SPP Southwest Power Pool

Preliminary System Impact Study SPP-2004-086-2P For The Designation of a New Network Resource Requested By Tenaska Power Services Company

From AEPW to AEPW

For a Reserved Amount Of 200 MW to 230 MW From 1/1/2006 To 1/1/2009

SPP Engineering, Tariff Studies

System Impact Study

Tenaska Power Services Co. has requested a system impact study to designate a New Network Resource in the AEPW Control Area to serve Network Load in the AEPW Control Area. The requested amount is 200 MW from 1/1/2006 to 1/1/2007, 215 MW from 1/1/2007 to 1/1/2008, and 230 MW from 1/1/2008 to 1/1/2009. The OASIS reservation number is 679858. 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. 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 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 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 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								230		
05G	AEPW-AEPW	53583 NWHENDR2 69 53595 POYNTER2 69 1	72	81.3	92.5	3.4890	89.1	2.4300	53530 EVENSID2 69 53583 NWHENDR2 69 1	230	Rebuild 3.22 miles of 397 ACSR with 1272 ACSR. Replace riser jumpers @ NW Henderson. Replace breaker & switches @ Poynter	$ 1,500,000
05SP	AEPW-AEPW	53583 NWHENDR2 69 53595 POYNTER2 69 1	72	95.8	107.0	3.5010	104.0	2.5650	53530 EVENSID2 69 53583 NWHENDR2 69 1	86	See Previous Upgrade Specified For Facility	
05SP	AEPW-AEPW	53557 KNOXLEE4 138 53586 OAK2HIL4 138 1	206	94.8	104.1	8.4060	100.9	5.4570	53557 KNOXLEE4 138 53574 MONROER4 138 1	128	Reset relays & replace wavetrap @ Knoxlee	$ 50,000
05SP	AEPW-AEPW	53515 BIGSNDY2 69 53589 PERDUE 2 69 1	85	85.4	96.7	4.1840	95.0	3.5280	53590 PERDUE 4 138 53666 LHAWKIN4 138 1	230	Rebuild 5.4 miles of 477 ACSR with 1272 ACSR.	$ 2,200,200
05SP	AEPW-AEPW	53530 EVENSID2 69 53583 NWHENDR2 69 1	72	87.4	97.4	3.1500	94.8	2.3350	53583 NWHENDR2 69 53595 POYNTER2 69 1	230	Rebuild 6.4 miles of 397 ACSR with 1272 ACSR. Replace Evenside breaker 1Z30 and jumpers	$ 2,700,000
05SP	AEPW-AEPW	53541 HALLSVL2 69 53567 LONGVHT2 69 1	47	79.1	94.1	3.0560	85.7	1.3440	53570 MARSHAL2 69 53623 MARAUTO2 69 1	230	Rebuild 7.07 miles of 4/0 ACSR with 795 ACSR.	$ 3,000,000
05SP	AEPW-AEPW	53584 NWHENDR4 138 53585 OAK1HIL4 138 1	210	89.6	97.3	7.0490	94.1	4.1000	53557 KNOXLEE4 138 53574 MONROER4 138 1	230	Replace wavetrap @ NW Henderson.	$ 30,000
05SP	AEPW-AEPW	53617 WHITNEY2 69 *B009 1 1	146	80.9	92.8	7.5850	82.6	1.0550	53618 WHITNEY4 138 *B033 1 2	230	Add 3rd Whitney Auto	$ 1,300,000
05SP	AEPW-AEPW	53617 WHITNEY2 69 *B033 1 2	146	80.7	92.6	7.5650	82.4	1.0530	53617 WHITNEY2 69 *B009 1 1	230	See Previous Upgrade Specified For Facility	
05SP	AEPW-AEPW	53618 WHITNEY4 138 *B009 1 1	146	81.4	93.4	7.5850	83.1	1.0550	53617 WHITNEY2 69 *B033 1 2	230	See Previous Upgrade Specified For Facility	
05SP	AEPW-AEPW	53618 WHITNEY4 138 *B033 1 2	146	81.2	93.2	7.5650	82.9	1.0530	53617 WHITNEY2 69 *B009 1 1	230	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
05SH	AEPW-AEPW	53276 LSSOUTH4 138 53527 DIANA 4 138 1	266	88.8	98.4	11.0320	92.2	3.9230	Multiple Outage Contingency 53615 WELSH 7 345 53620 WILKES 7 345 1 53615 WELSH 7 345 53301 NWTXARK7 345 1	230	Rebuild 11.78 miles of double 336 & 397 ACSR with 2-795 ACSR. Replace 1200A switch # 10387 & wavetrap jumpers @ Diana	$ 6,500,000
05SH	AEPW-AEPW	53583 NWHENDR2 69 53595 POYNTER2 69 1	72	80.5	91.7	3.4960	88.5	2.4920	53530 EVENSID2 69 53583 NWHENDR2 69 1	230	See Previous Upgrade Specified For Facility	
05FA	AEPW-AEPW	53276 LSSOUTH4 138 53527 DIANA 4 138 1	284	83.5	92.4	11.0190	87.5	4.8710	Multiple Outage Contingency 53615 WELSH 7 345 53620 WILKES 7 345 1 53615 WELSH 7 345 53301 NWTXARK7 345 1	230	See Previous Upgrade Specified For Facility	
05FA	AEPW-AEPW	53583 NWHENDR2 69 53595 POYNTER2 69 1	72	79.0	90.2	3.4910	87.0	2.5030	53530 EVENSID2 69 53583 NWHENDR2 69 1	230	See Previous Upgrade Specified For Facility	
05WP	AEPW-AEPW	53557 KNOXLEE4 138 53586 OAK2HIL4 138 1	206	83.1	92.5	8.4760	88.9	5.2400	53557 KNOXLEE4 138 53574 MONROER4 138 1	230	See Previous Upgrade Specified For Facility	
07SP	AEPW-AEPW	53557 KNOXLEE4 138 53586 OAK2HIL4 138 1	206	100.5	109.9	8.4670	106.9	5.7320	53557 KNOXLEE4 138 53574 MONROER4 138 1	0	See Previous Upgrade Specified For Facility	
07SP	AEPW-AEPW	53584 NWHENDR4 138 53585 OAK1HIL4 138 1	210	95.0	102.8	7.1270	99.8	4.3910	53557 KNOXLEE4 138 53574 MONROER4 138 1	147	See Previous Upgrade Specified For Facility	
07SP	AEPW-AEPW	53530 EVENSID2 69 53583 NWHENDR2 69 1	72	92.2	102.1	3.1060	99.8	2.3760	53583 NWHENDR2 69 53595 POYNTER2 69 1	180	See Previous Upgrade Specified For Facility	
07SP	AEPW-AEPW	53423 LONGWD 4 138 53457 OAKPH 4 138 1	208	92.0	95.9	3.4820	94.7	2.4270	Multiple Outage Contingency 53454 SW SHV 7 345 53424 LONGWD 7 345 1 53454 SW SHV 7 345 53528 DIANA 7 345 1	230	Rebuild 1.8 miles of 666 ACSR with 1590 ACSR	$ 800,000
07SP	AEPW-AEPW	53540 GREGGTN2 69 53562 LLAMOND2 69 1	107	85.8	93.2	3.4640	93.1	3.4130	53527 DIANA 4 138 53590 PERDUE 4 138 1	230	Rebuild 2.66 miles of 755 ACAR with 1590 ACSR	$ 1,100,000
07SP	AEPW-AEPW	53541 HALLSVL2 69 53567 LONGVHT2 69 1	47	82.7	97.6	3.0330	89.6	1.4060	53570 MARSHAL2 69 53623 MARAUTO2 69 1	230	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
07SP	AEPW-AEPW	53583 NWHENDR2 69 53595 POYNTER2 69 1	72	79.7	91.4	3.6590	86.6	2.1470	53522 CHEROKE4 138 53557 KNOXLEE4 138 1	230	See Previous Upgrade Specified For Facility	
07SP	AEPW-AEPW	53617 WHITNEY2 69 *B052 1 1	146	84.5	96.5	7.6160	86.3	1.1100	53617 WHITNEY2 69 *B128 1 2	230	See Previous Upgrade Specified For Facility	
07SP	AEPW-AEPW	53617 WHITNEY2 69 *B128 1 2	146	84.3	96.3	7.5960	86.1	1.1070	53617 WHITNEY2 69 *B052 1 1	230	See Previous Upgrade Specified For Facility	
07SP	AEPW-AEPW	53618 WHITNEY4 138 *B052 1 1	146	85.1	97.1	7.6160	86.8	1.1100	53617 WHITNEY2 69 *B128 1 2	230	See Previous Upgrade Specified For Facility	
07SP	AEPW-AEPW	53618 WHITNEY4 138 *B128 1 2	146	84.9	96.8	7.5960	86.6	1.1070	53618 WHITNEY4 138 *B052 1 1	230	See Previous Upgrade Specified For Facility	
07WP	AEPW-AEPW	53557 KNOXLEE4 138 53586 OAK2HIL4 138 1	206	88.6	98.1	8.5430	94.3	5.1550	53557 KNOXLEE4 138 53574 MONROER4 138 1	230	See Previous Upgrade Specified For Facility	
07WP	AEPW-AEPW	53583 NWHENDR2 69 53595 POYNTER2 69 1	72	80.2	90.9	3.3310	88.0	2.4130	53530 EVENSID2 69 53583 NWHENDR2 69 1	230	See Previous Upgrade Specified For Facility	
07WP	AEPW-AEPW	53584 NWHENDR4 138 53585 OAK1HIL4 138 1	210	84.0	92.0	7.3060	88.3	3.9180	53557 KNOXLEE4 138 53574 MONROER4 138 1	230	See Previous Upgrade Specified For Facility	
10SP	AEPW-AEPW	53557 KNOXLEE4 138 53586 OAK2HIL4 138 1	206	108.5	117.9	8.4190	113.6	4.6250	53557 KNOXLEE4 138 53574 MONROER4 138 1	0	See Previous Upgrade Specified For Facility	
10SP	AEPW-AEPW	53530 EVENSID2 69 53583 NWHENDR2 69 1	72	96.9	106.8	3.0780	104.4	2.3390	53583 NWHENDR2 69 53595 POYNTER2 69 1	71	See Previous Upgrade Specified For Facility	
10SP	AEPW-AEPW	53541 HALLSVL2 69 53567 LONGVHT2 69 1	47	86.4	101.2	3.0270	94.4	1.6300	53570 MARSHAL2 69 53623 MARAUTO2 69 1	211	See Previous Upgrade Specified For Facility	
10SP	AEPW-AEPW	53618 WHITNEY4 138 *B034 1 1	146	88.9	100.9	7.6230	90.8	1.2240	53618 WHITNEY4 138 *B101 1 2	212	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	53618 WHITNEY4 138 *B101 1 2	146	88.6	100.6	7.6030	90.6	1.2210	53617 WHITNEY2 69 *B034 1 1	218	See Previous Upgrade Specified For Facility	
10SP	AEPW-AEPW	53617 WHITNEY2 69 *B034 1 1	147	88.3	100.3	7.6230	90.2	1.2240	53618 WHITNEY4 138 *B101 1 2	225	See Previous Upgrade Specified For Facility	
10SP	AEPW-AEPW	53617 WHITNEY2 69 *B101 1 2	147	88.1	100.0	7.6030	90.0	1.2210	53618 WHITNEY4 138 *B034 1 1	230	See Previous Upgrade Specified For Facility	
10SP	AEPW-AEPW	53557 KNOXLEE4 138 53574 MONROER4 138 1	268	85.2	92.5	8.5150	89.1	4.5360	53557 KNOXLEE4 138 53586 OAK2HIL4 138 1	230	Solution Undetermined	TBD
10SP	AEPW-AEPW	53583 NWHENDR2 69 53595 POYNTER2 69 1	72	82.9	94.5	3.6310	89.7	2.1130	53522 CHEROKE4 138 53557 KNOXLEE4 138 1	230	See Previous Upgrade Specified For Facility	
10SP	AEPW-AEPW	53584 NWHENDR4 138 53585 OAK1HIL4 138 1	237	90.7	97.6	7.0960	93.9	3.3020	53557 KNOXLEE4 138 53574 MONROER4 138 1	230	See Previous Upgrade Specified For Facility	
10WP	AEPW-AEPW	53557 KNOXLEE4 138 53586 OAK2HIL4 138 1	205	95.5	105.0	8.4780	101.2	5.0890	53557 KNOXLEE4 138 53574 MONROER4 138 1	110	See Previous Upgrade Specified For Facility	
10WP	AEPW-AEPW	53583 NWHENDR2 69 53595 POYNTER2 69 1	72	82.5	93.0	3.2960	90.1	2.3790	53530 EVENSID2 69 53583 NWHENDR2 69 1	230	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	$ 19,180,200
											Total Cost with Facilities Monitored @ 100% Loading	$ 8,580,000

*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								230		
05G	AEPW-AEPW	53583 NWHENDR2 69 53595 POYNTER2 69 1	72	79.5	90.7	3.4890	87.3	2.4300	53530 EVENSID2 69 53583 NWHENDR2 69 1	230	See Previous Upgrade Specified For Facility in Scenario 1	
05SP	AEPW-AEPW	53583 NWHENDR2 69 53595 POYNTER2 69 1	72	93.8	104.9	3.5010	101.9	2.5650	53530 EVENSID2 69 53583 NWHENDR2 69 1	129	See Previous Upgrade Specified For Facility in Scenario 1	
05SP	AEPW-AEPW	53515 BIGSNDY2 69 53589 PERDUE 2 69 1	85	83.2	94.5	4.1840	92.7	3.5280	53590 PERDUE 4 138 53666 LHAWKIN4 138 1	230	See Previous Upgrade Specified For Facility in Scenario 1	
05SP	AEPW-AEPW	53530 EVENSID2 69 53583 NWHENDR2 69 1	72	85.6	95.6	3.1500	93.0	2.3350	53583 NWHENDR2 69 53595 POYNTER2 69 1	230	See Previous Upgrade Specified For Facility in Scenario 1	
05SP	AEPW-AEPW	53557 KNOXLEE4 138 53586 OAK2HIL4 138 1	206	88.8	98.2	8.4060	94.9	5.4570	53557 KNOXLEE4 138 53574 MONROER4 138 1	230	See Previous Upgrade Specified For Facility in Scenario 1	
05SP	AEPW-AEPW	53584 NWHENDR4 138 53585 OAK1HIL4 138 1	210	83.9	91.6	7.0490	88.3	4.1000	53557 KNOXLEE4 138 53574 MONROER4 138 1	230	See Previous Upgrade Specified For Facility in Scenario 1	
05SP	AEPW-AEPW	53617 WHITNEY2 69 *B009 1 1	146	82.5	94.4	7.5850	84.1	1.0550	53617 WHITNEY2 69 *B033 1 2	230	See Previous Upgrade Specified For Facility in Scenario 1	
05SP	AEPW-AEPW	53617 WHITNEY2 69 *B033 1 2	146	82.3	94.2	7.5650	83.9	1.0530	53618 WHITNEY4 138 *B009 1 1	230	See Previous Upgrade Specified For Facility in Scenario 1	
05SP	AEPW-AEPW	53618 WHITNEY4 138 *B009 1 1	146	83.0	95.0	7.5850	84.7	1.0550	53617 WHITNEY2 69 *B033 1 2	230	See Previous Upgrade Specified For Facility in Scenario 1	
05SP	AEPW-AEPW	53618 WHITNEY4 138 *B033 1 2	146	82.8	94.7	7.5650	84.5	1.0530	53618 WHITNEY4 138 *B009 1 1	230	See Previous Upgrade Specified For Facility in Scenario 1	
05SH		NONE IDENTIFIED								230		
05FA		NONE IDENTIFIED								230		
05WP		NONE IDENTIFIED								230		
07SP	AEPW-AEPW	53583 NWHENDR2 69 53595 POYNTER2 69 1	72	99.3	110.3	3.4520	107.4	2.5360	53530 EVENSID2 69 53583 NWHENDR2 69 1	14	See Previous Upgrade Specified For Facility in Scenario 1	
07SP	AEPW-AEPW	53557 KNOXLEE4 138 53586 OAK2HIL4 138 1	206	95.3	104.7	8.4670	101.3	5.3790	53557 KNOXLEE4 138 53574 MONROER4 138 1	115	See Previous Upgrade Specified For Facility in Scenario 1	
07SP	AEPW-AEPW	53530 EVENSID2 69 53583 NWHENDR2 69 1	72	90.6	100.5	3.1060	97.9	2.3080	53583 NWHENDR2 69 53595 POYNTER2 69 1	219	See Previous Upgrade Specified For Facility in Scenario 1	
07SP	AEPW-AEPW	53540 GREGGTN2 69 53562 LLAMOND2 69 1	107	83.2	90.6	3.4640	90.6	3.4330	53527 DIANA 4 138 53590 PERDUE 4 138 1	230	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	53584 NWHENDR4 138 53585 OAK1HIL4 138 1	210	90.0	97.8	7.1270	94.4	4.0380	53557 KNOXLEE4 138 53574 MONROER4 138 1	230	See Previous Upgrade Specified For Facility in Scenario 1	
07SP	AEPW-AEPW	53617 WHITNEY2 69 *B052 1 1	146	86.1	98.1	7.6160	87.8	1.0550	53618 WHITNEY4 138 *B128 1 2	230	See Previous Upgrade Specified For Facility in Scenario 1	
07SP	AEPW-AEPW	53617 WHITNEY2 69 *B128 1 2	146	85.9	97.8	7.5960	87.6	1.0520	53618 WHITNEY4 138 *B052 1 1	230	See Previous Upgrade Specified For Facility in Scenario 1	
07SP	AEPW-AEPW	53618 WHITNEY4 138 *B052 1 1	145	86.8	98.8	7.6160	88.4	1.0550	53617 WHITNEY2 69 *B128 1 2	230	See Previous Upgrade Specified For Facility in Scenario 1	
07SP	AEPW-AEPW	53618 WHITNEY4 138 *B128 1 2	145	86.6	98.6	7.5960	88.2	1.0520	53617 WHITNEY2 69 *B052 1 1	230	See Previous Upgrade Specified For Facility in Scenario 1	
07WP	AEPW-AEPW	53557 KNOXLEE4 138 53586 OAK2HIL4 138 1	206	82.1	91.6	8.5430	87.8	5.1550	53557 KNOXLEE4 138 53574 MONROER4 138 1	230	See Previous Upgrade Specified For Facility in Scenario 1	
10SP	AEPW-AEPW	53557 KNOXLEE4 138 53586 OAK2HIL4 138 1	206	103.0	112.4	8.4190	108.1	4.5620	53557 KNOXLEE4 138 53574 MONROER4 138 1	0	See Previous Upgrade Specified For Facility in Scenario 1	
10SP	AEPW-AEPW	53583 NWHENDR2 69 53595 POYNTER2 69 1	72	104.3	115.2	3.4220	112.6	2.5990	53530 EVENSID2 69 53583 NWHENDR2 69 1	0	See Previous Upgrade Specified For Facility in Scenario 1	
10SP	AEPW-AEPW	53530 EVENSID2 69 53583 NWHENDR2 69 1	72	95.1	105.0	3.0780	102.7	2.3630	53583 NWHENDR2 69 53595 POYNTER2 69 1	114	See Previous Upgrade Specified For Facility in Scenario 1	
10SP	AEPW-AEPW	53618 WHITNEY4 138 *B034 1 1	146	90.1	102.2	7.6230	92.2	1.2960	53617 WHITNEY2 69 *B101 1 2	189	See Previous Upgrade Specified For Facility in Scenario 1	
10SP	AEPW-AEPW	53618 WHITNEY4 138 *B101 1 2	146	89.9	101.9	7.6030	92.0	1.2920	53617 WHITNEY2 69 *B034 1 1	193	See Previous Upgrade Specified For Facility in Scenario 1	
10SP	AEPW-AEPW	53617 WHITNEY2 69 *B034 1 1	147	89.5	101.5	7.6230	91.6	1.2960	53618 WHITNEY4 138 *B101 1 2	201	See Previous Upgrade Specified For Facility in Scenario 1	
10SP	AEPW-AEPW	53617 WHITNEY2 69 *B101 1 2	147	89.3	101.2	7.6030	91.3	1.2920	53618 WHITNEY4 138 *B034 1 1	206	See Previous Upgrade Specified For Facility in Scenario 1	
10SP	AEPW-AEPW	53541 HALLSVL2 69 53567 LONGVHT2 69 1	46	75.5	90.6	3.0270	83.8	1.6720	53570 MARSHAL2 69 53623 MARAUTO2 69 1	230	See Previous Upgrade Specified For Facility in Scenario 1	
10SP	AEPW-AEPW	53584 NWHENDR4 138 53585 OAK1HIL4 138 1	237	86.0	92.9	7.0960	89.2	3.2390	53557 KNOXLEE4 138 53574 MONROER4 138 1	230	See Previous Upgrade Specified For Facility in Scenario 1	
10WP	AEPW-AEPW	53557 KNOXLEE4 138 53586 OAK2HIL4 138 1	205	89.4	98.9	8.4780	95.1	5.0890	53557 KNOXLEE4 138 53574 MONROER4 138 1	230	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
10WP	AEPW-AEPW	53583 NWHENDR2 69 53595 POYNTER2 69 1	72	80.7	91.2	3.2960	88.3	2.3790	53530 EVENSID2 69 53583 NWHENDR2 69 1	230	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	$ -

*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		NONE IDENTIFIED								230		
05G	AEPW-AEPW	53583 NWHENDR2 69 53595 POYNTER2 69 1	72	79.7	90.9	3.4890	87.5	2.4300	53530 EVENSID2 69 53583 NWHENDR2 69 1	230	See Previous Upgrade Specified For Facility in Scenario 1	
05SP	AEPW-AEPW	53583 NWHENDR2 69 53595 POYNTER2 69 1	72	94.0	105.2	3.5010	102.2	2.5650	53530 EVENSID2 69 53583 NWHENDR2 69 1	123	See Previous Upgrade Specified For Facility in Scenario 1	
05SP	AEPW-AEPW	53515 BIGSNDY2 69 53589 PERDUE 2 69 1	85	83.6	95.0	4.1840	93.2	3.5280	53590 PERDUE 4 138 53666 LHAWKIN4 138 1	230	See Previous Upgrade Specified For Facility in Scenario 1	
05SP	AEPW-AEPW	53530 EVENSID2 69 53583 NWHENDR2 69 1	72	85.8	95.9	3.1500	93.3	2.3350	53583 NWHENDR2 69 53595 POYNTER2 69 1	230	See Previous Upgrade Specified For Facility in Scenario 1	
05SP	AEPW-AEPW	53557 KNOXLEE4 138 53586 OAK2HIL4 138 1	206	90.6	100.0	8.4060	96.7	5.4570	53557 KNOXLEE4 138 53574 MONROER4 138 1	230	See Previous Upgrade Specified For Facility in Scenario 1	
05SP	AEPW-AEPW	53584 NWHENDR4 138 53585 OAK1HIL4 138 1	210	85.6	93.3	7.0490	90.1	4.1000	53557 KNOXLEE4 138 53574 MONROER4 138 1	230	See Previous Upgrade Specified For Facility in Scenario 1	
05SP	AEPW-AEPW	53617 WHITNEY2 69 *B009 1 1	146	82.3	94.2	7.5850	83.9	1.0550	53618 WHITNEY4 138 *B033 1 2	230	See Previous Upgrade Specified For Facility in Scenario 1	
05SP	AEPW-AEPW	53617 WHITNEY2 69 *B033 1 2	146	82.1	94.0	7.5650	83.7	1.0530	53618 WHITNEY4 138 *B009 1 1	230	See Previous Upgrade Specified For Facility in Scenario 1	
05SP	AEPW-AEPW	53618 WHITNEY4 138 *B009 1 1	146	82.8	94.8	7.5850	84.5	1.0550	53617 WHITNEY2 69 *B033 1 2	230	See Previous Upgrade Specified For Facility in Scenario 1	
05SP	AEPW-AEPW	53618 WHITNEY4 138 *B033 1 2	146	82.5	94.5	7.5650	84.2	1.0530	53618 WHITNEY4 138 *B009 1 1	230	See Previous Upgrade Specified For Facility in Scenario 1	
05SH	AEPW-AEPW	53583 NWHENDR2 69 53595 POYNTER2 69 1	72	78.8	90.1	3.4960	86.8	2.4920	53530 EVENSID2 69 53583 NWHENDR2 69 1	230	See Previous Upgrade Specified For Facility in Scenario 1	
05FA		NONE IDENTIFIED								230		
05WP		NONE IDENTIFIED								230		
07SP	AEPW-AEPW	53583 NWHENDR2 69 53595 POYNTER2 69 1	72	99.4	110.5	3.4520	107.5	2.5360	53530 EVENSID2 69 53583 NWHENDR2 69 1	12	See Previous Upgrade Specified For Facility in Scenario 1	
07SP	AEPW-AEPW	53557 KNOXLEE4 138 53586 OAK2HIL4 138 1	206	96.6	106.1	8.4670	102.6	5.3790	53557 KNOXLEE4 138 53574 MONROER4 138 1	83	See Previous Upgrade Specified For Facility in Scenario 1	
07SP	AEPW-AEPW	53530 EVENSID2 69 53583 NWHENDR2 69 1	72	90.7	100.6	3.1060	98.1	2.3080	53583 NWHENDR2 69 53595 POYNTER2 69 1	216	See Previous Upgrade Specified For Facility in Scenario 1	
07SP	AEPW-AEPW	53540 GREGGTN2 69 53562 LLAMOND2 69 1	107	90.9	97.7	3.1620	95.4	2.0830	3Wnd: OPEN *B0 31 1	230	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	53584 NWHENDR4 138 53585 OAK1HIL4 138 1	210	91.2	99.0	7.1270	95.6	4.0380	53557 KNOXLEE4 138 53574 MONROER4 138 1	230	See Previous Upgrade Specified For Facility in Scenario 1	
07SP	AEPW-AEPW	53617 WHITNEY2 69 *B052 1 1	146	86.0	97.9	7.6160	87.6	1.0550	3Wnd: OPEN *B1 28 2	230	See Previous Upgrade Specified For Facility in Scenario 1	
07SP	AEPW-AEPW	53617 WHITNEY2 69 *B128 1 2	146	85.7	97.6	7.5960	87.3	1.0520	3Wnd: OPEN *B0 52 1	230	See Previous Upgrade Specified For Facility in Scenario 1	
07SP	AEPW-AEPW	53618 WHITNEY4 138 *B052 1 1	145	86.6	98.6	7.6160	88.2	1.0550	3Wnd: OPEN *B1 28 2	230	See Previous Upgrade Specified For Facility in Scenario 1	
07SP	AEPW-AEPW	53618 WHITNEY4 138 *B128 1 2	145	86.4	98.4	7.5960	88.0	1.0520	3Wnd: OPEN *B0 52 1	230	See Previous Upgrade Specified For Facility in Scenario 1	
07WP	AEPW-AEPW	53557 KNOXLEE4 138 53586 OAK2HIL4 138 1	206	84.3	93.9	8.5430	90.1	5.1550	53557 KNOXLEE4 138 53574 MONROER4 138 1	230	See Previous Upgrade Specified For Facility in Scenario 1	
10SP	AEPW-AEPW	53557 KNOXLEE4 138 53586 OAK2HIL4 138 1	206	104.6	114.0	8.4190	109.7	4.5620	53557 KNOXLEE4 138 53574 MONROER4 138 1	0	See Previous Upgrade Specified For Facility in Scenario 1	
10SP	AEPW-AEPW	53583 NWHENDR2 69 53595 POYNTER2 69 1	72	104.6	115.5	3.4220	112.9	2.5990	53530 EVENSID2 69 53583 NWHENDR2 69 1	0	See Previous Upgrade Specified For Facility in Scenario 1	
10SP	AEPW-AEPW	53530 EVENSID2 69 53583 NWHENDR2 69 1	72	95.4	105.2	3.0780	103.0	2.3630	53583 NWHENDR2 69 53595 POYNTER2 69 1	107	See Previous Upgrade Specified For Facility in Scenario 1	
10SP	AEPW-AEPW	53618 WHITNEY4 138 *B034 1 1	146	90.1	102.1	7.6230	92.1	1.2600	53617 WHITNEY2 69 *B101 1 2	190	See Previous Upgrade Specified For Facility in Scenario 1	
10SP	AEPW-AEPW	53618 WHITNEY4 138 *B101 1 2	146	89.8	101.8	7.6030	91.8	1.2570	53617 WHITNEY2 69 *B034 1 1	196	See Previous Upgrade Specified For Facility in Scenario 1	
10SP	AEPW-AEPW	53617 WHITNEY2 69 *B034 1 1	147	89.5	101.4	7.6230	91.4	1.2600	53618 WHITNEY4 138 *B101 1 2	203	See Previous Upgrade Specified For Facility in Scenario 1	
10SP	AEPW-AEPW	53617 WHITNEY2 69 *B101 1 2	147	89.2	101.1	7.6030	91.2	1.2570	53618 WHITNEY4 138 *B034 1 1	209	See Previous Upgrade Specified For Facility in Scenario 1	
10SP	AEPW-AEPW	53541 HALLSVL2 69 53567 LONGVHT2 69 1	46	77.7	92.7	3.0270	86.0	1.6720	53570 MARSHAL2 69 53623 MARAUTO2 69 1	230	See Previous Upgrade Specified For Facility in Scenario 1	
10SP	AEPW-AEPW	53584 NWHENDR4 138 53585 OAK1HIL4 138 1	237	87.4	94.3	7.0960	90.5	3.2390	53557 KNOXLEE4 138 53574 MONROER4 138 1	230	See Previous Upgrade Specified For Facility in Scenario 1	
10WP	AEPW-AEPW	53557 KNOXLEE4 138 53586 OAK2HIL4 138 1	205	91.4	100.9	8.4780	97.1	5.0890	53557 KNOXLEE4 138 53574 MONROER4 138 1	209	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
10WP	AEPW-AEPW	53583 NWHENDR2 69 53595 POYNTER2 69 1	72	80.9	91.5	3.2960	88.6	2.3790	53530 EVENSID2 69 53583 NWHENDR2 69 1	230	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	$ -

*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