



SPP *Southwest
Power Pool*

*Preliminary
System Impact Study
SPP-2004-177-1P
For Transmission Service
Requested By
Xcel Energy Marketing*

From SPS to KACY

*For a Reserved Amount Of 20MW
From 6/1/2005
To 6/1/2006*

SPP Engineering, Tariff Studies

System Impact Study

Xcel Energy Marketing has requested a system impact study for long-term Firm Point-to-Point transmission service from SPS to KACY for 20 MW. The period of the service requested is from 6/1/2005 to 6/1/2006. The OASIS reservation number is 793360. 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.

This study was performed for the SPS to KACY request in order to provide preliminary results identifying facility upgrades that may be required for the requested service. The requested service was modeled as a transfer from the specified source in the SPS Control Area to marginally dispatched units in the KACY Control Area. The preliminary study is performed with only confirmed reservations included in the models. The models do not include any reservations, even those with a higher priority, that are still in study mode. The results of the transfer analyses are documented in Table 1 of the report. Table 1 summarizes the results of the Scenario 1 system impact analysis. The primary purpose of this preliminary study is to provide the customer with an estimated cost of the facility upgrades that may be required in order to accommodate the requested service. The preliminary study is performed by monitoring each facility at 90% of its rating.

Six seasonal models were used to study the SPS to KACY request for the requested service period. The SPP 2004 Series Cases Update 2, 2005 April Minimum (05AP), 2005 Spring Peak (05G), 2005 Summer Peak (05SP), 2005 Summer Shoulder (05SH), 2005 Fall Peak (05FA), and 2005/2006 Winter Peak (05WP) were used to study the impact of the request on the SPP system during the requested service period of 6/1/2005 to 6/1/2006. 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 2004 base case series models. From the six seasonal models, three system scenarios were developed. Scenario 1 includes confirmed West to East transfers not already included in the January 2004 base case series models, SPS Exporting (including the Lamar HVDC Tie flowing from SPS to Lamar), and ERCOT exporting. Scenario 2 includes confirmed East to West transfers not already included in the January 2004 base case series models, SPS Importing (including the Lamar HVDC Tie flowing from Lamar to SPS), and ERCOT importing. Scenario 3 includes confirmed West to East transfers not already included in the January 2004 base case series models, SPS Importing (including the Lamar HVDC Tie flowing from Lamar to SPS), and ERCOT importing. Scenarios 2 and 3 were not used due to SPS Importing in the pre-developed 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.

These study results are preliminary estimates only and are not intended for use in final determination of the granting of service. These results do not include an evaluation of potential constraints in the planning horizon beyond the reservation period that may limit the right to renew service. Also, these results do not include third party constraints in Non-SPP control areas. Any solutions, upgrades, and costs provided in the preliminary System Impact Study are planning estimates only.

SPP will also review the possibility of curtailment of previously confirmed service and/or the redispatch of units as an option for relieving the additional impacts on the SPP facilities caused by the SPS to KACY request. It is the responsibility of the customer to reach an agreement with the applicable party concerning the curtailment of confirmed service and the redispatch of units. The curtailment and redispatch requirements would be called upon prior to implementing NERC TLR Level 5a. These options will be evaluated as part of the Aggregate System Impact Study. Execution of a Facility Study Agreement is not required at this time to maintain queue position. The final upgrade solutions, cost assignments, available redispatch, and curtailment options will be determined upon the completion of the Aggregate System Impact Study and Facility Study. An Aggregate System Impact Study Agreement will be tendered prior to the close of the first open season, June 1, 2005.

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

Study Case	From Area - To Area	Branch Overload	Rating <MW>	BC % Loading	TC % Loading	%TDF	Outaged Branch Causing Overload	ATC <MW>	Solution	Estimated Cost
05AP	AEPW-AEPW	54121 ELKCTY-4 138 *B099 1 1	259	90.2	113.0	29.0240	50887 POTTRC6 230 50888 POTTRC7 345 1	200	Invalid Contingency, Outage requires curtailment of SPS to LAMAR 210 MW Transaction	
05AP	AEPW-AEPW	54153 ELKCITY6 230 *B099 1 1	260	89.9	112.5	29.0240	50887 POTTRC6 230 50888 POTTRC7 345 1	200	Invalid Contingency, Outage requires curtailment of SPS to LAMAR 210 MW Transaction	
05G	WERE-WERE	56851 AUBURN 6 230 56852 JEC 6 230 1	565	101.6	103.3	4.6860	56765 HOYT 7 345 56766 JEC N 7 345 1	0	May be relieved due to Westar Operating Procedure 400 - Outage of the Jeffrey Energy Center to Hoyt 345kV Line	TBD
05G	AEPW-AEPW	54121 ELKCTY-4 138 *B101 1 1	258	90.5	119.0	36.1720	50887 POTTRC6 230 50888 POTTRC7 345 1	200	Invalid Contingency, Outage requires curtailment of SPS to LAMAR 210 MW Transaction	
05G	AEPW-AEPW	54153 ELKCITY6 230 *B101 1 1	260	90.0	118.3	36.1720	50887 POTTRC6 230 50888 POTTRC7 345 1	200	Invalid Contingency, Outage requires curtailment of SPS to LAMAR 210 MW Transaction	
05G	WERE-WERE	56765 HOYT 7 345 56766 JEC N 7 345 1	1076	91.1	92.9	9.2800	56766 JEC N 7 345 56770 MORRIS 7 345 1	20	May be relieved due to Westar Operating Procedure 401 JEC Transmission Line Outage Matrix	TBD
05G	WERE-WERE	56853 LAWHILL6 230 *B325 LAWHL29X 1 1	299	90.0	92.3	3.4730	56853 LAWHILL6 230 56855 MIDLAND6 230 1	20	May be relieved due to Westar Operating Procedure 0901 Outage of the Lawrence Hill-Midland Junction 230kV Line	TBD
05G	WERE-WERE	56853 LAWHILL6 230 *B325 LAWHL29X 1 1	299	89.9	92.3	3.4730	3Wnd: OPEN *B3 54 M IDJ126X 1	20	May be relieved due to Westar Operating Procedure 0615 Loss of the Midland Junction 230/115kV Transformer	TBD
05SP	WERE-WERE	56851 AUBURN 6 230 56852 JEC 6 230 1	564	109.6	111.2	4.4010	56765 HOYT 7 345 56766 JEC N 7 345 1	0	May be relieved due to Westar Operating Procedure 400 - Outage of the Jeffrey Energy Center to Hoyt 345kV Line	TBD
05SP	WERE-WERE	56853 LAWHILL6 230 *B332 LAWHL29X 1 1	298	106.1	108.5	3.4740	56853 LAWHILL6 230 56855 MIDLAND6 230 1	0	May be relieved due to Westar Operating Procedure 0901 Outage of the Lawrence Hill Midland Junction 230kV Line	TBD
05SP	WERE-WERE	56853 LAWHILL6 230 *B332 LAWHL29X 1 1	298	106.1	108.4	3.4740	3Wnd: OPEN *B3 62 M IDJ126X 1	0	May be relieved due to Westar Operating Procedure 0615 Loss of the Midland Junction 230/115kV Transformer	TBD
05SP	WERE-WERE	57250 LWRNCHL3 115 *B332 LAWHL29X 1 1	302	104.8	107.1	3.4740	56853 LAWHILL6 230 56855 MIDLAND6 230 1	0	May be relieved due to Westar Operating Procedure 0901 Outage of the Lawrence Hill Midland Junction 230kV Line	TBD
05SP	WERE-WERE	57250 LWRNCHL3 115 *B332 LAWHL29X 1 1	302	104.7	107.1	3.4740	3Wnd: OPEN *B3 62 M IDJ126X 1	0	May be relieved due to Westar Operating Procedure 0615 Loss of the Midland Junction 230/115kV Transformer	TBD
05SP	WERE-WERE	57233 166TH 3 115 57244 JARBALO3 115 1	97	99.9	106.5	3.1730	57252 MIDLAND3 115 57261 PENTAGN3 115 1	0	May be relieved due to Westar Operating Procedure 1218 Outage of the Midland Jct - Pentagon 115kV Line Section	TBD
05SP	KACY-KACY	58651 BARBER 5 161 58691 BARBER 2 69 1	89	93.4	139.9	20.4610	Unit:5 8692 QUI N 269.0 I d:1	3	Solution Undetermined	TBD

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05SP	WERE-WERE	56765 HOYT 7 345 56766 JEC N 7 345 1	1075	90.1	91.7	8.9570	56766 JEC N 7 345 56770 MORRIS 7 345 1	20	May be relieved due to Westar Operating Procedure 401 JEC Transmission Line Outage Matrix	TBD
05SP	WERE-WERE	56855 MIDLAND6 230 *B362 MIDJ126X 1 1	308	94.5	96.8	3.3680	3Wnd: OPEN *B3 32 L AWHL29X 1	20	May be relieved due to Westar Operating Procedure 0631 Loss of the Lawrence Hill 230/115kV Transformer	TBD
05SP	WERE-WERE	57252 MIDLAND3 115 *B362 MIDJ126X 1 1	307	94.6	96.8	3.3680	3Wnd: OPEN *B3 32 L AWHL29X 1	20	May be relieved due to Westar Operating Procedure 0631 Loss of the Lawrence Hill 230/115kV Transformer	TBD
05SP	KACP-KACP	57969 STILWEL5 161 58053 REDEL 5 161 1	326	89.8	93.1	5.3330	57968 STILWEL7 345 59200 PHILL 7 345 1	20	Solution Undetermined	TBD
05SH	WERE-WERE	56851 AUBURN 6 230 56852 JEC 6 230 1	565	104.6	106.2	4.2130	56765 HOYT 7 345 56766 JEC N 7 345 1	0	May be relieved due to Westar Operating Procedure 400 - Outage of the Jeffrey Energy Center to Hoyt 345kV Line	TBD
05SH	KACY-KACY	58651 BARBER 5 161 58691 BARBER 2 69 1	89	92.8	139.6	20.4620	Unit:5 8692 QUI N 269.0 l d:1	3	Solution Undetermined	TBD
05SH	WERE-WERE	56853 LAWHILL6 230 *B332 LAWHL29X 1 1	299	93.8	96.2	3.4550	56853 LAWHILL6 230 56855 MIDLAND6 230 1	20	May be relieved due to Westar Operating Procedure 0901 Outage of the Lawrence Hill Midland Junction 230kV Line	TBD
05SH	WERE-WERE	56853 LAWHILL6 230 *B332 LAWHL29X 1 1	299	93.8	96.1	3.4550	3Wnd: OPEN *B3 62 M IDJ126X 1	20	May be relieved due to Westar Operating Procedure 0615 Loss of the Midland Junction 230/115kV Transformer	TBD
05SH	WERE-WERE	57233 166TH 3 115 57244 JARBALO3 115 1	97	93.3	99.9	3.1460	57252 MIDLAND3 115 57261 PENTAGN3 115 1	20	May be relieved due to Westar Operating Procedure 1218 Outage of the Midland Jct - Pentagon 115kV Line Section	TBD
05SH	WERE-WERE	57250 LWRNCHL3 115 *B332 LAWHL29X 1 1	302	92.9	95.2	3.4550	56853 LAWHILL6 230 56855 MIDLAND6 230 1	20	May be relieved due to Westar Operating Procedure 0901 Outage of the Lawrence Hill Midland Junction 230kV Line	TBD
05SH	WERE-WERE	57250 LWRNCHL3 115 *B332 LAWHL29X 1 1	302	92.8	95.1	3.4550	3Wnd: OPEN *B3 62 M IDJ126X 1	20	May be relieved due to Westar Operating Procedure 0615 Loss of the Midland Junction 230/115kV Transformer	TBD
05FA	WERE-WERE	56851 AUBURN 6 230 56852 JEC 6 230 1	565	101.7	103.3	4.5240	56765 HOYT 7 345 56766 JEC N 7 345 1	0	May be relieved due to Westar Operating Procedure 400 - Outage of the Jeffrey Energy Center to Hoyt 345kV Line	TBD
05WP	WERE-WERE	56851 AUBURN 6 230 56852 JEC 6 230 1	565	103.0	104.7	4.5270	56765 HOYT 7 345 56766 JEC N 7 345 1	0	May be relieved due to Westar Operating Procedure 400 - Outage of the Jeffrey Energy Center to Hoyt 345kV Line	TBD
05WP	WERE-WERE	57233 166TH 3 115 57244 JARBALO3 115 1	97	93.9	100.5	3.1510	57252 MIDLAND3 115 57261 PENTAGN3 115 1	18	May be relieved due to Westar Operating Procedure 1218 Outage of the Midland Jct - Pentagon 115kV Line Section	TBD

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05WP	WERE-WERE	56765 HOYT 7 345 56766 JEC N 7 345 1	1076	90.4	92.1	8.9170	56766 JEC N 7 345 56770 MORRIS 7 345 1	20	May be relieved due to Westar Operating Procedure 401 JEC Transmission Line Outage Matrix	TBD
									This cost may be higher due to additional facilities whose solutions will be determined during the Facility Study process	\$*
									Total Cost with Facilities Monitored @ 90% Loading	\$ -
									Total Cost with Facilities Monitored @ 100% Loading	\$ -

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 – 90%
4. Contingency Case Rating – Rate B
5. Contingency Case % of Rating – 90%
6. Base Case Load Flow – Do not solve AC
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 – 0.03
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