SPP Southwest Power Pool

System Impact Study SPP-2004-079-1 For The Designation of a Network Resource Requested By Kansas Electric Power Cooperative

For a Reserved Amount of 6 MW From 8/1/2004 To 8/1/2005

SPP Engineering, Tariff Studies

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1. Executive Summary

Kansas Electric Power Cooperative has requested a system impact study to designate a Network Resource in the Southwester Power Administration Control Area for 6 MW to serve network load in the Empire District Control Area. The period of the service requested is from 8/1/2004 to 8/1/2005. The request is for OASIS reservation number 673034.

The principal objective of this study is to identify system problems and potential system modifications necessary to facilitate the additional 6 MW request while maintaining system reliability.

The service was modeled from the source in SPA to the designated load in EDE. The new source location impacts overloaded facilities overloads on the SPP transmission system. Tables 1.1, 2.1 and 3.1 summarize the results of the system impact analyses for the new source location for Scenario 1. Table 1.1 lists SPP facility overloads identified. Table 2.1 lists SPP voltage violations identified. Table 3.1 lists Non-SPP facility overloads identified. Tables 1.2, 2.2 and 3.2 summarize the results of the system impact analyses for the new source location for Scenario 2. Table 1.2 lists SPP facility overloads identified. Table 2.2 lists SPP voltage violations identified. Table 3.2 lists Non-SPP facility overloads identified. Tables 1.3, 2.3 and 3.3 summarize the results of the system impact analyses for the new source location for Scenario 3. Table 1.3 lists SPP facility overloads identified. Table 2.3 lists SPP voltage violations identified. Table 3.3 lists Non-SPP facility overloads identified.

The study results of the SPA to EDE request show that limiting constraints exist. Due to the limiting constraints identified, the Transmission Service Requests cannot be granted. Any solutions, upgrades, and costs provided in the System Impact Study are planning estimates only. The final ATC and upgrades required may vary from these results due to unknown facility upgrades and proposed transmission plans that will be identified during the facility study process.

Facilities were identified that limit the ATC to 0 MW for the requested period of service. For some facilities, implementing the upgrade is not possible to accommodate the requested term for the service. SPP has reviewed the possibility of curtailment of previously confirmed service and the redispatch of units as an option for relieving the additional impacts on these facilities. No mitigation scenarios were found, but the customer may propose other options.

Facilities were also identified that limit the right to renew service beginning in the 2010 Summer Peak. These limitations can be mitigated if the customer chooses to roll the grandfathered service over under the SPP Oasis. The start date of the renewal of service must equal the end date of the contract for grandfathered service.

2. Introduction

Kansas Electric Power Cooperative has requested a system impact study to designate a Network Resource in the SPA Control Area for 6 MW to serve network load in the EDE Control Area. The principal objective of this study is to identify the restraints on the SPP Regional Tariff System that may limit the requested service.

This study includes steady-state contingency analyses (PSS/E function ACCC) and Available Transfer Capability (ATC) analyses. The steady-state analyses consider the impact of the 6 MW requests on transmission line loading and transmission bus voltages for system intact and system outages of single and selected multiple transmission lines and transformers on the SPP systems and first tier Non - SPP systems.

3. Study Methodology

A. Description

The system impact analysis was conducted to determine the steady-state impact of the 6 MW transfer on the SPP and first tier Non - SPP systems. The steady-state analysis was done to ensure current SPP Criteria and NERC Planning Standards requirements are fulfilled. The Southwest Power Pool conforms to the NERC Planning Standards, which provide the strictest requirements, related to voltage violations and thermal overloads during normal conditions and during a contingency. It requires that all facilities be within normal operating ratings for normal system conditions and within emergency ratings after a contingency.

The contingency set includes all SPP control area branches and ties 69kV and above, first tier Non - SPP control area branches and ties 115 kV and above, and any defined contingencies for these control areas. Generation unit outages for the SPP control area with reserve share program redispatch were included in the contingency set. The monitor elements include all SPP control area branches, ties, and buses 69 kV and above, and all first tier Non – SPP control area branches and ties 69 kV and above. Voltage monitoring was performed for SPP control area buses 69 kV and above.

A 3 % transfer distribution factor (TDF) cutoff was applied to all SPP control area facilities. For first tier Non – SPP control area facilities, a 3 % TDF cutoff was applied to AECI, AMRN, and ENTR and a 2 % TDF cutoff was applied to MEC, NPPD, and OPPD. For voltage monitoring, a 0.02 per unit change in voltage must occur due to the transfer to be considered a valid limit to the transfer.

B. Model Updates

SPP used sixteen seasonal models to study the SPA to EDE 6 MW transfer for the requested service period. The SPP 2005 Series Cases 2005 Spring Peak (05G), 2005 Summer Peak (05SP), and 2005 Summer Shoulder (05SH) were used to study the impact of 10 MW transfer on the system during the requested service period of 5/1/2004 to 8/1/2005. The 2005 Fall Peak (05FA), 2005/06 Winter Peak (05WP), 2006 April Minimum (06AP), 2006 Spring Peak (06G), 2006 Summer Shoulder (06SH), 2006 Summer Peak (06SP), 2006 Fall Peak (06FA), 2006/07 Winter Peak (06WP), 2007 Summer Peak (07SP), 2007/08 Winter Peak (07WP), 2010 Summer Peak (10SP), 2010/11 Winter Peak (10WP) and 2015 Summer Peak (15SP) models were used to evaluate renewal rights of the requested service.

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 SPP 2005 Series Cases. From the sixteen seasonal models, three system scenarios were developed. Scenario 1 includes confirmed West to East transfers not already included in the January 2005 base case series models, SPS exporting, and the Lamar HVDC Tie flowing from SPS to Lamar, and ERCOT exporting. Scenario 2 includes confirmed East to West transfers not already included in the January 2005 base case series models, SPS importing, and the Lamar HVDC Tie flowing from Lamar to SPS, and ERCOT importing. Scenario 3 includes confirmed West to East transfers no already included in the January 2005 base case series models, SPS importing, the Lamar HVDC Tie flowing from Lamar to SPS, and ERCOT importing

The Network load amounts for the 2005, 2006 and 2007 Summer Peaks were forecasted to be a maximum of 6 MW. The Network load for the 2010 Summer Peak was forecasted to be a maximum of 7 MW and the 2015 Summer Peak a maximum of 8 MW. The Network load amounts for the non-summer peak cases for 2005, 2006, and 2007 were forecasted to be a maximum of 5 MW and the 2010 Winter Peak a maximum of 6 MW.

C. Transfer Analysis

Using the selected cases both with and without the transfer modeled, the PSS/E Activity ACCC was run on the cases and compared to determine the facility overloads caused or impacted by the transfers. The PSS/E options chosen to conduct the analysis can be found in Appendix A.

D. Upgrade Analysis

This system impact study does not include analysis with the assigned upgrades modeled. To determine the final cost and possible start date of the requested service, additional analysis will be performed to determine the impact of modeling the assigned upgrades for the request.

4. Study Results

A. Study Analysis Results

Tables 1 through 3 contain the steady-state analysis results of the System Impact Study. The Tables are in the attached workbook *SPP-2004-079-1 Tables*. The tables identify the seasonal case in which the event occurred, the facility control area location, applicable ratings of the overloaded facility, the loading percentage with and without the 6 MW transfer, and the estimated ATC value if calculated. Comments are provided in the tables to document any SPP or Non - SPP identification or assignment of the event, existing mitigations plans or criteria to disregard the event as a limiting constraint, upgrades and costs to mitigate a limiting constraint, or any specific study procedures associated with modeling an event.

Table 1.1 lists the SPP Facility Overloads caused or impacted by the 6 MW transfer for Scenario 1. Solutions with engineering and construction costs are provided in the tables.

Table 2.1 lists voltage violations on first tier Non - SPP Regional Tariff participants' transmission systems caused or impacted by the 6 MW transfer for Scenario 1.

Table 3.1 lists overloads on first tier Non - SPP Regional Tariff participants' transmission systems caused or impacted by the 6 MW transfer for Scenario 1.

Table 1.2 lists the SPP Facility Overloads caused or impacted by the 6 MW transfer for Scenario 2. Solutions with engineering and construction costs are provided in the tables.

Table 2.2 lists voltage violations on first tier Non - SPP Regional Tariff participants' transmission systems caused or impacted by the 6 MW transfer for Scenario 2.

Table 3.2 lists overloads on first tier Non - SPP Regional Tariff participants' transmission systems caused or impacted by the 6 MW transfer for Scenario 2.

Table 1.3 lists the SPP Facility Overloads caused or impacted by the 6 MW transfer for Scenario 3. Solutions with engineering and construction costs are provided in the tables.

Table 2.3 lists voltage violations on first tier Non - SPP Regional Tariff participants' transmission systems caused or impacted by the 6 MW transfer for Scenario 3.

Table 3.3 lists overloads on first tier Non - SPP Regional Tariff participants' transmission systems caused or impacted by the 6 MW transfer for Scenario 3.

Tables 1.1a, 1.2a and 1.3a document the modeling representation of the events identified in Tables 1.1, 1.2 and 1.3 respectively to include bus numbers and bus names.

5. Conclusion

The study results of the SPA to EDE request show that limiting constraints exist. Due to the limiting constraints identified, the Transmission Service Requests cannot be granted. Any solutions, upgrades, and costs provided in the System Impact Study are planning estimates only. The final ATC and upgrades required may vary from these results due to unknown facility upgrades and proposed transmission plans that will be identified during the facility study process.

Facilities were identified that limit the ATC to 0 MW for the requested period of service. For some facilities, implementing the upgrade is not possible to accommodate the requested term for the service. SPP has reviewed the possibility of curtailment of previously confirmed service and the redispatch of units as an option for relieving the additional impacts on these facilities. No mitigation scenarios were found, but the customer may propose other options.

Facilities were also identified that limit the right to renew service beginning in the 2010 Summer Peak. These limitations can be mitigated if the customer chooses to roll the grandfathered service over under the SPP Oasis. The start date of the renewal of service must equal the end date of the contract for grandfathered service.

Appendix A

PSS/E CHOICES IN RUNNING LOAD FLOW PROGRAM AND ACCC

BASE CASES:
Solutions - Fixed slope decoupled Newton-Raphson solution (FDNS)
1. Tap adjustment – Stepping
2. Area interchange control – Tie lines only
3. Var limits – Apply immediately
4. Solution options - X Phase shift adjustment
   _ Flat start
   _ Lock DC taps
   _ Lock switched shunts

ACCC CASES:
Solutions – AC contingency checking (ACCC)
1. MW mismatch tolerance – 0.5
2. Contingency case rating – Rate B
3. Percent of rating – 100
4. Output code – Summary
5. Min flow change in overload report – 1mw
6. Excld cases w/ no overloads form report – YES
7. Exclude interfaces from report – NO
8. Perform voltage limit check – YES
9. Elements in available capacity table – 60000
10. Cutoff threshold for available capacity table – 99999.0
11. Min. contng. case Vltg chng for report – 0.02
12. Sorted output – None

Newton Solution:
1. Tap adjustment – Stepping
2. Area interchange control – Tie lines only
3. Var limits - Apply automatically
4. Solution options - X Phase shift adjustment
   _ Flat start
   _ Lock DC taps
   _ Lock switched shunts

Study Case	From Area	To Area	Monitored Branch Over 100% Rate B	Rate <MVA>	BC % Loading	TC % Loading	Outaged Branch Causing Overload	ATC (MW)	Solution	Estimated Cost
05G			None Identified					5		
05SH	AEPW	AEPW	CHAMBER SPRINGS - TONTITOWN 161KV	244	110.7	110.8	CHAMBER SPRINGS - FARMINGTON AECC 161KV	0	AEPW Upgrade Schedule Completion Date 5/1/2007	
05SP	AEPW	AEPW	CHAMBER SPRINGS - TONTITOWN 161KV	244	133.7	133.8	CHAMBER SPRINGS - FARMINGTON AECC 161KV	0	AEPW Upgrade Schedule Completion Date 5/1/2007	
05SP	AEPW	AEPW	CHAMBER SPRINGS - TONTITOWN 161KV	244	119.5	119.6	FARMINGTON AECC - SOUTH FAYETTEVILLE 161KV	0	AEPW Upgrade Schedule Completion Date 5/1/2007	
05SP	AEPW	AEPW	CHAMBER SPRINGS - TONTITOWN 161KV	244	101.0	101.0	FLINT CREEK - GENTRY REC 161KV	0	AEPW Upgrade Schedule Completion Date 5/1/2007	
05SP	AEPW	AEPW	CHAMBER SPRINGS - TONTITOWN 161KV	244	100.1	100.1	BEN279 - GENTRY REC 161KV	0	AEPW Upgrade Schedule Completion Date 5/1/2007	
05FA			None Identified					5		
05WP			None Identified					5		
06AP			None Identified					4		
06G			None Identified					5		
06SH	AEPW	AEPW	CHAMBER SPRINGS - TONTITOWN 161KV	244	114.6	114.8	CHAMBER SPRINGS - FARMINGTON AECC 161KV	0	AEPW Upgrade Schedule Completion Date 5/1/2007	
06SH	AEPW	AEPW	CHAMBER SPRINGS - TONTITOWN 161KV	244	107.1	107.2	FLINT CREEK - TONTITOWN 161KV	0	AEPW Upgrade Schedule Completion Date 5/1/2007	
06SH	AEPW	AEPW	CHAMBER SPRINGS - TONTITOWN 161KV	244	102.4	102.5	FARMINGTON AECC - SOUTH FAYETTEVILLE 161KV	0	AEPW Upgrade Schedule Completion Date 5/1/2007	
06SP	GRDA	GRDA	AFTON 161/69/13.8KV TRANSFORMER	50	101.9	102.5	AFTON - MIAMI 161KV	0	Solution Undetermined	
06SP	AEPW	AEPW	CHAMBER SPRINGS - TONTITOWN 161KV	244	138.7	138.8	CHAMBER SPRINGS - FARMINGTON AECC 161KV	0	AEPW Upgrade Schedule Completion Date 5/1/2007	
06SP	AEPW	AEPW	CHAMBER SPRINGS - TONTITOWN 161KV	244	123.7	123.8	FARMINGTON AECC - SOUTH FAYETTEVILLE 161KV	0	AEPW Upgrade Schedule Completion Date 5/1/2007	
06SP	AEPW	AEPW	CHAMBER SPRINGS - TONTITOWN 161KV	244	104.4	104.4	FLINT CREEK - GENTRY REC 161KV	0	AEPW Upgrade Schedule Completion Date 5/1/2007	
06SP	AEPW	AEPW	CHAMBER SPRINGS - TONTITOWN 161KV	244	103.4	103.5	BEN279 - GENTRY REC 161KV	0	AEPW Upgrade Schedule Completion Date 5/1/2007	
06SP	AEPW	AEPW	CHAMBER SPRINGS - TONTITOWN 161KV	244	102.6	102.7	BEN279 - EAST CENTERTON 161KV	0	AEPW Upgrade Schedule Completion Date 5/1/2007	
06FA			None Identified					5		
06WP			None Identified					5		
07SP			None Identified					6		
07WP			None Identified					5		
10SP	SWPA	SPRM	BROOKLINE - SPRINGFIELD 161KV	380	100.6	100.7	BROOKLINE - JUNCTION 161KV	7	Upgrade Modeled is Assigned to SPP 2003-253. Scheduled Completion Date 6/1/2007. Additional Upgrades Required. Solution Undetermined.	
10WP			None Identified					6		
15SP	GRDA	GRDA	412SUB - KANSAS TAP 161KV	338	101.5	101.6	FLINT CREEK - GRDA1 345KV	8	Reconductor 9.7 miles with 1590MCM ACSR.	$1,488,000
15SP	GRDA	GRDA	412SUB - KERR 161KV	338	102.2	102.3	FLINT CREEK - GRDA1 345KV	8	Reconductor 12.5 miles with 1590MCM ACSR	$1,918,000
15SP	SWPA	SPRM	BROOKLINE - SPRINGFIELD 161KV	380	102.6	102.7	BROOKLINE - JUNCTION 161KV	8	Upgrade Modeled is Assigned to SPP 2003-253. Scheduled Completion Date 6/1/2007. Additional Upgrades Required. Solution Undetermined.	
15SP	EMDE	EMDE	OZARKS - SUB 434 - OZARK SOUTHEAST 69KV	45	127.7	128.2	FLINT CREEK - GRDA1 345KV	8	Solution Undetermined	
15SP	WFEC	WFEC	PAOLI 138/69KV TRANSFORMER	42	106.7	107.3	LITTLE AXE - NOBLE 69KV	8	Upgrade from 42 MVA to 62 MVA, planned for 2007 by WFEC.	
15SP	EMDE	EMDE	SUB 389 - JOPLIN SOUTHWEST 161/69/12.5KV TRANSFORMER	75	126.2	126.7	SUB 184 - NEOSHO SOUTH JCT. - SUB 314 - NEOSHO LINDE 69KV	8	Replace 161/69 KV Transformer with a 150 MVA Transformer.	$1,565,000
15SP	EMDE	EMDE	SUB 389 - JOPLIN SOUTHWEST 161/69/12.5KV TRANSFORMER	75	111.7	112.2	SUB 314 - NEOSHO LINDE - SUB 56 - NEOSHO WEST 69KV	8	See Previous Upgrade Specified for Facility	
15SP	EMDE	EMDE	SUB 389 - JOPLIN SOUTHWEST 161/69/12.5KV TRANSFORMER	75	111.6	112.0	SUB 292 - TIPTON FORD - SUB 389 - JOPLIN SOUTHWEST 161KV	8	See Previous Upgrade Specified for Facility	
15SP	EMDE	EMDE	SUB 389 - JOPLIN SOUTHWEST 161/69/12.5KV TRANSFORMER	75	111.2	111.5	SUB 64 - JOPLIN 10TH ST. - SUB 145 - JOPLIN WEST 7TH 69KV	8	See Previous Upgrade Specified for Facility	
15SP	EMDE	EMDE	SUB 389 - JOPLIN SOUTHWEST 161/69/12.5KV TRANSFORMER	75	108.9	109.4	SUB 145 - JOPLIN WEST 7TH - SUB 439 - STATELINE 161KV	8	See Previous Upgrade Specified for Facility	
									Total Estimated Cost	$4,971,000

Table 2.1 - SPP Voltage Violations Caused or Impacted by the Transfer Using Scenario 1

Study Case	Area	Voltage Violation Bus	BC Voltage (PU)	TC Voltage (PU)	Outaged Branch Causing Voltage Violation	ATC (MW)	Solution
05G						5	
05SH						5	
05SP						6	
05FA						5	
05WP						5	
06AP						4	
06G						5	
06SH						5	
06SP						6	
06FA						5	
06WP						5	
07SP						6	
07WP	EMDE	59568 STK324 269.0	0.8786	0.853	OPEN LINE FROM BUS 59568 [STK324 269.000] TO BUS 59616 [STK324J269.000] CKT 1	5	Not a Load-Serving bus
10SP						7	
10WP						6	
15SP						8	

Study Case	From Area	To Area	Monitored Branch Over 100% Rate B	Rate <MVA>	BC % Loading	TC % Loading	Outaged Branch Causing Overload	Comment
05G			None Identified					
05SP			None Identified					
05FA			None Identified					
05WP			None Identified					
06AP			None Identified					
06G			None Identified					
06SH			None Identified					
06SP			None Identified					
06FA			None Identified					
06WP			None Identified					
07SP			None Identified					
07WP			None Identified					
10SP			None Identified					
10WP			None Identified					
15SP			None Identified					

Study Case	From Area	To Area	Monitored Branch Over 100% Rate B	Rate <MVA>	BC % Loading	TC % Loading	Outaged Branch Causing Overload	ATC (MW)	Solution	Estimated Cost
05G								5		
05SH								5		
05SP	SWPA	ENTR	BULL SHOALS - BULL SHOALS HES 161KV	167	105.0	105.1	EUREKA SPRINGS - OSAGE CREEK (AECC) 161KV	0	SPA - EES interconnection upgrade. Scheduled In-Service date 6/1/2006.	
05FA								5		
05WP								5		
06AP								4		
06G								5		
06SH								5		
06SP								6		
06FA								5		
06WP								5		
07SP								6		
07WP								5		
10SP	EMDE	EMDE	OZARKS - SUB 434 - OZARK SOUTHEAST 69KV	45	179.1	179.9	JAMESVILLE - SUB 415 - BLACKHAWK JCT. 69KV	7	Solution Undetermined.	
10SP	EMDE	EMDE	SUB 330 - OZARK NORTHWEST - SUB 434 - OZARK SOUTHEAST 69KV	45	134.6	135.3	JAMESVILLE - SUB 415 - BLACKHAWK JCT. 69KV	7	Solution Undetermined.	
10SP	EMDE	EMDE	SUB 330 - OZARK NORTHWEST - SUB 415 - BLACKHAWK JCT. 69KV	45	106.5	107.2	JAMESVILLE - SUB 415 - BLACKHAWK JCT. 69KV	7	Solution Undetermined.	
10WP								6		
15SP	AEPW	OKGE	CLARKSVILLE - MUSKOGEE 345KV	986	100.4	100.5	MUSKOGEE - RIVERSIDE STATION 345KV	8	Increase CTR at Muskogee to 2000-5 amps.	$5,000
15SP	WERE	WERE	HOYT - JEFFREY ENERGY CENTER 345KV	1076	101.6	101.7	AUBURN ROAD - JEFFREY ENERGY CENTER 230KV	8	Relieved due to Westar Operating Procedure 400 - Outage of the Jeffrey Energy Center to Hoyt 345kV Line.	
15SP	SWPA	ENTR	BULL SHOALS - BULL SHOALS HES 161KV	167	105.6	105.9	EVERTON - HARRISON-EAST 161KV	8	Solution Undetermined.	
15SP	SWPA	ENTR	BULL SHOALS - BULL SHOALS HES 161KV	167	108.5	108.8	SILVER HILL - ST. JOE 161KV	8	Solution Undetermined.	
15SP	SWPA	ENTR	BULL SHOALS - BULL SHOALS HES 161KV	167	107.7	108.0	EVERTON - ST. JOE 161KV	8	Solution Undetermined.	
15SP	SWPA	ENTR	BULL SHOALS - BULL SHOALS HES 161KV	167	115.5	115.7	EUREKA SPRINGS - OSAGE CREEK (AECC) 161KV	8	Solution Undetermined.	
15SP	EMDE	EMDE	SUB 389 - JOPLIN SOUTHWEST 161/69/12.5KV TRANSFORMER	75	120.8	121.4	SUB 184 - NEOSHO SOUTH JCT. - SUB 314 - NEOSHO LINDE 69KV	8	See Previous Upgrade Specified for Facility in Scenario 1	
15SP	EMDE	EMDE	SUB 389 - JOPLIN SOUTHWEST 161/69/12.5KV TRANSFORMER	75	112.1	112.4	SUB 292 - TIPTON FORD - SUB 389 - JOPLIN SOUTHWEST 161KV	8	See Previous Upgrade Specified for Facility in Scenario 1	
15SP	EMDE	EMDE	SUB 389 - JOPLIN SOUTHWEST 161/69/12.5KV TRANSFORMER	75	110.0	110.5	SUB 145 - JOPLIN WEST 7TH - SUB 439 - STATELINE 161KV	8	See Previous Upgrade Specified for Facility in Scenario 1	
15SP	EMDE	EMDE	SUB 389 - JOPLIN SOUTHWEST 161/69/12.5KV TRANSFORMER	75	109.7	110.2	SUB 314 - NEOSHO LINDE - SUB 56 - NEOSHO WEST 69KV	8	See Previous Upgrade Specified for Facility in Scenario 1	
15SP	EMDE	EMDE	SUB 389 - JOPLIN SOUTHWEST 161/69/12.5KV TRANSFORMER	75	109.5	109.9	NEOSHO - SUB 292 - TIPTON FORD 161KV	8	See Previous Upgrade Specified for Facility in Scenario 1	
15SP	EMDE	EMDE	OZARKS 161/69/12.5KV TRANSFORMER	75	117.7	118.1	JAMESVILLE - SUB 415 - BLACKHAWK JCT. 69KV	8	Solution Undetermined.	
									Total Estimated Cost	$5,000

Study Case	Area	Voltage Violation Bus	BC Voltage (PU)	TC Voltage (PU)	Outaged Branch Causing Voltage Violation	ATC (MW)	Solution
05G		None Identified				5	
05SH		None Identified				5	
05SP	EMDE	59500 RNM393 5 161	0.9745	0.8821	OPEN LINE FROM BUS 59500 [RNM393 5161.00] TO BUS 59593 [JOP391 5161.00] CKT 1	6	Not a Load-Serving bus
05FA		None Identified				5	
05WP		None Identified				5	
06AP		None Identified				4	
06G		None Identified				5	
06SH		None Identified				5	
06SP		None Identified				6	
06FA		None Identified				5	
06WP	EMDE	59568 STK324 269.0	0.8856	0.8576	OPEN LINE FROM BUS 59568 [STK324 269.000] TO BUS 59616 [STK324J269.000] CKT 1	5	Not a Load-Serving bus
07SP		None Identified				6	
07WP		None Identified				5	
10SP		None Identified				7	
10WP		None Identified				6	
15SP		None Identified				8	

Study Case	From Area	To Area	Monitored Branch Over 100% Rate B	Rate <MVA>	BC % Loading	TC % Loading	Outaged Branch Causing Overload	Comment
05G			None Identified					
05SH			None Identified					
05SP	ENTR	ENTR	99802 5BULLSH* 161 to 99809 5FLIPN 161 CKT 1	167	101.8	102.0	53136 EUREKA 5 161 to 99832 5OSAGE # 161 CKT 1	Relieved due to Entergy planned upgrades.
05SP	SWPA	ENTR	52660 BULL SH5 161 to 99802 5BULLSH* 161 CKT 1	167	105.0	105.1	53136 EUREKA 5 161 to 99832 5OSAGE # 161 CKT 1	SPA - EES interconnection upgrade. Scheduled In-Service date 6/1/2006.
05FA			None Identified					
05WP			None Identified					
06AP			None Identified					
06G			None Identified					
06SH			None Identified					
06SP			None Identified					
06FA			None Identified					
06WP			None Identified					
07SP			None Identified					
07WP			None Identified					
10SP			None Identified					
10WP			None Identified					
15SP	ENTR	ENTR	99802 5BULLSH* 161 to 99809 5FLIPN 161 CKT 1	167	101.6	101.9	99811 5HARR-E 161 to 99843 5EVRTON 161 CKT 1	Relieved due to Entergy planned upgrades.
15SP	SWPA	ENTR	52660 BULL SH5 161 to 99802 5BULLSH* 161 CKT 1	167	105.6	105.9	99811 5HARR-E 161 to 99843 5EVRTON 161 CKT 1	SPA - EES interconnection upgrade. Scheduled In-Service date 6/1/2006.
15SP	ENTR	ENTR	99802 5BULLSH* 161 to 99809 5FLIPN 161 CKT 1	167	104.5	104.8	99696 5AG_HILL 161 to 99860 5ST_JOE 161 CKT 1	Relieved due to Entergy planned upgrades.
15SP	SWPA	ENTR	52660 BULL SH5 161 to 99802 5BULLSH* 161 CKT 1	167	108.5	108.8	99696 5AG_HILL 161 to 99860 5ST_JOE 161 CKT 1	SPA - EES interconnection upgrade. Scheduled In-Service date 6/1/2006.
15SP	ENTR	ENTR	99802 5BULLSH* 161 to 99809 5FLIPN 161 CKT 1	167	103.7	104.0	99843 5EVRTON 161 to 99860 5ST_JOE 161 CKT 1	Relieved due to Entergy planned upgrades.
15SP	SWPA	ENTR	52660 BULL SH5 161 to 99802 5BULLSH* 161 CKT 1	167	107.7	108.0	99843 5EVRTON 161 to 99860 5ST_JOE 161 CKT 1	SPA - EES interconnection upgrade. Scheduled In-Service date 6/1/2006.
15SP	ENTR	ENTR	99696 5AG_HILL 161 to 99860 5ST_JOE 161 CKT 1	167	99.9	100.2	99802 5BULLSH* 161 to 99809 5FLIPN 161 CKT 1	Relieved due to Entergy planned upgrades.
15SP	ENTR	ENTR	99843 5EVRTON 161 to 99860 5ST_JOE 161 CKT 1	167	100.3	100.6	52660 BULL SH5 161 to 99802 5BULLSH* 161 CKT 1	Relieved due to Entergy planned upgrades.
15SP	ENTR	ENTR	99696 5AG_HILL 161 to 99860 5ST_JOE 161 CKT 1	167	101.9	102.1	52660 BULL SH5 161 to 99802 5BULLSH* 161 CKT 1	Relieved due to Entergy planned upgrades.
15SP	ENTR	ENTR	99802 5BULLSH* 161 to 99809 5FLIPN 161 CKT 1	167	111.2	111.4	53136 EUREKA 5 161 to 99832 5OSAGE # 161 CKT 1	Relieved due to Entergy planned upgrades.
15SP	SWPA	ENTR	52660 BULL SH5 161 to 99802 5BULLSH* 161 CKT 1	167	115.5	115.7	53136 EUREKA 5 161 to 99832 5OSAGE # 161 CKT 1	SPA - EES interconnection upgrade. Scheduled In-Service date 6/1/2006.

Study Case	From Area	To Area	Monitored Branch Over 100% Rate B	Rate <MVA>	BC % Loading	TC % Loading	Outaged Branch Causing Overload	ATC (MW)	Solution	Estimated Cost
05G			None Identified					5		
05SH	AEPW	AEPW	CHAMBER SPRINGS - TONTITOWN 161KV	244	105.1	105.2	CHAMBER SPRINGS - FARMINGTON AECC 161KV	0	AEPW Upgrade Schedule Completion Date 5/1/2007	
05SP	AEPW	AEPW	CHAMBER SPRINGS - TONTITOWN 161KV	244	128.1	128.2	CHAMBER SPRINGS - FARMINGTON AECC 161KV	0	AEPW Upgrade Schedule Completion Date 5/1/2007	
05SP	AEPW	AEPW	CHAMBER SPRINGS - TONTITOWN 161KV	244	113.8	113.9	FARMINGTON AECC - SOUTH FAYETTEVILLE 161KV	0	AEPW Upgrade Schedule Completion Date 5/1/2007	
05FA	SWPA	AEPW	BROKEN BOW - CRAIG JUNCTION 138KV	107	103.1	103.7	BBDAMTP4 - MOUNTAIN RIVER 138KV	0	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
05FA	SWPA	AEPW	BROKEN BOW - CRAIG JUNCTION 138KV	107	100.5	101.1	CRAIG JUNCTION - MOUNTAIN RIVER 138KV	0	See Previous Upgrade Specified for Facility	
05WP			None Identified					5		
06AP			None Identified					4		
06G			None Identified					5		
06SH	AEPW	AEPW	CHAMBER SPRINGS - TONTITOWN 161KV	244	109.0	109.2	CHAMBER SPRINGS - FARMINGTON AECC 161KV	0	AEPW Upgrade Schedule Completion Date 5/1/2007	
06SH	AEPW	AEPW	CHAMBER SPRINGS - TONTITOWN 161KV	244	102.8	102.9	FLINT CREEK - TONTITOWN 161KV	0	AEPW Upgrade Schedule Completion Date 5/1/2007	
06SP	AEPW	AEPW	CHAMBER SPRINGS - TONTITOWN 161KV	244	132.9	133.0	CHAMBER SPRINGS - FARMINGTON AECC 161KV	0	AEPW Upgrade Schedule Completion Date 5/1/2007	
06SP	AEPW	AEPW	CHAMBER SPRINGS - TONTITOWN 161KV	244	117.8	117.9	FARMINGTON AECC - SOUTH FAYETTEVILLE 161KV	0	AEPW Upgrade Schedule Completion Date 5/1/2007	
06FA	SWPA	AEPW	BROKEN BOW - CRAIG JUNCTION 138KV	107	105.5	106.1	BBDAMTP4 - MOUNTAIN RIVER 138KV	0	See Previous Upgrade Specified for Facility	
06FA	SWPA	AEPW	BROKEN BOW - CRAIG JUNCTION 138KV	107	102.9	103.5	CRAIG JUNCTION - MOUNTAIN RIVER 138KV	0	See Previous Upgrade Specified for Facility	
06WP			None Identified					5		
07SP			None Identified					6		
07WP			None Identified					5		
10SP			None Identified					7		
10WP			None Identified					6		
15SP	SWPA	SPRM	BROOKLINE - SPRINGFIELD 161KV	380	100.6	100.7	BROOKLINE - JUNCTION 161KV	8	Upgrade Modeled is Assigned to SPP-2003-253. Scheduled Completion Date 6/1/2007. Additional Upgrades Required. Solution Undetermined.	
15SP	EMDE	EMDE	SUB 389 - JOPLIN SOUTHWEST 161/69/12.5KV TRANSFORMER	75	112.3	112.7	SUB 184 - NEOSHO SOUTH JCT. - SUB 314 - NEOSHO LINDE 69KV	8	Solution Undetermined.	
15SP	EMDE	EMDE	SUB 389 - JOPLIN SOUTHWEST 161/69/12.5KV TRANSFORMER	75	109.5	109.9	SUB 292 - TIPTON FORD - SUB 389 - JOPLIN SOUTHWEST 161KV	8	Solution Undetermined.	
15SP	EMDE	EMDE	SUB 389 - JOPLIN SOUTHWEST 161/69/12.5KV TRANSFORMER	75	109.1	109.8	SUB 145 - JOPLIN WEST 7TH 161/69/12.5KV TRANSFORMER	8	Solution Undetermined.	
15SP	EMDE	EMDE	SUB 389 - JOPLIN SOUTHWEST 161/69/12.5KV TRANSFORMER	75	106.8	107.2	SUB 145 - JOPLIN WEST 7TH - SUB 439 - STATELINE 161KV	8	Solution Undetermined.	
15SP	EMDE	EMDE	SUB 389 - JOPLIN SOUTHWEST 161/69/12.5KV TRANSFORMER	75	105.7	106.0	NEOSHO - SUB 292 - TIPTON FORD 161KV	8	Reconductor with 556 ACSR	$ 2,350,000
									Total Estimated Cost	$ 5,050,000

Table 2.3 - SPP Voltage Violations Caused or Impacted by the Transfer Using Scenario 3

Study Case	Area	Voltage Violation Bus	BC Voltage (PU)	TC Voltage (PU)	Outaged Branch Causing Voltage Violation	ATC (MW)	Solution
05G		None Identified				5	
05SH		None Identified				5	
05SP		None Identified				6	
05FA		None Identified				5	
05WP		None Identified				5	
06AP		None Identified				4	
06G		None Identified				5	
06SH		None Identified				5	
06SP		None Identified				6	
06FA		None Identified				5	
06WP		None Identified				5	
07SP		None Identified				6	
07WP		None Identified				5	
10SP		None Identified				7	
10WP		None Identified				6	
15SP		None Identified				8	

Study Case	From Area	To Area	Monitored Branch Over 100% Rate B	Rate <MVA>	BC % Loading	TC % Loading	Outaged Branch Causing Overload	Comment
05G			None Identified					
05SH			None Identified					
05SP			None Identified					
05FA			None Identified					
05WP			None Identified					
06AP			None Identified					
06G			None Identified					
06SH			None Identified					
06SP			None Identified					
06FA			None Identified					
06WP			None Identified					
07SP	MIPU	AECI	59242 CLINTON5 161 to 96071 5CLINTN 161 CKT 1	100	100.8	101.3	59307 NEVPLT 2 69 to 59308 NEVADA 2 69 CKT 1	Solution Undetermined
07WP			None Identified					
10SP			None Identified					
10WP			None Identified					
15SP			None Identified					

Study Case	From Area	To Area	Monitored Branch Over 100% Rate B	Rate <MVA>	BC % Loading	TC % Loading	Outaged Branch Causing Overload	ATC (MW)	Solution	Estimated Cost
05G			None Identified					5		
05SH	AEPW	AEPW	53154 CHAMSPR5 161 to 53170 TONTITN5 161 CKT 1	244	110.7	110.8	53154 CHAMSPR5 161 to 53195 FARMGTN5 161 CKT 1	0	AEPW Upgrade Schedule Completion Date 5/1/2007	
05SP	AEPW	AEPW	53154 CHAMSPR5 161 to 53170 TONTITN5 161 CKT 1	244	133.7	133.8	53154 CHAMSPR5 161 to 53195 FARMGTN5 161 CKT 1	0	AEPW Upgrade Schedule Completion Date 5/1/2007	
05SP	AEPW	AEPW	53154 CHAMSPR5 161 to 53170 TONTITN5 161 CKT 1	244	119.5	119.6	53157 SFAYTVL5 161 to 53195 FARMGTN5 161 CKT 1	0	AEPW Upgrade Schedule Completion Date 5/1/2007	
05SP	AEPW	AEPW	53154 CHAMSPR5 161 to 53170 TONTITN5 161 CKT 1	244	101.0	101.0	53139 FLINTCR5 161 to 53187 GENTRYR5 161 CKT 1	0	AEPW Upgrade Schedule Completion Date 5/1/2007	
05SP	AEPW	AEPW	53154 CHAMSPR5 161 to 53170 TONTITN5 161 CKT 1	244	100.1	100.1	53183 BEN279_5 161 to 53187 GENTRYR5 161 CKT 1	0	AEPW Upgrade Schedule Completion Date 5/1/2007	
05FA			None Identified					5		
05WP			None Identified					5		
06AP			None Identified					4		
06G			None Identified					5		
06SH	AEPW	AEPW	53154 CHAMSPR5 161 to 53170 TONTITN5 161 CKT 1	244	114.6	114.8	53154 CHAMSPR5 161 to 53195 FARMGTN5 161 CKT 1	0	AEPW Upgrade Schedule Completion Date 5/1/2007	
06SH	AEPW	AEPW	53154 CHAMSPR5 161 to 53170 TONTITN5 161 CKT 1	244	107.1	107.2	53139 FLINTCR5 161 to 53170 TONTITN5 161 CKT 1	0	AEPW Upgrade Schedule Completion Date 5/1/2007	
06SH	AEPW	AEPW	53154 CHAMSPR5 161 to 53170 TONTITN5 161 CKT 1	244	102.4	102.5	53157 SFAYTVL5 161 to 53195 FARMGTN5 161 CKT 1	0	AEPW Upgrade Schedule Completion Date 5/1/2007	
06SP	GRDA	GRDA	54432 AFTON 5 161 WND 2 AFTAUTO1 1	50	101.9	102.5	54431 MIAMI 5 161 to 54432 AFTON 5 161 CKT 1	0	Solution Undetermined	
06SP	AEPW	AEPW	53154 CHAMSPR5 161 to 53170 TONTITN5 161 CKT 1	244	138.7	138.8	53154 CHAMSPR5 161 to 53195 FARMGTN5 161 CKT 1	0	AEPW Upgrade Schedule Completion Date 5/1/2007	
06SP	AEPW	AEPW	53154 CHAMSPR5 161 to 53170 TONTITN5 161 CKT 1	244	123.7	123.8	53157 SFAYTVL5 161 to 53195 FARMGTN5 161 CKT 1	0	AEPW Upgrade Schedule Completion Date 5/1/2007	
06SP	AEPW	AEPW	53154 CHAMSPR5 161 to 53170 TONTITN5 161 CKT 1	244	104.4	104.4	53139 FLINTCR5 161 to 53187 GENTRYR5 161 CKT 1	0	AEPW Upgrade Schedule Completion Date 5/1/2007	
06SP	AEPW	AEPW	53154 CHAMSPR5 161 to 53170 TONTITN5 161 CKT 1	244	103.4	103.5	53183 BEN279_5 161 to 53187 GENTRYR5 161 CKT 1	0	AEPW Upgrade Schedule Completion Date 5/1/2007	
06SP	AEPW	AEPW	53154 CHAMSPR5 161 to 53170 TONTITN5 161 CKT 1	244	102.6	102.7	53133 ECNTRTN5 161 to 53183 BEN279_5 161 CKT 1	0	AEPW Upgrade Schedule Completion Date 5/1/2007	
06FA			None Identified					5		
06WP			None Identified					5		
07SP			None Identified					6		
07WP			None Identified					5		
10SP	SWPA	SPRM	52692 SPRGFLD5 161 to 59969 BRKLNE 5 161 CKT 1	380	100.6	100.7	59955 JUNCTN 5 161 to 59969 BRKLNE 5 161 CKT 1	7	Upgrade Modeled is Assigned to SPP-2003-253. Scheduled Completion Date 6/1/2007. Additional Upgrades Required. Solution Undetermined.	
10WP			None Identified					6		
15SP	GRDA	GRDA	54437 412SUB 5 161 to 54514 KANSATP5 161 CKT 1	338	101.5	101.6	53140 FLINTCR7 345 to 54450 GRDA1 7 345 CKT 1	8	Reconductor 9.7 miles with 1590MCM ACSR.	$1,488,000
15SP	GRDA	GRDA	54435 KERR GR5 161 to 54437 412SUB 5 161 CKT 1	338	102.2	102.3	53140 FLINTCR7 345 to 54450 GRDA1 7 345 CKT 1	8	Reconductor 12.5 miles with 1590MCM ACSR	$1,918,000
15SP	SWPA	SPRM	52692 SPRGFLD5 161 to 59969 BRKLNE 5 161 CKT 1	380	102.6	102.7	59955 JUNCTN 5 161 to 59969 BRKLNE 5 161 CKT 1	8	Upgrade Modeled is Assigned to SPP-2003-253. Scheduled Completion Date 6/1/2007. Additional Upgrades Required. Solution Undetermined.	
15SP	EMDE	EMDE	59442 OZARKS 2 69 to 59609 OZK434 2 69 CKT 1	45	127.7	128.2	53140 FLINTCR7 345 to 54450 GRDA1 7 345 CKT 1	8	Solution Undetermined	
15SP	WFEC	WFEC	56022 PAOLI 2 69 to 56023 PAOLI 4 138 CKT 1	42	106.7	107.3	55976 LIL AXE2 69 to 56011 NOBLE 2 69 CKT 1	8	Upgrade from 42 MVA to 62 MVA, planned for 2007 by WFEC.	
15SP	EMDE	EMDE	59483 JOP389 5 161 WND 1 JOPLINSW 1	75	126.2	126.7	59543 NEO184 269.0 to 59563 LIN314 269.0 CKT 1	8	Replace 161/69 KV Transformer with a 150 MVA Transformer.	$1,565,000
15SP	EMDE	EMDE	59483 JOP389 5 161 WND 1 JOPLINSW 1	75	111.7	112.2	59524 NEO 56 269.0 to 59563 LIN314 269.0 CKT 1	8	See Previous Upgrade Specified for Facility	
15SP	EMDE	EMDE	59483 JOP389 5 161 WND 1 JOPLINSW 1	75	111.6	112.0	59472 TIP292 5 161 to 59483 JOP389 5 161 CKT 1	8	See Previous Upgrade Specified for Facility	
15SP	EMDE	EMDE	59483 JOP389 5 161 WND 1 JOPLINSW 1	75	111.2	111.5	59526 JOP 64 269.0 to 59539 JOP145 269.0 CKT 1	8	See Previous Upgrade Specified for Facility	
15SP	EMDE	EMDE	59483 JOP389 5 161 WND 1 JOPLINSW 1	75	108.9	109.4	59470 JOP145 5 161 to 59498 STL439 5 161 CKT 1	8	See Previous Upgrade Specified for Facility	
									Total Estimated Cost	$4,971,000

Study Case	From Area	To Area	Monitored Branch Over 100% Rate B	Rate <MVA>	BC % Loading	TC % Loading	Outaged Branch Causing Overload	ATC (MW)	Solution	Estimated Cost
05G								5		
05SH								5		
05SP	SWPA	ENTR	52660 BULL SH5 161 to 99802 5BULLSH* 161 CKT 1	167	105.0	105.1	53136 EUREKA 5 161 to 99832 5OSAGE # 161 CKT 1	0	SPA - EES interconnection upgrade. Scheduled In-Service date 6/1/2006.	
05FA								5		
05WP								5		
06AP								4		
06G								5		
06SH								5		
06SP								6		
06FA								5		
06WP								5		
07SP								6		
07WP								5		
10SP	EMDE	EMDE	59442 OZARKS 2 69 to 59609 OZK434 2 69 CKT 1	45	179.1	179.9	59604 BHJ415 2 69 to 96673 2JAMESV 69 CKT 1	7	Solution Undetermined.	
10SP	EMDE	EMDE	59570 OZK330 2 69 to 59609 OZK434 2 69 CKT 1	45	134.6	135.3	59604 BHJ415 2 69 to 96673 2JAMESV 69 CKT 1	7	Solution Undetermined.	
10SP	EMDE	EMDE	59570 OZK330 2 69 to 59604 BHJ415 2 69 CKT 1	45	106.5	107.2	59604 BHJ415 2 69 to 96673 2JAMESV 69 CKT 1	7	Solution Undetermined.	
10WP								6		
15SP	AEPW	OKGE	53756 CLARKSV7 345 to 55224 MUSKOGE7 345 CKT 1	986	100.4	100.5	53794 R.S.S.-7 345 to 55224 MUSKOGE7 345 CKT 1	8	Increase CTR at Muskogee to 2000-5 amps.	$5,000
15SP	WERE	WERE	56765 HOYT 7 345 to 56766 JEC N 7 345 CKT 1	1076	101.6	101.7	56851 AUBURN 6 230 to 56852 JEC 6 230 CKT 1	8	Relieved due to Westar Operating Procedure 400 - Outage of the Jeffrey Energy Center to Hoyt 345kV Line.	
15SP	SWPA	ENTR	52660 BULL SH5 161 to 99802 5BULLSH* 161 CKT 1	167	105.6	105.9	99811 5HARR-E 161 to 99843 5EVRTON 161 CKT 1	8	Solution Undetermined.	
15SP	SWPA	ENTR	52660 BULL SH5 161 to 99802 5BULLSH* 161 CKT 1	167	108.5	108.8	99696 5AG_HILL 161 to 99860 5ST_JOE 161 CKT 1	8	Solution Undetermined.	
15SP	SWPA	ENTR	52660 BULL SH5 161 to 99802 5BULLSH* 161 CKT 1	167	107.7	108.0	99843 5EVRTON 161 to 99860 5ST_JOE 161 CKT 1	8	Solution Undetermined.	
15SP	SWPA	ENTR	52660 BULL SH5 161 to 99802 5BULLSH* 161 CKT 1	167	115.5	115.7	53136 EUREKA 5 161 to 99832 5OSAGE # 161 CKT 1	8	Solution Undetermined.	
15SP	EMDE	EMDE	59483 JOP389 5 161 WND 1 JOPLINSW 1	75	120.8	121.4	59543 NEO184 269.0 to 59563 LIN314 269.0 CKT 1	8	See Previous Upgrade Specified for Facility in Scenario 1	
15SP	EMDE	EMDE	59483 JOP389 5 161 WND 1 JOPLINSW 1	75	112.1	112.4	59472 TIP292 5 161 to 59483 JOP389 5 161 CKT 1	8	See Previous Upgrade Specified for Facility in Scenario 1	
15SP	EMDE	EMDE	59483 JOP389 5 161 WND 1 JOPLINSW 1	75	110.0	110.5	59470 JOP145 5 161 to 59498 STL439 5 161 CKT 1	8	See Previous Upgrade Specified for Facility in Scenario 1	
15SP	EMDE	EMDE	59483 JOP389 5 161 WND 1 JOPLINSW 1	75	109.7	110.2	59524 NEO 56 269.0 to 59563 LIN314 269.0 CKT 1	8	See Previous Upgrade Specified for Facility in Scenario 1	
15SP	EMDE	EMDE	59483 JOP389 5 161 WND 1 JOPLINSW 1	75	109.5	109.9	52686 NEO SPA5 161 to 59472 TIP292 5 161 CKT 1	8	See Previous Upgrade Specified for Facility in Scenario 1	
15SP	EMDE	EMDE	59621 OZARKS 5 161 WND 1 OZARK 1	75	117.7	118.1	59604 BHJ415 269.0 to 96673 2JAMESV 69.0 CKT 1	8	Solution Undetermined.	
									Total Estimated Cost	$ 5,000

Study Case	From Area	To Area	Monitored Branch Over 100% Rate B	Rate <MVA>	BC % Loading	TC % Loading	Outaged Branch Causing Overload	ATC (MW)	Solution	Estimated Cost
05G			None Identified					5		
05SH	AEPW	AEPW	53154 CHAMSPR5 161 to 53170 TONTITN5 161 CKT 1	244	105.1	105.2	53154 CHAMSPR5 161 to 53195 FARMGTN5 161 CKT 1	0	AEPW Upgrade Schedule Completion Date 5/1/2007	
05SP	AEPW	AEPW	53154 CHAMSPR5 161 to 53170 TONTITN5 161 CKT 1	244	128.1	128.2	53154 CHAMSPR5 161 to 53195 FARMGTN5 161 CKT 1	0	AEPW Upgrade Schedule Completion Date 5/1/2007	
05SP	AEPW	AEPW	53154 CHAMSPR5 161 to 53170 TONTITN5 161 CKT 1	244	113.8	113.9	53157 SFAYTVL5 161 to 53195 FARMGTN5 161 CKT 1	0	AEPW Upgrade Schedule Completion Date 5/1/2007	
05FA	SWPA	AEPW	52814 BRKN BW4 138 to 54015 CRAIGJT4 138 CKT 1	107	103.1	103.7	55823 BBDAMTP4 138 to 56004 MTRIVER4 138 CKT 1	0	Rebuild 7.66 miles of 3/0 CW CU with 795 ACSR	$ 2,700,000
05FA	SWPA	AEPW	52814 BRKN BW4 138 to 54015 CRAIGJT4 138 CKT 1	107	100.5	101.1	54015 CRAIGJT4 138 to 56004 MTRIVER4 138 CKT 1	0	See Previous Upgrade Specified for Facility	
05WP			None Identified					5		
06AP			None Identified					4		
06G			None Identified					5		
06SH	AEPW	AEPW	53154 CHAMSPR5 161 to 53170 TONTITN5 161 CKT 1	244	109.0	109.2	53154 CHAMSPR5 161 to 53195 FARMGTN5 161 CKT 1	0	AEPW Upgrade Schedule Completion Date 5/1/2007	
06SH	AEPW	AEPW	53154 CHAMSPR5 161 to 53170 TONTITN5 161 CKT 1	244	102.8	102.9	53139 FLINTCR5 161 to 53170 TONTITN5 161 CKT 1	0	AEPW Upgrade Schedule Completion Date 5/1/2007	
06SP	AEPW	AEPW	53154 CHAMSPR5 161 to 53170 TONTITN5 161 CKT 1	244	132.9	133.0	53154 CHAMSPR5 161 to 53195 FARMGTN5 161 CKT 1	0	AEPW Upgrade Schedule Completion Date 5/1/2007	
06SP	AEPW	AEPW	53154 CHAMSPR5 161 to 53170 TONTITN5 161 CKT 1	244	117.8	117.9	53157 SFAYTVL5 161 to 53195 FARMGTN5 161 CKT 1	0	AEPW Upgrade Schedule Completion Date 5/1/2007	
06FA	SWPA	AEPW	52814 BRKN BW4 138 to 54015 CRAIGJT4 138 CKT 1	107	105.5	106.1	55823 BBDAMTP4 138 to 56004 MTRIVER4 138 CKT 1	0	See Previous Upgrade Specified for Facility	
06FA	SWPA	AEPW	52814 BRKN BW4 138 to 54015 CRAIGJT4 138 CKT 1	107	102.9	103.5	54015 CRAIGJT4 138 to 56004 MTRIVER4 138 CKT 1	0	See Previous Upgrade Specified for Facility	
06WP			None Identified					5		
07SP			None Identified					6		
07WP			None Identified					5		
10SP			None Identified					7		
10WP			None Identified					6		
15SP	SWPA	SPRM	52692 SPRGFLD5 161 to 59969 BRKLNE 5 161 CKT 1	380	100.6	100.7	59955 JUNCTN 5 161 to 59969 BRKLNE 5 161 CKT 1	8	Upgrade Modeled is Assigned to SPP-2003-253. Scheduled Completion Date 6/1/2007. Additional Upgrades Required. Solution Undetermined.	
15SP	EMDE	EMDE	59483 JOP389 5 161 WND 1 JOPLINSW 1	75	112.3	112.7	59524 NEO 56 269.0 to 59563 LIN314 269.0 CKT 1	8	Solution Undetermined.	
15SP	EMDE	EMDE	59483 JOP389 5 161 WND 1 JOPLINSW 1	75	109.5	109.9	59472 TIP292 5 161 to 59483 JOP389 5 161 CKT 1	8	Solution Undetermined.	
15SP	EMDE	EMDE	59483 JOP389 5 161 WND 1 JOPLINSW 1	75	109.1	109.8	59470 JOP145 5 161 to 59539 JOP145 269.0 to 59707 JOP145 112.5 CKT 1	8	Solution Undetermined.	
15SP	EMDE	EMDE	59592 JOP389 269.0 WND 2 JOPLINSW 1	75	106.8	107.2	59470 JOP145 5 161 to 59498 STL439 5 161 CKT 1	8	Solution Undetermined.	
15SP	EMDE	EMDE	59483 JOP389 5 161 WND 1 JOPLINSW 1	75	105.7	106.0	52686 NEO SPA5 161 to 59472 TIP292 5 161 CKT 1	8	Reconductor with 556 ACSR	$ 2,350,000
									Total Estimated Cost	$ 5,050,000