



SPP *Southwest Power Pool*

*System Impact Study
SPP-2003-262-1
For Transmission Service
Requested By
Southwestern Public Service
Company*

From SPS to KACY

*For a Reserved Amount Of 115 MW
From 6/1/2004
To 6/1/2011*

SPP Engineering, Tariff Studies

System Impact Study

Southwestern Public Service Company has requested a system impact study for long-term Firm Point-to-Point transmission service from SPS to KACY for 115 MW. The period of the service requested is from 6/1/2004 to 6/1/2011. The OASIS reservation number is 619235. The principal objective of this study is to identify system constraints on the SPP Regional Tariff System and potential system facility upgrades that may be necessary to provide the requested service.

The SPS to KACY request was studied to determine the facility upgrades required based on the actual queue position of the request. Only the higher priority requests in Facility Study mode were considered in developing the study models. The results of the transfer analysis are documented in Table 1. The results given in Table 1 include upgrades that may be assigned to higher priority requests. The results of this study gives the customer an estimated cost of the facility upgrades that may be required in order to accommodate the SPS to KACY request for redirected service.

Five seasonal models were used to study the SPS to KACY request for the requested service period. The SPP 2003 Series Cases 2004 Summer Peak (04SP), 2004 Fall Peak (04FA), 2004/05 Winter Peak (04WP), 2009 Summer Peak (09SP), and 2009/10 Winter Peak (09WP) were used to study the impact of the request on the SPP system during the requested service period of 6/1/2004 to 6/1/2011. The chosen base case models were modified to reflect the most current modeling information. The cases were modified to reflect firm transfers during the requested service period that were not already included in the January 2003 base case series models.

PTI's MUST First Contingency Incremental Transfer Capability (FCITC) DC analysis was used to study the request. The MUST options chosen to conduct the System Impact Study analysis can be found in Appendix A. The MUST option to convert MVA branch ratings to estimated MW ratings was used to partially compensate for reactive loading.

The study results of the SPS to KACY transfer show that limiting constraints exist. Due to the limiting constraints identified, the Transmission Service Request cannot be granted. Any solutions, upgrades, and costs provided in the System Impact Study are planning estimates only. The final ATC and upgrades required may vary from these results due to the status of higher priority requests, unknown facility upgrades and proposed transmission plans that will be identified during the facility study process, and the final results of the full AC analysis. Execution of a Facility Study Agreement is now required to maintain queue position. The final upgrade solutions and cost assignments will be determined upon the completion of the facility study.

Table 1 – SPP facility overloads identified for the SPS to KACY transfer

Study Case	From Area - To Area	Branch Overload	Rating <MW>	Pre Transfer Loading	%TDF	Outaged Branch Causing Overload	ATC <MW>	Solution	Estimated Cost
04SP	OKGE-OKGE	55177 PARKLN 2 69 55187 AHLOSTP2 69 1	72	77	0.3	55177 PARKLN 2 69 55182 VALLYVU2 69 1	0	Solution Undetermined	
04SP	AEPW-AEPW	53245 ALUMXT 4 138 53300 NWTXARK4 138 1	260	275	0.7	53299 NWT-BNT4 138 53300 NWTXARK4 138 1	0	Rebuild 1.68 miles of 1024 ACAR with 2156 ACSR, Replace wavetrapp jumpers with 2156 ACSR	\$ 840,000
04SP	WERE-WERE	56851 AUBURN 6 230 *B016 AUBRN77X 1 1	304	373	1.6	56765 HOYT 7 345 56766 JEC N 7 345 1	0	May be relieved due to WERE Op Guide 400, Outage of Hoyt to Jeffery Energy Center 345kV	
04SP	AECI-AECI	96137 4BRISTOW 138 96889 2BRISTOW 69 1	54	56	0.3	96137 4BRISTOW 138 96889 2BRISTOW 69 2	0	Replace 50 MVA Transformer with 84 MVA unit.	\$ 890,000
04SP	AECI-AECI	96137 4BRISTOW 138 96889 2BRISTOW 69 2	54	56	0.3	96137 4BRISTOW 138 96889 2BRISTOW 69 1	0	See Previous Upgrade Specified for Facility	
04SP	SWPA-ENTR	52660 BULL SH5 161 99825 5MDWAY# 161 1	161	170	0.2	99817 5ISES 1 161 99826 5MORFLD 161 1	0	Replace disconnect switches, metering CTs and wave trap at Bull Shoals.	\$ 150,000
04SP	WFEC-WFEC	55846 CARTERJ2 69 55876 DILL JT2 69 1	24	26	0.6	56027 PINERDG2 69 56088 WASHITA2 69 1	0	Current WFEC Work Plan to Reconductor from 4/0 to 795 - Complete by 2004 Winter	
04SP	AEPW-AEPW	53154 CHAMSPR5 161 53170 TONTITN5 161 1	247	334	1.7	53154 CHAMSPR5 161 53195 FARMGTN5 161 1	0	Rebuild 12 miles with 2156MCM ACSR. Replace Chamber Springs wavetrapp & reset relays.	\$ 7,200,000
04SP	AEPW-AEPW	53522 CHEROKE4 138 53557 KNOXLEE4 138 1	209	228	0.6	Multiple Outage Contingency 53454 SW SHV 7 345 to 53424 LONGWD 7 345 CKT 1 53454 SW SHV 7 345 to 53528 DIANA 7 345 CKT 1	0	Previously Assigned Upgrade In-Service Date 05SP	
04SP	AEPW-AEPW	53522 CHEROKE4 138 53611 TATUM 4 138 1	209	216	0.6	Multiple Outage Contingency 53454 SW SHV 7 345 to 53424 LONGWD 7 345 CKT 1 53454 SW SHV 7 345 to 53528 DIANA 7 345 CKT 1	0	Previously Assigned Upgrade In-Service Date 05SP	
04SP	WERE-WERE	57152 CIRCLVL3 115 57165 HTI JCT3 115 1	96	102	0.1	56765 HOYT 7 345 56772 STRANGR7 345 1	0	May be relieved due to WERE Op Guide 803, Outage of Hoyt to Stranger Creek 345kV	
04SP	AEPW-OMPA	54157 COMMTAP4 138 56204 OMDUNCN4 138 1	117	117	0.8	54112 CORNVIL4 138 54155 RUSHNGT4 138 1	0	Solution Undetermined	
04SP	WERE-WERE	57153 COLINE 3 115 *B034 COLINE5X 1 1	66	74	0.5	56772 STRANGR7 345 *B166 STRNGR1X 1 1	0	May be relieved due to WERE Op Guide 612, Outage of Stranger Creek 345/230kV Transformer	
04SP	AEPW-AEPW	53133 ECNTRTN5 161 53187 GENTRYR5 161 1	353	379	0.3	53139 FLINTCR5 161 53170 TONTITN5 161 1	0	Rebuild 19.16 miles of 2-397.5 ACSR with 2156 ACSR. Replace East Centerton Wavetrapp & jumpers	\$ 8,000,000
04SP	AEPW-AEPW	53139 FLINTCR5 161 53187 GENTRYR5 161 1	353	396	0.3	53139 FLINTCR5 161 53170 TONTITN5 161 1	0	Rebuild 1.09 miles of 2-397.5 ACSR with 2156 ACSR. Replace Flint Creek wavetrapp & jumpers	\$ 450,000
04SP	AEPW-AEPW	53139 FLINTCR5 161 53170 TONTITN5 161 1	311	356	0.4	53155 CHAMSPR7 345 53756 CLARKSV7 345 1	0	Rebuild 16.3 miles of 2-297 ACSR with 2156 ACSR. Replace Flint Creek wavetrapp & jumpers. Replace Flint Creek switch # 1K75	\$ 8,200,000
04SP	WERE-WERE	57795 GILL E 2 69 57813 MACARTH2 69 1	68	71	0.3	57795 GILL E 2 69 57825 OATVILL2 69 1	0	Replace substation bus and jumpers at MacArthur	\$ 22,000
04SP	WERE-WERE	57795 GILL E 2 69 57825 OATVILL2 69 1	71	81	0.3	57795 GILL E 2 69 57813 MACARTH2 69 1	0	Replace disconnect switches at Gill 69 kV (use 800 A.), Replace line switch at Oatville 69 kV (use 800 A.).	\$ 45,000
04SP	WERE-WERE	56853 LAWHILL6 230 *B101 LAWHL29X 1 1	298	339	3.5	56853 LAWHILL6 230 56855 MIDLAND6 230 1	0	May be relieved due to WERE Op Guide 901, Outage of Lawrence Hill to Midland Junction 230kV	
04SP	AEPW-AEPW	53571 MARSHL-4 138 53623 MARAUTO2 69 1	107	129	0.1	53571 MARSHL-4 138 53623 MARAUTO2 69 2	0	Replace 755 ACAR Strain Bus.	\$ 25,000
04SP	AEPW-AEPW	53571 MARSHL-4 138 53623 MARAUTO2 69 2	107	129	0.1	53571 MARSHL-4 138 53623 MARAUTO2 69 1	0	Replace 755 ACAR Strain Bus.	\$ 25,000
04SP	WERE-WERE	56855 MIDLAND6 230 *B114 MIDJ126X 1 1	308	312	3.4	56853 LAWHILL6 230 *B101 LAWHL29X 1 1	0	May be relieved due to WERE Op Guide 631, Outage of Lawrence Hill 230/115kV Transformer	
04SP	AEPW-AEPW	53598 ROKHILL4 138 53611 TATUM 4 138 1	209	211	0.6	Multiple Outage Contingency 53454 SW SHV 7 345 to 53424 LONGWD 7 345 CKT 1 53454 SW SHV 7 345 to 53528 DIANA 7 345 CKT 1	0	Previously Assigned Upgrade In-Service Date 05SP	
04SP	WERE-WERE	57182 TECHILE3 115 57270 STULL T3 115 1	92	95	3.0	56765 HOYT 7 345 56772 STRANGR7 345 1	0	May be relieved due to WERE Op Guide 803, Outage of Hoyt to Stranger Creek 345kV	
04SP	EMDE-EMDE	59467 ORO110 5 161 59494 OAK432 5 161 1	214	216	0.2	59472 TIP292 5 161 59483 JOP389 5 161 1	0	Reconstruct and replace 1.4 miles of 556 ACSR with Bundled 556 ACSR.	\$ 800,000
04SP	AEPW-AEPW	53245 ALUMXT 4 138 53250 BANN 4 138 1	260	260	0.7	53299 NWT-BNT4 138 53300 NWTXARK4 138 1	2	Replace six (6) 138 kV switches, five at Bann & one at Alumax Tap. Rebuild 0.67 miles of 1024 ACAR with 2156 ACSR. Replace wavetrapp jumpers @ Bann. Replace breaker 3300 @ Bann.	\$ 630,000

Table 1 - continued – SPP facility overloads identified for the SPS to KACY transfer

Study Case	From Area - To Area	Branch Overload	Rating <MW>	Pre Transfer Loading	%TDF	Outaged Branch Causing Overload	ATC <MW>	Solution	Estimated Cost
04SP	WERE-WERE	57233 166TH 3 115 57244 JARBALO3 115 1	97	97	3.2	57252 MIDLAND3 115 57261 PENTAGN3 115 1	15	May be relieved due to WERE Op Guide 1202, Overload of Jaggard to Jarbalo 115kV	
04SP	OKGE-OKGE	54742 OSAGE 2 69 54763 CONBLKS2 69 1	96	95	1.4	54760 KILDARE4 138 54761 WHEAGLE4 138 1	38	May have multiple upgrades required.	
04FA	SWPA-ENTR	52660 BULL SH5 161 99825 5MIDWAY# 161 1	162	164	0.1	52660 BULL SH5 161 52661 BUFRDTP5 161 1	0	See Previous Upgrade Specified for Facility	
04FA	SWPA-EMDE	52688 CARTHAG5 161 59466 ATL109 5 161 1	167	167	0.3	59472 TIP292 5 161 59483 JOP389 5 161 1	0	Replace 600 Amp disconnect switches	\$ 60,000
04FA	SWPS-SWPS	50937 NORTHW2 69 50938 NORTHW3 115 1	45	50	0.1	51001 COULTER2 69 51002 COULTER3 115 1	0	Solution Undetermined	
04WP	AEPW-AEPW	53154 CHAMSPR5 161 53170 TONTITN5 161 1	275	275	1.7	53154 CHAMSPR5 161 53195 FARMGTN5 161 1	2	See Previous Upgrade Specified for Facility	
09SP	OKGE-OKGE	55228 5TRIBES5 161 55234 PECANCK5 161 1	223	223	1.6	55230 AGENCY 5 161 55234 PECANCK5 161 1	0	May be able to increase CTR (if relays will coordinate) at Five Tribes sub.	\$ 5,000
09SP	OKGE-OKGE	55177 PARKLN 2 69 55187 AHLOSTP2 69 1	72	88	0.3	55177 PARKLN 2 69 55182 VALLYVU2 69 1	0	Solution Undetermined	
09SP	AEPW-AEPW	53245 ALUMXT 4 138 53250 BANN 4 138 1	260	286	0.7	53299 NWT-BNT4 138 53300 NWTXARK4 138 1	0	See Previous Upgrade Specified for Facility	
09SP	AEPW-AEPW	53245 ALUMXT 4 138 53300 NWTXARK4 138 1	260	301	0.7	53299 NWT-BNT4 138 53300 NWTXARK4 138 1	0	See Previous Upgrade Specified for Facility	
09SP	WFEC-WFEC	55810 ANADARK2 69 55828 BLANCHD2 69 1	33	34	0.6	55916 FRNKLS2 69 55917 FRNKLS4 138 1	0	Solution Undetermined	
09SP	WFEC-WFEC	55810 ANADARK2 69 55870 CYRIL 2 69 1	61	62	0.4	55814 ANADARK4 138 55923 GEORGIA4 138 1	0	Reconductor 13 mi of 336MCM ACSR with 795MCM.	\$ 2,626,000
09SP	WERE-WERE	56851 AUBURN 6 230 *B015 AUBRN77X 1 1	304	376	1.8	56765 HOYT 7 345 56766 JEC N 7 345 1	0	May be relieved due to WERE Op Guide 400, Outage of Hoyt to Jeffery Energy Center 345kV	
09SP	AEPW-AEPW	53512 BALDWIN2 69 53553 KARNCKT2 69 1	28	30	0.1	53404 FLOURNY2 69 53405 FLOURNY4 138 1	0	Rebuild 6.9 miles of # 2 CU with 477 ACSR	\$ 2,800,000
09SP	AEPW-AEPW	53512 BALDWIN2 69 53621 WOODLWN2 69 1	28	32	0.1	53404 FLOURNY2 69 53405 FLOURNY4 138 1	0	Rebuild 2.73 miles of # 2 CU with 477 ACSR	\$ 1,092,000
09SP	AEPW-OKGE	53126 BONANZA5 161 55261 BONANZT5 161 1	177	184	0.1	55262 AES 5 161 55264 TARBY 5 161 1	0	Rebuild 0.06 miles of 397.5 ACSR with 1272 ACSR & reset Bonanza relay	\$ 50,000
09SP	AECI-AECI	96137 4BRISTOW 138 96889 2BRISTOW 69 1	54	63	0.3	96137 4BRISTOW 138 96889 2BRISTOW 69 2	0	See Previous Upgrade Specified for Facility	
09SP	AECI-AECI	96137 4BRISTOW 138 96889 2BRISTOW 69 2	54	63	0.3	96137 4BRISTOW 138 96889 2BRISTOW 69 1	0	See Previous Upgrade Specified for Facility	
09SP	SWPA-ENTR	52660 BULL SH5 161 99825 5MIDWAY# 161 1	161	182	0.1	99817 5ISES 1 161 99826 5MORFLD 161 1	0	See Previous Upgrade Specified for Facility	
09SP	WFEC-WFEC	55846 CARTERJ2 69 55978 LKREEK2 69 1	26	26	0.3	56027 PINERDG2 69 56088 WASHITA2 69 1	0	Carter > Lake Creek: Upgrade 1/0 to 336	\$ 3,100,000
09SP	AEPW-AEPW	53154 CHAMSPR5 161 53195 FARMGTN5 161 1	335	389	1.1	53154 CHAMSPR5 161 53170 TONTITN5 161 1	0	See Previous Upgrade Specified for Facility	
09SP	AEPW-AEPW	53154 CHAMSPR5 161 53195 FARMGTN5 161 1	335	393	0.2	53131 DYESS 5 161 53159 SOSPRDL5 161 1	0	Replace Farmington switch 8839, rebuild 10.24 miles with 2156 ACSR, replace Chamber Springs wavetrap, & replace Farmington AECC bus.	\$ 6,400,000
09SP	AEPW-AEPW	53139 FLINTCR5 161 53154 CHAMSPR5 161 1	331	350	0.2	53155 CHAMSPR7 345 53756 CLARKSV7 345 1	0	Replace Terminal Equipment	\$ 60,000
09SP	AEPW-AEPW	53154 CHAMSPR5 161 53170 TONTITN5 161 1	244	396	1.7	53154 CHAMSPR5 161 53195 FARMGTN5 161 1	0	See Previous Upgrade Specified for Facility	
09SP	GRRD-GRRD	54451 CLARMR 5 161 54479 CLARMR 2 69 1	84	87	0.2	54451 CLARMR 5 161 54479 CLARMR 2 69 2	0	Add 3rd 161/69 KV Transformer	\$ 1,250,000
09SP	GRRD-GRRD	54451 CLARMR 5 161 54479 CLARMR 2 69 2	84	87	0.2	54451 CLARMR 5 161 54479 CLARMR 2 69 1	0	See Previous Upgrade Specified for Facility	
09SP	AEPW-OMPA	54157 COMMTAP4 138 56204 OMDUNCN4 138 1	117	135	0.8	54112 CORNVIL4 138 54155 RUSHNGT4 138 1	0	Solution Undetermined	
09SP	OKGE-OKGE	54742 OSAGE 2 69 54763 CONBLKS2 69 1	96	105	1.4	54760 KILDARE4 138 54761 WHEAGLE4 138 1	0	See Previous Upgrade Specified for Facility	
09SP	SWPS-SWPS	51176 CURRY3 115 51202 ROOSEVL3 115 2	158	159	3.1	51195 OASIS6 230 51203 ROOSEVL6 230 1	0	Solution Undetermined	
09SP	AEPW-AEPW	53133 ECNTRTN5 161 53187 GENTRYR5 161 1	353	402	0.7	53144 LOWELL 5 161 53170 TONTITN5 161 1	0	See Previous Upgrade Specified for Facility	
09SP	AEPW-WFEC	54122 ELKCTY-2 69 55897 ELKCITY2 69 1	38	43	0.6	56027 PINERDG2 69 56088 WASHITA2 69 1	0	Elk(AEPW)>Elk WFEC: Upgrade 4/0 to 795 ACSR	\$ 414,000
09SP	AEPW-AEPW	53170 TONTITN5 161 53194 ELMSPRR5 161 1	335	359	0.3	53154 CHAMSPR5 161 53195 FARMGTN5 161 1	0	Rebuild 1.6 miles of 2-397 ACSR with 2156 ACSR. Replace Elm Springs Switch and Strain Bus	\$ 1,000,000
09SP	AEPW-ENTR	53136 EUREKA 5 161 99832 5OSAGE # 161 1	244	246	0.3	52660 BULL SH5 161 99802 5BULLSH* 161 1	0	Rebuild 5.34 miles of 666 ACSR with 1590 ACSR. Replace wavetrap jumpers @ Eureka Springs	\$ 2,400,000
09SP	WERE-WERE	57236 COOP 3 115 57277 WAKARUS3 115 1	92	93	1.7	57271 SWLWRNC3 115 57277 WAKARUS3 115 1	0	Rebuild 1.53-mile line	\$ 390,000
09SP	AEPW-AEPW	53157 SFAYTVL5 161 53195 FARMGTN5 161 1	313	325	1.1	53154 CHAMSPR5 161 53170 TONTITN5 161 1	0	Replace Farmington switch 5894 and replace South Fayetteville wavetrap jumpers	\$ 50,000
09SP	AEPW-AEPW	53139 FLINTCR5 161 53187 GENTRYR5 161 1	350	463	0.3	53139 FLINTCR5 161 53170 TONTITN5 161 1	0	See Previous Upgrade Specified for Facility	
09SP	AEPW-AEPW	53139 FLINTCR5 161 53170 TONTITN5 161 1	305	415	0.4	53155 CHAMSPR7 345 53756 CLARKSV7 345 1	0	See Previous Upgrade Specified for Facility	
09SP	AEPW-AEPW	53406 FORBNGT2 69 53445 S SHV 2 69 1	90	91	0.1	53394 BROADMR2 69 53408 FTHUMBG2 69 1	0	Solution Undetermined	
09SP	OKGE-WFEC	54946 MIDWEST4 138 55917 FRNKLS4 138 1	184	229	0.2	55814 ANADARK4 138 56031 POCASET4 138 1	0	Replace 800 amp wavetrap with 2000 amp wavetrap at Franklin Switch and 795ACSR jumpers with 1590ACSR, connectors	\$ 24,000

Table 1 - continued – SPP facility overloads identified for the SPS to KACY transfer

Study Case	From Area - To Area	Branch Overload	Rating <MW>	Pre Transfer Loading	%TDF	Outaged Branch Causing Overload	ATC <MW>	Solution	Estimated Cost
09SP	WERE-WERE	57795 GILL E 2 69 57825 OATVILL2 69 1	71	77	0.3	57795 GILL E 2 69 57813 MACARTH2 69 1	0	See Previous Upgrade Specified for Facility	
09SP	WERE-WERE	57808 HYDRJN2 69 57813 MACARTH2 69 1	63	63	0.1	57784 CANAL 2 69 57838 RUTAN 2 69 1	0	Rebuild 2.21-mile line	\$ 945,000
09SP	WERE-WERE	57808 HYDRJN2 69 57824 OAKLAWN2 69 1	63	63	0.1	57784 CANAL 2 69 57838 RUTAN 2 69 1	0	Rebuild 1.39-mile line	\$ 596,000
09SP	WERE-WERE	57250 LWRNCHL3 115 57280 WREN 3 115 1	139	145	0.8	57253 MOCKBRD3 115 57271 SWLWRNC3 115 1	0	May be relieved due to WERE Op Guide 1211, Outage of Mockingbird Hill to Southwest Lawrence 115kV	
09SP	WERE-WERE	56853 LAWHILL6 230 *B101 LAWHL29X 1 1	298	338	3.2	56853 LAWHILL6 230 56855 MIDLAND6 230 1	0	May be relieved due to WERE Op Guide 901, Outage of Lawrence Hill to Midland Junction 230kV	
09SP	AEPW-AEPW	53423 LONGWD 4 138 53457 OAKPH 4 138 1	209	214	0.4	Multiple Outage Contingency 53454 SW SHV 7 345 to 53424 LONGWD 7 345 CKT 1 53454 SW SHV 7 345 to 53528 DIANA 7 345 CKT 1	0	Rebuild 1.8 miles of 666 ACSR with 1590 ACSR	\$ 800,000
09SP	SWPS-SWPS	50520 LP-HOLL2 69 50521 LP-HOLL6 230 1	89	101	0.4	50527 LP-WADS6 230 51689 LUBE6 230 1	0	Solution Undetermined	
09SP	AEPW-AEPW	53570 MARSHAL2 69 53579 NMARSHL2 69 1	72	72	0.1	53404 FLOURNY2 69 53405 FLOURNY4 138 1	0	Replace 350 CU bus & jumpers @ North Marshall.	\$ 23,356
09SP	AEPW-AEPW	53571 MARSHL-4 138 53623 MARAUTO2 69 1	107	137	0.1	53571 MARSHL-4 138 53623 MARAUTO2 69 2	0	Replace 1033 AAC Jumpers	\$ 15,000
09SP	AEPW-AEPW	53571 MARSHL-4 138 53623 MARAUTO2 69 2	107	137	0.1	53571 MARSHL-4 138 53623 MARAUTO2 69 1	0	Replace 1033 AAC Jumpers	\$ 15,000
09SP	WERE-WERE	56855 MIDLAND6 230 *B115 MIDJ126X 1 1	308	310	3.1	56853 LAWHILL6 230 *B101 LAWHL29X 1 1	0	May be relieved due to WERE Op Guide 631, Outage of Lawrence Hill 230/115kV Transformer	
09SP	AEPW-AEPW	53579 NMARSHL2 69 53621 WOODLWN2 69 1	50	51	0.1	Multiple Outage Contingency 53454 SW SHV 7 345 to 53424 LONGWD 7 345 CKT 1 53454 SW SHV 7 345 to 53528 DIANA 7 345 CKT 1	0	Replace 3/0 CU jumpers @ North Marshall	\$ 15,000
09SP	SWPS-SWPS	51094 NEHFD3 115 51095 DS-MTR2 69 1	80	82	0.3	51106 HEREPD3 115 51110 DFSMTH3 115 1	0	Solution Undetermined	
09SP	OKGE-OKGE	55234 PECANCK5 161 55235 PECANCK7 345 1	368	388	1.7	53756 CLARKSV7 345 55224 MUSKOGEE7 345 1	0	Add 2nd 345/161 kV 369MVA transformer.	\$ 3,000,000
09SP	AEPW-AEPW	53319 SETEXAR2 69 53329 TEXARK 2 69 1	90	96	0.1	53300 NWTXARK4 138 53323 SUGARHL4 138 1	0	Solution Undetermined	
09SP	AEPW-AEPW	53446 S SHV 4 138 53455 SW SHVT4 138 1	210	221	0.1	53453 SW SHV 4 138 53464 WESTELT4 138 1	0	Solution Undetermined	
09SP	AECI-AECI	96983 2STILWEL 69 96986 2TITANTP 69 1	36	37	0.0	54452 SALSWGR2 69 96859 2BRUSHY 69 1	0	Rebuild 9.2 miles with 795MCM ACSR	\$ 1,518,000
09SP	WERE-WERE	57271 SWLWRNC3 115 57277 WAKARUS3 115 1	92	91	1.7	57236 COOP 3 115 57277 WAKARUS3 115 1	29	Rebuild 4.09-mile line	\$ 1,000,000
09SP	AEPW-OKGE	54002 FIXCT4 138 55055 MAUD 4 138 1	88	86	2.0	Bas e Case	113	Rebuild 11.83 miles of 3/0 shielded Copperweld with 795 ACSR.	\$ 3,305,000
09SP	OKGE-OKGE	54721 IMO 2 69 54722 CLEVETP2 69 1	36	53	0.3	54730 SO4TH2 2 69 54731 SO4TH4 4 138 1	115	Invalid Contingency	
09WP	WERE-WERE	57623 ATHENS 2 69 57631 CC4VERN2 69 1	43	44	0.3	56797 WOLFCKR7 345 57981 LACYGNE7 345 1	0	May be relieved due to WERE Op Guide 302, Outage of Lacygne to Wolf Creek 345kV	
09WP	SWPA-ENTR	52660 BULL SH5 161 99825 5MIDWAY# 161 1	161	164	0.1	99817 5ISES 1 161 99826 5MORFLD 161 1	0	See Previous Upgrade Specified for Facility	
09WP	AEPW-AEPW	53154 CHAMSPR5 161 53170 TONTITN5 161 1	243	332	1.7	53154 CHAMSPR5 161 53195 FARMGTN5 161 1	0	See Previous Upgrade Specified for Facility	
09WP	WERE-WERE	57631 CC4VERN2 69 57636 GREEN 2 69 1	43	46	0.3	56797 WOLFCKR7 345 57981 LACYGNE7 345 1	0	May be relieved due to WERE Op Guide 302, Outage of Lacygne to Wolf Creek 345kV	
09WP	AEPW-AEPW	53139 FLINTCR5 161 53187 GENTRYR5 161 1	360	406	0.3	53139 FLINTCR5 161 53170 TONTITN5 161 1	0	See Previous Upgrade Specified for Facility	
09WP	AEPW-AEPW	53139 FLINTCR5 161 53170 TONTITN5 161 1	330	347	0.4	53155 CHAMSPR7 345 53756 CLARKSV7 345 1	0	See Previous Upgrade Specified for Facility	
09WP	AEPW-AEPW	53571 MARSHL-4 138 53623 MARAUTO2 69 1	121	124	0.1	53571 MARSHL-4 138 53623 MARAUTO2 69 2	0	See Previous Upgrade Specified for Facility	
09WP	AEPW-AEPW	53571 MARSHL-4 138 53623 MARAUTO2 69 2	121	124	0.1	53571 MARSHL-4 138 53623 MARAUTO2 69 1	0	See Previous Upgrade Specified for Facility	
09WP	SWPA-SWPA	52648 NORFORK5 161 52650 NORFORK2 69 1	25	27	0.1	52648 NORFORK5 161 96123 5WPLAIN 161 1	0	Replace Norfolk Transformer	\$ 1,300,000
09WP	OKGE-OKGE	55068 SHAWNEE2 69 55070 MISSION2 69 1	51	51	0.1	55059 SQUIRCK4 138 55075 FRSTHIL4 138 1	34	May be able to increase CTR (if relays will coordinate) at Shawnee sub.	\$ 5,000
09WP	OKGE-OKGE	55234 PECANCK5 161 55235 PECANCK7 345 1	369	368	1.7	53756 CLARKSV7 345 55224 MUSKOGEE7 345 1	69	See Previous Upgrade Specified for Facility	
09WP	OKGE-OKGE	54721 IMO 2 69 54722 CLEVETP2 69 1	36	37	0.4	54730 SO4TH2 2 69 54731 SO4TH4 4 138 1	115	Invalid Contingency	
Total Estimated Cost									\$ 61,535,356

Appendix A

MUST CHOICES IN RUNNING FCITC DC ANALYSIS

CONSTRAINTS/CONTINGENCY INPUT OPTIONS

1. AC Mismatch Tolerance – 2 MW
2. Base Case Rating – Rate A
3. Base Case % of Rating – 100%
4. Contingency Case Rating – Rate B
5. Contingency Case % of Rating – 100%
6. Base Case Load Flow – PSS/E
7. Convert branch ratings to estimated MW ratings – Yes
8. Contingency ID Reporting – Labels
9. Maximum number of contingencies to process - 50000

MUST CALCULATION OPTIONS

1. Phase Shifters Model for DC Linear Analysis – Constant flow for Base Case and Contingencies
2. Report Base Case Violations with FCITC – Yes
3. Maximum number of violations to report in FCITC table - 50000
4. Distribution Factor (OTDF and PTDF) Cutoff – 0.0
5. Maximum times to report the same elements - 10
6. Apply Distribution Factor to Contingency Analysis – Yes
7. Apply Distribution Factor to FCITC Reports – Yes
8. Minimum Contingency Case flow change – 1 MW
9. Minimum Contingency Case Distribution Factor change – 0.0
10. Minimum Distribution Factor for Transfer Sensitivity Analysis – 0.0