



# **SPP** *Southwest Power Pool*

*System Impact Study  
SPP-2004-006-1  
For Network Service  
Requested By  
Southwestern Public Service  
Company*

*From SPS To SPS*

*For a Reserved Amount Of 320 MW  
From 7/1/2004 To 7/1/2019*

*SPP Engineering, Tariff Studies*

# Table of Contents

<b>1. EXECUTIVE SUMMARY .....</b>	<b>3</b>
<b>2. INTRODUCTION .....</b>	<b>4</b>
<b>3. STUDY METHODOLOGY .....</b>	<b>5</b>
<b>A. DESCRIPTION.....</b>	<b>5</b>
<b>B. MODEL UPDATES.....</b>	<b>5</b>
<b>C. TRANSFER ANALYSIS .....</b>	<b>6</b>
<b>D. TRANSFER ANALYSIS BASED ON SPS TO LP&amp;L TIE-LINE POWER FACTOR .....</b>	<b>6</b>
<b>E. UPGRADE ANALYSIS.....</b>	<b>7</b>
<b>4. STUDY RESULTS.....</b>	<b>8</b>
<b>A. STUDY ANALYSIS RESULTS.....</b>	<b>8</b>
<b>5. CONCLUSION .....</b>	<b>9</b>
<b>FIGURE 1      10</b>	
<b>FIGURE 2      11</b>	
<b>FIGURE 3      12</b>	
<b>FIGURE 4      13</b>	
<b>APPENDIX A.....</b>	<b>14</b>

**ATTACHMENT: *SPP-2004-006-1 Tables***

## **1. Executive Summary**

Southwestern Public Service Company has requested a system impact study for Network Integration Transmission Service from SPS to SPS for 320 MW. The period of the service requested is from 7/1/2004 to 7/1/2019. The OASIS reservation number is 636882.

The principal objective of this study is to identify system constraints and potential system modifications necessary to grant the requested Network Service while maintaining system reliability. Due to higher priority requests and the complexity of the study, analysis was conducted to evaluate only the first year of service. The study includes transfer analyses from generation to load and generation to generation, and transfer analyses based on the aggregate power factor of the four SPS to Lubbock Power and Light (LP&L) 230 kV ties lines.

The requested service was studied using two System Scenarios with SPS exporting and importing, respectively. The service was modeled first by transfers from SPS and LP&L generation to the Network Load. No system violations were identified for the generation to load transfers, primarily due to LP&L generation being dispatched, based on priority, at 80 MW or greater with reactive output. To determine what limitations occur with all LP&L generation off, the service was then modeled from SPS generation to the Network load and to LP&L generation, until LP&L generation was dispatched at zero MW.

Tables 1.1 and 1.2 list the SPS facility overloads caused or impacted by the SPS generation to LP&L generation transfers modeled for Scenario 1 and 2, respectively. Tables 2.1 and 2.2 lists the SPS voltage violations caused or impacted by the SPS generation to LP&L generation transfers modeled for Scenario 1 and 2, respectively. No facilities outside of SPS were identified as being impacted with application of established transfer distribution factor cutoffs.

Limits were identified in the 2004 and 2005 Summer Peak models with all LP&L generation off. Due to the inability to mitigate the limiting constraints identified through transmission upgrades by the 7/1/2004 start date, critical contingencies were analyzed to determine maximum allowable SPS to LP&L aggregate tie line flow based on the aggregate tie line power factor. The Tuco 230 kV bus voltage stability limit for the outage of Jones Unit 1 is the most limiting event for lagging power factors ranging from 0.98 to 0.90 using Scenario 2. At unity power factor for the 2004 Summer Peak the overload of the new LP&L South 230/69 kV transformer tie for the outage of the LP&L-Wadsworth to Lubbock East Interchange 230 kV line is the most limiting using Scenario 1. At unity power factor for the 2005 Summer Peak the overload of the new LP&L South 230/69 kV transformer tie for the outage of the LP&L-Holley to Jones 230 kV line is the most limiting using Scenario 1. Figures 1, 2, 3 and 4 illustrate the tie line flow limit results of six worst contingencies based on the tie line power factor for the 2004 and 2005 Summer Peak models using both scenarios. Table 3 summarizes the SPS to LP&L tie line limits by season and power factor.

Based on historical tie line flow data, which reveals an average power factor of 95% with tie line flow greater than 200 MW, the tie line flow from SPS to LP&L will be limited to 238 MW for 2004 and 220 MW for 2005 based on a 95% power factor. If the customer agrees to the SPS to LP&L tie line flow limits, the request will be accepted for the first year. The reservation queue priority of the remaining years of requested service will remain the same. SPP also requests that a facility study agreement be executed. Upon execution of a facility study agreement, SPP will evaluate the remaining years of service and determine necessary transmission upgrades.

## **2. Introduction**

Southwestern Public Service Company has requested a system impact study for Network Integration Transmission Service from SPS to SPS for 320 MW. The principal objective of this study is to identify the restraints on the SPP Regional Tariff System and LP&L System that may limit the requested service and determine the least cost solutions required to alleviate the limiting facilities. Due to higher priority requests and the complexity of the study, analysis was conducted to evaluate only the first year of service.

The 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 request on transmission line and transformer loadings, and bus voltages for outages of single transmission lines and transformers, and selected multiple transmission lines and transformers on the SPP system and first tier Non - SPP systems. Generation unit outages were performed for the SPS control area.

The requested service was studied using two System Scenarios with SPS exporting and importing, respectively. The two scenarios were studied to capture worst case system limitations dependent on the bias of the transmission system. The service was modeled by transfers from SPS and LP&L generation to the Network Load and from SPS generation to LP&L generation up to LP&L generation dispatch of zero MW. The transfers modeled to LP&L generation were performed to determine maximum allowable flows across the SPS and LP&L tie lines. Six of the most limiting contingency events were evaluated in the Summer Peak models based on the aggregate tie line power factor. The maximum allowable aggregate tie line flow is based upon the most limiting critical contingency events and tie line lagging power factor.

### **3. Study Methodology**

#### **A. Description**

The system impact analysis was conducted to determine the steady-state impact of the requested service on the SPP and first tier Non - SPP control area 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. Normal operating ratings and emergency operating ratings monitored are Rate A and B in the SPP MDWG models, respectively. The lower bound of the normal voltage range monitored is 95%. The lower bound of the emergency voltage range monitored is 90%. The Tuco 230 kV bus voltage is monitored at 92.5% due to pre-determined system stability limitations.

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

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

#### **B. Model Updates**

SPP used eight seasonal models to study the requested service for the first year of service. The SPP 2004 Series Cases Update 2 2004 Summer Peak (04SP), 2004 Summer Shoulder (04SH), 2004 Fall Peak (04FA), 2004/2005 Winter Peak (04WP), 2005 April Minimum (05AP), 2005 Spring Peak (05G), 2005 Summer Peak (05SP), and 2005 Summer Shoulder (05SH) were used to study the impact of the requested service on the transmission system during the first year of service from 7/1/2004 to 7/1/2005. The Spring Peak models apply to April and May, the Summer Peak models apply to June through September, the Fall Peak models apply to October and November, and the Winter Peak models apply to December through March.

The chosen base case models were modified to reflect the most current modeling information. From the eight seasonal models, two system scenarios were developed. Scenario 1 includes SWPP OASIS transmission requests not already included in the SPP 2004 Series Cases flowing in a West to East direction with ERCOT exporting and the SPS Control Area exporting to outside control areas and exporting to the planned Lamar HVDC Tie. Scenario 2 includes transmission requests not already included in the SPP 2004 Series Cases flowing in an East to West direction with ERCOT net importing and SPS importing from an outside control area and importing from the planned Lamar HVDC Tie. The system scenarios were developed to minimize counter flows to the transfers studied. The Lamar HVDC Tie is modeled starting in the 2004 Fall Peak.

LP&L is currently connected to the SPS transmission system by three 230 kV tie lines. LP&L is adding a fourth 230 kV tie line to be in-service by 7/1/2004. The fourth 230 kV tie line was included in the study analysis. The minimum allowable lagging power factor measured at the ties is 0.95. LP&L generating capacity is approximately 232 MW. The maximum reactive capacity of these generating facilities is approximately 121 MVAR. LP&L has three 69 kV capacitor banks rated at 12 MVAR.

The Network load for the 2004 Summer Peak was forecasted to be a maximum of 320 MW. Summer peaks were forecasted to increase 2.7% annually. The Network load amounts modeled for the spring peaks, fall peaks and winter peaks was 65% of the summer peaks. The Network load amount modeled in the summer shoulder is 85% of the summer peaks. The Network load amount for 2005 April minimum is 47% of the summer peaks. Future Summer Peak and Non-Summer Peak loads were determined by scaling the 2004 summer peak values while maintaining constant real power and reactive power ratios. Table 3 documents the total Network load modeled in each seasonal case.

SPS currently has 55 MW of long-term firm point-to-point service to LP&L. The existing reserved service was modeled in the cases before any transfer analyses were performed. For models with LP&L generation dispatch at 0 MW, the aggregate SPS to LP&L tie line power factor was set to the minimum allowable 0.95 lagging power factor by adjusting the power factor of the Network Load. No changes were made to the Jones Unit 1 and 2 modeling parameters. The Qmax of both Jones Unit 1 and 2 is 120 MVAR.

### **C. Transfer Analysis**

Two different transfer analyses were performed. The service was modeled first by transfers from SPS and LP&L generation to the Network Load. No system violations were identified for the generation to load transfers, primarily due to LP&L generation being dispatched, based on priority, at 80 MW or greater with reactive output. To determine what limitations occur with all LP&L generation off, the service was then modeled from SPS generation to the Network load and to LP&L generation, until LP&L generation was dispatched at zero MW. Using the selected cases both with and without the transfers modeled, the PSS/E Activity ACCC was run on the cases and compared to determine the facility thermal overloads and voltage violations caused or impacted by the transfer. The PSS/E options chosen to conduct the analysis can be found in Appendix A. Subsequently, the loading of the limitations identified was determined with LP&L units dispatched up to 20 and 60 MW with 10 to 30 MVAR of reactive output, respectively. The reactive output of the generation results in tie line power factors close to unity.

### **D. Transfer Analysis Based on SPS to LP&L Tie-Line Power Factor**

To determine maximum allowable aggregate tie line flow based upon the most limiting critical contingency events and the tie line lagging power factor. Contingency cases were developed for the 2004 and 2005 Summer Peaks for both scenarios with the most limiting contingencies. Then a developed PSS/E IPLAN macro was used to adjust the aggregate tie line flow and power factor by pro rata scaling the real and reactive Network load while checking for thermal or voltage violations. The tie line MW limits were then graphed. The most limiting critical contingency events were determined by contingency analysis performed on the models with LP&L generation at zero MW and at the minimum allowable 0.95 lagging power factor

**E. Upgrade Analysis**

This system impact study does not include analysis of upgrades.

## **4. Study Results**

### **A. Study Analysis Results**

Tables 1.1, 2.1, 1.2, and 2.2 contain the initial steady-state analysis results of the System Impact Study. The Tables are in the attached workbook *SPP-2004-006-1 Tables*. The tables identify the seasonal case in which the event occurred, the transfer amount studied which does not include the existing 55 MW of firm service, the facility control area location, applicable ratings of the overloaded facility, the loading percentage or voltage with different LP&L dispatch levels where applicable, and the estimated level at which the limit is relieved by LP&L dispatch amounts. 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. No tie line power factor analysis is included in these results.

Table 1.1 and 1.2 lists the SPP Facility Overloads caused or impacted by the transfers modeled from SPS generation to LP&L generation, using Scenario 1 and 2, respectively. Table 2.1 and 2.2 lists the SPP facility voltage violations caused or impacted by the transfers modeled from SPS generation to LP&L generation, using Scenario 1 and 2, respectively. No facilities outside of SPS were identified as being impacted with application of established transfer distribution factor cutoffs. Limitations were identified for the 2004 and 2005 Summer Peaks. No limitations were identified in the Non-Summer Peak cases at the forecasted Network load amounts and with a pre-contingency 0.95 tie line lagging power factor.

From the results in the Tables, the six most limiting events were determined to be the following: Jones Unit 1 Outage, Jones Unit 2 Outage, LP&L South Interchange 230 kV Tie Outage, LP&L Wadsworth 230 kV Tie Outage, LP&L Holley 230 kV Tie Outage, and Tolk to Tuco 230 kV Line Outage. The violations that occur for these contingencies can be found in the Tables.

Figures 1, 2, 3, and 4 illustrate the results of the SPS to LP&L tie line limits based on lagging tie line power factor for 2004 and 2005 Summer Peaks using Scenario 1 and 2. Each Figure contains plots of the tie line flow limits where valid thermal or voltage violations occur on the SPS and LP&L systems for each critical contingency based on the lagging tie line power factor. From the Figures, the most limiting contingency is the outage of the Jones Unit 1. From Figures 2 and 4, scenario 2 or SPS importing is the worst-case scenario for power factors ranging from 0.98 to 0.90.

Two additional plots were added to Figures 2 and 4 to capture the effects on the most limiting contingency with the ERCOT North DC Tie flow from North to South at 220 MW and the reduction of the Jones Unit 2 Q<sub>max</sub> by 5%. The additional plot of the Jones Unit 1 outage with the ERCOTN flowing from North to South at 220 MW was selected to determine the maximum allowable tie line flow based on the tie line power factor for both the 2004 and 2005 Summer Peak. The additional plot with the Jones Unit 2 Q<sub>max</sub> reduced by 5% is provided for sensitivity purposes only and was not selected as the most limiting to the service. Table 3 summarizes the SPS to LP&L tie line limits by season.

Tables 1.1a and 1.2a documents the modeling representation of the events identified in Tables 1.1 and 1.2 to include bus numbers and bus names.



## **5. Conclusion**

Limits were identified in the 2004 and 2005 Summer Peak models with all LP&L generation off. Due to the inability to mitigate the limiting constraints identified through transmission upgrades by the 7/1/2004 start date, critical contingencies were analyzed to determine maximum allowable SPS to LP&L aggregate tie line flow based on the aggregate tie line power factor. The Tuco 230 kV bus voltage stability limit for the outage of Jones Unit 1 is the most limiting event for lagging power factors ranging from 0.98 to 0.90 using Scenario 2. At unity power factor for the 2004 Summer Peak the overload of the new LP&L South 230/69 kV transformer tie for the outage of the LP&L-Wadsworth to Lubbock East Interchange 230 kV line is the most limiting using Scenario 1. At unity power factor for the 2005 Summer Peak the overload of the new LP&L South 230/69 kV transformer tie for the outage of the LP&L-Holley to Jones 230 kV line is the most limiting using Scenario 1. Figures 1, 2, 3 and 4 illustrate the tie line flow limit results of six worst contingencies based on the tie line power factor for the 2004 and 2005 Summer Peak models using both scenarios. Table 3 summarizes the SPS to LP&L tie line limits by season and power factor.

Based on historical tie line flow data, which reveals an average power factor of 95% with tie line flow greater than 200 MW, the tie line flow from SPS to LP&L will be limited to 238 MW for 2004 and 220 MW for 2005 based on a 95% power factor. If the customer agrees to the SPS to LP&L tie line flow limits, the request will be accepted for the first year. The reservation queue priority of the remaining years of requested service will remain the same. SPP also requests that a facility study agreement be executed. Upon execution of a facility study agreement, SPP will evaluate the remaining years of service and determine necessary transmission upgrades.

Figure 1: SPS to LP&L Tie Line MW Limits for Scenario 1 2004 Summer Peak

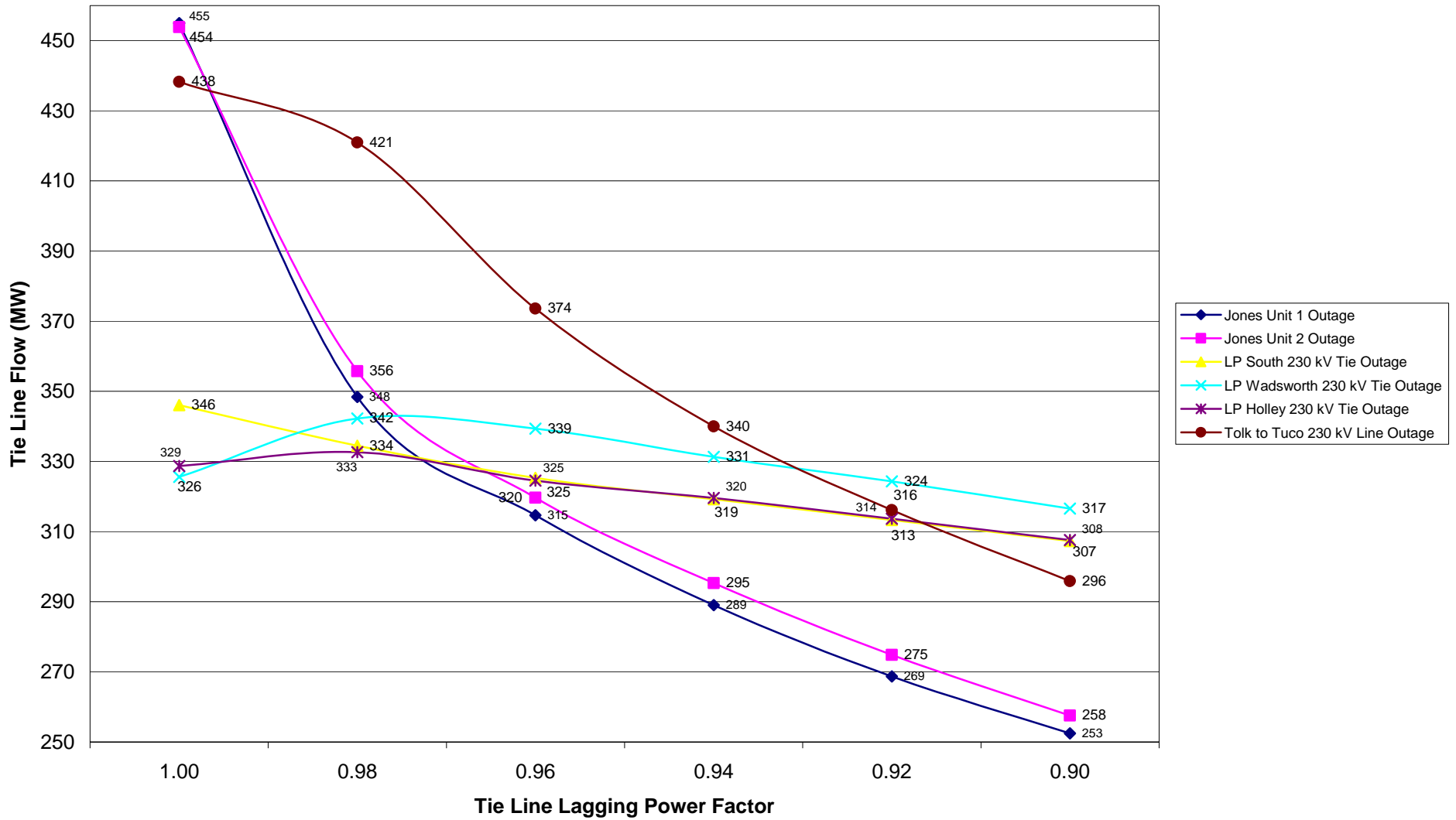


Figure 2: SPS to LP&L Tie Line MW Limits for Scenario 2 2004 Summer Peak

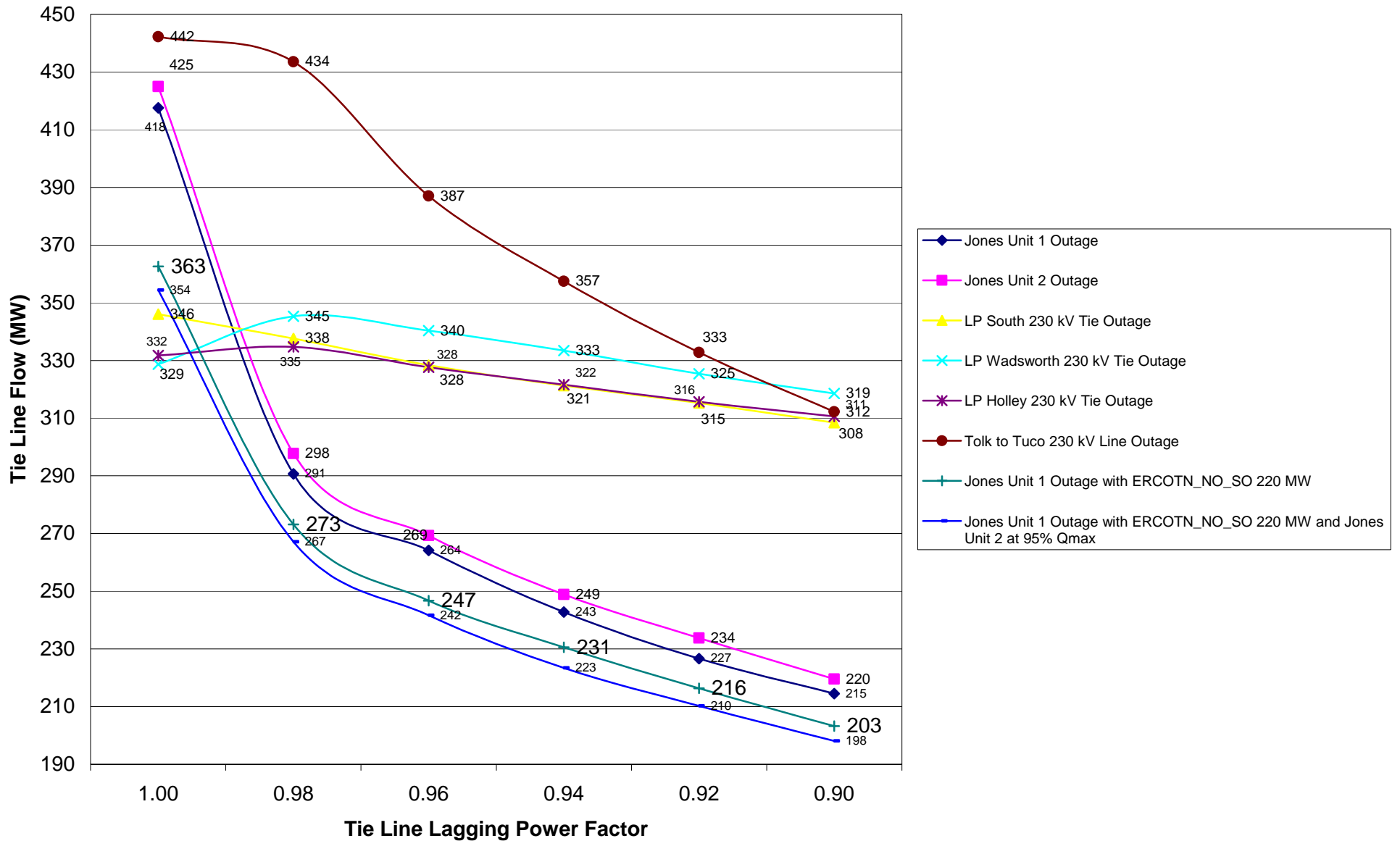


Figure 3: SPS to LP&L Tie Line MW Limits for Scenario 1 2005 Summer Peak

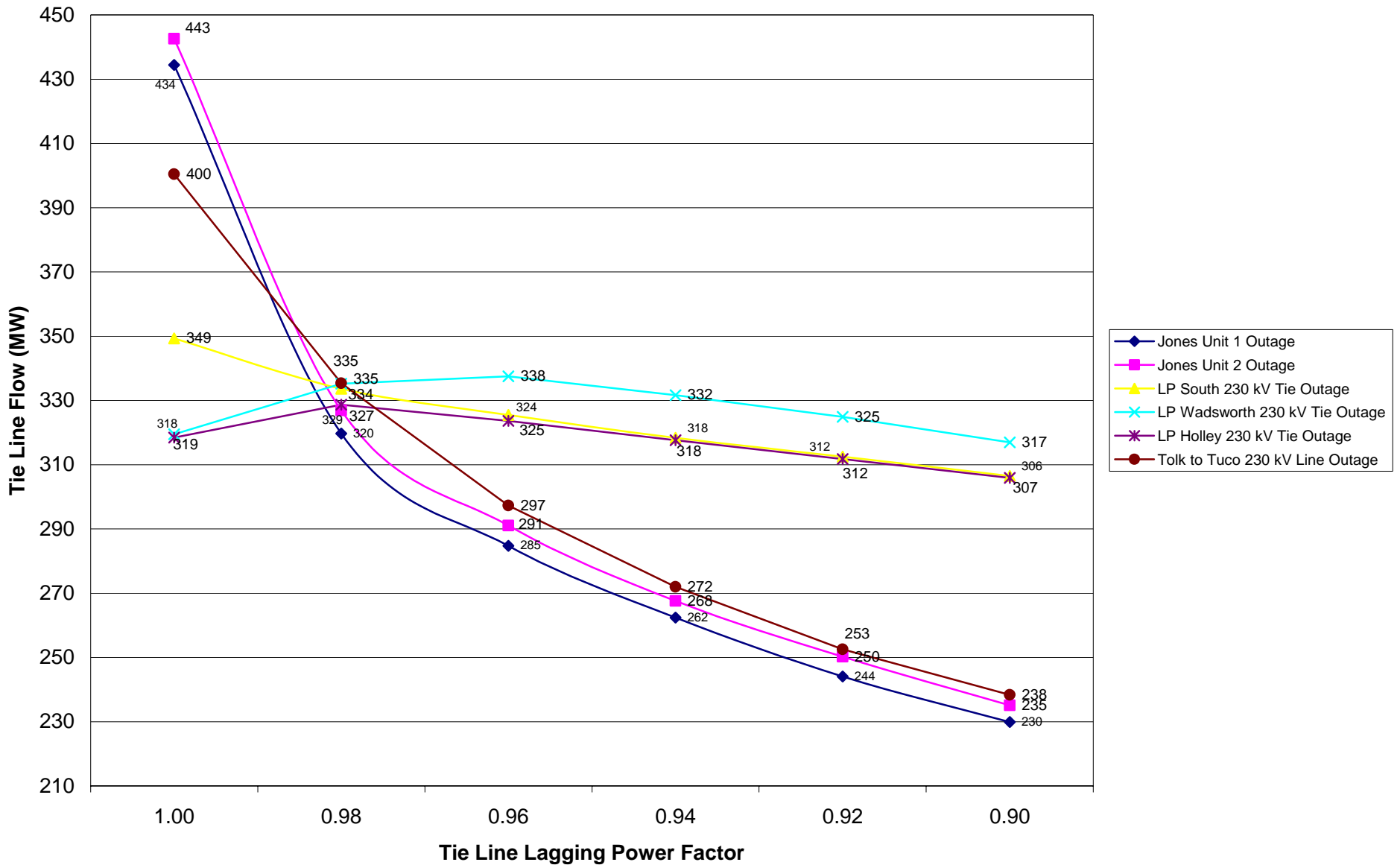
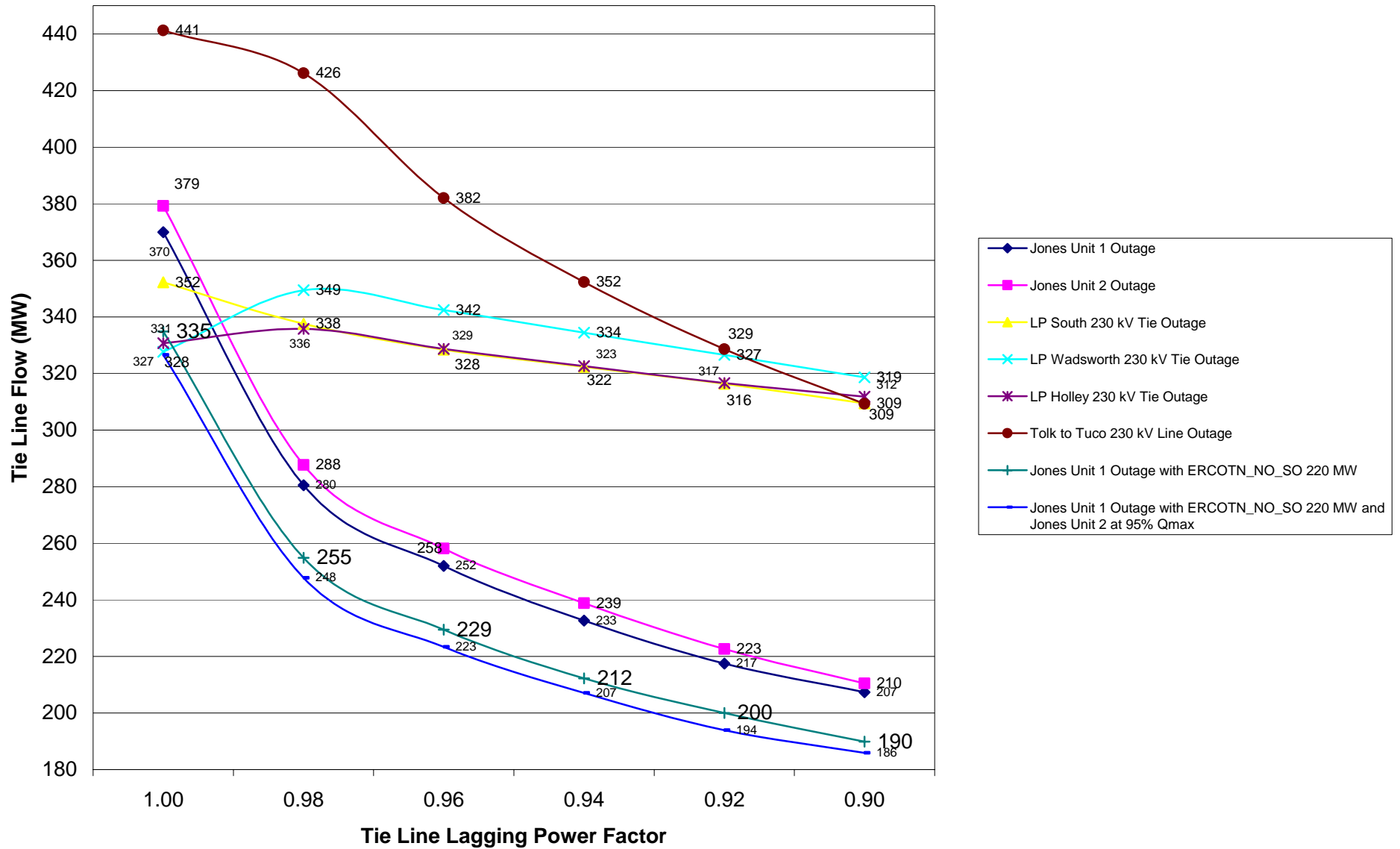


Figure 4: SPS to LP&L Tie Line MW Limits for Scenario 2 2005 Summer Peak



## **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

SPP-2004-006-1  
 Table 1.1 - SPP Facility Overloads  
 Caused or Impacted by Transfer Using Scenario 1

Southwest Power Pool  
 System Impact Study

Study Case	Transfer Amount (MW)	From Area	To Area	Monitored Branch Overload	Rate <MVA>	BC % Loading (LP&L PGEN = 232 MW)	TC % Loading (LP&L PGEN = 60 MW)	TC % Loading (LP&L PGEN = 20 MW)	TC % Loading (LP&L PGEN = 0 MW)	Outaged Branch Causing Overload	Transfer Amount minus LP&L Generation Required to Mitigate Violation (MW)	Solution	Estimated Cost
04SP	265	SPS	SPS	LP-COOP2 - LP-SLAT2 69KV	54	33.9	N/A	91.4	104.0	LP-COOP2 - LP-HCLI2 69KV	245	Short-term Solution is to Dispatch LP&L Generation	
04SP	265	SPS	SPS	LP-HOLL6 230/69KV TRANSFORMER	140	14.6	N/A	96.0	107.0	LP-SOUTH INT - LUBBOCK SOUTH INTERCHANGE 230KV	245	*	
04SP	265	SPS	SPS	LP-HOLL6 230/69KV TRANSFORMER	140	14.6	N/A	95.9	106.9	LP-SOUTH INT 230/69KV TRANSFORMER	245	*	
04SP	265	SPS	SPS	LP-HOLL6 230/69KV TRANSFORMER	140	13.1	N/A	91.2	101.9	LP-WADSWORTH STATION - LUBBOCK EAST INTERCHANGE 230KV	245	*	
04SP	265	SPS	SPS	LP-HOLL6 230/69KV TRANSFORMER	140	13.1	N/A	91.2	101.8	LP-HCLI2 230/69KV TRANSFORMER	245	*	
04SP	265	SPS	SPS	LP-SOUTH INT 230/69KV TRANSFORMER	140	17.6	N/A	94.6	104.3	JONES PLANT - LP-HOLL6 230KV	245	*	
04SP	265	SPS	SPS	LP-SOUTH INT 230/69KV TRANSFORMER	140	17.6	N/A	94.6	104.2	LP-HOLL2 230/69KV TRANSFORMER	245	*	
04SP	265	SPS	SPS	LP-SOUTH INT 230/69KV TRANSFORMER	140	17.6	N/A	91.0	101.0	LP-WADSWORTH STATION - LUBBOCK EAST INTERCHANGE 230KV	245	*	
04SP	265	SPS	SPS	LP-SOUTH INT 230/69KV TRANSFORMER	140	17.6	N/A	91.0	100.8	LP-HCLI2 230/69KV TRANSFORMER	245	*	
04SH	217			NONE IDENTIFIED									217
04FA	153			NONE IDENTIFIED									153
04WP	153			NONE IDENTIFIED									153
05AP	100			NONE IDENTIFIED									100
05G	159			NONE IDENTIFIED									159
05SP	274	SPS	SPS	LP-HOLL6 230/69KV TRANSFORMER	140	15.0	83.1	101.0	143.3	LP-SOUTH INT - LUBBOCK SOUTH INTERCHANGE 230KV	214	Short-term Solution is to Dispatch LP&L Generation	
05SP	274	SPS	SPS	LP-HOLL6 230/69KV TRANSFORMER	140	15.0	83.2	100.9	143.4	LP-SOUTH INT 230/69KV TRANSFORMER	214	*	
05SP	274	SPS	SPS	LP-COOP2 - LP-HCLI2 69KV	143	36.7	N/A	73.5	124.6	LP-SOUTH INT - LUBBOCK SOUTH INTERCHANGE 230KV	254	*	
05SP	274	SPS	SPS	LP-COOP2 - LP-HCLI2 69KV	143	36.7	N/A	73.3	124.5	LP-SOUTH INT 230/69KV TRANSFORMER	254	*	
05SP	274	SPS	SPS	LP-COOP2 - LP-SLAT2 69KV	54	34.4	N/A	95.4	110.3	LP-COOP2 - LP-HCLI2 69KV	254	*	
05SP	274	SPS	SPS	LP-HCLI2 230/69KV TRANSFORMER	140	16.7	N/A	92.0	106.1	JONES PLANT - LP-HOLL6 230KV	254	*	
05SP	274	SPS	SPS	LP-HCLI2 230/69KV TRANSFORMER	140	16.7	N/A	91.9	106.2	LP-HOLL2 230/69KV TRANSFORMER	254	*	
05SP	274	SPS	SPS	LP-HCLI2 230/69KV TRANSFORMER	140	18.3	N/A	90.9	131.2	LP-SOUTH INT - LUBBOCK SOUTH INTERCHANGE 230KV	254	*	
05SP	274	SPS	SPS	LP-HCLI2 230/69KV TRANSFORMER	140	18.3	N/A	90.8	131.2	LP-SOUTH INT 230/69KV TRANSFORMER	254	*	
05SP	274	SPS	SPS	LP-HOLL6 230/69KV TRANSFORMER	140	13.3	N/A	96.1	114.1	LP-WADSWORTH STATION - LUBBOCK EAST INTERCHANGE 230KV	254	*	
05SP	274	SPS	SPS	LP-HOLL6 230/69KV TRANSFORMER	140	13.2	N/A	96.0	114.1	LP-HCLI2 230/69KV TRANSFORMER	254	*	
05SP	274	SPS	SPS	LP-HOLL6 230/69KV TRANSFORMER	100	12.4	N/A	65.7	100.1	Base Case	254	*	
05SP	274	SPS	SPS	LP-SOUTH INT 230/69KV TRANSFORMER	140	18.1	N/A	99.3	115.6	LP-HOLL2 230/69KV TRANSFORMER	254	*	
05SP	274	SPS	SPS	LP-SOUTH INT 230/69KV TRANSFORMER	140	18.1	N/A	99.3	115.6	JONES PLANT - LP-HOLL6 230KV	254	*	
05SP	274	SPS	SPS	LP-SOUTH INT 230/69KV TRANSFORMER	140	18.0	N/A	95.7	113.7	LP-HCLI2 230/69KV TRANSFORMER	254	*	
05SP	274	SPS	SPS	LP-SOUTH INT 230/69KV TRANSFORMER	140	18.0	N/A	95.7	113.7	LP-WADSWORTH STATION - LUBBOCK EAST INTERCHANGE 230KV	254	*	
05SP	274	SPS	SPS	LP-SOUTH INT 230/69KV TRANSFORMER	100	20.3	N/A	68.1	102.1	Base Case	254	*	
05SH	224			NONE IDENTIFIED							224		
Note: Resulting Tie Line Power Factor not Specified													
												Total Estimated Cost	\$0

SPP-2004-006-1  
 Table 2.1 - SPP Voltage Violations  
 Caused or Impacted by Transfer Using Scenario 1

Southwest Power Pool  
 System Impact Study

Study Case	Transfer Amount (MW)	AREA	Monitored Bus with Violation	BC Voltage (PU) (LP&L PGEN = 232 MW)	TC Voltage (PU) (LP&L PGEN = 60 MW)	TC Voltage (PU) (LP&L PGEN = 20 MW)	TC Voltage (PU) (LP&L PGEN = 0 MW)	Outaged Branch Causing Voltage Violation	Transfer Amount minus LP&L Generation Required to Mitigate Violation (MW)	Solution	Estimated Cost
04SP	265	SPS	51533 TUCO6 230	0.9796	N/A	0.9263	0.9080	REMOVE UNIT 1 FROM BUS 51701 [JONES1 122.000] DISPATCH	245	Specific Monitored Bus Voltage 0.925 for Stability Limit, Short-term Solution is to Dispatch LP&L Generation	
04SP	265	SPS	51533 TUCO6 230	0.9796	N/A	0.9285	0.9100	REMOVE UNIT 1 FROM BUS 51702 [JONES2 121.000] DISPATCH	245	Specific Monitored Bus Voltage 0.925 for Stability Limit, Short-term Solution is to Dispatch LP&L Generation	
04SP	265	SPS	50507 LP-MLWK6 230	0.8697	N/A	N/A	0.8183	OPEN LINE FROM BUS 50507 LP-MLWK6 230 TO BUS 51647 CARLISL6 230 CKT 1	265	Not Load Serving Bus	
04SP	265	SPS	50507 LP-MLWK6 230	0.9599	N/A	N/A	0.8651	OPEN LINE FROM BUS 51533 TUCO6 230 TO BUS 51647 CARLISL6 230 CKT 1	265	Not Load Serving Bus	
04SP	265	SPS	50507 LP-MLWK6 230	0.9707	N/A	N/A	0.8779	REMOVE UNIT 1 FROM BUS 51701 [JONES1 122.000] DISPATCH	265	Not Load Serving Bus	
04SP	265	SPS	50507 LP-MLWK6 230	0.9707	N/A	N/A	0.8802	REMOVE UNIT 1 FROM BUS 51702 [JONES2 121.000] DISPATCH	265	Not Load Serving Bus	
04SP	265	SPS	50518 LP-SINT6 230	0.9726	N/A	N/A	0.8679	OPEN LINE FROM BUS 50518 LP-SINT6 230 TO BUS 51681 LUBS6 230 CKT 1	265	Not Load Serving Bus	
04SP	265	SPS	50518 LP-SINT6 230	0.9869	N/A	N/A	0.8839	REMOVE UNIT 1 FROM BUS 51701 [JONES1 122.000] DISPATCH	265	Not Load Serving Bus	
04SP	265	SPS	50518 LP-SINT6 230	0.9869	N/A	N/A	0.8872	REMOVE UNIT 1 FROM BUS 51702 [JONES2 121.000] DISPATCH	265	Not Load Serving Bus	
04SP	265	SPS	50521 LP-HOLL6 230	0.9909	N/A	N/A	0.8702	OPEN LINE FROM BUS 50521 LP-HOLL6 230 TO BUS 51699 JONES6 230 CKT 1	265	Not Load Serving Bus	
04SP	265	SPS	50521 LP-HOLL6 230	0.9910	N/A	N/A	0.8852	REMOVE UNIT 1 FROM BUS 51701 [JONES1 122.000] DISPATCH	265	Not Load Serving Bus	
04SP	265	SPS	50521 LP-HOLL6 230	0.9910	N/A	N/A	0.8887	REMOVE UNIT 1 FROM BUS 51702 [JONES2 121.000] DISPATCH	265	Not Load Serving Bus	
04SP	265	SPS	50527 LP-WADS6 230	1.0769	N/A	N/A	0.8298	OPEN LINE FROM BUS 50527 LP-WADS6 230 TO BUS 51689 LUBE6 230 CKT 1	265	Not Load Serving Bus	
04SP	265	SPS	50527 LP-WADS6 230	0.9939	N/A	N/A	0.8712	OPEN LINE FROM BUS 51689 LUBE6 230 TO BUS 51699 JONES6 230 CKT 1	265	Not Load Serving Bus	
04SP	265	SPS	50527 LP-WADS6 230	0.9906	N/A	N/A	0.8792	REMOVE UNIT 1 FROM BUS 51701 [JONES1 122.000] DISPATCH	265	Not Load Serving Bus	
04SP	265	SPS	50527 LP-WADS6 230	0.9906	N/A	N/A	0.8827	REMOVE UNIT 1 FROM BUS 51702 [JONES2 121.000] DISPATCH	265	Not Load Serving Bus	
04SP	265	SPS	51564 CROSBY3 115	0.9558	N/A	N/A	0.9328	Base Case	265	Not Load Serving Bus	
04SP	265	SPS	51647 CARLISL6 230	0.9600	N/A	N/A	0.8653	OPEN LINE FROM BUS 51533 TUCO6 230 TO BUS 51647 CARLISL6 230 CKT 1	265	Not Load Serving Bus	
04SP	265	SPS	51647 CARLISL6 230	0.9709	N/A	N/A	0.8785	REMOVE UNIT 1 FROM BUS 51701 [JONES1 122.000] DISPATCH	265	Not Load Serving Bus	
04SP	265	SPS	51647 CARLISL6 230	0.9709	N/A	N/A	0.8809	REMOVE UNIT 1 FROM BUS 51702 [JONES2 121.000] DISPATCH	265	Not Load Serving Bus	
04SP	265	SPS	51681 LUBS6 230	0.9872	N/A	N/A	0.8861	REMOVE UNIT 1 FROM BUS 51701 [JONES1 122.000] DISPATCH	265	Not Load Serving Bus	
04SP	265	SPS	51681 LUBS6 230	0.9872	N/A	N/A	0.8894	REMOVE UNIT 1 FROM BUS 51702 [JONES2 121.000] DISPATCH	265	Not Load Serving Bus	
04SP	265	SPS	51689 LUBE6 230	0.9937	N/A	N/A	0.8714	OPEN LINE FROM BUS 51689 LUBE6 230 TO BUS 51699 JONES6 230 CKT 1	265	Not Load Serving Bus	
04SP	265	SPS	51689 LUBE6 230	0.9904	N/A	N/A	0.8801	REMOVE UNIT 1 FROM BUS 51701 [JONES1 122.000] DISPATCH	265	Not Load Serving Bus	
04SP	265	SPS	51689 LUBE6 230	0.9904	N/A	N/A	0.8835	REMOVE UNIT 1 FROM BUS 51702 [JONES2 121.000] DISPATCH	265	Not Load Serving Bus	
04SP	265	SPS	51699 JONES6 230	0.9910	N/A	N/A	0.8879	REMOVE UNIT 1 FROM BUS 51701 [JONES1 122.000] DISPATCH	265	Not Load Serving Bus	
04SP	265	SPS	51699 JONES6 230	0.9910	N/A	N/A	0.8913	REMOVE UNIT 1 FROM BUS 51702 [JONES2 121.000] DISPATCH	265	Not Load Serving Bus	
04SP	265	SPS	51811 GRASSLN6 230	0.9917	N/A	N/A	0.8891	REMOVE UNIT 1 FROM BUS 51701 [JONES1 122.000] DISPATCH	265	Not Load Serving Bus	
04SP	265	SPS	51811 GRASSLN6 230	0.9917	N/A	N/A	0.8924	REMOVE UNIT 1 FROM BUS 51702 [JONES2 121.000] DISPATCH	265	Not Load Serving Bus	
04SP	265	SPS	51861 BORDEN6 230	0.9953	N/A	N/A	0.8973	REMOVE UNIT 1 FROM BUS 51701 [JONES1 122.000] DISPATCH	265	Not Load Serving Bus	
04SH	217		NONE IDENTIFIED						217		
04FA	153	SPS	50507 LP-MLWK6 230	1.0118	N/A	N/A	0.8695	OPEN LINE FROM BUS 50507 LP-MLWK6 230 TO BUS 51647 CARLISL6 230 CKT 1	153	Not Load Serving Bus	
04WP	153	SPS	50507 LP-MLWK6 230	0.9984	N/A	N/A	0.8653	OPEN LINE FROM BUS 50507 LP-MLWK6 230 TO BUS 51647 CARLISL6 230 CKT 1	153	Not Load Serving Bus	
05AP	100		NONE IDENTIFIED						100		
05G	159	SPS	50507 LP-MLWK6 230	0.9921	N/A	N/A	0.8672	OPEN LINE FROM BUS 50507 LP-MLWK6 230 TO BUS 51647 CARLISL6 230 CKT 1	159	Not Load Serving Bus	
05SP	274	SPS	51533 TUCO6 230	0.9746	0.9590	0.9146	0.8910	OPEN LINE FROM BUS 51435 TOLKE6 230 TO BUS 51533 TUCO6 230 CKT 1	214	Specific Monitored Bus Voltage 0.925 for Stability Limit, Short-term Solution is to Dispatch LP&L Generation	
05SP	274	SPS	51533 TUCO6 230	0.9782	0.9390	0.9116	0.8921	REMOVE UNIT 1 FROM BUS 51701 [JONES1 122.000] DISPATCH	214	Specific Monitored Bus Voltage 0.925 for Stability Limit, Short-term Solution is to Dispatch LP&L Generation	
05SP	274	SPS	51533 TUCO6 230	0.9788	0.9418	0.9135	0.8946	REMOVE UNIT 1 FROM BUS 51702 [JONES2 121.000] DISPATCH	214	Specific Monitored Bus Voltage 0.925 for Stability Limit, Short-term Solution is to Dispatch LP&L Generation	
05SP	274	SPS	50503 LP-ERSK269.0	1.0320	N/A	0.9740	0.4886	OPEN LINE FROM BUS 50518 LP-SINT6 230 TO BUS 51681 LUBS6 230 CKT 1	254	Voltage Collapse, Short-term Solution is to Dispatch LP&L Generation	
05SP	274	SPS	50503 LP-ERSK269.0	1.0320	N/A	0.9756	0.4897	OPEN LINE FROM BUS 50517 LP-SINT6269.0 TO BUS 50518 LP-SINT6 230 CKT 1	254	"	
05SP	274	SPS	50503 LP-ERSK269.0	1.0321	N/A	0.9716	0.8088	OPEN LINE FROM BUS 50527 LP-WADS6 230 TO BUS 51689 LUBE6 230 CKT 1	254	Short-term Solution is to Dispatch LP&L Generation	
05SP	274	SPS	50503 LP-ERSK269.0	1.0320	N/A	0.9721	0.8091	OPEN LINE FROM BUS 50524 LP-WADS269.0 TO BUS 50527 LP-WADS6 230 CKT 1	254	"	
05SP	274	SPS	50503 LP-ERSK269.0	1.0322	N/A	0.9877	0.8397	OPEN LINE FROM BUS 50520 LP-HOLL269.0 TO BUS 50521 LP-HOLL6 230 CKT 1	254	"	
05SP	274	SPS	50504 LP-MACK269.0	1.0350	N/A	0.9763	0.4986	OPEN LINE FROM BUS 50518 LP-SINT6 230 TO BUS 51681 LUBS6 230 CKT 1	254	Voltage Collapse, Short-term Solution is to Dispatch LP&L Generation	
05SP	274	SPS	50504 LP-MACK269.0	1.0350	N/A	0.9779	0.4996	OPEN LINE FROM BUS 50517 LP-SINT6269.0 TO BUS 50518 LP-SINT6 230 CKT 1	254	"	
05SP	274	SPS	50504 LP-MACK269.0	1.0350	N/A	0.9731	0.8148	OPEN LINE FROM BUS 50527 LP-WADS6 230 TO BUS 51689 LUBE6 230 CKT 1	254	Short-term Solution is to Dispatch LP&L Generation	
05SP	274	SPS	50504 LP-MACK269.0	1.0350	N/A	0.9737	0.8151	OPEN LINE FROM BUS 50524 LP-WADS269.0 TO BUS 50527 LP-WADS6 230 CKT 1	254	"	



SPP-2004-006-1  
 Table 2.1 - SPP Voltage Violations  
 Caused or Impacted by Transfer Using Scenario 1

Southwest Power Pool  
 System Impact Study

Study Case	Transfer Amount (MW)	AREA	Monitored Bus with Violation	BC Voltage (PU) (LP&L PGEN = 232 MW)	TC Voltage (PU) (LP&L PGEN = 60 MW)	TC Voltage (PU) (LP&L PGEN = 20 MW)	TC Voltage (PU) (LP&L PGEN = 0 MW)	Outaged Branch Causing Voltage Violation	Transfer Amount minus LP&L Generation Required to Mitigate Violation (MW)	Solution	Estimated Cost
05SP	274	SPS	50504 LP-MACK269.0	1.0350	N/A	0.9894	0.8457	OPEN LINE FROM BUS 50520 LP-HOLL269.0 TO BUS 50521 LP-HOLL6 230 CKT	254	"	
05SP	274	SPS	50506 LP-NES2 69.0	1.0340	N/A	0.9777	0.5049	OPEN LINE FROM BUS 50518 LP-SINT6 230 TO BUS 51681 LUBS6 230 CKT 1	254	Voltage Collapse, Short-term Solution is to Dispatch LP&L Generation	
05SP	274	SPS	50506 LP-NES2 69.0	1.0340	N/A	0.9792	0.5059	OPEN LINE FROM BUS 50517 LP-SINT269.0 TO BUS 50518 LP-SINT6 230 CKT	254	"	
05SP	274	SPS	50506 LP-NES2 69.0	1.0346	N/A	0.9753	0.8197	OPEN LINE FROM BUS 50527 LP-WADS6 230 TO BUS 51689 LUBE6 230 CKT 1	254	Short-term Solution is to Dispatch LP&L Generation	
05SP	274	SPS	50506 LP-NES2 69.0	1.0346	N/A	0.9758	0.8200	OPEN LINE FROM BUS 50524 LP-WADS269.0 TO BUS 50527 LP-WADS6 230 CKT 1	254	"	
05SP	274	SPS	50506 LP-NES2 69.0	1.0341	N/A	0.9901	0.8483	OPEN LINE FROM BUS 50520 LP-HOLL269.0 TO BUS 50521 LP-HOLL6 230 CKT	254	"	
05SP	274	SPS	50509 LP-MLWK269.0	1.0237	N/A	0.9308	0.8620	REMOVE UNIT 1 FROM BUS 51701 [JONES1 122.000] DISPATCH	254	"	
05SP	274	SPS	50509 LP-MLWK269.0	1.0239	N/A	0.9354	0.8688	REMOVE UNIT 1 FROM BUS 51702 [JONES2 121.000] DISPATCH	254	"	
05SP	274	SPS	50510 LP-VCKS269.0	1.0232	N/A	0.9690	0.4858	OPEN LINE FROM BUS 50518 LP-SINT6 230 TO BUS 51681 LUBS6 230 CKT 1	254	Voltage Collapse, Short-term Solution is to Dispatch LP&L Generation	
05SP	274	SPS	50510 LP-VCKS269.0	1.0232	N/A	0.9707	0.4868	OPEN LINE FROM BUS 50517 LP-SINT269.0 TO BUS 50518 LP-SINT6 230 CKT	254	"	
05SP	274	SPS	50510 LP-VCKS269.0	1.0233	N/A	0.9694	0.8105	OPEN LINE FROM BUS 50524 LP-WADS269.0 TO BUS 50527 LP-WADS6 230 CKT 1	254	Short-term Solution is to Dispatch LP&L Generation	
05SP	274	SPS	50510 LP-VCKS269.0	1.0237	N/A	0.9689	0.8102	OPEN LINE FROM BUS 50527 LP-WADS6 230 TO BUS 51689 LUBE6 230 CKT	254	"	
05SP	274	SPS	50510 LP-VCKS269.0	1.0170	N/A	0.9751	0.8364	OPEN LINE FROM BUS 50507 LP-MLWK6 230 TO BUS 51647 CARLISL6 230 CKT	254	"	
05SP	274	SPS	50511 LP-THOM 69.0	1.0212	N/A	0.9663	0.4813	OPEN LINE FROM BUS 50518 LP-SINT6 230 TO BUS 51681 LUBS6 230 CKT 1	254	Voltage Collapse, Short-term Solution is to Dispatch LP&L Generation	
05SP	274	SPS	50511 LP-THOM 69.0	1.0212	N/A	0.9680	0.4823	OPEN LINE FROM BUS 50517 LP-SINT269.0 TO BUS 50518 LP-SINT6 230 CKT	254	"	
05SP	274	SPS	50511 LP-THOM 69.0	1.0223	N/A	0.9678	0.8099	OPEN LINE FROM BUS 50527 LP-WADS6 230 TO BUS 51689 LUBE6 230 CKT 1	254	Short-term Solution is to Dispatch LP&L Generation	
05SP	274	SPS	50511 LP-THOM 69.0	1.0219	N/A	0.9684	0.8103	OPEN LINE FROM BUS 50524 LP-WADS269.0 TO BUS 50527 LP-WADS6 230 CKT 1	254	"	
05SP	274	SPS	50511 LP-THOM 69.0	1.0167	N/A	0.9763	0.8396	OPEN LINE FROM BUS 50507 LP-MLWK6 230 TO BUS 51647 CARLISL6 230 CKT	254	"	
05SP	274	SPS	50512 LP-MCCU269.0	1.0224	N/A	0.9688	0.4874	OPEN LINE FROM BUS 50518 LP-SINT6 230 TO BUS 51681 LUBS6 230 CKT 1	254	Voltage Collapse, Short-term Solution is to Dispatch LP&L Generation	
05SP	274	SPS	50512 LP-MCCU269.0	1.0224	N/A	0.9704	0.4884	OPEN LINE FROM BUS 50517 LP-SINT269.0 TO BUS 50518 LP-SINT6 230 CKT	254	"	
05SP	274	SPS	50512 LP-MCCU269.0	1.0234	N/A	0.9667	0.8085	OPEN LINE FROM BUS 50527 LP-WADS6 230 TO BUS 51689 LUBE6 230 CKT 1	254	Short-term Solution is to Dispatch LP&L Generation	
05SP	274	SPS	50512 LP-MCCU269.0	1.0231	N/A	0.9672	0.8088	OPEN LINE FROM BUS 50524 LP-WADS269.0 TO BUS 50527 LP-WADS6 230 CKT 1	254	"	
05SP	274	SPS	50512 LP-MCCU269.0	1.0183	N/A	0.9778	0.8418	OPEN LINE FROM BUS 50507 LP-MLWK6 230 TO BUS 51647 CARLISL6 230 CKT	254	"	
05SP	274	SPS	50513 LP-COOP269.0	1.0287	N/A	0.9772	0.5046	OPEN LINE FROM BUS 50518 LP-SINT6 230 TO BUS 51681 LUBS6 230 CKT 1	254	Voltage Collapse, Short-term Solution is to Dispatch LP&L Generation	
05SP	274	SPS	50513 LP-COOP269.0	1.0287	N/A	0.9787	0.5056	OPEN LINE FROM BUS 50517 LP-SINT269.0 TO BUS 50518 LP-SINT6 230 CKT	254	"	
05SP	274	SPS	50513 LP-COOP269.0	1.0303	N/A	0.9725	0.8168	OPEN LINE FROM BUS 50527 LP-WADS6 230 TO BUS 51689 LUBE6 230 CKT 1	254	Short-term Solution is to Dispatch LP&L Generation	
05SP	274	SPS	50513 LP-COOP269.0	1.0301	N/A	0.9731	0.8172	OPEN LINE FROM BUS 50524 LP-WADS269.0 TO BUS 50527 LP-WADS6 230 CKT 1	254	"	
05SP	274	SPS	50513 LP-COOP269.0	1.0293	N/A	0.9905	0.8499	OPEN LINE FROM BUS 50520 LP-HOLL269.0 TO BUS 50521 LP-HOLL6 230 CKT	254	"	
05SP	274	SPS	50515 LP-CHAL269.0	1.0222	N/A	0.9672	0.4825	OPEN LINE FROM BUS 50518 LP-SINT6 230 TO BUS 51681 LUBS6 230 CKT 1	254	Voltage Collapse, Short-term Solution is to Dispatch LP&L Generation	
05SP	274	SPS	50515 LP-CHAL269.0	1.0222	N/A	0.9689	0.4835	OPEN LINE FROM BUS 50517 LP-SINT269.0 TO BUS 50518 LP-SINT6 230 CKT	254	"	
05SP	274	SPS	50515 LP-CHAL269.0	1.0242	N/A	0.9709	0.8151	OPEN LINE FROM BUS 50527 LP-WADS6 230 TO BUS 51689 LUBE6 230 CKT 1	254	Short-term Solution is to Dispatch LP&L Generation	
05SP	274	SPS	50515 LP-CHAL269.0	1.0239	N/A	0.9715	0.8154	OPEN LINE FROM BUS 50524 LP-WADS269.0 TO BUS 50527 LP-WADS6 230 CKT 1	254	"	
05SP	274	SPS	50515 LP-CHAL269.0	1.0241	N/A	0.9848	0.8429	OPEN LINE FROM BUS 50520 LP-HOLL269.0 TO BUS 50521 LP-HOLL6 230 CKT	254	"	
05SP	274	SPS	50516 LP-SLAT269.0	1.0257	N/A	0.9726	0.4953	OPEN LINE FROM BUS 50518 LP-SINT6 230 TO BUS 51681 LUBS6 230 CKT 1	254	Voltage Collapse, Short-term Solution is to Dispatch LP&L Generation	
05SP	274	SPS	50516 LP-SLAT269.0	1.0257	N/A	0.9742	0.4963	OPEN LINE FROM BUS 50517 LP-SINT269.0 TO BUS 50518 LP-SINT6 230 CKT	254	"	
05SP	274	SPS	50516 LP-SLAT269.0	1.0286	N/A	0.9781	0.8260	OPEN LINE FROM BUS 50527 LP-WADS6 230 TO BUS 51689 LUBE6 230 CKT 1	254	Short-term Solution is to Dispatch LP&L Generation	
05SP	274	SPS	50516 LP-SLAT269.0	1.0284	N/A	0.9786	0.8263	OPEN LINE FROM BUS 50524 LP-WADS269.0 TO BUS 50527 LP-WADS6 230 CKT 1	254	"	
05SP	274	SPS	50516 LP-SLAT269.0	1.0280	N/A	0.9912	0.8524	OPEN LINE FROM BUS 50520 LP-HOLL269.0 TO BUS 50521 LP-HOLL6 230 CKT	254	"	
05SP	274	SPS	50517 LP-SINT269.0	1.0273	N/A	0.9753	0.5045	OPEN LINE FROM BUS 50518 LP-SINT6 230 TO BUS 51681 LUBS6 230 CKT 1	254	Voltage Collapse, Short-term Solution is to Dispatch LP&L Generation	
05SP	274	SPS	50517 LP-SINT269.0	1.0273	N/A	0.9768	0.5055	OPEN LINE FROM BUS 50517 LP-SINT269.0 TO BUS 50518 LP-SINT6 230 CKT	254	"	

SPP-2004-006-1  
 Table 2.1 - SPP Voltage Violations  
 Caused or Impacted by Transfer Using Scenario 1

Southwest Power Pool  
 System Impact Study

Study Case	Transfer Amount (MW)	AREA	Monitored Bus with Violation	BC Voltage (PU) (LP&L PGEN = 232 MW)	TC Voltage (PU) (LP&L PGEN = 60 MW)	TC Voltage (PU) (LP&L PGEN = 20 MW)	TC Voltage (PU) (LP&L PGEN = 0 MW)	Outaged Branch Causing Voltage Violation	Transfer Amount minus LP&L Generation Required to Mitigate Violation (MW)	Solution	Estimated Cost
05SP	274	SPS	50517 LP-SINT6269.0	1.0305	N/A	0.9825	0.8347	OPEN LINE FROM BUS 50527 LP-WADS6 230 TO BUS 51689 LUBE6 230 CKT 1	254	Short-term Solution is to Dispatch LP&L Generation	
05SP	274	SPS	50517 LP-SINT6269.0	1.0303	N/A	0.9831	0.8350	OPEN LINE FROM BUS 50524 LP-WADS269.0 TO BUS 50527 LP-WADS6 230 CKT 1	254	"	
05SP	274	SPS	50517 LP-SINT6269.0	1.0302	N/A	0.9945	0.8589	OPEN LINE FROM BUS 50520 LP-HOLL269.0 TO BUS 50521 LP-HOLL6 230 CKT 1	254	"	
05SP	274	SPS	50520 LP-HOLL269.0	1.0350	N/A	0.9856	0.5307	OPEN LINE FROM BUS 50518 LP-SINT6 230 TO BUS 51681 LUBS6 230 CKT 1	254	Voltage Collapse, Short-term Solution is to Dispatch LP&L Generation	
05SP	274	SPS	50520 LP-HOLL269.0	1.0350	N/A	0.9871	0.5317	OPEN LINE FROM BUS 50517 LP-SINT6269.0 TO BUS 50518 LP-SINT6 230 CKT 1	254	"	
05SP	274	SPS	50520 LP-HOLL269.0	1.0370	N/A	0.9850	0.8375	OPEN LINE FROM BUS 50527 LP-WADS6 230 TO BUS 51689 LUBE6 230 CKT 1	254	Short-term Solution is to Dispatch LP&L Generation	
05SP	274	SPS	50520 LP-HOLL269.0	1.0369	N/A	0.9855	0.8378	OPEN LINE FROM BUS 50524 LP-WADS269.0 TO BUS 50527 LP-WADS6 230 CKT 1	254	"	
05SP	274	SPS	50520 LP-HOLL269.0	1.0354	N/A	0.9960	0.8595	OPEN LINE FROM BUS 50520 LP-HOLL269.0 TO BUS 50521 LP-HOLL6 230 CKT 1	254	"	
05SP	274	SPS	50523 LP-BRND269.0	1.0312	N/A	0.9741	0.4841	OPEN LINE FROM BUS 50518 LP-SINT6 230 TO BUS 51681 LUBS6 230 CKT 1	254	Voltage Collapse, Short-term Solution is to Dispatch LP&L Generation	
05SP	274	SPS	50523 LP-BRND269.0	1.0312	N/A	0.9757	0.4851	OPEN LINE FROM BUS 50517 LP-SINT6269.0 TO BUS 50518 LP-SINT6 230 CKT 1	254	"	
05SP	274	SPS	50523 LP-BRND269.0	1.0314	N/A	0.9723	0.8063	OPEN LINE FROM BUS 50527 LP-WADS6 230 TO BUS 51689 LUBE6 230 CKT 1	254	Short-term Solution is to Dispatch LP&L Generation	
05SP	274	SPS	50523 LP-BRND269.0	1.0312	N/A	0.9729	0.8067	OPEN LINE FROM BUS 50524 LP-WADS269.0 TO BUS 50527 LP-WADS6 230 CKT 1	254	"	
05SP	274	SPS	50523 LP-BRND269.0	1.0283	N/A	0.9838	0.8404	OPEN LINE FROM BUS 50507 LP-MLWK6 230 TO BUS 51647 CARLISL6 230 CKT 1	254	"	
05SP	274	SPS	50524 LP-WADS269.0	1.0302	N/A	0.9884	0.5356	OPEN LINE FROM BUS 50518 LP-SINT6 230 TO BUS 51681 LUBS6 230 CKT 1	254	Voltage Collapse, Short-term Solution is to Dispatch LP&L Generation	
05SP	274	SPS	50524 LP-WADS269.0	1.0302	N/A	0.9899	0.5366	OPEN LINE FROM BUS 50517 LP-SINT6269.0 TO BUS 50518 LP-SINT6 230 CKT 1	254	"	
05SP	274	SPS	50524 LP-WADS269.0	1.0339	N/A	0.9790	0.8273	OPEN LINE FROM BUS 50527 LP-WADS6 230 TO BUS 51689 LUBE6 230 CKT 1	254	Short-term Solution is to Dispatch LP&L Generation	
05SP	274	SPS	50524 LP-WADS269.0	1.0338	N/A	0.9795	0.8276	OPEN LINE FROM BUS 50524 LP-WADS269.0 TO BUS 50527 LP-WADS6 230 CKT 1	254	"	
05SP	274	SPS	50524 LP-WADS269.0	1.0307	N/A	1.0003	0.8648	OPEN LINE FROM BUS 50520 LP-HOLL269.0 TO BUS 50521 LP-HOLL6 230 CKT 1	254	"	
05SP	274	SPS	50526 LP-OLIV269.0	1.0197	N/A	0.9652	0.4832	OPEN LINE FROM BUS 50518 LP-SINT6 230 TO BUS 51681 LUBS6 230 CKT 1	254	Voltage Collapse, Short-term Solution is to Dispatch LP&L Generation	
05SP	274	SPS	50526 LP-OLIV269.0	1.0197	N/A	0.9668	0.4842	OPEN LINE FROM BUS 50517 LP-SINT6269.0 TO BUS 50518 LP-SINT6 230 CKT 1	254	"	
05SP	274	SPS	50526 LP-OLIV269.0	1.0223	N/A	0.9704	0.8171	OPEN LINE FROM BUS 50527 LP-WADS6 230 TO BUS 51689 LUBE6 230 CKT 1	254	Short-term Solution is to Dispatch LP&L Generation	
05SP	274	SPS	50526 LP-OLIV269.0	1.0220	N/A	0.9710	0.8174	OPEN LINE FROM BUS 50524 LP-WADS269.0 TO BUS 50527 LP-WADS6 230 CKT 1	254	"	
05SP	274	SPS	50526 LP-OLIV269.0	1.0221	N/A	0.9836	0.8436	OPEN LINE FROM BUS 50520 LP-HOLL269.0 TO BUS 50521 LP-HOLL6 230 CKT 1	254	"	
05SP	274	SPS	51533 TUCO6 230	0.9788	N/A	0.9501	0.8651	OPEN LINE FROM BUS 50518 LP-SINT6 230 TO BUS 51681 LUBS6 230 CKT 1	254	Specific Monitored Bus Voltage 0.925 for Stability Limit, Short-term Solution is to Dispatch LP&L Generation	
05SP	274	SPS	51533 TUCO6 230	0.9788	N/A	0.9507	0.8654	OPEN LINE FROM BUS 50517 LP-SINT6269.0 TO BUS 50518 LP-SINT6 230 CKT 1	254	Specific Monitored Bus Voltage 0.925 for Stability Limit, Short-term Solution is to Dispatch LP&L Generation	
05SP	274	SPS	50507 LP-MLWK6 230	0.8697	N/A	N/A	0.7111	OPEN LINE FROM BUS 50507 LP-MLWK6 230 TO BUS 51647 CARLISL6 230 CKT 1	274	Not Load Serving Bus	
05SP	274	SPS	50507 LP-MLWK6 230	0.9727	N/A	N/A	0.8087	OPEN LINE FROM BUS 50518 LP-SINT6 230 TO BUS 51681 LUBS6 230 CKT 1	274	Not Load Serving Bus	
05SP	274	SPS	50507 LP-MLWK6 230	0.9727	N/A	N/A	0.8090	OPEN LINE FROM BUS 50517 LP-SINT6269.0 TO BUS 50518 LP-SINT6 230 CKT 1	274	Not Load Serving Bus	
05SP	274	SPS	50507 LP-MLWK6 230	0.9617	N/A	N/A	0.8491	OPEN LINE FROM BUS 51533 TUCO6 230 TO BUS 51647 CARLISL6 230 CKT 1	274	Not Load Serving Bus	
05SP	274	SPS	50507 LP-MLWK6 230	0.9705	N/A	N/A	0.8592	REMOVE UNIT 1 FROM BUS 51701 [JONES1 122.000] DISPATCH	274	Not Load Serving Bus	
05SP	274	SPS	50518 LP-SINT6 230	0.9841	N/A	N/A	0.8592	REMOVE UNIT 1 FROM BUS 51701 [JONES1 122.000] DISPATCH	274	Not Load Serving Bus	
05SP	274	SPS	50518 LP-SINT6 230	0.9851	N/A	N/A	0.8633	REMOVE UNIT 1 FROM BUS 51702 [JONES2 121.000] DISPATCH	274	Not Load Serving Bus	
05SP	274	SPS	50521 LP-HOLL6 230	0.9909	N/A	N/A	0.7604	OPEN LINE FROM BUS 50521 LP-HOLL6 230 TO BUS 51699 JONES6 230 CKT 1	274	Not Load Serving Bus	
05SP	274	SPS	50521 LP-HOLL6 230	0.9909	N/A	N/A	0.8134	OPEN LINE FROM BUS 50518 LP-SINT6 230 TO BUS 51681 LUBS6 230 CKT 1	274	Not Load Serving Bus	
05SP	274	SPS	50521 LP-HOLL6 230	0.9909	N/A	N/A	0.8139	OPEN LINE FROM BUS 50517 LP-SINT6269.0 TO BUS 50518 LP-SINT6 230 CKT 1	274	Not Load Serving Bus	
05SP	274	SPS	50521 LP-HOLL6 230	0.9885	N/A	N/A	0.8607	REMOVE UNIT 1 FROM BUS 51701 [JONES1 122.000] DISPATCH	274	Not Load Serving Bus	
05SP	274	SPS	50521 LP-HOLL6 230	0.9896	N/A	N/A	0.8650	REMOVE UNIT 1 FROM BUS 51702 [JONES2 121.000] DISPATCH	274	Not Load Serving Bus	
05SP	274	SPS	50527 LP-WADS6 230	1.0770	N/A	N/A	0.7131	OPEN LINE FROM BUS 50527 LP-WADS6 230 TO BUS 51689 LUBE6 230 CKT 1	274	Not Load Serving Bus	
05SP	274	SPS	50527 LP-WADS6 230	0.9898	N/A	N/A	0.8003	OPEN LINE FROM BUS 50518 LP-SINT6 230 TO BUS 51681 LUBS6 230 CKT 1	274	Not Load Serving Bus	
05SP	274	SPS	50527 LP-WADS6 230	0.9898	N/A	N/A	0.8007	OPEN LINE FROM BUS 50517 LP-SINT6269.0 TO BUS 50518 LP-SINT6 230 CKT 1	274	Not Load Serving Bus	
05SP	274	SPS	50527 LP-WADS6 230	0.9886	N/A	N/A	0.8525	OPEN LINE FROM BUS 51689 LUBE6 230 TO BUS 51699 JONES6 230 CKT 1	274	Not Load Serving Bus	
05SP	274	SPS	50527 LP-WADS6 230	0.9877	N/A	N/A	0.8540	REMOVE UNIT 1 FROM BUS 51701 [JONES1 122.000] DISPATCH	274	Not Load Serving Bus	
05SP	274	SPS	51041 AMARLS6 230	0.9418	N/A	N/A	0.8979	OPEN LINE FROM BUS 50915 NICHOL6 230 TO BUS 51041 AMARLS6 230 CKT 1	274	Not Load Serving Bus	
05SP	274	SPS	51321 SWISHER6 230	0.9664	N/A	N/A	0.8928	OPEN LINE FROM BUS 50518 LP-SINT6 230 TO BUS 51681 LUBS6 230 CKT 1	274	Not Load Serving Bus	
05SP	274	SPS	51321 SWISHER6 230	0.9664	N/A	N/A	0.8930	OPEN LINE FROM BUS 50517 LP-SINT6269.0 TO BUS 50518 LP-SINT6 230 CKT 1	274	Not Load Serving Bus	
05SP	274	SPS	51321 SWISHER6 230	0.9437	N/A	N/A	0.8979	OPEN LINE FROM BUS 51041 AMARLS6 230 TO BUS 51321 SWISHER6 230 CKT 1	274	Not Load Serving Bus	

SPP-2004-006-1  
 Table 2.1 - SPP Voltage Violations  
 Caused or Impacted by Transfer Using Scenario 1

Southwest Power Pool  
 System Impact Study

Study Case	Transfer Amount (MW)	AREA	Monitored Bus with Violation	BC Voltage (PU) (LP&L PGEN = 232 MW)	TC Voltage (PU) (LP&L PGEN = 60 MW)	TC Voltage (PU) (LP&L PGEN = 20 MW)	TC Voltage (PU) (LP&L PGEN = 0 MW)	Outaged Branch Causing Voltage Violation	Transfer Amount minus LP&L Generation Required to Mitigate Violation (MW)	Solution	Estimated Cost
05SP	274	SPS	51534 TUCO7 345	0.9932	N/A	N/A	0.8948	OPEN LINE FROM BUS 50518 LP-SINT6 230 TO BUS 51681 LUBS6 230 CKT	274	Not Load Serving Bus	
05SP	274	SPS	51534 TUCO7 345	0.9932	N/A	N/A	0.8950	OPEN LINE FROM BUS 50517 LP-SINT269.0 TO BUS 50518 LP-SINT6 230 CKT	274	Not Load Serving Bus	
05SP	274	SPS	51647 CARLISL6 23C	0.9729	N/A	N/A	0.8105	OPEN LINE FROM BUS 50518 LP-SINT6 230 TO BUS 51681 LUBS6 230 CKT	274	Not Load Serving Bus	
05SP	274	SPS	51647 CARLISL6 23C	0.9729	N/A	N/A	0.8108	OPEN LINE FROM BUS 50517 LP-SINT269.0 TO BUS 50518 LP-SINT6 230 CKT	274	Not Load Serving Bus	
05SP	274	SPS	51647 CARLISL6 23C	0.9618	N/A	N/A	0.8494	OPEN LINE FROM BUS 51533 TUCO6 230 TO BUS 51647 CARLISL6 230 CKT	274	Not Load Serving Bus	
05SP	274	SPS	51647 CARLISL6 23C	0.9707	N/A	N/A	0.8600	REMOVE UNIT 1 FROM BUS 51701 [JONES1 122.000] DISPATCH-	274	Not Load Serving Bus	
05SP	274	SPS	51647 CARLISL6 23C	0.9704	N/A	N/A	0.8715	Base Case	274	Not Load Serving Bus	
05SP	274	SPS	51681 LUBS6 23C	0.9872	N/A	N/A	0.8264	OPEN LINE FROM BUS 50518 LP-SINT6 230 TO BUS 51681 LUBS6 230 CKT	274	Not Load Serving Bus	
05SP	274	SPS	51681 LUBS6 23C	0.9872	N/A	N/A	0.8268	OPEN LINE FROM BUS 50517 LP-SINT269.0 TO BUS 50518 LP-SINT6 230 CKT	274	Not Load Serving Bus	
05SP	274	SPS	51681 LUBS6 23C	0.9844	N/A	N/A	0.8619	REMOVE UNIT 1 FROM BUS 51701 [JONES1 122.000] DISPATCH-	274	Not Load Serving Bus	
05SP	274	SPS	51681 LUBS6 23C	0.9854	N/A	N/A	0.8660	REMOVE UNIT 1 FROM BUS 51702 [JONES2 121.000] DISPATCH-	274	Not Load Serving Bus	
05SP	274	SPS	51681 LUBS6 23C	0.9863	N/A	N/A	0.8838	OPEN LINE FROM BUS 51733 SUNDOWN6 230 TO BUS 51763 WOLFRT6 230 CKT 1	274	Not Load Serving Bus	
05SP	274	SPS	51689 LUBE6 23C	0.9897	N/A	N/A	0.8034	OPEN LINE FROM BUS 50518 LP-SINT6 230 TO BUS 51681 LUBS6 230 CKT	274	Not Load Serving Bus	
05SP	274	SPS	51689 LUBE6 23C	0.9897	N/A	N/A	0.8039	OPEN LINE FROM BUS 50517 LP-SINT269.0 TO BUS 50518 LP-SINT6 230 CKT	274	Not Load Serving Bus	
05SP	274	SPS	51689 LUBE6 23C	0.9884	N/A	N/A	0.8529	OPEN LINE FROM BUS 51689 LUBE6 230 TO BUS 51699 JONES6 230 CKT	274	Not Load Serving Bus	
05SP	274	SPS	51689 LUBE6 23C	0.9875	N/A	N/A	0.8550	REMOVE UNIT 1 FROM BUS 51701 [JONES1 122.000] DISPATCH-	274	Not Load Serving Bus	
05SP	274	SPS	51689 LUBE6 23C	0.9886	N/A	N/A	0.8593	REMOVE UNIT 1 FROM BUS 51702 [JONES2 121.000] DISPATCH-	274	Not Load Serving Bus	
05SP	274	SPS	51699 JONES6 230	0.9910	N/A	N/A	0.8243	OPEN LINE FROM BUS 50518 LP-SINT6 230 TO BUS 51681 LUBS6 230 CKT	274	Not Load Serving Bus	
05SP	274	SPS	51699 JONES6 230	0.9910	N/A	N/A	0.8247	OPEN LINE FROM BUS 50517 LP-SINT269.0 TO BUS 50518 LP-SINT6 230 CKT	274	Not Load Serving Bus	
05SP	274	SPS	51699 JONES6 230	0.9885	N/A	N/A	0.8639	REMOVE UNIT 1 FROM BUS 51701 [JONES1 122.000] DISPATCH-	274	Not Load Serving Bus	
05SP	274	SPS	51699 JONES6 230	0.9896	N/A	N/A	0.8681	REMOVE UNIT 1 FROM BUS 51702 [JONES2 121.000] DISPATCH-	274	Not Load Serving Bus	
05SP	274	SPS	51699 JONES6 230	0.9910	N/A	N/A	0.8888	OPEN LINE FROM BUS 51435 TOLKE6 230 TO BUS 51533 TUCO6 230 CKT	274	Not Load Serving Bus	
05SP	274	SPS	51763 WOLFRT6 230	0.9833	N/A	N/A	0.8533	OPEN LINE FROM BUS 50518 LP-SINT6 230 TO BUS 51681 LUBS6 230 CKT	274	Not Load Serving Bus	
05SP	274	SPS	51763 WOLFRT6 230	0.9833	N/A	N/A	0.8536	OPEN LINE FROM BUS 50517 LP-SINT269.0 TO BUS 50518 LP-SINT6 230 CKT	274	Not Load Serving Bus	
05SP	274	SPS	51763 WOLFRT6 230	0.9794	N/A	N/A	0.8789	OPEN LINE FROM BUS 51733 SUNDOWN6 230 TO BUS 51763 WOLFRT6 230 CKT 1	274	Not Load Serving Bus	
05SP	274	SPS	51763 WOLFRT6 230	0.9803	N/A	N/A	0.8791	REMOVE UNIT 1 FROM BUS 51701 [JONES1 122.000] DISPATCH-	274	Not Load Serving Bus	
05SP	274	SPS	51763 WOLFRT6 230	0.9811	N/A	N/A	0.8823	REMOVE UNIT 1 FROM BUS 51702 [JONES2 121.000] DISPATCH-	274	Not Load Serving Bus	
05SP	274	SPS	51811 GRASSLN6 230	0.9913	N/A	N/A	0.8280	OPEN LINE FROM BUS 50518 LP-SINT6 230 TO BUS 51681 LUBS6 230 CKT	274	Not Load Serving Bus	
05SP	274	SPS	51811 GRASSLN6 230	0.9913	N/A	N/A	0.8284	OPEN LINE FROM BUS 50517 LP-SINT269.0 TO BUS 50518 LP-SINT6 230 CKT	274	Not Load Serving Bus	
05SP	274	SPS	51811 GRASSLN6 230	0.9888	N/A	N/A	0.8659	REMOVE UNIT 1 FROM BUS 51701 [JONES1 122.000] DISPATCH-	274	Not Load Serving Bus	
05SP	274	SPS	51811 GRASSLN6 230	0.9899	N/A	N/A	0.8699	REMOVE UNIT 1 FROM BUS 51702 [JONES2 121.000] DISPATCH-	274	Not Load Serving Bus	
05SP	274	SPS	51811 GRASSLN6 230	0.9910	N/A	N/A	0.8886	OPEN LINE FROM BUS 51435 TOLKE6 230 TO BUS 51533 TUCO6 230 CKT	274	Not Load Serving Bus	
05SP	274	SPS	51861 BORDEN6 23C	0.9950	N/A	N/A	0.8432	OPEN LINE FROM BUS 50518 LP-SINT6 230 TO BUS 51681 LUBS6 230 CKT	274	Not Load Serving Bus	
05SP	274	SPS	51861 BORDEN6 23C	0.9950	N/A	N/A	0.8436	OPEN LINE FROM BUS 50517 LP-SINT269.0 TO BUS 50518 LP-SINT6 230 CKT	274	Not Load Serving Bus	
05SP	274	SPS	51861 BORDEN6 23C	0.9925	N/A	N/A	0.8763	REMOVE UNIT 1 FROM BUS 51701 [JONES1 122.000] DISPATCH-	274	Not Load Serving Bus	
05SP	274	SPS	51861 BORDEN6 23C	0.9934	N/A	N/A	0.8801	REMOVE UNIT 1 FROM BUS 51702 [JONES2 121.000] DISPATCH-	274	Not Load Serving Bus	
05SP	274	SPS	51861 BORDEN6 23C	0.9943	N/A	N/A	0.8962	OPEN LINE FROM BUS 51435 TOLKE6 230 TO BUS 51533 TUCO6 230 CKT	274	Not Load Serving Bus	
05SH	224	SPS	50527 LP-WADDS6 230	0.9970	N/A	N/A	0.8919	OPEN LINE FROM BUS 51689 LUBE6 230 TO BUS 51699 JONES6 230 CKT	224	Not Load Serving Bus	
05SH	224	SPS	51689 LUBE6 23C	0.9969	N/A	N/A	0.8919	OPEN LINE FROM BUS 51689 LUBE6 230 TO BUS 51699 JONES6 230 CKT	224	Not Load Serving Bus	
Note: Resulting Tie Line Power Factor not Specified										Total Estimated Cost	\$0

SPP-2004-006-1  
 Table 1.2 - SPP Facility Overloads  
 Caused or Impacted by Transfer Using Scenario 2

Southwest Power Pool  
 System Impact Study

Study Case	Transfer Amount (MW)	From Area	To Area	Monitored Branch Overload	Rate <MVA>	BC % Loading (LP&L PGEN = 232 MW)	TC % Loading (LP&L PGEN = 20 MW)	TC % Loading (LP&L PGEN = 0 MW)	Outaged Branch Causing Overload	Transfer Amount minus LP&L Generation Required to Mitigate Violation (MW)	Solution	Estimated Cost
04SP	265	SPS	SPS	LP-COOP2 - LP-SLAT2 69KV	54	32.9	90.6	102.9	LP-COOP2 - LP-HCL12 69KV	245	Short-term Solution is to Dispatch LP&L Generation	
04SP	265	SPS	SPS	LP-HOLL2 230/69KV TRANSFORMER	140	12.7	90.9	101.5	LP-WADSWORTH STATION - LUBBOCK EAST INTERCHANGE 230KV	245	*	
04SP	265	SPS	SPS	LP-HOLL2 230/69KV TRANSFORMER	140	12.7	90.9	101.3	LP-HCL12 230/69KV TRANSFORMER	245	*	
04SP	265	SPS	SPS	LP-HOLL6 230/69KV TRANSFORMER	140	14.0	95.3	106.2	LP-SOUTH INT - LUBBOCK SOUTH INTERCHANGE 230KV	245	*	
04SP	265	SPS	SPS	LP-HOLL6 230/69KV TRANSFORMER	140	14.0	95.3	106.1	LP-SOUTH INT 230/69KV TRANSFORMER	245	*	
04SP	265	SPS	SPS	LP-SOUTH INT 230/69KV TRANSFORMER	140	16.8	93.9	103.3	JONES PLANT - LP-HOLL6 230KV	245	*	
04SP	265	SPS	SPS	LP-SOUTH INT 230/69KV TRANSFORMER	140	16.7	93.9	103.3	LP-HOLL2 230/69KV TRANSFORMER	245	*	
04SP	265	SPS	SPS	LP-SOUTH INT 230/69KV TRANSFORMER	140	16.7	90.4	100.2	LP-WADSWORTH STATION - LUBBOCK EAST INTERCHANGE 230KV	245	*	
04SP	265	SPS	SPS	LP-SOUTH INT 230/69KV TRANSFORMER	140	16.7	90.4	100.1	LP-HCL12 230/69KV TRANSFORMER	245	*	
04SH	217			NONE IDENTIFIED						217		
04FA	153			NONE IDENTIFIED						153		
04WP	153			NONE IDENTIFIED						153		
05AP	100			NONE IDENTIFIED						100		
05G	159			NONE IDENTIFIED						159		
05SP	274	SPS	SPS	LP-COOP2 - LP-SLAT2 69KV	54	32.4	93.3	106.8	LP-COOP2 - LP-HCL12 69KV	254	Short-term Solution is to Dispatch LP&L Generation	
05SP	274	SPS	SPS	LP-HCL12 230/69KV TRANSFORMER	140	17.2	89.6	104.7	LP-SOUTH INT 230/69KV TRANSFORMER	254	*	
05SP	274	SPS	SPS	LP-HCL12 230/69KV TRANSFORMER	140	17.2	89.5	105.7	LP-SOUTH INT - LUBBOCK SOUTH INTERCHANGE 230KV	254	*	
05SP	274	SPS	SPS	LP-HCL12 230/69KV TRANSFORMER	140	16.0	88.9	100.5	LP-HOLL2 230/69KV TRANSFORMER	254	*	
05SP	274	SPS	SPS	LP-HCL12 230/69KV TRANSFORMER	140	16.0	89.0	100.6	JONES PLANT - LP-HOLL6 230KV	254	*	
05SP	274	SPS	SPS	LP-HOLL2 230/69KV TRANSFORMER	140	13.7	98.3	115.7	LP-SOUTH INT - LUBBOCK SOUTH INTERCHANGE 230KV	254	*	
05SP	274	SPS	SPS	LP-HOLL2 230/69KV TRANSFORMER	140	13.7	98.4	114.6	LP-SOUTH INT 230/69KV TRANSFORMER	254	*	
05SP	274	SPS	SPS	LP-HOLL2 230/69KV TRANSFORMER	140	12.4	94.3	106.7	LP-HCL12 230/69KV TRANSFORMER	254	*	
05SP	274	SPS	SPS	LP-HOLL2 230/69KV TRANSFORMER	140	12.4	94.4	106.5	LP-WADSWORTH STATION - LUBBOCK EAST INTERCHANGE 230KV	254	*	
05SP	274	SPS	SPS	LP-SOUTH INT 230/69KV TRANSFORMER	140	16.4	96.8	108.4	LP-HOLL2 230/69KV TRANSFORMER	254	*	
05SP	274	SPS	SPS	LP-SOUTH INT 230/69KV TRANSFORMER	140	16.4	96.9	108.5	JONES PLANT - LP-HOLL6 230KV	254	*	
05SP	274	SPS	SPS	LP-SOUTH INT 230/69KV TRANSFORMER	140	16.3	93.2	105.4	LP-HCL12 230/69KV TRANSFORMER	254	*	
05SP	274	SPS	SPS	LP-SOUTH INT 230/69KV TRANSFORMER	140	16.3	93.3	105.1	LP-WADSWORTH STATION - LUBBOCK EAST INTERCHANGE 230KV	254	*	
05SP	274	SPS	SPS	LP-SOUTH INT 230/69KV TRANSFORMER	100	18.3	67.0	100.1	Base Case	254		
05SH	224			NONE IDENTIFIED						224		
											Total Estimated Cost	\$0

Note: Resulting Tie Line Power Factor not Specified

Study Case	Transfer Amount (MW)	AREA	Monitored Bus with Violation	BC Voltage (PU) (LP&L PGEN = 232 MW)	TC Voltage (PU) (LP&L PGEN = 60 MW)	TC Voltage (PU) (LP&L PGEN = 20 MW)	TC Voltage (PU) (LP&L PGEN = 0 MW)	Outaged Branch Causing Voltage Violation	Transfer Amount minus LP&L Generation Required to Mitigate Violation (MW)	Solution	Estimated Cost
04SP	265	SPS	51533 TUCO6 230	0.9721	0.9376	0.9151	0.8958	REMOVE UNIT 1 FROM BUS 51701 [JONES1 122.000] DISPATCH	205	Specific Monitored Bus Voltage 0.925 for Stability Limit, Short-term Solution is to Dispatch LP&L Generation	
04SP	265	SPS	51533 TUCO6 230	0.9728	0.94	0.9177	0.8982	REMOVE UNIT 1 FROM BUS 51702 [JONES2 121.000] DISPATCH	205	Specific Monitored Bus Voltage 0.925 for Stability Limit, Short-term Solution is to Dispatch LP&L Generation	
04SP	265	SPS	50523 LP-BRND269.0	1.0311	N/A	0.959	0.8862	REMOVE UNIT 1 FROM BUS 51701 [JONES1 122.000] DISPATCH	245	Short-term Solution is to Dispatch LP&L Generation	
04SP	265	SPS	50511 LP-THOM 69.0	1.0215	N/A	0.9525	0.8874	REMOVE UNIT 1 FROM BUS 51701 [JONES1 122.000] DISPATCH	245	"	
04SP	265	SPS	50510 LP-VCKS269.0	1.0231	N/A	0.9539	0.8878	REMOVE UNIT 1 FROM BUS 51701 [JONES1 122.000] DISPATCH	245	"	
04SP	265	SPS	50512 LP-MCCU269.0	1.0224	N/A	0.9534	0.8884	REMOVE UNIT 1 FROM BUS 51701 [JONES1 122.000] DISPATCH	245	"	
04SP	265	SPS	50509 LP-MLWK269.0	1.0217	N/A	0.9539	0.8895	REMOVE UNIT 1 FROM BUS 51701 [JONES1 122.000] DISPATCH	245	"	
04SP	265	SPS	50503 LP-ERSK269.0	1.032	N/A	0.9588	0.889	REMOVE UNIT 1 FROM BUS 51701 [JONES1 122.000] DISPATCH	245	"	
04SP	265	SPS	50515 LP-CHAL269.0	1.023	N/A	0.955	0.8916	REMOVE UNIT 1 FROM BUS 51701 [JONES1 122.000] DISPATCH	245	"	
04SP	265	SPS	50526 LP-OLIV269.0	1.021	N/A	0.9541	0.8922	REMOVE UNIT 1 FROM BUS 51701 [JONES1 122.000] DISPATCH	245	"	
04SP	265	SPS	50523 LP-BRND269.0	1.0312	N/A	0.9626	0.8923	REMOVE UNIT 1 FROM BUS 51702 [JONES2 121.000] DISPATCH	245	"	
04SP	265	SPS	50511 LP-THOM 69.0	1.0216	N/A	0.9561	0.8934	REMOVE UNIT 1 FROM BUS 51702 [JONES2 121.000] DISPATCH	245	"	
04SP	265	SPS	50510 LP-VCKS269.0	1.0233	N/A	0.9576	0.8939	REMOVE UNIT 1 FROM BUS 51702 [JONES2 121.000] DISPATCH	245	"	
04SP	265	SPS	50512 LP-MCCU269.0	1.0225	N/A	0.9571	0.8944	REMOVE UNIT 1 FROM BUS 51702 [JONES2 121.000] DISPATCH	245	"	
04SP	265	SPS	50509 LP-MLWK269.0	1.0219	N/A	0.9575	0.8954	REMOVE UNIT 1 FROM BUS 51702 [JONES2 121.000] DISPATCH	245	"	
04SP	265	SPS	50503 LP-ERSK269.0	1.032	N/A	0.9624	0.8951	REMOVE UNIT 1 FROM BUS 51702 [JONES2 121.000] DISPATCH	245	"	
04SP	265	SPS	50504 LP-MACK269.0	1.035	N/A	0.9608	0.8951	REMOVE UNIT 1 FROM BUS 51701 [JONES1 122.000] DISPATCH	245	"	
04SP	265	SPS	50515 LP-CHAL269.0	1.0231	N/A	0.9587	0.8976	REMOVE UNIT 1 FROM BUS 51702 [JONES2 121.000] DISPATCH	245	"	
04SP	265	SPS	50526 LP-OLIV269.0	1.0212	N/A	0.9577	0.8982	REMOVE UNIT 1 FROM BUS 51702 [JONES2 121.000] DISPATCH	245	"	
04SP	265	SPS	50513 LP-COOP269.0	1.0287	N/A	0.9614	0.8984	REMOVE UNIT 1 FROM BUS 51701 [JONES1 122.000] DISPATCH	245	"	
04SP	265	SPS	50506 LP-NE52 69.0	1.034	N/A	0.9624	0.8987	REMOVE UNIT 1 FROM BUS 51701 [JONES1 122.000] DISPATCH	245	"	
04SP	265	SPS	50507 LP-MLWK6 230	0.869741	N/A	N/A	0.822778	OPEN LINE FROM BUS 50507 LP-MLWK6 230 TO BUS 51647 CARLISL6 230 CKT 1	265	Not Load Serving Bus	
04SP	265	SPS	50507 LP-MLWK6 230	0.9638	N/A	N/A	0.8653	REMOVE UNIT 1 FROM BUS 51701 [JONES1 122.000] DISPATCH	265	Not Load Serving Bus	
04SP	265	SPS	50507 LP-MLWK6 230	0.96037	N/A	N/A	0.865538	OPEN LINE FROM BUS 51533 TUCO6 230 TO BUS 51647 CARLISL6 230 CKT 1	265	Not Load Serving Bus	
04SP	265	SPS	50507 LP-MLWK6 230	0.9645	N/A	N/A	0.8681	REMOVE UNIT 1 FROM BUS 51702 [JONES2 121.000] DISPATCH	265	Not Load Serving Bus	
04SP	265	SPS	50507 LP-MLWK6 230	0.959309	N/A	N/A	0.899882	OPEN LINE FROM BUS 51533 TUCO6 230 TO BUS 51534 TUCO7 345 CKT 1	265	Not Load Serving Bus	
04SP	265	SPS	50518 LP-SINT6 230	0.9842	N/A	N/A	0.8738	REMOVE UNIT 1 FROM BUS 51701 [JONES1 122.000] DISPATCH	265	Not Load Serving Bus	
04SP	265	SPS	50518 LP-SINT6 230	0.972611	N/A	N/A	0.874997	OPEN LINE FROM BUS 50518 LP-SINT6 230 TO BUS 51681 LUBS6 230 CKT 1	265	Not Load Serving Bus	
04SP	265	SPS	50518 LP-SINT6 230	0.9853	N/A	N/A	0.8777	REMOVE UNIT 1 FROM BUS 51702 [JONES2 121.000] DISPATCH	265	Not Load Serving Bus	
04SP	265	SPS	50521 LP-HOLL6 230	0.9882	N/A	N/A	0.8748	REMOVE UNIT 1 FROM BUS 51701 [JONES1 122.000] DISPATCH	265	Not Load Serving Bus	
04SP	265	SPS	50521 LP-HOLL6 230	0.990915	N/A	N/A	0.874961	OPEN LINE FROM BUS 50521 LP-HOLL6 230 TO BUS 51699 JONES6 230 CKT 1	265	Not Load Serving Bus	
04SP	265	SPS	50521 LP-HOLL6 230	0.9894	N/A	N/A	0.8788	REMOVE UNIT 1 FROM BUS 51702 [JONES2 121.000] DISPATCH	265	Not Load Serving Bus	
04SP	265	SPS	50527 LP-WADS6 230	1.076932	N/A	N/A	0.83674	OPEN LINE FROM BUS 50527 LP-WADS6 230 TO BUS 51689 LUBE6 230 CKT 1	265	Not Load Serving Bus	
04SP	265	SPS	50527 LP-WADS6 230	0.9882	N/A	N/A	0.8687	REMOVE UNIT 1 FROM BUS 51701 [JONES1 122.000] DISPATCH	265	Not Load Serving Bus	
04SP	265	SPS	50527 LP-WADS6 230	0.9894	N/A	N/A	0.8727	REMOVE UNIT 1 FROM BUS 51702 [JONES2 121.000] DISPATCH	265	Not Load Serving Bus	
04SP	265	SPS	50527 LP-WADS6 230	0.998625	N/A	N/A	0.873218	OPEN LINE FROM BUS 51689 LUBE6 230 TO BUS 51699 JONES6 230 CKT 1	265	Not Load Serving Bus	
04SP	265	SPS	51564 CROSBY3 115	0.9584	N/A	N/A	0.936418	Base Case	265	Not Load Serving Bus	
04SP	265	SPS	51647 CARLISL6 230	0.960487	N/A	N/A	0.865716	OPEN LINE FROM BUS 51533 TUCO6 230 TO BUS 51647 CARLISL6 230 CKT 1	265	Not Load Serving Bus	
04SP	265	SPS	51647 CARLISL6 230	0.964	N/A	N/A	0.866	REMOVE UNIT 1 FROM BUS 51701 [JONES1 122.000] DISPATCH	265	Not Load Serving Bus	
04SP	265	SPS	51647 CARLISL6 230	0.9647	N/A	N/A	0.8688	REMOVE UNIT 1 FROM BUS 51702 [JONES2 121.000] DISPATCH	265	Not Load Serving Bus	
04SP	265	SPS	51681 LUBS6 230	0.9844	N/A	N/A	0.8762	REMOVE UNIT 1 FROM BUS 51701 [JONES1 122.000] DISPATCH	265	Not Load Serving Bus	
04SP	265	SPS	51681 LUBS6 230	0.9856	N/A	N/A	0.88	REMOVE UNIT 1 FROM BUS 51702 [JONES2 121.000] DISPATCH	265	Not Load Serving Bus	
04SP	265	SPS	51689 LUBE6 230	0.988	N/A	N/A	0.8696	REMOVE UNIT 1 FROM BUS 51701 [JONES1 122.000] DISPATCH	265	Not Load Serving Bus	
04SP	265	SPS	51689 LUBE6 230	0.99847	N/A	N/A	0.873404	OPEN LINE FROM BUS 51689 LUBE6 230 TO BUS 51699 JONES6 230 CKT 1	265	Not Load Serving Bus	
04SP	265	SPS	51689 LUBE6 230	0.9892	N/A	N/A	0.8736	REMOVE UNIT 1 FROM BUS 51702 [JONES2 121.000] DISPATCH	265	Not Load Serving Bus	
04SP	265	SPS	51699 JONES6 230	0.9862	N/A	N/A	0.8776	REMOVE UNIT 1 FROM BUS 51701 [JONES1 122.000] DISPATCH	265	Not Load Serving Bus	
04SP	265	SPS	51699 JONES6 230	0.9894	N/A	N/A	0.8815	REMOVE UNIT 1 FROM BUS 51702 [JONES2 121.000] DISPATCH	265	Not Load Serving Bus	
04SP	265	SPS	51763 WOLFRTH6 230	0.9816	N/A	N/A	0.8937	REMOVE UNIT 1 FROM BUS 51701 [JONES1 122.000] DISPATCH	265	Not Load Serving Bus	
04SP	265	SPS	51763 WOLFRTH6 230	0.9824	N/A	N/A	0.8966	REMOVE UNIT 1 FROM BUS 51702 [JONES2 121.000] DISPATCH	265	Not Load Serving Bus	
04SP	265	SPS	51811 GRASSLN6 230	0.9884	N/A	N/A	0.8793	REMOVE UNIT 1 FROM BUS 51701 [JONES1 122.000] DISPATCH	265	Not Load Serving Bus	
04SP	265	SPS	51811 GRASSLN6 230	0.9896	N/A	N/A	0.8831	REMOVE UNIT 1 FROM BUS 51702 [JONES2 121.000] DISPATCH	265	Not Load Serving Bus	
04SP	265	SPS	51861 BORDEN6 230	0.992	N/A	N/A	0.8888	REMOVE UNIT 1 FROM BUS 51701 [JONES1 122.000] DISPATCH	265	Not Load Serving Bus	
04SP	265	SPS	51861 BORDEN6 230	0.9931	N/A	N/A	0.8923	REMOVE UNIT 1 FROM BUS 51702 [JONES2 121.000] DISPATCH	265	Not Load Serving Bus	
04SH	217		NONE IDENTIFIED						217		
04FA	153	SPS	50507 LP-MLWK6 230	1.018472	N/A	N/A	0.867846	OPEN LINE FROM BUS 50507 LP-MLWK6 230 TO BUS 51647 CARLISL6 230 CKT 1	153	Not Load Serving Bus	
04WP	153	SPS	50507 LP-MLWK6 230	1.012192	N/A	N/A	0.869728	OPEN LINE FROM BUS 50507 LP-MLWK6 230 TO BUS 51647 CARLISL6 230 CKT 1	153	Not Load Serving Bus	
05AP	100		NONE IDENTIFIED						100		

SPP-2004-006-1  
 Table 2.2 - SPP Voltage Violations  
 Caused or Impacted by Transfer using Scenario 2

Southwest Power Pool  
 System Impact Study

Study Case	Transfer Amount (MW)	AREA	Monitored Bus with Violation	BC Voltage (PU) (LP&L PGEN = 232 MW)	TC Voltage (PU) (LP&L PGEN = 60 MW)	TC Voltage (PU) (LP&L PGEN = 20 MW)	TC Voltage (PU) (LP&L PGEN = 0 MW)	Outaged Branch Causing Voltage Violation	Transfer Amount minus LP&L Generation Required to Mitigate Violation (MW)	Solution	Estimated Cost
05G	159	SPS	50507 LP-MLWK6 230	0.992112	N/A	N/A	0.867221	OPEN LINE FROM BUS 50507 LP-MLWK6 230 TO BUS 51647 CARLISL6 230 CKT 1	159	Not Load Serving Bus	
05SP	274	SPS	51533 TUCO6 230	0.9686	0.9297	0.9009	0.8783	REMOVE UNIT 1 FROM BUS 51701 [JONES1 122.000] DISPATCH	214	Specific Monitored Bus Voltage 0.925 for Stability Limit, Short-term Solution is to Dispatch LP&L Generation	
05SP	274	SPS	51533 TUCO6 230	0.969	0.9325	0.9033	0.8819	REMOVE UNIT 1 FROM BUS 51702 [JONES2 121.000] DISPATCH	214	Specific Monitored Bus Voltage 0.925 for Stability Limit, Short-term Solution is to Dispatch LP&L Generation	
05SP	274	SPS	51533 TUCO6 230	0.9619	N/A	0.9256	0.9016	REMOVE UNIT 1 FROM BUS 51441 [TOLK1 124.000] DISPATCH	254	Specific Monitored Bus Voltage 0.925 for Stability Limit, Short-term Solution is to Dispatch LP&L Generation	
05SP	274	SPS	51533 TUCO6 230	0.9619	N/A	0.9256	0.9016	REMOVE UNIT 1 FROM BUS 51442 [TOLK2 124.000] DISPATCH	254	Specific Monitored Bus Voltage 0.925 for Stability Limit, Short-term Solution is to Dispatch LP&L Generation	
05SP	274	SPS	50511 LP-THOM 69.0	1.021	N/A	0.9206	0.8393	REMOVE UNIT 1 FROM BUS 51701 [JONES1 122.000] DISPATCH	254	Short-term Solution is to Dispatch LP&L Generation	
05SP	274	SPS	50510 LP-VCKS269.0	1.0227	N/A	0.922	0.8398	REMOVE UNIT 1 FROM BUS 51701 [JONES1 122.000] DISPATCH	254	"	
05SP	274	SPS	50512 LP-MCCU269.0	1.022	N/A	0.9218	0.8406	REMOVE UNIT 1 FROM BUS 51701 [JONES1 122.000] DISPATCH	254	"	
05SP	274	SPS	50509 LP-MLWK269.0	1.0211	N/A	0.9217	0.8419	REMOVE UNIT 1 FROM BUS 51701 [JONES1 122.000] DISPATCH	254	"	
05SP	274	SPS	50523 LP-BRND269.0	1.031	N/A	0.9275	0.8383	REMOVE UNIT 1 FROM BUS 51701 [JONES1 122.000] DISPATCH	254	"	
05SP	274	SPS	50515 LP-CHAL269.0	1.0225	N/A	0.9235	0.844	REMOVE UNIT 1 FROM BUS 51701 [JONES1 122.000] DISPATCH	254	"	
05SP	274	SPS	50526 LP-OLIV269.0	1.0205	N/A	0.9229	0.8452	REMOVE UNIT 1 FROM BUS 51701 [JONES1 122.000] DISPATCH	254	"	
05SP	274	SPS	50503 LP-ERSK269.0	1.0319	N/A	0.9275	0.8415	REMOVE UNIT 1 FROM BUS 51701 [JONES1 122.000] DISPATCH	254	"	
05SP	274	SPS	50511 LP-THOM 69.0	1.021239	N/A	1.004222	0.848861	OPEN LINE FROM BUS 50518 LP-SINT6 230 TO BUS 51681 LUBS6 230 CKT 1	254	"	
05SP	274	SPS	50526 LP-OLIV269.0	1.019784	N/A	1.003182	0.849729	OPEN LINE FROM BUS 50518 LP-SINT6 230 TO BUS 51681 LUBS6 230 CKT 1	254	"	
05SP	274	SPS	50511 LP-THOM 69.0	1.0212	N/A	0.9258	0.8494	REMOVE UNIT 1 FROM BUS 51702 [JONES2 121.000] DISPATCH	254	"	
05SP	274	SPS	50510 LP-VCKS269.0	1.0229	N/A	0.9272	0.8498	REMOVE UNIT 1 FROM BUS 51702 [JONES2 121.000] DISPATCH	254	"	
05SP	274	SPS	50512 LP-MCCU269.0	1.0221	N/A	0.927	0.8506	REMOVE UNIT 1 FROM BUS 51702 [JONES2 121.000] DISPATCH	254	"	
05SP	274	SPS	50515 LP-CHAL269.0	1.022212	N/A	1.005252	0.850599	OPEN LINE FROM BUS 50518 LP-SINT6 230 TO BUS 51681 LUBS6 230 CKT 1	254	"	
05SP	274	SPS	50509 LP-MLWK269.0	1.0213	N/A	0.9268	0.8518	REMOVE UNIT 1 FROM BUS 51702 [JONES2 121.000] DISPATCH	254	"	
05SP	274	SPS	50523 LP-BRND269.0	1.031	N/A	0.9327	0.8483	REMOVE UNIT 1 FROM BUS 51702 [JONES2 121.000] DISPATCH	254	"	
05SP	274	SPS	50510 LP-VCKS269.0	1.023338	N/A	1.006742	0.851454	OPEN LINE FROM BUS 50518 LP-SINT6 230 TO BUS 51681 LUBS6 230 CKT 1	254	"	
05SP	274	SPS	50512 LP-MCCU269.0	1.022478	N/A	1.006392	0.852242	OPEN LINE FROM BUS 50518 LP-SINT6 230 TO BUS 51681 LUBS6 230 CKT 1	254	"	
05SP	274	SPS	50504 LP-MACK269.0	1.035	N/A	0.93	0.8483	REMOVE UNIT 1 FROM BUS 51701 [JONES1 122.000] DISPATCH	254	"	
05SP	274	SPS	50523 LP-BRND269.0	1.031222	N/A	1.011513	0.849824	OPEN LINE FROM BUS 50518 LP-SINT6 230 TO BUS 51681 LUBS6 230 CKT 1	254	"	
05SP	274	SPS	50515 LP-CHAL269.0	1.0227	N/A	0.9287	0.854	REMOVE UNIT 1 FROM BUS 51702 [JONES2 121.000] DISPATCH	254	"	
05SP	274	SPS	50513 LP-COOP269.0	1.0283	N/A	0.9307	0.852	REMOVE UNIT 1 FROM BUS 51701 [JONES1 122.000] DISPATCH	254	"	
05SP	274	SPS	50526 LP-OLIV269.0	1.0207	N/A	0.9281	0.8551	REMOVE UNIT 1 FROM BUS 51702 [JONES2 121.000] DISPATCH	254	"	
05SP	274	SPS	50503 LP-ERSK269.0	1.0319	N/A	0.9326	0.8515	REMOVE UNIT 1 FROM BUS 51702 [JONES2 121.000] DISPATCH	254	"	
05SP	274	SPS	50516 LP-SLAT269.0	1.0265	N/A	0.9312	0.8543	REMOVE UNIT 1 FROM BUS 51701 [JONES1 122.000] DISPATCH	254	"	
05SP	274	SPS	50503 LP-ERSK269.0	1.032	N/A	1.011373	0.852881	OPEN LINE FROM BUS 50518 LP-SINT6 230 TO BUS 51681 LUBS6 230 CKT 1	254	"	
05SP	274	SPS	50506 LP-NES2 69.0	1.034	N/A	0.9318	0.8524	REMOVE UNIT 1 FROM BUS 51701 [JONES1 122.000] DISPATCH	254	"	
05SP	274	SPS	50509 LP-MLWK269.0	1.023138	N/A	1.007567	0.857319	OPEN LINE FROM BUS 50518 LP-SINT6 230 TO BUS 51681 LUBS6 230 CKT 1	254	"	
05SP	274	SPS	50516 LP-SLAT269.0	1.025726	N/A	1.010239	0.858248	OPEN LINE FROM BUS 50518 LP-SINT6 230 TO BUS 51681 LUBS6 230 CKT 1	254	"	
05SP	274	SPS	50511 LP-THOM 69.0	1.02124	N/A	1.004565	0.862379	OPEN LINE FROM BUS 50517 LP-SINT269.0 TO BUS 50518 LP-SINT6 230 CKT 1	254	"	
05SP	274	SPS	50504 LP-MACK269.0	1.035	N/A	0.9351	0.8582	REMOVE UNIT 1 FROM BUS 51702 [JONES2 121.000] DISPATCH	254	"	
05SP	274	SPS	50526 LP-OLIV269.0	1.019784	N/A	1.00353	0.863221	OPEN LINE FROM BUS 50517 LP-SINT269.0 TO BUS 50518 LP-SINT6 230 CKT 1	254	"	
05SP	274	SPS	50517 LP-SINT269.0	1.0286	N/A	0.9355	0.8612	REMOVE UNIT 1 FROM BUS 51701 [JONES1 122.000] DISPATCH	254	"	
05SP	274	SPS	50504 LP-MACK269.0	1.035	N/A	1.013504	0.859486	OPEN LINE FROM BUS 50518 LP-SINT6 230 TO BUS 51681 LUBS6 230 CKT 1	254	"	
05SP	274	SPS	50513 LP-COOP269.0	1.0284	N/A	0.9358	0.8618	REMOVE UNIT 1 FROM BUS 51702 [JONES2 121.000] DISPATCH	254	"	
05SP	274	SPS	50515 LP-CHAL269.0	1.022213	N/A	1.005598	0.864132	OPEN LINE FROM BUS 50517 LP-SINT269.0 TO BUS 50518 LP-SINT6 230 CKT 1	254	"	
05SP	274	SPS	50517 LP-SINT269.0	1.027362	N/A	1.01265	0.862798	OPEN LINE FROM BUS 50518 LP-SINT6 230 TO BUS 51681 LUBS6 230 CKT 1	254	"	
05SP	274	SPS	50513 LP-COOP269.0	1.028699	N/A	1.014307	0.863264	OPEN LINE FROM BUS 50518 LP-SINT6 230 TO BUS 51681 LUBS6 230 CKT 1	254	"	
05SP	274	SPS	50510 LP-VCKS269.0	1.023339	N/A	1.007082	0.86489	OPEN LINE FROM BUS 50517 LP-SINT269.0 TO BUS 50518 LP-SINT6 230 CKT 1	254	"	
05SP	274	SPS	50516 LP-SLAT269.0	1.0267	N/A	0.9363	0.8641	REMOVE UNIT 1 FROM BUS 51702 [JONES2 121.000] DISPATCH	254	"	
05SP	274	SPS	50506 LP-NES2 69.0	1.034	N/A	0.937	0.8622	REMOVE UNIT 1 FROM BUS 51702 [JONES2 121.000] DISPATCH	254	"	
05SP	274	SPS	50512 LP-MCCU269.0	1.022479	N/A	1.006735	0.86565	OPEN LINE FROM BUS 50517 LP-SINT269.0 TO BUS 50518 LP-SINT6 230 CKT 1	254	"	
05SP	274	SPS	50523 LP-BRND269.0	1.031222	N/A	1.011857	0.863265	OPEN LINE FROM BUS 50517 LP-SINT269.0 TO BUS 50518 LP-SINT6 230 CKT 1	254	"	
05SP	274	SPS	50506 LP-NES2 69.0	1.034003	N/A	1.014807	0.863081	OPEN LINE FROM BUS 50518 LP-SINT6 230 TO BUS 51681 LUBS6 230 CKT 1	254	"	
05SP	274	SPS	50503 LP-ERSK269.0	1.032	N/A	1.011718	0.866265	OPEN LINE FROM BUS 50517 LP-SINT269.0 TO BUS 50518 LP-SINT6 230 CKT 1	254	"	
05SP	274	SPS	50524 LP-WADS269.0	1.0292	N/A	0.9419	0.8676	REMOVE UNIT 1 FROM BUS 51701 [JONES1 122.000] DISPATCH	254	"	
05SP	274	SPS	50509 LP-MLWK269.0	1.023139	N/A	1.007895	0.870401	OPEN LINE FROM BUS 50517 LP-SINT269.0 TO BUS 50518 LP-SINT6 230 CKT 1	254	"	
05SP	274	SPS	50517 LP-SINT269.0	1.0288	N/A	0.9406	0.8708	REMOVE UNIT 1 FROM BUS 51702 [JONES2 121.000] DISPATCH	254	"	

Study Case	Transfer Amount (MW)	AREA	Monitored Bus with Violation	BC Voltage (PU) (LP&L PGEN = 232 MW)	TC Voltage (PU) (LP&L PGEN = 60 MW)	TC Voltage (PU) (LP&L PGEN = 20 MW)	TC Voltage (PU) (LP&L PGEN = 0 MW)	Outaged Branch Causing Voltage Violation	Transfer Amount minus LP&L Generation Required to Mitigate Violation (MW)	Solution	Estimated Cost
05SP	274	SPS	50516 LP-SLAT269.0	1.025726	N/A	1.010588	0.871608	OPEN LINE FROM BUS 50517 LP-SINT269.0 TO BUS 50518 LP-SINT6 230 CKT 1	254	"	
05SP	274	SPS	50504 LP-MACK269.0	1.035	N/A	1.013851	0.872749	OPEN LINE FROM BUS 50517 LP-SINT269.0 TO BUS 50518 LP-SINT6 230 CKT 1	254	"	
05SP	274	SPS	50517 LP-SINT269.0	1.027362	N/A	1.013	0.875997	OPEN LINE FROM BUS 50517 LP-SINT269.0 TO BUS 50518 LP-SINT6 230 CKT 1	254	"	
05SP	274	SPS	50513 LP-COOP269.0	1.0287	N/A	1.014654	0.876463	OPEN LINE FROM BUS 50517 LP-SINT269.0 TO BUS 50518 LP-SINT6 230 CKT 1	254	"	
05SP	274	SPS	50506 LP-NES2 69.0	1.034003	N/A	1.015155	0.87625	OPEN LINE FROM BUS 50517 LP-SINT269.0 TO BUS 50518 LP-SINT6 230 CKT 1	254	"	
05SP	274	SPS	50524 LP-WADS269.0	1.0294	N/A	0.947	0.8771	REMOVE UNIT 1 FROM BUS 51702 [JONES2 121.000] DISPATCH	254	"	
05SP	274	SPS	50524 LP-WADS269.0	1.030253	N/A	1.024585	0.880262	OPEN LINE FROM BUS 50518 LP-SINT6 230 TO BUS 51681 LUBS6 230 CKT 1	254	"	
05SP	274	SPS	50509 LP-MLWK269.0	1.008878	N/A	0.985058	0.896026	OPEN LINE FROM BUS 50507 LP-MLWK6 230 TO BUS 51647 CARLISL6 230 CKT 1	254	"	
05SP	274	SPS	50507 LP-MLWK6 230	0.869724	N/A	N/A	0.772436	OPEN LINE FROM BUS 50507 LP-MLWK6 230 TO BUS 51647 CARLISL6 230 CKT 1	274	Not Load Serving Bus	
05SP	274	SPS	50507 LP-MLWK6 230	0.962	N/A	N/A	0.8446	REMOVE UNIT 1 FROM BUS 51701 [JONES1 122.000] DISPATCH	274	Not Load Serving Bus	
05SP	274	SPS	50507 LP-MLWK6 230	0.962	N/A	N/A	0.8488	REMOVE UNIT 1 FROM BUS 51702 [JONES2 121.000] DISPATCH	274	Not Load Serving Bus	
05SP	274	SPS	50507 LP-MLWK6 230	0.96584	N/A	N/A	0.859281	OPEN LINE FROM BUS 51533 TUCO6 230 TO BUS 51647 CARLISL6 230 CKT 1	274	Not Load Serving Bus	
05SP	274	SPS	50507 LP-MLWK6 230	0.9578	N/A	N/A	0.8778	REMOVE UNIT 1 FROM BUS 51441 [TOLK1 124.000] DISPATCH	274	Not Load Serving Bus	
05SP	274	SPS	50518 LP-SINT6 230	0.97265	N/A	N/A	0.784362	OPEN LINE FROM BUS 50518 LP-SINT6 230 TO BUS 51681 LUBS6 230 CKT 1	274	Not Load Serving Bus	
05SP	274	SPS	50518 LP-SINT6 230	0.9791	N/A	N/A	0.8504	REMOVE UNIT 1 FROM BUS 51701 [JONES1 122.000] DISPATCH	274	Not Load Serving Bus	
05SP	274	SPS	50518 LP-SINT6 230	0.9808	N/A	N/A	0.8561	REMOVE UNIT 1 FROM BUS 51702 [JONES2 121.000] DISPATCH	274	Not Load Serving Bus	
05SP	274	SPS	50520 LP-HOLL269.0	1.035	N/A	N/A	0.8676	REMOVE UNIT 1 FROM BUS 51701 [JONES1 122.000] DISPATCH	274	Not Load Serving Bus	
05SP	274	SPS	50520 LP-HOLL269.0	1.035	N/A	N/A	0.8771	REMOVE UNIT 1 FROM BUS 51702 [JONES2 121.000] DISPATCH	274	Not Load Serving Bus	
05SP	274	SPS	50520 LP-HOLL269.0	1.035	N/A	N/A	0.87712	OPEN LINE FROM BUS 50518 LP-SINT6 230 TO BUS 51681 LUBS6 230 CKT 1	274	Not Load Serving Bus	
05SP	274	SPS	50521 LP-HOLL6 230	0.990854	N/A	N/A	0.830509	OPEN LINE FROM BUS 50521 LP-HOLL6 230 TO BUS 51699 JONES6 230 CKT 1	274	Not Load Serving Bus	
05SP	274	SPS	50521 LP-HOLL6 230	0.983	N/A	N/A	0.8511	REMOVE UNIT 1 FROM BUS 51701 [JONES1 122.000] DISPATCH	274	Not Load Serving Bus	
05SP	274	SPS	50521 LP-HOLL6 230	0.9848	N/A	N/A	0.8569	REMOVE UNIT 1 FROM BUS 51702 [JONES2 121.000] DISPATCH	274	Not Load Serving Bus	
05SP	274	SPS	50527 LP-WADS6 230	1.076825	N/A	N/A	0.792693	OPEN LINE FROM BUS 50527 LP-WADS6 230 TO BUS 51689 LUBE6 230 CKT 1	274	Not Load Serving Bus	
05SP	274	SPS	50527 LP-WADS6 230	0.9821	N/A	N/A	0.8442	REMOVE UNIT 1 FROM BUS 51701 [JONES1 122.000] DISPATCH	274	Not Load Serving Bus	
05SP	274	SPS	50527 LP-WADS6 230	0.9841	N/A	N/A	0.8501	REMOVE UNIT 1 FROM BUS 51702 [JONES2 121.000] DISPATCH	274	Not Load Serving Bus	
05SP	274	SPS	50527 LP-WADS6 230	0.991159	N/A	N/A	0.862563	OPEN LINE FROM BUS 51689 LUBE6 230 TO BUS 51699 JONES6 230 CKT 1	274	Not Load Serving Bus	
05SP	274	SPS	51321 SWISHER6 230	0.9575	N/A	N/A	0.8939	REMOVE UNIT 1 FROM BUS 51701 [JONES1 122.000] DISPATCH	274	Not Load Serving Bus	
05SP	274	SPS	51321 SWISHER6 230	0.9577	N/A	N/A	0.8961	REMOVE UNIT 1 FROM BUS 51702 [JONES2 121.000] DISPATCH	274	Not Load Serving Bus	
05SP	274	SPS	51534 TUCO7 345	0.9704	N/A	N/A	0.8881	REMOVE UNIT 1 FROM BUS 51701 [JONES1 122.000] DISPATCH	274	Not Load Serving Bus	
05SP	274	SPS	51534 TUCO7 345	0.9707	N/A	N/A	0.8914	REMOVE UNIT 1 FROM BUS 51702 [JONES2 121.000] DISPATCH	274	Not Load Serving Bus	
05SP	274	SPS	51534 TUCO7 345	0.9524	N/A	N/A	0.8919	REMOVE UNIT 1 FROM BUS 51441 [TOLK1 124.000] DISPATCH	274	Not Load Serving Bus	
05SP	274	SPS	51534 TUCO7 345	0.9524	N/A	N/A	0.8919	REMOVE UNIT 1 FROM BUS 51442 [TOLK2 124.000] DISPATCH	274	Not Load Serving Bus	
05SP	274	SPS	51647 CARLISL6 230	0.9621	N/A	N/A	0.8454	REMOVE UNIT 1 FROM BUS 51701 [JONES1 122.000] DISPATCH	274	Not Load Serving Bus	
05SP	274	SPS	51647 CARLISL6 230	0.9622	N/A	N/A	0.8496	REMOVE UNIT 1 FROM BUS 51702 [JONES2 121.000] DISPATCH	274	Not Load Serving Bus	
05SP	274	SPS	51647 CARLISL6 230	0.965972	N/A	N/A	0.859539	OPEN LINE FROM BUS 51533 TUCO6 230 TO BUS 51647 CARLISL6 230 CKT 1	274	Not Load Serving Bus	
05SP	274	SPS	51647 CARLISL6 230	0.958	N/A	N/A	0.8783	REMOVE UNIT 1 FROM BUS 51441 [TOLK1 124.000] DISPATCH	274	Not Load Serving Bus	
05SP	274	SPS	51647 CARLISL6 230	0.958	N/A	N/A	0.8783	REMOVE UNIT 1 FROM BUS 51442 [TOLK2 124.000] DISPATCH	274	Not Load Serving Bus	
05SP	274	SPS	51647 CARLISL6 230	0.962603	N/A	N/A	0.881461	OPEN LINE FROM BUS 51533 TUCO6 230 TO BUS 51534 TUCO7 345 CKT 1	274	Not Load Serving Bus	
05SP	274	SPS	51647 CARLISL6 230	0.962603	N/A	N/A	0.881571	OPEN LINE FROM BUS 51534 TUCO7 345 TO BUS 54119 O.K.U.-7 345 CKT 1	274	Not Load Serving Bus	
05SP	274	SPS	51681 LUBS6 230	0.9792	N/A	N/A	0.8533	REMOVE UNIT 1 FROM BUS 51701 [JONES1 122.000] DISPATCH	274	Not Load Serving Bus	
05SP	274	SPS	51681 LUBS6 230	0.9811	N/A	N/A	0.8589	REMOVE UNIT 1 FROM BUS 51702 [JONES2 121.000] DISPATCH	274	Not Load Serving Bus	
05SP	274	SPS	51689 LUBE6 230	0.9819	N/A	N/A	0.8453	REMOVE UNIT 1 FROM BUS 51701 [JONES1 122.000] DISPATCH	274	Not Load Serving Bus	
05SP	274	SPS	51689 LUBE6 230	0.9839	N/A	N/A	0.8511	REMOVE UNIT 1 FROM BUS 51702 [JONES2 121.000] DISPATCH	274	Not Load Serving Bus	
05SP	274	SPS	51689 LUBE6 230	0.99096	N/A	N/A	0.862833	OPEN LINE FROM BUS 51689 LUBE6 230 TO BUS 51699 JONES6 230 CKT 1	274	Not Load Serving Bus	
05SP	274	SPS	51699 JONES6 230	0.9829	N/A	N/A	0.8543	REMOVE UNIT 1 FROM BUS 51701 [JONES1 122.000] DISPATCH	274	Not Load Serving Bus	
05SP	274	SPS	51699 JONES6 230	0.9847	N/A	N/A	0.8601	REMOVE UNIT 1 FROM BUS 51702 [JONES2 121.000] DISPATCH	274	Not Load Serving Bus	
05SP	274	SPS	51763 WOLFRTH6 230	0.9777	N/A	N/A	0.8755	REMOVE UNIT 1 FROM BUS 51701 [JONES1 122.000] DISPATCH	274	Not Load Serving Bus	
05SP	274	SPS	51763 WOLFRTH6 230	0.9789	N/A	N/A	0.88	REMOVE UNIT 1 FROM BUS 51702 [JONES2 121.000] DISPATCH	274	Not Load Serving Bus	
05SP	274	SPS	51811 GRASSLN6 230	0.9833	N/A	N/A	0.8571	REMOVE UNIT 1 FROM BUS 51701 [JONES1 122.000] DISPATCH	274	Not Load Serving Bus	
05SP	274	SPS	51811 GRASSLN6 230	0.9847	N/A	N/A	0.8625	REMOVE UNIT 1 FROM BUS 51702 [JONES2 121.000] DISPATCH	274	Not Load Serving Bus	
05SP	274	SPS	51861 BORDEN6 230	0.9871	N/A	N/A	0.8697	REMOVE UNIT 1 FROM BUS 51701 [JONES1 122.000] DISPATCH	274	Not Load Serving Bus	
05SP	274	SPS	51861 BORDEN6 230	0.9884	N/A	N/A	0.8743	REMOVE UNIT 1 FROM BUS 51702 [JONES2 121.000] DISPATCH	274	Not Load Serving Bus	
05SH	224	SPS	50527 LP-WADS6 230	0.998239	N/A	N/A	0.891269	OPEN LINE FROM BUS 51689 LUBE6 230 TO BUS 51699 JONES6 230 CKT 1	224	Not Load Serving Bus	
05SH	224	SPS	51689 LUBE6 230	0.998125	N/A	N/A	0.891239	OPEN LINE FROM BUS 51689 LUBE6 230 TO BUS 51699 JONES6 230 CKT 1	224	Not Load Serving Bus	
										Total Estimated Cost	\$0

Note: Resulting Tie Line Power Factor not Specified

SPP-2004-006-1  
 Table 3 - Network Load Totals  
 and Tie Line MW Limits by Season

Southwest Power Pool  
 System Impact Study

Study Case	Network Load MW	Network Load MVAR	Transfer Amount (MW)	Existing Service Modeled to Network Load (MW)	LP&L Tie MW Limit	LP&L Tie MW Limit @ 1.0 PF	LP&L Tie MW Limit @ 0.99 PF	LP&L Tie MW Limit @ 0.98 PF	LP&L Tie MW Limit @ 0.97 PF	LP&L Tie MW Limit @ 0.96 PF	LP&L Tie MW Limit @ 0.95 PF	LP&L Tie MW Limit @ 0.94 PF	LP&L Tie MW Limit @ 0.93 PF	LP&L Tie MW Limit @ 0.92 PF	LP&L Tie MW Limit @ 0.91 PF	LP&L Tie MW Limit @ 0.90 PF
04SP	320	49.3	265	55	N/A	326	295	273	258	247	238	231	222	216	210	203
04SH	272	41.9	217	55	272(1)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
04FA	208	32	153	55	208(1)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
04WP	208	47.3	153	55	208(1)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
05AP	154.5	23.8	100	55	155(1)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
05G	213.5	32.9	159	55	214(1)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
05SP	328.5	50.6	274	55	N/A	318	272	255	241	229	220	212	205	200	194	190
05SH	279	43	224	55	279(1)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

(1) Maximum Amount Evaluated with Pre-contingency Tie Line PF set at 0.95 lagging



Study Case	Transfer Amount (MW)	From Area	To Area	Monitored Branch Overload	Rate <MVA>	BC % Loading (LP&L PGEN = 232 MW)	TC % Loading (LP&L PGEN = 60 MW)	TC % Loading (LP&L PGEN = 20 MW)	TC % Loading (LP&L PGEN = 0 MW)	Outaged Branch Causing Overload	Transfer Amount minus LP&L Generation Required to Mitigate Violation (MW)	Solution	Estimated Cost
04SP	265	SPS	SPS	50516 LP-SLAT2 69 to 50513 LP-COOP2 69 CKT 1	54	33.9	N/A	91.4	104.0	50513 LP-COOP2 69 to 50524 LP-WADS2 69 CKT 1	245	Short-term Solution is to Dispatch LP&L Generation	
04SP	265	SPS	SPS	50521 LP-HOLL6 230 to 50520 LP-HOLL2 69 CKT 1	140	14.6	N/A	96.0	107.0	50518 LP-SINT6 230 to 51681 LUBS6 230 CKT 1	245	"	
04SP	265	SPS	SPS	50521 LP-HOLL6 230 to 50520 LP-HOLL2 69 CKT 1	140	14.6	N/A	95.9	106.9	50517 LP-SINT6 230 to 50518 LP-SINT6 230 CKT 1	245	"	
04SP	265	SPS	SPS	50521 LP-HOLL6 230 to 50520 LP-HOLL2 69 CKT 1	140	13.1	N/A	91.2	101.9	50527 LP-WADS6 230 to 51689 LUBE6 230 CKT 1	245	"	
04SP	265	SPS	SPS	50521 LP-HOLL6 230 to 50520 LP-HOLL2 69 CKT 1	140	13.1	N/A	91.2	101.8	50524 LP-WADS2 69 to 50527 LP-WADS6 230 CKT 1	245	"	
04SP	265	SPS	SPS	50518 LP-SINT6 230 to 50517 LP-SINT2 69 CKT 1	140	17.6	N/A	94.6	104.3	50521 LP-HOLL6 230 to 51699 JONES6 230 CKT 1	245	"	
04SP	265	SPS	SPS	50518 LP-SINT6 230 to 50517 LP-SINT2 69 CKT 1	140	17.6	N/A	94.6	104.2	50520 LP-HOLL2 69 to 50521 LP-HOLL6 230 CKT 1	245	"	
04SP	265	SPS	SPS	50518 LP-SINT6 230 to 50517 LP-SINT2 69 CKT 1	140	17.6	N/A	91.0	101.0	50527 LP-WADS6 230 to 51689 LUBE6 230 CKT 1	245	"	
04SP	265	SPS	SPS	50518 LP-SINT6 230 to 50517 LP-SINT2 69 CKT 1	140	17.6	N/A	91.0	100.8	50524 LP-WADS2 69 to 50527 LP-WADS6 230 CKT 1	245	"	
04SH	217			NONE IDENTIFIED							217		
04FA	153			NONE IDENTIFIED							153		
04WP	153			NONE IDENTIFIED							153		
05AP	100			NONE IDENTIFIED							100		
05G	159			NONE IDENTIFIED							159		
05SP	274	SPS	SPS	50521 LP-HOLL6 230 to 50520 LP-HOLL2 69 CKT 1	140	15.0	83.1	101.0	143.3	50518 LP-SINT6 230 to 51681 LUBS6 230 CKT 1	214	Short-term Solution is to Dispatch LP&L Generation	
05SP	274	SPS	SPS	50521 LP-HOLL6 230 to 50520 LP-HOLL2 69 CKT 1	140	15.0	83.2	100.9	143.4	50517 LP-SINT6 230 to 50518 LP-SINT6 230 CKT 1	214	"	
05SP	274	SPS	SPS	50524 LP-WADS2 69 to 50513 LP-COOP2 69 CKT 1	143	36.7	N/A	73.5	124.6	50518 LP-SINT6 230 to 51681 LUBS6 230 CKT 1	254	"	
05SP	274	SPS	SPS	50524 LP-WADS2 69 to 50513 LP-COOP2 69 CKT 1	143	36.7	N/A	73.3	124.5	50517 LP-SINT6 230 to 50518 LP-SINT6 230 CKT 1	254	"	
05SP	274	SPS	SPS	50516 LP-SLAT2 69 to 50513 LP-COOP2 69 CKT 1	54	34.4	N/A	95.4	110.3	50513 LP-COOP2 69 to 50524 LP-WADS2 69 CKT 1	254	"	
05SP	274	SPS	SPS	50524 LP-WADS2 69 to 50527 LP-WADS6 230 CKT 1	140	16.7	N/A	92.0	106.1	50521 LP-HOLL6 230 to 51699 JONES6 230 CKT 1	254	"	
05SP	274	SPS	SPS	50524 LP-WADS2 69 to 50527 LP-WADS6 230 CKT 1	140	16.7	N/A	91.9	106.2	50520 LP-HOLL2 69 to 50521 LP-HOLL6 230 CKT 1	254	"	
05SP	274	SPS	SPS	50524 LP-WADS2 69 to 50527 LP-WADS6 230 CKT 1	140	18.3	N/A	90.9	131.2	50518 LP-SINT6 230 to 51681 LUBS6 230 CKT 1	254	"	
05SP	274	SPS	SPS	50524 LP-WADS2 69 to 50527 LP-WADS6 230 CKT 1	140	18.3	N/A	90.8	131.2	50517 LP-SINT6 230 to 50518 LP-SINT6 230 CKT 1	254	"	
05SP	274	SPS	SPS	50521 LP-HOLL6 230 to 50520 LP-HOLL2 69 CKT 1	140	13.3	N/A	96.1	114.1	50527 LP-WADS6 230 to 51689 LUBE6 230 CKT 1	254	"	
05SP	274	SPS	SPS	50521 LP-HOLL6 230 to 50520 LP-HOLL2 69 CKT 1	140	13.2	N/A	96.0	114.1	50524 LP-WADS2 69 to 50527 LP-WADS6 230 CKT 1	254	"	
05SP	274	SPS	SPS	50520 LP-HOLL269.0 to 50521 LP-HOLL6 230 CKT 1	100	12.4	N/A	65.7	100.1	Base Case	254	"	
05SP	274	SPS	SPS	50518 LP-SINT6 230 to 50517 LP-SINT2 69 CKT 1	140	18.1	N/A	99.3	115.6	50520 LP-HOLL2 69 to 50521 LP-HOLL6 230 CKT 1	254	"	
05SP	274	SPS	SPS	50518 LP-SINT6 230 to 50517 LP-SINT2 69 CKT 1	140	18.1	N/A	99.3	115.6	50521 LP-HOLL6 230 to 51699 JONES6 230 CKT 1	254	"	
05SP	274	SPS	SPS	50517 LP-SINT2 69 to 50518 LP-SINT6 230 CKT 1	140	18.0	N/A	95.7	113.7	50524 LP-WADS2 69 to 50527 LP-WADS6 230 CKT 1	254	"	
05SP	274	SPS	SPS	50517 LP-SINT2 69 to 50518 LP-SINT6 230 CKT 1	140	18.0	N/A	95.7	113.7	50527 LP-WADS6 230 to 51689 LUBE6 230 CKT 1	254	"	
05SP	274	SPS	SPS	50517 LP-SINT269.0 to 50518 LP-SINT6 230 CKT 1	100	20.3	N/A	68.1	102.1	Base Case	254	"	
05SH	224			NONE IDENTIFIED							224		
												Total Estimated Cost	\$0

Study Case	Transfer Amount (MW)	From Area	To Area	Monitored Branch Overload	Rate <MVA>	BC % Loading (LP&L PGEN = 232 MW)	TC % Loading (LP&L PGEN = 20 MW)	TC % Loading (LP&L PGEN = 0 MW)	Outaged Branch Causing Overload	Transfer Amount minus LP&L Generation Required to Mitigate Violation (MW)	Solution	Estimated Cost
04SP	265	SPS	SPS	50516 LP-SLAT2 69 to 50513 LP-COOP2 69 CKT 1	54	32.9	90.6	102.9	50513 LP-COOP2 69 to 50524 LP-WADS2 69 CKT 1	245	Short-term Solution is to Dispatch LP&L Generation	
04SP	265	SPS	SPS	50520 LP-HOLL2 69 to 50521 LP-HOLL6 230 CKT 1	140	12.7	90.9	101.5	50527 LP-WADS6 230 to 51689 LUBE6 230 CKT 1	245	*	
04SP	265	SPS	SPS	50520 LP-HOLL2 69 to 50521 LP-HOLL6 230 CKT 1	140	12.7	90.9	101.3	50524 LP-WADS2 69 to 50527 LP-WADS6 230 CKT 1	245	*	
04SP	265	SPS	SPS	50521 LP-HOLL6 230 to 50520 LP-HOLL2 69 CKT 1	140	14.0	95.3	106.2	50518 LP-SINT6 230 to 51681 LUBS6 230 CKT 1	245	*	
04SP	265	SPS	SPS	50521 LP-HOLL6 230 to 50520 LP-HOLL2 69 CKT 1	140	14.0	95.3	106.1	50517 LP-SINT2 69 to 50518 LP-SINT6 230 CKT 1	245	*	
04SP	265	SPS	SPS	50518 LP-SINT6 230 to 50517 LP-SINT2 69 CKT 1	140	16.8	93.9	103.3	50521 LP-HOLL6 230 to 51699 JONES6 230 CKT 1	245	*	
04SP	265	SPS	SPS	50518 LP-SINT6 230 to 50517 LP-SINT2 69 CKT 1	140	16.7	93.9	103.3	50520 LP-HOLL2 69 to 50521 LP-HOLL6 230 CKT 1	245	*	
04SP	265	SPS	SPS	50518 LP-SINT6 230 to 50517 LP-SINT2 69 CKT 1	140	16.7	90.4	100.2	50527 LP-WADS6 230 to 51689 LUBE6 230 CKT 1	245	*	
04SP	265	SPS	SPS	50518 LP-SINT6 230 to 50517 LP-SINT2 69 CKT 1	140	16.7	90.4	100.1	50524 LP-WADS2 69 to 50527 LP-WADS6 230 CKT 1	245	*	
04SH	217			NONE IDENTIFIED						217		
04FA	153			NONE IDENTIFIED						153		
04WP	153			NONE IDENTIFIED						153		
05AP	100			NONE IDENTIFIED						100		
05G	159			NONE IDENTIFIED						159		
05SP	274	SPS	SPS	50516 LP-SLAT2 69 to 50513 LP-COOP2 69 CKT 1	54	32.4	93.3	106.8	50513 LP-COOP2 69 to 50524 LP-WADS2 69 CKT 1	254	Short-term Solution is to Dispatch LP&L Generation	
05SP	274	SPS	SPS	50524 LP-WADS2 69 to 50527 LP-WADS6 230 CKT 1	140	17.2	89.6	104.7	50517 LP-SINT2 69 to 50518 LP-SINT6 230 CKT 1	254	*	
05SP	274	SPS	SPS	50524 LP-WADS2 69 to 50527 LP-WADS6 230 CKT 1	140	17.2	89.5	105.7	50518 LP-SINT6 230 to 51681 LUBS6 230 CKT 1	254	*	
05SP	274	SPS	SPS	50524 LP-WADS2 69 to 50527 LP-WADS6 230 CKT 1	140	16.0	88.9	100.5	50520 LP-HOLL2 69 to 50521 LP-HOLL6 230 CKT 1	254	*	
05SP	274	SPS	SPS	50524 LP-WADS2 69 to 50527 LP-WADS6 230 CKT 1	140	16.0	89.0	100.6	50521 LP-HOLL6 230 to 51699 JONES6 230 CKT 1	254	*	
05SP	274	SPS	SPS	50520 LP-HOLL2 69 to 50521 LP-HOLL6 230 CKT 1	140	13.7	98.3	115.7	50518 LP-SINT6 230 to 51681 LUBS6 230 CKT 1	254	*	
05SP	274	SPS	SPS	50520 LP-HOLL2 69 to 50521 LP-HOLL6 230 CKT 1	140	13.7	98.4	114.6	50517 LP-SINT2 69 to 50518 LP-SINT6 230 CKT 1	254	*	
05SP	274	SPS	SPS	50520 LP-HOLL2 69 to 50521 LP-HOLL6 230 CKT 1	140	12.4	94.3	106.7	50524 LP-WADS2 69 to 50527 LP-WADS6 230 CKT 1	254	*	
05SP	274	SPS	SPS	50520 LP-HOLL2 69 to 50521 LP-HOLL6 230 CKT 1	140	12.4	94.4	106.5	50527 LP-WADS6 230 to 51689 LUBE6 230 CKT 1	254	*	
05SP	274	SPS	SPS	50518 LP-SINT6 230 to 50517 LP-SINT2 69 CKT 1	140	16.4	96.8	108.4	50520 LP-HOLL2 69 to 50521 LP-HOLL6 230 CKT 1	254	*	
05SP	274	SPS	SPS	50518 LP-SINT6 230 to 50517 LP-SINT2 69 CKT 1	140	16.4	96.9	108.5	50521 LP-HOLL6 230 to 51699 JONES6 230 CKT 1	254	*	
05SP	274	SPS	SPS	50518 LP-SINT6 230 to 50517 LP-SINT2 69 CKT 1	140	16.3	93.2	105.4	50524 LP-WADS2 69 to 50527 LP-WADS6 230 CKT 1	254	*	
05SP	274	SPS	SPS	50518 LP-SINT6 230 to 50517 LP-SINT2 69 CKT 1	140	16.3	93.3	105.1	50527 LP-WADS6 230 to 51689 LUBE6 230 CKT 1	254	*	
05SP	274	SPS	SPS	50517 LP-SINT269.0 to 50518 LP-SINT6 230 CKT 1	100	18.3	67.0	100.1	Base Case	254		
05SH	224			NONE IDENTIFIED						224		
											Total Estimated Cost	\$0