



SPP *Southwest Power Pool*

*Preliminary
System Impact Study
SPP-2004-155-1P
For Transmission Service
Requested By
Calpine Energy Services*

From OPPD to ERCOTE

*For a Redirected Amount Of 150MW
From 1/1/2005
To 1/1/2006*

SPP Engineering, Tariff Studies

System Impact Study

Calpine Energy Services has requested a system impact study for long-term Firm Point-to-Point transmission service from OPPD to ERCOTE for 150 MW. The period of the service requested is from 1/1/2005 to 1/1/2006. The OASIS reservation numbers are 765841, 765842, and 765843 for a total amount of 150 MW. This is a request to redirect the previously confirmed OASIS reservation numbers 696688, 696691, and 696694. These OASIS reservations are from CLEC to ERCOTE for a total amount of 150 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.

This study was performed for the OPPD to ERCOTE 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 OPPD Control Area to the ERCOTE DC tie. 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 results given in Tables 1, 2, and 3 include upgrades that may be assigned to higher priority requests. If a facility identified for the OPPD to ERCOTE study is also identified for a study with higher priority, the facility will be assigned to the request with the highest priority. If the higher priority customer does not take service, the facility would then be assigned to the OPPD to ERCOTE request. 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. This is done to provide an estimate of possible overloads that may be assigned to the customer if requests with higher priority are accepted.

Eleven seasonal models were used to study the OPPD to ERCOTE request for the requested service period. The SPP 2004 Series Cases Update 2, 2004/05 Winter Peak (04WP), 2005 April Minimum (05AP), 2005 Spring Peak (05G), 2005 Summer Shoulder (05SH), 2005 Summer Peak (05SP), 2005 Fall Peak (05FA), 2005/06 Winter Peak (05WP), 2007 Summer Peak (07SP), 2007/08 Winter Peak (07WP), 2010 Summer Peak (10SP), and 2010/11 Winter Peak (10WP) were used to study the impact of the request on the SPP system during the requested service period of 1/1/2005 to 1/1/2006. 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 eleven 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 importing. 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 July 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. 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 Facilities Study process, and the final results of the full AC analysis.

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 OPD to ERCOTE 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 Facilities Study. Execution of a Facility Study Agreement is now required to maintain queue position. The final upgrade solutions, cost assignments and available redispatch and curtailment options will be determined upon the completion of the facility study.

Table 1 – SPP facility overloads identified for the OPPD to ERCOTE 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	SWPA-AEPW	52814 BRKN BW4 138 54015 CRAIGJT4 138 1	107	101.2	106.9	4.0510	104.1	2.0720	55823 BBDAMTP4 138 56004 MTRIVER4 138 1	0	May be relieved by alternative switching scheme, otherwise rebuild 7.66 miles of 3/0 CW CU with 795 ACSR. E&C lead time is 15 months.	\$ 2,700,000
05AP	WFEC-AEPW	55948 HUGO PP4 138 54044 VALIANT4 138 1	287	88.1	90.8	5.1440	89.6	2.9070	55948 HUGO PP4 138 56079 VALLANT4 138 1	105	Upgrade to be completed by 6/1/2005 for SPP OATT Attachment AA, Replace switches, jumpers, & wavetrap, & reset CTs @ Valliant	
05G	SWPA-AEPW	52814 BRKN BW4 138 54015 CRAIGJT4 138 1	107	106.7	112.3	4.0390	109.6	2.0770	55823 BBDAMTP4 138 56004 MTRIVER4 138 1	0	See previous upgrade specified for facility	
05SH	SWPA-AEPW	52814 BRKN BW4 138 54015 CRAIGJT4 138 1	107	98.9	104.5	4.0450	101.8	2.0750	55823 BBDAMTP4 138 56004 MTRIVER4 138 1	0	See previous upgrade specified for facility	
05SH	AEPW-AEPW	54153 ELKCITY6 230 54121 ELKCTY-4 138	258	88.9	91.2	3.9460	#N/A*	#N/A*	54119 O.K.U.-7 345 54131 L.E.S.-7 345 1 54119 O.K.U.-7 345 59991 Oklaun 7 345	70	Replace free standing metering CT. Replace switches 1302, 1303, 1306, 1307. Change breaker 1305A	\$ 300,000
05FA	WFEC-AEPW	55948 HUGO PP4 138 54044 VALIANT4 138 1	288	98.2	100.9	5.1610	99.7	2.9030	55948 HUGO PP4 138 56079 VALLANT4 138 1	0	See previous upgrade specified for facility	
10WP	SWPA-AEPW	52814 BRKN BW4 138 54015 CRAIGJT4 138 1	107	99.3	104.9	4.0460	102.2	2.0760	55823 BBDAMTP4 138 56004 MTRIVER4 138 1	0	See previous upgrade specified for facility	
10SP	SWPA-AEPW	52814 BRKN BW4 138 54015 CRAIGJT4 138 1	107	90.4	96.0	4.0460	93.3	2.0760	55823 BBDAMTP4 138 56004 MTRIVER4 138 1	0	See previous upgrade specified for facility	
											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	\$ 300,000
											Total Cost with Facilities Monitored @ 100% Loading	\$ 2,700,000

* Existing Service has a minimal positive impact or a negative impact on facility. No credit for positive impact removed can be given to the new service for this facility.

Table 2 – SPP facility overloads identified for the OPPD to ERCOTE redirect 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	WERE-WERE	57013 MOUND 4 138 57429 MOUNDRG3 115	109	90.2	94.8	3.3220	91.0	0.5860	56769 LANG 7 345 56796 WICHITA7 345 1	0	May be relieved due to Westar Operating Procedure 801 - Outage of the Wichita to Lang 345kV Line	TBD
05SH	WERE-WERE	57013 MOUND 4 138 57429 MOUNDRG3 115	108	90.3	94.9	3.3210	91.1	0.5890	56769 LANG 7 345 56796 WICHITA7 345 1	0	May be relieved due to Westar Operating Procedure 801 - Outage of the Wichita to Lang 345kV Line	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	\$TBD
											Total Cost with Facilities Monitored @ 0% Loading	\$ -

Table 3 – SPP facility overloads identified for the OPD to ERCOTE redirect 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	SWPA-AEPW	52814 BRKN BW4 138 54015 CRAIGJT4 138 1	107	92.9	98.6	4.0510	95.8	2.0720	55823 BBDAMTP4 138 56004 MTRIVER4 138 1	0	See previous upgrade specified for facility identified in Scenario 1	
05G	SWPA-AEPW	52814 BRKN BW4 138 54015 CRAIGJT4 138 1	107	99.0	104.6	4.0390	101.9	2.0770	55823 BBDAMTP4 138 56004 MTRIVER4 138 1	0	See previous upgrade specified for facility identified in Scenario 1	
05SH	SWPA-AEPW	52814 BRKN BW4 138 54015 CRAIGJT4 138 1	107	90.5	96.1	4.0450	93.4	2.0750	55823 BBDAMTP4 138 56004 MTRIVER4 138 1	0	See previous upgrade specified for facility identified in Scenario 1	
05FA	WFEC-AEPW	55948 HUGO PP4 138 54044 VALIANT4 138 1	288	93.7	96.4	5.1610	95.2	2.9030	55948 HUGO PP4 138 56079 VALLANT4 138 1	0	See previous upgrade specified for facility identified in Scenario 1	
10WP	SWPA-AEPW	52814 BRKN BW4 138 54015 CRAIGJT4 138 1	107	92.0	97.6	4.0460	94.9	2.0760	55823 BBDAMTP4 138 56004 MTRIVER4 138 1	0	See previous upgrade specified for facility identified in Scenario 1	
											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