SPP Southwest Power Pool

Preliminary System Impact Study SPP-2004-024-1P For The Designation of a New Network Resource Requested By Midwest Energy

From WR to WR

For a Reserved Amount Of 26MW From 5/1/2004 To 8/1/2005

SPP Engineering, Tariff Studies

System Impact Study

Midwest Energy has requested a system impact study to designate a New Network Resource in the WR Control Area for 26 MW to serve Network Load in the WR Control Area. The period of the service requested is from 5/1/2004 to 8/1/2005. The OASIS reservation number is 650816. 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 WR to WR 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 WR to WR 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 WR to WR 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.

Eight seasonal models were used to study the WR to WR request for the requested service period. The SPP 2004 Series Cases Update 2, 2004 Summer Peak (04SP), 2004 Summer Shoulder (04SH), 2004 Fall Peak (04FA), 2004/05 Winter Peak (04WP), 2005 April Minimum (05AP), 2005 Spring Peak (05G), 2005 Summer Peak (05SP), and 2005 Summer Shoulder (05SH) were used to study the impact of the request on the SPP system during the requested service period of 5/1/2004 to 8/1/2005. 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 eight 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 WR to WR 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 WR to WR 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
04SP		NONE IDENTIFIED						26		
04SH	WERE-WERE	57321 ANZIO 3 115 57328 FT JCT 3 115 1	91	96.4	97.5	3.6700	57342 WJCCTY 3 115 57343 WJCCTYE3 115 1	26	May be relieved due to Westar Operating Procedure 1217 - Outage of the Fort Junction to West Junction City 115kV Line	TBD
04SH	WERE-WERE	57368 EXIDE J3 115 57381 SUMMIT 3 115 1	194	95.1	96.4	9.6340	57371 NORTHVW3 115 57381 SUMMIT 3 115 1	26	Rebuild and reconductor 4.94 miles with 1192 ACSR.	$ 1,100,000
04SH	WERE-WERE	57371 NORTHVW3 115 57381 SUMMIT 3 115 1	179	93.1	94.3	7.6330	57368 EXIDE J3 115 57381 SUMMIT 3 115 1	26	Solution Undetermined	TBD
04SH	WERE-WERE	57342 WJCCTY 3 115 57343 WJCCTYE3 115 1	139	97.3	98.4	6.0330	56766 JEC N 7 345 56773 SUMMIT 7 345 1	26	May be relieved due to Westar Operating Procedure 402 - Outage of the Jeffrey Energy Center to Summit 345 kV Line	TBD
04FA	WERE-WERE	57321 ANZIO 3 115 57328 FT JCT 3 115 1	91	91.1	92.0	3.1700	57342 WJCCTY 3 115 57343 WJCCTYE3 115 1	26	May be relieved due to Westar Operating Procedure 1217 - Outage of the Fort Junction to West Junction City 115kV Line	TBD
04FA	WERE-WERE	57342 WJCCTY 3 115 57343 WJCCTYE3 115 1	140	93.6	94.6	5.0440	56766 JEC N 7 345 56773 SUMMIT 7 345 1	26	May be relieved due to Westar Operating Procedure 402 - Outage of the Jeffrey Energy Center to Summit 345 kV Line	TBD
04FA	WERE-WERE	57368 EXIDE J3 115 57381 SUMMIT 3 115 1	194	90.3	91.5	9.0060	57371 NORTHVW3 115 57381 SUMMIT 3 115 1	26	See Previous Upgrade Specified For Facility	
04WP	WERE-WERE	57342 WJCCTY 3 115 57343 WJCCTYE3 115 1	140	91.8	92.8	5.0550	56766 JEC N 7 345 56773 SUMMIT 7 345 1	26	May be relieved due to Westar Operating Procedure 402 - Outage of the Jeffrey Energy Center to Summit 345 kV Line	TBD
04WP	WERE-WERE	57374 SPHILPJ3 115 57438 WMCPHER3 115 1	67	89.9	93.8	10.2160	56872 EMCPHER6 230 56873 SUMMIT 6 230 1	26	Tear down double circuit, build single circuit with 1192.5 ACSR.	$ 7,800,000
05AP		NONE IDENTIFIED						26		
05G	WERE-WERE	57374 SPHILPJ3 115 57438 WMCPHER3 115 1	65	98.5	102.6	10.2120	56872 EMCPHER6 230 56873 SUMMIT 6 230 1	9	See Previous Upgrade Specified For Facility	
05G	WERE-WERE	57342 WJCCTY 3 115 57343 WJCCTYE3 115 1	140	99.4	100.3	5.0510	56766 JEC N 7 345 56773 SUMMIT 7 345 1	18	May be relieved due to Westar Operating Procedure 402 - Outage of the Jeffrey Energy Center to Summit 345 kV Line	TBD
05G	WERE-WERE	57321 ANZIO 3 115 57328 FT JCT 3 115 1	91	96.4	97.3	3.1740	57342 WJCCTY 3 115 57343 WJCCTYE3 115 1	26	May be relieved due to Westar Operating Procedure 1217 - Outage of the Fort Junction to West Junction City 115kV Line	TBD
05G	WERE-WERE	57368 EXIDE J3 115 57381 SUMMIT 3 115 1	194	93.9	95.7	13.1070	56872 EMCPHER6 230 56873 SUMMIT 6 230 1	26	See Previous Upgrade Specified For Facility	
05G	WERE-WERE	57372 PHILIPS3 115 57374 SPHILPJ3 115 1	155	90.4	94.1	21.9600	56872 EMCPHER6 230 56873 SUMMIT 6 230 1	26	Rebuild 0.88 miles and reconductor with 1192.5 ACSR.	$ 417,200
05SP	WERE-WERE	57301 EAST ST3 115 57309 WEMPORI3 115 1	90	93.2	94.3	3.6680	57305 MORRIS 3 115 57309 WEMPORI3 115 1	26	May be relieved due to Westar Operating Procedure 1209 - Outage of the Morris to West Emporia 115kV Line	TBD
05SH	WERE-WERE	57321 ANZIO 3 115 57328 FT JCT 3 115 1	91	104.1	105.2	3.6750	57342 WJCCTY 3 115 57343 WJCCTYE3 115 1	0	May be relieved due to Westar Operating Procedure 1217 - Outage of the Fort Junction to West Junction City 115kV Line	TBD
05SH	WERE-WERE	57342 WJCCTY 3 115 57343 WJCCTYE3 115 1	139	106.0	107.2	6.0400	56766 JEC N 7 345 56773 SUMMIT 7 345 1	0	May be relieved due to Westar Operating Procedure 402 - Outage of the Jeffrey Energy Center to Summit 345 kV Line	TBD
05SH	WERE-WERE	57301 EAST ST3 115 57309 WEMPORI3 115 1	91	96.0	97.0	3.6690	57305 MORRIS 3 115 57309 WEMPORI3 115 1	26	May be relieved due to Westar Operating Procedure 1209 - Outage of the Morris to West Emporia 115kV Line	TBD
05SH	WERE-WERE	57368 EXIDE J3 115 57372 PHILIPS3 115 1	194	93.1	94.4	9.6440	57371 NORTHVW3 115 57381 SUMMIT 3 115 1	26	Rebuild and reconductor 0.34 miles with 1192 ACSR.	$ 95,200
05SH	WERE-WERE	57368 EXIDE J3 115 57381 SUMMIT 3 115 1	194	92.7	94.7	15.0740	56872 EMCPHER6 230 56873 SUMMIT 6 230 1	26	See Previous Upgrade Specified For Facility	

Study Case	From Area - To Area	Branch Overload	Rating <MW>	BC % Loading	TC % Loading	%TDF	Outaged Branch Causing Overload	ATC <MW>	Solution	Estimated Cost
05SH	WERE-WERE	57371 NORTHVW3 115 57381 SUMMIT 3 115 1	179	96.7	97.8	7.6410	57368 EXIDE J3 115 57381 SUMMIT 3 115 1	26	Solution Undetermined	TBD

Solution	Estimated Cost
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	$ 9,412,400
Total Cost with Facilities Monitored @ 100% Loading	$ 7,800,000

Table 2 – SPP facility overloads identified for the WR to WR 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
04SP	WERE-WERE	57301 EAST ST3 115 57309 WEMPORI3 115 1	90	89.7	90.7	3.6710	57305 MORRIS 3 115 57309 WEMPORI3 115 1	26	May be relieved due to Westar Operating Procedure 1209 - Outage of the Morris to West Emporia 115kV Line	TBD
04SH	WERE-WERE	57321 ANZIO 3 115 57328 FT JCT 3 115 1	91	105.7	106.8	3.6700	57342 WJCCTY 3 115 57343 WJCCTYE3 115 1	0	May be relieved due to Westar Operating Procedure 1217 - Outage of the Fort Junction to West Junction City 115kV Line	TBD
04SH	WERE-WERE	57342 WJCCTY 3 115 57343 WJCCTYE3 115 1	139	109.6	110.7	6.0330	56766 JEC N 7 345 56773 SUMMIT 7 345 1	0	May be relieved due to Westar Operating Procedure 402 - Outage of the Jeffrey Energy Center to Summit 345 kV Line	TBD
04SH	WERE-WERE	57301 EAST ST3 115 57309 WEMPORI3 115 1	91	93.0	94.0	3.6670	57305 MORRIS 3 115 57309 WEMPORI3 115 1	26	May be relieved due to Westar Operating Procedure 1209 - Outage of the Morris to West Emporia 115kV Line	TBD
04SH	WERE-WERE	57368 EXIDE J3 115 57372 PHILIPS3 115 1	194	91.5	92.8	9.6340	57371 NORTHVW3 115 57381 SUMMIT 3 115 1	26	See Previous Upgrade Specified For Facility in Scenario 1	
04SH	WERE-WERE	57368 EXIDE J3 115 57381 SUMMIT 3 115 1	194	93.9	95.9	15.0610	56872 EMCPHER6 230 56873 SUMMIT 6 230 1	26	See Previous Upgrade Specified For Facility in Scenario 1	
04SH	WERE-WERE	57371 NORTHVW3 115 57381 SUMMIT 3 115 1	179	90.3	91.4	7.6330	57368 EXIDE J3 115 57372 PHILIPS3 115 1	26	Solution Undetermined	TBD
04SH	WERE-WERE	57342 WJCCTY 3 115 57344 WJCCTYW3 115 1	139	90.2	91.4	6.5800	56766 JEC N 7 345 56773 SUMMIT 7 345 1	26	May be relieved due to Westar Operating Procedure 402 - Outage of the Jeffrey Energy Center to Summit 345 kV Line	TBD
04SH	WERE-WERE	57328 FT JCT 3 115 57343 WJCCTYE3 115 2	91	90.1	91.1	3.2290	56773 SUMMIT 7 345 *B471 SUMMIT1X 1 1	26	May be relieved due to Westar Operating Procedure 0617 - Outage of the Summit 345/230kV Transformer	TBD
04FA	WERE-WERE	57372 PHILIPS3 115 57374 SPHILPJ3 115 1	154	101.2	104.9	21.9360	56872 EMCPHER6 230 56873 SUMMIT 6 230 1	0	See Previous Upgrade Specified For Facility in Scenario 1	
04FA	WERE-WERE	57374 SPHILPJ3 115 57438 WMCPHER3 115 1	65	110.5	114.6	10.2010	56872 EMCPHER6 230 56873 SUMMIT 6 230 1	0	See Previous Upgrade Specified For Facility in Scenario 1	
04FA	WERE-WERE	57342 WJCCTY 3 115 57343 WJCCTYE3 115 1	140	105.0	106.0	5.0440	56766 JEC N 7 345 56773 SUMMIT 7 345 1	0	May be relieved due to Westar Operating Procedure 402 - Outage of the Jeffrey Energy Center to Summit 345 kV Line	TBD
04FA	WERE-WERE	57321 ANZIO 3 115 57328 FT JCT 3 115 1	91	99.3	100.2	3.1700	57342 WJCCTY 3 115 57343 WJCCTYE3 115 1	21	May be relieved due to Westar Operating Procedure 1217 - Outage of the Fort Junction to West Junction City 115kV Line	TBD
04FA	WERE-WERE	57368 EXIDE J3 115 57372 PHILIPS3 115 1	193	92.0	93.8	13.0940	56872 EMCPHER6 230 56873 SUMMIT 6 230 1	26	See Previous Upgrade Specified For Facility in Scenario 1	
04FA	WERE-WERE	57368 EXIDE J3 115 57381 SUMMIT 3 115 1	194	97.9	99.6	13.0940	56872 EMCPHER6 230 56873 SUMMIT 6 230 1	26	See Previous Upgrade Specified For Facility in Scenario 1	
04FA	WERE-WERE	57374 SPHILPJ3 115 57438 WMCPHER3 115 2	89	94.5	97.9	11.7350	56872 EMCPHER6 230 56873 SUMMIT 6 230 1	26	See Previous Upgrade Specified For Facility in Scenario 1	
04FA	WERE-WERE	57342 WJCCTY 3 115 57344 WJCCTYW3 115 1	139	90.0	91.0	5.5020	56766 JEC N 7 345 56773 SUMMIT 7 345 1	26	May be relieved due to Westar Operating Procedure 402 - Outage of the Jeffrey Energy Center to Summit 345 kV Line	TBD
04WP	WERE-WERE	57374 SPHILPJ3 115 57438 WMCPHER3 115 1	67	94.7	98.6	10.2160	56872 EMCPHER6 230 56873 SUMMIT 6 230 1	26	See Previous Upgrade Specified For Facility in Scenario 1	
04WP	WERE-WERE	57342 WJCCTY 3 115 57343 WJCCTYE3 115 1	140	94.0	94.9	5.0550	56766 JEC N 7 345 56773 SUMMIT 7 345 1	26	May be relieved due to Westar Operating Procedure 402 - Outage of the Jeffrey Energy Center to Summit 345 kV Line	TBD
05AP		NONE IDENTIFIED						26		
05G	WERE-WERE	57374 SPHILPJ3 115 57438 WMCPHER3 115 1	65	107.3	111.4	10.2120	56872 EMCPHER6 230 56873 SUMMIT 6 230 1	0	See Previous Upgrade Specified For Facility in 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
05G	WERE-WERE	57342 WJCCTY 3 115 57343 WJCCTYE3 115 1	140	102.9	103.9	5.0510	56766 JEC N 7 345 56773 SUMMIT 7 345 1	0	May be relieved due to Westar Operating Procedure 402 - Outage of the Jeffrey Energy Center to Summit 345 kV Line	TBD
05G	WERE-WERE	57372 PHILIPS3 115 57374 SPHILPJ3 115 1	155	98.5	102.2	21.9600	56872 EMCPHER6 230 56873 SUMMIT 6 230 1	11	See Previous Upgrade Specified For Facility in Scenario 1	
05G	WERE-WERE	57321 ANZIO 3 115 57328 FT JCT 3 115 1	91	98.4	99.3	3.1740	57342 WJCCTY 3 115 57343 WJCCTYE3 115 1	26	May be relieved due to Westar Operating Procedure 1217 - Outage of the Fort Junction to West Junction City 115kV Line	TBD
05G	WERE-WERE	57368 EXIDE J3 115 57372 PHILIPS3 115 1	194	91.7	93.5	13.1070	56872 EMCPHER6 230 56873 SUMMIT 6 230 1	26	See Previous Upgrade Specified For Facility in Scenario 1	
05G	WERE-WERE	57368 EXIDE J3 115 57381 SUMMIT 3 115 1	194	97.7	99.4	13.1070	56872 EMCPHER6 230 56873 SUMMIT 6 230 1	26	See Previous Upgrade Specified For Facility in Scenario 1	
05G	WERE-WERE	57374 SPHILPJ3 115 57438 WMCPHER3 115 2	89	92.0	95.4	11.7480	56872 EMCPHER6 230 56873 SUMMIT 6 230 1	26	See Previous Upgrade Specified For Facility in Scenario 1	
05G	WERE-WERE	57371 NORTHVW3 115 57381 SUMMIT 3 115 1	179	91.0	92.1	7.1730	57368 EXIDE J3 115 57381 SUMMIT 3 115 1	26	Solution Undetermined	TBD
05SP	WERE-WERE	57301 EAST ST3 115 57309 WEMPORI3 115 1	90	91.1	92.2	3.6680	57305 MORRIS 3 115 57309 WEMPORI3 115 1	26	May be relieved due to Westar Operating Procedure 1209 - Outage of the Morris to West Emporia 115kV Line	TBD
05SH	WERE-WERE	57321 ANZIO 3 115 57328 FT JCT 3 115 1	91	104.4	105.5	3.6750	57342 WJCCTY 3 115 57343 WJCCTYE3 115 1	0	May be relieved due to Westar Operating Procedure 1217 - Outage of the Fort Junction to West Junction City 115kV Line	TBD
05SH	WERE-WERE	57342 WJCCTY 3 115 57343 WJCCTYE3 115 1	139	107.6	108.7	6.0400	56766 JEC N 7 345 56773 SUMMIT 7 345 1	0	May be relieved due to Westar Operating Procedure 402 - Outage of the Jeffrey Energy Center to Summit 345 kV Line	TBD
05SH	WERE-WERE	57301 EAST ST3 115 57309 WEMPORI3 115 1	91	93.1	94.2	3.6690	57305 MORRIS 3 115 57309 WEMPORI3 115 1	26	May be relieved due to Westar Operating Procedure 1209 - Outage of the Morris to West Emporia 115kV Line	TBD
05SH	WERE-WERE	57368 EXIDE J3 115 57372 PHILIPS3 115 1	194	93.3	94.6	9.6440	57371 NORTHVW3 115 57381 SUMMIT 3 115 1	26	See Previous Upgrade Specified For Facility in Scenario 1	
05SH	WERE-WERE	57368 EXIDE J3 115 57381 SUMMIT 3 115 1	194	93.2	95.2	15.0740	56872 EMCPHER6 230 56873 SUMMIT 6 230 1	26	See Previous Upgrade Specified For Facility in Scenario 1	
05SH	WERE-WERE	57371 NORTHVW3 115 57381 SUMMIT 3 115 1	179	96.8	97.9	7.6410	57368 EXIDE J3 115 57381 SUMMIT 3 115 1	26	Solution Undetermined	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