SPP Southwest Power Pool

Preliminary System Impact Study SPP-2004-154-1P For The Designation of a New Network Resource Requested By Calpine Energy Services, L.P.

From AEPW to AEPW

For a Reserved Amount Of 300MW From 1/1/2006 To 1/1/2009

SPP Engineering, Tariff Studies

System Impact Study

Calpine Energy Services, L.P. has requested a system impact study to designate a New Network Resource in the AEPW Control Area for 300 MW to serve Network Load in the AEPW Control Area. The period of the service requested is from 1/1/2006 to 1/1/2009. The OASIS reservation numbers are 763673 and 763674. 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 AEPW to AEPW 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 new Network Resource in the AEPW Control Area to the Network Load in the AEPW Control Area. Positive impacts removed by the existing Network Resource were given as credits to the new Network Resource based upon the existing Network Resource being replaced by the new Network Resource. 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 AEPW to AEPW 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 AEPW to AEPW 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.

Ten seasonal models were used to study the AEPW to AEPW request for the requested service period. The SPP 2004 Series Cases Update 2, 2005 April Minimum (05AP), 2005 Spring Peak (05G), 2005 Summer Peak (05SP), 2005 Summer Shoulder (05SH), 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 1/1/2006 to 1/1/2009. 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 ten 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 exporting. 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 January 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 AEPW to AEPW 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. At the request of the customer, estimated engineering and construction lead times have been added to the Tables for known solutions that involve reconductors or rebuilds of existing lines or transformer additions.

Table 1 – SPP facility overloads identified for the AEPW to AEPW transfer using Scenario 1

Study Case	From Area - To Area	Branch Overload	Rating <MW>	BC % Loading	TC % Loading	%TDF	Existing TC % Loading	Existing %TDF	Outaged Branch Causing Overload	ATC <MW>	Solution	Estimated Cost
05AP		NONE IDENTIFIED								300		
05G	AEPW-AEPW	53571 MARSHL-4 138 *B042 1 1	107	91.0	101.3	3.6540	100.9	3.5320	3Wnd: OPEN *B0 17 2	263	Replace 755 ACAR Strain Bus & Replace 1033 AAC Jumpers	$ 40,000
05G	AEPW-AEPW	53623 MARAUTO2 69 *B042 1 1	107	90.9	101.2	3.6540	100.8	3.5320	3Wnd: OPEN *B0 17 2	265	See Previous Upgrade Specified For Facility	
05G	AEPW-AEPW	53571 MARSHL-4 138 *B017 1 2	107	90.9	101.2	3.6500	100.8	3.5280	3Wnd: OPEN *B0 42 1	266	See Previous Upgrade Specified For Facility	
05G	AEPW-AEPW	53623 MARAUTO2 69 *B017 1 2	107	90.8	101.1	3.6500	100.7	3.5280	3Wnd: OPEN *B0 42 1	268	See Previous Upgrade Specified For Facility	
05SP	AEPW-AEPW	53532 FORSTHL2 69 53596 QUITMAN2 69 1	59	113.2	129.3	3.1450	128.6	3.0110	53590 PERDUE 4 138 53666 LHAWKIN4 138 1	0	Replace Quitman bus, switches & jumpers. Change relay settings @ Quitman	$ 150,000
05SP	AEPW-AEPW	53571 MARSHL-4 138 *B041 1 1	107	105.2	115.4	3.6340	114.6	3.3390	3Wnd: OPEN *B1 42 2	0	See Previous Upgrade Specified For Facility	
05SP	AEPW-AEPW	53571 MARSHL-4 138 *B142 1 2	107	105.0	115.2	3.6300	114.4	3.3350	3Wnd: OPEN *B0 41 1	0	See Previous Upgrade Specified For Facility	
05SP	AEPW-AEPW	53623 MARAUTO2 69 *B041 1 1	107	105.1	115.3	3.6340	114.5	3.3390	3Wnd: OPEN *B1 42 2	0	See Previous Upgrade Specified For Facility	
05SP	AEPW-AEPW	53623 MARAUTO2 69 *B142 1 2	107	105.0	115.1	3.6300	114.3	3.3350	3Wnd: OPEN *B0 41 1	0	See Previous Upgrade Specified For Facility	
05SP	AEPW-AEPW	53278 MAGNOLA2 69 53336 WINNSBO2 69 1	72	97.4	114.2	4.0200	113.6	3.8860	53590 PERDUE 4 138 53666 LHAWKIN4 138 1	47	Replace Breaker, switches & jumpers @ Winnsboro. Replace switch # 9114 @ Magnolia Tap	$ 125,000
05SP	AEPW-AEPW	53278 MAGNOLA2 69 53532 FORSTHL2 69 1	72	97.0	113.8	4.0200	113.2	3.8860	53590 PERDUE 4 138 53666 LHAWKIN4 138 1	54	Replace switch # 9116 @ Magnolia Tap	$ 40,000
05SP	AEPW-AEPW	53245 ALUMXT 4 138 53300 NWTXARK4 138 1	260	92.8	101.2	7.2820	99.5	5.8380	Multiple Outage Contingency 53299 NW Texarkana Bann Tap 53300 N New Boston 138 1 53299 NW Texarkana Bann Tap 53298 NW Texarkana 138 1 53299 NW Texarkana Bann Tap 53250 Bann 138 1	257	Rebuild 1.68 miles of 1024 ACAR with 2156 ACSR, Replace wavetrap jumpers with 2156 ACSR. **E&C lead time is 12 months.**	$ 840,000
05SP	AEPW-AEPW	53245 ALUMXT 4 138 53250 BANN 4 138 1	260	87.2	95.6	7.2820	94.0	5.8380	Multiple Outage Contingency 53299 NW Texarkana Bann Tap 53300 N New Boston 138 1 53299 NW Texarkana Bann Tap 53298 NW Texarkana 138 1 53299 NW Texarkana Bann Tap 53250 Bann 138 1	300	Replace six (6) 138 kV switches, five at Bann & one at Alumax Tap. Rebuild 0.67 miles of 1024 ACAR with 2156 ACSR. Replace wavetrap jumpers @ Bann. Replace breaker 3300 @ Bann. **E&C lead time is 12 months.**	$ 630,000
05SP	AEPW-AEPW	53527 DIANA 4 138 53590 PERDUE 4 138 1	268	80.1	92.8	11.3770	92.0	10.6210	53542 HARRISN4 138 53561 LIBCYTP4 138 1	300	Replace Breaker 10070 @ Perdue	$ 150,000
05SP	AEPW-AEPW	53540 GREGGTN2 69 53562 LLAMOND2 69 1	107	85.1	95.4	3.6580	94.8	3.4400	53527 DIANA 4 138 53590 PERDUE 4 138 1	300	Rebuild 2.66 miles of 755 ACAR with 1590 ACSR. **E&C lead time is 15 months.**	$ 1,100,000

Table 1 – SPP facility overloads identified for the AEPW to AEPW transfer using Scenario 1

Study Case	From Area - To Area	Branch Overload	Rating <MW>	BC % Loading	TC % Loading	%TDF	Existing TC % Loading	Existing %TDF	Outaged Branch Causing Overload	ATC <MW>	Solution	Estimated Cost
05SP	AEPW-AEPW	53597 ROKHILL2 69 *B003 1 2	46	70.1	91.0	3.1840	90.5	3.1030	53516 BLOCKRT2 69 53570 MARSHAL2 69 1	300	Requires addition of 3rd Rock Hill 138/69kV 46MVA Unit to eliminate overload of unit #1 and #2. **E&C lead time is 24 months.**	$ 1,400,000
05SP	AEPW-AEPW	53597 ROKHILL2 69 *B068 1 1	46	70.6	91.6	3.2070	91.0	3.1250	53516 BLOCKRT2 69 53570 MARSHAL2 69 1	300	See Previous Upgrade Specified For Facility	
05SP	AEPW-AEPW	53598 ROKHILL4 138 *B003 1 2	46	70.1	91.0	3.1840	90.5	3.1030	53516 BLOCKRT2 69 53570 MARSHAL2 69 1	300	See Previous Upgrade Specified For Facility	
05SP	AEPW-AEPW	53598 ROKHILL4 138 *B068 1 1	46	70.6	91.6	3.2070	91.0	3.1250	53516 BLOCKRT2 69 53570 MARSHAL2 69 1	300	See Previous Upgrade Specified For Facility	
05SP	AEPW-AEPW	53781 BA101-N4 138 53818 ONETA--4 138 1	235	86.6	91.5	3.8570	**N/A***	**N/A***	3Wnd: OPEN *B0 19 1	300	Rebuild 6.05 miles of 795 ACSR with 1590 ACSR. Replace jumper @ Oneta. **E&C lead time is 18 months.**	$ 3,600,000
05SP	OKGE-OKGE	55234 PECANCK5 161 *B423 PECANCK1 1 1	369	88.5	93.3	5.8710	89.8	1.5410	55224 MUSKOGE7 345 55302 FTSMITH7 345 1	300	Add 2nd 345/161 kV 369MVA transformer. . **E&C lead time is 24 months.**	$ 3,000,000
05SP	OKGE-OKGE	55235 PECANCK7 345 *B423 PECANCK1 1 1	366	89.4	94.2	5.8710	90.7	1.5410	55224 MUSKOGE7 345 55302 FTSMITH7 345 1	300	See Previous Upgrade Specified For Facility	
05SH	OKGE-OKGE	55235 PECANCK7 345 *B423 PECANCK1 1 1	367	97.0	101.8	5.8700	98.5	1.8240	55224 MUSKOGE7 345 55302 FTSMITH7 345 1	189	See Previous Upgrade Specified For Facility	
05SH	OKGE-OKGE	55234 PECANCK5 161 *B423 PECANCK1 1 1	370	96.1	100.9	5.8700	97.6	1.8240	55224 MUSKOGE7 345 55302 FTSMITH7 345 1	243	See Previous Upgrade Specified For Facility	
05FA		NONE IDENTIFIED								300		
05WP		NONE IDENTIFIED								300		
07SP	AEPW-AEPW	53276 LSSOUTH4 138 53311 PITTSB_4 138 1	196	106.6	124.4	11.6260	124.0	11.3480	53619 WILKES 4 138 53622 WELSHRE4 138 1	0	Reset CT @ Pittsburg.	$ 10,000
07SP	AEPW-AEPW	53571 MARSHL-4 138 *B069 1 1	107	108.8	118.9	3.6150	118.1	3.3370	3Wnd: OPEN *B0 99 2	0	See Previous Upgrade Specified For Facility	
07SP	AEPW-AEPW	53571 MARSHL-4 138 *B099 1 2	107	108.7	118.8	3.6110	118.0	3.3340	3Wnd: OPEN *B0 69 1	0	See Previous Upgrade Specified For Facility	
07SP	AEPW-AEPW	53623 MARAUTO2 69 *B069 1 1	107	108.8	118.9	3.6150	118.1	3.3370	3Wnd: OPEN *B0 99 2	0	See Previous Upgrade Specified For Facility	
07SP	AEPW-AEPW	53623 MARAUTO2 69 *B099 1 2	107	108.6	118.7	3.6110	117.9	3.3340	3Wnd: OPEN *B0 69 1	0	See Previous Upgrade Specified For Facility	
07SP	AEPW-AEPW	53245 ALUMXT 4 138 53300 NWTXARK4 138 1	260	95.8	104.3	7.2920	104.0	7.0400	Multiple Outage Contingency 53299 NW Texarkana Bann Tap 53300 N New Boston 138 1 53299 NW Texarkana Bann Tap 53298 NW Texarkana 138 1 53299 NW Texarkana Bann Tap 53250 Bann 138 1	148	See Previous Upgrade Specified For Facility	
07SP	AEPW-AEPW	53245 ALUMXT 4 138 53250 BANN 4 138 1	260	90.3	98.7	7.2920	98.4	7.0400	Multiple Outage Contingency 53299 NW Texarkana Bann Tap 53300 N New Boston 138 1 53299 NW Texarkana Bann Tap 53298 NW Texarkana 138 1 53299 NW Texarkana Bann Tap 53250 Bann 138 1	300	See Previous Upgrade Specified For Facility	
07SP	AEPW-AEPW	53276 LSSOUTH4 138 53619 WILKES 4 138 1	314	87.3	96.6	9.8140	96.0	9.1550	53619 WILKES 4 138 53622 WELSHRE4 138 1	300	Reset CTs	$ 2,000

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Study Case	From Area - To Area	Branch Overload	Rating <MW>	BC % Loading	TC % Loading	%TDF	Existing TC % Loading	Existing %TDF	Outaged Branch Causing Overload	ATC <MW>	Solution	Estimated Cost
07SP	AEPW-AEPW	53423 LONGWD 4 138 53457 OAKPH 4 138 1	209	90.6	96.0	3.7280	94.6	2.7360	Multiple Outage Contingency 53454 SW SHV 7 345 53424 LONGWD 7 345 1 53454 SW SHV 7 345 53528 DIANA 7 345 1	300	Rebuild 1.8 miles of 666 ACSR with 1590 ACSR. **E&C lead time is 12 months.**	$ 800,000
07SP	AEPW-AEPW	53527 DIANA 4 138 53590 PERDUE 4 138 1	268	77.6	90.0	11.0680	89.7	10.7800	53542 HARRISN4 138 53561 LIBCYTP4 138 1	300	See Previous Upgrade Specified For Facility	
07SP	AEPW-AEPW	53532 FORSTHL2 69 53596 QUITMAN2 69 1	59	73.9	94.8	4.1120	94.5	4.0500	3Wnd: OPEN *B0 73 1	300	See Previous Upgrade Specified For Facility	
07SP	AEPW-AEPW	53540 GREGGTN2 69 53562 LLAMOND2 69 1	107	83.5	93.2	3.4680	93.1	3.4260	53527 DIANA 4 138 53590 PERDUE 4 138 1	300	See Previous Upgrade Specified For Facility	
07SP	AEPW-AEPW	53597 ROKHILL2 69 *B003 1 2	46	74.5	95.3	3.1750	95.1	3.1380	53516 BLOCKRT2 69 53570 MARSHAL2 69 1	300	See Previous Upgrade Specified For Facility	
07SP	AEPW-AEPW	53597 ROKHILL2 69 *B140 1 1	46	74.9	95.9	3.1970	95.6	3.1600	53516 BLOCKRT2 69 53570 MARSHAL2 69 1	300	See Previous Upgrade Specified For Facility	
07SP	AEPW-AEPW	53598 ROKHILL4 138 *B003 1 2	46	74.7	95.5	3.1750	95.3	3.1380	53516 BLOCKRT2 69 53570 MARSHAL2 69 1	300	See Previous Upgrade Specified For Facility	
07SP	AEPW-AEPW	53598 ROKHILL4 138 *B140 1 1	46	75.3	96.3	3.1970	96.1	3.1600	53516 BLOCKRT2 69 53570 MARSHAL2 69 1	300	See Previous Upgrade Specified For Facility	
07SP	OKGE-OKGE	55234 PECANCK5 161 *B399 PECANCK1 1 1	369	88.8	93.4	5.6580	90.8	2.4820	55224 MUSKOGE7 345 55302 FTSMITH7 345 1	300	See Previous Upgrade Specified For Facility	
07SP	OKGE-OKGE	55235 PECANCK7 345 *B399 PECANCK1 1 1	366	89.6	94.3	5.6580	91.7	2.4820	55224 MUSKOGE7 345 55302 FTSMITH7 345 1	300	See Previous Upgrade Specified For Facility	
07SP	AEPW-AEPW	53781 BA101-N4 138 53818 ONETA--4 138 1	235	88.4	93.3	3.8010	**N/A***	**N/A***	3Wnd: OPEN *B0 60 1	300	See Previous Upgrade Specified For Facility	
07WP	SWPA-AEPW	52814 BRKN BW4 138 54015 CRAIGJT4 138 1	107	78.6	93.2	5.2020	83.6	1.7770	55823 BBDAMTP4 138 56004 MTRIVER4 138 1	300	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
07WP	OKGE-OKGE	55234 PECANCK5 161 *B399 PECANCK1 1 1	370	89.9	94.4	5.6520	90.5	0.7240	55224 MUSKOGE7 345 55302 FTSMITH7 345 1	300	See Previous Upgrade Specified For Facility	
07WP	OKGE-OKGE	55235 PECANCK7 345 *B399 PECANCK1 1 1	369	90.2	94.8	5.6520	90.8	0.7240	55224 MUSKOGE7 345 55302 FTSMITH7 345 1	300	See Previous Upgrade Specified For Facility	
10SP	AEPW-AEPW	53276 LSSOUTH4 138 53311 PITTSB_4 138 1	196	116.4	134.3	11.6640	133.9	11.4020	53619 WILKES 4 138 53622 WELSHRE4 138 1	0	See Previous Upgrade Specified For Facility	
10SP	AEPW-AEPW	53557 KNOXLEE4 138 53586 OAK2HIL4 138 1	206	106.9	113.8	4.7940	113.6	4.6510	53557 KNOXLEE4 138 53574 MONROER4 138 1	0	Reset relays & replace wavetrap @ Knoxlee	$ 50,000
10SP	AEPW-AEPW	53598 ROKHILL4 138 *B039 1 1	46	82.1	103.1	3.1930	102.6	3.1160	53516 BLOCKRT2 69 53570 MARSHAL2 69 1	256	See Previous Upgrade Specified For Facility	
10SP	AEPW-AEPW	53597 ROKHILL2 69 *B039 1 1	46	81.9	102.8	3.1930	102.3	3.1160	53516 BLOCKRT2 69 53570 MARSHAL2 69 1	259	See Previous Upgrade Specified For Facility	
10SP	AEPW-AEPW	53597 ROKHILL2 69 *B130 1 2	46	81.5	102.3	3.1700	101.8	3.0940	53516 BLOCKRT2 69 53570 MARSHAL2 69 1	267	See Previous Upgrade Specified For Facility	
10SP	AEPW-AEPW	53598 ROKHILL4 138 *B130 1 2	46	81.5	102.3	3.1700	101.8	3.0940	53516 BLOCKRT2 69 53570 MARSHAL2 69 1	267	See Previous Upgrade Specified For Facility	
10SP	AEPW-AEPW	53532 FORSTHL2 69 53596 QUITMAN2 69 1	58	80.4	101.5	4.1140	101.2	4.0530	3Wnd: OPEN *B0 19 1	278	See Previous Upgrade Specified For Facility	
10SP	AEPW-AEPW	53276 LSSOUTH4 138 53619 WILKES 4 138 1	313	88.6	98.1	9.8450	96.7	8.4020	53619 WILKES 4 138 53622 WELSHRE4 138 1	300	See Previous Upgrade Specified For Facility	

Table 1 – SPP facility overloads identified for the AEPW to AEPW transfer using Scenario 1

Study Case	From Area - To Area	Branch Overload	Rating <MW>	BC % Loading	TC % Loading	%TDF	Existing TC % Loading	Existing %TDF	Outaged Branch Causing Overload	ATC <MW>	Solution	Estimated Cost
10SP	AEPW-AEPW	53278 MAGNOLA2 69 53336 WINNSBO2 69 1	72	71.3	92.1	4.9780	91.9	4.9170	3Wnd: OPEN *B0 19 1	300	See Previous Upgrade Specified For Facility	
10SP	AEPW-AEPW	53278 MAGNOLA2 69 53532 FORSTHL2 69 1	72	71.0	91.9	4.9780	91.6	4.9170	3Wnd: OPEN *B0 19 1	300	See Previous Upgrade Specified For Facility	
10SP	AEPW-AEPW	53453 SW SHV 4 138 *B003 1 1	657	88.8	94.3	12.1180	93.6	10.6280	3Wnd: OPEN *B0 9 2	300	Solution Undetermined	TBD
10SP	AEPW-AEPW	53453 SW SHV 4 138 *B009 1 2	657	87.1	92.5	11.8990	91.9	10.4360	3Wnd: OPEN *B0 3 1	300	Solution Undetermined	TBD
10SP	AEPW-AEPW	53453 SW SHV 4 138 53455 SW SHVT4 138 1	302	84.2	92.8	8.6520	91.8	7.5860	Multiple Outage Contingency 53464 Western Electric Tap 53453 SW Shreveport 138 1 53464 Western Electric Tap 53450 Stonewall 138 1 53464 Western Electric Tap 53463 Western Electric 138 1	300	Solution Undetermined	TBD
10SP	AEPW-AEPW	53454 SW SHV 7 345 *B003 1 1	654	89.3	94.8	12.1180	94.1	10.6280	3Wnd: OPEN *B0 9 2	300	Solution Undetermined	TBD
10SP	AEPW-AEPW	53454 SW SHV 7 345 *B009 1 2	654	87.6	93.0	11.8990	92.3	10.4360	3Wnd: OPEN *B0 3 1	300	Solution Undetermined	TBD
10SP	AEPW-AEPW	53527 DIANA 4 138 53590 PERDUE 4 138 1	268	83.9	96.4	11.1320	96.3	11.0650	53542 HARRISN4 138 53561 LIBCYTP4 138 1	300	See Previous Upgrade Specified For Facility	
10SP	AEPW-AEPW	53584 NWHENDR4 138 53585 OAK1HIL4 138 1	237	89.7	94.1	3.4700	93.9	3.3280	53557 KNOXLEE4 138 53574 MONROER4 138 1	300	Replace wavetrap @ NW Henderson.	$ 30,000
10SP	AEPW-AEPW	53619 WILKES 4 138 53622 WELSHRE4 138 1	260	82.0	94.3	10.6060	93.9	10.2530	53276 LSSOUTH4 138 53311 PITTSB_4 138 1	300	Solution Undetermined	TBD
10SP	AEPW-AEPW	53781 BA101-N4 138 53818 ONETA--4 138 1	235	89.9	94.8	3.8010	**N/A***	**N/A***	53785 RSSAUTO4 138 53795 R.S.S.-4 138 1	300	See Previous Upgrade Specified For Facility	
10SP	OKGE-OKGE	55234 PECANCK5 161 *B399 PECANCK1 1 1	369	88.5	93.1	5.6530	91.1	3.1060	55224 MUSKOGE7 345 55302 FTSMITH7 345 1	300	See Previous Upgrade Specified For Facility	
10SP	OKGE-OKGE	55235 PECANCK7 345 *B399 PECANCK1 1 1	366	89.5	94.1	5.6530	92.0	3.1060	55224 MUSKOGE7 345 55302 FTSMITH7 345 1	300	See Previous Upgrade Specified For Facility	
10WP	AEPW-AEPW	53597 ROKHILL2 69 *B042 1 1	46	71.4	93.2	3.3140	92.8	3.2650	53516 BLOCKRT2 69 53570 MARSHAL2 69 1	300	See Previous Upgrade Specified For Facility	
10WP	AEPW-AEPW	53597 ROKHILL2 69 *B140 1 2	46	70.9	92.6	3.2910	92.2	3.2420	53516 BLOCKRT2 69 53570 MARSHAL2 69 1	300	See Previous Upgrade Specified For Facility	
10WP	AEPW-AEPW	53598 ROKHILL4 138 *B042 1 1	46	71.4	93.2	3.3140	92.8	3.2650	53516 BLOCKRT2 69 53570 MARSHAL2 69 1	300	See Previous Upgrade Specified For Facility	
10WP	AEPW-AEPW	53598 ROKHILL4 138 *B140 1 2	46	70.9	92.6	3.2910	92.2	3.2420	53516 BLOCKRT2 69 53570 MARSHAL2 69 1	300	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	$14,667,000
											Total Cost with Facilities Monitored @ 100% Loading	$ 5,655,000

*Existing Network Resource has a minimal positive impact or a negative impact on facility. No credit for positive impact removed can be given to the New Network Resource for this facility.

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

Study Case	From Area - To Area	Branch Overload	Rating <MW>	BC % Loading	TC % Loading	%TDF	Existing TC % Loading	Existing %TDF	Outaged Branch Causing Overload	ATC <MW>	Solution	Estimated Cost
05AP		NONE IDENTIFIED								300		
05G	AEPW-AEPW	53571 MARSHL-4 138 *B017 1 2	107	83.0	93.2	3.6500	92.9	3.5280	3Wnd: OPEN *B0 42 1	300	See Previous Upgrade Specified For Facility in Scenario 1	
05G	AEPW-AEPW	53571 MARSHL-4 138 *B042 1 1	107	83.1	93.3	3.6540	93.0	3.5320	3Wnd: OPEN *B0 17 2	300	See Previous Upgrade Specified For Facility in Scenario 1	
05G	AEPW-AEPW	53623 MARAUTO2 69 *B017 1 2	107	82.9	93.1	3.6500	92.8	3.5280	3Wnd: OPEN *B0 42 1	300	See Previous Upgrade Specified For Facility in Scenario 1	
05G	AEPW-AEPW	53623 MARAUTO2 69 *B042 1 1	107	83.0	93.2	3.6540	92.9	3.5320	3Wnd: OPEN *B0 17 2	300	See Previous Upgrade Specified For Facility in Scenario 1	
05G	AEPW-AEPW	54023 OKMULGE4 138 54049 EC.HEN-4 138 1	104	81.9	95.5	4.7340	92.3	3.6270	54023 OKMULGE4 138 54057 KELCO 4 138 1	300	Replace Okmulgee Wavetrap	$ 40,000
05G	AEPW-AEPW	54028 WELETK4 138 54049 EC.HEN-4 138 1	104	78.5	92.1	4.7340	88.9	3.6270	54023 OKMULGE4 138 54057 KELCO 4 138 1	300	Replace Weleetka Wavetrap	$ 40,000
05SP	AEPW-AEPW	53532 FORSTHL2 69 53596 QUITMAN2 69 1	59	106.4	122.4	3.1450	121.8	3.0110	53590 PERDUE 4 138 53666 LHAWKIN4 138 1	0	See Previous Upgrade Specified For Facility in Scenario 1	
05SP	AEPW-AEPW	53571 MARSHL-4 138 *B041 1 1	107	96.9	107.1	3.6340	106.3	3.3390	3Wnd: OPEN *B1 42 2	91	See Previous Upgrade Specified For Facility in Scenario 1	
05SP	AEPW-AEPW	53623 MARAUTO2 69 *B041 1 1	107	96.8	107.0	3.6340	106.2	3.3390	3Wnd: OPEN *B1 42 2	94	See Previous Upgrade Specified For Facility in Scenario 1	
05SP	AEPW-AEPW	53571 MARSHL-4 138 *B142 1 2	107	96.8	107.0	3.6300	106.2	3.3350	3Wnd: OPEN *B0 41 1	94	See Previous Upgrade Specified For Facility in Scenario 1	
05SP	AEPW-AEPW	53623 MARAUTO2 69 *B142 1 2	107	96.7	106.9	3.6300	106.1	3.3350	3Wnd: OPEN *B0 41 1	96	See Previous Upgrade Specified For Facility in Scenario 1	
05SP	AEPW-AEPW	53278 MAGNOLA2 69 53336 WINNSBO2 69 1	72	91.8	108.6	4.0200	108.1	3.8860	53590 PERDUE 4 138 53666 LHAWKIN4 138 1	146	See Previous Upgrade Specified For Facility in Scenario 1	
05SP	AEPW-AEPW	53278 MAGNOLA2 69 53532 FORSTHL2 69 1	72	91.4	108.2	4.0200	107.6	3.8860	53590 PERDUE 4 138 53666 LHAWKIN4 138 1	154	See Previous Upgrade Specified For Facility in Scenario 1	
05SP	AEPW-AEPW	53245 ALUMXT 4 138 53300 NWTXARK4 138 1	260	82.3	90.7	7.2820	89.1	5.8380	Multiple Outage Contingency 53299 NW Texarkana Bann Tap 53300 N New Boston 138 1 53299 NW Texarkana Bann Tap 53298 NW Texarkana 138 1 53299 NW Texarkana Bann Tap 53250 Bann 138 1	300	See Previous Upgrade Specified For Facility in Scenario 1	
05SP	AEPW-AEPW	53540 GREGGTN2 69 53562 LLAMOND2 69 1	107	82.3	92.6	3.6580	92.0	3.4400	53527 DIANA 4 138 53590 PERDUE 4 138 1	300	See Previous Upgrade Specified For Facility in Scenario 1	
05SP	AEPW-AEPW	53597 ROKHILL2 69 *B003 1 2	46	72.7	93.6	3.1840	93.1	3.1030	53516 BLOCKRT2 69 53570 MARSHAL2 69 1	300	See Previous Upgrade Specified For Facility in Scenario 1	
05SP	AEPW-AEPW	53597 ROKHILL2 69 *B068 1 1	46	73.2	94.2	3.2070	93.7	3.1250	53516 BLOCKRT2 69 53570 MARSHAL2 69 1	300	See Previous Upgrade Specified For Facility in Scenario 1	

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

Study Case	From Area - To Area	Branch Overload	Rating <MW>	BC % Loading	TC % Loading	%TDF	Existing TC % Loading	Existing %TDF	Outaged Branch Causing Overload	ATC <MW>	Solution	Estimated Cost
05SP	AEPW-AEPW	53598 ROKHILL4 138 *B003 1 2	46	72.7	93.6	3.1840	93.1	3.1030	53516 BLOCKRT2 69 53570 MARSHAL2 69 1	300	See Previous Upgrade Specified For Facility in Scenario 1	
05SP	AEPW-AEPW	53598 ROKHILL4 138 *B068 1 1	46	73.2	94.2	3.2070	93.7	3.1250	53516 BLOCKRT2 69 53570 MARSHAL2 69 1	300	See Previous Upgrade Specified For Facility in Scenario 1	
05SP	AEPW-AEPW	53781 BA101-N4 138 53818 ONETA--4 138 1	202	86.6	91.9	3.5510	**N/A***	**N/A***	Base Case	300	See Previous Upgrade Specified For Facility in Scenario 1	
05FA		NONE IDENTIFIED								300		
05WP		NONE IDENTIFIED								300		
07SP	AEPW-AEPW	53276 LSSOUTH4 138 53311 PITTSB_4 138 1	196	104.8	122.6	11.6260	122.4	11.4970	53619 WILKES 4 138 53622 WELSHRE4 138 1	0	See Previous Upgrade Specified For Facility in Scenario 1	
07SP	AEPW-AEPW	53571 MARSHL-4 138 *B069 1 1	107	101.3	111.4	3.6150	110.6	3.3230	3Wnd: OPEN *B0 99 2	0	See Previous Upgrade Specified For Facility in Scenario 1	
07SP	AEPW-AEPW	53571 MARSHL-4 138 *B099 1 2	107	101.1	111.2	3.6110	110.4	3.3200	3Wnd: OPEN *B0 69 1	0	See Previous Upgrade Specified For Facility in Scenario 1	
07SP	AEPW-AEPW	53623 MARAUTO2 69 *B069 1 1	107	101.2	111.4	3.6150	110.5	3.3230	3Wnd: OPEN *B0 99 2	0	See Previous Upgrade Specified For Facility in Scenario 1	
07SP	AEPW-AEPW	53623 MARAUTO2 69 *B099 1 2	107	101.1	111.2	3.6110	110.4	3.3200	3Wnd: OPEN *B0 69 1	0	See Previous Upgrade Specified For Facility in Scenario 1	
07SP	AEPW-AEPW	53245 ALUMXT 4 138 53300 NWTXARK4 138 1	260	84.7	93.1	7.2920	91.5	5.8420	Multiple Outage Contingency 53299 NW Texarkana Bann Tap 53300 N New Boston 138 1 53299 NW Texarkana Bann Tap 53298 NW Texarkana 138 1 53299 NW Texarkana Bann Tap 53250 Bann 138 1	300	See Previous Upgrade Specified For Facility in Scenario 1	
07SP	AEPW-AEPW	53453 SW SHV 4 138 53455 SW SHVT4 138 1	302	81.8	90.5	8.7130	87.6	5.8420	Multiple Outage Contingency 53464 Western Electric Tap 53453 SW Shreveport 138 1 53464 Western Electric Tap 53450 Stonewall 138 1 53464 Western Electric Tap 53463 Western Electric 138 1	300	Solution Undetermined	TBD
07SP	AEPW-AEPW	53454 SW SHV 7 345 *B050 1 1	654	84.5	90.1	12.1960	87.7	6.9830	3Wnd: OPEN *B0 45 2	300	Solution Undetermined	TBD
07SP	AEPW-AEPW	53532 FORSTHL2 69 53596 QUITMAN2 69 1	59	73.7	94.6	4.1120	94.4	4.0550	3Wnd: OPEN *B0 73 1	300	See Previous Upgrade Specified For Facility in Scenario 1	
07SP	AEPW-AEPW	53540 GREGGTN2 69 53562 LLAMOND2 69 1	107	81.2	90.9	3.4680	90.5	3.3030	53527 DIANA 4 138 53590 PERDUE 4 138 1	300	See Previous Upgrade Specified For Facility in Scenario 1	
07SP	AEPW-AEPW	53597 ROKHILL2 69 *B003 1 2	46	77.3	98.1	3.1750	97.6	3.0950	53516 BLOCKRT2 69 53570 MARSHAL2 69 1	300	See Previous Upgrade Specified For Facility in Scenario 1	
07SP	AEPW-AEPW	53597 ROKHILL2 69 *B140 1 1	46	77.8	98.7	3.1970	98.2	3.1160	53516 BLOCKRT2 69 53570 MARSHAL2 69 1	300	See Previous Upgrade Specified For Facility in Scenario 1	
07SP	AEPW-AEPW	53598 ROKHILL4 138 *B003 1 2	46	77.3	98.1	3.1750	97.6	3.0950	53516 BLOCKRT2 69 53570 MARSHAL2 69 1	300	See Previous Upgrade Specified For Facility in Scenario 1	

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

Study Case	From Area - To Area	Branch Overload	Rating <MW>	BC % Loading	TC % Loading	%TDF	Existing TC % Loading	Existing %TDF	Outaged Branch Causing Overload	ATC <MW>	Solution	Estimated Cost
07SP	AEPW-AEPW	53598 ROKHILL4 138 *B140 1 1	46	77.8	98.7	3.1970	98.2	3.1160	53516 BLOCKRT2 69 53570 MARSHAL2 69 1	300	See Previous Upgrade Specified For Facility in Scenario 1	
07SP	AEPW-AEPW	53781 BA101-N4 138 53818 ONETA--4 138 1	202	89.8	95.0	3.5080	**N/A***	**N/A***	Base Case	300	See Previous Upgrade Specified For Facility in Scenario 1	
07WP	SWPA-AEPW	52814 BRKN BW4 138 54015 CRAIGJT4 138 1	107	76.2	90.8	5.2020	81.1	1.7770	55823 BBDAMTP4 138 56004 MTRIVER4 138 1	300	See Previous Upgrade Specified For Facility in Scenario 1	
10SP	AEPW-AEPW	53276 LSSOUTH4 138 53311 PITTSB_4 138 1	196	114.5	132.4	11.6640	132.0	11.3840	53619 WILKES 4 138 53622 WELSHRE4 138 1	0	See Previous Upgrade Specified For Facility in Scenario 1	
10SP	AEPW-AEPW	53557 KNOXLEE4 138 53586 OAK2HIL4 138 1	206	101.3	108.2	4.7940	108.0	4.6360	53557 KNOXLEE4 138 53574 MONROER4 138 1	0	See Previous Upgrade Specified For Facility in Scenario 1	
10SP	AEPW-AEPW	53276 LSSOUTH4 138 53619 WILKES 4 138 1	314	93.8	103.2	9.8450	101.7	8.3150	53619 WILKES 4 138 53622 WELSHRE4 138 1	198	Reset CTs	$ 2,000
10SP	AEPW-AEPW	53598 ROKHILL4 138 *B039 1 1	46	84.5	105.5	3.1930	104.9	3.1120	53516 BLOCKRT2 69 53570 MARSHAL2 69 1	222	See Previous Upgrade Specified For Facility in Scenario 1	
10SP	AEPW-AEPW	53597 ROKHILL2 69 *B039 1 1	46	84.3	105.2	3.1930	104.7	3.1120	53516 BLOCKRT2 69 53570 MARSHAL2 69 1	225	See Previous Upgrade Specified For Facility in Scenario 1	
10SP	AEPW-AEPW	53598 ROKHILL4 138 *B130 1 2	46	84.1	104.9	3.1700	104.4	3.0900	53516 BLOCKRT2 69 53570 MARSHAL2 69 1	230	See Previous Upgrade Specified For Facility in Scenario 1	
10SP	AEPW-AEPW	53597 ROKHILL2 69 *B130 1 2	46	83.7	104.4	3.1700	103.9	3.0900	53516 BLOCKRT2 69 53570 MARSHAL2 69 1	236	See Previous Upgrade Specified For Facility in Scenario 1	
10SP	AEPW-AEPW	53532 FORSTHL2 69 53596 QUITMAN2 69 1	58	80.1	101.2	4.1140	100.9	4.0480	3Wnd: OPEN *B0 19 1	283	See Previous Upgrade Specified For Facility in Scenario 1	
10SP	AEPW-AEPW	53245 ALUMXT 4 138 53250 BANN 4 138 1	260	82.7	91.1	7.2990	91.0	7.2590	Multiple Outage Contingency 53299 NW Texarkana Bann Tap 53300 N New Boston 138 1 53299 NW Texarkana Bann Tap 53298 NW Texarkana 138 1 53299 NW Texarkana Bann Tap 53250 Bann 138 1	300	See Previous Upgrade Specified For Facility in Scenario 1	
10SP	AEPW-AEPW	53245 ALUMXT 4 138 53300 NWTXARK4 138 1	260	88.5	97.0	7.2990	96.9	7.2590	Multiple Outage Contingency 53299 NW Texarkana Bann Tap 53300 N New Boston 138 1 53299 NW Texarkana Bann Tap 53298 NW Texarkana 138 1 53299 NW Texarkana Bann Tap 53250 Bann 138 1	300	See Previous Upgrade Specified For Facility in Scenario 1	
10SP	AEPW-AEPW	53278 MAGNOLA2 69 53336 WINNSBO2 69 1	72	71.0	91.9	4.9780	91.6	4.9120	3Wnd: OPEN *B0 19 1	300	See Previous Upgrade Specified For Facility in Scenario 1	
10SP	AEPW-AEPW	53278 MAGNOLA2 69 53532 FORSTHL2 69 1	72	70.7	91.6	4.9780	91.3	4.9120	3Wnd: OPEN *B0 19 1	300	See Previous Upgrade Specified For Facility in Scenario 1	
10SP	AEPW-AEPW	53453 SW SHV 4 138 *B003 1 1	657	91.1	96.6	12.1180	95.9	10.5450	3Wnd: OPEN *B0 9 2	300	Solution Undetermined	TBD
10SP	AEPW-AEPW	53453 SW SHV 4 138 *B009 1 2	657	89.4	94.8	11.8990	94.1	10.3550	3Wnd: OPEN *B0 3 1	300	Solution Undetermined	TBD

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

Study Case	From Area - To Area	Branch Overload	Rating <MW>	BC % Loading	TC % Loading	%TDF	Existing TC % Loading	Existing %TDF	Outaged Branch Causing Overload	ATC <MW>	Solution	Estimated Cost
10SP	AEPW-AEPW	53453 SW SHV 4 138 53455 SW SHVT4 138 1	302	88.1	96.7	8.6520	95.6	7.5270	Multiple Outage Contingency 53464 Western Electric Tap 53453 SW Shreveport 138 1 53464 Western Electric Tap 53450 Stonewall 138 1 53464 Western Electric Tap 53463 Western Electric 138 1	300	Solution Undetermined	TBD
10SP	AEPW-AEPW	53454 SW SHV 7 345 *B003 1 1	653	91.6	97.2	12.1180	96.4	10.5450	3Wnd: OPEN *B0 9 2	300	Solution Undetermined	TBD
10SP	AEPW-AEPW	53454 SW SHV 7 345 *B009 1 2	654	89.8	95.3	11.8990	94.6	10.3550	3Wnd: OPEN *B0 3 1	300	Solution Undetermined	TBD
10SP	AEPW-AEPW	53527 DIANA 4 138 53590 PERDUE 4 138 1	268	79.3	91.8	11.1320	91.7	11.0540	53542 HARRISN4 138 53561 LIBCYTP4 138 1	300	See Previous Upgrade Specified For Facility in Scenario 1	
10SP	AEPW-AEPW	53619 WILKES 4 138 53622 WELSHRE4 138 1	260	81.9	94.1	10.6060	93.7	10.2310	53276 LSSOUTH4 138 53311 PITTSB_4 138 1	300	Solution Undetermined	TBD
10SP	AEPW-AEPW	53781 BA101-N4 138 53818 ONETA--4 138 1	202	91.8	97.0	3.5090	**91.9**	**0.0300**	Base Case	300	See Previous Upgrade Specified For Facility in Scenario 1	
10WP	AEPW-AEPW	53597 ROKHILL2 69 *B042 1 1	46	73.6	95.3	3.3140	95.0	3.2650	53516 BLOCKRT2 69 53570 MARSHAL2 69 1	300	See Previous Upgrade Specified For Facility in Scenario 1	
10WP	AEPW-AEPW	53597 ROKHILL2 69 *B140 1 2	46	73.0	94.5	3.2910	94.2	3.2420	53516 BLOCKRT2 69 53570 MARSHAL2 69 1	300	See Previous Upgrade Specified For Facility in Scenario 1	
10WP	AEPW-AEPW	53598 ROKHILL4 138 *B042 1 1	46	73.6	95.3	3.3140	95.0	3.2650	53516 BLOCKRT2 69 53570 MARSHAL2 69 1	300	See Previous Upgrade Specified For Facility in Scenario 1	
10WP	AEPW-AEPW	53598 ROKHILL4 138 *B140 1 2	46	73.2	94.7	3.2910	94.4	3.2420	53516 BLOCKRT2 69 53570 MARSHAL2 69 1	300	See Previous Upgrade Specified For Facility in Scenario 1	
10WP	AEPW-AEPW	54023 OKMULGE4 138 54049 EC.HEN-4 138 1	105	78.4	91.9	4.7170	**N/A***	**N/A***	54023 OKMULGE4 138 54057 KELCO 4 138 1	300	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	$ 80,000
											Total Cost with Facilities Monitored @ 100% Loading	$ 2,000

*Existing Network Resource has a minimal positive impact or a negative impact on facility. No credit for positive impact removed can be given to the New Network Resource for this facility.

Table 3 – SPP facility overloads identified for the AEPW to AEPW transfer using Scenario 3

Study Case	From Area - To Area	Branch Overload	Rating <MW>	BC % Loading	TC % Loading	%TDF	Existing TC % Loading	Existing %TDF	Outaged Branch Causing Overload	ATC <MW>	Solution	Estimated Cost
05AP	AEPW-AEPW	54023 OKMULGE4 138 54049 EC.HEN-4 138 1	103	88.7	102.5	4.7370	99.4	3.6800	54023 OKMULGE4 138 54057 KELCO 4 138 1	245	Replace Okmulgee Wavetrap	$ 40,000
05AP	AEPW-AEPW	54028 WELETK4 138 54049 EC.HEN-4 138 1	103	86.6	100.4	4.7370	97.3	3.6800	54023 OKMULGE4 138 54057 KELCO 4 138 1	291	Replace Weleetka Wavetrap	$ 40,000
05AP	WFEC-AEPW	55948 HUGO PP4 138 54044 VALIANT4 138 1	288	91.1	96.8	5.4670	96.2	4.8700	55948 HUGO PP4 138 56079 VALLANT4 138 1	300	Upgrade to be completed by 6/1/2005 for SPP OATT Attachment AA, Replace switches, jumpers, & wavetrap, & reset CTs @ Valliant	
05G	AEPW-AEPW	54023 OKMULGE4 138 54049 EC.HEN-4 138 1	104	102.2	115.9	4.7340	112.7	3.6270	54023 OKMULGE4 138 54057 KELCO 4 138 1	0	See Previous Upgrade Specified For Facility	
05G	AEPW-AEPW	54028 WELETK4 138 54049 EC.HEN-4 138 1	103	98.7	112.5	4.7340	109.3	3.6270	54023 OKMULGE4 138 54057 KELCO 4 138 1	28	See Previous Upgrade Specified For Facility	
05G	SWPA-AEPW	52814 BRKN BW4 138 54015 CRAIGJT4 138 1	107	83.7	98.3	5.1980	92.9	3.2770	55823 BBDAMTP4 138 56004 MTRIVER4 138 1	300	See Previous Upgrade Specified For Facility in Scenario 1	
05G	AEPW-AEPW	53571 MARSHL-4 138 *B017 1 2	107	84.5	94.7	3.6500	94.4	3.5280	3Wnd: OPEN *B0 42 1	300	See Previous Upgrade Specified For Facility in Scenario 1	
05G	AEPW-AEPW	53571 MARSHL-4 138 *B042 1 1	107	84.6	94.8	3.6540	94.5	3.5320	3Wnd: OPEN *B0 17 2	300	See Previous Upgrade Specified For Facility in Scenario 1	
05G	AEPW-AEPW	53623 MARAUTO2 69 *B017 1 2	107	84.4	94.6	3.6500	94.3	3.5280	3Wnd: OPEN *B0 42 1	300	See Previous Upgrade Specified For Facility in Scenario 1	
05G	AEPW-AEPW	53623 MARAUTO2 69 *B042 1 1	107	84.6	94.8	3.6540	94.5	3.5320	3Wnd: OPEN *B0 17 2	300	See Previous Upgrade Specified For Facility in Scenario 1	
05SP	AEPW-AEPW	53532 FORSTHL2 69 53596 QUITMAN2 69 1	59	108.4	124.5	3.1450	123.8	3.0110	53590 PERDUE 4 138 53666 LHAWKIN4 138 1	0	See Previous Upgrade Specified For Facility in Scenario 1	
05SP	AEPW-AEPW	53571 MARSHL-4 138 *B041 1 1	107	98.8	109.0	3.6340	108.1	3.3390	3Wnd: OPEN *B1 42 2	36	See Previous Upgrade Specified For Facility in Scenario 1	
05SP	AEPW-AEPW	53623 MARAUTO2 69 *B041 1 1	107	98.7	108.9	3.6340	108.1	3.3390	3Wnd: OPEN *B1 42 2	39	See Previous Upgrade Specified For Facility in Scenario 1	
05SP	AEPW-AEPW	53571 MARSHL-4 138 *B142 1 2	107	98.6	108.8	3.6300	107.9	3.3350	3Wnd: OPEN *B0 41 1	41	See Previous Upgrade Specified For Facility in Scenario 1	
05SP	AEPW-AEPW	53623 MARAUTO2 69 *B142 1 2	107	98.6	108.8	3.6300	107.9	3.3350	3Wnd: OPEN *B0 41 1	41	See Previous Upgrade Specified For Facility in Scenario 1	
05SP	AEPW-AEPW	53278 MAGNOLA2 69 53336 WINNSBO2 69 1	72	93.5	110.3	4.0200	109.7	3.8860	53590 PERDUE 4 138 53666 LHAWKIN4 138 1	116	See Previous Upgrade Specified For Facility in Scenario 1	
05SP	AEPW-AEPW	53278 MAGNOLA2 69 53532 FORSTHL2 69 1	72	93.1	109.9	4.0200	109.3	3.8860	53590 PERDUE 4 138 53666 LHAWKIN4 138 1	124	See Previous Upgrade Specified For Facility in Scenario 1	
05SP	SWPA-AEPW	52814 BRKN BW4 138 54015 CRAIGJT4 138 1	107	85.4	100.0	5.1990	95.6	3.6310	55823 BBDAMTP4 138 56004 MTRIVER4 138 1	300	See Previous Upgrade Specified For Facility in Scenario 1	

Table 3 – SPP facility overloads identified for the AEPW to AEPW transfer using Scenario 3

Study Case	From Area - To Area	Branch Overload	Rating <MW>	BC % Loading	TC % Loading	%TDF	Existing TC % Loading	Existing %TDF	Outaged Branch Causing Overload	ATC <MW>	Solution	Estimated Cost
05SP	AEPW-AEPW	53245 ALUMXT 4 138 53300 NWTXARK4 138 1	260	86.6	95.0	7.2820	93.3	5.8380	Multiple Outage Contingency 53299 NW Texarkana Bann Tap 53300 N New Boston 138 1 53299 NW Texarkana Bann Tap 53298 NW Texarkana 138 1 53299 NW Texarkana Bann Tap 53250 Bann 138 1	300	See Previous Upgrade Specified For Facility in Scenario 1	
05SP	AEPW-AEPW	53540 GREGGTN2 69 53562 LLAMOND2 69 1	107	82.9	93.2	3.6580	92.5	3.4400	53527 DIANA 4 138 53590 PERDUE 4 138 1	300	See Previous Upgrade Specified For Facility in Scenario 1	
05SP	AEPW-AEPW	53597 ROKHILL2 69 *B003 1 2	46	72.3	93.2	3.1840	92.6	3.1030	53516 BLOCKRT2 69 53570 MARSHAL2 69 1	300	See Previous Upgrade Specified For Facility in Scenario 1	
05SP	AEPW-AEPW	53597 ROKHILL2 69 *B068 1 1	46	72.7	93.8	3.2070	93.2	3.1250	53516 BLOCKRT2 69 53570 MARSHAL2 69 1	300	See Previous Upgrade Specified For Facility in Scenario 1	
05SP	AEPW-AEPW	53598 ROKHILL4 138 *B003 1 2	46	72.3	93.2	3.1840	92.6	3.1030	53516 BLOCKRT2 69 53570 MARSHAL2 69 1	300	See Previous Upgrade Specified For Facility in Scenario 1	
05SP	AEPW-AEPW	53598 ROKHILL4 138 *B068 1 1	46	72.7	93.8	3.2070	93.2	3.1250	53516 BLOCKRT2 69 53570 MARSHAL2 69 1	300	See Previous Upgrade Specified For Facility in Scenario 1	
05SP	AEPW-AEPW	53781 BA101-N4 138 53818 ONETA--4 138 1	235	91.7	96.6	3.8570	**N/A***	**N/A***	53785 RSSAUTO4 138 53795 R.S.S.-4 138 1	300	See Previous Upgrade Specified For Facility in Scenario 1	
05SH	AEPW-AEPW	53276 LSSOUTH4 138 53311 PITTSB_4 138 1	197	72.3	90.4	11.8790	90.4	11.8770	53619 WILKES 4 138 53622 WELSHRE4 138 1	300	See Previous Upgrade Specified For Facility in Scenario 1	
05SH	AEPW-AEPW	53781 BA101-N4 138 53818 ONETA--4 138 1	235	87.1	92.1	3.8560	**N/A***	**N/A***	53785 RSSAUTO4 138 53795 R.S.S.-4 138 1	300	See Previous Upgrade Specified For Facility in Scenario 1	
05SH	OKGE-OKGE	55234 PECANCK5 161 *B423 PECANCK1 1 1	370	89.3	94.1	5.8700	90.8	1.8240	55224 MUSKOGE7 345 55302 FTSMITH7 345 1	300	See Previous Upgrade Specified For Facility in Scenario 1	
05SH	OKGE-OKGE	55235 PECANCK7 345 *B423 PECANCK1 1 1	367	90.1	94.9	5.8700	91.6	1.8240	55224 MUSKOGE7 345 55302 FTSMITH7 345 1	300	See Previous Upgrade Specified For Facility in Scenario 1	
05FA	SWPA-AEPW	52814 BRKN BW4 138 54015 CRAIGJT4 138 1	107	92.0	106.5	5.1990	102.6	3.7810	55823 BBDAMTP4 138 56004 MTRIVER4 138 1	165	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
05WP	SWPA-AEPW	52814 BRKN BW4 138 54015 CRAIGJT4 138 1	107	92.6	107.2	5.2030	97.6	1.7750	55823 BBDAMTP4 138 56004 MTRIVER4 138 1	152	See Previous Upgrade Specified For Facility in Scenario 1	
05WP	AEPW-AEPW	54023 OKMULGE4 138 54049 EC.HEN-4 138 1	104	84.4	98.0	4.7320	85.5	0.3640	54023 OKMULGE4 138 54057 KELCO 4 138 1	300	See Previous Upgrade Specified For Facility	
05WP	AEPW-AEPW	54028 WELETK4 138 54049 EC.HEN-4 138 1	104	79.9	93.5	4.7320	81.0	0.3640	54023 OKMULGE4 138 54057 KELCO 4 138 1	300	See Previous Upgrade Specified For Facility	
07SP	AEPW-AEPW	53276 LSSOUTH4 138 53311 PITTSB_4 138 1	196	104.6	122.4	11.6260	122.0	11.4000	53619 WILKES 4 138 53622 WELSHRE4 138 1	0	See Previous Upgrade Specified For Facility in Scenario 1	

Table 3 – SPP facility overloads identified for the AEPW to AEPW transfer using Scenario 3

Study Case	From Area - To Area	Branch Overload	Rating <MW>	BC % Loading	TC % Loading	%TDF	Existing TC % Loading	Existing %TDF	Outaged Branch Causing Overload	ATC <MW>	Solution	Estimated Cost
07SP	AEPW-AEPW	53571 MARSHL-4 138 *B069 1 1	107	102.7	112.8	3.6150	112.1	3.3440	3Wnd: OPEN *B0 99 2	0	See Previous Upgrade Specified For Facility in Scenario 1	
07SP	AEPW-AEPW	53571 MARSHL-4 138 *B099 1 2	107	102.5	112.6	3.6110	111.9	3.3410	3Wnd: OPEN *B0 69 1	0	See Previous Upgrade Specified For Facility in Scenario 1	
07SP	AEPW-AEPW	53623 MARAUTO2 69 *B069 1 1	107	102.6	112.8	3.6150	112.0	3.3440	3Wnd: OPEN *B0 99 2	0	See Previous Upgrade Specified For Facility in Scenario 1	
07SP	AEPW-AEPW	53623 MARAUTO2 69 *B099 1 2	107	102.5	112.6	3.6110	111.9	3.3410	3Wnd: OPEN *B0 69 1	0	See Previous Upgrade Specified For Facility in Scenario 1	
07SP	SWPA-AEPW	52814 BRKN BW4 138 54015 CRAIGJT4 138 1	107	85.9	100.5	5.1980	98.3	4.4380	55823 BBDAMTP4 138 56004 MTRIVER4 138 1	290	See Previous Upgrade Specified For Facility in Scenario 1	
07SP	AEPW-AEPW	53276 LSSOUTH4 138 53619 WILKES 4 138 1	314	90.8	100.1	9.8140	99.8	9.5070	53619 WILKES 4 138 53622 WELSHRE4 138 1	296	See Previous Upgrade Specified For Facility in Scenario 1	
07SP	AEPW-AEPW	53245 ALUMXT 4 138 53250 BANN 4 138 1	260	83.3	91.7	7.2920	91.2	6.8310	Multiple Outage Contingency 53299 NW Texarkana Bann Tap 53300 N New Boston 138 1 53299 NW Texarkana Bann Tap 53298 NW Texarkana 138 1 53299 NW Texarkana Bann Tap 53250 Bann 138 1	300	See Previous Upgrade Specified For Facility in Scenario 1	
07SP	AEPW-AEPW	53245 ALUMXT 4 138 53300 NWTXARK4 138 1	260	88.9	97.3	7.2920	96.8	6.8310	Multiple Outage Contingency 53299 NW Texarkana Bann Tap 53300 N New Boston 138 1 53299 NW Texarkana Bann Tap 53298 NW Texarkana 138 1 53299 NW Texarkana Bann Tap 53250 Bann 138 1	300	See Previous Upgrade Specified For Facility in Scenario 1	
07SP	AEPW-AEPW	53532 FORSTHL2 69 53596 QUITMAN2 69 1	59	73.7	94.6	4.1120	94.4	4.0570	3Wnd: OPEN *B0 73 1	300	See Previous Upgrade Specified For Facility in Scenario 1	
07SP	AEPW-AEPW	53540 GREGGTN2 69 53562 LLAMOND2 69 1	107	81.5	91.2	3.4680	91.1	3.4120	53527 DIANA 4 138 53590 PERDUE 4 138 1	300	See Previous Upgrade Specified For Facility in Scenario 1	
07SP	AEPW-AEPW	53597 ROKHILL2 69 *B003 1 2	46	76.5	97.3	3.1750	97.0	3.1380	53516 BLOCKRT2 69 53570 MARSHAL2 69 1	300	See Previous Upgrade Specified For Facility in Scenario 1	
07SP	AEPW-AEPW	53597 ROKHILL2 69 *B140 1 1	46	77.1	98.1	3.1970	97.8	3.1600	53516 BLOCKRT2 69 53570 MARSHAL2 69 1	300	See Previous Upgrade Specified For Facility in Scenario 1	
07SP	AEPW-AEPW	53598 ROKHILL4 138 *B003 1 2	46	76.7	97.5	3.1750	97.2	3.1380	53516 BLOCKRT2 69 53570 MARSHAL2 69 1	300	See Previous Upgrade Specified For Facility in Scenario 1	
07SP	AEPW-AEPW	53598 ROKHILL4 138 *B140 1 1	46	77.3	98.3	3.1970	98.1	3.1600	53516 BLOCKRT2 69 53570 MARSHAL2 69 1	300	See Previous Upgrade Specified For Facility in Scenario 1	
07SP	AEPW-AEPW	53781 BA101-N4 138 53818 ONETA--4 138 1	235	94.7	99.5	3.8010	**N/A***	**N/A***	3Wnd: OPEN *B0 60 1	300	See Previous Upgrade Specified For Facility in Scenario 1	
07WP	SWPA-AEPW	52814 BRKN BW4 138 54015 CRAIGJT4 138 1	107	98.0	112.6	5.2020	103.0	1.7770	55823 BBDAMTP4 138 56004 MTRIVER4 138 1	40	See Previous Upgrade Specified For Facility in Scenario 1	

Table 3 – SPP facility overloads identified for the AEPW to AEPW transfer using Scenario 3

Study Case	From Area - To Area	Branch Overload	Rating <MW>	BC % Loading	TC % Loading	%TDF	Existing TC % Loading	Existing %TDF	Outaged Branch Causing Overload	ATC <MW>	Solution	Estimated Cost
07WP	AEPW-AEPW	54023 OKMULGE4 138 54049 EC.HEN-4 138 1	104	93.3	106.9	4.7180	94.3	0.3630	54023 OKMULGE4 138 54057 KELCO 4 138 1	148	See Previous Upgrade Specified For Facility	
07WP	AEPW-AEPW	54028 WELETK4 138 54049 EC.HEN-4 138 1	104	88.7	102.4	4.7180	89.8	0.3630	54023 OKMULGE4 138 54057 KELCO 4 138 1	247	See Previous Upgrade Specified For Facility	
10SP	AEPW-AEPW	53276 LSSOUTH4 138 53311 PITTSB_4 138 1	196	114.4	132.2	11.6640	131.8	11.3840	53619 WILKES 4 138 53622 WELSHRE4 138 1	0	See Previous Upgrade Specified For Facility in Scenario 1	
10SP	AEPW-AEPW	53557 KNOXLEE4 138 53586 OAK2HIL4 138 1	206	102.9	109.9	4.7940	109.7	4.6360	53557 KNOXLEE4 138 53574 MONROER4 138 1	0	See Previous Upgrade Specified For Facility in Scenario 1	
10SP	AEPW-AEPW	53598 ROKHILL4 138 *B039 1 1	46	84.1	105.0	3.1930	104.5	3.1120	53516 BLOCKRT2 69 53570 MARSHAL2 69 1	228	See Previous Upgrade Specified For Facility in Scenario 1	
10SP	AEPW-AEPW	53597 ROKHILL2 69 *B039 1 1	46	83.9	104.8	3.1930	104.2	3.1120	53516 BLOCKRT2 69 53570 MARSHAL2 69 1	231	See Previous Upgrade Specified For Facility in Scenario 1	
10SP	AEPW-AEPW	53598 ROKHILL4 138 *B130 1 2	46	83.7	104.4	3.1700	103.9	3.0900	53516 BLOCKRT2 69 53570 MARSHAL2 69 1	236	See Previous Upgrade Specified For Facility in Scenario 1	
10SP	AEPW-AEPW	53245 ALUMXT 4 138 53300 NWTXARK4 138 1	260	93.2	101.6	7.2990	101.6	7.2590	Multiple Outage Contingency 53299 NW Texarkana Bann Tap 53300 N New Boston 138 1 53299 NW Texarkana Bann Tap 53298 NW Texarkana 138 1 53299 NW Texarkana Bann Tap 53250 Bann 138 1	241	See Previous Upgrade Specified For Facility in Scenario 1	
10SP	AEPW-AEPW	53597 ROKHILL2 69 *B130 1 2	46	83.2	104.0	3.1700	103.4	3.0900	53516 BLOCKRT2 69 53570 MARSHAL2 69 1	243	See Previous Upgrade Specified For Facility in Scenario 1	
10SP	AEPW-AEPW	53276 LSSOUTH4 138 53619 WILKES 4 138 1	314	92.1	101.5	9.8450	100.0	8.3150	53619 WILKES 4 138 53622 WELSHRE4 138 1	252	See Previous Upgrade Specified For Facility in Scenario 1	
10SP	AEPW-AEPW	53532 FORSTHL2 69 53596 QUITMAN2 69 1	58	80.2	101.4	4.1140	101.0	4.0480	3Wnd: OPEN *B0 19 1	281	See Previous Upgrade Specified For Facility in Scenario 1	
10SP	SWPA-AEPW	52814 BRKN BW4 138 54015 CRAIGJT4 138 1	107	80.0	94.6	5.1950	88.8	3.1260	55823 BBDAMTP4 138 56004 MTRIVER4 138 1	300	See Previous Upgrade Specified For Facility in Scenario 1	
10SP	AEPW-AEPW	53245 ALUMXT 4 138 53250 BANN 4 138 1	260	87.4	95.8	7.2990	95.8	7.2590	Multiple Outage Contingency 53299 NW Texarkana Bann Tap 53300 N New Boston 138 1 53299 NW Texarkana Bann Tap 53298 NW Texarkana 138 1 53299 NW Texarkana Bann Tap 53250 Bann 138 1	300	See Previous Upgrade Specified For Facility in Scenario 1	
10SP	AEPW-AEPW	53278 MAGNOLA2 69 53336 WINNSBO2 69 1	72	71.2	92.0	4.9780	91.7	4.9120	3Wnd: OPEN *B0 19 1	300	See Previous Upgrade Specified For Facility in Scenario 1	
10SP	AEPW-AEPW	53278 MAGNOLA2 69 53532 FORSTHL2 69 1	72	70.9	91.7	4.9780	91.4	4.9120	3Wnd: OPEN *B0 19 1	300	See Previous Upgrade Specified For Facility in Scenario 1	
10SP	AEPW-AEPW	53453 SW SHV 4 138 *B003 1 1	657	90.5	96.0	12.1180	95.3	10.5450	3Wnd: OPEN *B0 9 2	300	Solution Undetermined	TBD
10SP	AEPW-AEPW	53453 SW SHV 4 138 *B009 1 2	657	88.8	94.2	11.8990	93.5	10.3550	3Wnd: OPEN *B0 3 1	300	Solution Undetermined	TBD
10SP	AEPW-AEPW	53453 SW SHV 4 138 53455 SW SHVT4 138 1	302	87.3	95.9	8.6520	94.8	7.5270	Multiple Outage Contingency 53464 Western Electric Tap 53453 SW Shreveport 138 1 53464 Western Electric Tap 53450 Stonewall 138 1 53464 Western Electric Tap 53463 Western Electric 138 1	300	Solution Undetermined	TBD
10SP	AEPW-AEPW	53454 SW SHV 7 345 *B003 1 1	653	91.0	96.6	12.1180	95.9	10.5450	3Wnd: OPEN *B0 9 2	300	Solution Undetermined	TBD

Table 3 – SPP facility overloads identified for the AEPW to AEPW transfer using Scenario 3

Study Case	From Area - To Area	Branch Overload	Rating <MW>	BC % Loading	TC % Loading	%TDF	Existing TC % Loading	Existing %TDF	Outaged Branch Causing Overload	ATC <MW>	Solution	Estimated Cost
10SP	AEPW-AEPW	53454 SW SHV 7 345 *B009 1 2	654	89.3	94.7	11.8990	94.0	10.3550	3Wnd: OPEN *B0 3 1	300	Solution Undetermined	TBD
10SP	AEPW-AEPW	53527 DIANA 4 138 53590 PERDUE 4 138 1	268	80.1	92.6	11.1320	92.5	11.0540	53542 HARRISN4 138 53561 LIBCYTP4 138 1	300	See Previous Upgrade Specified For Facility in Scenario 1	
10SP	AEPW-AEPW	53580 NMINEOL2 69 53596 QUITMAN2 69 1	58	64.2	90.3	5.0520	90.3	5.0500	53278 MAGNOLA2 69 53336 WINNSBO2 69 1	300	See Previous Upgrade Specified For Facility in Scenario 1	
10SP	AEPW-AEPW	53584 NWHENDR4 138 53585 OAK1HIL4 138 1	237	86.4	90.8	3.4700	90.6	3.3130	53557 KNOXLEE4 138 53574 MONROER4 138 1	300	See Previous Upgrade Specified For Facility in Scenario 1	
10SP	AEPW-AEPW	53619 WILKES 4 138 53622 WELSHRE4 138 1	260	81.5	93.7	10.6060	93.3	10.2310	53276 LSSOUTH4 138 53311 PITTSB_4 138 1	300	Solution Undetermined	TBD
10SP	AEPW-AEPW	53781 BA101-N4 138 53818 ONETA--4 138 1	235	95.2	100.0	3.8010	**N/A***	**N/A***	53785 RSSAUTO4 138 53795 R.S.S.-4 138 1	300	See Previous Upgrade Specified For Facility in Scenario 1	
10SP	AEPW-AEPW	54023 OKMULGE4 138 54049 EC.HEN-4 138 1	105	78.4	91.9	4.7140	**N/A***	**N/A***	54023 OKMULGE4 138 54057 KELCO 4 138 1	300	See Previous Upgrade Specified For Facility	
10WP	AEPW-AEPW	54023 OKMULGE4 138 54049 EC.HEN-4 138 1	105	98.6	112.1	4.7170	99.7	0.3640	54023 OKMULGE4 138 54057 KELCO 4 138 1	31	See Previous Upgrade Specified For Facility	
10WP	AEPW-AEPW	54028 WELETK4 138 54049 EC.HEN-4 138 1	104	93.7	107.3	4.7170	94.8	0.3640	54023 OKMULGE4 138 54057 KELCO 4 138 1	139	See Previous Upgrade Specified For Facility	
10WP	SWPA-AEPW	52814 BRKN BW4 138 54015 CRAIGJT4 138 1	107	83.9	98.5	5.1990	88.9	1.7750	55823 BBDAMTP4 138 56004 MTRIVER4 138 1	300	See Previous Upgrade Specified For Facility in Scenario 1	
10WP	AEPW-AEPW	53597 ROKHILL2 69 *B042 1 1	46	73.2	94.9	3.3140	94.6	3.2650	53516 BLOCKRT2 69 53570 MARSHAL2 69 1	300	See Previous Upgrade Specified For Facility in Scenario 1	
10WP	AEPW-AEPW	53597 ROKHILL2 69 *B140 1 2	46	72.7	94.3	3.2910	94.0	3.2420	53516 BLOCKRT2 69 53570 MARSHAL2 69 1	300	See Previous Upgrade Specified For Facility in Scenario 1	
10WP	AEPW-AEPW	53598 ROKHILL4 138 *B042 1 1	46	73.4	95.1	3.3140	94.8	3.2650	53516 BLOCKRT2 69 53570 MARSHAL2 69 1	300	See Previous Upgrade Specified For Facility in Scenario 1	
10WP	AEPW-AEPW	53598 ROKHILL4 138 *B140 1 2	46	72.9	94.5	3.2910	94.2	3.2420	53516 BLOCKRT2 69 53570 MARSHAL2 69 1	300	See Previous Upgrade Specified For Facility 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	$2,780,000

*Existing Network Resource has a minimal positive impact or a negative impact on facility. No credit for positive impact removed can be given to the New Network Resource for this facility.

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