29	99.7	100.3	96090 5KINGDM 161 to 96523 5WLMSBG 161 CKT1
04WP	AECI-AECI	96090 5KINGDM 161 to 96517 2KINGDM 69.0 CKT 1	29	99.4	100.1	96099 5MONTCT 161 to 96523 5WLMSBG 161 CKT1
04WP	AECI-AECI	96090 5KINGDM 161 to 96517 2KINGDM 69.0 CKT 2	29	99.6	100.2	96090 5KINGDM 161 to 96523 5WLMSBG 161 CKT1
04WP	AECI-AECI	96098 5MOCITY 161 to 96153 1MOCTN1 100 CKT 1	34	99.3	100.2	96091 5LATHRP 161 to 96302 2LATHRP 69.0 CKT1
04WP	AECI-AECI	96153 1MOCTN1 100 to 96304 2MOCITY 69.0 CKT 1	34	99.3	100.2	96091 5LATHRP 161 to 96302 2LATHRP 69.0 CKT1
04WP	AECI-AECI	96154 1MOCTN2 100 to 96098 5MOCITY 161 CKT 2	34	99.4	100.2	96091 5LATHRP 161 to 96302 2LATHRP 69.0 CKT1
04WP	AECI-AECI	96154 1MOCTN2 100 to 96304 2MOCITY 69.0 CKT 2	34	99.4	100.2	96091 5LATHRP 161 to 96302 2LATHRP 69.0 CKT1
04WP	EES-EES	99263 3LEWIS # 115 to 99230 3COUCH 115 CKT 1	159	96.9	122.6	54351 NWTXARK8 500 to 99309 8MCNEIL 500 CKT1
04WP	EES-EES	99263 3LEWIS # 115 to 99303 3PATMOS# 115 CKT 1	159	99.3	108.2	99309 8MCNEIL 500 to 99310 3MCNEIL 115 CKT1
04WP	EES-EES	99389 4MURFRE 138 to 99387 3MURF-S 115 CKT 1	60	80.5	108.3	54351 NWTXARK8 500 to 99309 8MCNEIL 500 CKT1
06SP	AMRN-AECI	31221 MOBERLY 161 to 96120 5THMHIL 161 CKT 1	372	99.2	100.1	96044 7MCCRED 345 to 96049 7THOMHL 345 CKT1
06SP	MIPU-AECI	59217 WINDSR 5 161 to 96071 5CLINTN 161 CKT 1	123	99.5	102.7	59227 OAKGRV 5 161 to 59229 ODESSA 5 161 CKT1
06SP	NPPD-NPPD	64181 MAXWELL7 115 to 64039 CALAWAY7 115 CKT 1	105	99.5	100.2	64102 GENTLMN3 345 to 64282 SWEET W3 345 CKT2
06SP	SJLP-SJLP	69703 ST JOE 5 161 to 69701 MIDWAY 5 161 CKT 1	164	99.7	101.8	96039 7FAIRPT 345 to 96076 5FAIRPT 161 CKT3
06SP	EES-EES	97618 4NEWTONB 138 to 97768 4HLYSPG# 138 CKT 1	112	99.1	103.8	53526 CROCKET7 345 to 53637 TENRUSK7 345 CKT1
06SP	EES-EES	97618 4NEWTONB 138 to 97768 4HLYSPG# 138 CKT 1	112	98.6	101.7	97691 8CYPRESS 500 to 97717 8HARTBRG 500 CKT1
06SP	EES-EES	97618 4NEWTONB 138 to 97768 4HLYSPG# 138 CKT 1	112	98.6	101.7	97690 4CYPRESS 138 to 97691 8CYPRESS 500 CKT1
06SP	EES-EES	97768 4HLYSPG# 138 to 97698 4JASPER 138 CKT 1	112	97.0	102.3	53526 CROCKET7 345 to 97513 7GRIMES 345 CKT1
06SP	EES-EES	98273 4OAKGROV 138 to 98283 T300/331 138 CKT 1	135	94.9	100.3	98246 8WGLEN 500 to 98539 8WATERFO 500 CKT1
06SP	EES-EES	98273 4OAKGROV 138 to 98283 T300/331 138 CKT 1	135	94.8	100.2	98537 6WATFRD 230 to 98539 8WATERFO 500 CKT1
06SP	EES-EES	98569 6BGATEL 230 to 98259 6CONWY 230 CKT 1	436	99.4	100.5	97333 VIGNES 6 230 to 98544 6SORR 2 230 CKT1
06SP	EES-EES	99032 3LIBRTY 115 to 99060 3GILBR* 115 CKT 1	69	99.9	100.1	98482 3INDEPD 115 to 98484 3HAMMND 115 CKT1
06SP	EES-EES	99122 3ALTO 1 115 to 99123 3SWARTZ 115 CKT 1	114	98.7	101.2	98938 3B.WLSN 115 to 98950 3VKSB-S 115 CKT1
06SP	EES-EES	99263 3LEWIS # 115 to 99230 3COUCH 115 CKT 1	159	91.4	119.0	54351 NWTXARK8 500 to 99309 8MCNEIL 500 CKT1
06SP	EES-EES	99264 3MAG-DW 115 to 99230 3COUCH 115 CKT 1	108	98.6	101.2	99172 3SAREPT 115 to 99173 3HAYNVL 115 CKT1
06SP	EES-EES	99264 3MAG-DW 115 to 99230 3COUCH 115 CKT 1	108	99.4	101.1	99182 3DANVLL 115 to 99188 3JNSBRO 115 CKT1
06SP	EES-EES	99303 3PATMOS# 115 to 99263 3LEWIS # 115 CKT 1	159	99.1	109.1	99309 8MCNEIL 500 to 99310 3MCNEIL 115 CKT1

Table 6 – AEPW – EES 670MW transfer impact on previously assigned and identified SPP Facilities with 500kV line additions.

Study Year	From Area To Area	Branch Over 100% Rate B	Rate B	BC %Loading	TC %Loading	Outaged Branch That Caused Overload	ATC (MW)	Assignment	Solution	Estimated Cost
03G	AEPW-AEPW	**IPC JEFFERSON TO LIEBERMAN, 138KV** 53548 IPCJEFF4 138 to 53420 LIEBERM4 138 CKT 1	143	66.2	74.0	**LONGWOOD TO WILKES, 345KV** 53424 LONGWD 7 345 to 53620 WILKES 7 345 CKT1	670	Upgrade Modeled is Assigned to SPP-2000-086 150680 Est. In-Service Date 2/1/2004		
04SP	KACP-KACP	**LA CYGNE TO STILWELL, 345KV** 57981 LACYGNE7 to 57968 STILWEL7 CKT 1	1251	108.9	111.3	**WEST GARDNER TO LA CYGNE, 345KV** 57965 W.GRDNR7 345 to 57981 LACYGNE7 345 CKT1	0	SPP Flowgate		
04SP	SWPA-SWPA	**BUFORD TAP TO BULL SHOALS, 161KV** 52661 BUFRDTP5 161 to 52660 BULL SH5 161 CKT 1	167	99.2	106.9	**BULL SHOALS TO MIDWAY, 161KV** 52660 BULL SH5 161 to 99825 5MIDWAY# 161 CKT1	72		Solution Undetermined #1	
04SP	AEPW-AEPW	**LONGWOOD TO NORAM, 138KV** 53423 LONGWD 4 to 53473 NORAM 4	234	97.3	100.9	**Multiple Outage Contingency** **SOUTHWEST SHREVEPORT TO LONGWOOD, 345KV** 53454 SW SHV 7 345 to 53424 LONGWD 7 345 CKT 1 **SOUTHWEST SHREVEPORT TO DIANA, 345KV** 53454 SW SHV 7 345 to 53528 DIANA 7 345 CKT 1	508		#1 Reconductor 4.66 miles of bundled 266 ACSR with 1590 ACSR	1,333,000
04SP	AEPW-AEPW	**NORAM TO RAINES, 138KV** 53473 NORAM 4 to 53439 RAINES 4 1	234	95.7	99.3	**Multiple Outage Contingency** **SOUTHWEST SHREVEPORT TO LONGWOOD, 345KV** 53454 SW SHV 7 345 to 53424 LONGWD 7 345 CKT 1 **SOUTHWEST SHREVEPORT TO DIANA, 345KV** 53454 SW SHV 7 345 to 53528 DIANA 7 345 CKT 1	670		#2 Rebuild 5.58 miles of 2-266 ACSR with 1590 ACSR	1,596,000
04SP	KACP-KACP	**WEST GARDNER TO LA CYGNE, 345KV** 57965 W.GRDNR7 345 to 57981 LACYGNE7 345 CKT1	1251	97.1	99.2	**LA CYGNE TO STILWELL, 345KV** 57981 LACYGNE7 to 57968 STILWEL7 CKT 1	670			
04SP	AEPW-AEPW	**IPC JEFFERSON TO LIEBERMAN, 138KV** 53548 IPCJEFF4 138 to 53420 LIEBERM4 138 CKT 1	143	70.4	78.1	**LONGWOOD TO WILKES, 345KV** 53424 LONGWD 7 345 to 53620 WILKES 7 345 CKT1	670	Upgrade Modeled is Assigned to SPP-2000-086 150680 Est. In-Service Date 2/1/2004		
04SP	SWPA-SWPA	**NORFORK TO BUFORD TAP, 161KV** 52648 NORFORK5 161 to 52661 BUFRDTP5 161 CKT 1	189	86.6	93.4	**BULL SHOALS TO MIDWAY, 161KV** 52660 BULL SH5 161 to 99825 5MIDWAY# 161 CKT1	670			
04SP	AEPW-AEPW	**TATUM TO ROCKHILL, 138KV** 53611 TATUM 4 138 to 53598 ROKHILL4 138 CKT 1	235	84.1	87.9	**Multiple Outage Contingency** **SOUTHWEST SHREVEPORT TO LONGWOOD, 345KV** 53454 SW SHV 7 345 to 53424 LONGWD 7 345 CKT 1 **SOUTHWEST SHREVEPORT TO DIANA, 345KV** 53454 SW SHV 7 345 to 53528 DIANA 7 345 CKT 1	670	Upgrade Modeled is Assigned to SPP-2000-086 150680 Est. In-Service Date 4/1/2002		
04SP	AEPW-AEPW	**CHEROKEE REC TO KNOX LEE, 138KV** 53522 CHEROKE4 138 to 53557 KNOXLEE4 138 CKT 1	287	74.4	77.6	**Multiple Outage Contingency** **SOUTHWEST SHREVEPORT TO LONGWOOD, 345KV** 53454 SW SHV 7 345 to 53424 LONGWD 7 345 CKT 1 **SOUTHWEST SHREVEPORT TO DIANA, 345KV** 53454 SW SHV 7 345 to 53528 DIANA 7 345 CKT 1	670	Upgrade Modeled is Assigned to SPP-2000-086 150680 Est. In-Service Date 4/1/2002		
04SP	AEPW-AEPW	**CHEROKEE REC TO TATUM, 138KV** 53522 CHEROKE4 138 to 53611 TATUM 4 138 CKT 1	287	70.1	73.3	**Multiple Outage Contingency** **SOUTHWEST SHREVEPORT TO LONGWOOD, 345KV** 53454 SW SHV 7 345 to 53424 LONGWD 7 345 CKT 1 **SOUTHWEST SHREVEPORT TO DIANA, 345KV** 53454 SW SHV 7 345 to 53528 DIANA 7 345 CKT 1	670	Upgrade Modeled is Assigned to SPP-2000-086 150680 Est. In-Service Date 2/1/2003		

Table 6 continued – AEPW – EES 670MW transfer impact on previously assigned and identified SPP Facilities with 500kV line additions.

Study Year	From Area To Area	Branch Over 100% Rate B	Rate B	BC %Loading	TC %Loading	Outaged Branch That Caused Overload	ATC (MW)	Assignment	Solution	Estimated Cost
04WP	KACP-KACP	**LA CYGNE TO STILWELL, 345KV** 57981 LACYGNE7 to 57968 STILWEL7 CKT 1	1315	97.6	99.9	**WEST GARDNER TO LA CYGNE, 345KV** 57965 W.GRDNR7 345 to 57981 LACYGNE7 345 CKT1	670	SPP Flowgate		
06SP	KACP-KACP	**LA CYGNE TO STILWELL, 345KV** 57981 LACYGNE7 to 57968 STILWEL7 CKT 1	1251	103.9	106.3	**WEST GARDNER TO LA CYGNE, 345KV** 57965 W.GRDNR7 345 to 57981 LACYGNE7 345 CKT1	0	SPP Flowgate		
06SP	AEPW-AEPW	**LONGWOOD TO NORAM, 138KV** 53423 LONGWD 4 to 53473 NORAM 4	234	101.5	105.1	**Multiple Outage Contingency** **SOUTHWEST SHREVEPORT TO LONGWOOD, 345KV** 53454 SW SHV 7 345 to 53424 LONGWD 7 345 CKT 1 **SOUTHWEST SHREVEPORT TO DIANA, 345KV** 53454 SW SHV 7 345 to 53528 DIANA 7 345 CKT 1	0		See Previous	
06SP	SWPA-SWPA	**BUFORD TAP TO BULL SHOALS, 161KV** 52661 BUFRDTP5 161 to 52660 BULL SH5 161 CKT 1	167	106.0	113.6	**BULL SHOALS TO MIDWAY, 161KV** 52660 BULL SH5 161 to 99825 5MIDWAY# 161 CKT1	0		See Previous	
06SP	AEPW-AEPW	**NORAM TO RAINES, 138KV** 53473 NORAM 4 to 53439 RAINES 4 1	234	99.9	103.5	**Multiple Outage Contingency** **SOUTHWEST SHREVEPORT TO LONGWOOD, 345KV** 53454 SW SHV 7 345 to 53424 LONGWD 7 345 CKT 1 **SOUTHWEST SHREVEPORT TO DIANA, 345KV** 53454 SW SHV 7 345 to 53528 DIANA 7 345 CKT 1	16		See Previous	
06SP	SWPA-SWPA	**NORFORK TO BUFORD TAP, 161KV** 52648 NORFORK5 161 to 52661 BUFRDTP5 161 CKT 1	189	92.5	99.3	**BULL SHOALS TO MIDWAY, 161KV** 52660 BULL SH5 161 to 99825 5MIDWAY# 161 CKT1	670			
06SP	AEPW-AEPW	**IPC JEFFERSON TO LIEBERMAN, 138KV** 53548 IPCJEFF4 138 to 53420 LIEBERM4 138 CKT 1	143	73.0	80.9	**LONGWOOD TO WILKES, 345KV** 53424 LONGWD 7 345 to 53620 WILKES 7 345 CKT1	670	Upgrade Modeled is Assigned to SPP-2000-086 150680 Est. In-Service Date 2/1/2004		
06SP	AEPW-AEPW	**TATUM TO ROCKHILL, 138KV** 53611 TATUM 4 138 to 53598 ROKHILL4 138 CKT 1	235	85.4	89.4	**Multiple Outage Contingency** **SOUTHWEST SHREVEPORT TO LONGWOOD, 345KV** 53454 SW SHV 7 345 to 53424 LONGWD 7 345 CKT 1 **SOUTHWEST SHREVEPORT TO DIANA, 345KV** 53454 SW SHV 7 345 to 53528 DIANA 7 345 CKT 1	670	Upgrade Modeled is Assigned to SPP-2000-086 150680 Est. In-Service Date 4/1/2002		
06SP	AEPW-AEPW	**CHEROKEE REC TO KNOX LEE, 138KV** 53522 CHEROKE4 138 to 53557 KNOXLEE4 138 CKT 1	287	75.7	78.9	**Multiple Outage Contingency** **SOUTHWEST SHREVEPORT TO LONGWOOD, 345KV** 53454 SW SHV 7 345 to 53424 LONGWD 7 345 CKT 1 **SOUTHWEST SHREVEPORT TO DIANA, 345KV** 53454 SW SHV 7 345 to 53528 DIANA 7 345 CKT 1	670	Upgrade Modeled is Assigned to SPP-2000-086 150680 Est. In-Service Date 4/1/2002		
06SP	AEPW-AEPW	**CHEROKEE REC TO TATUM, 138KV** 53522 CHEROKE4 138 to 53611 TATUM 4 138 CKT 1	287	71.3	74.5	**Multiple Outage Contingency** **SOUTHWEST SHREVEPORT TO LONGWOOD, 345KV** 53454 SW SHV 7 345 to 53424 LONGWD 7 345 CKT 1 **SOUTHWEST SHREVEPORT TO DIANA, 345KV** 53454 SW SHV 7 345 to 53528 DIANA 7 345 CKT 1	670	Upgrade Modeled is Assigned to SPP-2000-086 150680 Est. In-Service Date 2/1/2003		
									Total Estimated Costs of Known Solutions	2,929,000

Table 7 – New Overloads caused by the Pittburg-NW Texarkana-McNeil 500kV line additions

Study Year	From Area To Area	Branch Over 100% Rate B	Rate B	BC Without New Lines %Loading	BC With New Lines %Loading	Outaged Branch That Caused Overload	Solution	Estimated Cost
03G	EES-EES	99264 3MAG-DW 115 to 99230 3COUCH 115 CKT 1	108	96.9	100.8	99308 3MAG-E 115 to 99310 3MCNEIL 115 CKT1		
04SP	AEPW-AEPW	53374 FULTON 3 115 to 53383 HOPE 3 115 CKT 1	174	90.3	101.9	53301 NWTXARK7 345 to 53372 FULTON 7 345 CKT1	Solution Undetermined #1	
04SP	AEPW-AEPW	53374 FULTON 3 115 to 53383 HOPE 3 115 CKT 1	174	90.2	101.8	53372 FULTON 7 345 to 53374 FULTON 3 115 CKT1	See Previous	
04SP	AEPW-WFEC	54140 S.W.S.-4 138 to 55814 ANADARK4 138 CKT 1	203	99.9	100.4	54112 CORNVIL4 138 to 55867 CORN TP4 138 CKT1	See Previous	
04SP	EES-EES	98410 4LIVON 138 to 98147 4L-642TP 138 CKT 1	289	99.6	102.2	98107 8RICHARD 500 to 98430 8WEBRE 500 CKT1		
04SP	EES-EES	99146 3STERL 115 to 99232 3CROS-N 115 CKT 1	80	99.6	100.4	99286 3CROS-S* 115 to 99305 3MERIDN# 115 CKT1		
04SP	EES-EES	99173 3HAYNVL 115 to 99249 3EMERSN 115 CKT 1	114	99.9	103.2	99171 3SPRINGH 115 to 99280 3TAYLOR 115 CKT1		
04SP	EES-EES	99542 3LR-FOU 115 to 99554 3LR-SPR* 115 CKT 1	159	98.8	100.4	99555 3LR-W 1 115 to 99557 3LR-WOD 115 CKT1		
04SP	EES-EES	99554 3LR-SPR* 115 to 99552 3LR-S 1 115 CKT 1	159	99.9	101.5	99543 3LR-GNS 115 to 99557 3LR-WOD 115 CKT1		
04SP	EES-EES	99782 5TRUMAN 161 to 99750 5HRSBRG* 161 CKT 1	148	99.8	101.4	99736 5CASH 1 161 to 99755 5JONES 161 CKT1		
04SP	EES-EES	99782 5TRUMAN 161 to 99781 5TRUM-W# 161 CKT 1	148	98.8	100.5	99763 5NEW-IN 161 to 99764 5NEWPO 161 CKT1		
04WP	EES-EES	99146 3STERL 115 to 99232 3CROS-N 115 CKT 1	80	99.0	100.2	99282 3WARR-E 115 to 99298 3CARMEL* 115 CKT1		
04WP	EES-EES	99263 3LEWIS # 115 to 99303 3PATMOS# 115 CKT 1	159	99.0	104.9	54351 NWTXARK8 500 to 99309 8MCNEIL 500 CKT1		
04WP	EES-EES	99264 3MAG-DW 115 to 99230 3COUCH 115 CKT 1	108	98.6	100.3	99308 3MAG-E 115 to 99310 3MCNEIL 115 CKT1		
06SP	AEPW-AEPW	53202 MIDLREA269.0 to 53142 HUNTING269.0 CKT 1	48	96.4	100.1	55263 TARBY 269.0 to 55278 HEAVENR269.0 CKT1	Solution Undetermined #2	
06SP	AEPW-AEPW	53374 FULTON 3 115 to 53383 HOPE 3 115 CKT 1	174	94.8	106.3	53301 NWTXARK7 345 to 53372 FULTON 7 345 CKT1	See Previous	
06SP	AEPW-AEPW	53374 FULTON 3 115 to 53383 HOPE 3 115 CKT 1	174	94.8	106.3	53372 FULTON 7 345 to 53374 FULTON 3 115 CKT1	See Previous	
06SP	OKGE-OKGE	55339 VBI 5 161 to 55336 VBI 269.0 CKT 2	40	99.1	100.2	55342 MASSARD269.0 to 55343 MASSARD5 161 CKT1	Solution Undetermined #3	
06SP	LAGN-EES	97311 GRENWD 3 115 to 98520 3HUMPHY 115 CKT 1	228	98.6	101.0	98107 8RICHARD 500 to 98430 8WEBRE 500 CKT1		
06SP	EES-EES	97618 4NEWTONB 138 to 97768 4HLYSPG# 138 CKT 1	112	99.7	100.6	97700 4KOUNTZE 138 to 97710 4WARREN 138 CKT1		
06SP	EES-EES	99171 3SPRINGH 115 to 99280 3TAYLOR 115 CKT 1	120	99.8	102.4	99249 3EMERSN 115 to 99288 3KERLIN* 115 CKT1		
06SP	EES-EES	99173 3HAYNVL 115 to 99249 3EMERSN 115 CKT 1	114	96.1	100.1	99230 3COUCH 115 to 99264 3MAG-DW 115 CKT1		
06SP	EES-EES	99278 3STEPHN 115 to 99302 3CAMD-S# 115 CKT 1	96	97.6	102.1	99293 3ELDEHV 115 to 99295 8ELDEHV 500 CKT1		
06SP	EES-EES	99540 3LR-CHI 115 to 99546 3LR-MAN 115 CKT 1	319	99.9	100.6	99539 3LR-ALX 115 to 99566 3MABEL 115 CKT1		
06SP	EES-EES	99542 3LR-FOU 115 to 99554 3LR-SPR* 115 CKT 1	159	98.2	100.1	99341 3WH BLF 115 to 99538 3LR-145 115 CKT1		
06SP	EES-EES	99554 3LR-SPR* 115 to 99552 3LR-S 1 115 CKT 1	159	99.5	101.4	99532 3FAUKLK 115 to 99562 3LYNCH 115 CKT1		
06SP	EES-EES	99782 5TRUMAN 161 to 99781 5TRUM-W# 161 CKT 1	148	99.5	101.5	99762 5NEW-AB 161 to 99763 5NEW-IN 161 CKT1		
							Total Estimated Costs of Known Solutions	0

5. Conclusion

The AEPW to EES transfer creates many new overloads in the system. In order to relieve some of these overloads, the Pittsburg-NW Texarkana-McNeil 500kV line was proposed. Although, the proposed line decreases the estimated facilities requiring possible upgrades by 23, preliminary cost analysis shows that the proposed line is not a cost effective solution for just the AEPW to EES 670MW request alone.

SPP feels that the proposed 500kV line should still be considered a viable solution and may be justified as a solution for future requests.

Therefore, the results show that the 670MW transfer requires the following system improvements to be completed before the start of service.

1. The upgrades associated with the facility overloads identified in Table 1 will be required before the start of service.

2. Any previously assigned upgrades and additional upgrades associated with the facilities in Table 3 will be required.

3. The upgrade associated with the La Cygne to Stilwell 345kV line overload will be required.

4. Third-party system additions will need to be reviewed with affected transmission owners.

A Facility Study is required to determine the details and costs of upgrades.

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 - X Phase shift adjustment
   _ Flat start
   _ Lock DC taps
   _ Lock switched shunts

ACCC CASES:
Solutions – AC contingency checking (ACCC)
1. MW mismatch tolerance –0.5
2. Contingency case rating – Rate B
3. Percent of rating – 100
4. Output code – Summary
5. Min flow change in overload report – 1mw
6. Excld 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 - X Phase shift adjustment
   _ Flat start
   _ Lock DC taps
   _ Lock switched shunts