



SPP

*Southwest
Power Pool*

*Preliminary
System Impact Study
SPP-2004-080-1P
For The Designation of a New
Network Resource
Requested By
The Empire District Electric Company*

From SECI to EDE

*For a Reserved Amount Of 100MW
From 6/1/2008
To 6/1/2028*

SPP Engineering, Tariff Studies

System Impact Study

The Empire District Electric Company has requested a system impact study to designate a New Network Resource in the SECI Control Area for 100 MW to serve Network Load in the EDE Control Area. The period of the service requested is from 6/1/2008 to 6/1/2028. The OASIS reservation numbers are 674623 and 674624. 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 SECI to EDE request in order to provide preliminary results identifying facility upgrades that may be required for the requested service. 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 and 2 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. The results given in Tables 1 and 2 include upgrades that may be assigned to higher priority requests. If a facility identified for the SECI to EDE 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 SECI to EDE 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.

Four seasonal models were used to study the SECI to EDE request for the requested service period. The SPP 2004 Series Cases Update 2, 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 6/1/2008 to 6/1/2028. 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 four seasonal models, two 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, and 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, and 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. 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 facility 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 SECI to EDE 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 Facility 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 SECI to EDE 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
07SP	WERE-WERE	56851 AUBURN 6 230 56852 JEC 6 230 1	559	111.6	112.6	5.8330	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
07SP	SWPA-SPRM	52692 SPRGFLD5 161 59969 BRKLINE 5 161 1	315	92.9	97.3	13.7730	59954 SWPS 5 161 59960 SWDISP 5 161 1	100	Upgrade the main and transfer buses and buswork within bay at Springfield to 1600 amps. Replace disconnect switches at Springfield.	\$ 250,000
07SP	SWPA-EMDE	52688 CARTHAG5 161 59466 ATL109 5 161 1	165	85.2	97.6	20.5240	59472 TIP292 5 161 59483 JOP389 5 161 1	100	Replace 600 Amp disconnect switches	\$ 60,000
07SP	WERE-WERE	56765 HOYT 7 345 56766 JEC N 7 345 1	1065	90.8	91.8	10.5660	56851 AUBURN 6 230 56852 JEC 6 230 1	100	May be relieved due to Westar Operating Procedure 400 - Outage of the Jeffrey Energy Center to Hoyt 345kV Line	TBD
07SP	EMDE-EMDE	59466 ATL109 5 161 59494 OAK432 5 161 1	212	87.5	95.9	17.8620	59472 TIP292 5 161 59483 JOP389 5 161 1	100	Solution Undetermined	\$ 1,140,000
07SP	EMDE-EMDE	59467 ORO110 5 161 59494 OAK432 5 161 1	212	82.2	92.6	22.0610	52688 CARTHAG5 161 59485 CAR395 5 161 1	100	Reconstruct and replace 1.4 miles of 556 ACSR with 795 ACSR.	\$ 375,000
07SP	EMDE-EMDE	59467 ORO110 5 161 59494 OAK432 5 161 1	173	81.7	90.9	15.9320	Base Case	100	See Previous Upgrade Specified For Facility	
07WP	WERE-WERE	56851 AUBURN 6 230 56852 JEC 6 230 1	559	103.5	104.5	5.7600	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
10SP	WERE-WERE	56851 AUBURN 6 230 56852 JEC 6 230 1	558	109.4	110.5	5.8780	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
10SP	SWPA-SPRM	52692 SPRGFLD5 161 59969 BRKLINE 5 161 1	312	95.2	98.7	10.9910	59954 SWPS 5 161 59960 SWDISP 5 161 1	100	See Previous Upgrade Specified For Facility	
10SP	AEPW-OKGE	53756 CLARKSV7 345 55224 MUSKOGEE7 345 1	883	91.0	92.1	9.2170	53794 R.S.S.-7 345 53819 ONETA--7 345 1	100	Increase CTR at Muskogee to 2000-5 amps.	\$ 5,000
10SP	EMDE-EMDE	59466 ATL109 5 161 59494 OAK432 5 161 1	212	89.3	92.3	6.2700	59472 TIP292 5 161 59483 JOP389 5 161 1	100	See Previous Upgrade Specified For Facility	
10SP	EMDE-EMDE	59467 ORO110 5 161 59494 OAK432 5 161 1	212	86.8	92.2	11.3610	59485 CAR395 5 161 59491 PUR421 5 161 1	100	See Previous Upgrade Specified For Facility	
10WP	WERE-WERE	56851 AUBURN 6 230 56852 JEC 6 230 1	559	98.2	99.2	5.8640	56765 HOYT 7 345 56766 JEC N 7 345 1	100	May be relieved due to Westar Operating Procedure 400 - Outage of the Jeffrey Energy Center to Hoyt 345kV Line	TBD
									This cost may be significantly higher due to additional facilities whose solutions will be determined during the Facility Study process	\$*
									Total Cost with Facilities Monitored @ 90% Loading	\$ 1,830,000
									Total Cost with Facilities Monitored @ 100% Loading	\$ -

Table 2 – SPP facility overloads identified for the SECI to EDE transfer using Scenario 2

Study Case	From Area - To Area	Branch Overload	Rating <MW>	BC % Loading	TC % Loading	%TDF	Outaged Branch Causing Overload	ATC <MW>	Solution	Estimated Cost
07SP	WERE-WERE	56851 AUBURN 6 230 56852 JEC 6 230 1	559	108.5	109.5	5.8330	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
07SP	EMDE-EMDE	59467 ORO110 5 161 59494 OAK432 5 161 1	212	84.4	92.8	17.8620	59472 TIP292 5 161 59483 JOP389 5 161 1	77	See Previous Upgrade Specified For Facility in Scenario 1	
07SP	SWPA-SPRM	52692 SPRGFLD5 161 59969 BRKLINE 5 161 1	314	86.9	91.3	13.7730	59954 SWPS 5 161 59960 SWDISP 5 161 1	92	See Previous Upgrade Specified For Facility in Scenario 1	
07WP	WERE-WERE	56851 AUBURN 6 230 56852 JEC 6 230 1	559	102.7	103.7	5.7600	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
10SP	WERE-WERE	56851 AUBURN 6 230 56852 JEC 6 230 1	559	106.3	107.3	5.8780	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
10SP	AEPW-OKGE	53756 CLARKSV7 345 55224 MUSKOGEE7 345 1	885	95.5	96.3	6.6590	53794 R.S.S.-7 345 55224 MUSKOGEE7 345 1	0	Solution Undetermined	TBD
10SP	SWPA-SPRM	52692 SPRGFLD5 161 59969 BRKLINE 5 161 1	311	88.3	91.8	10.9910	59959 BATFLD 5 161 59960 SWDISP 5 161 1	74	See Previous Upgrade Specified For Facility in Scenario 1	
10WP	WERE-WERE	56851 AUBURN 6 230 56852 JEC 6 230 1	559	97.2	98.2	5.8640	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
This cost may be significantly 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