



SPP *Southwest Power Pool*

*Preliminary
System Impact Study
SPP-2003-249-1P
For Transmission Service
Requested By
Southwestern Public Service
Company*

From SPS to EDDY

*For a Amount Of 67MW From
1/1/2005
To 1/1/2006*

SPP Engineering, Tariff Studies

System Impact Study

Southwestern Public Service Company has requested a system impact study for long-term Firm Point-to-Point transmission service from SPS to EDDY for 67 MW. The period of the service requested is from 1/1/2005 to 1/1/2006. The OASIS reservation numbers are 613909 and 613910. 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 EDDY 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 SPS to EDDY 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 SPS to EDDY 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.

Seven seasonal models were used to study the SPS to EDDY request for the requested service period. The SPP 2004 Series Cases 2004/05 Winter Peak (04WP), 2005 April (05AP), 2005 Spring (05G), 2005 Summer Peak (05SP), 2005 Summer Shoulder (05SH), 2005 Fall Peak (05FA), 2005/06 Winter Peak (05WP), 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 seven 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. 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.

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.

The study results of the SPS to EDDY transfer show that limiting constraints exist. Due to the limiting constraints identified, the Transmission Service Request cannot be granted. 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 SPS to EDDY redirect. 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 SPS to EDDY transfer using System Scenario 1

| Study Case | From Area -To Area | Branch Overload | Rating <MW> | Pre Transfer Loading | SPS to EDDY %TDF | Outaged Branch Causing Overload | ATC <MW> | Solution | Estimated Cost |
|------------|--------------------|---|-------------|----------------------|------------------|---|----------|---|----------------|
| 04WP | WFEC-WFEC | 55846 CARTERJ2 69 55876 DILL JT2 69 1 | 25 | 27 | 0.0860 | 56027 PINERDG2 69 56088 WASHITA2 69 1 | 0 | Current WFEC Work Plan to Reconductor from 4/0 to 795 - Complete by 2004 Winter | TBD |
| 04WP | WFEC-WFEC | 55897 ELKCITY2 69 54122 ELKCTY-2 69 1 | 39 | 41 | 0.0860 | 56027 PINERDG2 69 56088 WASHITA2 69 1 | 0 | Elk(AEPW)>Elk WFEC: Upgrade 4/0 to 795 ACSR | \$ 414,000 |
| 05AP | WFEC-WFEC | 55846 CARTERJ2 69 55876 DILL JT2 69 1 | 24 | 24 | 0.0260 | 56001 MORWODS4 138 54121 ELKCTY-4 138 1 | 0 | Current WFEC Work Plan to Reconductor from 4/0 to 795 - Complete by 2004 Winter | TBD |
| 05SH | WFEC-WFEC | 55897 ELKCITY2 69 54122 ELKCTY-2 69 1 | 39 | 40 | 0.2370 | 56027 PINERDG2 69 56088 WASHITA2 69 1 | 0 | See Previous Upgrade For Specified Facility | |
| 05FA | OKGE-OKGE | 54721 IMO 2 69 54722 CLEVETP2 69 1 | 36 | 42 | 0.0530 | 54731 SO4TH4 4 138 *B458 SO4TH 1 1 1 | 0 | Solution Undetermined | TBD |
| 05WP | WERE-WERE | 57151 AUBURN 3 115 57167 KEENE 3 115 1 | 68 | 81 | 0.0550 | 56852 JEC 6 230 56861 EMANHAT6 230 1 | 0 | May be relieved due to Westar Operating Procedure 900 - Outage of the JEC to East Manhattan 230kV Line | TBD |
| 05WP | WERE-WERE | 57167 KEENE 3 115 57339 S ALMA 3 115 1 | 68 | 77 | 0.0550 | 56852 JEC 6 230 56861 EMANHAT6 230 1 | 0 | May be relieved due to Westar Operating Procedure 900 - Outage of the JEC to East Manhattan 230kV Line | TBD |
| 05WP | WERE-WERE | 57335 MCDOWEL3 115 57340 SMANHAT3 115 1 | 68 | 72 | 0.0550 | 56852 JEC 6 230 56861 EMANHAT6 230 1 | 0 | May be relieved due to Westar Operating Procedure 900 - Outage of the JEC to East Manhattan 230kV Line | TBD |
| 05WP | WERE-WERE | 57372 PHILIPS3 115 57374 SPHILPJ3 115 1 | 159 | 161 | 0.3150 | 56872 EMCPHER6 230 56873 SUMMIT 6 230 1 | 0 | Rebuild 0.88 miles and reconductor with 1192.5 ACSR. | \$ 417,200 |
| 05WP | WERE-WERE | 57374 SPHILPJ3 115 57438 WMCPHER3 115 1 | 68 | 74 | 0.1460 | 56872 EMCPHER6 230 56873 SUMMIT 6 230 1 | 0 | Tear down double circuit, build single circuit with 1192.5 ACSR. | \$ 7,800,000 |
| 05WP | WERE-WERE | 57339 S ALMA 3 115 57340 SMANHAT3 115 1 | 68 | 73 | 0.0550 | 56852 JEC 6 230 56861 EMANHAT6 230 1 | 0 | May be relieved due to Westar Operating Procedure 900 - Outage of the JEC to East Manhattan 230kV Line | TBD |
| | | | | | | | | This cost may be significantly higher due to additional facilities whose solutions will be determined during the Facility Study process | \$* |
| | | | | | | | | Total Estimated Cost | \$ 8,631,200 |

Table 2 – SPP facility overloads identified for the SPS to EDDY transfer using System Scenario 2

| Study Case | From Area -To Area | Branch Overload | Rating <MW> | Pre Transfer Loading | SPS to EDDY%TDF | Outaged Branch Causing Overload | ATC <MW> | Solution | Estimated Cost |
|---|--------------------|---|-------------|----------------------|-----------------|--|----------|---|----------------|
| 05SP | WFEC-WFEC | 55897 ELKCITY2 69 54122 ELKCTY-2 69 1 | 39 | 41 | 0.0960 | 56027 PINERDG2 69 56088 WASHITA2 69 1 | 0 | Elk(AEPW)>Elk WFEC: Upgrade 4/0 to 795 ACSR | \$ 414,000 |
| 05SP | SPS-SPS | 50517 LP-SINT2 69 50526 LP-OLIV2 69 1 | 77 | 78 | 0.2030 | 50515 LP-CHAL2 69 50517 LP-SINT2 69 1 | 0 | Solution Undetermined | TBD |
| 05FA | WERE-WERE | 57151 AUBURN 3 115 57167 KEENE 3 115 1 | 68 | 89 | 0.0550 | 56852 JEC 6 230 56861 EMANHAT6 230 1 | 0 | May be relieved due to Westar Operating Procedure 900 - Outage of the JEC to East Manhattan 230kV Line | TBD |
| 05FA | OKGE-OKGE | 54721 IMO 2 69 54722 CLEVETP2 69 1 | 36 | 57 | 0.1020 | 54731 SO4TH4 4 138 54790 IMO TAP4 138 1 | 0 | Solution Undetermined | TBD |
| 05FA | WERE-WERE | 57368 EXIDE J3 115 57372 PHILIPS3 115 1 | 191 | 197 | 0.1710 | 56872 EMCIPHER6 230 56873 SUMMIT 6 230 1 | 0 | Rebuild and reconductor 0.34 miles with 1192 ACSR. | \$ 95,200 |
| 05FA | WERE-WERE | 57368 EXIDE J3 115 57381 SUMMIT 3 115 1 | 193 | 208 | 0.1710 | 56872 EMCIPHER6 230 56873 SUMMIT 6 230 1 | 0 | Rebuild and reconductor 4.94 miles with 1192 ACSR. | \$ 1,100,000 |
| 05FA | WERE-WERE | 57328 FT JCT 3 115 57343 WJCCTYE3 115 1 | 67 | 67 | 0.0640 | 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 |
| 05FA | WERE-WERE | 57167 KEENE 3 115 57339 S ALMA 3 115 1 | 68 | 85 | 0.0550 | 56852 JEC 6 230 56861 EMANHAT6 230 1 | 0 | May be relieved due to Westar Operating Procedure 900 - Outage of the JEC to East Manhattan 230kV Line | TBD |
| 05FA | WERE-WERE | 57335 MCDOWEL3 115 57340 SMANHAT3 115 1 | 68 | 79 | 0.0550 | 56852 JEC 6 230 56861 EMANHAT6 230 1 | 0 | May be relieved due to Westar Operating Procedure 900 - Outage of the JEC to East Manhattan 230kV Line | TBD |
| 05FA | WERE-WERE | 57372 PHILIPS3 115 57374 SPHILPJ3 115 1 | 159 | 176 | 0.3140 | 56872 EMCIPHER6 230 56873 SUMMIT 6 230 1 | 0 | Rebuild 0.88 miles and reconductor with 1192.5 ACSR. | \$ 417,200 |
| 05FA | WERE-WERE | 57374 SPHILPJ3 115 57438 WMCPHER3 115 1 | 68 | 81 | 0.1460 | 56872 EMCIPHER6 230 56873 SUMMIT 6 230 1 | 0 | Tear down double circuit, build single circuit with 1192.5 ACSR. | \$ 7,800,000 |
| 05FA | WERE-WERE | 57374 SPHILPJ3 115 57438 WMCPHER3 115 2 | 92 | 95 | 0.1680 | 56872 EMCIPHER6 230 56873 SUMMIT 6 230 1 | 0 | See Previous Upgrade For Specified Facility | |
| 05FA | WERE-WERE | 57339 S ALMA 3 115 57340 SMANHAT3 115 1 | 68 | 80 | 0.0550 | 56852 JEC 6 230 56861 EMANHAT6 230 1 | 0 | May be relieved due to Westar Operating Procedure 900 - Outage of the JEC to East Manhattan 230kV Line | TBD |
| 05FA | WERE-WERE | 57342 WJCCTY 3 115 57343 WJCCTYE3 115 1 | 140 | 146 | 0.1380 | 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 |
| 05WP | WERE-WERE | 57372 PHILIPS3 115 57374 SPHILPJ3 115 1 | 159 | 161 | 0.2540 | 56872 EMCIPHER6 230 56873 SUMMIT 6 230 1 | 0 | See Previous Upgrade For Specified Facility | |
| 05WP | WERE-WERE | 57374 SPHILPJ3 115 57438 WMCPHER3 115 1 | 68 | 74 | 0.1180 | 56872 EMCIPHER6 230 56873 SUMMIT 6 230 1 | 0 | See Previous Upgrade For Specified Facility | |
| This cost may be significantly higher due to additional facilities whose solutions will be determined during the Facility Study process | | | | | | | | | \$* |
| Total Estimated Cost | | | | | | | | | \$ 9,826,400 |

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 – 100%
4. Contingency Case Rating – Rate B
5. Contingency Case % of Rating – 100%
6. Base Case Load Flow – PSS/E
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 – 0.0
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