



SPP *Southwest
Power Pool*

*System Impact Study
SPP-2003-186-1
For The Designation of a New
Network Resource
Requested By
Empire District Electric Company*

From KCPL to EDE

*For a Reserved Amount Of 300 MW
From 6/1/2008
To 6/1/2033*

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 KCPL Control Area for 300 MW to serve EDE Network Load in the EDE Control Area. The period of the service requested is from 6/1/2008 to 6/1/2033. The OASIS reservation number is 544281. 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 300 MW transfer from the New Network Resource in KCPL to existing dispatched EDE Network Resources. The existing EDE Network Resources scaled include the EDE capacity purchase of 162 MW from the Westar Energy JEC units (54 MW from three units) and the remaining 138 MW from existing marginally dispatched Network Resources in the EDE Control Area.

The KCPL 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 KCPL to EDE 300 MW request.

Seven seasonal models were used to study the KCPL to EDE 300 MW 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 300 MW request on the SPP system during a the requested service period of 6/1/2008 to 6/1/2033. 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 KCPL to EDE 300 MW 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 KCPL 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		NONE IDENTIFIED					300		
04G	CELE-AEPW	50090 IPAPER 4 138 53461 WALLAKE4 138 1	236	257	0.2	50045 DOLHILL7 345 53454 SW SHV 7 345 1	0	May be relieved due to Dolet Hills Operating Directive	
04G	WERE-WERE	57151 AUBURN 3 115 57167 KEENE 3 115 1	68	72	0.1	56852 JEC 6 230 56861 EMANHAT6 230 1	0	May be relieved due to Westar Transmission Operating Directive 900 Outage of the JEC-East Manhattan 230kV Line	
04G	WERE-WERE	57167 KEENE 3 115 57339 S ALMA 3 115 1	68	68	0.1	56852 JEC 6 230 56861 EMANHAT6 230 1	0	May be relieved due to Westar Transmission Operating Directive 900 Outage of the JEC-East Manhattan 230kV Line	
04G	WERE-WERE	57623 ATHENS 2 69 57631 CC4VERN2 69 1	43	43	0.5	56791 BENTON 7 345 56797 WOLFCRK7 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	45	0.5	56791 BENTON 7 345 56797 WOLFCRK7 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	57216 KERFORD3 115 57259 NW LEAV3 115 1	67	67	0.6	57211 ARNOLD 3 115 57268 STRANGR3 115 1	25	May be relieved due to Westar Transmission Operating Directive 1200 Outage of the Arnold to Stranger Creek 115kV Line	
04SP	CELE-AEPW	50090 IPAPER 4 138 53461 WALLAKE4 138 1	208	246	0.2	50045 DOLHILL7 345 53454 SW SHV 7 345 1	0	May be relieved due to Dolet Hills Operating Directive	
04SP	AEPW-AEPW	53133 ECNTRTN5 161 53187 GENTRYR5 161 1	353	360	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 Wavetrap & jumpers	\$ 8,000,000
04SP	AEPW-AEPW	53139 FLINTCR5 161 53170 TONTITN5 161 1	311	352	0.2	53154 CHAMSPR5 161 53170 TONTITN5 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	354	376	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 wavetrap & jumpers	\$ 450,000
04SP	AEPW-AEPW	53142 HUNTING2 69 53202 MIDLREA2 69 1	36	36	0.1	55262 AES 5 161 55264 TARBY 5 161 1	0	Solution Undetermined	
04SP	AEPW-AEPW	53154 CHAMSPR5 161 53170 TONTITN5 161 1	247	285	1.0	53154 CHAMSPR5 161 53195 FARMGTN5 161 1	0	Rebuild 12 miles with 2156MCM ACSR. Replace Chamber Springs wavetrap & reset relays.	\$ 7,200,000
04SP	OKGE-OKGE	54933 DRAPER 4 138 54934 DRAPER 7 345 1	490	493	0.1	54933 DRAPER 4 138 54934 DRAPER 7 345 2	0	Add third 345 - 138 kV transformer at Draper in 2008 at OKGE expense and use the operating directive until 2008.	
04SP	OKGE-OKGE	54933 DRAPER 4 138 54934 DRAPER 7 345 2	490	493	0.1	54933 DRAPER 4 138 54934 DRAPER 7 345 1	0	Add third 345 - 138 kV transformer at Draper in 2008 at OKGE expense and use the operating directive until 2008.	
04SP	OKGE-WFEC	54946 MIDWEST4 138 55917 FRNKLNS4 138 1	186	202	0.1	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	55300 FTSMITH5 161 55305 FTSMITH8 500 1	475	477	1.1	55300 FTSMITH5 161 55302 FTSMITH7 345 1	0	Convert Ft. Smith 161kv to 1-1/2 breaker design and install 2nd 500-161kV transformer bank.	\$ 7,000,000
04SP	WERE-WERE	57151 AUBURN 3 115 57167 KEENE 3 115 1	68	71	0.1	56852 JEC 6 230 56861 EMANHAT6 230 1	0	May be relieved due to Westar Transmission Operating Directive 900 Outage of the JEC-East Manhattan 230kV Line	
04SP	WERE-WERE	57182 TECHILE3 115 57187 27CROCO3 115 1	67	75	0.3	56851 AUBURN 6 230 B016 AUBRN77X 1 1	0	May be relieved due to Westar Transmission Operating Directive 618 Loss of the Auburn Road 230/115 kV transformer	

Table 1 continued – SPP facility overloads identified for the KCPL 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	WERE-WERE	57301 EAST ST3 115 57309 WEMPOR13 115 1	91	94	0.1	57305 MORRIS 3 115 57309 WEMPOR13 115 1	0	May be relieved due to Westar Transmission Operating Directive 1209 Outage of the Morris-West Emporia 115kV Line	
04SP	WERE-WERE	57588 CHASE 2 69 57605 WHITE J2 69 1	43	50	0.1	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	WERE-WERE	57604 WEAVER 2 69 57837 RH JCT 2 69 1	43	44	0.1	57039 ELPASO 4 138 57042 FARBER 4 138 1	0	Move Rose Hill Jct. 69 kV load to Rose Hill 345/138 kV substation. Requires new transformer bay and a new 25 MVA 138-12 kV transformer.	\$ 1,400,000
04SP	EMDE-EMDE	59483 JOP389 5 161 B095 JOPLINSW 1 1	75	72	2.4	59472 TIP292 5 161 59483 JOP389 5 161 1	101	Replace 161/69 KV Transformer with a 150 MVA Transformer.	\$ 1,565,000
04SP	WERE-WERE	57160 41CALIF3 115 57188 27CROCJ3 115 1	68	67	0.3	56851 AUBURN 6 230 B016 AUBRN77X 1 1	195	May be relieved due to Westar Transmission Operating Directive 618 Loss of the Auburn Road 230/115 kV transformer	
04SP	SWPA-AECI	52694 SPRGFLD2 69 96661 2BTLFD 69 1	35	33	0.6	52692 SPRGFLD5 161 96678 5NIXA-1 161 1	297	Solution Undetermined	
04SP	WERE-WERE	57796 GILL W 2 69 B059 GEC3 GSU 1 1	136	138	0.1	57795 GILL E 2 69 57796 GILL W 2 69 1	300	Invalid Contingency	
04FA	CELE-AEPW	50090 IPAPER 4 138 53461 WALLAKE4 138 1	235	269	0.2	50045 DOLHILL7 345 53454 SW SHV 7 345 1	0	May be relieved due to Dolet Hills Operating Directive	
04FA	WERE-WERE	57151 AUBURN 3 115 57167 KEENE 3 115 1	68	76	0.1	56852 JEC 6 230 56861 EMANHAT6 230 1	0	May be relieved due to Westar Transmission Operating Directive 900 Outage of the JEC-East Manhattan 230kV Line	
04FA	WERE-WERE	57167 KEENE 3 115 57339 S ALMA 3 115 1	68	71	0.1	56852 JEC 6 230 56861 EMANHAT6 230 1	0	May be relieved due to Westar Transmission Operating Directive 900 Outage of the JEC-East Manhattan 230kV Line	
04FA	WERE-WERE	57301 EAST ST3 115 57309 WEMPOR13 115 1	92	97	0.1	57305 MORRIS 3 115 57309 WEMPOR13 115 1	0	May be relieved due to Westar Transmission Operating Directive 1209 Outage of the Morris-West Emporia 115kV Line	
04WP		NONE IDENTIFIED					300		
09SP	CELE-AEPW	50090 IPAPER 4 138 53461 WALLAKE4 138 1	208	246	0.2	50045 DOLHILL7 345 53454 SW SHV 7 345 1	0	May be relieved due to Dolet Hills Operating Directive	
09SP	SWPS-SWPS	51014 OSAGE--3 115 51080 CANYNE3 115 1	99	106	0.1	50993 BUSHLND6 230 51111 DFSMTH6 230 1	0	Rebuild 13 miles of 115 kV circuit with 397 ACSR on T-0-102 structures.	\$ 1,910,000
09SP	SWPS-SWPS	51020 RANDALL3 115 51082 PALODU 3 115 1	98	99	0.1	51041 AMARLS6 230 51321 SWISHER6 230 1	0	Rebuild 9 miles of 115 kV circuit with 397 ACSR on T-0-102 structures.	\$ 1,170,000
09SP	SWPA-ENTR	52618 JONESBO5 161 99755 5JONES 161 1	216	258	0.3	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	228	0.3	96073 5HARVELE 161 96114 5STFRAN 161 1	0	Reconductor line.	\$ 6,600,000
09SP	SWPA-AECI	52638 POP BLF5 161 96056 5ASHRVL 161 1	167	185	0.3	96073 5HARVELE 161 96114 5STFRAN 161 1	0	Reconductor line with 795 ACSR.	\$ 4,000,000
09SP	SWPA-SPRM	52692 SPRGFLD5 161 59969 BRKLNE 5 161 1	307	350	4.2	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	421	0.3	53139 FLINTCR5 161 53170 TONTITN5 161 1	0	See Previous Upgrade Specified for Facility	
09SP	AEPW-AEPW	53139 FLINTCR5 161 53154 CHAMSPR5 161 1	333	338	0.1	53155 CHAMSPR7 345 53756 CLARKSV7 345 1	0	Replace Terminal Equipment	\$ 60,000
09SP	AEPW-AEPW	53139 FLINTCR5 161 53170 TONTITN5 161 1	307	410	0.1	53154 CHAMSPR5 161 53170 TONTITN5 161 1	0	See Previous Upgrade Specified for Facility	
09SP	AEPW-AEPW	53139 FLINTCR5 161 53187 GENTRYR5 161 1	350	444	0.3	53139 FLINTCR5 161 53170 TONTITN5 161 1	0	See Previous Upgrade Specified for Facility	
09SP	AEPW-AEPW	53142 HUNTING2 69 53147 NHUNTNT2 69 1	48	48	0.1	55262 AES 5 161 55264 TARBY 5 161 1	0	Rebuild 0.24 miles of 4/0 ACSR with 795 ACSR & replace 4/0 jumpers @ Huntington	\$ 100,000
09SP	AEPW-AEPW	53142 HUNTING2 69 53202 MIDLREA2 69 1	36	39	0.1	55262 AES 5 161 55264 TARBY 5 161 1	0	Solution Undetermined	
09SP	AEPW-AEPW	53154 CHAMSPR5 161 53170 TONTITN5 161 1	243	346	1.0	53154 CHAMSPR5 161 53195 FARMGTN5 161 1	0	See Previous Upgrade Specified for Facility	

Table 1 continued – SPP facility overloads identified for the KCPL 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	AEPW-AEPW	53154 CHAMSPR5 161 53195 FARMGTN5 161 1	335	354	0.6	53154 CHAMSPR5 161 53170 TONTITN5 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	53170 TONTITN5 161 53194 ELMSPRR5 161 1	335	347	0.1	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	53374 FULTON 3 115 53383 HOPE 3 115 1	174	157	0.1	Base Case	0	Solution Undetermined	
09SP	AEPW-AEPW	53795 R.S.S.-4 138 53867 ORU-WTP4 138 1	304	312	0.3	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 Percent Load From Bus 53749 To Bus 53743 Move 100 Percent Load From Bus 53822 To Bus 53741 Move 100 Percent Load From Bus 53872 To Bus 53740	0	Replace wavetrap jumpers @ Riverside	\$ 10,000
09SP	OKGE-OKGE	54933 DRAPER 4 138 54934 DRAPER 7 345 1	489	512	0.1	54933 DRAPER 4 138 54934 DRAPER 7 345 2	0	Add third 345 - 138 kV transformer at Draper in 2008 at OKGE expense and use the operating directive until 2008.	
09SP	OKGE-OKGE	54933 DRAPER 4 138 54934 DRAPER 7 345 2	489	512	0.1	54933 DRAPER 4 138 54934 DRAPER 7 345 1	0	Add third 345 - 138 kV transformer at Draper in 2008 at OKGE expense and use the operating directive until 2008.	
09SP	OKGE-WFEC	54946 MIDWEST4 138 55917 FRNKLNS4 138 1	185	226	0.1	54946 MIDWEST4 138 54953 HOLLYWD4 138 1	0	See Previous Upgrade Specified for Facility	
09SP	OKGE-OKGE	55300 FTSMITH5 161 55302 FTSMITH7 345 1	489	489	0.9	55300 FTSMITH5 161 55305 FTSMITH8 500 1	0	See Previous Upgrade Specified for Facility	
09SP	OKGE-OKGE	55300 FTSMITH5 161 55305 FTSMITH8 500 1	474	523	1.1	55300 FTSMITH5 161 55302 FTSMITH7 345 1	0	See Previous Upgrade Specified for Facility	
09SP	WERE-WERE	57021 NEOSHO 4 138 B133 NEOSH2AX 1 1	19	22	0.3	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	16	18	0.2	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	16	18	0.2	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	57160 41CALIF3 115 57188 27CROCJ3 115 1	68	71	0.3	56851 AUBURN 6 230 B015 AUBRN77X 1 1	0	May be relieved due to Westar Transmission Operating Directive 618 Loss of the Auburn Road 230/115 kV transformer	
09SP	WERE-WERE	57182 TECHILE3 115 57187 27CROCO3 115 1	67	80	0.3	56851 AUBURN 6 230 B015 AUBRN77X 1 1	0	May be relieved due to Westar Transmission Operating Directive 618 Loss of the Auburn Road 230/115 kV transformer	
09SP	WERE-WERE	57182 TECHILE3 115 57187 27CROCO3 115 2	91	93	0.4	56851 AUBURN 6 230 B015 AUBRN77X 1 1	0	May be relieved due to Westar Transmission Operating Directive 618 Loss of the Auburn Road 230/115 kV transformer	
09SP	WERE-WERE	57588 CHASE 2 69 57605 WHITE J2 69 1	42	49	0.1	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	WERE-WERE	57796 GILL W 2 69 57830 PECK 2 69 1	35	38	0.1	57039 ELPASO 4 138 57042 FARBER 4 138 1	0	Repole 10.1 miles and keep existing conductor.	\$ 3,100,000
09SP	KACP-KACP	57978 CRAIG 5 161 58048 COLLEGE5 161 1	329	344	1.0	57969 STILWEL5 161 58050 ANTIOCH5 161 1	0	Reconductor 4 miles with 1192.5 ACSS, 558 normal/emergency rating and upgrade breaker.	\$ 700,000

Table 1 continued – SPP facility overloads identified for the KCPL 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	KACP-KACP	57993 STHTOWN5 161 58010 WINJT S5 161 1	224	230	3.1	57996 MIDTOWN5 161 57997 LEEDS 5 161 1	0	Solution Undetermined	
09SP	KACP-KACP	58000 BLUEVLY5 161 58010 WINJT S5 161 1	222	243	3.1	57996 MIDTOWN5 161 57997 LEEDS 5 161 1	0	replace 800 amp wavetrap with 1200 amp wavetrap at Blue Valley	\$ 8,000
09SP	EMDE-EMDE	59483 JOP389 5 161 B094 JOPLINSW 1 1	75	76	2.5	59472 TIP292 5 161 59483 JOP389 5 161 1	0	See Previous Upgrade Specified for Facility	
09SP	GRRD-GRRD	54451 CLARMR 5 161 54479 CLARMR 2 69 2	84	83	0.3	54451 CLARMR 5 161 54479 CLARMR 2 69 1	186	Add 3rd 161/69 KV Transformer	\$ 1,250,000
09SP	AECI-AECI	96983 2STILWEL 69 96986 2TITANTP 69 1	36	35	0.2	54452 SALSWGR2 69 96859 2BRUSHY 69 1	235	Rebuild 9.2 miles with 795MCM ACSR	\$ 1,518,000
09SP	EMDE-EMDE	59467 ORO110 5 161 B144 ORONOGO 1 1	75	62	4.5	59470 JOP145 5 161 B095 JOPLINW 1 1	270	Solution Undetermined	
09SP	GRRD-GRRD	54451 CLARMR 5 161 54479 CLARMR 2 69 1	84	83	0.3	54451 CLARMR 5 161 54479 CLARMR 2 69 2	273	See Previous Upgrade Specified for Facility	
09SP	KACP-KACP	57996 MIDTOWN5 161 57997 LEEDS 5 161 1	222	216	2.2	58000 BLUEVLY5 161 58010 WINJT S5 161 1	277	Solution Undetermined	
09SP	EMDE-EMDE	59500 RNM393 5 161 B150 REINMILL 1 1	75	71	1.4	59472 TIP292 5 161 59483 JOP389 5 161 1	279	Replace 161/69 KV Transformer with a 150 MVA Transformer.	\$ 1,730,000
09SP	EMDE-EMDE	59466 ATL109 5 161 B014 ATLAS 1 1	75	66	3.1	59483 JOP389 5 161 59607 JOP422 5 161 1	298	Solution Undetermined	
09WP	CELE-AEPW	50090 IPAPER 4 138 53461 WALLAKE4 138 1	235	273	0.2	50045 DOLHILL7 345 53454 SW SHV 7 345 1	0	May be relieved due to Dolet Hills Operating Directive	
09WP	AEPW-AEPW	53133 ECNTRTN5 161 53187 GENTRYR5 161 1	367	369	0.2	53139 FLINTCR5 161 53170 TONTITN5 161 1	0	See Previous Upgrade Specified for Facility	
09WP	AEPW-AEPW	53139 FLINTCR5 161 53170 TONTITN5 161 1	331	340	0.1	53154 CHAMSPR5 161 53170 TONTITN5 161 1	0	See Previous Upgrade Specified for Facility	
09WP	AEPW-AEPW	53139 FLINTCR5 161 53187 GENTRYR5 161 1	361	386	0.2	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	279	0.9	53154 CHAMSPR5 161 53195 FARMGTN5 161 1	0	See Previous Upgrade Specified for Facility	
09WP	OKGE-OKGE	54933 DRAPER 4 138 54934 DRAPER 7 345 1	489	517	0.1	54933 DRAPER 4 138 54934 DRAPER 7 345 2	0	Add third 345 - 138 kV transformer at Draper in 2008 at OKGE expense and use the operating directive until 2008.	
09WP	OKGE-OKGE	54933 DRAPER 4 138 54934 DRAPER 7 345 2	489	517	0.1	54933 DRAPER 4 138 54934 DRAPER 7 345 1	0	Add third 345 - 138 kV transformer at Draper in 2008 at OKGE expense and use the operating directive until 2008.	
09WP	WERE-WERE	57631 CC4VERN2 69 57636 GREEN 2 69 1	43	44	0.5	56791 BENTON 7 345 56797 WOLFCRK7 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	57623 ATHENS 2 69 57631 CC4VERN2 69 1	43	43	0.5	56791 BENTON 7 345 56797 WOLFCRK7 345 1	62	May be relieved due to Westar Transmission Operating Directive 1304 Overload of the Athens to Wolf Creek 69 kV Line	
09WP	SWPA-SPRM	52692 SPRGFLD5 161 59969 BRKLINE 5 161 1	316	309	3.4	59954 SWPS 5 161 59960 SWDISP 5 161 1	219	See Previous Upgrade Specified for Facility	
09WP	EMDE-EMDE	59483 JOP389 5 161 B094 JOPLINSW 1 1	75	71	1.6	59472 TIP292 5 161 59483 JOP389 5 161 1	257	See Previous Upgrade Specified for Facility	
Total Estimated Cost									\$63,457,000

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