SPP Southwest Power Pool

System Impact Study SPP-2003-204-2 For Transmission Service Requested By Southwestern Public Service Company

From SPS To MPS

For a Redirected Amount Of 200 MW From 6/1/2005 To 6/1/2010

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 MPS for 200 MW. The period of the service requested is from 6/1/2005 to 6/1/2010. The OASIS reservation numbers are 571175, 571178, 571179 and 571180. This is a request to redirect the previously confirmed OASIS reservations 381154, 381165, 297069 and 297076 for a total of 200 MW from SPS to AMRN. 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 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 SPS to MPS request for redirected service.

Five seasonal models were used to study the SPS to MPS 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 6/1/2005 to 6/1/2010. 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.

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

Study Case	From Area - To Area	Branch Overload	Rating <MW>	Pre Transfer Loading	SPS to MPS %TDF	SPS to AMRN %TDF	Outaged Branch Causing Overload	ATC <MW>	Solution	Estimated Cost
04SP	WERE-WERE	57153 COLINE 3 115 *B034 COLINE5X 1 1	66	72	0.701	0.509	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	0.271	0.235	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	80	0.314	0.270	57795 GILL E 2 69 57813 MACARTH2 69 1	0	Replace disconnect switches at Gill (use 800 A.), Replace line switch at Oatville (use 800 A.).	$ 45,000
04SP	WERE-WERE	56853 LAWHILL6 230 *B101 LAWHL29X 1 1	298	337	1.785	1.268	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	309	1.723	1.217	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	WERE-WERE	57182 TECHILE3 115 57270 STULL T3 115 1	92	92	2.073	1.348	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	1.155	N/A	57252 MIDLAND3 115 57261 PENTAGN3 115 1	126	May be relieved due to WERE Op Guide 1202 - Outage of Jarbalo - Jaggard 115kV	
04SP	OKGE-OKGE	54742 OSAGE 2 69 54763 CONBLKS2 69 1	96	94	1.378	N/A	54760 KILDARE4 138 54761 WHEAGLE4 138 1	162	Replace Wavetrap and increase CT ratio.	$ 30,000
09SP	WERE-WERE	56851 AUBURN 6 230 *B015 AUBRN77X 1 1	304	374	1.328	1.210	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	54742 OSAGE 2 69 54763 CONBLKS2 69 1	96	103	1.368	0.866	54760 KILDARE4 138 54761 WHEAGLE4 138 1	0	See Previous Upgrade Specified for Facility	
09SP	AEPW-AEPW	53133 ECNTRTN5 161 53187 GENTRYR5 161 1	353	366	0.453	N/A	53134 EROGERS2 69 53135 EROGERS5 161 1	0	Rebuild 19.16 miles of 2-397.5 ACSR with 2156 ACSR. Replace East Centerton Wavetrap & jumpers	$ 8,000,000
09SP	WERE-WERE	57236 COOP 3 115 57277 WAKARUS3 115 1	92	92	0.960	0.542	57271 SWLWRNC3 115 57277 WAKARUS3 115 1	0	Rebuild 1.53-mile line	$ 390,000
09SP	AEPW-AEPW	53139 FLINTCR5 161 53187 GENTRYR5 161 1	350	395	0.374	N/A	52681 WSHBRN 5 161 52686 NEO SPA5 161 1	0	Rebuild 1.09 miles of 2-397.5 ACSR with 2156 ACSR. Replace Flint Creek wavetrap & jumpers	$ 450,000
09SP	WERE-WERE	57795 GILL E 2 69 57825 OATVILL2 69 1	71	76	0.311	0.266	57795 GILL E 2 69 57813 MACARTH2 69 1	0	See Previous Upgrade Specified for Facility	
09SP	SWPA-ENTR	52618 JONESBO5 161 99755 5JONES 161 1	218	232	0.068	N/A	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	WERE-WERE	57250 LWRNCHL3 115 57280 WREN 3 115 1	139	144	0.433	0.248	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	336	1.559	1.124	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	OKGE-OKGE	55234 PECANCK5 161 55235 PECANCK7 345 1	368	385	1.695	1.373	53756 CLARKSV7 345 55224 MUSKOGE7 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	0.162	0.084	54452 SALSWGR2 69 96859 2BRUSHY 69 1	0	Rebuild 9.2 miles with 795MCM ACSR	$ 1,518,000
09SP	WERE-WERE	56855 MIDLAND6 230 *B115 MIDJ126X 1 1	308	308	1.481	1.066	56853 LAWHILL6 230 *B101 LAWHL29X 1 1	13	May be relieved due to WERE Op Guide 631 - Outage of Lawrence Hill 230/115kV Transformer	
09SP	KACP-KACP	57978 CRAIG 5 161 58048 COLLEGE5 161 1	330	329	1.757	0.433	57966 WGARDNR5 161 58044 MOONLT 5 161 1	29	Reconductor 4 miles with 1192.5 ACSS, 558 normal/emergency rating and upgrade breaker.	$ 700,000
09SP	WERE-WERE	57271 SWLWRNC3 115 57277 WAKARUS3 115 1	92	90	0.938	N/A	57236 COOP 3 115 57277 WAKARUS3 115 1	158	Rebuild 4.09-mile line	$ 1,000,000
09SP	SWPS-SWPS	51176 CURRY3 115 51202 ROOSEVL3 115 2	158	153	3.078	3.060	51195 OASIS6 230 51203 ROOSEVL6 230 1	163	Solution Undetermined	
09WP	OKGE-OKGE	55068 SHAWNEE2 69 55070 MISSION2 69 1	51	51	0.082	N/A	55059 SQUIRCK4 138 55075 FRSTHIL4 138 1	30	May be able to increase CTR (if relays will coordinate) at Shawnee sub.	$ 5,000
									Total Estimated Cost	$ 15,162,000

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