



# **SPP** *Southwest Power Pool*

*Preliminary  
System Impact Study  
SPP-2004-179-1P  
For Transmission Service  
Requested By  
Xcel Energy Marketing*

*From OKGE to SPS*

*For a Reserved Amount Of 150MW  
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 OKGE to SPS for 150 MW. The period of the service requested is from 6/1/2005 to 6/1/2006. The OASIS reservation numbers are 794579, 794633, and 794644. This is a request to redirect previously confirmed OASIS reservations 381168, 381169, and 381170. Oasis Reservations 381168, 381169, and 381170 are 50 MW requests from AMRN to SPS. 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 OKGE to SPS 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 OKGE Control Area to marginally dispatched units in the SPS 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 Tables 1, 2, and 3 of the report. Table 1 summarizes the results of the Scenario 1 system impact analysis. Table 2 summarizes the results of the Scenario 2 system impact analysis. Table 3 summarizes the results of the Scenario 3 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 OKGE to SPS request for the requested service period. The SPP 2004 Series Cases Update 2, 2005 April Minimum (05AP), 2005 Spring Peak (05G), Summer Peak (05SP), 2005 Summer Shoulder (05SH), 2005 Fall Peak (05FA), and 2005/06 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 Importing (including the Lamar HVDC Tie flowing from Lamar to SPS), 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.

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 OKGE to SPS 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 OKGE to SPS transfer using Scenario 1**

Study Case	From Area - To Area	Branch Overload	Rating <MW>	BC % Loading	TC % Loading	%TDF	Original TC% Loading	Original % TDF	Outaged Branch Causing Overload	ATC <MW>	Solution	Estimated Cost
05AP		NONE IDENTIFIED								150		
05G		NONE IDENTIFIED								150		
05SP	WFEC-OKGE	55917 FRNKLNS4 138 54946 MIDWEST4 138 1	187	108.2	111.8	4.5840	110.9	3.4240	56026 PHAROAH4 138 56084 WETUMKA4 138 1	0	Terminal Equipment Upgrade to be Completed by WFEC by 10/1/05 or earlier for SPP OATT Attachment AA	
05SP	WFEC-OKGE	55917 FRNKLNS4 138 54946 MIDWEST4 138 1	187	99.7	103.8	5.1230	101.3	1.9450	Unit:54208 SWS 38412 24.0 Id:1	10	See Previous Upgrade Specified For Facility	
05SP	AEPW-AEPW	54098 SNYDER-4 138 *B102 1 1	82	83.8	91.5	4.2470	90.9	3.9220	54117 FTCOBNG4 138 54140 S.W.S.-4 138 1	150	Solution Undetermined	TBD
05SP	AEPW-AEPW	54138 SNYDER-2 69 *B102 1 1	83	83.2	90.9	4.2470	90.3	3.9220	54117 FTCOBNG4 138 54140 S.W.S.-4 138 1	150	Solution Undetermined	TBD
05SP	OKGE-OKGE	55009 MCELROY4 138 55011 STILWTR4 138 1	222	89.2	97.1	11.6950	N/A*	N/A*	54880 NORTWST7 345 54881 SPRNGCK7 345 1	150	Solution Undetermined	TBD
05SH	WFEC-OKGE	55917 FRNKLNS4 138 54946 MIDWEST4 138 1	187	103.6	107.1	4.3430	106.2	3.2050	56026 PHAROAH4 138 56084 WETUMKA4 138 1	0	See Previous Upgrade Specified For Facility	
05SH	OKGE-OKGE	55009 MCELROY4 138 55011 STILWTR4 138 1	222	84.1	92.1	11.7990	N/A*	N/A*	54880 NORTWST7 345 54881 SPRNGCK7 345 1	150	Solution Undetermined	TBD
05SH	WFEC-OKGE	55917 FRNKLNS4 138 54946 MIDWEST4 138 1	187	94.0	97.8	4.8180	95.3	1.6710	Unit:54208 SWS 38412 24.0 Id:1	150	See Previous Upgrade Specified For Facility	
05FA		NONE IDENTIFIED								150		
05WP		NONE IDENTIFIED								150		
											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	\$ -

\*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 OKGE to SPS transfer using Scenario 2**

Study Case	From Area - To Area	Branch Overload	Rating <MW>	BC % Loading	TC % Loading	%TDF	Original TC% Loading	Original % TDF	Outaged Branch Causing Overload	ATC <MW>	Solution	Estimated Cost
05AP		NONE IDENTIFIED								150		
05G		NONE IDENTIFIED								150		
05SP	WFEC-OKGE	55917 FRNKLNS4 138 54946 MIDWEST4 138 1	187	108.2	111.9	4.5840	111.0	3.4290	56026 PHAROAH4 138 56084 WETUMKA4 138 1	0	See Previous Upgrade Specified For Facility in Scenario 1	
05SP	WFEC-OKGE	55917 FRNKLNS4 138 54946 MIDWEST4 138 1	187	97.0	101.1	5.1230	98.6	1.9570	Unit:54208 SWS 38412 24.0 Id:1	109	See Previous Upgrade Specified For Facility in Scenario 1	
05SP	OKGE-OKGE	55009 MCELROY4 138 55011 STILWTR4 138 1	222	88.2	96.1	11.6950	N/A*	N/A*	54880 NORTWST7 345 54881 SPRNGCK7 345 1	150	Solution Undetermined	TBD
05SH	WFEC-OKGE	55917 FRNKLNS4 138 54946 MIDWEST4 138 1	186	103.5	107.0	4.3430	106.1	3.2100	56026 PHAROAH4 138 56084 WETUMKA4 138 1	0	See Previous Upgrade Specified For Facility in Scenario 1	
05SH	OKGE-OKGE	55009 MCELROY4 138 55011 STILWTR4 138 1	222	82.8	90.8	11.7990	N/A*	N/A*	54880 NORTWST7 345 54881 SPRNGCK7 345 1	150	Solution Undetermined	TBD
05SH	WFEC-OKGE	55917 FRNKLNS4 138 54946 MIDWEST4 138 1	186	91.2	95.1	4.8180	92.6	1.6830	Unit:54208 SWS 38412 24.0 Id:1	150	See Previous Upgrade Specified For Facility in Scenario 1	
05FA		NONE IDENTIFIED								150		
05WP		NONE IDENTIFIED								150		
											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	\$ -

\*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 3 – SPP facility overloads identified for the OKGE to SPS transfer using Scenario 3**

Study Case	From Area - To Area	Branch Overload	Rating <MW>	BC % Loading	TC % Loading	%TDF	Original TC% Loading	Original % TDF	Outaged Branch Causing Overload	ATC <MW>	Solution	Estimated Cost
05AP		NONE IDENTIFIED								150		
05G		NONE IDENTIFIED								150		
05SP	WFEC-OKGE	55917 FRNKLNS4 138 54946 MIDWEST4 138 1	187	110.0	113.7	4.5840	112.8	3.4240	56026 PHAROAH4 138 56084 WETUMKA4 138 1	0	See Previous Upgrade Specified For Facility in Scenario 1	
05SP	WFEC-OKGE	55917 FRNKLNS4 138 54946 MIDWEST4 138 1	187	99.6	103.7	5.1230	101.1	1.9450	Unit:54208 SWS 38412 24.0 Id:1	16	See Previous Upgrade Specified For Facility in Scenario 1	
05SP	OKGE-OKGE	55009 MCELROY4 138 55011 STILWTR4 138 1	222	88.0	95.9	11.6950	N/A*	N/A*	54880 NORTWST7 345 54881 SPRNGCK7 345 1	150	Solution Undetermined	TBD
05SH	WFEC-OKGE	55917 FRNKLNS4 138 54946 MIDWEST4 138 1	187	105.3	108.8	4.3430	107.9	3.2050	56026 PHAROAH4 138 56084 WETUMKA4 138 1	0	See Previous Upgrade Specified For Facility in Scenario 1	
05SH	OKGE-OKGE	55009 MCELROY4 138 55011 STILWTR4 138 1	222	82.9	90.9	11.7990	N/A*	N/A*	54880 NORTWST7 345 54881 SPRNGCK7 345 1	150	Solution Undetermined	TBD
05SH	WFEC-OKGE	55917 FRNKLNS4 138 54946 MIDWEST4 138 1	187	93.7	97.6	4.8180	95.0	1.6720	Unit:54208 SWS 38412 24.0 Id:1	150	See Previous Upgrade Specified For Facility in Scenario 1	
05FA		NONE IDENTIFIED								150		
05WP		NONE IDENTIFIED								150		
											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	\$ -

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

## **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