



SPP *Southwest
Power Pool*

*System Impact Study
SPP-2003-199-1
For The Designation of a New
Network Resource
Requested By
Empire District Electric Company*

From WR to EDE

*For a Reserved Amount Of 100 MW
From 1/1/2005
To 1/1/2025*

SPP Engineering, Tariff Studies

System Impact Study

Empire District Electric Company has requested a system impact study to designate a New Network Resource in the WR Control Area for 100 MW to serve EDE Network Load in the EDE Control Area. The period of the service requested is from 1/1/2005 to 1/1/2025. The OASIS reservation numbers are 560587 and 560588. 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 requested service was modeled as a 100 MW transfer from the New Network Resource in WR to existing marginally dispatched EDE Network Resources in the EDE Control Area. The WR to EDE 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 WR to EDE request.

Seven seasonal models were used to study the WR to EDE request for the requested service period. The SPP 2003 Series Cases 2004 April Min (04AP), 2004 Spring Peak (04G), 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 1/1/2005 to 1/1/2025. 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 WR to EDE 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 WR to EDE transfer

Study Case	From Area - To Area	Branch Overload	Rating <MW>	Pre Transfer Loading	%TDF	Outaged Branch Causing Overload	ATC <MW>	Solution	Estimated Cost
04AP	CELE-AEPW	50090 IPAPER 4 138 53461 WALLAKE4 138 1	236	237	0.1360	50045 DOLHILL7 345 50046 DOLHILL6 230 1	0	May be relieved due to Dolet Hills Operating Directive	
04AP	AEPW-AEPW	53446 S SHV 4 138 53461 WALLAKE4 138 1	210	215	0.1180	50045 DOLHILL7 345 50046 DOLHILL6 230 1	0	May be relieved due to Dolet Hills Operating Directive	
04AP	WERE-WERE	57631 CC4VERN2 69 57636 GREEN 2 69 1	44	44	2.1620	56797 WOLFCRK7 345 57981 LACYGNE7 345 1	8	May be relieved due to Westar Transmission Operating Directive 1304 Overload of the Athens to Wolf Creek 69 kV Line	
04AP	WERE-WERE	57623 ATHENS 2 69 57631 CC4VERN2 69 1	44	44	2.1620	56797 WOLFCRK7 345 57981 LACYGNE7 345 1	34	May be relieved due to Westar Transmission Operating Directive 1304 Overload of the Athens to Wolf Creek 69 kV Line	
04FA	WERE-WERE	57152 CIRCLVL3 115 57165 HTI JCT3 115 1	95	98	0.1900	57982 IATAN 7 345 59199 ST JOE 3 345 1	0	See Previous Upgrade Specified for Facility	
04FA	WERE-WERE	57152 CIRCLVL3 115 57331 KING HL3 115 1	90	103	0.3190	56765 HOYT 7 345 56772 STRANGR7 345 1	0	May be relieved due to Westar Transmission Operating Directive 803 Outage of the Hoyt to Stranger 345 kV line	
04FA	WERE-WERE	57217 KELLY 3 115 57331 KING HL3 115 1	89	98	0.3190	56765 HOYT 7 345 56772 STRANGR7 345 1	0	May be relieved due to Westar Transmission Operating Directive 803 Outage of the Hoyt to Stranger 345 kV line	
04FA	WERE-WERE	57631 CC4VERN2 69 57636 GREEN 2 69 1	44	42	1.9120	56797 WOLFCRK7 345 57981 LACYGNE7 345 1	62	May be relieved due to Westar Transmission Operating Directive 1304 Overload of the Athens to Wolf Creek 69 kV Line	
04FA	WERE-WERE	57039 ELPASO 4 138 57046 GILL S 4 138 1	210	258	1.3910	57040 EVANS N4 138 57041 EVANS S4 138 1	100	Invalid Contingency	
04G	WERE-WERE	56851 AUBURN 6 230 *B016 AUBRN77X 1 1	306	327	0.6920	56765 HOYT 7 345 56766 JEC N 7 345 1	0	May be relieved due to Westar Transmission Operating Directive 400 Outage of the Jeffrey Energy Center to Hoyt 345kV Line	
04G	WERE-WERE	57151 AUBURN 3 115 57179 S GAGEW3 115 1	75	87	0.3010	56765 HOYT 7 345 56766 JEC N 7 345 1	0	May be relieved due to Westar Transmission Operating Directive 400 Outage of the Jeffrey Energy Center to Hoyt 345kV Line	
04G	WERE-WERE	57151 AUBURN 3 115 57179 S GAGEW3 115 2	97	102	0.3470	56765 HOYT 7 345 56766 JEC N 7 345 1	0	May be relieved due to Westar Transmission Operating Directive 400 Outage of the Jeffrey Energy Center to Hoyt 345kV Line	
04G	WERE-WERE	57152 CIRCLVL3 115 57165 HTI JCT3 115 1	95	97	0.1900	57982 IATAN 7 345 59199 ST JOE 3 345 1	0	Rebuild 15.50-mile line (1192.5 kcmil 45/7 ACSR, 223 MVA, 245 MVA), Replace CTs and Wave Trap (2000 A.)	\$ 5,800,000
04G	WERE-WERE	57152 CIRCLVL3 115 57331 KING HL3 115 1	90	101	0.3190	56765 HOYT 7 345 56772 STRANGR7 345 1	0	May be relieved due to Westar Transmission Operating Directive 803 Outage of the Hoyt to Stranger 345 kV line	
04G	WERE-WERE	57217 KELLY 3 115 57331 KING HL3 115 1	89	96	0.3190	56765 HOYT 7 345 56772 STRANGR7 345 1	0	May be relieved due to Westar Transmission Operating Directive 803 Outage of the Hoyt to Stranger 345 kV line	
04G	WERE-WERE	57623 ATHENS 2 69 57631 CC4VERN2 69 1	43	45	1.9130	56797 WOLFCRK7 345 57981 LACYGNE7 345 1	0	May be relieved due to Westar Transmission Operating Directive 1304 Overload of the Athens to Wolf Creek 69 kV Line	
04G	WERE-WERE	57631 CC4VERN2 69 57636 GREEN 2 69 1	43	47	1.9130	56797 WOLFCRK7 345 57981 LACYGNE7 345 1	0	May be relieved due to Westar Transmission Operating Directive 1304 Overload of the Athens to Wolf Creek 69 kV Line	
04G	WERE-WERE	57039 ELPASO 4 138 57046 GILL S 4 138 1	210	263	1.3900	57040 EVANS N4 138 57041 EVANS S4 138 1	100	Invalid Contingency	
04SP	AEPW-AEPW	53133 ECNTRTN5 161 53187 GENTRYR5 161 1	353	379	1.2150	53139 FLINTCR5 161 53170 TONTITN5 161 1	0	Rebuild 19.16 miles of 2-397.5 ACSR with 2156 ACSR. Replace East Centerton Wavetrap & jumpers	\$ 8,000,000
04SP	AEPW-AEPW	53139 FLINTCR5 161 53170 TONTITN5 161 1	311	414	0.3070	53139 FLINTCR5 161 53187 GENTRYR5 161 1	0	Rebuild 16.3 miles of 2-297 ACSR with 2156 ACSR. Replace Flint Creek wavetrap & jumpers. Replace Flint Creek switch # 1K75	\$ 8,200,000
04SP	AEPW-AEPW	53139 FLINTCR5 161 53187 GENTRYR5 161 1	353	396	1.2150	53139 FLINTCR5 161 53170 TONTITN5 161 1	0	Rebuild 1.09 miles of 2-397.5 ACSR with 2156 ACSR. Replace Flint Creek wavetrap & jumpers	\$ 450,000
04SP	AEPW-AEPW	53154 CHAMSPR5 161 53170 TONTITN5 161 1	247	334	2.7620	53154 CHAMSPR5 161 53195 FARMGTN5 161 1	0	Rebuild 12 miles with 2156MCM ACSR. Replace Chamber Springs wavetrap & reset relays.	\$ 7,200,000

Table 1 - continued – SPP facility overloads identified for the WR to EDE 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	AEPW-AEPW	53795 R.S.S.-4 138 53867 ORU-WTP4 138 1	304	305	0.7290	Multiple Outage Contingency: 53795 R.S.S.-4 138 53863 ORU ETP4 138 1 53863 ORU ETP4 138 53873 WARNTAP4 138 1 53749 ORU E4 138 53863 ORU ETP4 138 1 53822 81YALES4 138 53872 WAREN-W4 138 1 53822 81YALES4 138 53873 WARNTAP4 138 1 53861 96YALE-4 138 53873 WARNTAP4 138 1 Move 100% Load From Bus 53749 To Bus 53743 Move 100% Load From Bus 53822 To Bus 53741 Move 100% Load From Bus 53872 To Bus 53740	0	Replace wavetrap jumpers @ Riverside	\$ 10,000
04SP	OKGE-WFEC	54946 MIDWEST4 138 55917 FRNKLNS4 138 1	186	187	0.4910	54946 MIDWEST4 138 54953 HOLLYWD4 138 1	0	Replace 800 amp wavetrap with 2000 amp wavetrap at Franklin Switch and 795ACSR jumpers with 1590ACSR, connectors	\$ 24,000
04SP	OKGE-OKGE	55177 PARKLN 2 69 55187 AHLOSTP2 69 1	72	77	0.1870	55177 PARKLN 2 69 55182 VALLYVU2 69 1	0	Solution Undetermined	
04SP	WERE-WERE	56851 AUBURN 6 230 *B016 AUBRN77X 1 1	304	373	0.5760	56765 HOYT 7 345 56766 JEC N 7 345 1	0	May be relieved due to Westar Transmission Operating Directive 400 Outage of the Jeffrey Energy Center to Hoyt 345kV Line	
04SP	WERE-WERE	56853 LAWHILL6 230 *B101 LAHWHL29X 1 1	298	339	0.9750	56853 LAWHILL6 230 56855 MIDLAND6 230 1	0	May be relieved due to Westar Transmission Operating Directive 901 Outage of the Lawrence Hill-Midland Junction 230kV Line	
04SP	WERE-WERE	56855 MIDLAND6 230 *B114 MIDJ126X 1 1	308	312	0.9320	56853 LAWHILL6 230 *B101 LAHWHL29X 1 1	0	May be relieved due to Westar Transmission Operating Directive 631 Loss of the Lawrence Hill 230/115kV Transformer	
04SP	WERE-WERE	57152 CIRCLVL3 115 57165 HTI JCT3 115 1	96	102	0.4030	56765 HOYT 7 345 56772 STRANGR7 345 1	0	May be relieved due to Westar Transmission Operating Directive 803 Outage of the Hoyt to Stranger 345 kV line	
04SP	WERE-WERE	57153 COLINE 3 115 *B034 COLINE5X 1 1	66	74	0.0730	56772 STRANGR7 345 *B166 STRNGR1X 1 1	0	May be relieved due to Westar Transmission Operating Directive 612 Outage of the Stranger Creek 345/115kV Transformer	
04SP	WERE-WERE	57182 TECHILE3 115 57270 STULL T3 115 1	92	95	0.7840	56765 HOYT 7 345 56772 STRANGR7 345 1	0	May be relieved due to Westar Transmission Operating Directive 803 Outage of the Hoyt to Stranger 345 kV line	
04SP	WERE-WERE	57588 CHASE 2 69 57605 WHITE J2 69 1	43	45	0.2530	56991 WEAVER 4 138 *B183 WEAVER2X 1 1	0	May be relieved due to Westar Transmission Operating Directive 634 Outage of the Weaver 138-69kV Transformer	
04SP	EMDE-EMDE	59467 ORO110 5 161 59494 OAK432 5 161 1	214	216	4.9320	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	AECI-AECI	96137 4BRISTOW 138 96889 2BRISTOW 69 1	54	56	0.1150	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	0.1150	96137 4BRISTOW 138 96889 2BRISTOW 69 1	0	See Previous Upgrade Specified for Facility	
04SP	EMDE-EMDE	59483 JOP389 5 161 *B095 JOPLINSW 1 1	75	73	4.3170	59472 TIP292 5 161 59483 JOP389 5 161 1	38	Replace 161/69 KV Transformer with a 150 MVA Transformer.	\$ 1,565,000
04SP	GRRD-GRRD	54451 CLARMR 5 161 54479 CLARMR 2 69 2	84	84	0.7180	54451 CLARMR 5 161 54479 CLARMR 2 69 1	38	Add 3rd 161/69 KV Transformer	\$ 1,250,000
04SP	WERE-WERE	57021 NEOSHO 4 138 *B134 NEOSH2CX 1 2	17	16	0.6710	57021 NEOSHO 4 138 *B128 NEC3 GSU 1 1	73	May be relieved due to Westar Transmission Operating Directive 621 Outage of the Neosho SES #3 138/69 kV Main Transformer.	
04SP	WERE-WERE	57021 NEOSHO 4 138 *B133 NEOSH2BX 1 1	17	16	0.6710	57021 NEOSHO 4 138 *B128 NEC3 GSU 1 1	75	May be relieved due to Westar Transmission Operating Directive 621 Outage of the Neosho SES #3 138/69 kV Main Transformer.	
04SP	GRRD-GRRD	54451 CLARMR 5 161 54479 CLARMR 2 69 1	84	83	0.7150	54451 CLARMR 5 161 54479 CLARMR 2 69 2	79	See Previous Upgrade Specified for Facility	
04SP	WERE-WERE	57021 NEOSHO 4 138 *B132 NEOSH2AX 1 1	20	19	0.7790	57021 NEOSHO 4 138 *B128 NEC3 GSU 1 1	79	May be relieved due to Westar Transmission Operating Directive 621 Outage of the Neosho SES #3 138/69 kV Main Transformer.	
04WP	AEPW-AEPW	53139 FLINTCR5 161 53170 TONTITN5 161 1	334	345	0.3460	53139 FLINTCR5 161 53187 GENTRYR5 161 1	0	See Previous Upgrade Specified for Facility	
04WP	WERE-WERE	57152 CIRCLVL3 115 57165 HTI JCT3 115 1	95	111	0.2150	57982 IATAN 7 345 59199 ST JOE 3 345 1	0	See Previous Upgrade Specified for Facility	
04WP	WERE-WERE	57152 CIRCLVL3 115 57331 KING HL3 115 1	90	100	0.2150	57982 IATAN 7 345 59199 ST JOE 3 345 1	0	Rebuild 15.15 mile line with 1192.5 kcmil ACSR.	\$ 3,200,000
04WP	WERE-WERE	57217 KELLY 3 115 57331 KING HL3 115 1	88	95	0.2150	57982 IATAN 7 345 59199 ST JOE 3 345 1	0	Rebuild 9.61 mile line with 1192.5 kcmil ACSR.	\$ 2,400,000
04WP	AEPW-AEPW	53154 CHAMSPR5 161 53170 TONTITN5 161 1	275	275	2.7630	53154 CHAMSPR5 161 53195 FARMGTN5 161 1	1	See Previous Upgrade Specified for Facility	
04WP	WERE-WERE	57039 ELPASO 4 138 57046 GILL S 4 138 1	210	247	1.4190	57040 EVANS N4 138 57041 EVANS S4 138 1	100	Invalid Contingency	

Table 1 - continued – SPP facility overloads identified for the WR to EDE 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	SWPA-ENTR	52618 JONESBO5 161 99755 5JONES 161 1	218	231	0.5310	52600 N MADRD5 161 52610 KENNETT5 161 1	0	Line belongs to Entergy. SWPA: Change the ratio on the metering CTs to 1200/5 and adjust the meters	\$ 2,000
09SP	SWPA-AECI	52634 IDALIA 5 161 96056 5ASHRVL 161 1	206	209	0.3530	96073 5HARVELE 161 96114 5STFRAN 161 1	0	Reconductor line.	\$ 6,600,000
09SP	SWPA-SPRM	52692 SPRGFLD5 161 59969 BRKLN5 5 161 1	309	379	11.8650	59954 SWPS 5 161 59960 SWDISP 5 161 1	0	Replace disconnect switches at Springfield.	\$ 60,000
09SP	AEPW-AEPW	53133 ECNTRTN5 161 53187 GENTRYR5 161 1	353	438	1.2310	53139 FLINTCR5 161 53170 TONTITN5 161 1	0	See Previous Upgrade Specified for Facility	
09SP	AEPW-AEPW	53139 FLINTCR5 161 53154 CHAMSPR5 161 1	331	350	0.5850	53155 CHAMSPR7 345 53756 CLARKSV7 345 1	0	Replace Terminal Equipment	\$ 60,000
09SP	AEPW-AEPW	53139 FLINTCR5 161 53170 TONTITN5 161 1	305	479	0.3350	53139 FLINTCR5 161 53187 GENTRYR5 161 1	0	See Previous Upgrade Specified for Facility	
09SP	AEPW-AEPW	53139 FLINTCR5 161 53187 GENTRYR5 161 1	350	463	1.2310	53139 FLINTCR5 161 53170 TONTITN5 161 1	0	See Previous Upgrade Specified for Facility	
09SP	AEPW-AEPW	53154 CHAMSPR5 161 53170 TONTITN5 161 1	244	396	2.7360	53154 CHAMSPR5 161 53195 FARMGTN5 161 1	0	See Previous Upgrade Specified for Facility	
09SP	AEPW-AEPW	53154 CHAMSPR5 161 53195 FARMGTN5 161 1	335	393	0.1790	53131 DYESS 5 161 53159 SOSPRDL5 161 1	0	Replace Farmington switch 8839, rebuild 10.24 miles with 2156 ACSR, replace Chamber Springs wavetrapp, & replace Farmington AECC bus.	\$ 6,400,000
09SP	AEPW-AEPW	53157 SFAYTVL5 161 53195 FARMGTN5 161 1	313	328	0.1790	53131 DYESS 5 161 53159 SOSPRDL5 161 1	0	Replace Farmington switch 5894 and replace South Fayetteville wavetrapp jumpers	\$ 50,000
09SP	AEPW-AEPW	53170 TONTITN5 161 53194 ELMSPRR5 161 1	335	359	0.5170	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-AEPW	53795 R.S.S.-4 138 53867 ORU-WTP4 138 1	304	347	0.7140	Multiple Outage Contingency: 53795 R.S.S.-4 138 53863 ORU ETP4 138 1 53863 ORU ETP4 138 53873 WARNTAP4 138 1 53749 ORU E4 138 53863 ORU ETP4 138 1 53822 81YALES4 138 53872 WAREN-W4 138 1 53822 81YALES4 138 53873 WARNTAP4 138 1 53861 96YALE-4 138 53873 WARNTAP4 138 1 Move 100% Load From Bus 53749 To Bus 53743 Move 100% Load From Bus 53822 To Bus 53741 Move 100% Load From Bus 53872 To Bus 53740	0	See Previous Upgrade Specified for Facility	
09SP	GRRD-GRRD	54451 CLARMR 5 161 54479 CLARMR 2 69 1	84	87	0.6950	54451 CLARMR 5 161 54479 CLARMR 2 69 2	0	See Previous Upgrade Specified for Facility	
09SP	GRRD-GRRD	54451 CLARMR 5 161 54479 CLARMR 2 69 2	84	87	0.6970	54451 CLARMR 5 161 54479 CLARMR 2 69 1	0	See Previous Upgrade Specified for Facility	
09SP	OKGE-WFEC	54946 MIDWEST4 138 55917 FRNKLNS4 138 1	184	235	0.4890	54946 MIDWEST4 138 54953 HOLLYWD4 138 1	0	See Previous Upgrade Specified for Facility	
09SP	OKGE-OKGE	55177 PARKLN 2 69 55187 AHLOSTP2 69 1	72	88	0.1870	55177 PARKLN 2 69 55182 VALLYVU2 69 1	0	Solution Undetermined	
09SP	OKGE-OKGE	55228 5TRIBES5 161 55234 PECANCK5 161 1	223	223	1.3800	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	55234 PECANCK5 161 55235 PECANCK7 345 1	368	388	1.4420	53756 CLARKSV7 345 55224 MUSKOG7 345 1	0	Add 2nd 345/161 kV 369MVA transformer.	\$ 3,000,000
09SP	WFEC-WFEC	55810 ANADARK2 69 55870 CYRIL 2 69 1	61	62	0.0790	55814 ANADARK4 138 55923 GEORGIA4 138 1	0	Reconductor 13 miles of 336MCM ACSR with 795MCM.	\$ 2,626,000
09SP	MIDW-WEPL	56565 SEWARD 2 69 58792 SEWARD 3 115 1	44	52	0.1630	56601 HEIZER 3 115 58779 MULGREN6 230 1	0	Solution Undetermined	
09SP	WERE-WERE	56851 AUBURN 6 230 *B015 AUBRN77X 1 1	304	376	0.6090	56765 HOYT 7 345 56766 JEC N 7 345 1	0	May be relieved due to Westar Transmission Operating Directive 400 Outage of the Jeffrey Energy Center to Hoyt 345kV Line	
09SP	WERE-WERE	56853 LAWHILL6 230 *B101 LAWHL29X 1 1	298	338	0.8750	56853 LAWHILL6 230 56855 MIDLAND6 230 1	0	May be relieved due to Westar Transmission Operating Directive 901 Outage of the Lawrence Hill-Midland Junction 230kV Line	
09SP	WERE-WERE	56855 MIDLAND6 230 *B115 MIDJ126X 1 1	308	310	0.8290	56853 LAWHILL6 230 *B101 LAWHL29X 1 1	0	May be relieved due to Westar Transmission Operating Directive 631 Loss of the Lawrence Hill 230/115kV Transformer	
09SP	WERE-WERE	57021 NEOSHO 4 138 *B133 NEOSH2AX 1 1	20	23	0.7740	57021 NEOSHO 4 138 *B129 NEC3 GSU 1 1	0	May be relieved due to Westar Transmission Operating Directive 621 Outage of the Neosho SES #3 138/69 kV Main Transformer.	
09SP	WERE-WERE	57021 NEOSHO 4 138 *B134 NEOSH2BX 1 1	17	20	0.6670	57021 NEOSHO 4 138 *B129 NEC3 GSU 1 1	0	May be relieved due to Westar Transmission Operating Directive 621 Outage of the Neosho SES #3 138/69 kV Main Transformer.	
09SP	WERE-WERE	57021 NEOSHO 4 138 *B135 NEOSH2CX 1 2	17	20	0.6670	57021 NEOSHO 4 138 *B129 NEC3 GSU 1 1	0	May be relieved due to Westar Transmission Operating Directive 621 Outage of the Neosho SES #3 138/69 kV Main Transformer.	

Table 1 - continued – SPP facility overloads identified for the WR to EDE 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	57152 CIRCLVL3 115 57165 HTI JCT3 115 1	96	103	0.4010	56765 HOYT 7 345 56772 STRANGR7 345 1	0	May be relieved due to Westar Transmission Operating Directive 803 Outage of the Hoyt to Stranger 345 kV line	
09SP	WERE-WERE	57236 COOP 3 115 57277 WAKARUS3 115 1	92	93	0.3990	57271 SWLWRNC3 115 57277 WAKARUS3 115 1	0	Rebuild 1.53-mile line	\$ 390,000
09SP	WERE-WERE	57250 LWRNCHL3 115 57280 WREN 3 115 1	139	146	0.1020	57234 BISMARCK3 115 57236 COOP 3 115 1	0	May be relieved due to Westar Transmission Operating Directive 1210 Outage of the Bismark to COOP 115kV Line Section	
09SP	WERE-WERE	57588 CHASE 2 69 57605 WHITE J2 69 1	43	43	0.2510	56991 WEAVER 4 138 *B188 WEAVER2X 1 1	0	May be relieved due to Westar Transmission Operating Directive 634 Outage of the Weaver 138-69kV Transformer	
09SP	KACP-KACP	57978 CRAIG 5 161 58048 COLLEGE5 161 1	330	344	0.2550	57969 STILWEL5 161 58050 ANTIOCH5 161 1	0	Reconductor 4 miles with 1192.5 ACSS, 558 normal/emergency rating and upgrade breaker.	\$ 700,000
09SP	EMDE-EMDE	59483 JOP389 5 161 *B094 JOPLINSW 1 1	75	78	4.0160	59472 TIP292 5 161 59483 JOP389 5 161 1	0	See Previous Upgrade Specified for Facility	
09SP	AECI-AECI	96137 4BRISTOW 138 96889 2BRISTOW 69 1	54	63	0.1130	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	0.1130	96137 4BRISTOW 138 96889 2BRISTOW 69 1	0	See Previous Upgrade Specified for Facility	
09SP	AECI-AECI	96983 2STILWEL 69 96986 2TITANTP 69 1	36	37	0.3380	54452 SALSWGR2 69 96859 2BRUSHY 69 1	0	Rebuild 9.2 miles with 795MCM ACSR	\$ 1,518,000
09SP	EMDE-EMDE	59500 RNM393 5 161 *B150 REINMILL 1 1	75	74	2.6610	59472 TIP292 5 161 59483 JOP389 5 161 1	7	Replace 161/69 KV Transformer with a 150 MVA Transformer.	\$ 1,730,000
09SP	SWPA-AECI	52638 POP BLF5 161 96056 5ASHRVL 161 1	167	167	0.3430	96073 5HARVELE 161 96114 5STFRAN 161 1	25	Reconductor line with 795 ACSR.	\$ 4,000,000
09SP	EMDE-EMDE	59467 ORO110 5 161 59494 OAK432 5 161 1	214	212	6.0670	59472 TIP292 5 161 59483 JOP389 5 161 1	26	See Previous Upgrade Specified for Facility	
09WP	SWPA-SPRM	52692 SPRGFLD5 161 59969 BRKLINE 5 161 1	318	337	11.2230	59954 SWPS 5 161 59960 SWDISP 5 161 1	0	See Previous Upgrade Specified for Facility	
09WP	AEPW-AEPW	53133 ECNTRTN5 161 53187 GENTRYR5 161 1	367	388	1.1770	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	408	0.2900	53139 FLINTCR5 161 53187 GENTRYR5 161 1	0	See Previous Upgrade Specified for Facility	
09WP	AEPW-AEPW	53139 FLINTCR5 161 53187 GENTRYR5 161 1	360	406	1.1770	53139 FLINTCR5 161 53170 TONTITN5 161 1	0	See Previous Upgrade Specified for Facility	
09WP	AEPW-AEPW	53154 CHAMSPR5 161 53170 TONTITN5 161 1	243	332	2.6950	53154 CHAMSPR5 161 53195 FARMGTN5 161 1	0	See Previous Upgrade Specified for Facility	
09WP	WERE-WERE	57152 CIRCLVL3 115 57165 HTI JCT3 115 1	95	105	0.2120	57982 IATAN 7 345 59199 ST JOE 3 345 1	0	See Previous Upgrade Specified for Facility	
09WP	WERE-WERE	57152 CIRCLVL3 115 57331 KING HL3 115 1	90	93	0.2120	57982 IATAN 7 345 59199 ST JOE 3 345 1	0	See Previous Upgrade Specified for Facility	
09WP	WERE-WERE	57217 KELLY 3 115 57331 KING HL3 115 1	88	102	0.3270	56765 HOYT 7 345 56772 STRANGR7 345 1	0	May be relieved due to Westar Transmission Operating Directive 803 Outage of the Hoyt to Stranger 345 kV line	
09WP	WERE-WERE	57623 ATHENS 2 69 57631 CC4VERN2 69 1	43	44	1.8690	56797 WOLFCRK7 345 57981 LACYGNE7 345 1	0	May be relieved due to Westar Transmission Operating Directive 1304 Overload of the Athens to Wolf Creek 69 kV Line	
09WP	WERE-WERE	57631 CC4VERN2 69 57636 GREEN 2 69 1	43	46	1.8690	56797 WOLFCRK7 345 57981 LACYGNE7 345 1	0	May be relieved due to Westar Transmission Operating Directive 1304 Overload of the Athens to Wolf Creek 69 kV Line	
09WP	EMDE-EMDE	59500 RNM393 5 161 *B150 REINMILL 1 1	75	74	2.8730	59472 TIP292 5 161 59483 JOP389 5 161 1	4	See Previous Upgrade Specified for Facility	
09WP	EMDE-EMDE	59483 JOP389 5 161 *B094 JOPLINSW 1 1	75	71	4.5340	59472 TIP292 5 161 59483 JOP389 5 161 1	75	See Previous Upgrade Specified for Facility	
09WP	OKGE-OKGE	55234 PECANCK5 161 55235 PECANCK7 345 1	369	368	1.4620	53756 CLARKSV7 345 55224 MUSKOGEE7 345 1	78	See Previous Upgrade Specified for Facility	
Total Estimated Cost									\$67,930,000

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