



***System Impact Study SPP-2002-228
For Transmission Service
Requested By
Calpine Energy Services L.P.***

From AEPW To WFEC

***For a Reserved Amount Of
150 MW From 6/1/2004 To 6/1/2006***

***For a Reserved Amount Of
100 MW From 6/1/2006 To 6/1/2007***

SPP Engineering, Tariff Studies

System Impact Study

Calpine Energy Services L.P. has requested a system impact study for long-term Firm Point-to-Point transmission service from AEPW to WFEC. The request is for OASIS reservations 453718 for 150 MW from 6/1/2004 to 6/1/2006 and 453719 for 100 MW from 6/1/2006 to 6/1/2007.

The principal objective of this study is to identify constraints on the SPP Regional Tariff System and potential facility upgrades that may be necessary to facilitate the additional service requested.

The AEPW to WFEC transfers were studied to determine the facility upgrades required based on the actual queue position of the requests with only those higher priority requests in Facility Study mode included in the models. Higher priority requests still in study that have not gone to facility study were not included in the models. These results are documented in Table 1 of the report. The results given in Table 1 include upgrades that may be assigned to higher priority requests. The results of this study give the customer an estimated cost of facility upgrades that may be required in order to accommodate the AEPW to WFEC transfers.

SPP used five seasonal models to study an AEPW to WFEC 150 MW transfer for the requested service periods. The SPP 2003 Series Cases 2004 Summer Peak, 2004 Fall Peak, 2004/05 Winter Peak, 2009 Summer Peak, and 2009/10 Winter Peak were used to study the impact of the 150 MW and 100 MW transfer on the SPP system during the requested service periods of 6/1/2004 to 6/1/2006 and 6/1/2006 to 6/1/2007, respectively. The Spring Peak models apply to April and May, the Summer Peak models apply to June through September, the Fall Peak models apply to October and November, and the Winter Peak models apply to December through March. 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 2003 base case series models.

With only the higher priority requests that have signed Facility Study Agreements included in the models, the study results of the AEPW to WFEC 150 MW transfer show that limiting constraints exist. Due to the number of limiting constraints identified, the Transmission Service Request cannot be granted. 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. The upgrades and cost provided in the 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 that will be identified during the facility study process, and the final results of the full AC analysis. Execution of a Facility Study Agreement is now required to maintain queue position. The final upgrade solutions and cost assignments will be determined upon the completion of the facility study.

Table 1 – SPP facility upgrades identified for the AEPW to WFEC 150 MW transfer

| Study Year | From Area - To Area | Branch Over 100% Rate B | Rate B <MW> | Outaged Branch Causing Overload | ATC | Solution | Estimated Cost |
|------------|---------------------|--|-------------|--|-----|---|----------------|
| 04SP | SWPS-SWPS | 50937 NORTHW2 69 50938 NORTHW3 115 1 | 45.3 | 51001 COULTER2 69 51002 COULTER3 115 1 | 0 | Solution Undetermined | Not Available |
| 04SP | SWPA-ENTR | 52660 BULL SH5 161 99825 5MIDWAY# 161 1 | 161.4 | 99817 5ISES 1 161 99826 5MORFLD 161 1 | 0 | Solution Undetermined | Not Available |
| 04SP | SWPA-SPRM | 52692 SPRGFLD5 161 59969 BRKLN5 5 161 1 | 317.1 | 59954 SWPS 5 161 59960 SWDISP 5 161 1 | 0 | Solution Undetermined | Not Available |
| 04SP | AEPW-AEPW | 53133 ECNTRTN5 161 53187 GENTRYR5 161 1 | 352.5 | 53139 FLINTCR5 161 53170 TONTITN5 161 1 | 0 | Rebuild 19.16 miles of 2-397.5 ACSR with 2156 ACSR | \$8,000,000 |
| 04SP | AEPW-AEPW | 53139 FLINTCR5 161 53170 TONTITN5 161 1 | 310.6 | 53154 CHAMSPR5 161 53170 TONTITN5 161 1 | 0 | Replace switch and jumpers | \$45,000 |
| 04SP | AEPW-AEPW | 53139 FLINTCR5 161 53187 GENTRYR5 161 1 | 353.4 | 53139 FLINTCR5 161 53170 TONTITN5 161 1 | 0 | Rebuild 1.09 miles of 2-397.5 ACSR with 2156 ACSR. | \$400,000 |
| 04SP | AEPW-AEPW | 53154 CHAMSPR5 161 53170 TONTITN5 161 1 | 247 | 53139 FLINTCR5 161 53170 TONTITN5 161 1 | 0 | Rebuild 12 miles with 2156ACSR | \$7,200,000 |
| 04SP | AEPW-AEPW | 53154 CHAMSPR5 161 53195 FARMGTN5 161 1 | 334.8 | 53154 CHAMSPR5 161 53170 TONTITN5 161 1 | 0 | Replace Farmington switch | \$60,000 |
| 04SP | AEPW-AEPW | 53753 DENVR-C4 138 53805 DENVER-1 138 1 | 32.6 | Multiple Outage Contingency with Load Change 53829 T.NO.--4 138 53851 46ST--E4 138 1 53757 DENVTAP4 138 53851 46ST--E4 138 1 53757 DENVTAP4 138 53834 W.ED.-E4 138 1 53754 DENVR-E4 138 53757 DENVTAP4 138 1 Move 100.0% load from 53834 W.ED.-E4 138 to 53845 W.ED.-W4 138 | 0 | Solution Undetermined | Not Available |
| 04SP | AEPW-OMPA | 54157 COMMTAP4 138 56204 OMDUNCN4 138 1 | 116.9 | 54112 CORNVIL4 138 54155 RUSHNGT4 138 1 | 0 | Solution Undetermined | Not Available |
| 04SP | GRRD-GRRD | 54432 AFTON 5 161 54433 AFTON 2 69 1 | 49.9 | 54431 MIAMI 5 161 54432 AFTON 5 161 1 | 0 | Replace 50 MVA Transformer with 84 MVA unit | \$833,000 |
| 04SP | GRRD-GRRD | 54451 CLARMR 5 161 54479 CLARMR 2 69 1 | 83.8 | 54451 CLARMR 5 161 54479 CLARMR 2 69 2 | 0 | Solution Undetermined | Not Available |
| 04SP | GRRD-GRRD | 54451 CLARMR 5 161 54479 CLARMR 2 69 2 | 83.8 | 54451 CLARMR 5 161 54479 CLARMR 2 69 1 | 0 | Solution Undetermined | Not Available |
| 04SP | OKGE-OKGE | 54852 SLVRLAK4 138 54854 PANTHER4 138 1 | 285.3 | 54873 LONEOAK4 138 54879 NORTWST4 138 1 | 0 | Solution Undetermined | Not Available |
| 04SP | OKGE-OKGE | 54933 DRAPER 4 138 54934 DRAPER 7 345 1 | 490.1 | 54933 DRAPER 4 138 54934 DRAPER 7 345 2 | 0 | Solution Undetermined | Not Available |
| 04SP | OKGE-OKGE | 54933 DRAPER 4 138 54934 DRAPER 7 345 2 | 490.1 | 54933 DRAPER 4 138 54934 DRAPER 7 345 1 | 0 | Solution Undetermined | Not Available |
| 04SP | OKGE-OKGE | 54941 HSL 4 138 54973 RENO 4 138 1 | 286.9 | 54941 HSL 4 138 54966 MIDWAY 4 138 1 | 0 | Solution Undetermined | Not Available |
| 04SP | OKGE-OKGE | 55221 MUSKOGEE2 69 55222 MUSKOGEE5 161 1 | 41 | 55221 MUSKOGEE2 69 55222 MUSKOGEE5 161 3 | 0 | Solution Undetermined | Not Available |
| 04SP | OKGE-OKGE | 55221 MUSKOGEE2 69 55222 MUSKOGEE5 161 2 | 41 | 55221 MUSKOGEE2 69 55222 MUSKOGEE5 161 3 | 0 | Solution Undetermined | Not Available |
| 04SP | OKGE-OKGE | 55234 PECANCK5 161 55235 PECANCK7 345 1 | 368.1 | 55224 MUSKOGEE7 345 55302 FTSMITH7 345 1 | 0 | Add 2nd 345/161 kV 369MVA transformer. | \$3,000,000 |
| 04SP | WFEC-WFEC | 55802 ACME 2 69 55916 FRNKLSN2 69 1 | 34 | 55841 CANADNS2 69 55842 CANADNS4 138 1 | 0 | Upgrade Assigned to SPP-1999-017 Acme Jct to Acme Sub: Upgrade From 3/0 To 795MCM Estimated In-Service Date 12/1/05 | Not Available |
| 04SP | WFEC-WFEC | 55802 ACME 2 69 56095 WNORMAN2 69 1 | 38 | 55841 CANADNS2 69 55842 CANADNS4 138 1 | 0 | Solution Undetermined | Not Available |
| 04SP | WFEC-WFEC | 55846 CARTERJ2 69 55876 DILL JT2 69 1 | 24.1 | 56027 PINERDGT 69 56088 WASHITA2 69 1 | 0 | Solution Undetermined | Not Available |
| 04SP | WFEC-WFEC | 55924 GOLDSBY2 69 56018 OU SW 2 69 1 | 33.8 | 55916 FRNKLSN2 69 55917 FRNKLSN4 138 1 | 0 | Solution Undetermined | Not Available |
| 04SP | WERE-WERE | 57182 TECHILE3 115 57187 27CROCO3 115 1 | 67.2 | 56851 AUBURN 6 230 100000 16 ~~~00 161 0 | 0 | May be relieved due to Westar Transmission Operating Directive 618 Loss of the Auburn 230/115 kV transformer | Not Available |
| 04SP | WERE-WERE | 57244 JARBALO3 115 57259 NW LEAV3 115 1 | 124.6 | 57242 HALLMRK3 115 57244 JARBALO3 115 1 | 0 | May be relieved due to Westar Transmission Operating Directive 1216 Outage of the Jarbalo to Hallmark 115 kV Line Section | Not Available |

Table 1 – continued – SPP facility upgrades identified for the AEPW to WFEK 150 MW transfer

| Study Year | From Area - To Area | Branch Over 100% Rate B | Rate B <MW> | Outaged Branch Causing Overload | ATC | Solution | Estimated Cost |
|------------|---------------------|---|-------------|---|-----|---|----------------|
| 04SP | WERE-WERE | 57412 ARKVALJ3 115 57435 3 VANBU3 115 1 | 67.9 | 57413 CIRCLE 3 115 57415 DAVIS 3 115 1 | 0 | May be relieved due to Westar Transmission Operating Directive 1205 Outage of the Circle to Davis 115 kV Line | Not Available |
| 04SP | WERE-WERE | 57588 CHASE 2 69 57605 WHITE J2 69 1 | 42.8 | 56991 WEAVER 4 138 100001 83 ---00 1831 0 | 0 | Solution Undetermined | Not Available |
| 04SP | WERE-WERE | 57786 CHISHLM2 69 57832 RIPLEYM2 69 1 | 128 | 57040 EVANS N4 138 57065 SG12COL4 138 1 | 0 | May be relieved due to Westar Transmission Operating Directive 1105 Outage of the Moundridge to Halstead 138 kV line, Gordan Evans to Halstead 138 kV line or loss of the Halstead 138 kV bus | Not Available |
| 04SP | KACP-MIPU | 57993 STHTOWN5 161 59210 MARTCTY5 161 1 | 166 | 57969 STILWEL5 161 57994 HICKMAN5 161 1 | 0 | Solution Undetermined | Not Available |
| 04SP | OKGE-OKGE | 55237 TIBBENS2 69 55246 BEELINE2 69 1 | 65.9 | 55241 BLUEBEL2 69 55242 BLUEBEL4 138 1 | 5 | Solution Undetermined | Not Available |
| 04SP | GRRD-GRRD | 54447 TAHLQH 2 69 54455 TAHLQH 5 161 2 | 77.5 | 54447 TAHLQH 2 69 54455 TAHLQH 5 161 1 | 68 | May be relieved by GRDA 2001 and 2002 Mitigation Submitted to Adjust LTC at Okay, Sallisaw, and the 2 TFS at Kansas to 1.10 | Not Available |
| 04SP | WFEC-WFEC | 56022 PAOLI 2 69 56023 PAOLI 4 138 1 | 41.8 | 55841 CANADNS2 69 56011 NOBLE 2 69 1 | 103 | Solution Undetermined | Not Available |
| 04FA | OKGE-OKGE | 54852 SLVRLAK4 138 54854 PANTHER4 138 1 | 285.7 | 54873 LONEOAK4 138 54879 NORTWST4 138 1 | 0 | See Previous | See Previous |
| 04FA | OKGE-OKGE | 54933 DRAPER 4 138 54934 DRAPER 7 345 1 | 489.8 | 54933 DRAPER 4 138 54934 DRAPER 7 345 2 | 0 | See Previous | See Previous |
| 04FA | OKGE-OKGE | 54933 DRAPER 4 138 54934 DRAPER 7 345 2 | 489.8 | 54933 DRAPER 4 138 54934 DRAPER 7 345 1 | 0 | See Previous | See Previous |
| 04FA | WFEC-WFEC | 55802 ACME 2 69 55916 FRNKLS2 69 1 | 34 | 55841 CANADNS2 69 55842 CANADNS4 138 1 | 0 | See Previous | See Previous |
| 04FA | WFEC-WFEC | 55924 GOLDSBY2 69 56018 OU SW 2 69 1 | 33.4 | 55916 FRNKLS2 69 55917 FRNKLS4 138 1 | 0 | See Previous | See Previous |
| 04FA | WERE-WERE | 57412 ARKVALJ3 115 57413 CIRCLE 3 115 1 | 67.9 | 57413 CIRCLE 3 115 57415 DAVIS 3 115 1 | 0 | May be relieved due to Westar Transmission Operating Directive 1205 Outage of the Circle to Davis 115 kV Line | Not Available |
| 04FA | WERE-WERE | 57815 MEAD 2 69 57829 PLAZA 2 69 1 | 71.9 | 57040 EVANS N4 138 57041 EVANS S4 138 1 | 0 | Solution Undetermined | Not Available |
| 04WP | SWPS-SWPS | 50520 LP-HOLL2 69 50521 LP-HOLL6 230 1 | 88.8 | 50507 LP-MLWK6 230 51647 CARLISL6 230 1 | 0 | Solution Undetermined | Not Available |
| 04WP | SWPA-SWPA | 52648 NORFORK5 161 52650 NORFORK2 69 1 | 25 | 52648 NORFORK5 161 52650 NORFORK2 69 2 | 0 | Replace Norfork Transformer by SWPA In-Service Date 6/1/2005 | Not Available |
| 04WP | AEPW-AEPW | 53154 CHAMSPR5 161 53170 TONTITN5 161 1 | 274.8 | 53154 CHAMSPR5 161 53195 FARMGTN5 161 1 | 0 | See Previous | See Previous |
| 04WP | AEPW-AEPW | 53795 R.S.S.-4 138 54030 EXP_OKM4 138 1 | 132.3 | 53795 R.S.S.-4 138 54023 OKMULGE4 138 1 | 0 | Solution Undetermined | Not Available |
| 04WP | AEPW-AEPW | 54023 OKMULGE4 138 54049 EC.HEN-4 138 1 | 104.5 | 54023 OKMULGE4 138 54057 KELCO 4 138 1 | 0 | Solution Undetermined | Not Available |
| 04WP | AEPW-AEPW | 54028 WELETK4 138 54049 EC.HEN-4 138 1 | 104.2 | 54023 OKMULGE4 138 54057 KELCO 4 138 1 | 0 | Solution Undetermined | Not Available |
| 04WP | OKGE-OKGE | 54852 SLVRLAK4 138 54854 PANTHER4 138 1 | 286.3 | 54873 LONEOAK4 138 54879 NORTWST4 138 1 | 0 | See Previous | See Previous |
| 04WP | WFEC-WFEC | 55802 ACME 2 69 55916 FRNKLS2 69 1 | 34 | 55841 CANADNS2 69 55842 CANADNS4 138 1 | 0 | See Previous | See Previous |
| 04WP | WFEC-WFEC | 55802 ACME 2 69 56095 WNORMAN2 69 1 | 37.9 | 55841 CANADNS2 69 55842 CANADNS4 138 1 | 0 | See Previous | See Previous |
| 04WP | WFEC-WFEC | 55924 GOLDSBY2 69 56018 OU SW 2 69 1 | 33.8 | 55916 FRNKLS2 69 55917 FRNKLS4 138 1 | 0 | See Previous | See Previous |
| 04WP | WFEC-WFEC | 55976 LIL AXE2 69 56011 NOBLE 2 69 1 | 25.9 | 56022 PAOLI 2 69 56023 PAOLI 4 138 1 | 0 | Solution Undetermined | Not Available |
| 04WP | WFEC-WFEC | 56022 PAOLI 2 69 56023 PAOLI 4 138 1 | 41.6 | 55841 CANADNS2 69 56011 NOBLE 2 69 1 | 0 | See Previous | See Previous |
| 04WP | WFEC-WFEC | 55841 CANADNS2 69 56011 NOBLE 2 69 1 | 37.7 | 56022 PAOLI 2 69 56023 PAOLI 4 138 1 | 116 | Solution Undetermined | Not Available |
| 09SP | SWPS-SWPS | 50520 LP-HOLL2 69 50521 LP-HOLL6 230 1 | 88.8 | 50507 LP-MLWK6 230 50509 LP-MLWK2 69 1 | 0 | See Previous | See Previous |
| 09SP | SWPA-SWPA | 52648 NORFORK5 161 52650 NORFORK2 69 1 | 25 | 52648 NORFORK5 161 52650 NORFORK2 69 2 | 0 | See Previous | See Previous |
| 09SP | SWPA-ENTR | 52660 BULL SH5 161 99825 5MIDWAY# 161 1 | 161.5 | 99817 5ISES 1 161 99826 5MORFLD 161 1 | 0 | See Previous | See Previous |

Table 1 – continued – SPP facility upgrades identified for the AEPW to WFEK 150 MW transfer

| Study Year | From Area - To Area | Branch Over 100% Rate B | Rate B <MW> | Outaged Branch Causing Overload | ATC | Solution | Estimated Cost |
|------------|---------------------|--|-------------|--|-----|--|----------------|
| 09SP | SWPA-AEPW | 52680 BEAVER 5 161 53136 EUREKA 5 161 1 | 263 | Multiple Outage Contingency 59481 MON383 7 345 to 59984 BRKLINE 7 345 CKT1 53140 FLINTCR7 345 to 59481 MON383 7 345 CKT1 | 0 | AEPW Reconductor 1.25 miles with 1590ACSR SWPA Reconnect CT's; Replace metering & reset relays SWPA: Reconductor 6 miles of 795 ACSR with 1590 ACSR. Reconnect CT's to 1000:5 Tap on Bkrs 42, 32, & half or 22. Replace metering & reset relays for Line 2 & Line 3. Conduct Environmental Impact Study. | \$2,420,000 |
| 09SP | SWPA-SWPA | 52692 SPRGFLD5 161 52694 SPRGFLD2 69 3 | 22 | 52692 SPRGFLD5 161 52694 SPRGFLD2 69 1 | 0 | Replace 25/25MVA transformer #3 with 80MVA unit to eliminate overload of both 25MVA #3 and 80MVA #1 transformers | \$1,300,000 |
| 09SP | SWPA-SPRM | 52692 SPRGFLD5 161 59969 BRKLINE 5 161 1 | 308.7 | 59954 SWPS 5 161 59960 SWDISP 5 161 1 | 0 | See Previous | See Previous |
| 09SP | AEPW-OKGE | 53126 BONANZA5 161 55261 BONANZT5 161 1 | 177 | 55262 AES 5 161 55264 TARBY 5 161 1 | 0 | Rebuild 0.06 miles of 397.5 ACSR with 795MCM ACSR | \$50,000 |
| 09SP | AEPW-AEPW | 53131 DYESS 5 161 53159 SOSPRDL5 161 1 | 312 | 53154 CHAMSPR5 161 53195 FARMGTN5 161 1 | 0 | Solution Undetermined | Not Available |
| 09SP | AEPW-AEPW | 53133 ECNTRTN5 161 53187 GENTRYR5 161 1 | 350.2 | 53140 FLINTCR7 345 53172 ECNTRTN7 345 1 | 0 | See Previous | See Previous |
| 09SP | AEPW-ENTR | 53136 EUREKA 5 161 99832 SOSAGE # 161 1 | 243.9 | 52660 BULL SH5 161 99802 5BULLSH* 161 1 | 0 | Solution Undetermined | Not Available |
| 09SP | AEPW-AEPW | 53139 FLINTCR5 161 53170 TONTITN5 161 1 | 306.1 | 53154 CHAMSPR5 161 53170 TONTITN5 161 1 | 0 | See Previous | See Previous |
| 09SP | AEPW-AEPW | 53139 FLINTCR5 161 53187 GENTRYR5 161 1 | 349 | 53140 FLINTCR7 345 53172 ECNTRTN7 345 1 | 0 | See Previous | See Previous |
| 09SP | AEPW-AEPW | 53154 CHAMSPR5 161 53155 CHAMSPR7 345 1 | 659.4 | 53140 FLINTCR7 345 54450 GRDA1 7 345 1 | 0 | Install 2nd 345/161 kV Auto-transformer | \$4,000,000 |
| 09SP | AEPW-AEPW | 53154 CHAMSPR5 161 53170 TONTITN5 161 1 | 243.7 | 53140 FLINTCR7 345 53172 ECNTRTN7 345 1 | 0 | See Previous | See Previous |
| 09SP | AEPW-AEPW | 53154 CHAMSPR5 161 53195 FARMGTN5 161 1 | 335 | 53131 DYESS 5 161 53159 SOSPRDL5 161 1 | 0 | See Previous | See Previous |
| 09SP | AEPW-AEPW | 53157 SFAYTVL5 161 53195 FARMGTN5 161 1 | 312.7 | 53131 DYESS 5 161 53159 SOSPRDL5 161 1 | 0 | Solution Undetermined | Not Available |
| 09SP | AEPW-AEPW | 53170 TONTITN5 161 53194 ELMSPRR5 161 1 | 334.7 | 53154 CHAMSPR5 161 53195 FARMGTN5 161 1 | 0 | Replace Switch & Jumpers | \$100,000 |
| 09SP | AEPW-AEPW | 53513 BECKVIL2 69 53597 ROKHILL2 69 1 | 58.8 | 53518 CARTHAG2 69 53597 ROKHILL2 69 1 | 0 | Solution Undetermined | Not Available |
| 09SP | AEPW-AEPW | 53540 GREGGTN2 69 53562 LLAMOND2 69 1 | 107 | 53589 PERDUE 2 69 53590 PERDUE 4 138 1 | 0 | Solution Undetermined | Not Available |
| 09SP | AEPW-AEPW | 53753 DENVR-C4 138 53805 DENVER-1 13.8 1 | 32.6 | Multiple Outage Contingency with Load Change 53829 T.NO.--4 138 53851 46ST--E4 138 1 53757 DENVTAP4 138 53851 46ST--E4 138 1 53757 DENVTAP4 138 53834 W.ED.-E4 138 1 53754 DENVR-E4 138 53757 DENVTAP4 138 1 Move 100.0% load from 53834 W.ED.-E4 138 to 53845 W.ED.-W4 138 | 0 | See Previous | See Previous |
| 09SP | AEPW-AEPW | 53759 DENVR-W4 138 53805 DENVER-1 13.8 1 | 32.6 | Multiple Outage Contingency with Load Change 53768 CARSN-S4 138 53789 KENSH-W4 138 1 53768 CARSN-S4 138 53790 CARSON-113.8 1 53768 CARSN-S4 138 53800 T.P.S.-4 138 1 53753 DENVR-C4 138 53789 KENSH-W4 138 1 Move 100.0% load from 53789 KENSH-W4 138 to 53755 KENSH-E4 138 | 0 | See Previous | See Previous |
| 09SP | AEPW-AEPW | 53768 CARSN-S4 138 53790 CARSON-1 13.8 1 | 31.8 | 53750 CARSN-T4 138 53751 UNIONAV4 138 1 | 0 | Solution Undetermined | Not Available |
| 09SP | AEPW-AEPW | 53781 BA101-N4 138 53818 ONETA--4 138 1 | 235 | 53840 96GARN-4 138 53870 81GARN-4 138 1 | 0 | Solution Undetermined | Not Available |
| 09SP | AEPW-AEPW | 53798 BA.N-ST4 138 53818 ONETA--4 138 1 | 234 | 53866 T.NO.--7 345 53955 N.E.S.-7 345 1 | 0 | Rebuild 4.31 miles of 795 ACSR with 1590 ACSR. | \$2,370,500 |
| 09SP | AEPW-AEPW | 53949 PRY-JCT2 69 53968 PRY-JCT4 138 1 | 60.1 | 53802 CATOOSA4 138 53846 15&273E4 138 1 | 0 | Solution Undetermined | Not Available |
| 09SP | AEPW-WFEC | 54122 ELKCTY-2 69 55897 ELKCITY2 69 1 | 38.5 | 56027 PINERDG2 69 56088 WASHITA2 69 1 | 0 | Solution Undetermined | Not Available |
| 09SP | AEPW-OMPA | 54157 COMMTAP4 138 56204 OMDUNCN4 138 1 | 116.8 | 54112 CORNVIL4 138 54155 RUSHNGT4 138 1 | 0 | See Previous | See Previous |
| 09SP | GRRD-GRRD | 54427 COLINS 5 161 54476 COLNSGR2 69 1 | 50 | 54427 COLINS 5 161 54476 COLNSGR2 69 2 | 0 | Solution Undetermined | Not Available |
| 09SP | GRRD-GRRD | 54432 AFTON 5 161 54433 AFTON 2 69 1 | 49.9 | 54431 MIAMI 5 161 54432 AFTON 5 161 1 | 0 | See Previous | See Previous |

Table 1 – continued – SPP facility upgrades identified for the AEPW to WFEW 150 MW transfer

| Study Year | From Area - To Area | Branch Over 100% Rate B | Rate B <MW> | Outaged Branch Causing Overload | ATC | Solution | Estimated Cost |
|------------|---------------------|--|-------------|---|-----|---|----------------|
| 09SP | GRRD-GRRD | 54435 KERR GR5 161 54437 412SUB 5 161 1 | 336.8 | 53140 FLINTCR7 345 54450 GRDA1 7 345 1 | 0 | Reconductor 12.5 miles with 1590MCM ACSR. | \$1,918,000 |
| 09SP | GRRD-GRRD | 54437 412SUB 5 161 54514 KANSATP5 161 1 | 336.1 | 53140 FLINTCR7 345 54450 GRDA1 7 345 1 | 0 | Reconductor 9.7 miles with 1590MCM ACSR | \$1,488,000 |
| 09SP | GRRD-GRRD | 54447 TAHLQH 2 69 54455 TAHLQH 5 161 1 | 77.4 | 54447 TAHLQH 2 69 54455 TAHLQH 5 161 2 | 0 | May be relieved by GRDA 2001 and 2002 Mitigation Submitted to Adjust LTC at Okay, Sallisaw, and the 2 TFS at Kansas to 1.10 | Not Available |
| 09SP | GRRD-GRRD | 54447 TAHLQH 2 69 54455 TAHLQH 5 161 2 | 77.4 | 54447 TAHLQH 2 69 54455 TAHLQH 5 161 1 | 0 | See Previous | See Previous |
| 09SP | GRRD-GRRD | 54451 CLARMR 5 161 54479 CLARMR 2 69 1 | 83.7 | 54451 CLARMR 5 161 54479 CLARMR 2 69 2 | 0 | See Previous | See Previous |
| 09SP | GRRD-GRRD | 54451 CLARMR 5 161 54479 CLARMR 2 69 2 | 83.7 | 54451 CLARMR 5 161 54479 CLARMR 2 69 1 | 0 | See Previous | See Previous |
| 09SP | OKGE-OKGE | 54840 JONESTP4 138 54941 HSL 4 138 1 | 287 | 54941 HSL 4 138 54973 RENO 4 138 1 | 0 | Solution Undetermined | Not Available |
| 09SP | OKGE-OKGE | 54852 SLVRLAK4 138 54854 PANTHER4 138 1 | 284.6 | 54873 LONEOAK4 138 54879 NORTWST4 138 1 | 0 | See Previous | See Previous |
| 09SP | OKGE-OKGE | 54933 DRAPER 4 138 54934 DRAPER 7 345 1 | 488.8 | 54933 DRAPER 4 138 54934 DRAPER 7 345 2 | 0 | See Previous | See Previous |
| 09SP | OKGE-OKGE | 54933 DRAPER 4 138 54934 DRAPER 7 345 2 | 488.8 | 54933 DRAPER 4 138 54934 DRAPER 7 345 1 | 0 | See Previous | See Previous |
| 09SP | OKGE-OKGE | 54941 HSL 4 138 54973 RENO 4 138 1 | 287 | 54941 HSL 4 138 54966 MIDWAY 4 138 1 | 0 | See Previous | See Previous |
| 09SP | OKGE-WFEC | 54946 MIDWEST4 138 55917 FRNKLS4 138 1 | 209.3 | 55814 ANADARK4 138 56031 POCASET4 138 1 | 0 | Replace 600A metering CTs with 1200A | \$55,000 |
| 09SP | OKGE-OKGE | 55221 MUSKOGEE2 69 55222 MUSKOGEE5 161 1 | 41 | 55221 MUSKOGEE2 69 55222 MUSKOGEE5 161 3 | 0 | See Previous | See Previous |
| 09SP | OKGE-OKGE | 55221 MUSKOGEE2 69 55222 MUSKOGEE5 161 2 | 41 | 55221 MUSKOGEE2 69 55222 MUSKOGEE5 161 3 | 0 | See Previous | See Previous |
| 09SP | OKGE-OKGE | 55228 STRIBES5 161 55234 PECANCK5 161 1 | 222.9 | 55230 AGENCY 5 161 55234 PECANCK5 161 1 | 0 | Solution Undetermined | Not Available |
| 09SP | OKGE-OKGE | 55234 PECANCK5 161 55235 PECANCK7 345 1 | 368.5 | 55224 MUSKOGEE7 345 55302 FTSMITH7 345 1 | 0 | See Previous | See Previous |
| 09SP | WFEC-WFEC | 55846 CARTERJ2 69 55876 DILL JT2 69 1 | 24.2 | 56027 PINERDG2 69 56088 WASHITA2 69 1 | 0 | See Previous | See Previous |
| 09SP | WFEC-WFEC | 55863 COMANCH2 69 56086 WALTERS2 69 1 | 37.6 | 54099 COMANC-2 69 54187 L-DISTP2 69 1 | 0 | Solution Undetermined | Not Available |
| 09SP | WFEC-WFEC | 55979 LNDYSW2 69 56087 WALVILL2 69 1 | 26 | 55911 FLETCHR2 69 55990 MARLOWJ2 69 1 | 0 | Solution Undetermined | Not Available |
| 09SP | MIDW-WEPL | 56565 SEWARD 2 69 58792 SEWARD 3 115 1 | 43.7 | 56601 HEIZER 3 115 58779 MULGREN6 230 1 | 0 | See Previous | See Previous |
| 09SP | WERE-WERE | 57160 41CALIF3 115 57188 27CROCJ3 115 1 | 67.4 | 56851 AUBURN 6 230 100000 15 ---00 151 0 | 0 | May be relieved due to Westar Transmission Operating Directive 618 Loss of the Auburn 230/115 kV transformer | Not Available |
| 09SP | WERE-WERE | 57182 TECHILE3 115 57187 27CROC03 115 1 | 67.3 | 56851 AUBURN 6 230 100000 15 ---00 151 0 | 0 | See Previous | See Previous |
| 09SP | WERE-WERE | 57182 TECHILE3 115 57187 27CROC03 115 1 | 67.3 | 57182 TECHILE3 115 57187 27CROC03 115 2 | 0 | Solution Undetermined | Not Available |
| 09SP | WERE-WERE | 57438 WMCPHER3 115 57439 WHEATLD3 115 1 | 69.6 | 57413 CIRCLE 3 115 57432 RICE 3 115 1 | 0 | Solution Undetermined | Not Available |
| 09SP | WERE-WERE | 57588 CHASE 2 69 57605 WHITE J2 69 1 | 42.5 | 56991 WEAVER 4 138 100001 88 ---00 1881 0 | 0 | See Previous | See Previous |
| 09SP | AEPW-AEPW | 53798 BA.N-ST4 138 53816 LLANETP4 138 1 | 234.6 | 53866 T.NO.--7 345 53955 N.E.S.-7 345 1 | 50 | Rebuild 4.63 miles of 795 ACSR with 1590 ACSR | \$2,600,000 |
| 09SP | WFEC-WFEC | 55916 FRNKLS2 69 55917 FRNKLS4 138 1 | 69.7 | 55841 CANADNS2 69 55842 CANADNS4 138 1 | 52 | Replace 70 MVA Auto with 112 MVA autotransformer (100 MVA base Rating), Upgrade 138 and 69 KV buswork and switches. | \$1,005,000 |
| 09WP | SWPA-SWPA | 52648 NORFORK5 161 52650 NORFORK2 69 1 | 25 | 52648 NORFORK5 161 96123 5WPLAIN 161 1 | 0 | See Previous | See Previous |
| 09WP | SWPA-SWPA | 52648 NORFORK5 161 52650 NORFORK2 69 1 | 25 | 52648 NORFORK5 161 52650 NORFORK2 69 2 | 0 | See Previous | See Previous |
| 09WP | SWPA-SWPA | 52648 NORFORK5 161 52650 NORFORK2 69 2 | 25 | 52648 NORFORK5 161 52650 NORFORK2 69 1 | 0 | Solution Undetermined | Not Available |
| 09WP | SWPA-ENTR | 52660 BULL SH5 161 99825 5MIDWAY# 161 1 | 161.2 | 99817 5ISES 1 161 99826 5MORFLD 161 1 | 0 | See Previous | See Previous |
| 09WP | SWPA-AEPW | 52680 BEAVER 5 161 53136 EUREKA 5 161 1 | 262.1 | 59481 MON383 7 345 59984 BRKLINE 7 345 1 | 0 | See Previous | See Previous |
| 09WP | SWPA-SPRM | 52692 SPRGFLD5 161 59969 BRKLINE 5 161 1 | 318.4 | 59954 SWPS 5 161 59960 SWDISP 5 161 1 | 0 | See Previous | See Previous |
| 09WP | AEPW-AEPW | 53154 CHAMSPR5 161 53170 TONTITN5 161 1 | 243.9 | 53154 CHAMSPR5 161 53195 FARMGTN5 161 1 | 0 | See Previous | See Previous |
| 09WP | OKGE-OKGE | 54852 SLVRLAK4 138 54854 PANTHER4 138 1 | 285.5 | 54873 LONEOAK4 138 54879 NORTWST4 138 1 | 0 | See Previous | See Previous |
| 09WP | OKGE-OKGE | 54933 DRAPER 4 138 54934 DRAPER 7 345 1 | 489.7 | 54933 DRAPER 4 138 54934 DRAPER 7 345 2 | 0 | See Previous | See Previous |

Table 1 – continued – SPP facility upgrades identified for the AEPW to WFEW 150 MW transfer

| Study Year | From Area - To Area | Branch Over 100% Rate B | Rate B <MW> | Outaged Branch Causing Overload | ATC | Solution | Estimated Cost |
|--------------------------------------|---------------------|---|-------------|--|-----|--------------|----------------|
| 09WP | OKGE-OKGE | 54933 DRAPER 4 138 54934 DRAPER 7 345 2 | 489.7 | 54933 DRAPER 4 138 54934 DRAPER 7 345 1 | 0 | See Previous | See Previous |
| 09WP | OKGE-OKGE | 55228 5TRIBES5 161 55234 PECANCK5 161 1 | 222.7 | 55230 AGENCY 5 161 55234 PECANCK5 161 1 | 0 | See Previous | See Previous |
| 09WP | OKGE-OKGE | 55234 PECANCK5 161 55235 PECANCK7 345 1 | 368.9 | 55224 MUSKOGEE7 345 55302 FTSMITH7 345 1 | 0 | See Previous | See Previous |
| 09WP | WFEC-WFEC | 55802 ACME 2 69 55916 FRNKLNS2 69 1 | 34 | 54947 CANADN-4 138 55842 CANADNS4 138 1 | 0 | See Previous | See Previous |
| 09WP | WFEC-WFEC | 55802 ACME 2 69 56095 WNORMAN2 69 1 | 38 | 54947 CANADN-4 138 55842 CANADNS4 138 1 | 0 | See Previous | See Previous |
| 09WP | WFEC-WFEC | 55924 GOLDSBY2 69 56018 OU SW 2 69 1 | 33.9 | 55916 FRNKLNS2 69 55917 FRNKLNS4 138 1 | 0 | See Previous | See Previous |
| 09WP | WERE-WERE | 57815 MEAD 2 69 57829 PLAZA 2 69 1 | 72 | 57040 EVANS N4 138 57041 EVANS S4 138 1 | 0 | See Previous | See Previous |
| 09WP | GRRD-GRRD | 54432 AFTON 5 161 54433 AFTON 2 69 1 | 50 | 54431 MIAMI 5 161 54432 AFTON 5 161 1 | 96 | See Previous | See Previous |
| Total (Excludes Costs Not Available) | | | | | | | \$36,844,500 |