



SPP *Southwest Power Pool*

***System Impact Study
SPP-2003-209-2
For Transmission Service
Requested By
Exelon Generation Company, LLC***

From AEPW To MPS

***For 400 MW
From 1/1/2004 To 1/1/2005***

SPP Engineering, Tariff Studies

System Impact Study

Exelon Generation Company, LLC has requested a system impact study for long-term Firm Point-to-Point transmission service from AEPW to MPS for 400 MW. The period of the service requested is from 1/1/2004 to 1/1/2005. The OASIS reservation number is 576130. This study is being performed to provide preliminary results for the potential redirect of firm service from AEPW to AMRN. The AEPW to AMRN firm service was renewed from 1/1/2004 to 1/1/2005 for an amount of 265MW. Therefore, the study for the potential redirect of this service was performed for an amount of 265 MW. 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 AEPW to MPS 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 AEPW to MPS request for redirected service. At the customer's request, an additional analysis was performed to determine the impacts of redirecting confirmed ERCOTE to EES service to the requested path of AEPW to MPS. The results of this analysis are documented in Table 2. The AEPW to MPS transfer has a greater impact on all originally identified facilities than the ERCOTE to EES original request.

Eight seasonal models were used to study the AEPW to MPS request for the requested service period. The SPP 2003 Series Cases 2003/04 Winter Peak (03WP), 2004 April Minimum (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. 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 MPS 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.

This study was performed in order to provide estimated upgrades required for a potential redirect of service. If an actual redirect of service is desired, a request must be made on OASIS that designates the Request Type as a redirect of confirmed service. After the request for redirect is made, another study must be performed based on the actual queue position of the new request.

Table 1 – SPP facility overloads identified for the CSWS to MPS transfer as a redirect of CSWS to AMRN service

Study Case	From Area - To Area	Branch Overload	Rating <MW>	Pre Transfer Loading	CSWS to MPS TDF	CSWS to AMRN TDF	Outaged Branch Causing Overload	ATC <MW>	Solution	Estimated Cost
03WP	WFEC-WFEC	55802 ACME 2 69 55916 FRNKLNS2 69 1	34	40	0.075	0.064	55841 CANADNS2 69 55924 GOLDSBY2 69 1	0	Acme Jct to Acme Sub: Upgrade From 3/0 To 795MCM. WFEC current work plan - 04SP	
03WP	WERE-WERE	57151 AUBURN 3 115 57179 S GAGEW3 115 1	75	79	0.503	0.292	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	
03WP	WERE-WERE	57039 ELPASO 4 138 57046 GILL S 4 138 1	210	210	0.377	0.282	57040 EVANS N4 138 57041 EVANS S4 138 1	35	Solution Undetermined	
04AP	WFEC-WFEC	55802 ACME 2 69 55916 FRNKLNS2 69 1	34	35	0.074	0.064	55841 CANADNS2 69 55924 GOLDSBY2 69 1	0	See Previous Upgrade Specified for Facility	
04G	WERE-WERE	57151 AUBURN 3 115 57179 S GAGEW3 115 1	75	87	0.508	0.296	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	
04G	WERE-WERE	57151 AUBURN 3 115 57179 S GAGEW3 115 2	97	101	0.585	0.340	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	
04G	WERE-WERE	56851 AUBURN 6 230 *B016 AUBRN77X 1 1	306	325	1.038	0.718	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	
04G	WERE-WERE	57039 ELPASO 4 138 57046 GILL S 4 138 1	210	263	0.380	0.293	57040 EVANS N4 138 57041 EVANS S4 138 1	0	Solution Undetermined	
04SP	WERE-WERE	57153 COLINE 3 115 *B034 COLINE5X 1 1	66	72	0.433	0.241	56765 HOYT 7 345 56772 STRANGR7 345 1	0	May be relieved due to WERE Op Guide 803, Outage of Hoyt to Stranger 345kV	
04SP	WERE-WERE	57795 GILL E 2 69 57813 MACARTH2 69 1	68	71	0.071	0.034	57795 GILL E 2 69 57825 OATVILL2 69 1	0	Replace substation bus and jumpers at MacArthur 69 kV.	\$ 22,000
04SP	WERE-WERE	57795 GILL E 2 69 57825 OATVILL2 69 1	71	80	0.085	0.042	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	OKGE-OKGE	54941 HSL 4 138 54973 RENO 4 138 1	287	291	0.678	0.538	54941 HSL 4 138 54966 MIDWAY 4 138 1	0	Replace switches & ct's at Horseshoe Lake in 2004 at OKGE expense.	
04SP	WERE-WERE	56853 LAWHILL6 230 *B101 LAHWL29X 1 1	298	338	1.308	0.790	56853 LAWHILL6 230 56855 MIDLAND6 230 1	0	May be relieved due to WERE Op Guide 901, Outage of Lawrence Hill - Midland Junction 230kV	
04SP	WERE-WERE	56855 MIDLAND6 230 *B114 MIDJ126X 1 1	308	310	1.258	0.752	56853 LAWHILL6 230 *B101 LAHWL29X 1 1	0	May be relieved due to WERE Op Guide 631, Outage of Lawrence Hill 230/115kV Transformer	
04SP	WERE-WERE	57182 TECHILE3 115 57270 STULL T3 115 1	92	93	1.270	0.545	56765 HOYT 7 345 56772 STRANGR7 345 1	0	May be relieved due to WERE Op Guide 803, Outage of Hoyt to Stranger 345kV	
04SP	WERE-WERE	57233 166TH 3 115 57244 JARBALO3 115 1	97	96	0.752	0.125	57252 MIDLAND3 115 57261 PENTAGN3 115 1	97	Westar Transmission Operating Directive 1202, Overload of the Jarbalo to Jaggard 115kV Line	
04SP	OKGE-OKGE	55237 TIBBENS2 69 55246 BEELINE2 69 1	66	65	0.360	0.319	55241 BLUEBEL2 69 55242 BLUEBEL4 138 1	145	Possible Expediting of OKGE Planned Upgrade	
04SP	OKGE-OKGE	54742 OSAGE 2 69 54763 CONBLKS2 69 1	96	93	1.437	0.928	54760 KILDARE4 138 54761 WHEAGLE4 138 1	265	Previously Assigned Upgrade	
04FA	WERE-WERE	57039 ELPASO 4 138 57046 GILL S 4 138 1	210	258	0.387	0.282	57040 EVANS N4 138 57041 EVANS S4 138 1	0	Solution Undetermined	
04WP	WERE-WERE	57039 ELPASO 4 138 57046 GILL S 4 138 1	210	246	0.376	0.284	57040 EVANS N4 138 57041 EVANS S4 138 1	0	Solution Undetermined	
09SP	WERE-WERE	56851 AUBURN 6 230 *B015 AUBRN77X 1 1	304	375	0.784	0.666	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	OKGE-OKGE	54721 IMO 2 69 54722 CLEVETP2 69 1	36	53	0.055	0.029	54730 SO4TH2 2 69 54731 SO4TH4 4 138 1	0	Invalid Contingency	
09SP	KACP-KACP	57978 CRAIG 5 161 58048 COLLEGE5 161 1	330	330	1.271	0.053	57966 WGARDNR5 161 58044 MOONLT 5 161 1	0	Reconductor 4 miles with 1192.5 ACSS, 558 normal/emergency rating and upgrade breaker.	\$ 700,000
09SP	OKGE-OKGE	54742 OSAGE 2 69 54763 CONBLKS2 69 1	96	103	1.428	0.927	54760 KILDARE4 138 54761 WHEAGLE4 138 1	265	Previously Assigned Upgrade	

Table 1- continued – SPP facility overloads identified for the CSWS to MPS transfer as a redirect of CSWS to AMRN service

Study Case	From Area - To Area	Branch Overload	Rating <MW>	Pre Transfer Loading	CSWS to MPS TDF	CSWS to AMRN TDF	Outaged Branch Causing Overload	ATC <MW>	Solution	Estimated Cost
09SP	WERE-WERE	57236 COOP 3 115 57277 WAKARUS3 115 1	92	93	0.599	0.182	57271 SWLWRNC3 115 57277 WAKARUS3 115 1	0	Rebuild 1.53-mile line	\$ 390,000
09SP	OKGE-WFEC	54946 MIDWEST4 138 55917 FRNKLS4 138 1	184	200	0.400	N/A*	55869 CROMWEL4 138 56094 WEWOKA 4 138 1	0	Replace 800 amp wavetrapp with 2000 amp wavetrapp at Franklin Switch and 795ACSR jumpers with 1590ACSR, connectors	\$ 24,000
09SP	WERE-WERE	57795 GILL E 2 69 57825 OATVILL2 69 1	71	77	0.086	0.041	57795 GILL E 2 69 57813 MACARTH2 69 1	0	See Previous Upgrade Specified for Facility	
09SP	OKGE-OKGE	54941 HSL 4 138 54973 RENO 4 138 1	287	304	0.670	0.530	54941 HSL 4 138 54966 MIDWAY 4 138 1	0	Replace switches & ct's at Horseshoe Lake in 2004 at OKGE expense.	
09SP	WERE-WERE	57250 LWRNCHL3 115 57280 WREN 3 115 1	139	145	0.274	0.089	57253 MOCKBRD3 115 57271 SWLWRNC3 115 1	0	May be relieved due to WERE Op Guide 1211, Outage of Mockingbird - SW Lawrence 115kV	
09SP	WERE-WERE	56853 LAWHILL6 230 *B101 LAWHL29X 1 1	298	337	1.162	0.727	56853 LAWHILL6 230 56855 MIDLAND6 230 1	0	May be relieved due to WERE Op Guide 901, Outage of Lawrence Hill - Midland Junction 230kV	
09SP	WERE-WERE	56855 MIDLAND6 230 *B115 MIDJ126X 1 1	308	309	1.104	0.689	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	OKGE-OKGE	55234 PECANCK5 161 55235 PECANCK7 345 1	368	378	4.041	3.718	53756 CLARKSV7 345 55224 MUSKOGEE7 345 1	0	Add 2nd 345/161 kV 369MVA transformer.	\$ 3,000,000
09SP	AECI-AECI	96983 2STILWEL 69 96986 2TITANTP 69 1	36	36	0.175	0.098	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	0.587	0.179	57236 COOP 3 115 57277 WAKARUS3 115 1	147	Rebuild 4.09-mile line	\$ 1,000,000
09WP	OKGE-OKGE	54721 IMO 2 69 54722 CLEVETP2 69 1	36	37	0.056	0.031	54730 SO4TH2 2 69 54731 SO4TH4 4 138 1	265	Invalid Contingency	
									Total Estimated Cost	\$ 6,699,000

*Original request path has negative impact on facility. No credit for positive impact removed can be given to the redirected path for this facility.

Table 2 – SPP facility overloads identified for the CSWS to MPS transfer as a redirect of ERCOTE to EES service

Study Case	From Area - To Area	Branch Overload	Rating <MW>	Pre Transfer Loading	AEPW to MPS %TDF	ERCOTE to EES %TDF	Outaged Branch Causing Overload	ATC <MW>	Solution	Estimated Cost
03WP	WFEC-WFEC	55802 ACME 2 69 55916 FRNKLNS2 69 1	34	40	0.075	0.002	55841 CANADNS2 69 55924 GOLDSBY2 69 1	0	Acme Jct to Acme Sub: Upgrade From 3/0 To 795MCM. WFEC Current Work Plan.	
03WP	WFEC-WFEC	55802 ACME 2 69 56095 WNORMAN2 69 1	38	38	0.086	0.003	55841 CANADNS2 69 55842 CANADNS4 138 1	0	Acme Sub > West Norman: Upgrade from 3/0 to 795 ACSR. WFEC Current Work Plan.	
03WP	WERE-WERE	57151 AUBURN 3 115 57179 S GAGEW3 115 1	75	79	0.503	0.002	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	
03WP	WERE-WERE	57152 CIRCLVL3 115 57165 HTI JCT3 115 1	95	128	0.056	0.003	56765 HOYT 7 345 56772 STRANGR7 345 1	0	May be relieved due to WERE Op Guide 803, Outage of Hoyt to Stranger 345kV	
03WP	WERE-WERE	57152 CIRCLVL3 115 57331 KING HL3 115 1	90	117	0.056	0.003	56765 HOYT 7 345 56772 STRANGR7 345 1	0	May be relieved due to WERE Op Guide 803, Outage of Hoyt to Stranger 345kV	
03WP	WERE-WERE	57217 KELLY 3 115 57331 KING HL3 115 1	88	112	0.056	0.003	56765 HOYT 7 345 56772 STRANGR7 345 1	0	May be relieved due to WERE Op Guide 803, Outage of Hoyt to Stranger 345kV	
03WP	SWPA-SWPA	52648 NORFORK5 161 52650 NORFORK2 69 1	25	26	0.091	N/A*	52648 NORFORK5 161 52650 NORFORK2 69 2	0	Replace Norfork Transformer	\$ 1,300,000
03WP	WERE-WERE	57039 ELPASO 4 138 57046 GILL S 4 138 1	210	210	0.377	N/A*	57040 EVANS N4 138 57041 EVANS S4 138 1	35	Solution Undetermined	
04AP	WFEC-WFEC	55802 ACME 2 69 55916 FRNKLNS2 69 1	34	35	0.074	0.002	55841 CANADNS2 69 55924 GOLDSBY2 69 1	0	Acme Jct to Acme Sub: Upgrade From 3/0 To 795MCM. WFEC Current Work Plan.	
04G	WFEC-WFEC	55802 ACME 2 69 55916 FRNKLNS2 69 1	34	36	0.087	0.003	55841 CANADNS2 69 55842 CANADNS4 138 1	0	Acme Jct to Acme Sub: Upgrade From 3/0 To 795MCM. WFEC Current Work Plan.	
04G	WERE-WERE	57151 AUBURN 3 115 57179 S GAGEW3 115 1	75	87	0.508	0.002	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	
04G	WERE-WERE	57151 AUBURN 3 115 57179 S GAGEW3 115 2	97	101	0.585	0.003	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	
04G	WERE-WERE	56851 AUBURN 6 230 *B016 AUBRN77X 1 1	306	325	1.038	0.005	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	
04G	WERE-WERE	57152 CIRCLVL3 115 57165 HTI JCT3 115 1	95	112	0.068	0.003	56765 HOYT 7 345 56772 STRANGR7 345 1	0	May be relieved due to WERE Op Guide 803, Outage of Hoyt to Stranger 345kV	
04G	WERE-WERE	57152 CIRCLVL3 115 57331 KING HL3 115 1	90	99	0.068	0.003	56765 HOYT 7 345 56772 STRANGR7 345 1	0	May be relieved due to WERE Op Guide 803, Outage of Hoyt to Stranger 345kV	
04G	WERE-WERE	57039 ELPASO 4 138 57046 GILL S 4 138 1	210	263	0.380	N/A*	57040 EVANS N4 138 57041 EVANS S4 138 1	0	Solution Undetermined	
04G	WERE-WERE	57217 KELLY 3 115 57331 KING HL3 115 1	89	95	0.068	0.003	56765 HOYT 7 345 56772 STRANGR7 345 1	0	May be relieved due to WERE Op Guide 803, Outage of Hoyt to Stranger 345kV	
04SP	WFEC-WFEC	55802 ACME 2 69 56095 WNORMAN2 69 1	38	42	0.092	0.003	55841 CANADNS2 69 55842 CANADNS4 138 1	0	Acme Sub > West Norman: Upgrade from 3/0 to 795 ACSR. WFEC Current Work Plan.	
04SP	AEPW-AEPW	53245 ALUMXT 4 138 53300 NWTXARK4 138 1	260	273	0.454	0.021	53299 NWT-BNT4 138 53300 NWTXARK4 138 1	0	Rebuild 1.68 miles of 1024 ACAR with 2156 ACSR, Replace wavetrap jumpers with 2156 ACSR	\$ 840,000
04SP	WERE-WERE	56851 AUBURN 6 230 *B016 AUBRN77X 1 1	304	372	0.644	0.004	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	0.054	0.002	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	0.054	0.002	96137 4BRISTOW 138 96889 2BRISTOW 69 1	0	See Previous Upgrade Specified for Facility	
04SP	SWPA-ENTR	52660 BULL SH5 161 99825 5MIDWAY# 161 1	161	166	0.592	0.010	99817 5ISES 1 161 99826 5MORFLD 161 1	0	Replace disconnect switches, metering CTs and wave trap at Bull Shoals.	\$ 150,000
04SP	AEPW-AEPW	53154 CHAMSPR5 161 53170 TONTITN5 161 1	247	324	3.841	0.013	53154 CHAMSPR5 161 53195 FARMGTN5 161 1	0	Rebuild 12 miles with 2156MCM ACSR. Replace Chamber Springs wavetrap & reset relays.	\$ 7,200,000
04SP	AEPW-AEPW	53522 CHEROKE4 138 53557 KNOXLEE4 138 1	209	225	0.442	0.033	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	213	0.442	0.033	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	

Table 2 - continued – SPP facility overloads identified for the CSWS to MPS transfer as a redirect of ERCOTE to EES service

Study Case	From Area - To Area	Branch Overload	Rating <MW>	Pre Transfer Loading	AEPW to MPS %TDF	ERCOTE to EES %TDF	Outaged Branch Causing Overload	ATC <MW>	Solution	Estimated Cost
04SP	WERE-WERE	57152 CIRCLVL3 115 57165 HTI JCT3 115 1	96	101	0.095	0.003	56765 HOYT 7 345 56772 STRANGR7 345 1	0	May be relieved due to WERE Op Guide 803, Outage of Hoyt to Stranger 345kV	
04SP	WERE-WERE	57153 COLINE 3 115 *B034 COLINE5X 1 1	66	72	0.433	0.002	56765 HOYT 7 345 56772 STRANGR7 345 1	0	May be relieved due to WERE Op Guide 803, Outage of Hoyt to Stranger 345kV	
04SP	AEPW-AEPW	53133 ECNTRTN5 161 53187 GENTRYR5 161 1	353	376	0.619	0.006	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 53187 GENTRYR5 161 1	354	394	0.619	0.006	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	53139 FLINTCR5 161 53170 TONTITN5 161 1	311	364	0.308	0.005	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	OKGE-WFEC	54946 MIDWEST4 138 55917 FRNKLS4 138 1	186	187	0.087	0.002	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	WERE-WERE	57795 GILL E 2 69 57813 MACARTH2 69 1	68	71	0.071	0.001	57795 GILL E 2 69 57825 OATVILL2 69 1	0	Replace substation bus and jumpers at MacArthur 69 kV.	\$ 22,000
04SP	WERE-WERE	57795 GILL E 2 69 57825 OATVILL2 69 1	71	80	0.085	0.001	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	OKGE-OKGE	54941 HSL 4 138 54973 RENO 4 138 1	287	291	0.678	0.009	54941 HSL 4 138 54966 MIDWAY 4 138 1	0	Replace switches & ct's at Horseshoe Lake in 2004 at OKGE expense.	
04SP	WERE-WERE	56853 LAWHILL6 230 *B101 LAWHL29X 1 1	298	338	1.308	0.005	56853 LAWHILL6 230 56855 MIDLAND6 230 1	0	May be relieved due to WERE Op Guide 901, Outage of Lawrence Hill - Midland Junction 230kV	
04SP	WERE-WERE	56855 MIDLAND6 230 *B114 MIDJ126X 1 1	308	310	1.258	0.005	57250 LWRNCHL3 115 *B101 LAWHL29X 1 1	0	May be relieved due to WERE Op Guide 631, Outage of Lawrence Hill 230/115kV Transformer	
04SP	OKGE-OKGE	55221 MUSKOG2 69 55222 MUSKOG5 161 1	41	42	0.087	0.001	55221 MUSKOG2 69 55222 MUSKOG5 161 3	0	Replace the existing 2- 41MVA 161/69 kV transformers with 1-100MVA in approximately 2005 at OKGE expense.	
04SP	OKGE-OKGE	55221 MUSKOG2 69 55222 MUSKOG5 161 2	41	43	0.089	0.001	55221 MUSKOG2 69 55222 MUSKOG5 161 3	0	Replace the existing 2- 41MVA 161/69 kV transformers with 1-100MVA in approximately 2005 at OKGE expense.	
04SP	WERE-WERE	57182 TECHILE3 115 57270 STULL T3 115 1	92	93	1.270	0.005	56765 HOYT 7 345 56772 STRANGR7 345 1	0	May be relieved due to WERE Op Guide 803, Outage of Hoyt to Stranger 345kV	
04SP	WERE-WERE	57233 166TH 3 115 57244 JARBALO3 115 1	97	96	0.752	0.002	57252 MIDLAND3 115 57261 PENTAGN3 115 1	97	Westar Transmission Operating Directive 1202, Overload of the Jarbalo to Jaggard 115kV Line	
04SP	OKGE-OKGE	55237 TIBBENS2 69 55246 BEELINE2 69 1	66	65	0.360	N/A*	55241 BLUEBEL2 69 55242 BLUEBEL4 138 1	145	Possible Expediting of OKGE Planned Upgrade	
04SP	AEPW-AEPW	53598 ROKHILL4 138 53611 TATUM 4 138 1	209	208	0.442	0.033	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	156	Previously Assigned Upgrade In-Service Date 05SP	
04FA	WERE-WERE	57152 CIRCLVL3 115 57165 HTI JCT3 115 1	95	115	0.118	0.003	56765 HOYT 7 345 56772 STRANGR7 345 1	0	May be relieved due to WERE Op Guide 803, Outage of Hoyt to Stranger 345kV	
04FA	WERE-WERE	57152 CIRCLVL3 115 57331 KING HL3 115 1	90	102	0.118	0.003	56765 HOYT 7 345 56772 STRANGR7 345 1	0	May be relieved due to WERE Op Guide 803, Outage of Hoyt to Stranger 345kV	
04FA	WERE-WERE	57039 ELPASO 4 138 57046 GILL S 4 138 1	210	258	0.387	N/A*	57040 EVANS N4 138 57041 EVANS S4 138 1	0	Solution Undetermined	
04FA	WERE-WERE	57217 KELLY 3 115 57331 KING HL3 115 1	89	97	0.118	0.003	56765 HOYT 7 345 56772 STRANGR7 345 1	0	May be relieved due to WERE Op Guide 803, Outage of Hoyt to Stranger 345kV	
04WP	WERE-WERE	57152 CIRCLVL3 115 57165 HTI JCT3 115 1	95	124	0.052	0.003	56765 HOYT 7 345 56772 STRANGR7 345 1	0	May be relieved due to WERE Op Guide 803, Outage of Hoyt to Stranger 345kV	
04WP	WERE-WERE	57152 CIRCLVL3 115 57331 KING HL3 115 1	90	113	0.052	0.003	56765 HOYT 7 345 56772 STRANGR7 345 1	0	May be relieved due to WERE Op Guide 803, Outage of Hoyt to Stranger 345kV	

Table 2 - continued – SPP facility overloads identified for the CSWS to MPS transfer as a redirect of ERCOTE to EES service

Study Case	From Area - To Area	Branch Overload	Rating <MW>	Pre Transfer Loading	AEPW to MPS %TDF	ERCOTE to EES %TDF	Outaged Branch Causing Overload	ATC <MW>	Solution	Estimated Cost
04WP	WERE-WERE	57039 ELPASO 4 138 57046 GILL S 4 138 1	210	246	0.376	N/A*	57040 EVANS N4 138 57041 EVANS S4 138 1	0	Solution Undetermined	
04WP	WERE-WERE	57217 KELLY 3 115 57331 KING HL3 115 1	88	107	0.052	0.003	56765 HOYT 7 345 56772 STRANGR7 345 1	0	May be relieved due to WERE Op Guide 803, Outage of Hoyt to Stranger 345kV	
04WP	SWPA-SWPA	52648 NORFORK5 161 52650 NORFORK2 69 1	25	27	0.091	N/A*	52648 NORFORK5 161 52650 NORFORK2 69 2	0	See Previous Upgrade Specified for Facility	
09SP	AEPW-AEPW	53245 ALUMXT 4 138 53250 BANN 4 138 1	260	284	0.458	0.021	53299 NWT-BNT4 138 53300 NWTXARK4 138 1	0	Replace six (6) 138 kV switches, five at Bann & one at Alumax Tap. Rebuild 0.67 miles of 1024 ACAR with 2156 ACSR. Replace wavetrap jumpers @ Bann. Replace breaker 3300 @ Bann.	\$ 630,000
09SP	AEPW-AEPW	53245 ALUMXT 4 138 53300 NWTXARK4 138 1	260	299	0.458	0.021	53299 NWT-BNT4 138 53300 NWTXARK4 138 1	0	See Previous Upgrade Specified for Facility	
09SP	WERE-WERE	56851 AUBURN 6 230 *B015 AUBRN77X 1 1	304	375	0.784	0.005	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-OKGE	53126 BONANZA5 161 55261 BONANZT5 161 1	177	183	0.436	0.001	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	0.055	0.002	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	0.055	0.002	96137 4BRISTOW 138 96889 2BRISTOW 69 1	0	See Previous Upgrade Specified for Facility	
09SP	SWPA-SPRM	52692 SPRGFLD5 161 59969 BRKLINE 5 161 1	309	354	0.143	0.013	59955 JUNCTN 5 161 59969 BRKLINE 5 161 1	0	Replace disconnect switches at Springfield.	\$ 60,000
09SP	SWPA-ENTR	52660 BULL SH5 161 99825 5MIDWAY# 161 1	161	178	0.565	0.010	99817 5ISES 1 161 99826 5MORFLD 161 1	0	See Previous Upgrade Specified for Facility	
09SP	AEPW-AEPW	53154 CHAMSPR5 161 53195 FARMGTN5 161 1	335	383	2.582	0.010	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	53139 FLINTCR5 161 53154 CHAMSPR5 161 1	331	348	0.534	0.004	53155 CHAMSPR7 345 53756 CLARKSV7 345 1	0	Replace Terminal Equipment	\$ 60,000
09SP	AEPW-AEPW	53154 CHAMSPR5 161 53170 TONTITN5 161 1	243	386	3.857	0.013	53154 CHAMSPR5 161 53195 FARMGTN5 161 1	0	See Previous Upgrade Specified for Facility	
09SP	WERE-WERE	57152 CIRCLVL3 115 57165 HTI JCT3 115 1	96	101	0.110	0.003	56765 HOYT 7 345 56772 STRANGR7 345 1	0	May be relieved due to WERE Op Guide 803, Outage of Hoyt to Stranger 345kV	
09SP	GRRD-GRRD	54451 CLARMR 5 161 54479 CLARMR 2 69 1	84	86	0.325	0.001	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	86	0.326	0.001	54451 CLARMR 5 161 54479 CLARMR 2 69 1	0	See Previous Upgrade Specified for Facility	
09SP	OKGE-OKGE	54721 IMO 2 69 54722 CLEVETP2 69 1	36	53	0.055	0.001	54730 SO4TH2 2 69 54731 SO4TH4 4 138 1	0	Invalid Contingency	
09SP	KACP-KACP	57978 CRAIG 5 161 58048 COLLEGE5 161 1	330	330	1.271	0.001	57966 WGARDNR5 161 58044 MOONLT 5 161 1	0	Reconductor 4 miles with 1192.5 ACSS, 558 normal/emergency rating and upgrade breaker.	\$ 700,000
09SP	SWPS-SWPS	51176 CURRY3 115 51202 ROOSEVL3 115 2	158	159	0.069	0.002	51195 OASIS6 230 51203 ROOSEVL6 230 1	0	Solution Undetermined	
09SP	AEPW-AEPW	53133 ECNTRTN5 161 53187 GENTRYR5 161 1	353	436	0.638	0.006	53139 FLINTCR5 161 53170 TONTITN5 161 1	0	See Previous Upgrade Specified for Facility	
09SP	AEPW-AEPW	53170 TONTITN5 161 53194 ELMSPRR5 161 1	335	357	0.703	0.004	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	WERE-WERE	57236 COOP 3 115 57277 WAKARUS3 115 1	92	93	0.599	0.002	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	318	2.582	0.010	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	405	1.049	0.007	53154 CHAMSPR5 161 53195 FARMGTN5 161 1	0	See Previous Upgrade Specified for Facility	
09SP	AEPW-AEPW	53139 FLINTCR5 161 53170 TONTITN5 161 1	305	412	0.885	N/A*	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	90	0.066	0.005	53394 BROADMR2 69 53408 FTHUMBG2 69 1	0	Solution Undetermined	
09SP	OKGE-WFEC	54946 MIDWEST4 138 55917 FRNKLSN4 138 1	184	206	0.400	0.014	55869 CROMWEL4 138 56084 WETUMKA4 138 1	0	See Previous Upgrade Specified for Facility	
09SP	WERE-WERE	57795 GILL E 2 69 57825 OATVILL2 69 1	71	77	0.086	0.001	57795 GILL E 2 69 57813 MACARTH2 69 1	0	See Previous Upgrade Specified for Facility	
09SP	OKGE-OKGE	54941 HSL 4 138 54973 RENO 4 138 1	287	304	0.670	0.009	54941 HSL 4 138 54966 MIDWAY 4 138 1	0	Replace switches & ct's at Horseshoe Lake in 2004 at OK's expense.	
09SP	AEPW-AEPW	53549 JACKSNV4 138 53588 OVERTON4 138 1	235	251	0.322	0.027	53526 CROCKET7 345 53637 TENRUSK7 345 1	0	Reset relays at Jacksonville & Overton.	\$ 15,000
09SP	AEPW-AEPW	53557 KNOXLEE4 138 53586 OAK2HIL4 138 1	206	233	0.052	0.005	53557 KNOXLEE4 138 53574 MONROER4 138 1	0	Reset relays & replace wavetrap @ Knoxville	\$ 50,000
09SP	WERE-WERE	57250 LWRNCHL3 115 57280 WREN 3 115 1	139	145	0.274	0.001	57253 MOCKBRD3 115 57271 SWLWRNC3 115 1	0	May be relieved due to WERE Op Guide 1211, Outage of Mockingbird - SW Lawrence 115kV	
09SP	WERE-WERE	56853 LAWHILL6 230 *B101 LAHWL29X 1 1	298	337	1.162	0.005	56853 LAWHILL6 230 56855 MIDLAND6 230 1	0	May be relieved due to WERE Op Guide 901, Outage of Lawrence Hill - Midland Junction 230kV	

Table 2 - continued – SPP facility overloads identified for the CSWS to MPS transfer as a redirect of ERCOTE to EES service

Study Case	From Area - To Area	Branch Overload	Rating <MW>	Pre Transfer Loading	AEPW to MPS %TDF	ERCOTE to EES %TDF	Outaged Branch Causing Overload	ATC <MW>	Solution	Estimated Cost
09SP	AEPW-AEPW	53423 LONGWD 4 138 53457 OAKPH 4 138 1	209	212	0.363	0.028	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	AEPW-AEPW	53570 MARSHAL2 69 53579 NMARSHL2 69 1	72	73	0.091	0.007	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 350 CU bus & jumpers @ North Marshall.	\$ 23,356
09SP	WERE-WERE	56855 MIDLAND6 230 *B115 MIDJ126X 1 1	308	309	1.104	0.005	57250 LWRNCHL3 115 *B101 LAWHL29X 1 1	0	May be relieved due to WERE Op Guide 631, Outage of Lawrence Hill 230/115kV Transformer	
09SP	OKGE-OKGE	55221 MUSKOGEE2 69 55222 MUSKOGEE5 161 1	41	41	0.087	0.001	55221 MUSKOGEE2 69 55222 MUSKOGEE5 161 3	0	Replace the existing 2- 41MVA 161/69 kV transformers with 1-100MVA in approximately 2005 at OKGE expense.	
09SP	OKGE-OKGE	55221 MUSKOGEE2 69 55222 MUSKOGEE5 161 2	41	42	0.090	0.001	55221 MUSKOGEE2 69 55222 MUSKOGEE5 161 3	0	Replace the existing 2- 41MVA 161/69 kV transformers with 1-100MVA in approximately 2005 at OKGE expense.	
09SP	OKGE-OKGE	55234 PECANCK5 161 55235 PECANCK7 345 1	368	378	4.041	0.012	53756 CLARKSV7 345 55224 MUSKOGEE7 345 1	0	Add 2nd 345/161 kV 369MVA transformer.	\$ 3,000,000
09SP	AEPW-AEPW	53446 S SHV 4 138 53455 SW SHVT4 138 1	210	220	0.089	0.008	53453 SW SHV 4 138 53464 WESTELT4 138 1	0	Solution Undetermined	
09SP	SWPA-SWPA	52692 SPRGFLD5 161 52694 SPRGFLD2 69 3	22	24	0.076	N/A*	52692 SPRGFLD5 161 52694 SPRGFLD2 69 1	0	Replace 25/25MVA transformer #3 with 80MVA unit to eliminate overload of both 25MVA #3 and 80MVA #1 transformers.	\$ 1,300,000
09SP	AECI-AECI	96983 2STILWEL 69 96986 2TITANTP 69 1	36	36	0.175	N/A*	54452 SALSWGR2 69 96859 2BRUSHY 69 1	0	Rebuild 9.2 miles with 795MCM ACSR	\$ 1,518,000
09SP	GRRD-GRRD	54447 TAHLQH 2 69 54455 TAHLQH 5 161 1	77	82	0.085	N/A*	54447 TAHLQH 2 69 54455 TAHLQH 5 161 2	0	Add 3rd 161/69 KV Transformer	\$ 1,400,000
09SP	GRRD-GRRD	54447 TAHLQH 2 69 54455 TAHLQH 5 161 2	77	83	0.087	N/A*	54447 TAHLQH 2 69 54455 TAHLQH 5 161 1	0	See Previous Upgrade Specified for Facility	
09SP	WERE-WERE	57271 SWLWRNC3 115 57277 WAKARUS3 115 1	92	91	0.587	0.002	57236 COOP 3 115 57277 WAKARUS3 115 1	147	Rebuild 4.09-mile line	\$ 1,000,000
09SP	AEPW-ENTR	53136 EUREKA 5 161 99832 5OSAGE # 161 1	244	242	0.911	0.012	52660 BULL SH5 161 99802 5BULLSH* 161 1	216	Rebuild 5.34 miles of 666 ACSR with 1590 ACSR. Replace wavetrap jumpers @ Eureka Springs	\$ 2,400,000
09WP	SWPA-SPRM	52692 SPRGFLD5 161 59969 BRKLINE 5 161 1	318	318	0.170	0.013	59955 JUNCTN 5 161 59969 BRKLINE 5 161 1	0	See Previous Upgrade Specified for Facility	
09WP	AEPW-AEPW	53154 CHAMSPR5 161 53170 TONTITN5 161 1	243	322	3.842	0.013	53154 CHAMSPR5 161 53195 FARMGTN5 161 1	0	See Previous Upgrade Specified for Facility	
09WP	OKGE-OKGE	54721 IMO 2 69 54722 CLEVETP2 69 1	36	37	0.056	0.001	54730 SO4TH2 2 69 54731 SO4TH4 4 138 1	0	Invalid Contingency	
09WP	AEPW-AEPW	53133 ECNTRTN5 161 53187 GENTRYR5 161 1	367	385	0.632	0.006	53139 FLINTCR5 161 53170 TONTITN5 161 1	0	See Previous Upgrade Specified for Facility	
09WP	AEPW-AEPW	53139 FLINTCR5 161 53187 GENTRYR5 161 1	360	370	1.505	0.008	53144 LOWELL 5 161 53152 ROGERS 5 161 1	0	See Previous Upgrade Specified for Facility	
09WP	AEPW-AEPW	53139 FLINTCR5 161 53170 TONTITN5 161 1	330	344	0.881	0.006	53155 CHAMSPR7 345 53756 CLARKSV7 345 1	0	See Previous Upgrade Specified for Facility	
09WP	SWPA-SWPA	52648 NORFORK5 161 52650 NORFORK2 69 1	25	31	0.086	N/A*	52648 NORFORK5 161 52650 NORFORK2 69 2	0	See Previous Upgrade Specified for Facility	
09WP	SWPA-SWPA	52648 NORFORK5 161 52650 NORFORK2 69 2	25	26	0.073	N/A*	52648 NORFORK5 161 52650 NORFORK2 69 1	0	See Previous Upgrade Specified for Facility	
09WP	SWPA-ENTR	52660 BULL SH5 161 99825 5MIDWAY# 161 1	161	160	0.583	0.010	99817 5ISES 1 161 99826 5MORFLD 161 1	170	See Previous Upgrade Specified for Facility	
									Total Estimated Cost	\$ 49,217,356

*Original request path has negative impact on facility. No credit for positive impact removed can be given to the redirected path for this facility.

Note: The Total Estimated Cost for Table 1 and Table 2 are independent of each other.

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