



SPP *Southwest Power Pool*

***System Impact Study SPP-2001-364
For Transmission Service
Requested By
Empire District Electric Company***

From SECI To EDE

***For a Reserved Amount Of 150 MW
From 3/1/06
To 4/1/08***

SPP Tariff Studies

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ATTACHMENT: *SPP-2001-364 Tables*

1. Executive Summary

Empire District Electric Company (EDE) has requested a system impact study for Network Service from a New Designated Network Resource in the SECI Control Area for 150 MW to serve EDE Network Load in the EDE Control Area. The period of the service is from 3/1/06 to 4/1/08. The SWPP OASIS Reservation number is 318877.

This study is a revision to a previous study conducted for this service using PTI's MUST FCITC DC Analysis where numerous limiting facilities were identified. The principal objective of this study is to identify current system limitations using AC analyses and to determine the system upgrades necessary to provide the requested service.

The Network Service was modeled as a 150 MW transfer from the New Designated Network Resource to existing EDE Network Resources in the EDE Control Area. The SECI to EDE 150 MW transfer was studied using two System Scenarios and causes new facility overloads on the SPP transmission system, as well as increasing the loading on previously overloaded facilities. Tables 1.1, 2.1, 3.1 and 4.1 summarize the results of the Scenario 1 system impact analyses. Tables 1.2, 2.2, 3.2 and 4.2 summarize the results of the Scenario 2 system impact analyses.

Tables 1.1 and 1.2 list the SPP Facility Overloads caused or impacted by the requested service and include solutions with engineering and construction costs to alleviate the limiting facilities. Tables 2.1 and 2.2 include Non - SPP Facility Overloads caused or impacted by the requested service. Tables 3.1 and 3.2 list the SPP Facility Overloads caused or impacted by modeling the selected upgrades to be assigned and include solutions with engineering and construction costs to alleviate the limiting facilities. Tables 4.1 and 4.2 list the Non - SPP Facility Overloads caused or impacted by modeling the selected upgrades to be assigned. Excluding any third party requirements, the total engineering and construction cost to provide the requested service may be determined by summing the total costs shown in Tables 1.1, 1.2, 3.1, and 3.2. For Non-SPP third-party facilities listed in Tables 2.1, 2.2, 4.1, and 4.2, the facility limitations will be mitigated in accordance with Section 21 of the SWPP OATT.

Excluding any third party requirements, the total engineering and construction cost required to provide the requested service is \$61,518,500. The ATC is determined to be zero until the majority of the assigned upgrades are constructed. The estimated in-service date of the upgrades to alleviate the most limiting Summer Peak and Winter Peak facilities is 5/1/2006. Four facilities were identified that limit the renewal rights of the requested service. A facility study may now be conducted to summarize the operating limits and to determine the financial characteristics associated with the requested service.

2. Introduction

Empire District Electric Company (EDE) has requested a system impact study for Network Service from a New Designated Network Resource in the SECI Control Area for 150 MW to serve EDE 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 Network Service and determine the least cost solutions required to alleviate the limiting facilities.

The Network Service was modeled as a 150 MW transfer from the New Designated Network Resource to existing EDE Network Resources in the EDE Control Area. The SECI to EDE 150 MW transfer was studied using two System Scenarios. The first scenario includes SWPP OASIS transmission requests not already included in the SPP 2003 Series Cases flowing in a West to East direction with the Southwestern Public Service (SPS) Control Area exporting to outside control areas and exporting to the planned Lamar HVDC Tie. The second scenario includes transmission requests not already included in the SPP 2003 Series Cases flowing in an East to West direction with SPS importing from an outside control area and importing from the planned Lamar HVDC Tie. The two scenarios were studied to capture system limitations dependent on the flow direction of the Lamar HVDC Tie to and from SPS and possible system conditions dictated by the energy market.

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 150 MW transfer and the impact of the required upgrades for service on transmission line loading and transmission bus voltages for 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 150 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.

B. Model Updates

SPP used seven seasonal models to study the SECI to EDE 150 MW transfer for the requested service period. The SPP 2003 Series Cases 2004 April Minimum (04AP), 2004 Spring Peak (04G), 2004 Summer Peak (04SP), 2004 Fall Peak (04FA), 2004 Winter Peak (04WP), 2009 Summer Peak (09SP), and 2009/10 Winter Peak (09WP) were used to study the impact of the 150 MW transfer on the SPP system during the requested service period of 3/1/06 to 4/1/08 and deferred service period of 5/1/06 to 6/1/2008.

The chosen base case models were modified to reflect the most current modeling information. The Lamar HVDC Tie and Designated Network Resource were added to the 2004 models coupled with the 2009 models as a proxy for the study years not included in the SPP 2003 Series Cases. From the seven seasonal models, two system scenarios were developed. Scenario 1 includes confirmed West to East transfers not already included in the January 2003 base case series models, SPS Exporting, and the Lamar HVDC Tie flowing from SPS to Lamar. Scenario 2 includes confirmed East to West transfers not already included in the January 2003 base case series models, SPS Importing, and the Lamar HVDC Tie flowing from Lamar to SPS.

C. Transfer Analysis

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

D. Upgrade Analysis

Using the 2009 Summer Peak and 2009/10 Winter Peak cases both with and without the assigned upgrades modeled, the PSS/E Activity ACCC was run on the cases and compared to determine the facility overloads caused or impacted by the assigned upgrades. The PSS/E options chosen to conduct the analysis can be found in Appendix A.

4. Study Results

A. Study Analysis Results

Table sets 1, 2, 3, and 4 contain the steady-state analysis results of the System Impact Study. The Tables are in the attached workbook *SPP-2001-364 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 studied transfer and assigned upgrades modeled, and the estimated ATC value using interpolation 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.

Tables 1.1 and 1.2 list the SPP Facility Overloads caused or impacted by the 150 MW transfer, using Scenario 1 and 2 respectively. Solutions with engineering and construction costs are provided in the tables.

Tables 2.1 and 2.2 list overloads on first tier Non - SPP Regional Tariff participants' transmission systems caused or impacted by the 150 MW transfer, using Scenario 1 and 2 respectively. Comments are provided in the tables. Analysis was not conducted to determine the mitigating effects of the selected upgrades on the Non – SPP facilities listed in Tables 2.1 and 2.2.

Tables 3.1 and 3.2 list additional SPP Facility Overloads caused or impacted by modeling the assigned upgrades from Tables 1.1 and 1.2, using Scenario 1 and 2 respectively. Solutions with engineering and construction costs are provided in the table. Subsequent upgrade solutions identified due to previous upgrades were also modeled to determine system impact.

Tables 4.1 and 4.2 list additional Non - SPP facility overloads caused or impacted by modeling the final set of assigned upgrades from Tables 1.1, 1.2, 3.1, and 3.2. Comments are provided in the table.

Tables 1.1a, 1.2a, 3.1a, and 3.2a document the modeling representation of the events identified in Tables 1.1, 1.2, 3.1, and 3.2 respectively to include bus numbers and bus names.

Four facilities were identified as limiting the rollover rights of the transmission service. These facilities can be found in Tables 1.1 and 1.2. The date provided with these identified limitations depicts at which point the facility is a limitation for the renewal of the requested transmission service.

5. Conclusion

The SECI to EDE 150 MW Network Service request causes new facility overloads on the SPP transmission system, as well as increasing the loading on previously overloaded facilities. Excluding any third party requirements, the total engineering and construction cost required to provide the requested service is \$61,518,500. The ATC is determined to be zero until the majority of the assigned upgrades are constructed. The estimated in-service date of the upgrades to alleviate the most limiting Summer Peak and Winter Peak facilities is 5/1/2006. Four facilities were identified that limit the renewal rights of the requested service. A facility study may now be conducted to summarize the operating limits and to determine the financial characteristics associated with the requested 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 - 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. Excl'd 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 - Phase shift adjustment
 - Flat start
 - Lock DC taps
 - Lock switched shunts

Study Year	From Area	To Area	Monitored Branch Over 100% Rate B	Rate	BC % Loading	TC % Loading	ATC (MW)	Outaged Branch Causing Overload	Solution	Cost
04AP	WFEC	WFEC	CARTER JCT - DILL JCT 69KV	26	99.1	103.9	29	ELK CITY - MOREWOOD SW 138KV CKT 1	Current WFEC Work Plan to Reconductor from 4/0 to 795 - Complete by 2004 Winter	-
04G	WERE	WERE	ATHENS SS - COFFEY COUNTY NO. 4 VERNON 69KV	45	105.2	108.4	0	LACYGNE - WOLF CREEK 345KV CKT 1	Westar Transmission Operating Directive 1304, Overload of the Athens to Wolf Creek 69 kV Line	-
04G	WERE	WERE	AUBURN ROAD - JEFFREY ENERGY CENTER 230KV	565	104.6	105.5	0	HOYT - JEFFERY ENERGY CENTER 345KV CKT 1	Westar Transmission Operating Directive 400, Outage of the Jeffrey Energy Center to Hoyt 345 kV line	-
04G	WERE	WERE	AUBURN ROAD - SOUTH GAGE (WEST) 115KV	75	111.1	112.8	0	HOYT - JEFFERY ENERGY CENTER 345KV CKT 1	*	-
04G	WERE	WERE	AUBURN ROAD - SOUTH GAGE (WEST) 115KV CKT 2	97	101.5	103.0	0	HOYT - JEFFERY ENERGY CENTER 345KV CKT 1	*	-
04G	WFEC	WFEC	CARTER JCT - DILL JCT 69KV	26	100.4	105.5	0	ELK CITY - MOREWOOD SW 138KV CKT 1	Current WFEC Work Plan to Reconductor from 4/0 to 795 - Complete by 2004 Winter	-
04G	WERE	WERE	COFFEY COUNTY NO. 4 VERNON - GREEN 69KV	45	106.5	109.7	0	LACYGNE - WOLF CREEK 345KV CKT 1	Westar Transmission Operating Directive 1304, Overload of the Athens to Wolf Creek 69 kV Line	-
04G	AEPW	AEPW	ELK CITY 230/138KV TRANSFORMER	263	101.3	111.3	0	TUCO INTERCHANGE 345/230KV TRANSFORMER CKT 1	Replace free standing metering CT. Replace switches 1302, 1303, 1306, & 1307. Changeout breaker 1305A	300,000
04G	AEPW	AEPW	ELK CITY 230/138KV TRANSFORMER	263	101.3	111.2	0	OKLAUNION - TUCO INTERCHANGE 345KV CKT 1	See Previous	See Previous
04G	AEPW	AEPW	ELK CITY 230/138KV TRANSFORMER	263	101.3	111.2	0	Multiple Outage Contingency: OKLAUNION - TUCO INTERCHANGE 345KV CKT 1 TUCO INTERCHANGE 345/230KV TRANSFORMER CKT 1	*	*
04G	WERE	WERE	COFFEY COUNTY NO. 4 VERNON - GREEN 69KV	45	99.2	102.3	39	ROSE HILL - WOLF CREEK 345KV CKT 1	Westar Transmission Operating Directive 1304, Overload of the Athens to Wolf Creek 69 kV Line	-
04G	WERE	WERE	COFFEY COUNTY NO. 4 VERNON - GREEN 69KV	45	99.0	102.1	47	BENTON - WOLF CREEK 345KV CKT 1	*	-
04G	WERE	WERE	ATHENS SS - COFFEY COUNTY NO. 4 VERNON 69KV	45	97.9	101.0	102	ROSE HILL - WOLF CREEK 345KV CKT 1	Westar Transmission Operating Directive 1304, Overload of the Athens to Wolf Creek 69 kV Line	-
04G	WERE	WERE	ATHENS SS - COFFEY COUNTY NO. 4 VERNON 69KV	45	97.7	100.8	112	BENTON - WOLF CREEK 345KV CKT 1	*	-
04SP	AEPW	AEPW	CHAMBER SPRINGS - TONTITOWN 161KV	247	138.4	140.2	0	CHAMBER SPRINGS - FARMINGTON AECC 161KV CKT 1	345 kV Project for NW Arkansas: Build 20 mile Flint Creek - East Centerton 345 kV line with East Centerton 345/161 kV auto transformer	20,200,000
04SP	AEPW	AEPW	CHAMBER SPRINGS - TONTITOWN 161KV	247	130.8	132.1	0	FLINT CREEK - TONTITOWN 161KV CKT 1	Relieved or Impact Removed by Selected Upgrades to be Assigned, Modeled in 09SP	-
04SP	AEPW	AEPW	CHAMBER SPRINGS - TONTITOWN 161KV	247	126.2	128.0	0	FARMINGTON AECC - SOUTH FAYETTEVILLE 161KV CKT 1	*	-
04SP	AEPW	AEPW	CHAMBER SPRINGS - TONTITOWN 161KV	247	107.4	109.0	0	FLINT CREEK - GENTRY REC 161KV CKT 1	*	-
04SP	AEPW	AEPW	CHAMBER SPRINGS - TONTITOWN 161KV	247	106.6	108.2	0	EAST CENTERTON - GENTRY REC 161KV CKT 1	*	-
04SP	GRRD	GRRD	CLAREMORE 161/69KV TRANSFORMER CKT 1	84	103.6	105.0	0	CLAREMORE 161/69KV TRANSFORMER CKT 2	Add 3rd 161/69 KV Transformer	1,250,000
04SP	GRRD	GRRD	CLAREMORE 161/69KV TRANSFORMER CKT 2	84	103.6	105.0	0	CLAREMORE 161/69KV TRANSFORMER CKT 1	See Previous	See Previous
04SP	AEPW	AEPW	EAST CENTERTON - GENTRY REC 161KV	353	109.2	109.6	0	FLINT CREEK - TONTITOWN 161KV CKT 1	Relieved or Impact Removed by Selected Upgrades to be Assigned, Modeled in 09SP	-
04SP	AEPW	AEPW	EAST CENTERTON - GENTRY REC 161KV	305	101.0	101.5	0	Base Case	Relieved or Impact Removed by Selected Upgrades to be Assigned, Modeled in 09SP	-
04SP	AEPW	AEPW	FLINT CREEK - GENTRY REC 161KV	354	111.2	111.7	0	FLINT CREEK - TONTITOWN 161KV CKT 1	Relieved or Impact Removed by Selected Upgrades to be Assigned, Modeled in 09SP	-
04SP	AEPW	AEPW	FLINT CREEK - GENTRY REC 161KV	304	104.1	104.7	0	Base Case	*	-
04SP	AEPW	AEPW	FLINT CREEK - GENTRY REC 161KV	354	102.1	102.8	0	LOWELL - TONTITOWN 161KV CKT 1	*	-
04SP	AEPW	AEPW	FLINT CREEK - TONTITOWN 161KV	312	113.2	113.7	0	CHAMBER SPRINGS 345/161KV TRANSFORMER CKT 1	Relieved or Impact Removed by Selected Upgrades to be Assigned, Modeled in 09SP	-
04SP	AEPW	AEPW	FLINT CREEK - TONTITOWN 161KV	312	113.2	113.7	0	CHAMBER SPRINGS - CLARKSVILLE 345KV CKT 1	*	-
04SP	WERE	WERE	LAWRENCE HILL 230/115/13.8KV TRANSFORMER	308	114.4	115.3	0	LAWRENCE HILL - MIDLAND JCT 230KV	Westar Transmission Operating Directive 901, Outage of the Lawrence Hill-Midland Junction 230kV Line	-
04SP	WERE	WERE	LAWRENCE HILL 230/115/13.8KV TRANSFORMER	308	114.4	115.3	0	MIDLAND JCT 230/115/118.0KV TRANSFORMER	Westar Transmission Operating Directive 615, Loss of the Midland Junction 230/115 kV transformer	-
04SP	WERE	WERE	LAWRENCE HILL 230/115/13.8KV TRANSFORMER	308	111.9	112.8	0	LAWRENCE HILL - MIDLAND JCT 230KV	Westar Transmission Operating Directive 901, Outage of the Lawrence Hill-Midland Junction 230kV Line	-
04SP	WERE	WERE	LAWRENCE HILL 230/115/13.8KV TRANSFORMER	308	111.9	112.7	0	MIDLAND JCT 230/115/118.0KV TRANSFORMER	Westar Transmission Operating Directive 615, Loss of the Midland Junction 230/115 kV transformer	-
04SP	WERE	WERE	MIDLAND JCT 230/115/18KV TRANSFORMER	308	102.2	103.0	0	LAWRENCE HILL 230/115/13.8KV TRANSFORMER	Westar Transmission Operating Directive 631, Loss of the Lawrence Hill 230/115kV Transformer	-
04SP	WERE	WERE	MIDLAND JCT 230/115/18KV TRANSFORMER	308	100.9	101.6	0	LAWRENCE HILL 230/115/13.8KV TRANSFORMER	*	-
04SP	AEPW	AEPW	ORU WEST TAP - RIVERSIDE STATION 138KV	304	101.0	101.7	0	Multiple Outage Contingency with Load Throwover: 53795 R.S.-4138 to 53863 ORU ETP4138 CKT 1 53863 ORU ETP4138 to 53749 ORU E4138 CKT 1 53863 ORU ETP4138 to 53873 WARNTAP4138 CKT 1 53873 WARNTAP4138 53822 81YALES4138 CKT 1 53873 WARNTAP4138 to 53861 96	Replace wavetraps jumpers @ Riverside	10,000
04SP	AEPW	AEPW	FLINT CREEK - GENTRY REC 161KV	354	100.0	100.6	7	LOWELL - ROGERS 161KV CKT 1	Relieved or Impact Removed by Selected Upgrades to be Assigned, Modeled in 09SP	-

Table 1.1 - SPP Facility Overloads
Caused or Impacted by Transfer (Scenario 1)

Southwest Power Pool
System Impact Study

Study Year	From Area	To Area	Monitored Branch Over 100% Rate B	Rate	BC % Loading	TC % Loading	ATC (MW)	Outaged Branch Causing Overload	Solution	Cost
04SP	AEPW	AEPW	EAST CENTERTON - GENTRY REC 161KV	353	99.9	100.7	12	LOWELL - TONTITOWN 161KV CKT 1	Relieved or Impact Removed by Selected Upgrades to be Assigned, Modeled in 09SP	-
04SP	WFEC	WFEC	CARTER JCT - DILL JCT 69KV	26	99.3	101.6	43	BRANTLEY - MORWOOD 69KV CKT 1	Current WFEC Work Plan to Reconductor from 4/0 to 795 - Complete by 2004 Winter	-
04SP	AEPW	AEPW	ELK CITY 230/138KV TRANSFORMER	263	96.7	106.9	49	TUCO INTERCHANGE 345/230KV TRANSFORMER CKT 1	See Previous	See Previous
04SP	AEPW	AEPW	ELK CITY 230/138KV TRANSFORMER	263	96.6	106.8	50	OKLAUNION - TUCO INTERCHANGE 345KV CKT 1	"	"
04SP	AEPW	AEPW	ELK CITY 230/138KV TRANSFORMER	263	96.6	106.8	50	Multiple Outage Contingency: OKLAUNION - TUCO INTERCHANGE 345KV CKT 1 TUCO INTERCHANGE 345/230KV TRANSFORMER CKT 1	"	"
04SP	GRRD	GRRD	AFTON 161/69KV TRANSFORMER	50	95.0	102.3	103	AFTON - MIAMI 161KV CKT 1	09SP loading is 94.3% with selected upgrades, Exclude Facility Due to Facility not being overloaded during Deferral Period, Starting 5/1/2006 and Ending 6/1/2008	-
04SP	AEPW	AEPW	CHAMBER SPRINGS - FARMINGTON AECC 161KV	335	99.4	100.2	111	CHAMBER SPRINGS - TONTITOWN 161KV CKT 1	Relieved or Impact Removed by Selected Upgrades to be Assigned, Modeled in 09SP	-
04SP	WERE	WERE	166TH STREET - JARBALO JCT SS 115KV	97	98.6	100.2	128	MIDLAND JUNCTION - PENTAGON 115KV CKT 1	Westar Transmission Operating Directive 1202, Overload of the Jarbalo to Jaggard 115KV Line	-
04SP	AEPW	WFEC	ELDORADO - LAKE PAULINE 69KV	20	97.7	100.4	130	ANADARKO - PARADISE 138KV CKT 1	AEPW: Reset CTs @ Lake Pauline	10,000
04SP	WFEC	WFEC	CARTER JCT - DILL JCT 69KV	26	98.3	100.1	138	GOTEBO - MOUNTAIN VIEW 69KV CKT 1	Current WFEC Work Plan to Reconductor from 4/0 to 795 - Complete by 2004 Winter	-
04SP	SWPA	SPRM	BROOKLINE - SPRINGFIELD 161KV	323	96.9	100.1	144	SOUTHWEST - SOUTHWEST DISPOSAL 161KV CKT 1	Relieved or Impact Removed by Selected Upgrades to be Assigned, Modeled in 09SP	-
04FA	WERE	WERE	AUBURN ROAD - JEFFREY ENERGY CENTER 230KV	565	102.1	103.5	0	HOYT - JEFFERY ENERGY CENTER 345KV CKT 1	Westar Transmission Operating Directive 400, Outage of the Jeffrey Energy Center to Hoyt 345 kV line	-
04FA	OKGE	OKGE	CIMARRON - CZECH HALL 138KV	287	100.8	101.7	0	CIMARRON - HAYMAKER 138KV CKT 1	Updated Emergency Rating, 382 MVA	-
04FA	AEPW	AEPW	ELK CITY 230/138KV TRANSFORMER	263	100.7	111.3	0	TUCO INTERCHANGE 345/230KV TRANSFORMER CKT 1	See Previous	See Previous
04FA	AEPW	AEPW	ELK CITY 230/138KV TRANSFORMER	263	100.7	111.1	0	OKLAUNION - TUCO INTERCHANGE 345KV CKT 1	"	"
04FA	AEPW	AEPW	ELK CITY 230/138KV TRANSFORMER	263	100.7	111.1	0	Multiple Outage Contingency: OKLAUNION - TUCO INTERCHANGE 345KV CKT 1 TUCO INTERCHANGE 345/230KV TRANSFORMER CKT 1	"	"
04FA	WERE	WERE	COFFEY COUNTY NO. 4 VERNON - GREEN 69KV	45	99.3	102.6	32	LACYGNE - WOLF CREEK 345KV CKT 1	Westar Transmission Operating Directive 1304, Overload of the Athens to Wolf Creek 69 kV Line	-
04FA	WFEC	WFEC	CARTER JCT - DILL JCT 69KV	26	97.3	102.3	80	ELK CITY - MOREWOOD SW 138KV CKT 1	Current WFEC Work Plan to Reconductor from 4/0 to 795 - Complete by 2004 Winter	-
04FA	WERE	WERE	ATHENS SS - COFFEY COUNTY NO. 4 VERNON 69KV	45	98.0	101.3	93	LACYGNE - WOLF CREEK 345KV CKT 1	Westar Transmission Operating Directive 1304, Overload of the Athens to Wolf Creek 69 kV Line	-
04FA	OKGE	OKGE	CIMARRON - CZECH HALL 138KV	287	99.3	100.2	117	DIVISION AVE - HAYMAKER 138KV CKT 1	Updated Emergency Rating, 382 MVA	-
04WP	WERE	WERE	AUBURN ROAD - JEFFREY ENERGY CENTER 230KV	565	102.8	104.2	0	HOYT - JEFFERY ENERGY CENTER 345KV CKT 1	Westar Transmission Operating Directive 400, Outage of the Jeffrey Energy Center to Hoyt 345 kV line	-
04WP	AEPW	AEPW	CHAMBER SPRINGS - TONTITOWN 161KV	275	101.6	103.1	0	CHAMBER SPRINGS - FARMINGTON AECC 161KV CKT 1	Relieved or Impact Removed by Selected Upgrades to be Assigned, Modeled in 09WP	-
04WP	AEPW	AEPW	ELK CITY 230/138KV TRANSFORMER	263	97.5	107.3	38	TUCO INTERCHANGE 345/230KV TRANSFORMER CKT 1	See Previous	See Previous
04WP	AEPW	AEPW	ELK CITY 230/138KV TRANSFORMER	263	97.5	107.3	38	OKLAUNION - TUCO INTERCHANGE 345KV CKT 1	"	"
04WP	AEPW	AEPW	ELK CITY 230/138KV TRANSFORMER	263	97.5	107.3	38	Multiple Outage Contingency: OKLAUNION - TUCO INTERCHANGE 345KV CKT 1 TUCO INTERCHANGE 345/230KV TRANSFORMER CKT 1	"	"
09SP	OKGE	OKGE	5 TRIBES - PECAN CREEK 161KV	223	102.3	103.4	0	AGENCY - PECAN CREEK 161KV CKT 1	May be able to increase CTR (if relays will coordinate) at Five Tribes sub.	5,000
09SP	WERE	WERE	AUBURN ROAD - JEFFREY ENERGY CENTER 230KV	565	111.6	113.3	0	HOYT - JEFFERY ENERGY CENTER 345KV CKT 1	Westar Transmission Operating Directive 400, Outage of the Jeffrey Energy Center to Hoyt 345 kV line	-
09SP	WERE	WERE	AUBURN ROAD 230/115/13.8KV TRANSFORMER	308	120.5	121.0	0	HOYT - JEFFERY ENERGY CENTER 345KV CKT 1	Westar Transmission Operating Directive 400, Outage of the Jeffrey Energy Center to Hoyt 345 kV line	-
09SP	WERE	WERE	AUBURN ROAD 230/115/13.8KV TRANSFORMER	308	119.3	119.8	0	HOYT - JEFFERY ENERGY CENTER 345KV CKT 1	"	-
09SP	SPRM	SPRM	BATTLEFIELD - SOUTHWEST DISPOSAL 161KV	358	100.0	102.1	0	BROOKLINE - SPRINGFIELD 161KV CKT 1	Relieved and Impact Removed by Selected Upgrades to be Assigned	-
09SP	SWPA	SPRM	BROOKLINE - SPRINGFIELD 161KV	323	128.6	131.7	0	SOUTHWEST - SOUTHWEST DISPOSAL 161KV CKT 1	Impact Removed by Selected Upgrades to be Assigned	-
09SP	SWPA	SPRM	BROOKLINE - SPRINGFIELD 161KV	323	127.7	130.9	0	BATTLEFIELD - SOUTHWEST DISPOSAL 161KV CKT 1	"	-
09SP	SWPA	SPRM	BROOKLINE - SPRINGFIELD 161KV	323	118.7	121.2	0	BROOKLINE - JUNCTION 161KV CKT 1	"	-
09SP	SWPA	SPRM	BROOKLINE - SPRINGFIELD 161KV	323	105.1	108.5	0	BATTLEFIELD - SPRINGFIELD 161KV CKT 1	"	-
09SP	SWPA	SPRM	BROOKLINE - SPRINGFIELD 161KV	323	101.7	104.3	0	JUNCTION - NICHOLS 161KV CKT 1	"	-
09SP	AEPW	AEPW	CHAMBER SPRINGS - FARMINGTON AECC 161KV	335	121.8	122.6	0	CHAMBER SPRINGS - TONTITOWN 161KV CKT 1	Impact Removed by Selected Upgrades to be Assigned	-
09SP	AEPW	AEPW	CHAMBER SPRINGS - FARMINGTON AECC 161KV	335	112.9	113.4	0	FLINT CREEK - TONTITOWN 161KV CKT 1	"	-
09SP	AEPW	AEPW	CHAMBER SPRINGS - FARMINGTON AECC 161KV	335	112.7	113.3	0	FLINT CREEK - GENTRY REC 161KV CKT 1	Relieved and Impact Removed by Selected Upgrades to be Assigned	-
09SP	AEPW	AEPW	CHAMBER SPRINGS - FARMINGTON AECC 161KV	335	111.9	112.5	0	EAST CENTERTON - GENTRY REC 161KV CKT 1	"	-

Table 1.1 - SPP Facility Overloads
Caused or Impacted by Transfer (Scenario 1)

Southwest Power Pool
System Impact Study

Study Year	From Area	To Area	Monitored Branch Over 100% Rate B	Rate	BC % Loading	TC % Loading	ATC (MW)	Outaged Branch Causing Overload	Solution	Cost
09SP	AEPW	AEPW	CHAMBER SPRINGS - FARMINGTON AECC 161KV	335	104.7	105.2	0	ELM SPRINGS REC - TONTITOWN 161KV CKT 1	-	-
09SP	AEPW	AEPW	CHAMBER SPRINGS - FLINT CREEK 161KV	335	110.6	111.0	0	CHAMBER SPRINGS 345/161KV TRANSFORMER CKT 1	Relieved and Impact Removed by Selected Upgrades to be Assigned	-
09SP	AEPW	AEPW	CHAMBER SPRINGS - FLINT CREEK 161KV	335	110.6	111.0	0	CHAMBER SPRINGS - CLARKSVILLE 345KV CKT 1	-	-
09SP	AEPW	AEPW	CHAMBER SPRINGS - TONTITOWN 161KV	244	173.7	175.6	0	CHAMBER SPRINGS - FARMINGTON AECC 161KV CKT 1	Impact Removed by Selected Upgrades to be Assigned	-
09SP	AEPW	AEPW	CHAMBER SPRINGS - TONTITOWN 161KV	244	161.6	163.0	0	FLINT CREEK - TONTITOWN 161KV CKT 1	-	-
09SP	AEPW	AEPW	CHAMBER SPRINGS - TONTITOWN 161KV	244	156.4	158.3	0	FARMINGTON AECC - SOUTH FAYETTEVILLE 161KV CKT 1	-	-
09SP	AEPW	AEPW	CHAMBER SPRINGS - TONTITOWN 161KV	244	135.9	137.6	0	FLINT CREEK - GENTRY REC 161KV CKT 1	Relieved and Impact Removed by Selected Upgrades to be Assigned	-
09SP	AEPW	AEPW	CHAMBER SPRINGS - TONTITOWN 161KV	244	134.4	136.0	0	EAST CENTERTON - GENTRY REC 161KV CKT 1	-	-
09SP	GRRD	GRRD	CLAREMORE 161/69KV TRANSFORMER CKT 1	84	108.7	110.1	0	CLAREMORE 161/69KV TRANSFORMER CKT 2	See Previous	See Previous
09SP	GRRD	GRRD	CLAREMORE 161/69KV TRANSFORMER CKT 2	84	109.0	110.4	0	CLAREMORE 161/69KV TRANSFORMER CKT 1	-	-
09SP	KACP	KACP	COLLEGE - CRAIG 161KV	335	105.4	105.8	0	ANTIOCH - STILLWELL 161KV CKT 1	Limits Rollover Rights 6/1/2008	-
09SP	KACP	KACP	COLLEGE - CRAIG 161KV	335	103.3	104.2	0	BROOKRIDGE - OVERLAND PARK 161KV CKT 1	Limits Rollover Rights 6/1/2009	-
09SP	KACP	KACP	COLLEGE - CRAIG 161KV	335	100.8	101.4	0	MOONLIGHT - WEST GARDNER 161KV CKT 1	Limits Rollover Rights 6/1/2009	-
09SP	AEPW	AEPW	EAST CENTERTON - GENTRY REC 161KV	353	132.7	133.2	0	FLINT CREEK - TONTITOWN 161KV CKT 1	Relieved and Impact Removed by Selected Upgrades to be Assigned	-
09SP	AEPW	AEPW	EAST CENTERTON - GENTRY REC 161KV	353	119.6	120.4	0	LOWELL - TONTITOWN 161KV CKT 1	-	-
09SP	AEPW	AEPW	EAST CENTERTON - GENTRY REC 161KV	353	117.1	117.7	0	CHAMBER SPRINGS - FARMINGTON AECC 161KV CKT 1	-	-
09SP	AEPW	AEPW	EAST CENTERTON - GENTRY REC 161KV	353	116.8	117.6	0	LOWELL - ROGERS 161KV CKT 1	-	-
09SP	AEPW	AEPW	EAST CENTERTON - GENTRY REC 161KV	353	114.1	114.7	0	CHAMBER SPRINGS - TONTITOWN 161KV CKT 1	-	-
09SP	AEPW	WFEC	ELDORADO - LAKE PAULINE 69KV	20	106.8	109.2	0	ANADARKO - PARADISE 138KV CKT 1	See Previous	See Previous
09SP	AEPW	AEPW	ELM SPRINGS REC - TONTITOWN 161KV	335	116.8	117.1	0	CHAMBER SPRINGS - FARMINGTON AECC 161KV CKT 1	Impact Removed by Selected Upgrades to be Assigned	-
09SP	AEPW	AEPW	ELM SPRINGS REC - TONTITOWN 161KV	335	106.1	106.4	0	FARMINGTON AECC - SOUTH FAYETTEVILLE 161KV CKT 1	Relieved and Impact Removed by Selected Upgrades to be Assigned	-
09SP	WERE	WERE	FARMER'S CONSUMER CO-OP - WAKARUSA JCT SS 115KV	92	101.4	102.9	0	SOUTHWEST LAWRENCE - WAKARUSA JCT SS 115KV CKT 1	Limits Rollover Rights 6/1/2008	-
09SP	AEPW	AEPW	FARMINGTON AECC - SOUTH FAYETTEVILLE 161KV	313	108.8	109.8	0	CHAMBER SPRINGS - TONTITOWN 161KV CKT 1	Relieved and Impact Removed by Selected Upgrades to be Assigned	-
09SP	AEPW	AEPW	FLINT CREEK - GENTRY REC 161KV	354	135.5	136.0	0	FLINT CREEK - TONTITOWN 161KV CKT 1	Relieved and Impact Removed by Selected Upgrades to be Assigned	-
09SP	AEPW	AEPW	FLINT CREEK - GENTRY REC 161KV	354	122.5	123.3	0	LOWELL - TONTITOWN 161KV CKT 1	-	-
09SP	AEPW	AEPW	FLINT CREEK - GENTRY REC 161KV	354	120.0	120.6	0	CHAMBER SPRINGS - FARMINGTON AECC 161KV CKT 1	-	-
09SP	AEPW	AEPW	FLINT CREEK - GENTRY REC 161KV	354	119.7	120.4	0	LOWELL - ROGERS 161KV CKT 1	-	-
09SP	AEPW	AEPW	FLINT CREEK - GENTRY REC 161KV	354	117.0	117.7	0	CHAMBER SPRINGS - TONTITOWN 161KV CKT 1	-	-
09SP	AEPW	AEPW	FLINT CREEK - TONTITOWN 161KV	312	139.6	140.2	0	CHAMBER SPRINGS 345/161KV TRANSFORMER CKT 1	Impact Removed by Selected Upgrades to be Assigned	-
09SP	AEPW	AEPW	FLINT CREEK - TONTITOWN 161KV	312	139.6	140.2	0	CHAMBER SPRINGS - CLARKSVILLE 345KV CKT 1	-	-
09SP	AEPW	AEPW	FLINT CREEK - TONTITOWN 161KV	312	138.9	139.3	0	CHAMBER SPRINGS - TONTITOWN 161KV CKT 1	-	-
09SP	AEPW	AEPW	FLINT CREEK - TONTITOWN 161KV	312	107.8	108.2	0	FLINT CREEK - SUB 392 - DECATUR SOUTH 161KV CKT 1	Relieved and Impact Removed by Selected Upgrades to be Assigned	-
09SP	AEPW	AEPW	FLINT CREEK - TONTITOWN 161KV	312	105.1	105.4	0	SUB 184 - NEOSHO SOUTH JCT. - SUB 435 - NOEL SW 161KV CKT 1	-	-
09SP	WFEC	OKGE	FRANKLIN SW - MIDWEST TAP 138KV	215	107.7	108.2	0	POCASSETT - TUTTLE 138KV CKT 1	Impact Removed by Selected Upgrades to be Assigned	-
09SP	WFEC	OKGE	FRANKLIN SW - MIDWEST TAP 138KV	215	103.4	103.9	0	SUNSHINE CANYON - TUTTLE 138KV CKT 1	-	-
09SP	ENTR	SWPA	JONES - JONESBORO 161KV	223	111.3	111.9	0	KENNETT - NEW MADRID 161KV CKT 1	Line belongs to Entergy. SWPA terminal equipment is good for 900 amps.	-
09SP	ENTR	SWPA	JONES - JONESBORO 161KV	223	102.2	102.8	0	KENNETT - PARAGOULD 161KV CKT 1	-	-
09SP	WERE	WERE	LAWRENCE HILL 230/115/13.8KV TRANSFORMER	308	114.4	115.1	0	LAWRENCE HILL - MIDLAND JCT 230KV	Westar Transmission Operating Directive 901, Outage of the Lawrence Hill-Midland Junction 230kV Line	-
09SP	WERE	WERE	LAWRENCE HILL 230/115/13.8KV TRANSFORMER	308	114.2	115.0	0	MIDLAND JCT 230/115/118.0KV TRANSFORMER	Westar Transmission Operating Directive 615, Loss of the Midland Junction 230/115 kV transformer	-
09SP	WERE	WERE	LAWRENCE HILL 230/115/13.8KV TRANSFORMER	308	111.9	112.6	0	LAWRENCE HILL - MIDLAND JCT 230KV	Westar Transmission Operating Directive 901, Outage of the Lawrence Hill-Midland Junction 230kV Line	-
09SP	WERE	WERE	LAWRENCE HILL 230/115/13.8KV TRANSFORMER	308	111.7	112.4	0	MIDLAND JCT 230/115/118.0KV TRANSFORMER	Westar Transmission Operating Directive 615, Loss of the Midland Junction 230/115 kV transformer	-
09SP	WERE	WERE	MIDLAND JCT 230/115/18KV TRANSFORMER	308	102.2	102.9	0	LAWRENCE HILL 230/115/13.8KV TRANSFORMER	Westar Transmission Operating Directive 631, Loss of the Lawrence Hill 230/115kV Transformer	-
09SP	WERE	WERE	MIDLAND JCT 230/115/18KV TRANSFORMER	308	100.6	101.3	0	LAWRENCE HILL 230/115/13.8KV TRANSFORMER	-	-
09SP	AEPW	AEPW	ORU WEST TAP - RIVERSIDE STATION 138KV	304	114.7	115.4	0	Multiple Outage Contingency with Load Throwover: 53795 R.S.S.-4138 to 53863 ORU ETP4138 CKT 1 53863 ORU ETP4138 to 53749 ORU E4138 CKT 1 53863 ORU ETP4138 to 53873 WARNTAP4138 CKT 1 53873 WARNTAP4138 53822 81YALES4138 CKT 1 53873 WARNTAP4138 to 53861 96	See Previous	See Previous
09SP	OKGE	OKGE	PECAN CREEK 345/161KV TRANSFORMER	369	107.6	108.5	0	CLARKSVILLE - MUSKOGEE 345KV CKT 1	Add 2nd 345/161 kV 369MVA transformer.	3,000,000
09SP	OKGE	OKGE	PECAN CREEK 345/161KV TRANSFORMER	369	107.0	107.4	0	FT SMITH - MUSKOGEE 345KV CKT 1	See Previous	See Previous

Table 1.1 - SPP Facility Overloads
Caused or Impacted by Transfer (Scenario 1)

Southwest Power Pool
System Impact Study

Study Year	From Area	To Area	Monitored Branch Over 100% Rate B	Rate	BC % Loading	TC % Loading	ATC (MW)	Outaged Branch Causing Overload	Solution	Cost
09SP	WFEC	SWPA	PHAROAH - WELEETKA 138KV	191	106.4	106.9	0	FRANKLIN - FRANKLIN SW 138KV CKT 1	WFEC: Replace wavetraps at Weleetka and replace jumpers. SWPA: Replace metering CT's at Weleetka.	135,000
09SP	SPRM	SPRM	SOUTHWEST - SOUTHWEST DISPOSAL 161KV	358	101.2	103.2	0	BROOKLINE - SPRINGFIELD 161KV CKT 1	Impact Removed by Selected Upgrades to be Assigned	-
09SP	AECI	AECI	STILWELL - TITANTIC TAP 69KV	36	114.3	115.3	0	2BRUSHY - SALLISAW 69KV CKT 1	Rebuild 9.2 miles with 795MCM ACSR	1,518,000
09SP	AECI	GRRD	TAHLEQUAH - TITANTIC TAP 69KV	47	104.0	104.8	0	2BRUSHY - SALLISAW 69KV CKT 1	Rebuild 9.4 miles with 795MCM ACSR	1,551,000
09SP	GRRD	GRRD	412SUB - KERR 161KV	338	99.7	100.8	42	FLINT CREEK - GRDA1 345KV CKT 1	Chouteau Maid Operating Procedure Applied	-
09SP	WERE	WERE	SW LAWRENCE - WAKARUSA JCT SS 115KV	92	99.3	100.8	72	FARMER'S CONSUMER CO-OP - WAKARUSA JCT SS 115KV CKT 1	Limits Rollover Rights 6/1/2009	-
09SP	GRRD	GRRD	412SUB - KANSAS TAP 161KV	338	99.0	100.1	134	FLINT CREEK - GRDA1 345KV CKT 1	Chouteau Maid Operating Procedure Applied	-
09SP	AEPW	AEPW	ELK CITY 230/138KV TRANSFORMER	263	91.0	101.0	135	OKLAUNION - TUCO INTERCHANGE 345KV CKT 1	See Previous	See Previous
09SP	AEPW	AEPW	ELK CITY 230/138KV TRANSFORMER	263	91.1	100.9	136	TUCO INTERCHANGE 345/230KV TRANSFORMER CKT 1	"	"
09SP	AEPW	AEPW	ELK CITY 230/138KV TRANSFORMER	263	91.0	100.9	136	Multiple Outage Contingency: OKLAUNION - TUCO INTERCHANGE 345KV CKT 1 TUCO INTERCHANGE 345/230KV TRANSFORMER CKT 1	"	"
09WP	WERE	WERE	ATHENS SS - COFFEY COUNTY NO. 4 VERNON 69KV	45	102.9	106.2	0	LACYGNE - WOLF CREEK 345KV CKT 1	Westar Transmission Operating Directive 1304, Overload of the Athens to Wolf Creek 69 kV Line	-
09WP	WERE	WERE	AUBURN ROAD - JEFFREY ENERGY CENTER 230KV	565	100.1	101.6	0	HOYT - JEFFREY ENERGY CENTER 345KV CKT 1	Westar Transmission Operating Directive 400, Outage of the Jeffrey Energy Center to Hoyt 345 kV line	-
09WP	SWPA	SPRM	BROOKLINE - SPRINGFIELD 161KV	323	111.8	114.5	0	SOUTHWEST - SOUTHWEST DISPOSAL 161KV CKT 1	Impact Removed by Selected Upgrades to be Assigned	-
09WP	SWPA	SPRM	BROOKLINE - SPRINGFIELD 161KV	323	111.2	113.9	0	BATTLEFIELD - SOUTHWEST DISPOSAL 161KV CKT 1	"	-
09WP	SWPA	SPRM	BROOKLINE - SPRINGFIELD 161KV	323	104.9	107.1	0	BROOKLINE - JUNCTION 161KV CKT 1	"	-
09WP	AEPW	AEPW	CHAMBER SPRINGS - FARMINGTON AECC 161KV	335	100.0	100.8	0	CHAMBER SPRINGS - TONTITOWN 161KV CKT 1	Relieved and Impact Removed by Selected Upgrades to be Assigned	-
09WP	AEPW	AEPW	CHAMBER SPRINGS - TONTITOWN 161KV	244	142.2	143.9	0	CHAMBER SPRINGS - FARMINGTON AECC 161KV CKT 1	Impact Removed by Selected Upgrades to be Assigned	-
09WP	AEPW	AEPW	CHAMBER SPRINGS - TONTITOWN 161KV	244	133.6	134.8	0	FLINT CREEK - TONTITOWN 161KV CKT 1	"	-
09WP	AEPW	AEPW	CHAMBER SPRINGS - TONTITOWN 161KV	244	127.5	129.2	0	FARMINGTON AECC - SOUTH FAYETTEVILLE 161KV CKT 1	"	-
09WP	AEPW	AEPW	CHAMBER SPRINGS - TONTITOWN 161KV	244	112.4	113.9	0	FLINT CREEK - GENTRY REC 161KV CKT 1	Relieved and Impact Removed by Selected Upgrades to be Assigned	-
09WP	AEPW	AEPW	CHAMBER SPRINGS - TONTITOWN 161KV	244	111.7	113.2	0	EAST CENTERTON - GENTRY REC 161KV CKT 1	"	-
09WP	OKGE	OKGE	CIMARRON - CZECH HALL 138KV	287	102.1	102.7	0	DIVISION AVE - MUSTANG 138KV CKT 1	Updated Emergency Rating, 382 MVA	-
09WP	OKGE	OKGE	CIMARRON - CZECH HALL 138KV	287	101.4	102.2	0	DIVISION AVE - HAYMAKER 138KV CKT 1	"	-
09WP	OKGE	OKGE	CIMARRON - CZECH HALL 138KV	287	100.9	101.8	0	CIMARRON - HAYMAKER 138KV CKT 1	"	-
09WP	WERE	WERE	COFFEY COUNTY NO. 4 VERNON - GREEN 69KV	45	104.2	107.5	0	LACYGNE - WOLF CREEK 345KV CKT 1	Westar Transmission Operating Directive 1304, Overload of the Athens to Wolf Creek 69 kV Line	-
09WP	AEPW	AEPW	EAST CENTERTON - GENTRY REC 161KV	368	110.4	110.8	0	FLINT CREEK - TONTITOWN 161KV CKT 1	Relieved and Impact Removed by Selected Upgrades to be Assigned	-
09WP	AEPW	AEPW	EAST CENTERTON - GENTRY REC 161KV	368	102.7	103.3	0	LOWELL - TONTITOWN 161KV CKT 1	"	-
09WP	AEPW	AEPW	EAST CENTERTON - GENTRY REC 161KV	368	102.1	102.7	0	LOWELL - ROGERS 161KV CKT 1	"	-
09WP	AEPW	AEPW	FLINT CREEK - GENTRY REC 161KV	368	112.4	112.7	0	FLINT CREEK - TONTITOWN 161KV CKT 1	Relieved and Impact Removed by Selected Upgrades to be Assigned	-
09WP	AEPW	AEPW	FLINT CREEK - GENTRY REC 161KV	368	104.7	105.3	0	LOWELL - TONTITOWN 161KV CKT 1	"	-
09WP	AEPW	AEPW	FLINT CREEK - GENTRY REC 161KV	368	104.0	104.6	0	LOWELL - ROGERS 161KV CKT 1	"	-
09WP	AEPW	AEPW	FLINT CREEK - TONTITOWN 161KV	335	105.4	105.7	0	CHAMBER SPRINGS 345/161KV TRANSFORMER CKT 1	Relieved and Impact Removed by Selected Upgrades to be Assigned	-
09WP	AEPW	AEPW	FLINT CREEK - TONTITOWN 161KV	335	105.4	105.7	0	CHAMBER SPRINGS - CLARKSVILLE 345KV CKT 1	"	-
09WP	OKGE	OKGE	PECAN CREEK 345/161KV TRANSFORMER	369	101.4	102.4	0	CLARKSVILLE - MUSKOGEE 345KV CKT 1	See Previous	See Previous
09WP	OKGE	OKGE	PECAN CREEK 345/161KV TRANSFORMER	369	101.8	102.2	0	FT SMITH - MUSKOGEE 345KV CKT 1	"	"
09WP	AEPW	AEPW	FLINT CREEK - GENTRY REC 161KV	368	100.0	100.6	12	EAST ROGERS - ROGERS 161KV CKT 1	Relieved and Impact Removed by Selected Upgrades to be Assigned	-
09WP	AEPW	AEPW	FLINT CREEK - GENTRY REC 161KV	368	99.8	100.3	72	CHAMBER SPRINGS - TONTITOWN 161KV CKT 1	"	-
09WP	AEPW	AEPW	ELK CITY 230/138KV TRANSFORMER	263	92.4	102.4	114	OKLAUNION - TUCO INTERCHANGE 345KV CKT 1	See Previous	See Previous
09WP	AEPW	AEPW	ELK CITY 230/138KV TRANSFORMER	263	92.4	102.4	114	Multiple Outage Contingency: OKLAUNION - TUCO INTERCHANGE 345KV CKT 1 TUCO INTERCHANGE 345/230KV TRANSFORMER CKT 1	"	"
09WP	AEPW	AEPW	ELK CITY 230/138KV TRANSFORMER	263	92.4	102.3	115	TUCO INTERCHANGE 345/230KV TRANSFORMER CKT 1	"	"
Total Engineering & Construction Costs										27,979,000

Table 2.1 - Non-SPP Facility Overloads
Caused or Impacted by Transfer (Scenario 1)

Study Year	From Area	To Area	Monitored Branch Over 100% Rate B	Rate	BC % Loading	TC % Loading	Outaged Branch Causing Overload	Comments
04AP	AEPW	CELE	53461 WALLAKE4 138 to 50090 IPAPER 4 138 CKT 1	236	103.7	103.8	50045 DOLHILL7 345 to 50046 DOLHILL6 230 CKT 1	May not be applicable for deferral period starting 5/1/2006
04G	SWPA	AECI	52634 IDALIA 5 161 to 97243 2IDALIA 69 CKT 1	56	104.4	104.5	52634 IDALIA 5 161 to 97243 2IDALIA 69 CKT 2	"
04G	MEC	MEC	64220 WRIGHT 5 161 to 64646 WRI MID8 69 CKT 1	83	107.0	107.1	63719 HOPE 5 161 to 64648 HOPE MD8 69 CKT 1	"
04G	AECI	AECI	96089 5JAMESV 161 to 96673 2JAMESV 69 CKT 1	56	104.1	104.9	96089 5JAMESV 161 to 96673 2JAMESV 69 CKT 2	"
04G	AECI	AECI	96089 5JAMESV 161 to 96673 2JAMESV 69 CKT 2	56	107.9	108.7	96089 5JAMESV 161 to 96673 2JAMESV 69 CKT 1	"
04SP	AMRN	AMRN	31239 MOREAU 161 to 31240 MOREAU 69 CKT 1	84	103.0	103.4	30677 GUTHRIE 161 to 30805 JC FAIR 69 CKT 99	"
04SP	AMRN	AMRN	31239 MOREAU 161 to 31240 MOREAU 69 CKT 1	84	100.3	100.6	30026 APCH TP 161 to 30028 APCH FLT 161 CKT 1	"
04SP	AMRN	AMRN	31239 MOREAU 161 to 31240 MOREAU 69 CKT 1	84	100.3	100.6	30028 APCH FLT 161 to 30027 APCH FLT 69 CKT 1	"
04SP	MIPU	MIPU	59296 HSNVLSW2 69 to 59295 HSNVL 2 69 CKT 1	53	115.8	115.9	59279 RGREEN 2 69 to 59280 PHILL 2 69 CKT 1	"
04SP	MEC	MEC	64648 HOPE MD8 69 to 63719 HOPE 5 161 CKT 1	105	103.2	103.3	64220 WRIGHT 5 161 to 64646 WRI MID8 69 CKT 1	"
04SP	NPPD	NPPD	64726 ALBION 7 115 to 64727 ALBION 9 34.5 CKT 2	11	179.6	179.7	64726 ALBION 7 115 to 64727 ALBION 9 34.5 CKT 1	"
04SP	NPPD	NPPD	64728 ALDA 7 115 to 64729 ALDA 9 34.5 CKT 2	31	117.5	117.7	64728 ALDA 7 115 to 64729 ALDA 9 34.5 CKT 1	"
04SP	NPPD	NPPD	64743 BEATRCE7 115 to 64744 BEATRCE9 34.5 CKT 2	35	125.2	125.3	64743 BEATRCE7 115 to 64744 BEATRCE9 34.5 CKT 1	"
04SP	NPPD	NPPD	64755 BROKENB7 115 to 64756 BROKENBG 69 CKT 2	35	175.7	175.9	64755 BROKENB7 115 to 64756 BROKENBG 69 CKT 1	"
04SP	NPPD	NPPD	64855 HOLDREG7 115 to 64856 HOLDREG9 34.5 CKT 1	35	110.4	110.5	64855 HOLDREG7 115 to 64856 HOLDREG9 34.5 CKT 2	"
04SP	NPPD	NPPD	64855 HOLDREG7 115 to 64856 HOLDREG9 34.5 CKT 2	35	110.4	110.5	64855 HOLDREG7 115 to 64856 HOLDREG9 34.5 CKT 1	"
04SP	NPPD	NPPD	64876 KEARNEY7 115 to 64877 KEARNEY9 34.5 CKT 1	35	102.0	102.1	64876 KEARNEY7 115 to 64877 KEARNEY9 34.5 CKT 2	"
04SP	NPPD	NPPD	64876 KEARNEY7 115 to 64877 KEARNEY9 34.5 CKT 2	35	102.0	102.1	64876 KEARNEY7 115 to 64877 KEARNEY9 34.5 CKT 1	"
04SP	AECI	AECI	96071 5CLINTN 161 to 96692 2CLINTN 69 CKT 2	25	98.4	100.3	96071 5CLINTN 161 to 96692 2CLINTN 69 CKT 3	"
04SP	AECI	AECI	96089 5JAMESV 161 to 96673 2JAMESV 69 CKT 1	56	110.6	111.6	96089 5JAMESV 161 to 96673 2JAMESV 69 CKT 2	"
04SP	AECI	AECI	96089 5JAMESV 161 to 96673 2JAMESV 69 CKT 2	56	114.6	115.6	96089 5JAMESV 161 to 96673 2JAMESV 69 CKT 1	"
04SP	AECI	AECI	96090 5KINGDM 161 to 96517 2KINGDM 69 CKT 2	25	100.1	100.4	96090 5KINGDM 161 to 96517 2KINGDM 69 CKT 3	"
04SP	AECI	AECI	96090 5KINGDM 161 to 96517 2KINGDM 69 CKT 3	25	100.0	100.3	96090 5KINGDM 161 to 96517 2KINGDM 69 CKT 2	"
04SP	AECI	AECI	96123 5WPLAIN 161 to 97123 2WSTPL3 69 CKT 2	56	106.0	106.3	96123 5WPLAIN 161 to 97123 2WSTPL3 69 CKT 1	"
04SP	AECI	AECI	96126 5MOBTAP 161 to 96120 5THMHIL 161 CKT 1	372	105.7	106.2	96044 7MCCRED 345 to 96049 7THOMHL 345 CKT 1	"
04SP	AECI	AECI	96654 2MILO 69 to 96802 2CLARK 69 CKT 1	36	101.6	103.0	52690 CARTHG 2 69 to 96649 2JASPER 69 CKT 1	"
04SP	AECI	AECI	96691 2SHARSVL 69 to 96699 2ELYNTP 69 CKT 1	36	101.5	104.5	59207 ARCHIE 5 161 to 59240 ADRIAN 5 161 CKT 1	"
04SP	AECI	AECI	96691 2SHARSVL 69 to 96699 2ELYNTP 69 CKT 1	36	99.2	101.2	57995 MONTROS5 161 to 96071 5CLINTN 161 CKT 1	"
04SP	AECI	AECI	96691 2SHARSVL 69 to 96699 2ELYNTP 69 CKT 1	36	97.7	100.8	59216 BUTLER 5 161 to 59240 ADRIAN 5 161 CKT 1	"
04SP	AECI	AECI	96692 2CLINTN 69 to 96701 2GAINES 69 CKT 1	36	103.8	105.7	96108 5OSCEOL 161 to 96811 2OSCEOL 69 CKT 1	"
04SP	AECI	AECI	96943 2SILVCTY 69 to 96945 2YALE 69 CKT 1	35	105.1	105.3	96889 2BRISTOW 69 to 96921 2BRISWES 69 CKT 1	"
04SP	AECI	AECI	96943 2SILVCTY 69 to 96945 2YALE 69 CKT 1	35	100.2	100.4	96890 2BRISTW 69 to 96921 2BRISWES 69 CKT 1	"
04FA	IP	MEC	32415 GALESBRG 138 to 64411 GALESBR5 161 CKT 1	100	107.0	108.0	64411 GALESBR5 161 to 32415 GALESBRG 138 CKT 2	"
04FA	IP	MEC	32415 GALESBRG 138 to 64411 GALESBR5 161 CKT 2	100	108.4	109.3	64411 GALESBR5 161 to 32415 GALESBRG 138 CKT 1	"
04FA	MEC	MEC	64646 WRI MID8 69 to 64220 WRIGHT 5 161 CKT 1	83	109.9	110.0	63719 HOPE 5 161 to 64648 HOPE MD8 69 CKT 1	"
04FA	NPPD	NPPD	64784 COLMBUS7 115 to 64785 COLMBUS9 34.5 CKT 1	46	112.2	112.3	64784 COLMBUS7 115 to 64785 COLMBUS9 34.5 CKT 2	"
04FA	NPPD	NPPD	64784 COLMBUS7 115 to 64785 COLMBUS9 34.5 CKT 2	46	111.9	112.0	64784 COLMBUS7 115 to 64785 COLMBUS9 34.5 CKT 1	"
04FA	AECI	AECI	96089 5JAMESV 161 to 96673 2JAMESV 69 CKT 1	56	100.0	100.7	96089 5JAMESV 161 to 96673 2JAMESV 69 CKT 2	"
04FA	AECI	AECI	96089 5JAMESV 161 to 96673 2JAMESV 69 CKT 2	56	103.6	104.5	96089 5JAMESV 161 to 96673 2JAMESV 69 CKT 1	"
04FA	AECI	AECI	96120 5THMHIL 161 to 96126 5MOBTAP 161 CKT 1	386	101.0	101.4	96044 7MCCRED 345 to 96049 7THOMHL 345 CKT 1	"
04WP	MEC	MEC	64220 WRIGHT 5 161 to 64646 WRI MID8 69 CKT 1	83	128.7	128.8	63719 HOPE 5 161 to 64648 HOPE MD8 69 CKT 1	"
04WP	NPPD	NPPD	64749 BEVERLY7 115 to 64750 BEVERLY8 69 CKT 2	16	112.0	112.1	64749 BEVERLY7 115 to 64750 BEVERLY8 69 CKT 1	"
04WP	NPPD	NPPD	64784 COLMBUS7 115 to 64785 COLMBUS9 34.5 CKT 1	46	126.4	126.7	64784 COLMBUS7 115 to 64785 COLMBUS9 34.5 CKT 2	"
04WP	NPPD	NPPD	64784 COLMBUS7 115 to 64785 COLMBUS9 34.5 CKT 2	46	126.1	126.3	64784 COLMBUS7 115 to 64785 COLMBUS9 34.5 CKT 1	"
04WP	AECI	AECI	96063 5CALIF 161 to 96550 2CALIF 69 CKT 1	64	103.6	103.8	96057 5BARNET 161 to 96618 2BARNET 69 CKT 1	"
04WP	AECI	AECI	96089 5JAMESV 161 to 96673 2JAMESV 69 CKT 2	64	102.7	103.4	96089 5JAMESV 161 to 96673 2JAMESV 69 CKT 1	"
04WP	AECI	AECI	96090 5KINGDM 161 to 96517 2KINGDM 69 CKT 2	29	104.4	104.6	96090 5KINGDM 161 to 96517 2KINGDM 69 CKT 3	"
04WP	AECI	AECI	96090 5KINGDM 161 to 96517 2KINGDM 69 CKT 3	29	104.3	104.5	96090 5KINGDM 161 to 96517 2KINGDM 69 CKT 2	"
04WP	AECI	AECI	96123 5WPLAIN 161 to 97123 2WSTPL3 69 CKT 2	64	100.1	100.3	96123 5WPLAIN 161 to 97123 2WSTPL3 69 CKT 1	"

Study Year	From Area	To Area	Monitored Branch Over 100% Rate B	Rate	BC % Loading	TC % Loading	Outaged Branch Causing Overload	Comments
09SP	CELE	CELE	50179 SHOAKS 4 138 to 50154 PINEV 4 138 CKT 1	148	104.9	105.0	50154 PINEV 4 138 to 50158 PVKFTAP4 138 CKT 1	Whether Facility was Relieved or Impact was removed by Selected Upgrades was not determined.
09SP	SWPA	AECI	52638 POP BLF5 161 to 96056 5ASHRVL 161 CKT 1	167	102.0	102.6	96073 5HARVELE 161 to 96114 5STFRAN 161 CKT 1	"
09SP	SWPA	SPRM	52692 SPRGFLD5 161 to 59969 BRKLINE 5 161 CKT 1	323	128.6	131.7	59954 SWPS 5 161 to 59960 SWDISP 5 161 CKT 1	Impact Removed by Selected Upgrades to be Assigned
09SP	SWPA	SPRM	52692 SPRGFLD5 161 to 59969 BRKLINE 5 161 CKT 1	323	127.7	130.9	59959 BATFLD 5 161 to 59960 SWDISP 5 161 CKT 1	"
09SP	SWPA	SPRM	52692 SPRGFLD5 161 to 59969 BRKLINE 5 161 CKT 1	323	118.7	121.2	59955 JUNCTN 5 161 to 59969 BRKLINE 5 161 CKT 1	"
09SP	SWPA	SPRM	52692 SPRGFLD5 161 to 59969 BRKLINE 5 161 CKT 1	323	105.1	108.5	52692 SPRGFLD5 161 to 59959 BATFLD 5 161 CKT 1	"
09SP	SWPA	SPRM	52692 SPRGFLD5 161 to 59969 BRKLINE 5 161 CKT 1	323	101.7	104.3	59955 JUNCTN 5 161 to 59956 NICHOLS5 161 CKT 1	"
09SP	SUNC	SUNC	56393 PLYMELL3 115 to 56448 HOLCOMB3 115 CKT 1	143	102.4	105.1	56420 FLETCHR3115 to 56448 HOLCOMB3115 CKT 1	Solved with Taps Fixed and Switched Shunts Locked, Whether Facility was Relieved or Impact was removed by Selected Upgrades was not determined.
09SP	KACY	KACY	58682 EVERETT2 69 to 58678 KAW 2 69 CKT 1	68	107.6	107.7	58681 MUNCIE 2 69 to 58686 LEVEE 2 69 CKT 1	Whether Facility was Relieved or Impact was removed by Selected Upgrades was not determined.
09SP	MEC	MEC	64068 GRENFLD5 161 to 64197 NORWLK5 161 CKT 1	223	107.9	108.0	64050 SE POLK3 345 to 64634 SE MID 5 161 CKT 1	"
09SP	MEC	MEC	64068 GRENFLD5 161 to 64197 NORWLK5 161 CKT 1	223	107.9	108.0	64051 SEPOLK 5 161 to 64634 SE MID 5 161 CKT 1	"
09SP	MEC	MEC	64648 HOPE MD8 69 to 63719 HOPE 5 161 CKT 1	105	119.4	119.5	64220 WRIGHT 5 161 to 64646 WRI MID8 69 CKT 1	"
09SP	NPPD	NPPD	64726 ALBION 7 115 to 64727 ALBION 9 34.5 CKT 2	11	191.4	191.5	64726 ALBION 7 115 to 64727 ALBION 9 34.5 CKT 1	"
09SP	NPPD	NPPD	64728 ALDA 7 115 to 64729 ALDA 9 34.5 CKT 2	31	125.7	126.1	64728 ALDA 7 115 to 64729 ALDA 9 34.5 CKT 1	"
09SP	NPPD	NPPD	64755 BROKENB7 115 to 64756 BROKENBG 69 CKT 2	35	158.3	158.4	64755 BROKENB7 115 to 64756 BROKENBG 69 CKT 1	"
09SP	NPPD	NPPD	64778 COLMB.E7 115 to 64779 COLMB.E9 34.5 CKT 1	70	110.7	110.8	64778 COLMB.E7 115 to 64779 COLMB.E9 34.5 CKT 2	"
09SP	NPPD	NPPD	64855 HOLDREG7 115 to 64856 HOLDREG9 34.5 CKT 1	35	116.4	116.5	64855 HOLDREG7 115 to 64856 HOLDREG9 34.5 CKT 2	"
09SP	NPPD	NPPD	64855 HOLDREG7 115 to 64856 HOLDREG9 34.5 CKT 2	35	116.4	116.5	64855 HOLDREG7 115 to 64856 HOLDREG9 34.5 CKT 1	"
09SP	NPPD	NPPD	65016 YORK 7 115 to 65017 YORK 9 34.5 CKT 2	31	137.8	137.9	65016 YORK 7 115 to 65017 YORK 9 34.5 CKT 1	"
09SP	AECI	SWPA	96056 5ASHRVL 161 to 52634 IDALIA 5 161 CKT 1	206	106.4	106.8	96073 5HARVELE 161 to 96114 5STFRAN 161 CKT 1	"
09SP	AECI	AECI	96071 5CLINTN 161 to 96692 2CLINTN 69 CKT 3	56	105.9	107.9	96071 5CLINTN 161 to 96692 2CLINTN 69 CKT 1	"
09SP	AECI	AMRN	96079 5FREDTN 161 to 30583 FRED TAP 161 CKT 1	56	137.6	137.9	96054 7WWEAST 345 to 97274 5WWEAST 161 CKT 1	"
09SP	AECI	AECI	96089 5JAMESV 161 to 96673 2JAMESV 69 CKT 1	56	119.5	119.8	96089 5JAMESV 161 to 96673 2JAMESV 69 CKT 2	"
09SP	AECI	AECI	96089 5JAMESV 161 to 96673 2JAMESV 69 CKT 2	56	122.9	123.3	96089 5JAMESV 161 to 96673 2JAMESV 69 CKT 1	"
09SP	AECI	AECI	96096 5MARIES 161 to 97184 2MARIES 69 CKT 1	25	105.2	105.4	96096 5MARIES 161 to 97184 2MARIES 69 CKT 3	"
09SP	AECI	AECI	96096 5MARIES 161 to 97184 2MARIES 69 CKT 2	25	105.7	106.0	96096 5MARIES 161 to 97184 2MARIES 69 CKT 3	"
09SP	AECI	AECI	96108 5OSCEOL 161 to 96071 5CLINTN 161 CKT 1	123	99.2	105.5	59207 ARCHIE 5 161 to 59240 ADRIAN 5 161 CKT 1	"
09SP	AECI	AECI	96108 5OSCEOL 161 to 96071 5CLINTN 161 CKT 1	123	99.5	105.0	52702 TRUMAN 5 161 to 96552 5EDMONS 161 CKT 1	"
09SP	AECI	AECI	96108 5OSCEOL 161 to 96071 5CLINTN 161 CKT 1	123	97.9	103.5	96552 5EDMONS 161 to 96555 5GRAVOI 161 CKT 1	"
09SP	AECI	AECI	96108 5OSCEOL 161 to 96071 5CLINTN 161 CKT 1	123	97.0	103.5	59208 NEVADA 5 161 to 59216 BUTLER_5 161 CKT 1	"
09SP	AECI	AECI	96108 5OSCEOL 161 to 96071 5CLINTN 161 CKT 1	123	97.1	103.4	59216 BUTLER_5 161 to 59240 ADRIAN 5 161 CKT 1	"
09SP	AECI	AECI	96108 5OSCEOL 161 to 96811 2OSCEOL 69 CKT 1	56	111.3	111.9	96692 2CLINTN 69 to 96701 2GAINES 69 CKT 1	"
09SP	AECI	AECI	96108 5OSCEOL 161 to 96811 2OSCEOL 69 CKT 1	56	102.8	104.7	52698 STOCKTN5 161 to 96108 5OSCEOL 161 CKT 1	"
09SP	AECI	AECI	96108 5OSCEOL 161 to 96811 2OSCEOL 69 CKT 1	56	101.2	101.8	96701 2GAINES 69 to 96810 2MTZION 69 CKT 1	"
09SP	AECI	AECI	96108 5OSCEOL 161 to 96811 2OSCEOL 69 CKT 1	56	99.4	100.7	52698 STOCKTN5 161 to 96101 5MORGAN 161 CKT 1	"
09SP	AECI	AECI	96112 5SALEM 161 to 97027 2SALEM3 69 CKT 1	56	119.4	119.6	96112 5SALEM 161 to 97027 2SALEM3 69 CKT 2	"
09SP	AECI	AECI	96112 5SALEM 161 to 97027 2SALEM3 69 CKT 2	56	118.9	119.1	96112 5SALEM 161 to 97027 2SALEM3 69 CKT 1	"
09SP	AECI	AECI	96124 5HOLDEN 161 to 96071 5CLINTN 161 CKT 1	227	101.9	102.2	96110 5PITTSV 161 to 96124 5HOLDEN 161 CKT 1	"
09SP	AECI	AECI	96124 5HOLDEN 161 to 96336 2HOLDEN 69 CKT 1	56	110.8	111.1	96110 5PITTSV 161 to 96331 2PITTSV 69 CKT 1	"
09SP	AECI	AECI	96126 5MOBTAP 161 to 96120 5THMHIL 161 CKT 1	372	107.7	108.4	96044 7MCCRED 345 to 96049 7THOMHL 345 CKT 1	"
09SP	AECI	AECI	96336 2HOLDEN 69 to 96124 5HOLDEN 161 CKT 1	56	145.5	146.5	96071 5CLINTN 161 to 96124 5HOLDEN 161 CKT 1	"
09SP	AECI	AECI	96654 2MILO 69 to 96802 2CLARK 69 CKT 1	36	119.0	120.6	52690 CARTHG 2 69 to 96649 2JASPER 69 CKT 1	"
09SP	AECI	AECI	96654 2MILO 69 to 96802 2CLARK 69 CKT 1	36	102.2	103.8	96649 2JASPER 69 to 96651 2LAMAR 69 CKT 1	"

Table 2.1 - Non-SPP Facility Overloads
Caused or Impacted by Transfer (Scenario 1)

Study Year	From Area	To Area	Monitored Branch Over 100% Rate B	Rate	BC % Loading	TC % Loading	Outaged Branch Causing Overload	Comments
09SP	AECI	AECI	96692 2CLINTN 69 to 96701 2GAINES 69 CKT 1	36	135.6	138.6	Multiple Contingency: 96071 5CLINTN 161 to 96108 5OSCEOL 161 CKT 1 52698 STOCKTN5161 to 96108 5OSCEOL 161 CKT 1	"
09SP	AECI	AECI	96692 2CLINTN 69 to 96701 2GAINES 69 CKT 1	36	129.3	131.6	96108 5OSCEOL 161 to 96811 2OSCEOL 69 CKT 1	"
09SP	AECI	AECI	96692 2CLINTN 69 to 96701 2GAINES 69 CKT 1	36	123.9	129.7	96071 5CLINTN 161 to 96108 5OSCEOL 161 CKT 1	"
09SP	AECI	AECI	96699 2ELYNTP 69 to 96705 2PECULR 69 CKT 1	36	98.8	101.9	59207 ARCHIE 5 161 to 59240 ADRIAN 5 161 CKT 1	"
09SP	AECI	AECI	96701 2GAINES 69 to 96810 2MTZION 69 CKT 1	36	117.1	120.1	Multiple Contingency: 96071 5CLINTN 161 to 96108 5OSCEOL 161 CKT 1 52698 STOCKTN5161 to 96108 5OSCEOL 161 CKT 1	"
09SP	AECI	AECI	96701 2GAINES 69 to 96810 2MTZION 69 CKT 1	36	108.9	114.7	96071 5CLINTN 161 to 96108 5OSCEOL 161 CKT 1	"
09SP	AECI	AECI	96701 2GAINES 69 to 96810 2MTZION 69 CKT 1	36	110.6	112.9	96108 5OSCEOL 161 to 96811 2OSCEOL 69 CKT 1	"
09SP	AECI	AECI	96833 2AGRA 69 to 96836 2CUSHING 69 CKT 1	44	108.8	108.9	96143 4VALLEY 138 to 96844 4RAMSEY 138 CKT 1	"
09SP	AECI	AECI	96890 2BRISTW 69 to 96921 2BRISWES 69 CKT 1	36	101.1	101.5	96138 4CLEVLND 138 to 96141 4STILWTR 138 CKT 1	"
09SP	AECI	AECI	96890 2BRISTW 69 to 96921 2BRISWES 69 CKT 1	36	100.4	101.0	96140 4SILVCTY 138 to 96141 4STILWTR 138 CKT 1	"
09SP	AECI	AECI	96943 2SILVCTY 69 to 96945 2YALE 69 CKT 1	35	124.7	124.8	96140 4SILVCTY 138 to 96141 4STILWTR 138 CKT 1	"
09SP	AECI	AECI	96943 2SILVCTY 69 to 96945 2YALE 69 CKT 1	35	112.0	112.1	96890 2BRISTW 69 to 96921 2BRISWES 69 CKT 1	"
09SP	AECI	AECI	96943 2SILVCTY 69 to 96945 2YALE 69 CKT 1	35	107.6	107.8	96890 2BRISTW 69 to 96903 2KWIKSET 69 CKT 1	"
09SP	AECI	AECI	96943 2SILVCTY 69 to 96945 2YALE 69 CKT 1	35	102.9	103.0	96903 2KWIKSET 69 to 96910 2SHAMROK 69 CKT 1	"
09SP	AECI	AECI	96945 2YALE 69 to 96943 2SILVCTY 69 CKT 1	35	118.0	118.1	96889 2BRISTOW 69 to 96921 2BRISWES 69 CKT 1	"
09SP	AECI	AECI	97274 5WWEAST 161 to 97278 2WWEAST 69 CKT 1	56	105.0	105.2	96079 5FREDTN 161 to 97267 2MARQUA 69 CKT 1	"
09SP	ENTR	SWPA	99755 5JONES 161 to 52618 JONESBO5 161 CKT 1	223	111.3	111.9	52600 N MADRD5 161 to 52610 KENNETT5 161 CKT 1	Less than 3% Impact
09SP	ENTR	SWPA	99755 5JONES 161 to 52618 JONESBO5 161 CKT 1	223	102.2	102.8	52610 KENNETT5 161 to 52612 PARAGLD5 161 CKT 1	"
09WP	AMRN	AMRN	31890 VIAD 1 34.5 to 30282 CAPE GIR 161 CKT 1	84	104.8	104.9	30282 CAPE GIR 161 to 31890 VIAD 1 34.5 CKT 99	Whether Facility was Relieved or Impact was removed by Selected Upgrades was not determined.
09WP	SWPA	SPRM	52692 SPRGFLD5 161 to 59969 BRKLINE 5 161 CKT 1	323	111.8	114.5	59954 SWPS 5 161 to 59960 SWDISP 5 161 CKT 1	Impact Removed by Selected Upgrades to be Assigned
09WP	SWPA	SPRM	52692 SPRGFLD5 161 to 59969 BRKLINE 5 161 CKT 1	323	111.2	113.9	59959 BATFLD 5 161 to 59960 SWDISP 5 161 CKT 1	"
09WP	SWPA	SPRM	52692 SPRGFLD5 161 to 59969 BRKLINE 5 161 CKT 1	323	104.9	107.1	59955 JUNCTN 5 161 to 59969 BRKLINE 5 161 CKT 1	"
09WP	SUNC	SUNC	56393 PLYMELL3 115 to 56448 HOLCOMB3 115 CKT 1	143	98.1	101.1	56420 FLETCHR3115 to 56448 HOLCOMB3115 CKT 1	Solved with Taps Fixed and Switched Shunts Locked, Whether Facility was Relieved or Impact was removed by Selected Upgrades was not determined.
09WP	NPPD	NPPD	64755 BROKENB7 115 to 64756 BROKENBG 69 CKT 2	35	108.7	108.8	64755 BROKENB7 115 to 64756 BROKENBG 69 CKT 1	Whether Facility was Relieved or Impact was removed by Selected Upgrades was not determined.
09WP	NPPD	NPPD	65016 YORK 7 115 to 65017 YORK 9 34.5 CKT 2	31	124.5	124.8	65016 YORK 7 115 to 65017 YORK 9 34.5 CKT 1	"
09WP	AECI	AMRN	96079 5FREDTN 161 to 30583 FRED TAP 161 CKT 1	56	111.0	111.3	96054 7WWEAST 345 to 97274 5WWEAST 161 CKT 1	"
09WP	AECI	AECI	96089 5JAMESV 161 to 96673 2JAMESV 69 CKT 1	64	104.5	104.9	96089 5JAMESV 161 to 96673 2JAMESV 69 CKT 2	"
09WP	AECI	AECI	96089 5JAMESV 161 to 96673 2JAMESV 69 CKT 2	64	107.7	108.0	96089 5JAMESV 161 to 96673 2JAMESV 69 CKT 1	"
09WP	AECI	AECI	96112 5SALEM 161 to 97027 2SALEM3 69 CKT 1	64	107.0	107.2	96112 5SALEM 161 to 97027 2SALEM3 69 CKT 2	"
09WP	AECI	AECI	96112 5SALEM 161 to 97027 2SALEM3 69 CKT 2	64	106.6	106.7	96112 5SALEM 161 to 97027 2SALEM3 69 CKT 1	"
09WP	AECI	AECI	96123 5WPLAIN 161 to 97123 2WSTPL3 69 CKT 1	64	100.4	101.0	96123 5WPLAIN 161 to 97123 2WSTPL3 69 CKT 2	"
09WP	AECI	AECI	96124 5HOLDEN 161 to 96336 2HOLDEN 69 CKT 1	64	118.6	119.4	96071 5CLINTN 161 to 96124 5HOLDEN 161 CKT 1	"
09WP	AECI	AECI	96692 2CLINTN 69 to 96701 2GAINES 69 CKT 1	43	105.4	107.5	Multiple Contingency: 96071 5CLINTN 161 to 96108 5OSCEOL 161 CKT 1 52698 STOCKTN5161 to 96108 5OSCEOL 161 CKT 1	"
09WP	AECI	AECI	96692 2CLINTN 69 to 96701 2GAINES 69 CKT 1	43	101.3	102.6	96108 5OSCEOL 161 to 96811 2OSCEOL 69 CKT 1	"

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 Table 3.1 - SPP Facility Overloads
 Caused or Impacted by Selected Upgrades (Scenario 1)

Southwest Power Pool
 System Impact Study

Study Year	From Area	To Area	Monitored Branch Over 100% Rate B	Rate	BC Without Upgrades %Loading	BC With Upgrades %Loading	TC Without Upgrades %Loading	TC With Upgrades %Loading	Outaged Branch Causing Overload	Solution	Cost	
09SP	ENTR	EMDE	50MAHA - SUB 312 - POWERSITE 161KV	162	124.7	126.0	122.8	124.2	EUREKA SPRINGS - OSAGE 161KV CKT 1	Contingency is Invalid, Contingency Causes Voltage to Collapse at Osage, With Load removed at Osage, Facility Not Overloaded	-	
09SP	AEPW	SWPA	BEAVER - EUREKA SPRINGS 161KV	263	96.8	103.7	95.7	102.6	5HARR-E - 5HARR-S 161KV CKT 1	SWPA: Reconnect CT's to 1000:5 Tap on Bkrs 42, 32, & half or 22. Replace metering & reset relays for Line 2 & Line 3. AEPW: Replace Wavetrap & Metering CT Jumpers	67,500	
09SP	AEPW	SWPA	BEAVER - EUREKA SPRINGS 161KV	263	93.0	103.5	91.4	102.0	BULL SHOALS - BULL SHOALS 161KV CKT 1		See Previous	See Previous
09SP	AEPW	SWPA	BEAVER - EUREKA SPRINGS 161KV	263	92.1	102.6	90.5	101.1	5FLIPN - BULL SHOALS 161KV CKT 1		-	-
09SP	AEPW	SWPA	BEAVER - EUREKA SPRINGS 161KV	263	91.7	102.2	89.7	100.2	Multiple Outage Contingency: Monett - Brookline 345kV Flint Creek - Monett 345kV	-	-	
09SP	AEPW	SWPA	BEAVER - EUREKA SPRINGS 161KV	263	91.2	101.7	89.8	100.3	5BEE BR - 5QUITMN 161KV CKT 1	-	-	
09SP	OKGE	AEPW	BONANZA - BONANZA TAP 161KV	177	103.0	105.0	103.0	105.1	AES - TARBV 161KV CKT 1	Rebuild 0.06 miles of 397.5 ACSR with 795MCM ACSR.	50,000	
09SP	OKGE	AEPW	BONANZA - BONANZA TAP 161KV	177	98.0	100.4	97.9	100.3	GRAND PRAIRIE - VBI 161KV CKT 1	See Previous	See Previous	
09SP	ENTR	SWPA	BULL SHOALS - MIDWAY 161KV	162	118.4	119.2	117.0	117.8	5ISES 1 - 5MORFLD 161KV CKT 1	Replace disconnect switches, metering CTs and wave trap at Bull Shoals	150,000	
09SP	ENTR	SWPA	BULL SHOALS - MIDWAY 161KV	162	111.7	112.6	110.3	111.2	5BATEVL - 5MORFLD 161KV	See Previous	See Previous	
09SP	ENTR	SWPA	BULL SHOALS - MIDWAY 161KV	162	99.5	100.6	< 100.0	< 100.0	5BATEVL - 5CUSHMN 161KV	-	-	
09SP	ENTR	AEPW	EUREKA SPRINGS - OSAGE 161KV	244	111.6	115.6	110.7	114.7	BULL SHOALS - BULL SHOALS 161KV CKT 1	Rebuild 5.34 miles of 666 ACSR with 1590 ACSR. Replace wavetrap jumpers @ Eureka Springs	2,400,000	
09SP	ENTR	AEPW	EUREKA SPRINGS - OSAGE 161KV	244	110.1	114.2	109.2	113.3	5FLIPN - BULL SHOALS 161KV CKT 1	See Previous	See Previous	
09SP	ENTR	AEPW	EUREKA SPRINGS - OSAGE 161KV	244	106.9	111.1	105.9	110.1	5FLIPN - SUMMIT 161KV CKT 1	-	-	
09SP	ENTR	AEPW	EUREKA SPRINGS - OSAGE 161KV	244	103.7	108.1	102.8	107.2	5BEE BR - 5QUITMN 161KV CKT 1	-	-	
09SP	ENTR	AEPW	EUREKA SPRINGS - OSAGE 161KV	244	102.9	107.2	102.0	106.3	5HARR-E - SUMMIT 161KV CKT 1	-	-	
09SP	EMDE	SWPA	SUB 438 - RIVERSIDE - TABLE ROCK 161KV	268	103.7	104.6	104.0	105.0	EUREKA SPRINGS - OSAGE 161KV CKT 1	Contingency is Invalid, Contingency Causes Voltage to Collapse at Osage, With Load removed at Osage, Facility Not Overloaded	-	
09SP	GRRD	GRRD	TAHLEQUAH 161/69KV TRANSFORMER CKT 1	78	115.8	120.4	115.8	120.3	TAHLEQUAH 161/69KV TRANSFORMER CKT 2	Add 3rd 161/69 KV Transformer	1,400,000	
09SP	GRRD	GRRD	TAHLEQUAH 161/69KV TRANSFORMER CKT 2	78	116.6	121.2	116.5	121.1	TAHLEQUAH 161/69KV TRANSFORMER CKT 1	See Previous	See Previous	
09WP	SWPA	AEPW	BEAVER - EUREKA SPRINGS 161KV	263	102.2	112.5	99.8	110.1	Multiple Outage Contingency: Monett - Brookline 345kV Flint Creek - Monett 345kV	See Previous	See Previous	
09WP	SWPA	AEPW	BEAVER - EUREKA SPRINGS 161KV	263	96.8	106.9	95.0	105.0	5BEE BR - 5QUITMN 161KV CKT 1	-	-	
09WP	SWPA	AEPW	BEAVER - EUREKA SPRINGS 161KV	263	95.4	105.4	93.5	103.7	5BEE BR - 5CLINTN 161KV CKT 1	-	-	
09WP	SWPA	AEPW	BEAVER - EUREKA SPRINGS 161KV	263	94.1	104.2	92.3	102.4	5CLINTN - 5CLIN-W# 161KV CKT 1	-	-	
09WP	SWPA	AEPW	BEAVER - EUREKA SPRINGS 161KV	263	92.6	102.7	90.2	100.5	FT SMITH - MUSKOGEE 345KV CKT 1	-	-	
Total Engineering & Construction Costs											4,067,500	

Table 4.1 - Non-SPP Facility Overloads
Caused or Impacted by Selected Upgrades (Scenario 1)

Study Year	From Area	To Area	Monitored Branch Over 100% Rate B	Rate	BC Without Upgrades %Loading	BC With Upgrades %Loading	TC Without Upgrades %Loading	TC With Upgrades %Loading	Outaged Branch Causing Overload	Comments
09SP	SWPA	AECI	52638 POP BLF5 161 to 96056 5ASHRVL 161 CKT 1	167	102.0	104.3	102.6	104.9	96073 5HARVELE 161 to 96114 5STFRAN 161 CKT 1	
09SP	SWPA	AECI	52640 DONIPHNS 161 to 97201 2DONIPH 69 CKT 1	18.75	126.6	130.3	126.5	130.2	52640 DONIPHNS 161 to 97201 2DONIPH 69 CKT 2	
09SP	SWPA	ENTR	52660 BULL SH5 161 to 99825 5MIDWAY# 161 CKT 1	162	99.5	100.4	<100.0	<100.0	99798 5BATEVL 161 to 99808 5CUSHMN 161 CKT 1	
09SP	SWPA	AECI	52690 CARTHG 2 69 to 96649 2JASPER 69 CKT 1	47	102.9	103.2	100.2	100.5	96654 2MILO 69 to 96802 2CLARK 69 CKT 1	
09SP	SWPA	AECI	52690 CARTHG 2 69 to 96751 2REEDS 69 CKT 1	36	114.2	114.8	104.4	105.0	59468 AUR124 5 161 to 59480 MON383 5 161 CKT 1	
09SP	SWPA	AECI	52690 CARTHG 2 69 to 96751 2REEDS 69 CKT 1	36	110.7	111.5	102.3	103.0	52690 CARTHG 2 69 to 96649 2JASPER 69 CKT 1	
09SP	SWPA	AECI	52690 CARTHG 2 69 to 96751 2REEDS 69 CKT 1	36	110.6	110.9	101.8	102.2	59479 LAR382 5 161 to 59480 MON383 5 161 CKT 1	
09SP	SWPA	AECI	52690 CARTHG 2 69 to 96751 2REEDS 69 CKT 1	36	104.5	105.3	<100.0	<100.0	96649 2JASPER 69 to 96651 2LAMAR 69 CKT 1	
09SP	SWPA	AECI	52690 CARTHG 2 69 to 96751 2REEDS 69 CKT 1	36	103.6	104.4	<100.0	<100.0	59537 AUR124 2 69 to 59578 AUR355 2 69 CKT 1	
09SP	MIPU	AECI	59217 WINDSR 5 161 to 96071 5CLINTN 161 CKT 1	123	126.1	126.4	125.0	125.3	58062 SALSBRYS 161 to 58064 NORTON-5 161 CKT 1	
09SP	MIPU	AECI	59217 WINDSR 5 161 to 96071 5CLINTN 161 CKT 1	123	120.1	120.5	119.0	119.3	52702 TRUMAN 5 161 to 96552 5EDMONS 161 CKT 1	
09SP	MIPU	AECI	59217 WINDSR 5 161 to 96071 5CLINTN 161 CKT 1	123	118.3	118.6	117.3	117.7	59228 WBURGE 5 161 to 59229 ODESSA 5 161 CKT 1	
09SP	MIPU	AECI	59217 WINDSR 5 161 to 96071 5CLINTN 161 CKT 1	123	118.1	118.4	117.0	117.3	96552 5EDMONS 161 to 96555 5GRAVOI 161 CKT 1	
09SP	MIPU	AECI	59217 WINDSR 5 161 to 96071 5CLINTN 161 CKT 1	123	115.3	115.6	114.0	114.3	59242 CLINTON5 161 to 96071 5CLINTN 161 CKT 1	
09SP	AECI	AECI	96119 5SULLVN 161 to 97152 2SULVN3 69 CKT 1	56	114.3	114.4	114.1	114.2	96119 5SULLVN 161 to 97152 2SULVN3 69 CKT 2	
09SP	AECI	AECI	96336 2HOLDEN 69 to 96124 5HOLDEN 161 CKT 1	56	143.8	143.9	142.8	142.9	96110 5PITTSV 161 to 96124 5HOLDEN 161 CKT 1	
09SP	AECI	AECI	96651 2LAMAR 69 to 96649 2JASPER 69 CKT 1	36	107.2	107.7	103.8	104.4	96654 2MILO 69 to 96802 2CLARK 69 CKT 1	
09SP	AECI	AECI	96751 2REEDS 69 to 96659 2BOWRML 69 CKT 1	36	106.7	107.3	<100.0	<100.0	59468 AUR124 5 161 to 59480 MON383 5 161 CKT 1	
09SP	AECI	AECI	96751 2REEDS 69 to 96659 2BOWRML 69 CKT 1	36	103.2	104.0	<100.0	<100.0	52690 CARTHG 2 69 to 96649 2JASPER 69 CKT 1	
09SP	AECI	AECI	96751 2REEDS 69 to 96659 2BOWRML 69 CKT 1	36	103.0	103.4	<100.0	<100.0	59479 LAR382 5 161 to 59480 MON383 5 161 CKT 1	
09SP	AECI	AECI	96834 2CARNEY 69 to 96833 2AGRA 69 CKT 1	36	118.0	118.1	116.9	117.0	96143 4VALLEY 138 to 96850 2VALLEY 69 CKT 1	
09SP	AECI	AECI	96890 2BRISTW 69 to 96921 2BRISWES 69 CKT 1	36	101.1	101.7	101.5	102.1	96138 4CLEVLND 138 to 96141 4STILWTR 138 CKT 1	
09SP	AECI	AECI	96890 2BRISTW 69 to 96921 2BRISWES 69 CKT 1	36	100.4	101.2	101.0	101.8	96140 4SILVCTY 138 to 96141 4STILWTR 138 CKT 1	
09SP	AECI	AECI	96943 2SILVCTY 69 to 96945 2YALE 69 CKT 1	35	112.0	112.2	112.1	112.4	96890 2BRISTW 69 to 96921 2BRISWES 69 CKT 1	
09SP	AECI	AECI	96943 2SILVCTY 69 to 96945 2YALE 69 CKT 1	35	107.6	107.8	107.8	108.0	96890 2BRISTW 69 to 96903 2KWIKSET 69 CKT 1	
09SP	AECI	AECI	96943 2SILVCTY 69 to 96945 2YALE 69 CKT 1	35	102.9	103.1	103.0	103.2	96903 2KWIKSET 69 to 96910 2SHAMROK 69 CKT 1	
09SP	AECI	AECI	96945 2YALE 69 to 96943 2SILVCTY 69 CKT 1	35	118.0	118.1	118.1	118.3	96889 2BRISTOW 69 to 96921 2BRISWES 69 CKT 1	
09SP	ENTR	SWPA	99825 5MIDWAY# 161 to 52660 BULL SH5 161 CKT 1	162	118.4	119.1	117.0	117.7	99817 5ISES 1 161 to 99826 5MORFLD 161 CKT 1	
09SP	ENTR	SWPA	99825 5MIDWAY# 161 to 52660 BULL SH5 161 CKT 1	162	111.7	112.5	110.3	111.1	99798 5BATEVL 161 to 99826 5MORFLD 161 CKT 1	
09SP	ENTR	EMDE	99831 5OMAHA * 161 to 59474 OZD312 5 161 CKT 1	162	124.7	126.0	122.8	124.2	53136 EUREKA 5 161 to 99832 5OSAGE # 161 CKT 1	Contingency is Invalid, Contingency Causes Voltage to Collapse at Osage, With Load removed at Osage, Facility Not Overloaded
09SP	ENTR	AEPW	99832 5OSAGE # 161 to 53136 EUREKA 5 161 CKT 1	244	111.6	115.6	110.7	114.7	52660 BULL SH5 161 to 99802 5BULLSH* 161 CKT 1	
09SP	ENTR	AEPW	99832 5OSAGE # 161 to 53136 EUREKA 5 161 CKT 1	244	110.1	114.2	109.2	113.3	99802 5BULLSH* 161 to 99809 5FLIPN 161 CKT 1	
09SP	ENTR	AEPW	99832 5OSAGE # 161 to 53136 EUREKA 5 161 CKT 1	244	106.9	111.1	105.9	110.1	99809 5FLIPN 161 to 99837 5SUMMIT 161 CKT 1	
09SP	ENTR	AEPW	99832 5OSAGE # 161 to 53136 EUREKA 5 161 CKT 1	244	103.7	108.1	102.8	107.1	99519 5QUITMN 161 to 99799 5BEE BR 161 CKT 1	
09SP	ENTR	AEPW	99832 5OSAGE # 161 to 53136 EUREKA 5 161 CKT 1	244	102.9	107.2	102.0	106.3	99811 5HARR-E 161 to 99837 5SUMMIT 161 CKT 1	
09WP	SWPA	AECI	52640 DONIPHNS 161 to 97201 2DONIPH 69 CKT 1	18.75	144.4	145.2	144.3	145.2	52640 DONIPHNS 161 to 97201 2DONIPH 69 CKT 2	
09WP	SWPA	AECI	52690 CARTHG 2 69 to 96751 2REEDS 69 CKT 1	43	110.5	111.1	102.4	102.9	59468 AUR124 5 161 to 59480 MON383 5 161 CKT 1	
09WP	SWPA	AECI	52690 CARTHG 2 69 to 96751 2REEDS 69 CKT 1	43	106.3	107.1	<100.0	<100.0	52690 CARTHG 2 69 to 96649 2JASPER 69 CKT 1	
09WP	SWPA	AECI	52690 CARTHG 2 69 to 96751 2REEDS 69 CKT 1	43	102.0	102.7	<100.0	<100.0	52688 CARTHAG5 161 to 59479 LAR382 5 161 CKT 1	
09WP	SWPA	AECI	52690 CARTHG 2 69 to 96751 2REEDS 69 CKT 1	43	101.8	102.6	<100.0	<100.0	96649 2JASPER 69 to 96651 2LAMAR 69 CKT 1	
09WP	SWPA	AECI	52690 CARTHG 2 69 to 96751 2REEDS 69 CKT 1	43	100.4	100.8	<100.0	<100.0	59479 LAR382 5 161 to 59480 MON383 5 161 CKT 1	
09WP	MIPU	AECI	59217 WINDSR 5 161 to 96071 5CLINTN 161 CKT 1	131	107.4	107.6	106.4	106.7	52702 TRUMAN 5 161 to 96552 5EDMONS 161 CKT 1	
09WP	MIPU	AECI	59217 WINDSR 5 161 to 96071 5CLINTN 161 CKT 1	131	105.1	105.4	104.1	104.4	96552 5EDMONS 161 to 96555 5GRAVOI 161 CKT 1	
09WP	MIPU	AECI	59217 WINDSR 5 161 to 96071 5CLINTN 161 CKT 1	131	105.1	105.3	104.1	104.4	58062 SALSBRYS 161 to 58064 NORTON-5 161 CKT 1	
09WP	MIPU	AECI	59217 WINDSR 5 161 to 96071 5CLINTN 161 CKT 1	131	101.9	102.1	101.1	101.3	59228 WBURGE 5 161 to 59229 ODESSA 5 161 CKT 1	
09WP	AECI	AECI	96751 2REEDS 69 to 96659 2BOWRML 69 CKT 1	43	104.7	105.3	<100.0	<100.0	59468 AUR124 5 161 to 59480 MON383 5 161 CKT 1	
09WP	AECI	AECI	96751 2REEDS 69 to 96659 2BOWRML 69 CKT 1	43	100.6	101.5	<100.0	<100.0	52690 CARTHG 2 69 to 96649 2JASPER 69 CKT 1	

Table 1.2 - SPP Facility Overloads
Caused or Impacted by Transfer (Scenario 2)

Southwest Power Pool
System Impact Study

Study Year	From Area	To Area	Monitored Branch Over 100% Rate B	Rate	BC % Loading	TC % Loading	ATC (MW)	Outaged Branch Causing Overload	Solution	Cost
04G	WERE	WERE	ATHENS SS - COFFEY COUNTY NO. 4 VERNON 69KV	45	102.0	105.1	0	BENTON - WOLF CREEK 345KV CKT 1	Westar Transmission Operating Directive 1304, Overload of the Athens to Wolf Creek 69 kV Line	-
04G	WERE	WERE	ATHENS SS - COFFEY COUNTY NO. 4 VERNON 69KV	45	101.4	104.6	0	ROSE HILL - WOLF CREEK 345KV CKT 1	"	-
04G	WERE	WERE	COFFEY COUNTY NO. 4 VERNON - GREEN 69KV	45	103.3	106.4	0	BENTON - WOLF CREEK 345KV CKT 1	Westar Transmission Operating Directive 1304, Overload of the Athens to Wolf Creek 69 kV Line	-
04G	WERE	WERE	COFFEY COUNTY NO. 4 VERNON - GREEN 69KV	45	102.7	105.9	0	ROSE HILL - WOLF CREEK 345KV CKT 1	"	-
04G	WERE	WERE	AUBURN ROAD - JEFFREY ENERGY CENTER 230KV	565	99.4	100.8	64	HOYT - JEFFERY ENERGY CENTER 345KV CKT 1	Solved with Taps Fixed and Switched Shunts Locked, Westar Transmission Operating Directive 400, Outage of the Jeffrey Energy Center to Hoyt 345 kV line	-
04G	WERE	WERE	GOLDEN PLAINS JUNCTION - HESSTON 69KV	32	97.8	101.8	82	HALSTEAD - MUD CREEK JUNCTION 69KV CKT 1	Westar Transmission Operating Directive 400, Outage of the Halstead to Newton 69 kV line	-
04G	WERE	WERE	GOLDEN PLAINS JUNCTION - HESSTON 69KV	32	97.0	101.0	113	MID AM JUNCTION - MUD CREEK JUNCTION 69KV CKT 1	"	-
04G	WERE	WERE	GOLDEN PLAINS JUNCTION - HESSTON 69KV	32	96.3	100.3	139	MID AM JUNCTION - NEWTON 69KV CKT 1	"	-
04SP	WERE	WERE	AUBURN ROAD - JEFFREY ENERGY CENTER 230KV	565	105.8	106.8	0	HOYT - JEFFERY ENERGY CENTER 345KV CKT 1	Westar Transmission Operating Directive 400, Outage of the Jeffrey Energy Center to Hoyt 345 kV line	-
04SP	SPS	SPS	CANYON EAST - OSAGE SWITCHING STATION 115KV	99	113.2	114.9	0	BUSHLAND INTRCHNG - DEAF SMITH INTRCHNG 230KV CKT 1	Rebuild 13 miles of 115 kV circuit with 397 ACSR on T-0-102 structures.	1,910,000
04SP	AEPW	AEPW	CHAMBER SPRINGS - TONTITOWN 161KV	247	115.5	117.4	0	CHAMBER SPRINGS - FARMINGTON AECC 161KV CKT 1	Relieved or Impact Removed by Selected Upgrades to be Assigned, Modeled in 09SP	-
04SP	AEPW	AEPW	CHAMBER SPRINGS - TONTITOWN 161KV	247	113.6	115.0	0	FLINT CREEK - TONTITOWN 161KV CKT 1	"	-
04SP	AEPW	AEPW	CHAMBER SPRINGS - TONTITOWN 161KV	247	103.6	105.4	0	FARMINGTON AECC - SOUTH FAYETTEVILLE 161KV CKT 1	"	-
04SP	AEPW	AEPW	EAST CENTERTON - GENTRY REC 161KV	353	103.0	103.4	0	FLINT CREEK - TONTITOWN 161KV CKT 1	Relieved or Impact Removed by Selected Upgrades to be Assigned, Modeled in 09SP	-
04SP	AEPW	AEPW	FLINT CREEK - GENTRY REC 161KV	354	105.1	105.5	0	FLINT CREEK - TONTITOWN 161KV CKT 1	Relieved or Impact Removed by Selected Upgrades to be Assigned, Modeled in 09SP	-
04SP	AEPW	AEPW	FLINT CREEK - TONTITOWN 161KV	312	105.9	106.3	0	CHAMBER SPRINGS 345/161KV TRANSFORMER CKT 1	Relieved or Impact Removed by Selected Upgrades to be Assigned, Modeled in 09SP	-
04SP	AEPW	AEPW	FLINT CREEK - TONTITOWN 161KV	312	105.9	106.3	0	CHAMBER SPRINGS - CLARKSVILLE 345KV CKT 1	"	-
04SP	OKGE	OKGE	FT SMITH 500/161KV TRANSFORMER	480	104.0	104.5	0	FT SMITH 345/161KV TRANSFORMER CKT 1	Convert Ft. Smith 161kv to 1-1/2 breaker design and install 2nd 500-161KV transformer bank.	10,000,000
04SP	SPS	SPS	HAPPY INTRCHNG - PALODU 115KV	99	100.8	103.6	0	AMARILLO S INTRCHNG - SWISHER CO INTRCHNG 230KV CKT 1	Rebuild 24 miles of 115 kV circuit with 397 ACSR on T-0-102 structures.	3,130,000
04SP	WERE	WERE	LAWRENCE HILL 230/115/13.8KV TRANSFORMER	308	106.7	107.5	0	LAWRENCE HILL - MIDLAND JCT 230KV	Westar Transmission Operating Directive 901, Outage of the Lawrence Hill-Midland Junction 230kV Line	-
04SP	WERE	WERE	LAWRENCE HILL 230/115/13.8KV TRANSFORMER	308	106.7	107.4	0	MIDLAND JCT 230/115/118.0KV TRANSFORMER	Westar Transmission Operating Directive 615, Loss of the Midland Junction 230/115 kV transformer	-
04SP	WERE	WERE	LAWRENCE HILL 230/115/13.8KV TRANSFORMER	308	104.4	105.2	0	LAWRENCE HILL - MIDLAND JCT 230KV	Westar Transmission Operating Directive 901, Outage of the Lawrence Hill-Midland Junction 230kV Line	-
04SP	WERE	WERE	LAWRENCE HILL 230/115/13.8KV TRANSFORMER	308	104.4	105.0	0	MIDLAND JCT 230/115/118.0KV TRANSFORMER	Westar Transmission Operating Directive 615, Loss of the Midland Junction 230/115 kV transformer	-
04SP	SPS	SPS	PALODU - RANDALL COUNTY INTRCHNG 115KV	99	102.7	105.5	0	AMARILLO S INTRCHNG - SWISHER CO INTRCHNG 230KV CKT 1	Rebuild 9 miles of 115 kV circuit with 397 ACSR on T-0-102 structures.	1,170,000
04SP	SPS	SPS	RANDALL COUNTY INTRCHNG 230/115KV TRANSFORMER	259	100.9	101.8	0	AMARILLO S INTRCHNG - NICHOLS STATION 230KV CKT 1	Open Amarillo South 230/115KV Transformer to Relieve Facility	-
04SP	SPS	SPS	CANYON EAST - CANYON WEST 115KV	99	99.5	101.2	43	BUSHLAND INTRCHNG - DEAF SMITH INTRCHNG 230KV CKT 1	Rebuild 4 miles of 115 kV circuit with 397 ACSR on T-0-102 structures.	590,000
04WP	WERE	WERE	AUBURN ROAD - JEFFREY ENERGY CENTER 230KV	565	99.3	100.7	79	HOYT - JEFFERY ENERGY CENTER 345KV CKT 1	Westar Transmission Operating Directive 400, Outage of the Jeffrey Energy Center to Hoyt 345 kV line	-
09SP	AECI	SWPA	5ASHRVL - IDALIA 161KV	206	116.7	117.2	0	5HARVELE - 5STFRAN 161KV CKT 1	Reconductor line.	6,600,000
09SP	SWPA	AECI	5ASHRVL - POPLAR BLUFF 161KV	167	113.5	114.1	0	5HARVELE - 5STFRAN 161KV CKT 1	Replace disconnect switches at Poplar Bluff. & Reconductor line.	4,070,000
09SP	SWPA	AECI	5ASHRVL - POPLAR BLUFF 161KV	167	104.6	105.3	0	96073 5HARVELE 161 to 96084 5GRNFR 161 CKT 1	"	-
09SP	WERE	WERE	AUBURN ROAD - JEFFREY ENERGY CENTER 230KV	565	104.5	106.2	0	HOYT - JEFFERY ENERGY CENTER 345KV CKT 1	Westar Transmission Operating Directive 400, Outage of the Jeffrey Energy Center to Hoyt 345 kV line	-
09SP	WERE	WERE	AUBURN ROAD 230/115/13.8KV TRANSFORMER	308	114.4	114.9	0	HOYT - JEFFERY ENERGY CENTER 345KV CKT 1	Westar Transmission Operating Directive 400, Outage of the Jeffrey Energy Center to Hoyt 345 kV line	-
09SP	WERE	WERE	AUBURN ROAD 230/115/13.8KV TRANSFORMER	308	113.3	113.8	0	HOYT - JEFFERY ENERGY CENTER 345KV CKT 1	"	-
09SP	KACP	KACP	BLUE VALLEY - WINCHESTER JUNCTION SOUTH 161KV	224	101.2	102.1	0	LEEDS - MIDTOWN 161KV CKT 1	Limits Rollover Rights 6/1/2009	-
09SP	SWPA	SPRM	BROOKLINE - SPRINGFIELD 161KV	323	121.2	124.4	0	SOUTHWEST - SOUTHWEST DISPOSAL 161KV CKT 1	Impact Removed by Selected Upgrades to be Assigned	-
09SP	SWPA	SPRM	BROOKLINE - SPRINGFIELD 161KV	323	120.3	123.5	0	BATTLEFIELD - SOUTHWEST DISPOSAL 161KV CKT 1	"	-
09SP	SWPA	SPRM	BROOKLINE - SPRINGFIELD 161KV	323	109.5	112.2	0	BROOKLINE - JUNCTION 161KV CKT 1	"	-
09SP	SPS	SPS	CANYON EAST - OSAGE SWITCHING STATION 115KV	99	106.2	107.8	0	BUSHLAND INTRCHNG - DEAF SMITH INTRCHNG 230KV CKT 1	See Previous	See Previous
09SP	AEPW	AEPW	CHAMBER SPRINGS - FARMINGTON AECC 161KV	335	109.4	110.3	0	CHAMBER SPRINGS - TONTITOWN 161KV CKT 1	Impact Removed by Selected Upgrades to be Assigned	-

Study Year	From Area	To Area	Monitored Branch Over 100% Rate B	Rate	BC % Loading	TC % Loading	ATC (MW)	Outaged Branch Causing Overload	Solution	Cost
09SP	AEPW	AEPW	CHAMBER SPRINGS - FARMINGTON AECC 161KV	335	104.9	105.4	0	FLINT CREEK - TONTITOWN 161KV CKT 1	Relieved and Impact Removed by Selected Upgrades to be Assigned	-
09SP	AEPW	AEPW	CHAMBER SPRINGS - FARMINGTON AECC 161KV	335	103.7	104.3	0	FLINT CREEK - GENTRY REC 161KV CKT 1	"	-
09SP	AEPW	AEPW	CHAMBER SPRINGS - FARMINGTON AECC 161KV	335	102.9	103.5	0	EAST CENTERTON - GENTRY REC 161KV CKT 1	"	-
09SP	AEPW	AEPW	CHAMBER SPRINGS - FLINT CREEK 161KV	335	104.8	105.2	0	CHAMBER SPRINGS 345/161KV TRANSFORMER CKT 1	Relieved and Impact Removed by Selected Upgrades to be Assigned	-
09SP	AEPW	AEPW	CHAMBER SPRINGS - FLINT CREEK 161KV	335	104.8	105.2	0	CHAMBER SPRINGS - CLARKSVILLE 345KV CKT 1	"	-
09SP	AEPW	AEPW	CHAMBER SPRINGS - TONTITOWN 161KV	244	150.5	152.4	0	CHAMBER SPRINGS - FARMINGTON AECC 161KV CKT 1	Impact Removed by Selected Upgrades to be Assigned	-
09SP	AEPW	AEPW	CHAMBER SPRINGS - TONTITOWN 161KV	244	143.6	145.1	0	FLINT CREEK - TONTITOWN 161KV CKT 1	"	-
09SP	AEPW	AEPW	CHAMBER SPRINGS - TONTITOWN 161KV	244	133.4	135.3	0	FARMINGTON AECC - SOUTH FAYETTEVILLE 161KV CKT 1	"	-
09SP	AEPW	AEPW	CHAMBER SPRINGS - TONTITOWN 161KV	244	116.6	118.3	0	FLINT CREEK - GENTRY REC 161KV CKT 1	Relieved and Impact Removed by Selected Upgrades to be Assigned	-
09SP	AEPW	AEPW	CHAMBER SPRINGS - TONTITOWN 161KV	244	115.1	116.7	0	EAST CENTERTON - GENTRY REC 161KV CKT 1	"	-
09SP	GRRD	GRRD	CLAREMORE 161/69KV TRANSFORMER CKT 1	84	103.5	104.9	0	CLAREMORE 161/69KV TRANSFORMER CKT 2	See Table 1.1	See Table 1.1
09SP	GRRD	GRRD	CLAREMORE 161/69KV TRANSFORMER CKT 2	84	103.8	105.2	0	CLAREMORE 161/69KV TRANSFORMER CKT 1	"	-
09SP	KACP	KACP	COLLEGE - CRAIG 161KV	335	106.3	107.2	0	BROOKRIDGE - OVERLAND PARK 161KV CKT 1	Limits Rollover Rights 6/1/2008	-
09SP	KACP	KACP	COLLEGE - CRAIG 161KV	335	105.9	106.2	0	ANTIOCH - STILWELL 161KV CKT 1	Limits Rollover Rights 6/1/2008	-
09SP	KACP	KACP	COLLEGE - CRAIG 161KV	335	100.6	101.3	0	MOONLIGHT - WEST GARDNER 161KV CKT 1	Limits Rollover Rights 6/1/2009	-
09SP	AEPW	AEPW	EAST CENTERTON - GENTRY REC 161KV	353	125.3	125.8	0	FLINT CREEK - TONTITOWN 161KV CKT 1	Relieved and Impact Removed by Selected Upgrades to be Assigned	-
09SP	AEPW	AEPW	EAST CENTERTON - GENTRY REC 161KV	353	109.9	110.7	0	LOWELL - TONTITOWN 161KV CKT 1	"	-
09SP	AEPW	AEPW	EAST CENTERTON - GENTRY REC 161KV	353	109.1	109.7	0	CHAMBER SPRINGS - FARMINGTON AECC 161KV CKT 1	"	-
09SP	AEPW	AEPW	EAST CENTERTON - GENTRY REC 161KV	353	107.2	108.0	0	LOWELL - ROGERS 161KV CKT 1	"	-
09SP	AEPW	AEPW	EAST CENTERTON - GENTRY REC 161KV	353	105.8	106.4	0	FARMINGTON AECC - SOUTH FAYETTEVILLE 161KV CKT 1	"	-
09SP	AEPW	AEPW	ELM SPRINGS REC - TONTITOWN 161KV	335	111.0	111.4	0	CHAMBER SPRINGS - FARMINGTON AECC 161KV CKT 1	Impact Removed by Selected Upgrades to be Assigned	-
09SP	AEPW	AEPW	ELM SPRINGS REC - TONTITOWN 161KV	335	100.7	101.0	0	FARMINGTON AECC - SOUTH FAYETTEVILLE 161KV CKT 1	Relieved and Impact Removed by Selected Upgrades to be Assigned	-
09SP	AEPW	AEPW	FLINT CREEK - GENTRY REC 161KV	354	128.1	128.6	0	FLINT CREEK - TONTITOWN 161KV CKT 1	Relieved and Impact Removed by Selected Upgrades to be Assigned	-
09SP	AEPW	AEPW	FLINT CREEK - GENTRY REC 161KV	354	112.8	113.5	0	LOWELL - TONTITOWN 161KV CKT 1	"	-
09SP	AEPW	AEPW	FLINT CREEK - GENTRY REC 161KV	354	112.0	112.6	0	CHAMBER SPRINGS - FARMINGTON AECC 161KV CKT 1	"	-
09SP	AEPW	AEPW	FLINT CREEK - GENTRY REC 161KV	354	110.1	110.8	0	LOWELL - ROGERS 161KV CKT 1	"	-
09SP	AEPW	AEPW	FLINT CREEK - GENTRY REC 161KV	354	108.7	109.3	0	FARMINGTON AECC - SOUTH FAYETTEVILLE 161KV CKT 1	"	-
09SP	AEPW	AEPW	FLINT CREEK - TONTITOWN 161KV	312	132.4	132.8	0	CHAMBER SPRINGS - TONTITOWN 161KV CKT 1	Impact Removed by Selected Upgrades to be Assigned	-
09SP	AEPW	AEPW	FLINT CREEK - TONTITOWN 161KV	312	131.1	131.7	0	CHAMBER SPRINGS 345/161KV TRANSFORMER CKT 1	"	-
09SP	AEPW	AEPW	FLINT CREEK - TONTITOWN 161KV	312	131.1	131.7	0	CHAMBER SPRINGS - CLARKSVILLE 345KV CKT 1	"	-
09SP	AEPW	AEPW	FLINT CREEK - TONTITOWN 161KV	312	107.0	107.3	0	FLINT CREEK - SUB 392 - DECATUR SOUTH 161KV CKT 1	Relieved and Impact Removed by Selected Upgrades to be Assigned	-
09SP	OKGE	OKGE	FT SMITH 345/161KV TRANSFORMER	493	107.3	107.7	0	FT SMITH 500/161KV TRANSFORMER CKT 1	See Previous	See Previous
09SP	OKGE	OKGE	FT SMITH 500/161KV TRANSFORMER	480	116.4	116.9	0	FT SMITH 345/161KV TRANSFORMER CKT 1	"	-
09SP	OKGE	OKGE	FT SMITH 500/161KV TRANSFORMER	480	102.2	103.1	0	FT SMITH 500/345KV TRANSFORMER CKT 1	"	-
09SP	ENTR	SWPA	JONES - JONESBORO 161KV	223	124.2	124.8	0	KENNETT - NEW MADRID 161KV CKT 1	Line belongs to Entergy. SWPA: Change the ratio on the metering CTs to 1200/5 and adjust the meters	2,000
09SP	ENTR	SWPA	JONES - JONESBORO 161KV	223	115.9	116.5	0	KENNETT - PARAGOULD 161KV CKT 1	See Previous	See Previous
09SP	WERE	WERE	LAWRENCE HILL 230/115/13.8KV TRANSFORMER	308	106.0	106.6	0	LAWRENCE HILL - MIDLAND JCT 230KV	Westar Transmission Operating Directive 901, Outage of the Lawrence Hill-Midland Junction 230KV Line	-
09SP	WERE	WERE	LAWRENCE HILL 230/115/13.8KV TRANSFORMER	308	106.0	106.6	0	MIDLAND JCT 230/115/118.0KV TRANSFORMER	Westar Transmission Operating Directive 615, Loss of the Midland Junction 230/115 kV transformer	-
09SP	WERE	WERE	LAWRENCE HILL 230/115/13.8KV TRANSFORMER	308	103.7	104.3	0	LAWRENCE HILL - MIDLAND JCT 230KV	Westar Transmission Operating Directive 901, Outage of the Lawrence Hill-Midland Junction 230kV Line	-
09SP	WERE	WERE	LAWRENCE HILL 230/115/13.8KV TRANSFORMER	308	103.7	104.3	0	MIDLAND JCT 230/115/118.0KV TRANSFORMER	Westar Transmission Operating Directive 615, Loss of the Midland Junction 230/115 kV transformer	-
09SP	SPS	SPS	RANDALL COUNTY INTRCHNG 230/115KV TRANSFORMER	259	103.8	104.7	0	AMARILLO S INTRCHNG - NICHOLS STATION 230KV CKT 1	Open Amarillo South 230/115KV Transformer to Relieve Facility	-
09SP	AECI	SWPA	5ASHRVL - IDALIA 161KV	206	99.9	100.7	15	96040 7FLETCH 345 to 96051 7WILHLM 345 CKT 1	See Previous	See Previous
09SP	SWPA	SPRM	BROOKLINE - SPRINGFIELD 161KV	323	98.6	102.1	60	BATTLEFIELD - SPRINGFIELD 161KV CKT 1	Relieved and Impact Removed by Selected Upgrades to be Assigned	-
09SP	SPS	SPS	PALODU - RANDALL COUNTY INTRCHNG 115KV	99	98.0	100.9	103	AMARILLO S INTRCHNG - SWISHER CO INTRCHNG 230KV CKT 1	See Previous	See Previous
09WP	WERE	WERE	ATHENS SS - COFFEY COUNTY NO. 4 VERNON 69KV	45	100.6	103.5	0	BENTON - WOLF CREEK 345KV CKT 1	Westar Transmission Operating Directive 1304, Overload of the Athens to Wolf Creek 69 kV Line	-
09WP	SWPA	SPRM	BROOKLINE - SPRINGFIELD 161KV	323	103.6	106.4	0	SOUTHWEST - SOUTHWEST DISPOSAL 161KV CKT 1	Impact Removed by Selected Upgrades to be Assigned	-
09WP	SWPA	SPRM	BROOKLINE - SPRINGFIELD 161KV	323	103.0	105.8	0	BATTLEFIELD - SOUTHWEST DISPOSAL 161KV CKT 1	"	-
09WP	AEPW	AEPW	CHAMBER SPRINGS - TONTITOWN 161KV	244	119.4	121.1	0	CHAMBER SPRINGS - FARMINGTON AECC 161KV CKT 1	Impact Removed by Selected Upgrades to be Assigned	-

Table 1.2 - SPP Facility Overloads
Caused or Impacted by Transfer (Scenario 2)

Southwest Power Pool
System Impact Study

Study Year	From Area	To Area	Monitored Branch Over 100% Rate B	Rate	BC % Loading	TC % Loading	ATC (MW)	Outaged Branch Causing Overload	Solution	Cost
09WP	AEPW	AEPW	CHAMBER SPRINGS - TONTITOWN 161KV	244	116.2	117.5	0	FLINT CREEK - TONTITOWN 161KV CKT 1	Relieved and Impact Removed by Selected Upgrades to be Assigned	-
09WP	AEPW	AEPW	CHAMBER SPRINGS - TONTITOWN 161KV	244	104.3	106.0	0	FARMINGTON AECC - SOUTH FAYETTEVILLE 161KV CKT 1	"	-
09WP	WERE	WERE	COFFEY COUNTY NO. 4 VERNON - GREEN 69KV	45	101.8	104.8	0	BENTON - WOLF CREEK 345KV CKT 1	Westar Transmission Operating Directive 1304, Overload of the Athens to Wolf Creek 69 kV Line	-
09WP	WERE	WERE	COFFEY COUNTY NO. 4 VERNON - GREEN 69KV	45	101.2	104.3	0	ROSE HILL - WOLF CREEK 345KV CKT 1	"	-
09WP	AEPW	AEPW	EAST CENTERTON - GENTRY REC 161KV	368	104.3	104.7	0	FLINT CREEK - TONTITOWN 161KV CKT 1	Relieved and Impact Removed by Selected Upgrades to be Assigned	-
09WP	AEPW	AEPW	FLINT CREEK - GENTRY REC 161KV	368	106.3	106.6	0	FLINT CREEK - TONTITOWN 161KV CKT 1	Relieved and Impact Removed by Selected Upgrades to be Assigned	-
09WP	WERE	WERE	ATHENS SS - COFFEY COUNTY NO. 4 VERNON 69KV	45	99.9	103.1	3	ROSE HILL - WOLF CREEK 345KV CKT 1	Westar Transmission Operating Directive 1304, Overload of the Athens to Wolf Creek 69 kV Line	-
									Total Engineering & Construction Costs	27,472,000

Study Year	From Area	To Area	Monitored Branch Over 100% Rate B	Rate	BC % Loading	TC % Loading	Outaged Branch Causing Overload	Comments
04AP	KACY	KACY	58683 OWN COR2 69 to 58692 QUIN 2 69 CKT 1	82	110.7	110.8	58683 OWN COR2 69 to 58692 QUIN 2 69 CKT 2	May not be applicable for deferral period starting 5/1/2006
04AP	KACY	KACY	58683 OWN COR2 69 to 58692 QUIN 2 69 CKT 2	82	107.8	107.9	58683 OWN COR2 69 to 58692 QUIN 2 69 CKT 1	"
04G	CELE	CELE	50282 G2RODEMR 22 to 50177 RODEMR 6 230 CKT 1	580	100.3	100.4	50050 EEEESV 6 230 to 50097 LEESV 6 230 CKT 1	"
04G	SWPA	AECI	52634 IDALIA 5 161 to 97243 2IDALIA 69 CKT 2	56	105.3	105.4	52634 IDALIA 5 161 to 97243 2IDALIA 69 CKT 1	"
04G	KACY	KACY	58683 OWN COR2 69 to 58692 QUIN 2 69 CKT 2	82	105.6	105.7	58683 OWN COR2 69 to 58692 QUIN 2 69 CKT 1	"
04G	MEC	MEC	64646 WRI MID8 69 to 64220 WRIGHT 5 161 CKT 1	83	105.1	105.2	63719 HOPE 5 161 to 64648 HOPE MD8 69 CKT 1	"
04G	NPPD	NPPD	64727 ALBION 9 34.5 to 64726 ALBION 7 115 CKT 2	11	118.3	121.0	64726 ALBION 9 34.5 to 64727 ALBION 9 34.5 CKT 1	"
04G	NPPD	NPPD	64778 COLMB.E7 115 to 64779 COLMB.E9 34.5 CKT 1	70	103.3	103.4	64778 COLMB.E7 115 to 64779 COLMB.E9 34.5 CKT 2	"
04G	NPPD	NPPD	64778 COLMB.E7 115 to 64779 COLMB.E9 34.5 CKT 2	70	103.6	103.7	64778 COLMB.E7 115 to 64779 COLMB.E9 34.5 CKT 1	"
04G	AECI	AECI	96089 5JAMESV 161 to 96673 2JAMESV 69 CKT 1	56	102.8	103.8	96089 5JAMESV 161 to 96673 2JAMESV 69 CKT 2	"
04G	AECI	AECI	96089 5JAMESV 161 to 96673 2JAMESV 69 CKT 2	56	106.5	107.5	96089 5JAMESV 161 to 96673 2JAMESV 69 CKT 1	"
04SP	AMRN	AMRN	31239 MOREAU 161 to 31240 MOREAU 69 CKT 1	84	104.7	105.0	Multiple Contingency: 30606 GASC S138 to 31815 TEGELER 138 CKT 1 31195 MILLER S138 to 31400 OSAGE 138 CKT 1	"
04SP	AMRN	AMRN	31239 MOREAU 161 to 31240 MOREAU 69 CKT 1	84	104.9	105.3	30677 GUTHRIE 161 to 30805 JC FAIR 69 CKT 99	"
04SP	AMRN	AMRN	31239 MOREAU 161 to 31240 MOREAU 69 CKT 1	84	102.4	102.6	31195 MILLER S 138 to 31196 MILLER 138 CKT 1	"
04SP	AMRN	AMRN	31239 MOREAU 161 to 31240 MOREAU 69 CKT 1	84	102.3	102.4	30814 JC ZION 138 to 31196 MILLER 138 CKT 1	"
04SP	SWPA	AECI	52634 IDALIA 5 161 to 97243 2IDALIA 69 CKT 1	56	102.7	102.8	52634 IDALIA 5 161 to 97243 2IDALIA 69 CKT 2	"
04SP	SWPA	AECI	52634 IDALIA 5 161 to 97243 2IDALIA 69 CKT 2	56	102.3	102.4	52634 IDALIA 5 161 to 97243 2IDALIA 69 CKT 1	"
04SP	MIPU	MIPU	59296 HSNVLSW2 69 to 59295 HSNVL 2 69 CKT 1	53	109.0	109.1	59279 RGREEN 2 69 to 59280 PHILL 2 69 CKT 1	"
04SP	MIPU	MIPU	59304 URICHTP2 69 to 59301 CLNTPLT2 69 CKT 1	41	115.4	115.6	59307 NEVPLT 2 69 to 59308 NEVADA 2 69 CKT 1	"
04SP	MIPU	MIPU	59306 APCITY 2 69 to 59304 URICHTP2 69 CKT 1	41	105.9	106.2	59307 NEVPLT 2 69 to 59308 NEVADA 2 69 CKT 1	"
04SP	MEC	MEC	64220 WRIGHT 5 161 to 64646 WRI MID8 69 CKT 1	83	152.3	152.4	63719 HOPE 5 161 to 64648 HOPE MD8 69 CKT 1	"
04SP	MEC	MEC	64648 HOPE MD8 69 to 63719 HOPE 5 161 CKT 1	105	101.7	101.8	64220 WRIGHT 5 161 to 64646 WRI MID8 69 CKT 1	"
04SP	NPPD	NPPD	64726 ALBION 7 115 to 64727 ALBION 9 34.5 CKT 2	11	179.3	179.4	64726 ALBION 7 115 to 64727 ALBION 9 34.5 CKT 1	"
04SP	NPPD	NPPD	64728 ALDA 7 115 to 64729 ALDA 9 34.5 CKT 2	31	117.5	117.6	64728 ALDA 7 115 to 64729 ALDA 9 34.5 CKT 1	"
04SP	NPPD	NPPD	64755 BROKENB7 115 to 64756 BROKENBG 69 CKT 2	35	175.6	175.8	64755 BROKENB7 115 to 64756 BROKENBG 69 CKT 1	"
04SP	NPPD	NPPD	64784 COLMBUS7 115 to 64785 COLMBUS9 34.5 CKT 1	46	105.8	105.9	64784 COLMBUS7 115 to 64785 COLMBUS9 34.5 CKT 2	"
04SP	NPPD	NPPD	64876 KEARNEY7 115 to 64877 KEARNEY9 34.5 CKT 2	35	102.0	102.1	64876 KEARNEY7 115 to 64877 KEARNEY9 34.5 CKT 1	"
04SP	NPPD	NPPD	65016 YORK 7 115 to 65017 YORK 9 34.5 CKT 2	31	124.7	124.8	65016 YORK 7 115 to 65017 YORK 9 34.5 CKT 1	"
04SP	AECI	AECI	96079 5FREDTN 161 to 97267 2MARQUA 69 CKT 1	50	103.8	104.2	Multiple Contingency: 96038 7ESSEX 345 to 96046 7NEWMAD 345 CKT 1 96038 7ESSEX 345 to 96054 7WWEAST 345 CKT 1 30974 LUTESVIL345 to 96054 7WWEAST 345 CKT 1	"
04SP	AECI	AECI	96079 5FREDTN 161 to 97267 2MARQUA 69 CKT 1	50	103.4	103.9	Multiple Contingency: 96038 7ESSEX 345 to 96054 7WWEAST 345 CKT 1 30974 LUTESVIL345 to 96054 7WWEAST 345 CKT 1	"
04SP	AECI	AECI	96089 5JAMESV 161 to 96673 2JAMESV 69 CKT 1	56	109.6	110.6	96089 5JAMESV 161 to 96673 2JAMESV 69 CKT 2	"
04SP	AECI	AECI	96089 5JAMESV 161 to 96673 2JAMESV 69 CKT 2	56	113.5	114.6	96089 5JAMESV 161 to 96673 2JAMESV 69 CKT 1	"
04SP	AECI	AECI	96096 5MARIES 161 to 97184 2MARIES 69 CKT 1	25	104.4	106.2	96096 5MARIES 161 to 97184 2MARIES 69 CKT 3	"
04SP	AECI	AECI	96096 5MARIES 161 to 97184 2MARIES 69 CKT 1	25	104.4	106.1	96096 5MARIES 161 to 97184 2MARIES 69 CKT 2	"
04SP	AECI	AECI	96096 5MARIES 161 to 97184 2MARIES 69 CKT 2	25	105.0	106.7	96096 5MARIES 161 to 97184 2MARIES 69 CKT 3	"
04SP	AECI	AECI	96096 5MARIES 161 to 97184 2MARIES 69 CKT 2	25	104.8	105.0	96096 5MARIES 161 to 97184 2MARIES 69 CKT 1	"
04SP	AECI	AECI	96096 5MARIES 161 to 97184 2MARIES 69 CKT 3	25	105.1	106.8	96096 5MARIES 161 to 97184 2MARIES 69 CKT 2	"
04SP	AECI	AECI	96096 5MARIES 161 to 97184 2MARIES 69 CKT 3	25	105.0	105.2	96096 5MARIES 161 to 97184 2MARIES 69 CKT 1	"
04SP	AECI	AECI	96108 5OSCEOL 161 to 96071 5CLINTN 161 CKT 1	123	94.5	100.9	59207 ARCHIE 5 161 to 59240 ADRIAN 5 161 CKT 1	"
04SP	AECI	AECI	96123 5WPLAIN 161 to 97123 2WSTPL3 69 CKT 1	56	103.1	104.5	96123 5WPLAIN 161 to 97123 2WSTPL3 69 CKT 2	"
04SP	AECI	AECI	96123 5WPLAIN 161 to 97123 2WSTPL3 69 CKT 2	56	112.4	112.7	96123 5WPLAIN 161 to 97123 2WSTPL3 69 CKT 1	"
04SP	AECI	AECI	96126 5MOBTAP 161 to 96120 5THMHL 161 CKT 1	372	104.2	104.9	96044 7MCCRED 345 to 96049 7THOMHL 345 CKT 1	"
04SP	AECI	AECI	96654 2MILO 69 to 96802 2CLARK 69 CKT 1	36	103.4	105.1	52690 CARTHG 2 69 to 96649 2JASPER 69 CKT 1	"
04SP	AECI	AECI	96692 2CLINTN 69 to 96701 2GAINES 69 CKT 1	36	103.2	108.7	96071 5CLINTN 161 to 96108 5OSCEOL 161 CKT 1	"

Study Year	From Area	To Area	Monitored Branch Over 100% Rate B	Rate	BC % Loading	TC % Loading	Outaged Branch Causing Overload	Comments
04SP	AECI	AECI	96692 2CLINTN 69 to 96701 2GAINES 69 CKT 1	36	100.3	102.4	96108 5OSCEOL 161 to 96811 2OSCEOL 69 CKT 1	"
04SP	AECI	AECI	96943 2SILVCTY 69 to 96945 2YALE 69 CKT 1	35	103.2	103.3	96889 2BRISTOW 69 to 96921 2BRISWES 69 CKT 1	"
04SP	AECI	AECI	96984 2TENKILR 69 to 96879 2VIAN 69 CKT 1	36	102.5	102.6	54447 TAHLQH 2 69 to 96961 2PARK 69 CKT 1	"
04SP	AECI	AECI	97274 5WWEAST 161 to 97278 2WWEAST 69 CKT 1	56	116.2	116.5	Multiple Contingency: 30583 FRED TAP161 to 31976 WEDEKN T161 CKT 1 30282 CAPE GIR161 to 31976 WEDEKN T161 CKT 1 30585 FREDTOWN138 to 31610 RIVMIN 2138 CKT 1	"
04SP	AECI	AECI	97274 5WWEAST 161 to 97278 2WWEAST 69 CKT 1	56	116.2	116.5	Multiple Contingency: 30583 FRED TAP161 to 31976 WEDEKN T161 CKT 1 30282 CAPE GIR161 to 31976 WEDEKN T161 CKT 1 30585 FREDTOWN138 to 31610 RIVMIN 2138 CKT 1	"
04SP	AECI	AECI	97274 5WWEAST 161 to 97278 2WWEAST 69 CKT 1	56	108.6	108.8	Multiple Contingency: 30282 CAPE GIR161 to 31976 WEDEKN T161 CKT 1 30585 FREDTOWN138 to 31610 RIVMIN 2138 CKT 1	"
04SP	AECI	AECI	97274 5WWEAST 161 to 97278 2WWEAST 69 CKT 1	56	103.9	104.2	Multiple Contingency: 30282 CAPE GIR161 to 31976 WEDEKN T161 CKT 1 30585 FREDTOWN138 to 31610 RIVMIN 2138 CKT 1 31976 WEDEKN T161 to 31984 WEDKND N161 CKT 1 31975 WEDEKIND161 to 31984 WEDKND N161 CKT 99 30583 FRED TAP161 to 30586 FREDTOWN161 CKT 1	"
04SP	AECI	AECI	97274 5WWEAST 161 to 97278 2WWEAST 69 CKT 1	56	102.8	103.1	Multiple Contingency: 96038 7ESSEX 345 to 96075 5ESSEX 161 CKT 1 52634 IDALIA 5161 to 96075 5ESSEX 161 CKT 1	"
04FA	WEPL	WEPL	58771 JUD-LRG3 115 to 58764 GRNBURG3 115 CKT 1	80	88.0	106.3	58779 MULGREN6 230 to 58795 SPEARVL6 230 CKT 1	"
04FA	MEC	MEC	64646 WRI MID8 69 to 64220 WRIGHT 5 161 CKT 1	83	108.1	108.2	63719 HOPE 5 161 to 64648 HOPE MD8 69 CKT 1	"
04FA	NPPD	NPPD	64784 COLMBUS7 115 to 64785 COLMBUS9 34.5 CKT 2	46	111.9	112.0	64784 COLMBUS7 115 to 64785 COLMBUS9 34.5 CKT 1	"
04FA	AECI	AECI	96089 5JAMESV 161 to 96673 2JAMESV 69 CKT 2	56	102.1	103.0	96089 5JAMESV 161 to 96673 2JAMESV 69 CKT 1	"
04WP	MEC	MEC	64646 WRI MID8 69 to 64220 WRIGHT 5 161 CKT 1	83	127.3	127.4	63719 HOPE 5 161 to 64648 HOPE MD8 69 CKT 1	"
04WP	NPPD	NPPD	64749 BEVERLY7 115 to 64750 BEVERLY8 69 CKT 2	16	111.5	111.7	64749 BEVERLY7 115 to 64750 BEVERLY8 69 CKT 1	"
04WP	NPPD	NPPD	64784 COLMBUS7 115 to 64785 COLMBUS9 34.5 CKT 1	46	126.4	126.6	64784 COLMBUS7 115 to 64785 COLMBUS9 34.5 CKT 2	"
04WP	NPPD	NPPD	64784 COLMBUS7 115 to 64785 COLMBUS9 34.5 CKT 2	46	126.1	126.3	64784 COLMBUS7 115 to 64785 COLMBUS9 34.5 CKT 1	"
04WP	AECI	AECI	96089 5JAMESV 161 to 96673 2JAMESV 69 CKT 2	64	102.0	102.8	96089 5JAMESV 161 to 96673 2JAMESV 69 CKT 1	"
04WP	AECI	AECI	96090 5KINGDM 161 to 96517 2KINGDM 69 CKT 2	29	100.6	100.9	96090 5KINGDM 161 to 96517 2KINGDM 69 CKT 3	"
04WP	AECI	AECI	96090 5KINGDM 161 to 96517 2KINGDM 69 CKT 3	29	100.6	100.8	96090 5KINGDM 161 to 96517 2KINGDM 69 CKT 2	"
04WP	AECI	AECI	96123 5WPLAIN 161 to 97123 2WSTPL3 69 CKT 2	64	103.4	103.6	96123 5WPLAIN 161 to 97123 2WSTPL3 69 CKT 1	"
09SP	AMRN	AECI	31941 WARENTN 161 to 96059 5BIG CK 161 CKT 1	227	100.1	100.3	Multiple Contingency: 30102 BELLEAU 345 to 31747 SIOUX 345 CKT 1 30102 BELLEAU 345 to 30535 ENON 345 CKT 1 30535 ENON 345 to 31230 MONTGMRY345 CKT 1	Whether Facility was Relieved or Impact was removed by Selected Upgrades was not determined.
09SP	CELE	CELE	50013 BEACRK 4 138 to 50012 BC PST 4 138 CKT 1	120	109.4	109.5	50033 COLFAX 6 230 to 50177 RODEMR 6 230 CKT 1	"
09SP	CELE	CELE	50013 BEACRK 4 138 to 50012 BC PST 4 138 CKT 1	120	106.0	106.1	50033 COLFAX 6 230 to 99116 6MONTGY 230 CKT 1	"
09SP	SWPA	AECI	52638 POP BLF5 161 to 96056 5ASHRVL 161 CKT 1	167	113.5	114.1	96073 5HARVELE 161 to 96114 5STFRAN 161 CKT 1	"
09SP	SWPA	AECI	52638 POP BLF5 161 to 96056 5ASHRVL 161 CKT 1	167	104.6	105.3	96073 5HARVELE 161 to 96084 5GRNFR161 CKT 1	"
09SP	SUNC	SUNC	56393 PLYMELL3 115 to 56448 HOLCOMB3 115 CKT 1	143	102.3	105.1	56420 FLETCHR3115 to 56448 HOLCOMB3115 CKT 1	Solved with Taps Fixed and Switched Shunts Locked, Whether Facility was Relieved or Impact was removed by Selected Upgrades was not determined.
09SP	SUNC	SUNC	56448 HOLCOMB3 115 to 56447 HOLCGEN1 22 CKT 1	380	99.0	100.2	56449 HOLCOMB7 345 to 56469 SPERVIL7 345 CKT 1	Whether Facility was Relieved or Impact was removed by Selected Upgrades was not determined.
09SP	KACY	KACY	58683 OWN COR2 69 to 58686 LEVEE 2 69 CKT 1	82	101.3	101.4	58692 QUIN 2 69 to 58693 V WEST2 69 CKT 1	"
09SP	WEPL	WEPL	58784 OTISSUB3 115 to 58823 OTISSUB1 34.5 CKT 1	8	105.5	105.6	58784 OTISSUB3 115 to 58823 OTISSUB1 34.5 CKT 2	"

Table 2.2 - Non-SPP Facility Overloads
Caused or Impacted by Transfer (Scenario 2)

Study Year	From Area	To Area	Monitored Branch Over 100% Rate B	Rate	BC % Loading	TC % Loading	Outaged Branch Causing Overload	Comments
09SP	WEPL	WEPL	58784 OTISSUB3 115 to 58823 OTISSUB1 34.5 CKT 2	8	104.0	104.2	58784 OTISSUB3 115 to 58823 OTISSUB1 34.5 CKT 1	"
09SP	MIPU	MIPU	59302 CLNTGRN2 69 to 59303 CLINTON2 69 CKT 1	78	106.0	106.1	59301 CLNTPLT2 69 to 59303 CLINTON2 69 CKT 1	"
09SP	MEC	MEC	64068 GRENFLD5 161 to 64197 NORWLK5 161 CKT 1	223	101.4	101.6	64050 SE POLK3 345 to 64634 SE MID 5 161 CKT 1	"
09SP	MEC	MEC	64068 GRENFLD5 161 to 64197 NORWLK5 161 CKT 1	223	101.4	101.6	64051 SEPOLK 5 161 to 64634 SE MID 5 161 CKT 1	"
09SP	MEC	MEC	64648 HOPE MD8 69 to 63719 HOPE 5 161 CKT 1	105	117.8	117.9	64220 WRIGHT 5 161 to 64646 WRI MID8 69 CKT 1	"
09SP	NPPD	NPPD	64726 ALBION 7 115 to 64727 ALBION 9 34.5 CKT 2	11	191.0	191.2	64726 ALBION 7 115 to 64727 ALBION 9 34.5 CKT 1	"
09SP	NPPD	NPPD	64728 ALDA 7 115 to 64729 ALDA 9 34.5 CKT 1	31	126.3	126.6	64728 ALDA 7 115 to 64729 ALDA 9 34.5 CKT 2	"
09SP	NPPD	NPPD	64728 ALDA 7 115 to 64729 ALDA 9 34.5 CKT 2	31	125.8	125.9	64728 ALDA 7 115 to 64729 ALDA 9 34.5 CKT 1	"
09SP	NPPD	NPPD	64743 BEATRCE7 115 to 64744 BEATRCE9 34.5 CKT 2	35	139.6	139.7	64743 BEATRCE7 115 to 64744 BEATRCE9 34.5 CKT 1	"
09SP	NPPD	NPPD	64747 BELDEN 7 115 to 64748 BELDEN 8 69 CKT 2	25	115.7	115.8	64747 BELDEN 7 115 to 64748 BELDEN 8 69 CKT 1	"
09SP	NPPD	NPPD	64749 BEVERLY7 115 to 64750 BEVERLY8 69 CKT 2	16	227.4	227.6	64749 BEVERLY7 115 to 64750 BEVERLY8 69 CKT 1	"
09SP	NPPD	NPPD	64778 COLMB.E7 115 to 64779 COLMB.E9 34.5 CKT 2	70	110.9	111.0	64778 COLMB.E7 115 to 64779 COLMB.E9 34.5 CKT 1	"
09SP	NPPD	NPPD	64784 COLMBUS7 115 to 64785 COLMBUS9 34.5 CKT 1	46	109.3	109.5	64784 COLMBUS7 115 to 64785 COLMBUS9 34.5 CKT 2	"
09SP	NPPD	NPPD	64784 COLMBUS7 115 to 64785 COLMBUS9 34.5 CKT 2	46	109.2	109.4	64784 COLMBUS7 115 to 64785 COLMBUS9 34.5 CKT 1	"
09SP	NPPD	NPPD	64855 HOLDREG7 115 to 64856 HOLDREG9 34.5 CKT 1	35	116.3	116.4	64855 HOLDREG7 115 to 64856 HOLDREG9 34.5 CKT 2	"
09SP	NPPD	NPPD	64855 HOLDREG7 115 to 64856 HOLDREG9 34.5 CKT 2	35	116.3	116.4	64855 HOLDREG7 115 to 64856 HOLDREG9 34.5 CKT 1	"
09SP	NPPD	NPPD	64876 KEARNEY7 115 to 64877 KEARNEY9 34.5 CKT 1	35	112.1	112.2	64876 KEARNEY7 115 to 64877 KEARNEY9 34.5 CKT 2	"
09SP	NPPD	NPPD	64876 KEARNEY7 115 to 64877 KEARNEY9 34.5 CKT 2	35	112.4	112.6	64876 KEARNEY7 115 to 64877 KEARNEY9 34.5 CKT 1	"
09SP	NPPD	NPPD	65016 YORK 7 115 to 65017 YORK 9 34.5 CKT 2	31	137.5	137.8	65016 YORK 7 115 to 65017 YORK 9 34.5 CKT 1	"
09SP	AECI	SWPA	96056 5ASHRVL 161 to 52634 IDALIA 5 161 CKT 1	206	116.7	117.2	96073 5HARVELE 161 to 96114 5STFRAN 161 CKT 1	"
09SP	AECI	SWPA	96056 5ASHRVL 161 to 52634 IDALIA 5 161 CKT 1	206	105.3	105.5	96073 5HARVELE 161 to 96084 5GRNFRT 161 CKT 1	"
09SP	AECI	SWPA	96056 5ASHRVL 161 to 52634 IDALIA 5 161 CKT 1	206	99.9	100.7	96040 7FLETCH 345 to 96051 7WILHLM 345 CKT 1	"
09SP	AECI	AECI	96071 5CLINTN 161 to 96692 2CLINTN 69 CKT 3	56	105.4	107.4	96071 5CLINTN 161 to 96692 2CLINTN 69 CKT 1	"
09SP	AECI	AECI	96074 5CUBA 161 to 97138 2CUBA 69 CKT 1	56	101.8	102.0	96112 5SALEM 161 to 97027 2SALEM3 69 CKT 1	"
09SP	AECI	AECI	96074 5CUBA 161 to 97138 2CUBA 69 CKT 1	56	101.7	101.9	96112 5SALEM 161 to 97027 2SALEM3 69 CKT 2	"
09SP	AECI	AMRN	96079 5FREDTN 161 to 30583 FRED TAP 161 CKT 1	56	146.5	147.0	96054 7WWEAST 345 to 97274 5WWEAST 161 CKT 1	"
09SP	AECI	AECI	96083 5GIBSON 161 to 97291 2GIBSON 69 CKT 1	50	102.9	103.0	96073 5HARVELE 161 to 96114 5STFRAN 161 CKT 1	"
09SP	AECI	AECI	96089 5JAMESV 161 to 96673 2JAMESV 69 CKT 1	56	117.2	117.6	96089 5JAMESV 161 to 96673 2JAMESV 69 CKT 2	"
09SP	AECI	AECI	96089 5JAMESV 161 to 96673 2JAMESV 69 CKT 2	56	120.5	120.9	96089 5JAMESV 161 to 96673 2JAMESV 69 CKT 1	"
09SP	AECI	AECI	96096 5MARIES 161 to 97184 2MARIES 69 CKT 3	56	107.2	108.0	96078 5FRANKS 161 to 96080 5FTWOOD 161 CKT 1	"
09SP	AECI	AECI	96108 5OSCEOL 161 to 96071 5CLINTN 161 CKT 1	123	112.1	118.6	59207 ARCHIE 5 161 to 59240 ADRIAN 5 161 CKT 1	"
09SP	AECI	AECI	96108 5OSCEOL 161 to 96071 5CLINTN 161 CKT 1	123	110.6	117.3	59208 NEVADA 5 161 to 59216 BUTLER 5 161 CKT 1	"
09SP	AECI	AECI	96108 5OSCEOL 161 to 96071 5CLINTN 161 CKT 1	123	109.9	116.6	56793 NEOSHO 7 345 to 57981 LACYGNE7 345 CKT 1	"
09SP	AECI	AECI	96108 5OSCEOL 161 to 96071 5CLINTN 161 CKT 1	123	110.0	116.5	59216 BUTLER 5 161 to 59240 ADRIAN 5 161 CKT 1	"
09SP	AECI	AECI	96108 5OSCEOL 161 to 96071 5CLINTN 161 CKT 1	123	108.7	114.7	52702 TRUMAN 5 161 to 96552 5EDMONS 161 CKT 1	"
09SP	AECI	AECI	96108 5OSCEOL 161 to 96811 2OSCEOL 69 CKT 1	56	106.5	107.1	96692 2CLINTN 69 to 96701 2GAINES 69 CKT 1	"
09SP	AECI	AECI	96108 5OSCEOL 161 to 96811 2OSCEOL 69 CKT 1	56	102.6	104.7	52698 STOCKTN5 161 to 96108 5OSCEOL 161 CKT 1	"
09SP	AECI	AECI	96109 5PHILIPS 161 to 97071 2PBURG 69 CKT 1	84	99.0	100.9	96102 5MRSHFL 161 to 97163 2MRSHFL 69 CKT 1	"
09SP	AECI	AECI	96112 5SALEM 161 to 97027 2SALEM3 69 CKT 1	56	121.4	121.5	96112 5SALEM 161 to 97027 2SALEM3 69 CKT 2	"
09SP	AECI	AECI	96112 5SALEM 161 to 97027 2SALEM3 69 CKT 2	56	120.9	121.0	96112 5SALEM 161 to 97027 2SALEM3 69 CKT 1	"
09SP	AECI	AECI	96124 5HOLDEN 161 to 96071 5CLINTN 161 CKT 1	227	100.7	101.0	96110 5PITTSV 161 to 96124 5HOLDEN 161 CKT 1	"
09SP	AECI	AECI	96124 5HOLDEN 161 to 96336 2HOLDEN 69 CKT 1	56	115.6	116.0	96110 5PITTSV 161 to 96331 2PITTSV 69 CKT 1	"
09SP	AECI	AECI	96126 5MOBTAP 161 to 96120 5THMHIL 161 CKT 1	372	106.9	107.7	96044 7MCCRED 345 to 96049 7THOMHL 345 CKT 1	"
09SP	AECI	AECI	96336 2HOLDEN 69 to 96124 5HOLDEN 161 CKT 1	56	149.5	150.5	96071 5CLINTN 161 to 96124 5HOLDEN 161 CKT 1	"
09SP	AECI	AECI	96647 2BLLMYTP 69 to 96654 2MILO 69 CKT 1	36	98.9	100.8	52690 CARTHG 2 69 to 96649 2JASPER 69 CKT 1	"
09SP	AECI	AECI	96654 2MILO 69 to 96802 2CLARK 69 CKT 1	36	121.1	122.9	52690 CARTHG 2 69 to 96649 2JASPER 69 CKT 1	"
09SP	AECI	AECI	96654 2MILO 69 to 96802 2CLARK 69 CKT 1	36	104.3	105.9	96649 2JASPER 69 to 96651 2LAMAR 69 CKT 1	"
09SP	AECI	AECI	96654 2MILO 69 to 96802 2CLARK 69 CKT 1	36	94.5	101.8	52698 STOCKTN5 161 to 96101 5MORGAN 161 CKT 1	"
09SP	AECI	AECI	96692 2CLINTN 69 to 96701 2GAINES 69 CKT 1	36	134.7	140.9	96071 5CLINTN 161 to 96108 5OSCEOL 161 CKT 1	"
09SP	AECI	AECI	96692 2CLINTN 69 to 96701 2GAINES 69 CKT 1	36	134.9	137.9	Multiple Contingency: 96071 5CLINTN 161 to 96108 5OSCEOL 161 CKT 1 52698 STOCKTN5161 to 96108 5OSCEOL 161 CKT 1	"

Study Year	From Area	To Area	Monitored Branch Over 100% Rate B	Rate	BC % Loading	TC % Loading	Outaged Branch Causing Overload	Comments
09SP	AECI	AECI	96692 2CLINTN 69 to 96701 2GAINES 69 CKT 1	36	127.0	129.3	96108 5OSCEOL 161 to 96811 2OSCEOL 69 CKT 1	"
09SP	AECI	AECI	96692 2CLINTN 69 to 96701 2GAINES 69 CKT 1	36	97.6	100.9	96555 5GRAVOI 161 to 96563 5SUNRIS 161 CKT 1	"
09SP	AECI	AECI	96699 2ELYNTP 69 to 96705 2PECULR 69 CKT 1	36	98.8	102.0	59207 ARCHIE 5 161 to 59240 ADRIAN 5 161 CKT 1	"
09SP	AECI	AECI	96701 2GAINES 69 to 96810 2MTZION 69 CKT 1	36	119.5	125.6	96071 5CLINTN 161 to 96108 5OSCEOL 161 CKT 1	"
09SP	AECI	AECI	96701 2GAINES 69 to 96810 2MTZION 69 CKT 1	36	116.2	119.5	Multiple Contingency: 96071 5CLINTN 161 to 96108 5OSCEOL 161 CKT 1 52698 STOCKTN5161 to 96108 5OSCEOL 161 CKT 1	"
09SP	AECI	AECI	96701 2GAINES 69 to 96810 2MTZION 69 CKT 1	36	108.2	110.6	96108 5OSCEOL 161 to 96811 2OSCEOL 69 CKT 1	"
09SP	AECI	AECI	96811 2OSCEOL 69 to 96773 2ELKTON 69 CKT 1	36	102.5	106.7	52698 STOCKTN5 161 to 96108 5OSCEOL 161 CKT 1	"
09SP	AECI	AECI	96811 2OSCEOL 69 to 96773 2ELKTON 69 CKT 1	36	99.3	102.0	96770 2BUFFLO 69 to 97068 2LONGLN 69 CKT 1	"
09SP	AECI	AECI	96811 2OSCEOL 69 to 96773 2ELKTON 69 CKT 1	36	97.8	101.6	52698 STOCKTN5 161 to 96101 5MORGAN 161 CKT 1	"
09SP	AECI	AECI	96834 2CARNEY 69 to 96833 2AGRA 69 CKT 1	36	115.8	115.9	96143 4VALLEY 138 to 96850 2VALLEY 69 CKT 1	"
09SP	AECI	AECI	96943 2SILVCTY 69 to 96945 2YALE 69 CKT 1	35	123.7	123.8	96140 4SILVCTY 138 to 96141 4STILWTR 138 CKT 1	"
09SP	AECI	AECI	96943 2SILVCTY 69 to 96945 2YALE 69 CKT 1	35	109.5	109.7	96890 2BRISTW 69 to 96921 2BRISWES 69 CKT 1	"
09SP	AECI	AECI	96943 2SILVCTY 69 to 96945 2YALE 69 CKT 1	35	104.9	105.1	96890 2BRISTW 69 to 96903 2KWIKSET 69 CKT 1	"
09SP	AECI	AECI	96943 2SILVCTY 69 to 96945 2YALE 69 CKT 1	35	100.2	100.6	96903 2KWIKSET 69 to 96910 2SHAMROK 69 CKT 1	"
09SP	AECI	AECI	96945 2YALE 69 to 96943 2SILVCTY 69 CKT 1	35	115.7	115.8	96889 2BRISTOW 69 to 96921 2BRISWES 69 CKT 1	"
09SP	AECI	AECI	97274 5WWEAST 161 to 97278 2WWEAST 69 CKT 1	56	102.7	103.0	Multiple Contingency: 96038 7ESSEX 345 to 96075 5ESSEX 161 CKT 1 52634 IDALIA 5161 to 96075 5ESSEX 161 CKT 1	"
09SP	AECI	AECI	97274 5WWEAST 161 to 97278 2WWEAST 69 CKT 1	56	110.8	111.1	96079 5FREDTN 161 to 97267 2MARQUA 69 CKT 1	"
09SP	AECI	AECI	97274 5WWEAST 161 to 97278 2WWEAST 69 CKT 1	56	103.3	103.6	52634 IDALIA 5 161 to 96075 5ESSEX 161 CKT 1	"
09SP	ENTR	SWPA	99755 5JONES 161 to 52618 JONESBO5 161 CKT 1	223	124.2	124.8	52600 N MADRD5 161 to 52610 KENNETT5 161 CKT 1	Less Than 3% Impact
09SP	ENTR	SWPA	99755 5JONES 161 to 52618 JONESBO5 161 CKT 1	223	115.9	116.5	52610 KENNETT5 161 to 52612 PARAGLD5 161 CKT 1	"
09SP	ENTR	ENTR	99811 5HARR-E 161 to 99837 5SUMMIT 161 CKT 1	162	116.0	118.8	99519 5QUITMN 161 to 99799 5BEE BR 161 CKT 1	Whether Facility was Relieved or Impact was removed by Selected Upgrades was not determined.
09SP	ENTR	ENTR	99811 5HARR-E 161 to 99837 5SUMMIT 161 CKT 1	162	111.2	113.9	99799 5BEE BR 161 to 99807 5CLINTN 161 CKT 1	"
09SP	ENTR	ENTR	99837 5SUMMIT 161 to 99811 5HARR-E 161 CKT 1	162	106.4	109.2	99806 5CLIN-W# 161 to 99807 5CLINTN 161 CKT 1	"
09WP	SUNC	SUNC	56393 PLYMELL3 115 to 56448 HOLCOMB3 115 CKT 1	143	98.1	101.0	56420 FLETCHR3115 to 56448 HOLCOMB3115 CKT 1	Solved with Taps Fixed and Switched Shunts Locked, Whether Facility was Relieved or Impact was removed by Selected Upgrades was not determined.
09WP	MEC	MEC	64646 WRI MID8 69 to 64220 WRIGHT 5 161 CKT 1	83	142.7	142.8	63719 HOPE 5 161 to 64648 HOPE MD8 69 CKT 1	Whether Facility was Relieved or Impact was removed by Selected Upgrades was not determined.
09WP	NPPD	NPPD	64755 BROKENB7 115 to 64756 BROKENBG 69 CKT 2	35	108.7	108.8	64755 BROKENB7 115 to 64756 BROKENBG 69 CKT 1	"
09WP	NPPD	NPPD	64784 COLMBUS7 115 to 64785 COLMBUS9 34.5 CKT 1	46	130.4	130.6	64784 COLMBUS7 115 to 64785 COLMBUS9 34.5 CKT 2	"
09WP	NPPD	NPPD	64784 COLMBUS7 115 to 64785 COLMBUS9 34.5 CKT 2	46	130.1	130.3	64784 COLMBUS7 115 to 64785 COLMBUS9 34.5 CKT 1	"
09WP	NPPD	NPPD	65016 YORK 7 115 to 65017 YORK 9 34.5 CKT 2	31	124.7	124.8	65016 YORK 7 115 to 65017 YORK 9 34.5 CKT 1	"
09WP	AECI	AMRN	96079 5FREDTN 161 to 30583 FRED TAP 161 CKT 1	56	119.2	119.5	96054 7WWEAST 345 to 97274 5WWEAST 161 CKT 1	"
09WP	AECI	AECI	96089 5JAMESV 161 to 96673 2JAMESV 69 CKT 1	64	102.8	103.1	96089 5JAMESV 161 to 96673 2JAMESV 69 CKT 2	"
09WP	AECI	AECI	96089 5JAMESV 161 to 96673 2JAMESV 69 CKT 2	64	105.6	105.9	96089 5JAMESV 161 to 96673 2JAMESV 69 CKT 1	"
09WP	AECI	AECI	96112 5SALEM 161 to 97027 2SALEM3 69 CKT 1	64	108.9	109.0	96112 5SALEM 161 to 97027 2SALEM3 69 CKT 2	"
09WP	AECI	AECI	96112 5SALEM 161 to 97027 2SALEM3 69 CKT 2	64	108.4	108.5	96112 5SALEM 161 to 97027 2SALEM3 69 CKT 1	"
09WP	AECI	AECI	96123 5WPLAIN 161 to 97123 2WSTPL3 69 CKT 2	64	119.8	121.2	96123 5WPLAIN 161 to 97123 2WSTPL3 69 CKT 1	"
09WP	AECI	AECI	96124 5HOLDEN 161 to 96336 2HOLDEN 69 CKT 1	64	121.7	122.5	96071 5CLINTN 161 to 96124 5HOLDEN 161 CKT 1	"
09WP	AECI	AECI	96692 2CLINTN 69 to 96701 2GAINES 69 CKT 1	43	103.7	106.0	Multiple Contingency: 96071 5CLINTN 161 to 96108 5OSCEOL 161 CKT 1 52698 STOCKTN5161 to 96108 5OSCEOL 161 CKT 1	"
09WP	AECI	AECI	96692 2CLINTN 69 to 96701 2GAINES 69 CKT 1	43	98.7	103.2	96071 5CLINTN 161 to 96108 5OSCEOL 161 CKT 1	"

Table 3.2 - SPP Facility Overloads
 Caused or Impacted by Selected Upgrades (Scenario 2)

Southwest Power Pool
 System Impact Study

Study Year	From Area	To Area	Monitored Branch Over 100% Rate B	Rate	BC Without Upgrades %Loading	BC With Upgrades %Loading	TC Without Upgrades %Loading	TC With Upgrades %Loading	Outaged Branch Causing Overload	Solution	Cost
09SP	ENTR	EMDE	50MAHA - SUB 312 - POWERSITE 161KV	162	110.4	111.3	109.1	110.0	EUREKA SPRINGS - OSAGE 161KV CKT 1	Contingency is Invalid, Contingency Causes Voltage to Collapse at Osage, With Load removed at Osage, Facility Not Overloaded	-
09SP	OKGE	AEPW	BONANZA - BONANZA TAP 161KV	177	99.1	102.6	99.1	102.6	AES - TARBYP 161KV CKT 1	See Table 3.1	See Table 3.1
09SP	SWPA	SWPA	EUFAULA 161/138/13.8KV TRANSFORMER	105	98.7	104.6	97.5	103.4	WELEETKA 161/138KV TRANSFORMER CKT 1	Replace Eufaula Transformer	2,000,000
09SP	SWPA	SWPA	EUFAULA 161/138/13.8KV TRANSFORMER	105	98.6	104.5	97.4	103.3	GORE - WELEETKA 161KV CKT 1	See Previous	See Previous
09SP	ENTR	AEPW	EUREKA SPRINGS - OSAGE 161KV	244	99.0	102.6	98.3	101.9	BULL SHOALS - BULL SHOALS 161KV CKT 1	See Table 3.1	See Table 3.1
09SP	ENTR	AEPW	EUREKA SPRINGS - OSAGE 161KV	244	97.4	101.1	96.7	100.4	5FLIPN - BULL SHOALS 161KV CKT 1	"	"
09SP	OKGE	AEPW	HOWE INT - WISTER 69KV	48	100.7	104.0	100.2	103.5	EUFAULA - STIGLER TAP 138KV CKT 1	Invalid Contingency	-
09SP	EMDE	SWPA	SUB 438 - RIVERSIDE - TABLE ROCK 161KV	268	< 100.0	< 100.0	99.4	100.4	EUREKA SPRINGS - OSAGE 161KV CKT 1	Contingency is Invalid, Contingency Causes Voltage to Collapse at Osage, With Load removed at Osage, Facility Not Overloaded	-
09SP	GRRD	GRRD	TAHLEQUAH 161/69KV TRANSFORMER CKT 1	78	116.7	120.8	116.6	120.7	TAHLEQUAH 161/69KV TRANSFORMER CKT 2	See Table 3.1	See Table 3.1
09SP	GRRD	GRRD	TAHLEQUAH 161/69KV TRANSFORMER CKT 2	78	117.4	121.6	117.3	121.5	TAHLEQUAH 161/69KV TRANSFORMER CKT 1	"	"
09WP	SWPA	SWPA	EUFAULA 161/138/13.8KV TRANSFORMER	105	98.4	103.3	97.3	102.2	WELEETKA 161/138KV TRANSFORMER CKT 1	See Previous	See Previous
09WP	SWPA	SWPA	EUFAULA 161/138/13.8KV TRANSFORMER	105	98.3	103.1	97.1	102.0	GORE - WELEETKA 161KV CKT 1	"	"
Total Engineering & Construction Costs											2,000,000

Study Year	From Area	To Area	Monitored Branch Over 100% Rate B	Rate	BC Without Upgrades %Loading	BC With Upgrades %Loading	TC Without Upgrades %Loading	TC With Upgrades %Loading	Outaged Branch Causing Overload	Comments
09SP	SWPA	AECI	52638 POP BLF5 161 to 96056 5ASHRVL 161 CKT 1	167	113.5	116.1	114.1	116.4	96073 5HARVELE 161 to 96114 5STFRAN 161 CKT 1	
09SP	SWPA	AECI	52638 POP BLF5 161 to 96056 5ASHRVL 161 CKT 1	167	104.6	106.7	105.3	107.3	96073 5HARVELE 161 to 96084 5GRNFRT 161 CKT 1	
09SP	SWPA	AECI	52640 DONIPHNS 161 to 97201 2DONIPH 69 CKT 1	18.75	124.9	125.5	124.7	125.4	52640 DONIPHNS 161 to 97201 2DONIPH 69 CKT 2	
09SP	MIPU	AECI	59217 WINDSR 5 161 to 96071 5CLINTN 161 CKT 1	123	105.1	105.3	103.9	104.3	58062 SALSBRY5 161 to 58064 NORTON-5 161 CKT 1	
09SP	AECI	SWPA	96056 5ASHRVL 161 to 52638 POP BLF5 161 CKT 1	167	<100.0	<100.0	97.8	100.1	96040 7FLETCH 345 to 96051 7WILHLM 345 CKT 1	
09SP	AECI	MIPU	96071 5CLINTN 161 to 59242 CLINTON5 161 CKT 1	100	110.4	110.5	110.1	110.2	59307 NEVPLT 2 69 to 59308 NEVADA 2 69 CKT 1	
09SP	AECI	AECI	96108 SOSCEOL 161 to 96811 2OSCEOL 69 CKT 1	56	106.5	106.6	107.1	107.2	96692 2CLINTN 69 to 96701 2GAINES 69 CKT 1	
09SP	AECI	AECI	96119 5SULLVN 161 to 97152 2SULVN3 69 CKT 1	56	112.8	112.9	112.5	112.6	96119 5SULLVN 161 to 97152 2SULVN3 69 CKT 2	
09SP	AECI	AECI	96119 5SULLVN 161 to 97152 2SULVN3 69 CKT 2	50	125.9	126.0	125.6	125.7	96119 5SULLVN 161 to 97152 2SULVN3 69 CKT 1	
09SP	AECI	AECI	96833 2AGRA 69 to 96836 2CUSHING 69 CKT 1	44	108.1	108.2	108.1	108.2	96143 4VALLEY 138 to 96844 4RAMSEY 138 CKT 1	
09SP	AECI	AECI	96834 2CARNEY 69 to 96833 2AGRA 69 CKT 1	36	96.6	100.3	116.0	116.1	96143 4VALLEY 138 to 96844 4RAMSEY 138 CKT 1	
09SP	AECI	AECI	96909 2SALYBRN 69 to 96905 2MUSK-SW 69 CKT 1	51	102.1	104.4	102.0	104.2	96893 2CHECDST 69 to 96895 2CHECOTA 69 CKT 1	
09SP	AECI	AECI	96943 2SILVCTY 69 to 96945 2YALE 69 CKT 1	35	109.5	109.7	109.7	109.9	96890 2BRISTW 69 to 96921 2BRISWES 69 CKT 1	
09SP	AECI	AECI	96943 2SILVCTY 69 to 96945 2YALE 69 CKT 1	35	104.9	105.1	105.1	105.3	96890 2BRISTW 69 to 96903 2KWIKSET 69 CKT 1	
09SP	AECI	AECI	96943 2SILVCTY 69 to 96945 2YALE 69 CKT 1	35	100.2	100.6	100.6	100.8	96903 2KWIKSET 69 to 96910 2SHAMROK 69 CKT 1	
09SP	AECI	AECI	96945 2YALE 69 to 96943 2SILVCTY 69 CKT 1	35	115.7	115.8	115.8	116.0	96889 2BRISTOW 69 to 96921 2BRISWES 69 CKT 1	
09SP	ENTR	EMDE	99831 5OMAHA * 161 to 59474 OZD312 5 161 CKT 1	162	110.4	111.3	109.1	109.9	53136 EUREKA 5 161 to 99832 5OSAGE # 161 CKT 1	Contingency is Invalid, Contingency Causes Voltage to Collapse at Osage, With Load removed at Osage, Facility Not Overloaded
09SP	ENTR	AEPW	99832 5OSAGE # 161 to 53136 EUREKA 5 161 CKT 1	244	99.0	102.6	98.3	101.9	52660 BULL SH5 161 to 99802 5BULLSH* 161 CKT 1	
09SP	ENTR	AEPW	99832 5OSAGE # 161 to 53136 EUREKA 5 161 CKT 1	244	97.4	101.1	96.7	100.4	99802 5BULLSH* 161 to 99809 5FLIPN 161 CKT 1	
09WP	CELE	CELE	50023 CARROLL6 230 to 50024 CARROLL4 138 CKT 1	336	120.6	120.7	120.6	120.7	50045 DOLHILL7 345 to 53454 SW SHV 7 345 CKT 1	
09WP	CELE	AEPW	50090 IPAPER 4 138 to 53461 WALLAKE4 138 CKT 1	236	122.4	122.7	122.4	122.7	50045 DOLHILL7 345 to 53454 SW SHV 7 345 CKT 1	
09WP	CELE	CELE	50113 MANSFLD4 138 to 50090 IPAPER 4 138 CKT 1	232	134.6	134.9	134.6	134.8	50045 DOLHILL7 345 to 53454 SW SHV 7 345 CKT 1	
09WP	SWPA	AECI	52640 DONIPHNS 161 to 97201 2DONIPH 69 CKT 1	18.75	143.5	144.0	143.3	143.8	52640 DONIPHNS 161 to 97201 2DONIPH 69 CKT 2	
09WP	AECI	AECI	96119 5SULLVN 161 to 97152 2SULVN3 69 CKT 2	58	113.6	113.7	113.3	113.4	96119 5SULLVN 161 to 97152 2SULVN3 69 CKT 1	

Study Year	From Area	To Area	Monitored Branch Over 100% Rate B	Rate	BC % Loading	TC % Loading	ATC (MW)	Outaged Branch Causing Overload	Solution	Cost
04AP	WFEC	WFEC	55876 DILL JT2 69 to 55846 CARTERJ2 69 CKT 1	26	99.1	103.9	29	54121 ELKCTY-4 138 to 56001 MORWODS4 138 CKT 1	Current WFEC Work Plan to Reconductor from 4/0 to 795 - Complete by 2004 Winter	-
04G	WERE	WERE	57631 CC4VERN2 69 to 57623 ATHENS 2 69 CKT 1	45	105.2	108.4	0	56797 WOLFCKR7 345 to 57981 LACYGNE7 345 CKT 1	Westar Transmission Operating Directive 1304, Overload of the Athens to Wolf Creek 69 kV Line	-
04G	WERE	WERE	56851 AUBURN 6 230 to 56852 JEC 6 230 CKT 1	565	104.6	105.5	0	56765 HOYT 7 345 to 56766 JEC N 7 345 CKT 1	Westar Transmission Operating Directive 400, Outage of the Jeffrey Energy Center to Hoyt 345 kV line	-
04G	WERE	WERE	57151 AUBURN 3 115 to 57179 S GAGEW3 115 CKT 1	75	111.1	112.8	0	56765 HOYT 7 345 to 56766 JEC N 7 345 CKT 1	*	-
04G	WERE	WERE	57151 AUBURN 3 115 to 57179 S GAGEW3 115 CKT 2	97	101.5	103.0	0	56765 HOYT 7 345 to 56766 JEC N 7 345 CKT 1	*	-
04G	WFEC	WFEC	55876 DILL JT2 69 to 55846 CARTERJ2 69 CKT 1	26	100.4	105.5	0	54121 ELKCTY-4 138 to 56001 MORWODS4 138 CKT 1	Current WFEC Work Plan to Reconductor from 4/0 to 795 - Complete by 2004 Winter	-
04G	WERE	WERE	57636 GREEN 2 69 to 57631 CC4VERN2 69 CKT 1	45	106.5	109.7	0	56797 WOLFCKR7 345 to 57981 LACYGNE7 345 CKT 1	Westar Transmission Operating Directive 1304, Overload of the Athens to Wolf Creek 69 kV Line	-
04G	AEPW	AEPW	54153 ELKCITY6 230 to 54121 ELKCTY-4 138 CKT 1	263	101.3	111.3	0	51533 TUCO6 230 to 51534 TUCO7 345 CKT 1	Replace free standing metering CT. Replace switches 1302, 1303, 1306, & 1307. Changeout breaker 1305A	300,000
04G	AEPW	AEPW	54153 ELKCITY6 230 to 54121 ELKCTY-4 138 CKT 1	263	101.3	111.2	0	51534 TUCO7 345 to 54119 O.K.U.-7 345 CKT 1	See Previous	See Previous
04G	AEPW	AEPW	54153 ELKCITY6 230 to 54121 ELKCTY-4 138 CKT 1	263	101.3	111.2	0	Multiple Outage Contingency: 51534 TUCO7 345 to 54119 O.K.U.-7 345 CKT 1 51533 TUCO6 230 to 51534 TUCO7 345 CKT 1	*	*
04G	WERE	WERE	57636 GREEN 2 69 to 57631 CC4VERN2 69 CKT 1	45	99.2	102.3	39	56794 ROSEHIL7 345 to 56797 WOLFCKR7 345 CKT 1	Westar Transmission Operating Directive 1304, Overload of the Athens to Wolf Creek 69 kV Line	-
04G	WERE	WERE	57636 GREEN 2 69 to 57631 CC4VERN2 69 CKT 1	45	99.0	102.1	47	56791 BENTON 7 345 to 56797 WOLFCKR7 345 CKT 1	*	-
04G	WERE	WERE	57631 CC4VERN2 69 to 57623 ATHENS 2 69 CKT 1	45	97.9	101.0	102	56794 ROSEHIL7 345 to 56797 WOLFCKR7 345 CKT 1	Westar Transmission Operating Directive 1304, Overload of the Athens to Wolf Creek 69 kV Line	-
04G	WERE	WERE	57631 CC4VERN2 69 to 57623 ATHENS 2 69 CKT 1	45	97.7	100.8	112	56791 BENTON 7 345 to 56797 WOLFCKR7 345 CKT 1	*	-
04SP	AEPW	AEPW	53170 TONTITN5 161 to 53154 CHAMSPR5 161 CKT 1	247	138.4	140.2	0	53154 CHAMSPR5 161 to 53195 FARMGTN5 161 CKT 1	345 kV Project for NW Arkansas: Build 20 mile Flint Creek - East Centerton 345 kV line with East Centerton 345/161 kV auto transformer	20,200,000
04SP	AEPW	AEPW	53170 TONTITN5 161 to 53154 CHAMSPR5 161 CKT 1	247	130.8	132.1	0	53139 FLINTCR5 161 to 53170 TONTITN5 161 CKT 1	Relieved or Impact Removed by Selected Upgrades to be Assigned, Modeled in 09SP	-
04SP	AEPW	AEPW	53154 CHAMSPR5 161 to 53170 TONTITN5 161 CKT 1	247	126.2	128.0	0	53157 SFAYTVL5 161 to 53195 FARMGTN5 161 CKT 1	*	-
04SP	AEPW	AEPW	53170 TONTITN5 161 to 53154 CHAMSPR5 161 CKT 1	247	107.4	109.0	0	53139 FLINTCR5 161 to 53187 GENTRYR5 161 CKT 1	*	-
04SP	AEPW	AEPW	53170 TONTITN5 161 to 53154 CHAMSPR5 161 CKT 1	247	106.6	108.2	0	53133 ECNTRTN5 161 to 53187 GENTRYR5 161 CKT 1	*	-
04SP	GRRD	GRRD	54451 CLARMR 5 161 to 54479 CLARMR 2 69 CKT 1	84	103.6	105.0	0	54451 CLARMR 5 161 to 54479 CLARMR 2 69 CKT 2	Add 3rd 161/69 kV Transformer	1,250,000
04SP	GRRD	GRRD	54451 CLARMR 5 161 to 54479 CLARMR 2 69 CKT 2	84	103.6	105.0	0	54451 CLARMR 5 161 to 54479 CLARMR 2 69 CKT 1	See Previous	See Previous
04SP	AEPW	AEPW	53133 ECNTRTN5 161 to 53187 GENTRYR5 161 CKT 1	353	109.2	109.6	0	53139 FLINTCR5 161 to 53170 TONTITN5 161 CKT 1	Relieved or Impact Removed by Selected Upgrades to be Assigned, Modeled in 09SP	-
04SP	AEPW	AEPW	53187 GENTRYR5 161 to 53133 ECNTRTN5 161 CKT 1	305	101.0	101.5	0	Base Case	*	-
04SP	AEPW	AEPW	53187 GENTRYR5 161 to 53139 FLINTCR5 161 CKT 1	354	111.2	111.7	0	53139 FLINTCR5 161 to 53170 TONTITN5 161 CKT 1	Relieved or Impact Removed by Selected Upgrades to be Assigned, Modeled in 09SP	-
04SP	AEPW	AEPW	53187 GENTRYR5 161 to 53139 FLINTCR5 161 CKT 1	304	104.1	104.7	0	Base Case	*	-
04SP	AEPW	AEPW	53187 GENTRYR5 161 to 53139 FLINTCR5 161 CKT 1	354	102.1	102.8	0	53144 LOWELL 5 161 to 53170 TONTITN5 161 CKT 1	*	-
04SP	AEPW	AEPW	53170 TONTITN5 161 to 53139 FLINTCR5 161 CKT 1	312	113.2	113.7	0	53154 CHAMSPR5 161 to 53155 CHAMSPR7 345 CKT 1	Relieved or Impact Removed by Selected Upgrades to be Assigned, Modeled in 09SP	-
04SP	AEPW	AEPW	53170 TONTITN5 161 to 53139 FLINTCR5 161 CKT 1	312	113.2	113.7	0	53155 CHAMSPR7 345 to 53756 CLARKSV7 345 CKT 1	*	-
04SP	WERE	WERE	56853*LAWHILL6 230 LAWHL29X 1	308	114.4	115.3	0	56853 LAWHILL6230 to 56855 MIDLAND6230 CKT 1	Westar Transmission Operating Directive 901, Outage of the Lawrence Hill-Midland Junction 230kV Line	-
04SP	WERE	WERE	56853*LAWHILL6 230 LAWHL29X 1	308	114.4	115.3	0	56855 MIDLAND6230 to 57252 MIDLAND3115 to 56884 MIDLAND118.0 CKT 1	Westar Transmission Operating Directive 615, Loss of the Midland Junction 230/115 kV transformer	-
04SP	WERE	WERE	57250*LWRNCHL3 115 WND 2 LAWHL29X 1	308	111.9	112.8	0	56853 LAWHILL6230 to 56855 MIDLAND6230 CKT 1	Westar Transmission Operating Directive 901, Outage of the Lawrence Hill-Midland Junction 230kV Line	-
04SP	WERE	WERE	57250*LWRNCHL3 115 WND 2 LAWHL29X 1	308	111.9	112.7	0	56855 MIDLAND6230 to 57252 MIDLAND3115 to 56884 MIDLAND118.0 CKT 1	Westar Transmission Operating Directive 615, Loss of the Midland Junction 230/115 kV transformer	-
04SP	WERE	WERE	56855*MIDLAND6 230 MIDJ126X 1	308	102.2	103.0	0	56853 LAWHILL6230 to 57250 LWRNCHL3115 to 56882 LAWHILL113.8 CKT 1	Westar Transmission Operating Directive 631, Loss of the Lawrence Hill 230/115kV Transformer	-
04SP	WERE	WERE	57252*MIDLAND3 115 WND 2 MIDJ126X 1	308	100.9	101.6	0	56853 LAWHILL6230 to 57250 LWRNCHL3115 to 56882 LAWHILL113.8 CKT 1	*	-
04SP	AEPW	AEPW	53867 ORU-WTP4 138 to 53795 R.S.-4 138 CKT 1	304	101.0	101.7	0	Multiple Outage Contingency with Load Throwover: 53795 R.S.-4138 to 53863 ORU ETP4138 CKT 1 53863 ORU ETP4138 to 53749 ORU E4138 CKT 1 53863 ORU ETP4138 to 53873 WARNTAP4138 CKT 1 53873 WARNTAP4138 53822 81VALES4138 CKT 1 53873 WARNTAP4138 to 53861 96	Replace wavetrapped jumpers @ Riverside	10,000
04SP	AEPW	AEPW	53187 GENTRYR5 161 to 53139 FLINTCR5 161 CKT 1	354	100.0	100.6	7	53144 LOWELL 5 161 to 53152 ROGERS 5 161 CKT 1	Relieved or Impact Removed by Selected Upgrades to be Assigned, Modeled in 09SP	-

Study Year	From Area	To Area	Monitored Branch Over 100% Rate B	Rate	BC % Loading	TC % Loading	ATC (MW)	Outaged Branch Causing Overload	Solution	Cost
04SP	AEPW	AEPW	53133 ECNTRTN5 161 to 53187 GENTRYR5 161 CKT 1	353	99.9	100.7	12	53144 LOWELL 5 161 to 53170 TONTITN5 161 CKT 1	Relieved or Impact Removed by Selected Upgrades to be Assigned, Modeled in 09SP	-
04SP	WFEC	WFEC	55876 DILL JT2 69 to 55846 CARTERJ2 69 CKT 1	26	99.3	101.6	43	55832 BRANTLY2 69 to 56002 MORWOOD2 69 CKT 1	Current WFEC Work Plan to Reconductor from 4/0 to 795 - Complete by 2004 Winter	-
04SP	AEPW	AEPW	54153 ELKCITY6 230 to 54121 ELKCTY-4 138 CKT 1	263	96.7	106.9	49	51533 TUCO6 230 to 51534 TUCO7 345 CKT 1	See Previous	See Previous
04SP	AEPW	AEPW	54153 ELKCITY6 230 to 54121 ELKCTY-4 138 CKT 1	263	96.6	106.8	50	51534 TUCO7 345 to 54119 O.K.U.-7 345 CKT 1	*	*
04SP	AEPW	AEPW	54153 ELKCITY6 230 to 54121 ELKCTY-4 138 CKT 1	263	96.6	106.8	50	Multiple Outage Contingency: 51534 TUCO7 345 to 54119 O.K.U.-7 345 CKT 1 51533 TUCO6 230 to 51534 TUCO7 345 CKT 1	*	*
04SP	GRRD	GRRD	54432 AFTON 5 161 to 54433 AFTON 2 69 CKT 1	50	95.0	102.3	103	54431 MIAMI 5 161 to 54432 AFTON 5 161 CKT 1	09SP loading is 94.3% with selected upgrades. Exclude Facility Due to Facility not being overloaded during Deferral Period, Starting 5/1/2006 and Ending 6/1/2008	-
04SP	AEPW	AEPW	53195 FARMGTN5 161 to 53154 CHAMSPR5 161 CKT 1	335	99.4	100.2	111	53154 CHAMSPR5 161 to 53170 TONTITN5 161 CKT 1	Relieved or Impact Removed by Selected Upgrades to be Assigned, Modeled in 09SP	-
04SP	WERE	WERE	57244 JARBALO3 115 to 57233 166TH 3 115 CKT 1	97	98.6	100.2	128	57252 MIDLAND3 115 to 57261 PENTAGN3 115 CKT 1	Westar Transmission Operating Directive 1202, Overload of the Jarbalo to Jaggard 115kV Line	-
04SP	AEPW	WFEC	54297 LAKEP2WT 69 to 55896 ELDORDO2 69 CKT 1	20	97.7	100.4	130	55814 ANADARK4 138 to 56024 PARADSE4 138 CKT 1	AEPW: Reset CTs @ Lake Pauline	10,000
04SP	WFEC	WFEC	55876 DILL JT2 69 to 55846 CARTERJ2 69 CKT 1	26	98.3	100.1	138	55925 GOTEBO 2 69 to 56003 MTNVIEW2 69 CKT 1	Current WFEC Work Plan to Reconductor from 4/0 to 795 - Complete by 2004 Winter	-
04SP	SWPA	SPRM	52692 SPRGFLD5 161 to 59969 BRKLINE 5 161 CKT 1	323	96.9	100.1	144	59954 SWPS 5 161 to 59960 SWDISP 5 161 CKT 1	Relieved or Impact Removed by Selected Upgrades to be Assigned, Modeled in 09SP	-
04FA	WERE	WERE	56852 JEC 6 230 to 56851 AUBURN 6 230 CKT 1	565	102.1	103.5	0	56765 HOYT 7 345 to 56766 JEC N 7 345 CKT 1	Westar Transmission Operating Directive 400, Outage of the Jeffrey Energy Center to Hoyt 345 kV line	-
04FA	OKGE	OKGE	54894 CZECHAL4 138 to 54898 CIMARON4 138 CKT 1	287	100.8	101.7	0	54863 HAYMAKR4 138 to 54898 CIMARON4 138 CKT 1	Updated Emergency Rating, 382 MVA	-
04FA	AEPW	AEPW	54153 ELKCITY6 230 to 54121 ELKCTY-4 138 CKT 1	263	100.7	111.3	0	51533 TUCO6 230 to 51534 TUCO7 345 CKT 1	See Previous	See Previous
04FA	AEPW	AEPW	54153 ELKCITY6 230 to 54121 ELKCTY-4 138 CKT 1	263	100.7	111.1	0	51534 TUCO7 345 to 54119 O.K.U.-7 345 CKT 1	*	*
04FA	AEPW	AEPW	54153 ELKCITY6 230 to 54121 ELKCTY-4 138 CKT 1	263	100.7	111.1	0	Multiple Outage Contingency: 51534 TUCO7 345 to 54119 O.K.U.-7 345 CKT 1 51533 TUCO6 230 to 51534 TUCO7 345 CKT 1	*	*
04FA	WERE	WERE	57636 GREEN 2 69 to 57631 CC4VERN2 69 CKT 1	45	99.3	102.6	32	56797 WOLFCKR7 345 to 57981 LACYGNE7 345 CKT 1	Westar Transmission Operating Directive 1304, Overload of the Athens to Wolf Creek 69 kV Line	-
04FA	WFEC	WFEC	55876 DILL JT2 69 to 55846 CARTERJ2 69 CKT 1	26	97.3	102.3	80	54121 ELKCTY-4 138 to 56001 MORWODS4 138 CKT 1	Current WFEC Work Plan to Reconductor from 4/0 to 795 - Complete by 2004 Winter	-
04FA	WERE	WERE	57631 CC4VERN2 69 to 57623 ATHENS 2 69 CKT 1	45	98.0	101.3	93	56797 WOLFCKR7 345 to 57981 LACYGNE7 345 CKT 1	Westar Transmission Operating Directive 1304, Overload of the Athens to Wolf Creek 69 kV Line	-
04FA	OKGE	OKGE	54894 CZECHAL4 138 to 54898 CIMARON4 138 CKT 1	287	99.3	100.2	117	54853 DIVISION4 138 to 54863 HAYMAKR4 138 CKT 1	Updated Emergency Rating, 382 MVA	-
04WP	WERE	WERE	56852 JEC 6 230 to 56851 AUBURN 6 230 CKT 1	565	102.8	104.2	0	56765 HOYT 7 345 to 56766 JEC N 7 345 CKT 1	Westar Transmission Operating Directive 400, Outage of the Jeffrey Energy Center to Hoyt 345 kV line	-
04WP	AEPW	AEPW	53170 TONTITN5 161 to 53154 CHAMSPR5 161 CKT 1	275	101.6	103.1	0	53154 CHAMSPR5 161 to 53195 FARMGTN5 161 CKT 1	Relieved or Impact Removed by Selected Upgrades to be Assigned, Modeled in 09WP	-
04WP	AEPW	AEPW	54153 ELKCITY6 230 to 54121 ELKCTY-4 138 CKT 1	263	97.5	107.3	38	51533 TUCO6 230 to 51534 TUCO7 345 CKT 1	See Previous	See Previous
04WP	AEPW	AEPW	54153 ELKCITY6 230 to 54121 ELKCTY-4 138 CKT 1	263	97.5	107.3	38	51534 TUCO7 345 to 54119 O.K.U.-7 345 CKT 1	*	*
04WP	AEPW	AEPW	54153 ELKCITY6 230 to 54121 ELKCTY-4 138 CKT 1	263	97.5	107.3	38	Multiple Outage Contingency: 51534 TUCO7 345 to 54119 O.K.U.-7 345 CKT 1 51533 TUCO6 230 to 51534 TUCO7 345 CKT 1	*	*
09SP	OKGE	OKGE	55228 5TRIBESS 161 to 55234 PECANCK5 161 CKT 1	223	102.3	103.4	0	55230 AGENCY 5 161 to 55234 PECANCK5 161 CKT 1	May be able to increase CTR (if relays will coordinate) at Five Tribes sub.	5,000
09SP	WERE	WERE	56851 AUBURN 6 230 to 56852 JEC 6 230 CKT 1	565	111.6	113.3	0	56765 HOYT 7 345 to 56766 JEC N 7 345 CKT 1	Westar Transmission Operating Directive 400, Outage of the Jeffrey Energy Center to Hoyt 345 kV line	-
09SP	WERE	WERE	56851 AUBURN 6 230 AUBRN77X 1	308	120.5	121.0	0	56765 HOYT 7345 to 56766 JEC N 7345 CKT 1	Westar Transmission Operating Directive 400, Outage of the Jeffrey Energy Center to Hoyt 345 kV line	-
09SP	WERE	WERE	57151 AUBURN 3 115 WND 2 AUBRN77X 1	308	119.3	119.8	0	56765 HOYT 7345 to 56766 JEC N 7345 CKT 1	*	-
09SP	SPRM	SPRM	59959 BATFLD 5 161 to 59960 SWDISP 5 161 CKT 1	358	100.0	102.1	0	52692 SPRGFLD5 161 to 59969 BRKLINE 5 161 CKT 1	Relieved and Impact Removed by Selected Upgrades to be Assigned	-
09SP	SWPA	SPRM	52692 SPRGFLD5 161 to 59969 BRKLINE 5 161 CKT 1	323	128.6	131.7	0	59954 SWPS 5 161 to 59960 SWDISP 5 161 CKT 1	Impact Removed by Selected Upgrades to be Assigned	-
09SP	SWPA	SPRM	52692 SPRGFLD5 161 to 59969 BRKLINE 5 161 CKT 1	323	127.7	130.9	0	59959 BATFLD 5 161 to 59960 SWDISP 5 161 CKT 1	*	-
09SP	SWPA	SPRM	52692 SPRGFLD5 161 to 59969 BRKLINE 5 161 CKT 1	323	118.7	121.2	0	59955 JUNCTN 5 161 to 59969 BRKLINE 5 161 CKT 1	*	-
09SP	SWPA	SPRM	52692 SPRGFLD5 161 to 59969 BRKLINE 5 161 CKT 1	323	105.1	108.5	0	52692 SPRGFLD5 161 to 59959 BATFLD 5 161 CKT 1	*	-
09SP	SWPA	SPRM	52692 SPRGFLD5 161 to 59969 BRKLINE 5 161 CKT 1	323	101.7	104.3	0	59955 JUNCTN 5 161 to 59956 NICHOLS5 161 CKT 1	*	-
09SP	AEPW	AEPW	53195 FARMGTN5 161 to 53154 CHAMSPR5 161 CKT 1	335	121.8	122.6	0	53154 CHAMSPR5 161 to 53170 TONTITN5 161 CKT 1	Impact Removed by Selected Upgrades to be Assigned	-
09SP	AEPW	AEPW	53195 FARMGTN5 161 to 53154 CHAMSPR5 161 CKT 1	335	112.9	113.4	0	53139 FLINTCR5 161 to 53170 TONTITN5 161 CKT 1	*	-
09SP	AEPW	AEPW	53195 FARMGTN5 161 to 53154 CHAMSPR5 161 CKT 1	335	112.7	113.3	0	53139 FLINTCR5 161 to 53187 GENTRYR5 161 CKT 1	Relieved and Impact Removed by Selected Upgrades to be Assigned	-
09SP	AEPW	AEPW	53195 FARMGTN5 161 to 53154 CHAMSPR5 161 CKT 1	335	111.9	112.5	0	53133 ECNTRTN5 161 to 53187 GENTRYR5 161 CKT 1	*	-

Table 1.1a - SPP Facility Overloads
 Caused or Impacted by Transfer with Modeling Details (Scenario 1)

Southwest Power Pool
 System Impact Study

Study Year	From Area	To Area	Monitored Branch Over 100% Rate B	Rate	BC % Loading	TC % Loading	ATC (MW)	Outaged Branch Causing Overload	Solution	Cost
09SP	AEPW	AEPW	53195 FARMGTN5 161 to 53154 CHAMSPR5 161 CKT 1	335	104.7	105.2	0	53170 TONTITN5 161 to 53194 ELMSPRR5 161 CKT 1	-	-
09SP	AEPW	AEPW	53154 CHAMSPR5 161 to 53139 FLINTCR5 161 CKT 1	335	110.6	111.0	0	53154 CHAMSPR5 161 to 53155 CHAMSPR7 345 CKT 1	Relieved and Impact Removed by Selected Upgrades to be Assigned	-
09SP	AEPW	AEPW	53154 CHAMSPR5 161 to 53139 FLINTCR5 161 CKT 1	335	110.6	111.0	0	53155 CHAMSPR7 345 to 53756 CLARKSV7 345 CKT 1	-	-
09SP	AEPW	AEPW	53170 TONTITN5 161 to 53154 CHAMSPR5 161 CKT 1	244	173.7	175.6	0	53154 CHAMSPR5 161 to 53195 FARMGTN5 161 CKT 1	Impact Removed by Selected Upgrades to be Assigned	-
09SP	AEPW	AEPW	53170 TONTITN5 161 to 53154 CHAMSPR5 161 CKT 1	244	161.6	163.0	0	53139 FLINTCR5 161 to 53170 TONTITN5 161 CKT 1	-	-
09SP	AEPW	AEPW	53170 TONTITN5 161 to 53154 CHAMSPR5 161 CKT 1	244	156.4	158.3	0	53157 SFAYTVL5 161 to 53195 FARMGTN5 161 CKT 1	-	-
09SP	AEPW	AEPW	53170 TONTITN5 161 to 53154 CHAMSPR5 161 CKT 1	244	135.9	137.6	0	53139 FLINTCR5 161 to 53187 GENTRYR5 161 CKT 1	Relieved and Impact Removed by Selected Upgrades to be Assigned	-
09SP	AEPW	AEPW	53170 TONTITN5 161 to 53154 CHAMSPR5 161 CKT 1	244	134.4	136.0	0	53133 ECNTRTN5 161 to 53187 GENTRYR5 161 CKT 1	-	-
09SP	GRRD	GRRD	54451 CLARMR 5 161 to 54479 CLARMR 2 69 CKT 1	84	108.7	110.1	0	54451 CLARMR 5 161 to 54479 CLARMR 2 69 CKT 2	See Previous	See Previous
09SP	GRRD	GRRD	54451 CLARMR 5 161 to 54479 CLARMR 2 69 CKT 2	84	109.0	110.4	0	54451 CLARMR 5 161 to 54479 CLARMR 2 69 CKT 1	-	-
09SP	KACP	KACP	58048 COLLEGE5 161 to 57978 CRAIG 5 161 CKT 1	335	105.4	105.8	0	57969 STILWEL5 161 to 58050 ANTIOCH5 161 CKT 1	Limits Rollover Rights 6/1/2008	-
09SP	KACP	KACP	58048 COLLEGE5 161 to 57978 CRAIG 5 161 CKT 1	335	103.3	104.2	0	58033 BRKRIDG5 161 to 58047 OVERLPK5 161 CKT 1	Limits Rollover Rights 6/1/2009	-
09SP	KACP	KACP	58048 COLLEGE5 161 to 57978 CRAIG 5 161 CKT 1	335	100.8	101.4	0	57966 WGARDNR5 161 to 58044 MOONLT 5 161 CKT 1	Limits Rollover Rights 6/1/2009	-
09SP	AEPW	AEPW	53133 ECNTRTN5 161 to 53187 GENTRYR5 161 CKT 1	353	132.7	133.2	0	53139 FLINTCR5 161 to 53170 TONTITN5 161 CKT 1	Relieved and Impact Removed by Selected Upgrades to be Assigned	-
09SP	AEPW	AEPW	53133 ECNTRTN5 161 to 53187 GENTRYR5 161 CKT 1	353	119.6	120.4	0	53144 LOWELL 5 161 to 53170 TONTITN5 161 CKT 1	-	-
09SP	AEPW	AEPW	53133 ECNTRTN5 161 to 53187 GENTRYR5 161 CKT 1	353	117.1	117.7	0	53154 CHAMSPR5 161 to 53195 FARMGTN5 161 CKT 1	-	-
09SP	AEPW	AEPW	53133 ECNTRTN5 161 to 53187 GENTRYR5 161 CKT 1	353	116.8	117.6	0	53144 LOWELL 5 161 to 53152 ROGERS 5 161 CKT 1	-	-
09SP	AEPW	AEPW	53133 ECNTRTN5 161 to 53187 GENTRYR5 161 CKT 1	353	114.1	114.7	0	53154 CHAMSPR5 161 to 53170 TONTITN5 161 CKT 1	-	-
09SP	AEPW	WFEC	54297 LAKEP2WT 69 to 55896 ELDORDO2 69 CKT 1	20	106.8	109.2	0	55814 ANADARK4 138 to 56024 PARADSE4 138 CKT 1	See Previous	See Previous
09SP	AEPW	AEPW	53194 ELMSPRR5 161 to 53170 TONTITN5 161 CKT 1	335	116.8	117.1	0	53154 CHAMSPR5 161 to 53195 FARMGTN5 161 CKT 1	Impact Removed by Selected Upgrades to be Assigned	-
09SP	AEPW	AEPW	53194 ELMSPRR5 161 to 53170 TONTITN5 161 CKT 1	335	106.1	106.4	0	53157 SFAYTVL5 161 to 53195 FARMGTN5 161 CKT 1	Relieved and Impact Removed by Selected Upgrades to be Assigned	-
09SP	WERE	WERE	57277 WAKARUS3 115 to 57236 COOP 3 115 CKT 1	92	101.4	102.9	0	57271 SWLWRNC3 115 to 57277 WAKARUS3 115 CKT 1	Limits Rollover Rights 6/1/2008	-
09SP	AEPW	AEPW	53195 FARMGTN5 161 to 53157 SFAYTVL5 161 CKT 1	313	108.8	109.8	0	53154 CHAMSPR5 161 to 53170 TONTITN5 161 CKT 1	Relieved and Impact Removed by Selected Upgrades to be Assigned	-
09SP	AEPW	AEPW	53187 GENTRYR5 161 to 53139 FLINTCR5 161 CKT 1	354	135.5	136.0	0	53139 FLINTCR5 161 to 53170 TONTITN5 161 CKT 1	Relieved and Impact Removed by Selected Upgrades to be Assigned	-
09SP	AEPW	AEPW	53187 GENTRYR5 161 to 53139 FLINTCR5 161 CKT 1	354	122.5	123.3	0	53144 LOWELL 5 161 to 53170 TONTITN5 161 CKT 1	-	-
09SP	AEPW	AEPW	53187 GENTRYR5 161 to 53139 FLINTCR5 161 CKT 1	354	120.0	120.6	0	53154 CHAMSPR5 161 to 53195 FARMGTN5 161 CKT 1	-	-
09SP	AEPW	AEPW	53187 GENTRYR5 161 to 53139 FLINTCR5 161 CKT 1	354	119.7	120.4	0	53144 LOWELL 5 161 to 53152 ROGERS 5 161 CKT 1	-	-
09SP	AEPW	AEPW	53187 GENTRYR5 161 to 53139 FLINTCR5 161 CKT 1	354	117.0	117.7	0	53154 CHAMSPR5 161 to 53170 TONTITN5 161 CKT 1	-	-
09SP	AEPW	AEPW	53170 TONTITN5 161 to 53139 FLINTCR5 161 CKT 1	312	139.6	140.2	0	53154 CHAMSPR5 161 to 53155 CHAMSPR7 345 CKT 1	Impact Removed by Selected Upgrades to be Assigned	-
09SP	AEPW	AEPW	53170 TONTITN5 161 to 53139 FLINTCR5 161 CKT 1	312	139.6	140.2	0	53155 CHAMSPR7 345 to 53756 CLARKSV7 345 CKT 1	-	-
09SP	AEPW	AEPW	53170 TONTITN5 161 to 53139 FLINTCR5 161 CKT 1	312	138.9	139.3	0	53154 CHAMSPR5 161 to 53170 TONTITN5 161 CKT 1	-	-
09SP	AEPW	AEPW	53170 TONTITN5 161 to 53139 FLINTCR5 161 CKT 1	312	107.8	108.2	0	53139 FLINTCR5 161 to 59484 DEC392 5 161 CKT 1	Relieved and Impact Removed by Selected Upgrades to be Assigned	-
09SP	AEPW	AEPW	53170 TONTITN5 161 to 53139 FLINTCR5 161 CKT 1	312	105.1	105.4	0	59471 NEO184 5 161 to 59496 NOL435 5 161 CKT 1	-	-
09SP	WFEC	OKGE	55917 FRNKLN54 138 to 54946 MIDWEST4 138 CKT 1	215	107.7	108.2	0	56031 POCASET4 138 to 56072 TUTTLE 4 138 CKT 1	Impact Removed by Selected Upgrades to be Assigned	-
09SP	WFEC	OKGE	55917 FRNKLN54 138 to 54946 MIDWEST4 138 CKT 1	215	103.4	103.9	0	56059 WNSHIN4 138 to 56072 TUTTLE 4 138 CKT 1	-	-
09SP	ENTR	SWPA	99755 5JONES 161 to 52618 JONESBO5 161 CKT 1	223	111.3	111.9	0	52600 N MADRD5 161 to 52610 KENNETT5 161 CKT 1	Line belongs to Entergy. SWPA terminal equipment is good for 900 amps.	-
09SP	ENTR	SWPA	99755 5JONES 161 to 52618 JONESBO5 161 CKT 1	223	102.2	102.8	0	52610 KENNETT5 161 to 52612 PARAGLD5 161 CKT 1	-	-
09SP	WERE	WERE	56853LAWHILL6 230 LAWHL29X 1	308	114.4	115.1	0	56853 LAWHL6230 to 56855 MIDLAND6230 CKT 1	Westar Transmission Operating Directive 901, Outage of the Lawrence Hill-Midland Junction 230kV Line	-
09SP	WERE	WERE	56853LAWHILL6 230 LAWHL29X 1	308	114.2	115.0	0	56855 MIDLAND6230 to 57252 MIDLAND3115 to 56884 MIDLAND118.0 CKT 1	Westar Transmission Operating Directive 615, Loss of the Midland Junction 230/115 kV transformer	-
09SP	WERE	WERE	57250LWRNCHL3 115 WND 2 LAWHL29X 1	308	111.9	112.6	0	56853 LAWHL6230 to 56855 MIDLAND6230 CKT 1	Westar Transmission Operating Directive 901, Outage of the Lawrence Hill-Midland Junction 230kV Line	-
09SP	WERE	WERE	57250LWRNCHL3 115 WND 2 LAWHL29X 1	308	111.7	112.4	0	56855 MIDLAND6230 to 57252 MIDLAND3115 to 56884 MIDLAND118.0 CKT 1	Westar Transmission Operating Directive 615, Loss of the Midland Junction 230/115 kV transformer	-
09SP	WERE	WERE	56855MIDLAND6 230 MIDJ126X 1	308	102.2	102.9	0	56853 LAWHL6230 to 57250 LWRNCHL3115 to 56882 LAWHL113.8 CKT 1	Westar Transmission Operating Directive 631, Loss of the Lawrence Hill 230/115kV Transformer	-
09SP	WERE	WERE	57252MIDLAND3 115 WND 2 MIDJ126X 1	308	100.6	101.3	0	56853 LAWHL6230 to 57250 LWRNCHL3115 to 56882 LAWHL113.8 CKT 1	-	-
09SP	AEPW	AEPW	53967 ORU-WTP4 138 to 53795 R.S.S.-4 138 CKT 1	304	114.7	115.4	0	Multiple Outage Contingency with Load Throwover: 53795 R.S.S.-4138 to 53863 ORU ETP4138 CKT 1 53863 ORU ETP4138 to 53749 ORU E4138 CKT 1 53863 ORU ETP4138 to 53873 WARTAP4138 CKT 1 53873 WARTAP4138 53822 81YALES4138 CKT 1 53873 WARTAP4138 to 53861 96	See Previous	See Previous
09SP	OKGE	OKGE	55235 PECANCK7 345 to 55234 PECANCK5 161 CKT 1	369	107.6	108.5	0	53756 CLARKSV7 345 to 55224 MUSKOGEE7 345 CKT 1	Add 2nd 345/161 kV 369MVA transformer.	3,000,000
09SP	OKGE	OKGE	55235 PECANCK7 345 to 55234 PECANCK5 161 CKT 1	369	107.0	107.4	0	55224 MUSKOGEE7 345 to 55302 FTSMITH7 345 CKT 1	See Previous	See Previous

Study Year	From Area	To Area	Monitored Branch Over 100% Rate B	Rate	BC % Loading	TC % Loading	ATC (MW)	Outaged Branch Causing Overload	Solution	Cost
09SP	WFEC	SWPA	56026 PHAROAH4 138 to 52792 WELEETK4 138 CKT 1	191	106.4	106.9	0	55913 FRANKLN4 138 to 55917 FRANKLNS4 138 CKT 1	WFEC: Replace wavetrapp at Weleetka and replace jumpers. SWPA: Replace metering CT's at Weleetka.	135,000
09SP	SPRM	SPRM	59960 SWDISP 5 161 to 59954 SWPS 5 161 CKT 1	358	101.2	103.2	0	52692 SPRGFLD5 161 to 59969 BRKLINE 5 161 CKT 1	Impact Removed by Selected Upgrades to be Assigned	-
09SP	AECI	AECI	96983 2STILWEL 69 to 96986 2TITANTP 69 CKT 1	36	114.3	115.3	0	54452 SALSWGR2 69 to 96859 2BRUSHY 69 CKT 1	Rebuild 9.2 miles with 795MCM ACSR	1,518,000
09SP	AECI	GRRD	96986 2TITANTP 69 to 54447 TAHLOH 2 69 CKT 1	47	104.0	104.8	0	54452 SALSWGR2 69 to 96859 2BRUSHY 69 CKT 1	Rebuild 9.4 miles with 795MCM ACSR	1,551,000
09SP	GRRD	GRRD	54437 412SUB 5 161 to 54435 KERR GR5 161 CKT 1	338	99.7	100.8	42	53140 FLINTCR7 345 to 54450 GRDA1 7 345 CKT 1	Chouteau Maid Operating Procedure Applied	-
09SP	WERE	WERE	57277 WAKARUS3 115 to 57271 SWLWRNC3 115 CKT 1	92	99.3	100.8	72	57236 COOP 3 115 to 57277 WAKARUS3 115 CKT 1	Limits Rollover Rights 6/1/2009	-
09SP	GRRD	GRRD	54437 412SUB 5 161 to 54514 KANSATP5 161 CKT 1	338	99.0	100.1	134	53140 FLINTCR7 345 to 54450 GRDA1 7 345 CKT 1	Chouteau Maid Operating Procedure Applied	-
09SP	AEPW	AEPW	54153 ELKCITY6 230 to 54121 ELKCTY-4 138 CKT 1	263	91.0	101.0	135	51534 TUCO7 345 to 54119 O.K.U.-7 345 CKT 1	See Previous	See Previous
09SP	AEPW	AEPW	54153 ELKCITY6 230 to 54121 ELKCTY-4 138 CKT 1	263	91.1	100.9	136	51533 TUCO6 230 to 51534 TUCO7 345 CKT 1		*
09SP	AEPW	AEPW	54153 ELKCITY6 230 to 54121 ELKCTY-4 138 CKT 1	263	91.0	100.9	136	Multiple Outage Contingency: 51534 TUCO7 345 to 54119 O.K.U.-7 345 CKT 1 51533 TUCO6 230 to 51534 TUCO7 345 CKT 1		*
09WP	WERE	WERE	57631 CC4VERN2 69 to 57623 ATHENS 2 69 CKT 1	45	102.9	106.2	0	56797 WOLFCCRK7 345 to 57981 LACYGNE7 345 CKT 1	Westar Transmission Operating Directive 1304, Overload of the Athens to Wolf Creek 69 kV Line	-
09WP	WERE	WERE	56851 AUBURN 6 230 to 56852 JEC 6 230 CKT 1	565	100.1	101.6	0	56765 HOYT 7 345 to 56766 JEC N 7 345 CKT 1	Westar Transmission Operating Directive 400, Outage of the Jeffrey Energy Center to Hoyt 345 kV line	-
09WP	SWPA	SPRM	52692 SPRGFLD5 161 to 59969 BRKLINE 5 161 CKT 1	323	111.8	114.5	0	59954 SWPS 5 161 to 59960 SWDISP 5 161 CKT 1	Impact Removed by Selected Upgrades to be Assigned	-
09WP	SWPA	SPRM	52692 SPRGFLD5 161 to 59969 BRKLINE 5 161 CKT 1	323	111.2	113.9	0	59959 BATFLD 5 161 to 59960 SWDISP 5 161 CKT 1		-
09WP	SWPA	SPRM	52692 SPRGFLD5 161 to 59969 BRKLINE 5 161 CKT 1	323	104.9	107.1	0	59955 JUNCTN 5 161 to 59969 BRKLINE 5 161 CKT 1		-
09WP	AEPW	AEPW	53195 FARMGTN5 161 to 53154 CHAMSPR5 161 CKT 1	335	100.0	100.8	0	53154 CHAMSPR5 161 to 53170 TONTITN5 161 CKT 1	Relieved and Impact Removed by Selected Upgrades to be Assigned	-
09WP	AEPW	AEPW	53170 TONTITN5 161 to 53154 CHAMSPR5 161 CKT 1	244	142.2	143.9	0	53154 CHAMSPR5 161 to 53195 FARMGTN5 161 CKT 1	Impact Removed by Selected Upgrades to be Assigned	-
09WP	AEPW	AEPW	53170 TONTITN5 161 to 53154 CHAMSPR5 161 CKT 1	244	133.6	134.8	0	53139 FLINTCR5 161 to 53170 TONTITN5 161 CKT 1		-
09WP	AEPW	AEPW	53170 TONTITN5 161 to 53154 CHAMSPR5 161 CKT 1	244	127.5	129.2	0	53157 SFAYTVL5 161 to 53195 FARMGTN5 161 CKT 1		-
09WP	AEPW	AEPW	53170 TONTITN5 161 to 53154 CHAMSPR5 161 CKT 1	244	112.4	113.9	0	53139 FLINTCR5 161 to 53187 GENTRYR5 161 CKT 1	Relieved and Impact Removed by Selected Upgrades to be Assigned	-
09WP	AEPW	AEPW	53170 TONTITN5 161 to 53154 CHAMSPR5 161 CKT 1	244	111.7	113.2	0	53133 ECNTRTN5 161 to 53187 GENTRYR5 161 CKT 1		-
09WP	OKGE	OKGE	54894 CZECHAL4 138 to 54898 CIMARON4 138 CKT 1	287	102.1	102.7	0	54853 DIVISION4 138 to 54861 MUSTANG4 138 CKT 1	Updated Emergency Rating, 382 MVA	-
09WP	OKGE	OKGE	54894 CZECHAL4 138 to 54898 CIMARON4 138 CKT 1	287	101.4	102.2	0	54853 DIVISION4 138 to 54863 HAYMAKR4 138 CKT 1		-
09WP	OKGE	OKGE	54894 CZECHAL4 138 to 54898 CIMARON4 138 CKT 1	287	100.9	101.8	0	54863 HAYMAKR4 138 to 54898 CIMARON4 138 CKT 1		-
09WP	WERE	WERE	57636 GREEN 2 69 to 57631 CC4VERN2 69 CKT 1	45	104.2	107.5	0	56797 WOLFCCRK7 345 to 57981 LACYGNE7 345 CKT 1	Westar Transmission Operating Directive 1304, Overload of the Athens to Wolf Creek 69 kV Line	-
09WP	AEPW	AEPW	53133 ECNTRTN5 161 to 53187 GENTRYR5 161 CKT 1	368	110.4	110.8	0	53139 FLINTCR5 161 to 53170 TONTITN5 161 CKT 1	Relieved and Impact Removed by Selected Upgrades to be Assigned	-
09WP	AEPW	AEPW	53133 ECNTRTN5 161 to 53187 GENTRYR5 161 CKT 1	368	102.7	103.3	0	53144 LOWELL 5 161 to 53170 TONTITN5 161 CKT 1		-
09WP	AEPW	AEPW	53133 ECNTRTN5 161 to 53187 GENTRYR5 161 CKT 1	368	102.1	102.7	0	53144 LOWELL 5 161 to 53152 ROGERS 5 161 CKT 1		-
09WP	AEPW	AEPW	53187 GENTRYR5 161 to 53139 FLINTCR5 161 CKT 1	368	112.4	112.7	0	53139 FLINTCR5 161 to 53170 TONTITN5 161 CKT 1	Relieved and Impact Removed by Selected Upgrades to be Assigned	-
09WP	AEPW	AEPW	53187 GENTRYR5 161 to 53139 FLINTCR5 161 CKT 1	368	104.7	105.3	0	53144 LOWELL 5 161 to 53170 TONTITN5 161 CKT 1		-
09WP	AEPW	AEPW	53187 GENTRYR5 161 to 53139 FLINTCR5 161 CKT 1	368	104.0	104.6	0	53144 LOWELL 5 161 to 53152 ROGERS 5 161 CKT 1		-
09WP	AEPW	AEPW	53170 TONTITN5 161 to 53139 FLINTCR5 161 CKT 1	335	105.4	105.7	0	53154 CHAMSPR5 161 to 53155 CHAMSPR7 345 CKT 1	Relieved and Impact Removed by Selected Upgrades to be Assigned	-
09WP	AEPW	AEPW	53170 TONTITN5 161 to 53139 FLINTCR5 161 CKT 1	335	105.4	105.7	0	53155 CHAMSPR7 345 to 53756 CLARKSV7 345 CKT 1		-
09WP	OKGE	OKGE	55235 PECANCK7 345 to 55234 PECANCK5 161 CKT 1	369	101.4	102.4	0	53756 CLARKSV7 345 to 55224 MUSKOGEE7 345 CKT 1	See Previous	See Previous
09WP	OKGE	OKGE	55235 PECANCK7 345 to 55234 PECANCK5 161 CKT 1	369	101.8	102.2	0	55224 MUSKOGEE7 345 to 55302 FTSMITH7 345 CKT 1		*
09WP	AEPW	AEPW	53187 GENTRYR5 161 to 53139 FLINTCR5 161 CKT 1	368	100.0	100.6	12	53135 EROGERS5 161 to 53152 ROGERS 5 161 CKT 1	Relieved and Impact Removed by Selected Upgrades to be Assigned	-
09WP	AEPW	AEPW	53187 GENTRYR5 161 to 53139 FLINTCR5 161 CKT 1	368	99.8	100.3	72	53154 CHAMSPR5 161 to 53170 TONTITN5 161 CKT 1		-
09WP	AEPW	AEPW	54153 ELKCITY6 230 to 54121 ELKCTY-4 138 CKT 1	263	92.4	102.4	114	51534 TUCO7 345 to 54119 O.K.U.-7 345 CKT 1	See Previous	See Previous
09WP	AEPW	AEPW	54153 ELKCITY6 230 to 54121 ELKCTY-4 138 CKT 1	263	92.4	102.4	114	Multiple Outage Contingency: 51534 TUCO7 345 to 54119 O.K.U.-7 345 CKT 1 51533 TUCO6 230 to 51534 TUCO7 345 CKT 1		*
09WP	AEPW	AEPW	54153 ELKCITY6 230 to 54121 ELKCTY-4 138 CKT 1	263	92.4	102.3	115	51533 TUCO6 230 to 51534 TUCO7 345 CKT 1		*

Table 3.1a - SPP Facility Overloads
Caused or Impacted by Selected Upgrades with Modeling Details (Scenario 1)

Study Year	From Area	To Area	Monitored Branch Over 100% Rate B	Rate	BC Without Upgrades %Loading	BC With Upgrades %Loading	TC Without Upgrades %Loading	TC With Upgrades %Loading	Outaged Branch Causing Overload	Solution	Cost
09SP	ENTR	EMDE	99831 50MAHA * 161 to 59474 OZD312 5 161 CKT 1	162	124.7	126.0	122.8	124.2	53136 EUREKA 5 161 to 99832 5OSAGE # 161 CKT 1	Contingency is Invalid, Contingency Causes Voltage to Collapse at Osage, With Load removed at Osage, Facility Not Overloaded	-
09SP	AEPW	SWPA	53136 EUREKA 5 161 to 52680 BEAVER 5 161 CKT 1	263	96.8	103.7	95.7	102.6	99797 5HARR-S 161 to 99811 5HARR-E 161 CKT 1	SWPA: Reconnect CT's to 1000.5 Tap on Bkrs 42, 32, & half or 22. Replace metering & reset relays for Line 2 & Line 3. AEPW: Replace Wavetrap & Metering CT Jumpers	67,500
09SP	AEPW	SWPA	53136 EUREKA 5 161 to 52680 BEAVER 5 161 CKT 1	263	93.0	103.5	91.4	102.0	52660 BULL SH5 161 to 99802 5BULLSH* 161 CKT 1	See Previous	See Previous
09SP	AEPW	SWPA	53136 EUREKA 5 161 to 52680 BEAVER 5 161 CKT 1	263	92.1	102.6	90.5	101.1	99802 5BULLSH* 161 to 99809 5FLIPN 161 CKT 1	"	"
09SP	AEPW	SWPA	53136 EUREKA 5 161 to 52680 BEAVER 5 161 CKT 1	263	91.7	102.2	89.7	100.2	Multiple Outage Contingency: 59481 MON383 7 345 to 59984 BRKLINE 7 345 CKT1 53140 FLINTCR7 345 to 59481 MON383 7 345 CKT1	"	"
09SP	AEPW	SWPA	53136 EUREKA 5 161 to 52680 BEAVER 5 161 CKT 1	263	91.2	101.7	89.8	100.3	99519 5QUITMN 161 to 99799 5BEE BR 161 CKT 1	"	"
09SP	OKGE	AEPW	55261 BONANZT5 161 to 53126 BONANZA5 161 CKT 1	177	103.0	105.0	103.0	105.1	55262 AES 5 161 to 55264 TARBY 5 161 CKT 1	Rebuild 0.06 miles of 397.5 ACSR with 795MCM ACSR.	50,000
09SP	OKGE	AEPW	55261 BONANZT5 161 to 53126 BONANZA5 161 CKT 1	177	98.0	100.4	97.9	100.3	55314 GRANDPR5 161 to 55339 VBI 5 161 CKT 1	See Previous	See Previous
09SP	ENTR	SWPA	99825 5MIDWAY# 161 to 52660 BULL SH5 161 CKT 1	162	118.4	119.2	117.0	117.8	99817 5ISES 1 161 to 99826 5MORFLD 161 CKT 1	Replace disconnect switches, metering CTs and wave trap at Bull Shoals	150,000
09SP	ENTR	SWPA	99825 5MIDWAY# 161 to 52660 BULL SH5 161 CKT 1	162	111.7	112.6	110.3	111.2	99798 5BATEVL 161 to 99826 5MORFLD 161 CKT 1	See Previous	See Previous
09SP	ENTR	SWPA	99825 5MIDWAY# 161 to 52660 BULL SH5 161 CKT 1	162	99.5	100.6	< 100.0	< 100.0	99798 5BATEVL 161 to 99808 5CUSHMN 161 CKT 1	"	"
09SP	ENTR	AEPW	99832 5OSAGE # 161 to 53136 EUREKA 5 161 CKT 1	244	111.6	115.6	110.7	114.7	52660 BULL SH5 161 to 99802 5BULLSH* 161 CKT 1	Rebuild 5.34 miles of 666 ACSR with 1590 ACSR. Replace wavetrap jumpers @ Eureka Springs	2,400,000
09SP	ENTR	AEPW	99832 5OSAGE # 161 to 53136 EUREKA 5 161 CKT 1	244	110.1	114.2	109.2	113.3	99802 5BULLSH* 161 to 99809 5FLIPN 161 CKT 1	See Previous	See Previous
09SP	ENTR	AEPW	99832 5OSAGE # 161 to 53136 EUREKA 5 161 CKT 1	244	106.9	111.1	105.9	110.1	99809 5FLIPN 161 to 99837 5SUMMIT 161 CKT 1	"	"
09SP	ENTR	AEPW	99832 5OSAGE # 161 to 53136 EUREKA 5 161 CKT 1	244	103.7	108.1	102.8	107.2	99519 5QUITMN 161 to 99799 5BEE BR 161 CKT 1	"	"
09SP	ENTR	AEPW	99832 5OSAGE # 161 to 53136 EUREKA 5 161 CKT 1	244	102.9	107.2	102.0	106.3	99811 5HARR-E 161 to 99837 5SUMMIT 161 CKT 1	"	"
09SP	EMDE	SWPA	59497 RVS438 5 161 to 52672 TABLE R5 161 CKT 1	268	103.7	104.6	104.0	105.0	53136 EUREKA 5 161 to 99832 5OSAGE # 161 CKT 1	Contingency is Invalid, Contingency Causes Voltage to Collapse at Osage, With Load removed at Osage, Facility Not Overloaded	-
09SP	GRRD	GRRD	54455 TAHLQH 5 161 to 54447 TAHLQH 2 69 CKT 1	78	115.8	120.4	115.8	120.3	54447 TAHLQH 2 69 to 54455 TAHLQH 5 161 CKT 2	Add 3rd 161/69 KV Transformer	1,400,000
09SP	GRRD	GRRD	54455 TAHLQH 5 161 to 54447 TAHLQH 2 69 CKT 2	78	116.6	121.2	116.5	121.1	54447 TAHLQH 2 69 to 54455 TAHLQH 5 161 CKT 1	See Previous	See Previous
09WP	SWPA	AEPW	52680 BEAVER 5 161 to 53136 EUREKA 5 161 CKT 1	263	102.2	112.5	99.8	110.1	Multiple Outage Contingency: 59481 MON383 7 345 to 59984 BRKLINE 7 345 CKT1 53140 FLINTCR7 345 to 59481 MON383 7 345 CKT1	See Previous	See Previous
09WP	SWPA	AEPW	52680 BEAVER 5 161 to 53136 EUREKA 5 161 CKT 1	263	96.8	106.9	95.0	105.0	99519 5QUITMN 161 to 99799 5BEE BR 161 CKT 1	"	"
09WP	SWPA	AEPW	52680 BEAVER 5 161 to 53136 EUREKA 5 161 CKT 1	263	95.4	105.4	93.5	103.7	99799 5BEE BR 161 to 99807 5CLINTN 161 CKT 1	"	"
09WP	SWPA	AEPW	52680 BEAVER 5 161 to 53136 EUREKA 5 161 CKT 1	263	94.1	104.2	92.3	102.4	99806 5CLIN-W# 161 to 99807 5CLINTN 161 CKT 1	"	"
09WP	SWPA	AEPW	52680 BEAVER 5 161 to 53136 EUREKA 5 161 CKT 1	263	92.6	102.7	90.2	100.5	55224 MUSKOG7 345 to 55302 FTSMITH7 345 CKT 1	"	"

Study Year	From Area	To Area	Monitored Branch Over 100% Rate B	Rate	BC % Loading	TC % Loading	ATC (MW)	Outaged Branch Causing Overload	Solution	Cost
04G	WERE	WERE	57631 CC4VERN2 69 to 57623 ATHENS 2 69 CKT 1	45	102.0	105.1	0	56791 BENTON 7 345 to 56797 WOLFCKR7 345 CKT 1	Westar Transmission Operating Directive 1304, Overload of the Athens to Wolf Creek 69 kV Line	-
04G	WERE	WERE	57631 CC4VERN2 69 to 57623 ATHENS 2 69 CKT 1	45	101.4	104.6	0	56794 ROSEHIL7 345 to 56797 WOLFCKR7 345 CKT 1	*	-
04G	WERE	WERE	57636 GREEN 2 69 to 57631 CC4VERN2 69 CKT 1	45	103.3	106.4	0	56791 BENTON 7 345 to 56797 WOLFCKR7 345 CKT 1	Westar Transmission Operating Directive 1304, Overload of the Athens to Wolf Creek 69 kV Line	-
04G	WERE	WERE	57636 GREEN 2 69 to 57631 CC4VERN2 69 CKT 1	45	102.7	105.9	0	56794 ROSEHIL7 345 to 56797 WOLFCKR7 345 CKT 1	*	-
04G	WERE	WERE	56851 AUBURN 6 230 to 56852 JEC 6 230 CKT 1	565	99.4	100.8	64	56765 HOYT 7 345 to 56766 JEC N 7 345 CKT 1	Solved with Taps Fixed and Switched Shunts Locked, Westar Transmission Operating Directive 400, Outage of the Jeffrey Energy Center to Hoyt 345 kV line	-
04G	WERE	WERE	57737 HESSTON2 69 to 57735 GOLDPLJ2 69 CKT 1	32	97.8	101.8	82	57736 HALSTED2 69 to 57744 MUDCRKJ2 69 CKT 1	Westar Transmission Operating Directive 1301, Outage of the Halstead to Newton 69 kV line	-
04G	WERE	WERE	57737 HESSTON2 69 to 57735 GOLDPLJ2 69 CKT 1	32	97.0	101.0	113	57741 MID AMJ2 69 to 57744 MUDCRKJ2 69 CKT 1	*	-
04G	WERE	WERE	57737 HESSTON2 69 to 57735 GOLDPLJ2 69 CKT 1	32	96.3	100.3	139	57741 MID AMJ2 69 to 57745 NEWTON 2 69 CKT 1	*	-
04SP	WERE	WERE	56851 AUBURN 6 230 to 56852 JEC 6 230 CKT 1	565	105.8	106.8	0	56765 HOYT 7 345 to 56766 JEC N 7 345 CKT 1	Westar Transmission Operating Directive 400, Outage of the Jeffrey Energy Center to Hoyt 345 kV line	-
04SP	SPS	SPS	51014 OSAGE--3 115 to 51080 CANYNE3 115 CKT 1	99	113.2	114.9	0	50993 BUSHLND6 230 to 51111 DFSMTH6 230 CKT 1	Rebuild 13 miles of 115 kV circuit with 397 ACSR on T-0-102 structures.	1,910,000
04SP	AEPW	AEPW	53170 TONTITN5 161 to 53154 CHAMSPR5 161 CKT 1	247	115.5	117.4	0	53154 CHAMSPR5 161 to 53195 FARMGTN5 161 CKT 1	Relieved or Impact Removed by Selected Upgrades to be Assigned, Modeled in 09SP	-
04SP	AEPW	AEPW	53170 TONTITN5 161 to 53154 CHAMSPR5 161 CKT 1	247	113.6	115.0	0	53139 FLINTCR5 161 to 53170 TONTITN5 161 CKT 1	*	-
04SP	AEPW	AEPW	53170 TONTITN5 161 to 53154 CHAMSPR5 161 CKT 1	247	103.6	105.4	0	53157 SFAYTVL5 161 to 53195 FARMGTN5 161 CKT 1	*	-
04SP	AEPW	AEPW	53133 ECNTRTN5 161 to 53187 GENTRYR5 161 CKT 1	353	103.0	103.4	0	53139 FLINTCR5 161 to 53170 TONTITN5 161 CKT 1	Relieved or Impact Removed by Selected Upgrades to be Assigned, Modeled in 09SP	-
04SP	AEPW	AEPW	53187 GENTRYR5 161 to 53139 FLINTCR5 161 CKT 1	354	105.1	105.5	0	53139 FLINTCR5 161 to 53170 TONTITN5 161 CKT 1	Relieved or Impact Removed by Selected Upgrades to be Assigned, Modeled in 09SP	-
04SP	AEPW	AEPW	53170 TONTITN5 161 to 53139 FLINTCR5 161 CKT 1	312	105.9	106.3	0	53154 CHAMSPR5 161 to 53155 CHAMSPR7 345 CKT 1	Relieved or Impact Removed by Selected Upgrades to be Assigned, Modeled in 09SP	-
04SP	AEPW	AEPW	53170 TONTITN5 161 to 53139 FLINTCR5 161 CKT 1	312	105.9	106.3	0	53155 CHAMSPR7 345 to 53756 CLARKSV7 345 CKT 1	*	-
04SP	OKGE	OKGE	55305 FTSMITH8 500 to 55300 FTSMITH5 161 CKT 1	480	104.0	104.5	0	55300 FTSMITH5 161 to 55302 FTSMITH7 345 CKT 1	Convert Ft. Smith 161kV to 1-1/2 breaker design and install 2nd 500-161kV transformer bank.	10,000,000
04SP	SPS	SPS	51082 PALODU 3 115 to 51302 HAPPY3 115 CKT 1	99	100.8	103.6	0	51041 AMARLS6 230 to 51321 SWISHER6 230 CKT 1	Rebuild 24 miles of 115 kV circuit with 397 ACSR on T-0-102 structures.	3,130,000
04SP	WERE	WERE	56853*LAWHILL6 230 LAHWL29X 1	308	106.7	107.5	0	56853 LAWHILL6230 to 56855 MIDLAND6230 CKT 1	Westar Transmission Operating Directive 901, Outage of the Lawrence Hill-Midland Junction 230kV Line	-
04SP	WERE	WERE	56853*LAWHILL6 230 LAHWL29X 1	308	106.7	107.4	0	56855 MIDLAND6230 to 57252 MIDLAND3115 to 56884 MIDLAND118.0 CKT 1	Westar Transmission Operating Directive 615, Loss of the Midland Junction 230/115 kV transformer	-
04SP	WERE	WERE	57250*LWRNCHL3 115 WND 2 LAHWL29X 1	308	104.4	105.2	0	56853 LAWHILL6230 to 56855 MIDLAND6230 CKT 1	Westar Transmission Operating Directive 901, Outage of the Lawrence Hill-Midland Junction 230kV Line	-
04SP	WERE	WERE	57250*LWRNCHL3 115 WND 2 LAHWL29X 1	308	104.4	105.0	0	56855 MIDLAND6230 to 57252 MIDLAND3115 to 56884 MIDLAND118.0 CKT 1	Westar Transmission Operating Directive 615, Loss of the Midland Junction 230/115 kV transformer	-
04SP	SPS	SPS	51020 RANDALL3 115 to 51082 PALODU 3 115 CKT 1	99	102.7	105.5	0	51041 AMARLS6 230 to 51321 SWISHER6 230 CKT 1	Rebuild 9 miles of 115 kV circuit with 397 ACSR on T-0-102 structures.	1,170,000
04SP	SPS	SPS	51021 RANDALL6 230 to 51020 RANDALL3 115 CKT 1	259	100.9	101.8	0	50915 NICHOL6 230 to 51041 AMARLS6 230 CKT 1	Open Amarillo South 230/115kV Transformer to Relieve Facility	-
04SP	SPS	SPS	51080 CANYNE3 115 to 51078 CANYNW3 115 CKT 1	99	99.5	101.2	43	50993 BUSHLND6 230 to 51111 DFSMTH6 230 CKT 1	Rebuild 4 miles of 115 kV circuit with 397 ACSR on T-0-102 structures.	590,000
04WP	WERE	WERE	56851 AUBURN 6 230 to 56852 JEC 6 230 CKT 1	565	99.3	100.7	79	56765 HOYT 7 345 to 56766 JEC N 7 345 CKT 1	Westar Transmission Operating Directive 400, Outage of the Jeffrey Energy Center to Hoyt 345 kV line	-
09SP	AECI	SWPA	96056 5ASHRVL 161 to 52634 IDALIA 5 161 CKT 1	206	116.7	117.2	0	96073 5HARVELE 161 to 96114 5STFRAN 161 CKT 1	Reconductor line.	6,600,000
09SP	SWPA	AECI	52638 POP BLF5 161 to 96056 5ASHRVL 161 CKT 1	167	113.5	114.1	0	96073 5HARVELE 161 to 96114 5STFRAN 161 CKT 1	Replace disconnect switches at Poplar Bluff. & Reconductor line.	4,070,000
09SP	SWPA	AECI	52638 POP BLF5 161 to 96056 5ASHRVL 161 CKT 1	167	104.6	105.3	0	96073 5HARVELE 161 to 96084 5GRNFRNT 161 CKT 1	*	-
09SP	WERE	WERE	56851 AUBURN 6 230 to 56852 JEC 6 230 CKT 1	565	104.5	106.2	0	56765 HOYT 7 345 to 56766 JEC N 7 345 CKT 1	Westar Transmission Operating Directive 400, Outage of the Jeffrey Energy Center to Hoyt 345 kV line	-
09SP	WERE	WERE	56851*AUBURN 6 230 WND 1 AUBRN77X 1	308	114.4	114.9	0	56765 HOYT 7345 to 56766 JEC N 7345 CKT 1	Westar Transmission Operating Directive 400, Outage of the Jeffrey Energy Center to Hoyt 345 kV line	-
09SP	WERE	WERE	57151*AUBURN 3 115 WND 2 AUBRN77X 1	308	113.3	113.8	0	56765 HOYT 7345 to 56766 JEC N 7345 CKT 1	*	-
09SP	KACP	KACP	58010 WINJT S5 161 to 58000 BLUEVLY5 161 CKT 1	224	101.2	102.1	0	57996 MIDTOWN5 161 to 57997 LEEDS 5 161 CKT 1	Limits Rollover Rights 6/1/2009	-
09SP	SWPA	SPRM	52692 SPRGFLD5 161 to 59969 BRKLINE 5 161 CKT 1	323	121.2	124.4	0	59954 SWPS 5 161 to 59960 SWDISP 5 161 CKT 1	Impact Removed by Selected Upgrades to be Assigned	-
09SP	SWPA	SPRM	52692 SPRGFLD5 161 to 59969 BRKLINE 5 161 CKT 1	323	120.3	123.5	0	59959 BATFLD 5 161 to 59960 SWDISP 5 161 CKT 1	*	-
09SP	SWPA	SPRM	52692 SPRGFLD5 161 to 59969 BRKLINE 5 161 CKT 1	323	109.5	112.2	0	59955 JUNCTN 5 161 to 59969 BRKLINE 5 161 CKT 1	*	-
09SP	SPS	SPS	51014 OSAGE--3 115 to 51080 CANYNE3 115 CKT 1	99	106.2	107.8	0	50993 BUSHLND6 230 to 51111 DFSMTH6 230 CKT 1	See Previous	See Previous
09SP	AEPW	AEPW	53195 FARMGTN5 161 to 53154 CHAMSPR5 161 CKT 1	335	109.4	110.3	0	53154 CHAMSPR5 161 to 53170 TONTITN5 161 CKT 1	Impact Removed by Selected Upgrades to be Assigned	-

Table 1.2a - SPP Facility Overloads
 Caused or Impacted by Transfer with Modeling Details (Scenario 2)

Southwest Power Pool
 System Impact Study

Study Year	From Area	To Area	Monitored Branch Over 100% Rate B	Rate	BC % Loading	TC % Loading	ATC (MW)	Outaged Branch Causing Overload	Solution	Cost
09SP	AEPW	AEPW	53195 FARMGTN5 161 to 53154 CHAMSPR5 161 CKT 1	335	104.9	105.4	0	53139 FLINTCR5 161 to 53170 TONTITN5 161 CKT 1	Relieved and Impact Removed by Selected Upgrades to be Assigned	-
09SP	AEPW	AEPW	53195 FARMGTN5 161 to 53154 CHAMSPR5 161 CKT 1	335	103.7	104.3	0	53139 FLINTCR5 161 to 53187 GENTRYR5 161 CKT 1	*	-
09SP	AEPW	AEPW	53195 FARMGTN5 161 to 53154 CHAMSPR5 161 CKT 1	335	102.9	103.5	0	53133 ECNTRTN5 161 to 53187 GENTRYR5 161 CKT 1	*	-
09SP	AEPW	AEPW	53154 CHAMSPR5 161 to 53139 FLINTCR5 161 CKT 1	335	104.8	105.2	0	53154 CHAMSPR5 161 to 53155 CHAMSPR7 345 CKT 1	Relieved and Impact Removed by Selected Upgrades to be Assigned	-
09SP	AEPW	AEPW	53154 CHAMSPR5 161 to 53139 FLINTCR5 161 CKT 1	335	104.8	105.2	0	53155 CHAMSPR7 345 to 53756 CLARKSV7 345 CKT 1	*	-
09SP	AEPW	AEPW	53170 TONTITN5 161 to 53154 CHAMSPR5 161 CKT 1	244	150.5	152.4	0	53154 CHAMSPR5 161 to 53195 FARMGTN5 161 CKT 1	Impact Removed by Selected Upgrades to be Assigned	-
09SP	AEPW	AEPW	53170 TONTITN5 161 to 53154 CHAMSPR5 161 CKT 1	244	143.6	145.1	0	53139 FLINTCR5 161 to 53170 TONTITN5 161 CKT 1	*	-
09SP	AEPW	AEPW	53170 TONTITN5 161 to 53154 CHAMSPR5 161 CKT 1	244	133.4	135.3	0	53157 SFAYTVL5 161 to 53195 FARMGTN5 161 CKT 1	*	-
09SP	AEPW	AEPW	53170 TONTITN5 161 to 53154 CHAMSPR5 161 CKT 1	244	116.6	118.3	0	53139 FLINTCR5 161 to 53187 GENTRYR5 161 CKT 1	Relieved and Impact Removed by Selected Upgrades to be Assigned	-
09SP	AEPW	AEPW	53170 TONTITN5 161 to 53154 CHAMSPR5 161 CKT 1	244	115.1	116.7	0	53133 ECNTRTN5 161 to 53187 GENTRYR5 161 CKT 1	*	-
09SP	GRRD	GRRD	54451 CLARMR 5 161 to 54479 CLARMR 2 69 CKT 1	84	103.5	104.9	0	54451 CLARMR 5 161 to 54479 CLARMR 2 69 CKT 2	See Table 1.1a	See Table 1.1a
09SP	GRRD	GRRD	54451 CLARMR 5 161 to 54479 CLARMR 2 69 CKT 2	84	103.8	105.2	0	54451 CLARMR 5 161 to 54479 CLARMR 2 69 CKT 1	*	-
09SP	KACP	KACP	58048 COLLEGE5 161 to 57978 CRAIG 5 161 CKT 1	335	106.3	107.2	0	58033 BRKIDG5 161 to 58047 OVERLPK5 161 CKT 1	Limits Rollover Rights 6/1/2008	-
09SP	KACP	KACP	58048 COLLEGE5 161 to 57978 CRAIG 5 161 CKT 1	335	105.9	106.2	0	57969 STILLWEL5 161 to 58050 ANTIOCH5 161 CKT 1	Limits Rollover Rights 6/1/2008	-
09SP	KACP	KACP	58048 COLLEGE5 161 to 57978 CRAIG 5 161 CKT 1	335	100.6	101.3	0	57966 WGDNR5 161 to 58044 MOONLT 5 161 CKT 1	Limits Rollover Rights 6/1/2009	-
09SP	AEPW	AEPW	53133 ECNTRTN5 161 to 53187 GENTRYR5 161 CKT 1	353	125.3	125.8	0	53139 FLINTCR5 161 to 53170 TONTITN5 161 CKT 1	Relieved and Impact Removed by Selected Upgrades to be Assigned	-
09SP	AEPW	AEPW	53133 ECNTRTN5 161 to 53187 GENTRYR5 161 CKT 1	353	109.9	110.7	0	53144 LOWELL 5 161 to 53170 TONTITN5 161 CKT 1	*	-
09SP	AEPW	AEPW	53133 ECNTRTN5 161 to 53187 GENTRYR5 161 CKT 1	353	109.1	109.7	0	53154 CHAMSPR5 161 to 53195 FARMGTN5 161 CKT 1	*	-
09SP	AEPW	AEPW	53133 ECNTRTN5 161 to 53187 GENTRYR5 161 CKT 1	353	107.2	108.0	0	53144 LOWELL 5 161 to 53152 ROGERS 5 161 CKT 1	*	-
09SP	AEPW	AEPW	53133 ECNTRTN5 161 to 53187 GENTRYR5 161 CKT 1	353	105.8	106.4	0	53157 SFAYTVL5 161 to 53195 FARMGTN5 161 CKT 1	*	-
09SP	AEPW	AEPW	53194 ELMSPRR5 161 to 53170 TONTITN5 161 CKT 1	335	111.0	111.4	0	53154 CHAMSPR5 161 to 53195 FARMGTN5 161 CKT 1	Impact Removed by Selected Upgrades to be Assigned	-
09SP	AEPW	AEPW	53194 ELMSPRR5 161 to 53170 TONTITN5 161 CKT 1	335	100.7	101.0	0	53157 SFAYTVL5 161 to 53195 FARMGTN5 161 CKT 1	Relieved and Impact Removed by Selected Upgrades to be Assigned	-
09SP	AEPW	AEPW	53187 GENTRYR5 161 to 53139 FLINTCR5 161 CKT 1	354	128.1	128.6	0	53139 FLINTCR5 161 to 53170 TONTITN5 161 CKT 1	Relieved and Impact Removed by Selected Upgrades to be Assigned	-
09SP	AEPW	AEPW	53187 GENTRYR5 161 to 53139 FLINTCR5 161 CKT 1	354	112.8	113.5	0	53144 LOWELL 5 161 to 53170 TONTITN5 161 CKT 1	*	-
09SP	AEPW	AEPW	53187 GENTRYR5 161 to 53139 FLINTCR5 161 CKT 1	354	112.0	112.6	0	53154 CHAMSPR5 161 to 53195 FARMGTN5 161 CKT 1	*	-
09SP	AEPW	AEPW	53187 GENTRYR5 161 to 53139 FLINTCR5 161 CKT 1	354	110.1	110.8	0	53144 LOWELL 5 161 to 53152 ROGERS 5 161 CKT 1	*	-
09SP	AEPW	AEPW	53187 GENTRYR5 161 to 53139 FLINTCR5 161 CKT 1	354	108.7	109.3	0	53157 SFAYTVL5 161 to 53195 FARMGTN5 161 CKT 1	*	-
09SP	AEPW	AEPW	53170 TONTITN5 161 to 53139 FLINTCR5 161 CKT 1	312	132.4	132.8	0	53154 CHAMSPR5 161 to 53170 TONTITN5 161 CKT 1	Impact Removed by Selected Upgrades to be Assigned	-
09SP	AEPW	AEPW	53170 TONTITN5 161 to 53139 FLINTCR5 161 CKT 1	312	131.1	131.7	0	53154 CHAMSPR5 161 to 53155 CHAMSPR7 345 CKT 1	*	-
09SP	AEPW	AEPW	53170 TONTITN5 161 to 53139 FLINTCR5 161 CKT 1	312	131.1	131.7	0	53155 CHAMSPR7 345 to 53756 CLARKSV7 345 CKT 1	*	-
09SP	AEPW	AEPW	53170 TONTITN5 161 to 53139 FLINTCR5 161 CKT 1	312	107.0	107.3	0	53139 FLINTCR5 161 to 59484 DEC392 5 161 CKT 1	Relieved and Impact Removed by Selected Upgrades to be Assigned	-
09SP	OKGE	OKGE	55302 FTSMITH7 345 to 55300 FTSMITH5 161 CKT 1	493	107.3	107.7	0	55300 FTSMITH5 161 to 55305 FTSMITH8 500 CKT 1	See Previous	See Previous
09SP	OKGE	OKGE	55305 FTSMITH8 500 to 55300 FTSMITH5 161 CKT 1	480	116.4	116.9	0	55300 FTSMITH5 161 to 55302 FTSMITH7 345 CKT 1	*	-
09SP	OKGE	OKGE	55305 FTSMITH8 500 to 55300 FTSMITH5 161 CKT 1	480	102.2	103.1	0	55302 FTSMITH7 345 to 55305 FTSMITH8 500 CKT 1	*	-
09SP	ENTR	SWPA	99755 5JONES 161 to 52618 JONESBO5 161 CKT 1	223	124.2	124.8	0	52600 N MADRD5 161 to 52610 KENNETT5 161 CKT 1	Line belongs to Entergy. SWPA: Change the ratio on the metering CTs to 1200/5 and adjust the meters	2,000
09SP	ENTR	SWPA	99755 5JONES 161 to 52618 JONESBO5 161 CKT 1	223	115.9	116.5	0	52610 KENNETT5 161 to 52612 PARAGLD5 161 CKT 1	See Previous	See Previous
09SP	WERE	WERE	56853*LAWHILL6 230 LAHWL29X 1	308	106.0	106.6	0	56853 LAHWL6230 to 56855 MIDLAND6230 CKT 1	Westar Transmission Operating Directive 901, Outage of the Lawrence Hill-Midland Junction 230kV Line	-
09SP	WERE	WERE	56853*LAWHILL6 230 LAHWL29X 1	308	106.0	106.6	0	56855 MIDLAND6230 to 57252 MIDLAND3115 to 56884 MIDLAND118.0 CKT 1	Westar Transmission Operating Directive 615, Loss of the Midland Junction 230/115 kV transformer	-
09SP	WERE	WERE	57250*LWRNCHL3 115 WND 2 LAHWL29X 1	308	103.7	104.3	0	56853 LAHWL6230 to 56855 MIDLAND6230 CKT 1	Westar Transmission Operating Directive 901, Outage of the Lawrence Hill-Midland Junction 230kV Line	-
09SP	WERE	WERE	57250*LWRNCHL3 115 WND 2 LAHWL29X 1	308	103.7	104.3	0	56855 MIDLAND6230 to 57252 MIDLAND3115 to 56884 MIDLAND118.0 CKT 1	Westar Transmission Operating Directive 615, Loss of the Midland Junction 230/115 kV transformer	-
09SP	SPS	SPS	51021 RANDALL6 230 to 51020 RANDALL3 115 CKT 1	259	103.8	104.7	0	50915 NICHOL6 230 to 51041 AMARLS6 230 CKT 1	Open Amarillo South 230/115KV Transformer to Relieve Facility	-
09SP	AECI	SWPA	96056 5ASHRVL 161 to 52634 IDALIA 5 161 CKT 1	206	99.9	100.7	15	96040 7FLETCH 345 to 96051 7WILHLM 345 CKT 1	See Previous	See Previous
09SP	SWPA	SPRM	52692 SPRGFLD5 161 to 59969 BRKLN5 5 161 CKT 1	323	98.6	102.1	60	52692 SPRGFLD5 161 to 59959 BATFLD 5 161 CKT 1	Relieved and Impact Removed by Selected Upgrades to be Assigned	-
09SP	SPS	SPS	51020 RANDALL3 115 to 51082 PALODU 3 115 CKT 1	99	98.0	100.9	103	51041 AMARLS6 230 to 51321 SWISHER6 230 CKT 1	See Previous	See Previous
09WP	WERE	WERE	57631 CC4VERN2 69 to 57623 ATHENS 2 69 CKT 1	45	100.6	103.5	0	56791 BENTON 7 345 to 56797 WOLFCKR7 345 CKT 1	Westar Transmission Operating Directive 1304, Overload of the Athens to Wolf Creek 69 kV Line	-
09WP	SWPA	SPRM	52692 SPRGFLD5 161 to 59969 BRKLN5 5 161 CKT 1	323	103.6	106.4	0	59954 SWPS 5 161 to 59960 SWDISP 5 161 CKT 1	Impact Removed by Selected Upgrades to be Assigned	-
09WP	SWPA	SPRM	52692 SPRGFLD5 161 to 59969 BRKLN5 5 161 CKT 1	323	103.0	105.8	0	59959 BATFLD 5 161 to 59960 SWDISP 5 161 CKT 1	*	-
09WP	AEPW	AEPW	53170 TONTITN5 161 to 53154 CHAMSPR5 161 CKT 1	244	119.4	121.1	0	53154 CHAMSPR5 161 to 53195 FARMGTN5 161 CKT 1	Impact Removed by Selected Upgrades to be Assigned	-

Table 1.2a - SPP Facility Overloads
 Caused or Impacted by Transfer with Modeling Details (Scenario 2)

Study Year	From Area	To Area	Monitored Branch Over 100% Rate B	Rate	BC % Loading	TC % Loading	ATC (MW)	Outaged Branch Causing Overload	Solution	Cost
09WP	AEPW	AEPW	53170 TONTITN5 161 to 53154 CHAMSPR5 161 CKT 1	244	116.2	117.5	0	53139 FLINTCR5 161 to 53170 TONTITN5 161 CKT 1	Relieved and Impact Removed by Selected Upgrades to be Assigned	-
09WP	AEPW	AEPW	53170 TONTITN5 161 to 53154 CHAMSPR5 161 CKT 1	244	104.3	106.0	0	53157 SFAYTVL5 161 to 53195 FARMGTN5 161 CKT 1	*	-
09WP	WERE	WERE	57636 GREEN 2 69 to 57631 CC4VERN2 69 CKT 1	45	101.8	104.8	0	56791 BENTON 7 345 to 56797 WOLFCRK7 345 CKT 1	Westar Transmission Operating Directive 1304, Overload of the Athens to Wolf Creek 69 kV Line	-
09WP	WERE	WERE	57636 GREEN 2 69 to 57631 CC4VERN2 69 CKT 1	45	101.2	104.3	0	56794 ROSEHIL7 345 to 56797 WOLFCRK7 345 CKT 1	*	-
09WP	AEPW	AEPW	53133 ECNTRTN5 161 to 53187 GENTRYR5 161 CKT 1	368	104.3	104.7	0	53139 FLINTCR5 161 to 53170 TONTITN5 161 CKT 1	Relieved and Impact Removed by Selected Upgrades to be Assigned	-
09WP	AEPW	AEPW	53187 GENTRYR5 161 to 53139 FLINTCR5 161 CKT 1	368	106.3	106.6	0	53139 FLINTCR5 161 to 53170 TONTITN5 161 CKT 1	Relieved and Impact Removed by Selected Upgrades to be Assigned	-
09WP	WERE	WERE	57631 CC4VERN2 69 to 57623 ATHENS 2 69 CKT 1	45	99.9	103.1	3	56794 ROSEHIL7 345 to 56797 WOLFCRK7 345 CKT 1	Westar Transmission Operating Directive 1304, Overload of the Athens to Wolf Creek 69 kV Line	-

Table 3.2a - SPP Facility Overloads
Caused or Impacted by Selected Upgrades with Modeling Details (Scenario 2)

Study Year	From Area	To Area	Monitored Branch Over 100% Rate B	Rate	BC Without Upgrades %Loading	BC With Upgrades %Loading	TC Without Upgrades %Loading	TC With Upgrades %Loading	Outaged Branch Causing Overload	Solution	Cost
09SP	ENTR	EMDE	99831 5OMAHA * 161 to 59474 OZD312 5 161 CKT 1	162	110.4	111.3	109.1	110.0	53136 EUREKA 5 161 to 99832 5OSAGE # 161 CKT 1	Contingency is Invalid, Contingency Causes Voltage to Collapse at Osage, With Load removed at Osage, Facility Not Overloaded	-
09SP	OKGE	AEPW	55261 BONANZT5 161 to 53126 BONANZA5 161 CKT 1	177	99.1	102.6	99.1	102.6	55262 AES 5 161 to 55264 TARBY 5 161 CKT 1	See Table 3.1a	See Table 3.1a
09SP	SWPA	SWPA	52774*EUFAULA4 138 WND 2 EUFAULA1	105	98.7	104.6	97.5	103.4	52790 WELEETK5 161 to 52792 WELEETK4 138 CKT 1	Replace Eufaula Transformer	2,000,000
09SP	SWPA	SWPA	52774*EUFAULA4 138 WND 2 EUFAULA1	105	98.6	104.5	97.4	103.3	52752 GORE 5 161 to 52790 WELEETK5 161 CKT 1	See Previous	See Previous
09SP	ENTR	AEPW	99832 5OSAGE # 161 to 53136 EUREKA 5 161 CKT 1	244	99.0	102.6	98.3	101.9	52660 BULL SH5 161 to 99802 5BULLSH* 161 CKT 1	See Table 3.1a	See Table 3.1a
09SP	ENTR	AEPW	99832 5OSAGE # 161 to 53136 EUREKA 5 161 CKT 1	244	97.4	101.1	96.7	100.4	99802 5BULLSH* 161 to 99809 5FLIPN 161 CKT 1	*	*
09SP	OKGE	AEPW	55259 HOWEIN 2 69 to 54003 WISTER-2 69 CKT 1	48	100.7	104.0	100.2	103.5	52774 EUFAULA4 138 to 54050 STIGLRT4 138 CKT 1	Invalid Contingency	-
09SP	EMDE	SWPA	59497 RVS438 5 161 to 52672 TABLE R5 161 CKT 1	268	< 100.0	< 100.0	99.4	100.4	53136 EUREKA 5 161 to 99832 5OSAGE # 161 CKT 1	Contingency is Invalid, Contingency Causes Voltage to Collapse at Osage, With Load removed at Osage, Facility Not Overloaded	-
09SP	GRRD	GRRD	54455 TAHLQH 5 161 to 54447 TAHLQH 2 69 CKT 1	78	116.7	120.8	116.6	120.7	54447 TAHLQH 2 69 to 54455 TAHLQH 5 161 CKT 2	See Table 3.1a	See Table 3.1a
09SP	GRRD	GRRD	54455 TAHLQH 5 161 to 54447 TAHLQH 2 69 CKT 2	78	117.4	121.6	117.3	121.5	54447 TAHLQH 2 69 to 54455 TAHLQH 5 161 CKT 1	*	*
09WP	SWPA	SWPA	52774*EUFAULA4 138 WND 2 EUFAULA1	105	98.4	103.3	97.3	102.2	52790 WELEETK5 161 to 52792 WELEETK4 138 CKT 1	See Previous	See Previous
09WP	SWPA	SWPA	52774*EUFAULA4 138 WND 2 EUFAULA1	105	98.3	103.1	97.1	102.0	52752 GORE 5 161 to 52790 WELEETK5 161 CKT 1	*	*