



# **SPP** *Southwest Power Pool*

***System Impact Study  
SPP-2001-341  
For Network Service  
Requested By  
Western Resources***

***From 1/1/02  
To 1/1/03***

***SPP Coordinated Planning***

# 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>
A. DESCRIPTION .....	5
B. MODEL UPDATES .....	5
C. STEADY-STATE CONTINGENCY ANALYSIS.....	6
D. GENERATION SENSITIVITY ANALYSIS.....	6
E. LINEAR FCITC ANALYSIS .....	6
<b>4. STUDY RESULTS.....</b>	<b>7</b>
A. STEADY-STATE CONTINGENCY ANALYSIS RESULTS .....	7
B. GENERATION SENSITIVITY ANALYSIS RESULTS .....	7
C. LINEAR FCITC ANALYSIS RESULTS .....	7
TABLE 1 – WESTERN RESOURCES’ NETWORK FACILITIES WITH VOLTAGES LESS THAN 10% OF NOMINAL	9
TABLE 2 – WESTERN RESOURCES NETWORK FACILITIES WITH THERMAL LOADING ABOVE 100% RATE B	
.....	11
TABLE 3 – WESTERN RESOURCES’ NETWORK FACILITIES IDENTIFIED AS LIMITS IN THE MUST	
GENERATION SENSITIVITY ANALYSIS.....	17
GENERATION ADJUSTMENT TABLES FOR LIMITS FOUND IN THE GENERATION SENSITIVITY ANALYSIS ...	18
TABLE 4 – SPP AND NON-SPP NETWORK FACILITIES IDENTIFIED AS LIMITS IN THE MUST LINEAR FCITC	
ANALYSIS (EXTERNAL NETWORK RESOURCES TO INTERNAL NETWORK RESOURCES).....	28
<b>5. CONCLUSION .....</b>	<b>29</b>
<b>APPENDIX A .....</b>	<b>30</b>

## **1. Executive Summary**

Western Resources has requested a system impact study for Network Integration Transmission Service. The period of the Network Service is from 1/1/02 to 1/1/03. The request is for reservation 314286.

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.

- Tables 1 and 2 document Network Facilities in Western Resources identified as having voltage and thermal violations. Western Resources has provided Mitigation Plans and Solutions for these violations.
- Table 3 summarizes the Western Resources Network Facility Limits identified in the Generation Sensitivity Analysis. No other SPP or Non-SPP facilities were identified for the Generation Sensitivity Analysis. Western Resources has provided Mitigation Plans and Solutions for these limitations.
- Table 4 summarizes the Western Resources Network Facility Limits identified in the Linear First Contingency Incremental Transfer Capability (FCITC) Analysis for transfers from the External Network Resources to the Internal Network Resources. No other SPP or Non-SPP facilities were identified as limiting the transfers from the External Network Resources in the FCITC Analysis. Western Resources has provided Mitigation Plans and Solutions for these limitations.

The results of the study show that the applied for Network Integration Transmission Service by Western Resources from 1/1/02 to 1/1/03 can be accepted. The Western Resources Network Facilities identified in the System Impact Study were addressed and mitigated by Western Resources. The Transmission Operating Directives used to mitigate the Western Resources limitations are on file at SPP.

## **2. Introduction**

Western Resources has requested an impact study for Network Integration Transmission Service. The transmission service runs from 1/1/02 to 1/1/03.

The principal objective of the study is to identify the constraints on the SPP Regional Tariff System, which includes the Western Resources Transmission System, that limit the Network Integration Transmission Service. Software used to perform the analysis includes Power Technologies Inc.'s (PTI) Power System Simulator for Engineering (PSS/E) and Managing and Utilizing System Transmission (MUST). This study includes a steady-state contingency analysis (PTI's PSS/E function ACCC), PTI's MUST Generation Sensitivity Analysis, and PTI's MUST Linear FCITC Analysis.

The steady-state contingency analysis considers Western Resources' transmission line loadings and transmission bus voltages for outages of transmission lines and transformers.

The Generation Sensitivity Analysis shows the First Contingency Incremental Transfer Capability (FCITC) between the Network Resources and Network Load and what the limitations are, if any, for a given generation dispatch to serve load. The Network Resources include all designated network resources within the Western Resources control area, excluding Wolf Creek; the Kansas City Power & Light (KACP) control area, the Empire District Electric Co. (EMDE) control area, and the 40 MW of MoPEP resources in the 2002 Summer Peak.

The Linear FCITC Analysis shows the FCITC between the Designated Resources outside of SPP to the Designated Resources inside of SPP, described above. The External Network Resources include 200 MW from Omaha Public Power District (OPPD), 50 MW from American Electric Power (AEP), 50 MW from CINergy (CIN), 50 MW from MidAmerican Electric Company (MEC), and 60 MW of capacity from Missouri Public Energy Pool (MoPEP).

### **3. Study Methodology**

#### **A. Description**

The system impact study consists of three analyses. PSS/E's ACCC steady-state contingency analysis was used to identify any system criteria violations on the Western Resources' Transmission System. Power Technologies Inc.'s MUST software Generation Sensitivity function was used to identify any SPP and Non-SPP system overloads caused by the worst dispatch of the Western Resources Designated Network Resources within SPP to serve the designated Network Load of Western Resources. Power Technologies Inc.'s MUST software Linear FCITC function was used to identify any SPP and Non-SPP system overloads caused by transfers between the Western Resources Designated Network Resources outside of SPP and the Western Resources Designated Network Resources inside of SPP.

The three analyses were 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**

The SPP used six seasonal models to study the Western Resources Network Integration Transmission Service. The SPP 2001 Series Cases used are as follows. The 2001/02 Winter Peak, 2002 Spring Minimum (April), 2002 Spring Peak, 2002 Summer Peak, 2002 Fall Peak, and 2002/03 Winter Peak were used to study the impact of the Network Service on the SPP system during the transmission request period of 1/1/02 to 1/1/03.

The chosen base case models were modified to reflect the most current modeling information. The cases were modified to reflect future firm transfers during the request period that were not already included in the January 2001 base case series models. All of these modified models were used in the steady-state contingency analysis.

The modified 2001/02 Winter Peak, 2002 Summer Peak, and 2002/03 Winter Peak were used for the Generation Sensitivity Analysis and Linear FCITC Analysis. For the two analyses, the models were adjusted to model the online external designated Network Resources as Western Resources' Generators, which included the capacity from KACP's La Cygne Units, capacity from EMDE's State Line Plant, and 40 MW of capacity from the MoPEP resources in the 2002 Summer Peak.

For the Generation Sensitivity Analysis, the models were adjusted further by scaling down the online Network Resources and Network Load by 200 MW to allow room for a 200 MW transfer from the Network Resources to the Network Load. The scaling factors used maintained the ratio of the network load or generation to be scaled to the total network load or generation being scaled.

### **C. Steady-State Contingency Analysis**

Using the first set of created models and the ACCC function of PSS/E, single and select double contingency outages were analyzed to determine the Western Resources' Network Facilities with thermal and voltage violations during a contingency. The PSS/E options chosen to conduct the Impact Study analysis can be found in Appendix A.

### **D. Generation Sensitivity Analysis**

The MUST Generation Sensitivity Analysis (GSA) was used to determine any thermal constraints due to specific generation dispatches of the designated Network Resources to serve the Network Load. The Network Resources used in the analysis includes all designated network resources internal to SPP, excluding Wolf Creek and includes all designated network resources external to SPP already included in the SPP 2001 Series Models, which includes 40 MW of capacity from the MoPEP Resources in the 2002 Summer Peak Model.

The GSA analysis requires the modeling of a transfer, in this case the transfer from Network Resources to Network Load. To overcome this limitation, the 2001/02 Winter Peak, 2002 Summer Peak, 2002/03 Winter Peak power flow models were modified to provide room for a 200 MW transfer as mentioned above in the model update section.

The GSA function of MUST finds dispatches that minimize the FCITC of a study transfer. The study transfer in this case is from the Designated Network Resources, described above, to the Designated Network Load with the same scaling factors described in the model update section.

### **E. Linear FCITC Analysis**

The MUST Linear FCITC was used to determine any thermal constraints due to transferring power from the External Network Resources to the Internal Network Resources with the External Network Resources being the resources of OPPD, AEP, CIN, MEC, and MoPEP and the Internal Network Resources being the remaining specified Network Resources in the Western Resources Control Area, the KACP Control Area, and the EMDE Control Area.

Two different lists of participating generators were used for the scaling down of the Internal Network Resources. The first list included all on-line Internal Network Resources, excluding Wolf Creek. The second list included all on-line Internal Network Resources, excluding Wolf Creek and the other must-run units, which includes the Jeffrey Units, the La Cygne Units, and Lawrence Unit 5.

The first list of participating generators was used to study all of the transfers in the 2001/02 Winter Peak and 2002/03 Winter Peak, and both lists of participating generators were used in the 2002 Summer Peak. The transfers studied include a 200 MW transfer from OPPD, 50 MW transfers from AEP, CIN, and MEC, a 20 MW transfer from MoPEP in the 2002 Summer Peak, and a 60 MW transfer from MoPEP in the winter peak cases. The 20 MW transfer level from MoPEP in the 2002 Summer Peak was used because 40 MW of the 60 MW Network Resource was already included in the 2002 Summer Peak Model.

## **4. Study Results**

### **A. Steady-State Contingency Analysis Results**

Tables 1 and 2 contain the analysis results of the steady-state contingency analysis. The tables identify the seasonal case in which the event occurred; the emergency rating of the overloaded circuit (Rate B) if applicable, the contingent loading percentage of the circuit or per unit voltage, and any solutions received from Western Resources.

Table 1 contains the voltage violations found below ten percent of the nominal voltages respectively for contingency conditions. SPP criterion states that transmission system voltages must be maintained within plus or minus 10% of nominal voltage on load serving buses for contingency conditions. Table 2 contains the Western Resources Network Facilities overloaded above 100% of their emergency ratings for contingency conditions. All of the Network Facility limits identified were mitigated by Western Resources through either Generation Redispatch, Planned Upgrades, or established Transmission Operating Directives.

### **B. Generation Sensitivity Analysis Results**

Table 3 contains the Network Facilities that limit the studied 200 MW transfer from Internal Network Resources to Network Load for the 2001/02 Winter Peak, 2002 Summer Peak, and 2002/03 Winter Peak. For each numbered constraint found in Table 3, a generation adjustment table documents the dispatches that cause these reduced FCITCs. All of Network Facility limits identified were mitigated by Western Resources through either Generation Redispatch or established Transmission Operating Directives. No other SPP or Non-SPP Facilities were identified as limitations.

For an explanation of the columns found in Table 3 the following descriptions are included. The Worst Dispatch FCITC column contains the FCITC that results from the Worst Dispatch found in the Limiting Constraints Generator adjustments page. The Base FCITC is the FCITC that results from a dispatch using the scaling factors described in the model update section and can be seen under the column Study PF in the Limiting Constraints Generator adjustments page. The Study Flow column is the flow on the line when the Worst Dispatch FCITC number is used with the scaling factors above, which has a flow less than the limit. In addition, the study scaling factors dispatch has the specified Outage Transfer Distribution Factor (OTDF) shown in Table 3.

### **C. Linear FCITC Analysis Results**

Table 4 contains the Network Facilities that limit the transfer of power from the External Network Resources to Internal Network Resources for the 2001/02 Winter Peak, 2002 Summer Peak, and 2002/03 Winter Peak. The tables identify the seasonal case of the transfer; the transfer and transfer level, the FCITC, the from bus and to bus Control Area or owner, the limiting constraint, the rating of the constraint, the base and contingent MW flow on the constraint, the loading percentage of the constraint with and without the studied transfer, the contingency, distribution factors, any SPP identification or assignment of the event, and any solutions received from the transmission owners.

Table 4 includes transfers from the External Network Resources to the Internal Network Resources for the winter peak cases and 2002 Summer Peak. The two different Internal Network

Resources subsystems are labeled “WR\_IM\_1” and “WR\_IM\_2”. The subsystem “WR\_IM\_1” includes all on-line Internal Network Resources, excluding Wolf Creek. The subsystem “WR\_IM\_2” includes all on-line Internal Network Resources, excluding Wolf Creek and the other must-run units, which includes the Jeffrey Units, the La Cygne Units, and Lawrence Unit 5. The use of subsystem “WR\_IM\_2” was used only in 2002 Summer Peak. The single Western Resources limitation was mitigated with an established Operating Directive.



**Table 1** – Western Resources’ Network Facilities with Voltages less than 10% of Nominal

CASE	BUS #	AREA 536 BUSES WITH VOLTAGE LESS THAN 0.9000 PU:	KV	V (PU) AFTER CONT.	V (PU) BEFORE CONT.	CONTINGENCY - OPEN BRANCH FROM BUS TO BUS	MITIGATION PLAN, SOLUTION
01WP	57011	HALSTEAD 138 KV NORTH BUS	138	0.8717	1.0088	57040/57065 EVANS ENERGY CENTER TO SEDGWICK COUNTY NO. 12 COLWICH, 138KV	Directive 1105
01WP	57013	MOUNDRIDGE	138	0.8171	1.0038	57011/57013 HALSTEAD NORTH BUS TO MOUNDRIDGE, 138KV	"
01WP	57065	SEDGWICK COUNTY NO. 12 COLWICH	138	0.8712	1.0180	57040/57065 EVANS ENERGY CENTER TO SEDGWICK COUNTY NO. 12 COLWICH, 138KV	"
01WP	57732	BURRTON	69	0.8587	0.9770	"	"
01WP	57736	HALSTEAD	69	0.8669	0.9842	"	"
02AP	56996	TIOGA	138	0.8939	0.9953	56996/57001 TIOGA TO ALTOONA, 138KV	Directive 503
02AP	57013	MOUNDRIDGE	138	0.8583	1.0354	57011/57013 HALSTEAD NORTH BUS TO MOUNDRIDGE, 138KV	Directive 1105
02G	57011	HALSTEAD 138 KV NORTH BUS	138	0.8254	1.0059	"	Directive 1105
02G	57012	HALSTEAD 138 KV SOUTH BUS	138	0.8254	1.0059	"	"
02G	57013	MOUNDRIDGE	138	0.8162	1.0002	"	"
02G	57065	SEDGWICK COUNTY NO. 12 COLWICH	138	0.8247	1.0175	"	"
02G	57732	BURRTON	69	0.8109	0.9726	"	"
02G	57733	GATZ	69	0.8947	0.9742	"	"
02G	57734	GOLDEN PLAINS	69	0.8980	0.9877	"	"
02G	57735	GOLDEN PLAINS JUNCTION	69	0.8984	0.9881	"	"
02G	57736	HALSTEAD	69	0.8208	0.9807	"	"
02G	57740	MID AM	69	0.8678	0.9747	"	"
02G	57741	MID AM JUNCTION	69	0.8678	0.9747	"	"
02G	57743	MUD CREEK	69	0.8619	0.9753	"	"
02G	57744	MUD CREEK JUNCTION	69	0.8620	0.9753	"	"
02G	57745	NEWTON	69	0.8905	0.9725	"	"
02SP	56912	EDWARDSVILLE	161	0.8798	1.013	56912/58742 EDWARDSVILLE TO METRO, 161KV	Isolated Bus & No Load
02SP	56996	TIOGA	138	0.8940	0.9798	56996/57001 TIOGA TO ALTOONA, 138KV	Directive 503
02SP	57011	HALSTEAD 138 KV NORTH BUS	138	0.6682	1.0113	57040/57065 EVANS ENERGY CENTER TO SEDGWICK COUNTY NO. 12 COLWICH, 138KV	Directive 1105
02SP	57012	HALSTEAD 138 KV SOUTH BUS	138	0.6682	1.0113	"	"
02SP	57013	MOUNDRIDGE	138	0.6617	1.0052	"	"
02SP	57065	SEDGWICK COUNTY NO. 12 COLWICH	138	0.6669	1.0266	"	"
02SP	57485	WATHENA	69	0.8943	0.9468	57211/57268 ARNOLD TO STRANGER CREEK, 115KV	Directive 1200
02SP	57652	WARE	69	0.8545	0.9936	57765/57769 LITCHFIELD TO PITNAC, 69KV	Local Problem
02SP	57732	BURRTON	69	0.6468	0.9743	57040/57065 EVANS ENERGY CENTER TO SEDGWICK COUNTY NO. 12 COLWICH, 138KV	Directive 1105
02SP	57733	GATZ	69	0.7414	0.9728	"	"
02SP	57734	GOLDEN PLAINS	69	0.7330	0.9878	"	"
02SP	57735	GOLDEN PLAINS JUNCTION	69	0.7337	0.9883	"	"
02SP	57736	HALSTEAD	69	0.6638	0.9855	"	"
02SP	57737	HESSTON	69	0.7356	0.9901	"	"
02SP	57738	MAHANNA	69	0.8486	0.9959	"	"
02SP	57740	MID AM	69	0.7173	0.9762	"	"
02SP	57741	MID AM JUNCTION	69	0.7174	0.9763	"	"
02SP	57742	MOUNDRIDGE	69	0.7489	1.0032	"	"
02SP	57743	MUD CREEK	69	0.7105	0.9771	"	"
02SP	57744	MUD CREEK JUNCTION	69	0.7106	0.9772	"	"
02SP	57745	NEWTON	69	0.7441	0.9731	"	"
02SP	57747	YOST	69	0.7392	0.9937	"	"

**Table 1 continued** – Western Resources’ Facilities with Voltages less than 10% of Nominal

CASE	BUS #	AREA 536 BUSES WITH VOLTAGE LESS THAN 0.9000 PU:	KV	V (PU) AFTER CONT.	V (PU) BEFORE CONT.	CONTINGENCY - OPEN BRANCH FROM BUS TO BUS	MITIGATION PLAN, SOLUTION
02SP	57757	CATO	69	0.8482	0.9955	57765/57769 LITCHFIELD TO PITNAC, 69KV	Local Problem
02SP	57767	MULBERRY	69	0.8413	0.9998	"	"
02SP	57769	PITNAC	69	0.8374	1.005	"	"
02SP	57773	SEKAN NO. 8 CLEMONS	69	0.8482	0.9955	"	"
02SP	57774	SHEFFIELD	69	0.8478	0.9957	"	"
02FA	57011	HALSTEAD 138 KV NORTH BUS	138	0.8249	1.0058	57040/57065 EVANS ENERGY CENTER TO SEDGWICK COUNTY NO. 12 COLWICH, 138KV	Directive 1105
02FA	57011	"	138	0.8375	1.0058	57012/57065 HALSTEAD SOUTH BUS TO SEDGWICK COUNTY NO. 12 COLWICH, 138KV	"
02FA	57012	HALSTEAD 138 KV SOUTH BUS	138	0.8249	1.0058	57040/57065 EVANS ENERGY CENTER TO SEDGWICK COUNTY NO. 12 COLWICH, 138KV	"
02FA	57012	"	138	0.8375	1.0058	57012/57065 HALSTEAD SOUTH BUS TO SEDGWICK COUNTY NO. 12 COLWICH, 138KV	"
02FA	57013	MOUNDRIDGE	138	0.8156	1.0001	57040/57065 EVANS ENERGY CENTER TO SEDGWICK COUNTY NO. 12 COLWICH, 138KV	"
02FA	57013	"	138	0.8280	1.0001	57012/57065 HALSTEAD SOUTH BUS TO SEDGWICK COUNTY NO. 12 COLWICH, 138KV	"
02FA	57065	SEDGWICK COUNTY NO. 12 COLWICH	138	0.8242	1.0175	57040/57065 EVANS ENERGY CENTER TO SEDGWICK COUNTY NO. 12 COLWICH, 138KV	"
02FA	57732	BURRTON	69	0.8101	0.9724	"	"
02FA	57732	"	69	0.8230	0.9724	57012/57065 HALSTEAD SOUTH BUS TO SEDGWICK COUNTY NO. 12 COLWICH, 138KV	"
02FA	57733	GATZ	69	0.8942	0.9741	57040/57065 EVANS ENERGY CENTER TO SEDGWICK COUNTY NO. 12 COLWICH, 138KV	"
02FA	57734	GOLDEN PLAINS	69	0.8974	0.9877	"	"
02FA	57735	GOLDEN PLAINS JUNCTION	69	0.8978	0.9881	"	"
02FA	57736	HALSTEAD	69	0.8202	0.9807	"	"
02FA	57736	"	69	0.8329	0.9807	57012/57065 HALSTEAD SOUTH BUS TO SEDGWICK COUNTY NO. 12 COLWICH, 138KV	"
02FA	57740	MID AM	69	0.8673	0.9746	57040/57065 EVANS ENERGY CENTER TO SEDGWICK COUNTY NO. 12 COLWICH, 138KV	"
02FA	57740	"	69	0.8790	0.9746	57012/57065 HALSTEAD SOUTH BUS TO SEDGWICK COUNTY NO. 12 COLWICH, 138KV	"
02FA	57741	MID AM JUNCTION	69	0.8673	0.9746	57040/57065 EVANS ENERGY CENTER TO SEDGWICK COUNTY NO. 12 COLWICH, 138KV	"
02FA	57741	"	69	0.8790	0.9746	57012/57065 HALSTEAD SOUTH BUS TO SEDGWICK COUNTY NO. 12 COLWICH, 138KV	"
02FA	57743	MUD CREEK	69	0.8614	0.9752	57040/57065 EVANS ENERGY CENTER TO SEDGWICK COUNTY NO. 12 COLWICH, 138KV	"
02FA	57743	"	69	0.8733	0.9752	57012/57065 HALSTEAD SOUTH BUS TO SEDGWICK COUNTY NO. 12 COLWICH, 138KV	"
02FA	57744	MUD CREEK JUNCTION	69	0.8615	0.9753	57040/57065 EVANS ENERGY CENTER TO SEDGWICK COUNTY NO. 12 COLWICH, 138KV	"
02FA	57744	"	69	0.8733	0.9753	57012/57065 HALSTEAD SOUTH BUS TO SEDGWICK COUNTY NO. 12 COLWICH, 138KV	"
02FA	57745	NEWTON	69	0.8900	0.9725	57040/57065 EVANS ENERGY CENTER TO SEDGWICK COUNTY NO. 12 COLWICH, 138KV	"
02WP	57011	HALSTEAD 138 KV NORTH BUS	138	0.8634	1.0082	57040/57065 EVANS ENERGY CENTER TO SEDGWICK COUNTY NO. 12 COLWICH, 138KV	Directive 1105
02WP	57012	HALSTEAD 138 KV SOUTH BUS	138	0.8634	1.0082	"	"
02WP	57013	MOUNDRIDGE	138	0.8146	1.003	57011/57013 HALSTEAD NORTH BUS TO MOUNDRIDGE, 138KV	"
02WP	57065	SEDGWICK COUNTY NO. 12 COLWICH	138	0.8629	1.0179	57040/57065 EVANS ENERGY CENTER TO SEDGWICK COUNTY NO. 12 COLWICH, 138KV	"
02WP	57732	BURRTON	69	0.8502	0.9762	"	"
02WP	57736	HALSTEAD	69	0.8587	0.9836	"	"
02WP	57743	MUD CREEK	69	0.8988	0.9798	"	"
02WP	57744	MUD CREEK JUNCTION	69	0.8989	0.9799	"	"

**Table 2** – Western Resources Network Facilities with Thermal Loading above 100% Rate B

Study Year	Overloaded Branch	Rate B	% Loading	Outaged Branch	Mitigation Plan, Solution
01WP	ANZIO TO FORT JUNCTION SWITCHING STATION, 115KV 57321 ANZIO 3 115 TO 57328 FT JCT 3 115 CKT1	92	106.2	FORT JCT SWITCHING STATION TO WEST JCT CITY JCT (EAST) 57342 WJCCTY 3 115 TO 57343 WJCCTYE3 115 CKT1	Increase West-End Generation
01WP	FORT JCT SWITCHING STATION TO WEST JCT CITY JCT (EAST) 115KV 57328 FT JCT 3 115 TO 57343 WJCCTYE3 115 CKT1	68	120.6	FORT JCT SWITCHING STATION TO WEST JCT CITY JCT (EAST) 57328 FT JCT 3 115 TO 57343 WJCCTYE3 115 CKT2	Invalid Contingency
01WP	"	68	103.7	SUMMIT 345/230 KV TRANSFORMER 56773 SUMMIT 7 345 TO 56813 SUMMIT7X1.00 CKT1	Increase West-End Generation Directive 401,402
01WP	"	68	103.6	JEFFREY ENERGY CENTER TO SUMMIT, 345KV 56766 JEC N 7 345 TO 56773 SUMMIT 7 345 CKT1	Increase West-End Generation Directive 401,402
01WP	WEST JUNCTION CITY TO WEST JUNCTION CITY JUNCTION (EAST) 57342 WJCCTY 3 115 TO 57343 WJCCTYE3 115 CKT1	141	109.2	SUMMIT 345/230 KV TRANSFORMER 56773 SUMMIT 7 345 TO 56813 SUMMIT7X1.00 CKT1	Increase West-End Generation Directive 401,402
01WP	"	141	109.1	JEFFREY ENERGY CENTER TO SUMMIT, 345KV 56766 JEC N 7 345 TO 56773 SUMMIT 7 345 CKT1	Increase West-End Generation Directive 401,402
01WP	EXIDE JUNCTION TO SUMMIT, 115KV 57368 EXIDE J3 115 TO 57381 SUMMIT 3 115 CKT1	181	103.5	EAST MCPHERSON TO SUMMIT, 230KV 56872 EMCIPHER6 230 TO 56873 SUMMIT 6 230 CKT1	Increase Hutchison Energy Center Generation
01WP	NORTH AMERICAN PHILIPS TO NORTH AMERICAN PHILIPS JCT SOUTH 57372 PHILIPS3 115 TO 57374 SPHILPJ3 115 CKT1	160	106.7	EAST MCPHERSON TO SUMMIT, 230KV 56872 EMCIPHER6 230 TO 56873 SUMMIT 6 230 CKT1	Increase Hutchison Energy Center Generation
01WP	NORTH AMERICAN PHILIPS JCT SOUTH TO WEST MCPHERSON, 115KV CKT 1 57374 SPHILPJ3 115 TO 57438 WMCPHER3 115 CKT1	68	115.2	EAST MCPHERSON TO SUMMIT, 230KV 56872 EMCIPHER6 230 TO 56873 SUMMIT 6 230 CKT1	Increase Hutchison Energy Center Generation
01WP	NORTH AMERICAN PHILIPS JCT SOUTH TO WEST MCPHERSON, 115KV CKT 2 57374 SPHILPJ3 115 TO 57438 WMCPHER3 115 CKT2	92	100.5	EAST MCPHERSON TO SUMMIT, 230KV 56872 EMCIPHER6 230 TO 56873 SUMMIT 6 230 CKT1	Increase Hutchison Energy Center Generation
02G	HALSTEAD SOUTH BUS 138/69KV TRANSFORMER 57012 HALSTDS4 138 TO 57736 HALSTED269.0 CKT1	55	109.3	HALSTEAD NORTH BUS TO HALSTEAD SOUTH BUS, 138KV 57011 HALSTDN4 138 TO 57012 HALSTDS4 138 CKT1	Invalid Contingency
02G	AUBURN ROAD TO KEENE, 115KV 57151 AUBURN 3 115 TO 57167 KEENE 3 115 CKT1	68	102.2	JEFFREY ENERGY CENTER TO EAST MANHATTAN 230 KV 56852 JEC 6 230 TO 56861 EMANHAT6 230 CKT1	Increase West-End Generation Directive 900
02G	HOYT TO HOYT HTI SWITCHING JUNCTION, 115KV 57163 HOYT 3 115 TO 57165 HTI JCT3 115 CKT1	92	100.7	HOYT TO STRANGER CREEK, 345KV 56765 HOYT 7 345 TO 56772 STRANGR7 345 CKT1	Directive 803, Upgrade Assigned to 2001-21 1 02SP New Rate B=120MVA
02G	ANZIO TO FORT JUNCTION SWITCHING STATION 115KV 57321 ANZIO 3 115 TO 57328 FT JCT 3 115 CKT1	92	101.3	WEST JUNCTION CITY TO WEST JUNCTION CITY JCT (EAST) 57342 WJCCTY 3 115 TO 57343 WJCCTYE3 115 CKT1	Increase West-End Generation
02G	FORT JCT SWITCHING STATION TO WEST JCT CITY JCT (EAST) 115KV 57328 FT JCT 3 115 TO 57343 WJCCTYE3 115 CKT1	68	112.2	FORT JCT SWITCHING STATION TO WEST JCT CITY JCT (EAST) 57328 FT JCT 3 115 TO 57343 WJCCTYE3 115 CKT2	Invalid Contingency
02G	"	68	103.1	SUMMIT 230/115KV TRANSFORMER 56873 SUMMIT 6 230 TO 57381 SUMMIT 3 115 CKT1	Increase West-End Generation
02G	WEST JUNCTION CITY TO WEST JUNCTION CITY JUNCTION (EAST) 57342 WJCCTY 3 115 TO 57343 WJCCTYE3 115 CKT1	141	108.6	SUMMIT 230/115KV TRANSFORMER 56873 SUMMIT 6 230 TO 57381 SUMMIT 3 115 CKT1	Increase West-End Generation
02G	"	141	103.3	JEFFREY ENERGY CENTER TO SUMMIT, 345KV 56766 JEC N 7 345 TO 56773 SUMMIT 7 345 CKT1	Increase West-End Generation Directive 401,402
02G	"	141	103.2	SUMMIT 345/230 KV TRANSFORMER 56773 SUMMIT 7 345 TO 56813 SUMMIT7X1.00 CKT1	Increase West-End Generation Directive 401,402
02G	SANDHILL ARK VALLEY CO-OP D.P. JUNCTION TO CIRCLE, 115KV 57412 ARKVALJ3 115 TO 57413 CIRCLE 3 115 CKT1	68	107.7	CIRCLE TO DAVIS, 115KV 57413 CIRCLE 3 115 TO 57415 DAVIS 3 115 CKT1	Directive 1205
02G	SANDHILL ARK VALLEY CO-OP D.P. JUNCTION TO 3RD & VAN BUREN 57412 ARKVALJ3 115 TO 57435 3 VANBU3 115 CKT1	68	104.1	CIRCLE TO DAVIS, 115KV 57413 CIRCLE 3 115 TO 57415 DAVIS 3 115 CKT1	Directive 1205

**Table 2 continued** – Western Resources Network Facilities with Thermal Loading above 100% Rate B

Study Year	Overloaded Branch	Rate B	% Loading	Outaged Branch	Mitigation Plan, Solution
02G	<b>E &amp; MADISON JUNCTION TO 3RD &amp; VAN BUREN, 69KV</b> 57508 E MADSN269.0 TO 57527 3 VANBU269.0 CKT1	41	102.9	<b>CIRCLE TO DAVIS, 115KV</b> 57413 CIRCLE 3 115 TO 57415 DAVIS 3 115 CKT1	Directive 1205
02G	<b>GRANT JUNCTION (WEST) TO RIPLEY MIDDLE BUS SECTION, 69KV</b> 57800 GRANT J269.0 TO 57832 RIPLEYM269.0 CKT1	108	100.5	<b>EVANS ENERGY CENTER NORTH TO SEDGWICK COUNTY #12</b> 57040 EVANS N4 138 TO 57065 SG12COL4 138 CKT1	Directive 1105
02SP	<b>AUBURN ROAD 230/115KV TRANSFORMER</b> 56851 AUBURN 6 230 TO 57151 AUBURN 3 115 CKT1	308	113.6	<b>HOYT TO JEFFREY ENERGY CENTER 345 KV NORTH BUS</b> 56765 HOYT 7 345 TO 56766 JEC N 7 345 CKT1	Directive 400
02SP	"	308	103.3	<b>HOYT 345/115KV TRANSFORMER</b> 56765 HOYT 7 345 TO 56804 HOYT 7X1.00 CKT1	Directive 400
02SP	"	308	102.1	<b>JEFFREY ENERGY CENTER TO EAST MANHATTAN 230 KV</b> 56852 JEC 6 230 TO 56861 EMANHAT6 230 CKT1	Increase West-End Generation Directive 900
02SP	<b>LAWRENCE HILL 230/115KV TRANSFORMER</b> 56853 LAWHILL6 230 TO 57250 LWRNCHL3 115 CKT1	308	105.3	<b>MIDLAND JUNCTION 230/115KV TRANSFORMER</b> 56855 MIDLAND6 230 TO 57252 MIDLAND3 115 CKT1	Directive 615
02SP	"	308	105.2	<b>LAWRENCE HILL TO MIDLAND, 230KV</b> 56853 LAWHILL6 230 TO 56855 MIDLAND6 230 CKT1	Directive 615
02SP	<b>HALSTEAD SOUTH BUS 138/69KV TRANSFORMER</b> 57012 HALSTDS4 138 TO 57736 HALSTED269.0 CKT1	55	149.1	<b>HALSTEAD NORTH BUS TO HALSTEAD SOUTH BUS, 138KV</b> 57011 HALSTDN4 138 TO 57012 HALSTDS4 138 CKT1	Invalid Contingency
02SP	<b>AUBURN ROAD TO INDIAN HILLS 115 KV</b> 57151 AUBURN 3 115 TO 57166 INDIANH3 115 CKT1	118	118.6	<b>HOYT TO JEFFREY ENERGY CENTER 345 KV NORTH BUS</b> 56765 HOYT 7 345 TO 56766 JEC N 7 345 CKT1	Directive 400
02SP	"	118	101.9	<b>HOYT 345/115KV TRANSFORMER</b> 56765 HOYT 7 345 TO 56804 HOYT 7X1.00 CKT1	Directive 400
02SP	<b>AUBURN ROAD TO KEENE, 115KV</b> 57151 AUBURN 3 115 TO 57167 KEENE 3 115 CKT1	68	109.2	<b>JEFFREY ENERGY CENTER TO EAST MANHATTAN 230 KV</b> 56852 JEC 6 230 TO 56861 EMANHAT6 230 CKT1	Increase West-End Generation Directive 900
02SP	<b>CIRCLEVILLE TO HOYT HTI SWITCHING JUNCTION, 115KV</b> 57152 CIRCLVL3 115 TO 57165 HTI JCT3 115 CKT1	92	102.8	<b>HOYT TO STRANGER CREEK, 345KV</b> 56765 HOYT 7 345 TO 56772 STRANGR7 345 CKT1	Directive 803, Upgrade Assigned to 2001-227 02SP New Rate B=97MVA
02SP	<b>41ST &amp; CALIFORNIA TO 27TH &amp; CROCO JUNCTION, 115KV</b> 57160 41CALIF3 115 TO 57188 27CROCJ3 115 CKT1	68	106.7	<b>AUBURN ROAD 230/115KV TRANSFORMER</b> 56851 AUBURN 6 230 TO 57151 AUBURN 3 115 CKT1	Directive 618
02SP	<b>HOYT TO HOYT HTI SWITCHING JUNCTION, 115KV</b> 57163 HOYT 3 115 TO 57165 HTI JCT3 115 CKT1	92	109.4	<b>HOYT TO STRANGER CREEK, 345KV</b> 56765 HOYT 7 345 TO 56772 STRANGR7 345 CKT1	Directive 803, Upgrade Assigned to 2001-211 02SP New Rate B=120MVA
02SP	"	92	100.5	<b>KELLY 161/115KV TRANSFORMER</b> 56913 KELLY 5 161 TO 57217 KELLY 3 115 CKT1	Upgrade Assigned to 2001-211 New 02SP Rate B=120MVA
02SP	<b>KEENE TO SOUTH ALMA, 115KV</b> 57167 KEENE 3 115 TO 57339 S ALMA 3 115 CKT1	68	101.9	<b>JEFFREY ENERGY CENTER TO EAST MANHATTAN 230 KV</b> 56852 JEC 6 230 TO 56861 EMANHAT6 230 CKT1	Increase West-End Generation Directive 900
02SP	<b>TECUMSEH HILL EAST BUS TO 27TH &amp; CROCO, 115KV CKT 1</b> 57182 TECHILE3 115 TO 57187 27CROCO3 115 CKT1	68	117.1	<b>AUBURN ROAD 230/115KV TRANSFORMER</b> 56851 AUBURN 6 230 TO 57151 AUBURN 3 115 CKT1	Directive 618
02SP	"	68	110.6	<b>TECUMSEH HILL EAST BUS TO 27TH &amp; CROCO, 115KV CKT 2</b> 57182 TECHILE3 115 TO 57187 27CROCO3 115 CKT2	Invalid Contingency
02SP	<b>TECUMSEH HILL EAST BUS TO 27TH &amp; CROCO, 115KV CKT 2</b> 57182 TECHILE3 115 TO 57187 27CROCO3 115 CKT2	92	103.2	<b>AUBURN ROAD 230/115KV TRANSFORMER</b> 56851 AUBURN 6 230 TO 57151 AUBURN 3 115 CKT1	Directive 618
02SP	<b>KERFORD JUNCTION TO NORTHWEST LEAVENWORTH, 115KV</b> 57216 KERFORD3 115 TO 57259 NW LEAV3 115 CKT1	68	118.7	<b>ARNOLD TO STRANGER CREEK, 115KV</b> 57211 ARNOLD 3 115 TO 57268 STRANGR3 115 CKT1	Directive 1200
02SP	<b>LAWRENCE HILL TO WREN, 115KV</b> 57250 LWRNCHL3 115 TO 57280 WREN 3 115 CKT1	141	105.4	<b>MOCKINGBIRD HILL SW. STATION TO SOUTHWEST LAWRENCE</b> 57253 MOCKBRD3 115 TO 57271 SWLWRNC3 115 CKT1	Installing Baldwin Creek-SW Lawrence Line

**Table 2 continued** – Western Resources Network Facilities with Thermal Loading above 100% Rate B

Study Year	Overloaded Branch	Rate B	% Loading	Outaged Branch	Mitigation Plan, Solution
02SP	<b>LAWRENCE HILL TO WREN, 115KV</b> 57250 LWRNCHL3 115 TO 57280 WREN 3 115 CKT1	141	102.5	<b>BISMARK JCT SW. STATION TO FARMER'S CO-OP, 115KV</b> 57234 BISMARK3 115 TO 57236 COOP 3 115 CKT1	Directive 1210, Installing Baldwin Creek-SW Lawrence Line
02SP	<b>EAST STREET TO WEST EMPORIA, 115KV</b> 57301 EAST ST3 115 TO 57309 WEMPOR3 115 CKT1	92	100.7	<b>MORRIS COUNTY 230/115KV TRANSFORMER</b> 56863 MORRIS 6 230 TO 57305 MORRIS 3 115 CKT1	Directive 625
02SP	<b>NORTH AMERICAN PHILIPS TO NORTH AMERICAN PHILIPS JCT SOUTH</b> 57372 PHILIPS3 115 TO 57374 SPHILPJ3 115 CKT1	160	102.3	<b>SUMMIT 230/115KV TRANSFORMER</b> 56873 SUMMIT 6 230 TO 57381 SUMMIT 3 115 CKT1	Increase West-End Generation
02SP	<b>NORTH AMERICAN PHILIPS JCT SOUTH TO WEST MCPHERSON, 115KV CKT 1</b> 57374 SPHILPJ3 115 TO 57438 WMCPHER3 115 CKT1	68	110.9	<b>SUMMIT 230/115KV TRANSFORMER</b> 56873 SUMMIT 6 230 TO 57381 SUMMIT 3 115 CKT1	Directive 613
02SP	<b>SANDHILL ARK VALLEY CO-OP D.P. JUNCTION TO CIRCLE, 115KV</b> 57412 ARKVALJ3 115 TO 57413 CIRCLE 3 115 CKT1	68	123.2	<b>CIRCLE TO DAVIS, 115KV</b> 57413 CIRCLE 3 115 TO 57415 DAVIS 3 115 CKT1	Directive 1205
02SP	"	68	119.6	<b>43RD &amp; LORRAINE TO HUTCHISON, 69KV</b> 57512 43LORAN269.0 TO 57513 HEC 269.0 CKT1	Directive 1307
02SP	"	68	103.9	<b>43RD &amp; LORRAINE TO MEADOWLARK, 69KV</b> 57512 43LORAN269.0 TO 57517 MEADOW 269.0 CKT1	Directive 1308
02SP	<b>SANDHILL ARK VALLEY CO-OP D.P. JUNCTION TO 3RD &amp; VAN BUREN</b> 57412 ARKVALJ3 115 TO 57435 3 VANBU3 115 CKT1	68	118.2	<b>CIRCLE TO DAVIS, 115KV</b> 57413 CIRCLE 3 115 TO 57415 DAVIS 3 115 CKT1	Directive 1205
02SP	"	68	114.6	<b>43RD &amp; LORRAINE TO HUTCHISON, 69KV</b> 57512 43LORAN269.0 TO 57513 HEC 269.0 CKT1	Directive 1307
02SP	<b>ARNOLD TO MIDWEST GRAIN SOLVENTS JUNCTION #2, 69KV</b> 57471 ARNOLD 269.0 TO 57479 MWSOLJ2269.0 CKT1	41	100.7	<b>ARNOLD TO PARALLEL, 115KV</b> 57211 ARNOLD 3 115 TO 57218 PARALEL3 115 CKT1	Atchison steel tower 69kV line operated paralleled.
02SP	<b>ATCHISON JUNCTION #2 TO WALNUT STREET, 69KV</b> 57473 ATCH J2269.0 TO 57484 WALNUT 269.0 CKT1	41	107.1	<b>ARNOLD TO PARALLEL, 115KV</b> 57211 ARNOLD 3 115 TO 57218 PARALEL3 115 CKT1	Rebuilding Atchison to Walnut 69kV Line
02SP	<b>DAVIS TO MAPLE STREET JUNCTION, 69KV</b> 57506 DAVIS 269.0 TO 57516 MAPLE J269.0 CKT1	43	102.1	<b>CIRCLE TO DAVIS, 115KV</b> 57413 CIRCLE 3 115 TO 57415 DAVIS 3 115 CKT1	Directive 1205
02SP	<b>E &amp; MADISON JUNCTION TO MAPLE STREET JUNCTION, 69KV</b> 57508 E MADSN269.0 TO 57516 MAPLE J269.0 CKT1	41	120.8	<b>CIRCLE TO DAVIS, 115KV</b> 57413 CIRCLE 3 115 TO 57415 DAVIS 3 115 CKT1	Directive 1205
02SP	<b>E &amp; MADISON JUNCTION TO 3RD &amp; VAN BUREN, 69KV</b> 57508 E MADSN269.0 TO 57527 3 VANBU269.0 CKT1	41	139.7	<b>CIRCLE TO DAVIS, 115KV</b> 57413 CIRCLE 3 115 TO 57415 DAVIS 3 115 CKT1	Directive 1205
02SP	<b>HUTCHINSON TO HUTCHINSON GAS TURBINE STATION, 69KV</b> 57513 HEC 269.0 TO 57514 HEC GT 269.0 CKT1	130	104.0	<b>CIRCLE TO HUTCHINSON GAS TURBINE STATION, 115KV</b> 57413 CIRCLE 3 115 TO 57421 HEC GT 3 115 CKT1	Directive 1204
02SP	<b>MARMATON TO MCKEE, 69KV</b> 57639 MARMATN269.0 TO 57640 MCKEE 269.0 CKT1	72	102.1	<b>LITCHFIELD TO PITNAC, 69KV</b> 57765 LITCH 269.0 TO 57769 PITNAC 269.0 CKT1	Local Area Problem Not Subject To NERC
02SP	<b>GATZ TO GOLDEN PLAINS JUNCTION, 69KV</b> 57733 GATZ 269.0 TO 57735 GOLDPLJ269.0 CKT1	32	123.4	<b>HALSTEAD TO MUD CREEK JUNCTION, 69KV</b> 57736 HALSTED269.0 TO 57744 MUDCRKJ269.0 CKT1	Local Area Problem Not Subject To NERC
02SP	"	32	122.0	<b>MID AM JUNCTION TO MUD CREEK JUNCTION, 69KV</b> 57741 MID AMJ269.0 TO 57744 MUDCRKJ269.0 CKT1	Local Area Problem Not Subject To NERC
02SP	"	32	121.0	<b>MID AM JUNCTION TO NEWTON, 69KV</b> 57741 MID AMJ269.0 TO 57745 NEWTON 269.0 CKT1	Local Area Problem Not Subject To NERC
02SP	"	32	117.6	<b>GRANT JUNCTION (WEST) TO RIPLEY MIDDLE BUS SECTION, 69KV</b> 57800 GRANT J269.0 TO 57832 RIPLEYM269.0 CKT1	Local Area Problem Not Subject To NERC
02SP	<b>GOLDEN PLAINS JUNCTION TO HESSTON, 69KV</b> 57735 GOLDPLJ269.0 TO 57737 HESSTON269.0 CKT1	32	125.9	<b>HALSTEAD TO MUD CREEK JUNCTION, 69KV</b> 57736 HALSTED269.0 TO 57744 MUDCRKJ269.0 CKT1	Local Area Problem Not Subject To NERC
02SP	"	32	124.6	<b>MID AM JUNCTION TO MUD CREEK JUNCTION, 69KV</b> 57741 MID AMJ269.0 TO 57744 MUDCRKJ269.0 CKT1	Local Area Problem Not Subject To NERC

**Table 2 continued** – Western Resources Network Facilities with Thermal Loading above 100% Rate B

Study Year	Overloaded Branch	Rate B	% Loading	Outaged Branch	Mitigation Plan, Solution
02SP	<b>GOLDEN PLAINS JUNCTION TO HESSTON, 69KV</b> 57735 GOLDPLJ269.0 TO 57737 HESSTON269.0 CKT1	32	123.6	<b>MID AM JUNCTION TO NEWTON, 69KV</b> 57741 MID AMJ269.0 TO 57745 NEWTON 269.0 CKT1	Local Area Problem Not Subject To NERC
02SP	"	32	120.0	<b>GRANT JUNCTION (WEST) TO RIPLEY MIDDLE BUS SECTION, 69KV</b> 57800 GRANT J269.0 TO 57832 RIPLEYM269.0 CKT1	Local Area Problem Not Subject To NERC
02SP	<b>MAHANNA TO NEWTON, 69KV</b> 57738 MAHANNA269.0 TO 57745 NEWTON 269.0 CKT1	101	145.2	<b>EVANS ENERGY CENTER NORTH TO SEDGWICK COUNTY #12</b> 57040 EVANS N4 138 TO 57065 SG12COL4 138 CKT1	Directive 1105
02SP	"	101	128.3	<b>HALSTEAD SOUTH TO SEDGWICK COUNTY #12</b> 57012 HALSTDS4 138 TO 57065 SG12COL4 138 CKT1	Directive 1105
02SP	<b>MAHANNA TO GRANT JUNCTION (WEST), 69KV</b> 57738 MAHANNA269.0 TO 57800 GRANT J269.0 CKT1	101	151.0	<b>EVANS ENERGY CENTER NORTH TO SEDGWICK COUNTY #12</b> 57040 EVANS N4 138 TO 57065 SG12COL4 138 CKT1	Directive 1105
02SP	"	101	133.8	<b>HALSTEAD SOUTH TO SEDGWICK COUNTY #12</b> 57012 HALSTDS4 138 TO 57065 SG12COL4 138 CKT1	Directive 1105
02SP	<b>CHISHOLM TO RIPLEY MIDDLE BUS SECTION, 69KV</b> 57786 CHISHLM269.0 TO 57832 RIPLEYM269.0 CKT1	143	107.9	<b>EVANS ENERGY CENTER NORTH TO SEDGWICK COUNTY #12</b> 57040 EVANS N4 138 TO 57065 SG12COL4 138 CKT1	Directive 1105
02SP	"	143	104.3	<b>HALSTEAD SOUTH TO SEDGWICK COUNTY #12</b> 57012 HALSTDS4 138 TO 57065 SG12COL4 138 CKT1	Directive 1105
02SP	<b>EASTBOROUGH TO MINNEHA JUNCTION SOUTH, 69KV</b> 57792 EASTBOR269.0 TO 57819 MINNEJS269.0 CKT1	72	113.3	<b>MINNEHA JUNCTION NORTH TO NORTHEAST EAST, 69KV</b> 57818 MINNEJN269.0 TO 57822 NOEASTE269.0 CKT1	Local Area Problem Not Subject To NERC
02SP	<b>GILL ENERGY CENTER EAST TO OATVILLE, 69KV</b> 57795 GILL E 269.0 TO 57825 OATVILL269.0 CKT1	72	110.9	<b>HOOVER NORTH BUS 138/69KV TRANSFORMER</b> 57049 HOOVERN4 138 TO 57805 HOOVERN269.0 CKT3	Directive 620
02SP	"	72	104.4	<b>GILL ENERGY CENTER EAST TO MACARTHUR, 69KV</b> 57795 GILL E 269.0 TO 57813 MACARTH269.0 CKT1	Local Area Problem Not Subject To NERC, Reduce GEC Generation
02SP	<b>GRANT JUNCTION (WEST) TO RIPLEY MIDDLE BUS SECTION, 69KV</b> 57800 GRANT J269.0 TO 57832 RIPLEYM269.0 CKT1	108	157.6	<b>EVANS ENERGY CENTER NORTH TO SEDGWICK COUNTY #12</b> 57040 EVANS N4 138 TO 57065 SG12COL4 138 CKT1	Directive 1105
02SP	"	108	141.6	<b>HALSTEAD SOUTH TO SEDGWICK COUNTY #12</b> 57012 HALSTDS4 138 TO 57065 SG12COL4 138 CKT1	Directive 1105
02SP	<b>MINNEHA JUNCTION SOUTH TO 64TH STREET, 69KV</b> 57819 MINNEJS269.0 TO 57842 64TH 269.0 CKT1	72	113.3	<b>MINNEHA JUNCTION NORTH TO NORTHEAST EAST, 69KV</b> 57818 MINNEJN269.0 TO 57822 NOEASTE269.0 CKT1	Local Area Problem Not Subject To NERC
02FA	<b>HALSTEAD SOUTH BUS 138/69KV TRANSFORMER</b> 57012 HALSTDS4 138 TO 57736 HALSTED269.0 CKT1	55	110.5	<b>HALSTEAD NORTH BUS TO HALSTEAD SOUTH BUS, 138KV</b> 57011 HALSTDN4 138 TO 57012 HALSTDS4 138 CKT1	Invalid Contingency
02FA	<b>AUBURN ROAD TO KEENE, 115KV</b> 57151 AUBURN 3 115 TO 57167 KEENE 3 115 CKT1	68	103.7	<b>JEFFREY ENERGY CENTER TO EAST MANHATTAN 230 KV</b> 56852 JEC 6 230 TO 56861 EMANHAT6 230 CKT1	Increase West-End Generation Directive 900
02FA	<b>CIRCLEVILLE TO HOYT HTI SWITCHING JUNCTION, 115KV</b> 57152 CIRCLVL3 115 TO 57165 HTI JCT3 115 CKT1	92	106.1	<b>HOYT TO STRANGER CREEK, 345KV</b> 56765 HOYT 7 345 TO 56772 STRANGR7 345 CKT1	Directive 803, Upgrade Assigned to 2001-227 02SP New Rate B=97MVA
02FA	<b>HOYT TO HOYT HTI SWITCHING JUNCTION, 115KV</b> 57163 HOYT 3 115 TO 57165 HTI JCT3 115 CKT1	92	111.0	<b>HOYT TO STRANGER CREEK, 345KV</b> 56765 HOYT 7 345 TO 56772 STRANGR7 345 CKT1	Directive 803, Upgrade Assigned to 2001-211 02SP New Rate B=120MVA
02FA	<b>ANZIO TO FORT JUNCTION SWITCHING STATION 115KV</b> 57321 ANZIO 3 115 TO 57328 FT JCT 3 115 CKT1	92	109.4	<b>WEST JUNCTION CITY TO WEST JUNCTION CITY JCT (EAST)</b> 57342 WJCCY3 115 TO 57343 WJCCY3 115 CKT1	Increase West-End Generation
02FA	<b>FORT JCT SW. STATION TO MCDOWELL CREEK SWITCHING STATION</b> 57328 FT JCT 3 115 TO 57335 MCDOWEL3 115 CKT1	68	102.2	<b>SUMMIT 230/115KV TRANSFORMER</b> 56873 SUMMIT 6 230 TO 57381 SUMMIT 3 115 CKT1	Increase West-End Generation
02FA	<b>FORT JCT SWITCHING STATION TO WEST JCT CITY JCT (EAST) 115KV</b> 57328 FT JCT 3 115 TO 57343 WJCCY3 115 CKT1	68	121.7	<b>FORT JCT SW. STATION TO WEST JUNCTION CITY JCT (EAST)</b> 57328 FT JCT 3 115 TO 57343 WJCCY3 115 CKT2	Invalid Contingency

**Table 2 continued** – Western Resources Network Facilities with Thermal Loading above 100% Rate B

Study Year	Overloaded Branch	Rate B	% Loading	Outaged Branch	Mitigation Plan, Solution
02FA	<b>FORT JCT SWITCHING STATION TO WEST JCT CITY JCT (EAST) 115KV</b> 57328 FT JCT 3 115 TO 57343 WJCCTYE3 115 CKT1	68	109.5	<b>SUMMIT 230/115KV TRANSFORMER</b> 56873 SUMMIT 6 230 TO 57381 SUMMIT 3 115 CKT1	Increase West-End Generation
02FA	<b>WEST JUNCTION CITY TO WEST JUNCTION CITY JUNCTION (EAST)</b> 57342 WJCCTY 3 115 TO 57343 WJCCTYE3 115 CKT1	141	115.3	<b>SUMMIT 230/115KV TRANSFORMER</b> 56873 SUMMIT 6 230 TO 57381 SUMMIT 3 115 CKT1	Increase West-End Generation
02FA	<b>SANDHILL ARK VALLEY CO-OP D.P. JUNCTION TO CIRCLE, 115KV</b> 57412 ARKVALJ3 115 TO 57413 CIRCLE 3 115 CKT1	68	108.1	<b>CIRCLE TO DAVIS, 115KV</b> 57413 CIRCLE 3 115 TO 57415 DAVIS 3 115 CKT1	Directive 1205
02FA	<b>SANDHILL ARK VALLEY CO-OP D.P. JUNCTION TO 3RD &amp; VAN BUREN</b> 57412 ARKVALJ3 115 TO 57435 3 VANBU3 115 CKT1	68	104.4	<b>CIRCLE TO DAVIS, 115KV</b> 57413 CIRCLE 3 115 TO 57415 DAVIS 3 115 CKT1	Directive 1205
02FA	<b>E &amp; MADISON JUNCTION TO 3RD &amp; VAN BUREN, 69KV</b> 57508 E MADSN269.0 TO 57527 3 VANBU269.0 CKT1	41	103.5	<b>CIRCLE TO DAVIS, 115KV</b> 57413 CIRCLE 3 115 TO 57415 DAVIS 3 115 CKT1	Directive 1205
02FA	<b>GRANT JUNCTION (WEST) TO RIPLEY MIDDLE BUS SECTION, 69KV</b> 57800 GRANT J269.0 TO 57832 RIPLEYM269.0 CKT1	108	100.8	<b>EVANS ENERGY CENTER NORTH TO SEDGWICK COUNTY #12</b> 57040 EVANS N4 138 TO 57065 SG12COL4 138 CKT1	Directive 1105
02WP	<b>EL PASO TO GILL ENERGY CENTER WEST BUS, 138 KV</b> 57039 ELPASO 4 138 TO 57045 GILL W4 138 CKT1	191	128.0	<b>EVANS ENERGY CENTER (NORTH TO SOUTH)</b> 57040 EVANS N4 138 TO 57041 EVANS S4 138 CKT1	Invalid Contingency
02WP	<b>AUBURN ROAD TO KEENE, 115KV</b> 57151 AUBURN 3 115 TO 57167 KEENE 3 115 CKT 1	68	103.3	<b>JEFFREY ENERGY CENTER TO EAST MANHATTAN</b> 56852 JEC 6230 TO 56861 EMANHAT6230 CKT1	Increase West-End Generation Directive 900
02WP	<b>HOYT TO HOYT HTI SWITCHING JUNCTION, 115KV</b> 57163 HOYT 3 115 TO 57165 HTI JCT3 115 CKT1	92	102.3	<b>HOYT TO STRANGER CREEK, 345KV</b> 56765 HOYT 7 345 TO 56772 STRANGR7 345 CKT1	Directive 803, Upgrade Assigned to 2001-211 02SP New Rate B=120MVA
02WP	<b>ANZIO TO FORT JUNCTION SWITCHING STATION 115KV</b> 57321 ANZIO 3 115 TO 57328 FT JCT 3 115 CKT1	92	108.2	<b>WEST JUNCTION CITY TO WEST JUNCTION CITY JCT (EAST)</b> 57342 WJCCTY 3 115 TO 57343 WJCCTYE3 115 CKT1	Increase West-End Generation
02WP	<b>FORT JCT SW. STATION TO MCDOWELL CREEK SW. STATION 115 KV</b> 57328 FT JCT 3 115 TO 57335 MCDOWEL3 115 CKT1	68	103.3	<b>SUMMIT 230/115KV TRANSFORMER</b> 56873 SUMMIT 6230 TO 57381 SUMMIT 3 115 CKT1	Increase West-End Generation
02WP	<b>FORT JCT SWITCHING STATION TO WEST JCT CITY JCT (EAST) 115KV</b> 57328 FT JCT 3 115 TO 57343 WJCCTYE3 115 CKT1	68	122.6	<b>FORT JCT SW. STATION TO WEST JUNCTION CITY JCT (EAST)</b> 57328 FT JCT 3 115 TO 57343 WJCCTYE3 115 CKT2	Invalid Contingency
02WP	"	68	105.8	<b>JEFFREY ENERGY CENTER TO SUMMIT, 345KV</b> 56766 JEC N 7 345 TO 56773 SUMMIT 7 345 CKT1	Increase West-End Generation Directive 401,402
02WP	"	68	105.6	<b>SUMMIT 345/230 KV TRANSFORMER</b> 56773 SUMMIT 7 345 TO 56813 SUMMIT7X1.00 CKT1	Increase West-End Generation Directive 401,402
02WP	<b>WEST JUNCTION CITY TO WEST JUNCTION CITY JUNCTION (EAST)</b> 57342 WJCCTY 3 115 TO 57343 WJCCTYE3 115 CKT1	141	122.4	<b>SUMMIT 230/115KV TRANSFORMER</b> 56873 SUMMIT 6230 TO 57381 SUMMIT 3 115 CKT1	Increase West-End Generation
02WP	"	141	111.4	<b>JEFFREY ENERGY CENTER TO SUMMIT, 345KV</b> 56766 JEC N 7 345 TO 56773 SUMMIT 7 345 CKT1	Increase West-End Generation Directive 401,402
02WP	"	141	111.2	<b>SUMMIT 345/230 KV TRANSFORMER</b> 56773 SUMMIT 7 345 TO 56813 SUMMIT7X1.00 CKT1	Increase West-End Generation Directive 401,402
02WP	<b>WEST JUNCTION CITY TO WEST JUNCTION CITY JUNCTION (WEST)</b> 57342 WJCCTY 3 115 TO 57344 WJCCTYW3 115 CKT1	141	105.7	<b>SUMMIT 230/115KV TRANSFORMER</b> 56873 SUMMIT 6230 TO 57381 SUMMIT 3 115 CKT1	Increase West-End Generation
02WP	<b>WEST JUNCTION CITY JUNCTION (WEST) TO CHAPMAN, 115KV</b> 57344 WJCCTYW3 115 TO 57362 CHAPMAN3 115 CKT1	68	100.6	<b>SUMMIT 230/115KV TRANSFORMER</b> 56873 SUMMIT 6230 TO 57381 SUMMIT 3 115 CKT1	Increase West-End Generation
02WP	<b>EXIDE JUNCTION TO NORTH AMERICAN PHILIPS, 115KV</b> 57368 EXIDE J3 115 TO 57372 PHILIPS3 115 CKT1	181	100.3	<b>EAST MCPHERSON TO SUMMIT, 230KV</b> 56872 EMCIPHER6230 TO 56873 SUMMIT 6230 CKT1	Increase West-End Generation
02WP	<b>EXIDE JUNCTION TO SUMMIT, 115KV</b> 57368 EXIDE J3 115 TO 57381 SUMMIT 3 115 CKT1	181	105.5	<b>EAST MCPHERSON TO SUMMIT, 230KV</b> 56872 EMCIPHER6230 TO 56873 SUMMIT 6230 CKT1	Increase West-End Generation
02WP	<b>NORTH AMERICAN PHILIPS TO NORTH AMERICAN PHILIPS JCT SOUTH</b> 57372 PHILIPS3 115 TO 57374 SPHILP3 115 CKT1	160	107.9	<b>EAST MCPHERSON TO SUMMIT, 230KV</b> 56872 EMCIPHER6230 TO 56873 SUMMIT 6230 CKT1	Increase West-End Generation

**Table 2 continued** – Western Resources Network Facilities with Thermal Loading above 100% Rate B

Study Year	Overloaded Branch	Rate B	% Loading	Outaged Branch	Mitigation Plan, Solution
02WP	NORTH AMERICAN PHILIPS JCT SOUTH TO WEST MCPHERSON, 115KV CKT 1 57374 SPHILPJ3 115 TO 57438 WMCPHER3 115 CKT1	68	116.4	EAST MCPHERSON TO SUMMIT, 230KV 56872 EMCIPHER6230 TO 56873 SUMMIT 6230 CKT1	Increase West-End Generation
02WP	NORTH AMERICAN PHILIPS JCT SOUTH TO WEST MCPHERSON, 115KV CKT 2 57374 SPHILPJ3 115 TO 57438 WMCPHER3 115 CKT2	92	101.6	EAST MCPHERSON TO SUMMIT, 230KV 56872 EMCIPHER6 230 TO 56873 SUMMIT 6 230 CKT1	Increase West-End Generation



**Table 3** – Western Resources’ Network Facilities identified as limits in the MUST Generation Sensitivity Analysis

MUST Generation Sensitivity Analysis												
Study Case	Limiting Constraint	Worst Dispatch FCITC	Base FCITC	Limiting Facility	Initial Flow	Limit	Study Flow	OTDF	LODF	Outaged Facility	Mitigation Plan, Solutions	
01WP	1	25	36	57321 ANZIO 3 115 57328 FT JCT 3 115 1	-91.1	-92	-91.7	-0.0262	0.8187	57342 WJCCTY 3 115 57343 WJCCTYE3 115 1	Increase West-End generation	
01WP	2	167	194	57368 EXIDE J3 115 57381 SUMMIT 3 115 1	-171.1	-181	-179.6	-0.0513	0.3584	56872 EMCIPHER6 230 56873 SUMMIT 6 230 1	Increase HEC / McPherson Generation	
01WP	3	179	218	57372 PHILIPS3 115 57374 SPHILPJ3 115 1	150.0	160	158.2	0.0457	-0.5501	56872 EMCIPHER6 230 56873 SUMMIT 6 230 1	Increase HEC / McPherson Generation	
02SP	4	1	42	57513 HEC 269.0 57514 HEC GT 269.0 1	-129.0	-130	-129.0	-0.0249	1.0000	57413 CIRCLE 3 115 57421 HEC GT 3 115 1	Reduce HEC GT3 / GT4 Generation	
02SP	5	26	136	57250 LWRNCHL3 115 57280 WREN 3 115 1	137.3	141	138.0	0.0274	0.5870	57234 BISMARK3 115 57236 COOP 3 115 1	Directive 1210	
02SP	6	27	990	57153 COLINE 3 115 57180 TEC E 3 115 1	-129.4	-153	-130.0	-0.0239	-0.8971	57180 TEC E 3 115 57182 TECHILE3 115 1	Directive 1203	
02SP	7	32	32	57738 MAHANNA269.0 57745 NEWTON 269.0 1	100.4	101	101.0	0.0202	-1.0000	57012 HALSTDS4 138 57065 SG12COL4 138 1	Directive 1105	
02SP	8	33	84	57151 AUBURN 3 115 57179 S GAGEW3 115 1	89.3	91	90.0	0.0204	-0.0650	56765 HOYT 7 345 56766 JEC N 7 345 1	Directive 400	
02SP	9	36	279	56853 LAWHILL6 230 57250 LWRNCHL3 115 1	292.6	308	294.6	0.0551	0.7222	56853 LAWHILL6 230 56855 MIDLAND6 230 1	Directive 615	
02SP	10	36	281	56853 LAWHILL6 230 57250 LWRNCHL3 115 1	292.5	308	294.5	0.0551	0.7222	56855 MIDLAND6 230 57252 MIDLAND3 115 1	Directive 615	
02SP	11	44	83	56851 AUBURN 6 230 57151 AUBURN 3 115 1	303.2	308	305.7	0.0581	0.2710	56765 HOYT 7 345 56804 HOYT 7X1.00 1	Directive 623	
02SP	12	69	131	57151 AUBURN 3 115 57166 INDIANH3 115 1	114.7	118	116.4	0.0248	0.1601	56765 HOYT 7 345 56804 HOYT 7X1.00 1	Directive 623	
02SP	13	79	168	56851 AUBURN 6 230 57151 AUBURN 3 115 1	298.7	308	303.1	0.0555	0.2150	56852 JEC 6 230 56861 EMANHAT6 230 1	Directive 900	
02SP	14	90	106	57786 CHISHLM269.0 57832 RIPLEYM269.0 1	140.0	143	142.5	0.0286	0.3873	57040 EVANS N4 138 57065 SG12COL4 138 1	Directive 1105	
02SP	15	91	383	57372 PHILIPS3 115 57374 SPHILPJ3 115 1	-149.0	-160	-151.6	-0.0289	-0.6295	56873 SUMMIT 6 230 57381 SUMMIT 3 115 1	Directive 613	
02SP	16	143	168	57786 CHISHLM269.0 57832 RIPLEYM269.0 1	138.2	143	142.3	0.0286	-0.3873	57012 HALSTDS4 138 57065 SG12COL4 138 1	Directive 1105	
02SP	17	162	461	56851 AUBURN 6 230 56852 JEC 6 230 1	-545.9	-598	-564.1	-0.1132	0.3370	56765 HOYT 7 345 56766 JEC N 7 345 1	Directive 400	
02WP	18	32	59	57163 HOYT 3 115 57165 HTI JCT3 115 1	90.7	92	91.4	0.0226	0.0725	56765 HOYT 7 345 56772 STRANGR7 345 1	Directive 803, Upgrade Assigned to 2001-211 New Rate B=120 MVA	
02WP	19	110	128	57368 EXIDE J3 115 57381 SUMMIT 3 115 1	-174.6	-181	-180.1	-0.0504	0.3583	56872 EMCIPHER6 230 56873 SUMMIT 6 230 1	Increase HEC / McPherson Generation	
02WP	20	160	196	57372 PHILIPS3 115 57374 SPHILPJ3 115 1	151.4	160	158.4	0.044	-0.5500	56872 EMCIPHER6 230 56873 SUMMIT 6 230 1	Increase HEC / McPherson Generation	
02WP	21	169	321	57152 CIRCLVL3 115 57165 HTI JCT3 115 1	-85.2	-92	-88.8	-0.0212	-0.0725	56765 HOYT 7 345 56772 STRANGR7 345 1	Directive 803, Upgrade Assigned to 2001-227 New Rate B=97 MVA	
02WP	22	188	330	57151 AUBURN 3 115 57166 INDIANH3 115 1	106.2	118	112.9	0.0358	-0.0953	56765 HOYT 7 345 56766 JEC N 7 345 1	Directive 400	

## Generation Adjustment Tables For Limits Found In the Generation Sensitivity Analysis

2001 Winter Peak Generator Adjustments For Limiting Constraint Number 1 57321 ANZIO 3 115 57328 FT JCT 3 115 1							
Generator bus	Worst Dispatch	Study PF	Generation Outage PF	Pmin	Pmax	Porig	Pnew
56651 JEC U1 26.0	--	0.191	-0.034	250	744	622	
56652 JEC U2 26.0	--	0.191	-0.023	250	740	622	
56653 JEC U3 26.0	--	0.191	-0.023	250	742	622	
56663 LEC U5 24.0	--	0.1	-0.0305	125	394	314	
56672 TEC U8 16.0	24.8	0.0347	-0.0379	52	158	113	137.8
56734 GEC U4 14.4	--	0.0275	-0.0194	23	106	90	
57561 WINFLD 269.0	--	0.0043	-0.0203	0	40.2	14	
57632 CHANUTE269.0	--	0.0057	-0.0217	0	38.6	19	
56654 LACG1WR 22.0	--	0.0995	-0.0233	0	344	324	
56656 LACG2WR 24.0	--	0.0975	-0.0233	0	337	317	
56658 S2GWR 18.0	--	0.0174	-0.0214	0	60	57	
56660 S3GWR 18.0	--	0.0174	-0.0214	0	60	57	
56665 S4GWR 18.0	--	0.0231	-0.0214	0	80	75	

2001 Winter Peak Generator Adjustments For Limiting Constraint Number 2 57368 EXIDE J3 115 57381 SUMMIT 3 115 1							
Generator bus	Worst Dispatch	Study PF	Generation Outage PF	Pmin	Pmax	Porig	Pnew
56651 JEC U1 26.0	--	0.191	-0.0533	250	744	622	
56652 JEC U2 26.0	118	0.191	-0.0597	250	740	622	740
56653 JEC U3 26.0	48.6	0.191	-0.0597	250	742	622	670.6
56663 LEC U5 24.0	--	0.1	-0.0472	125	394	314	
56672 TEC U8 16.0	--	0.0347	-0.0458	52	158	113	
56734 GEC U4 14.4	--	0.0275	-0.0349	23	106	90	
57561 WINFLD 269.0	--	0.0043	-0.037	0	40.2	14	
57632 CHANUTE269.0	--	0.0057	-0.0396	0	38.6	19	
56654 LACG1WR 22.0	--	0.0995	-0.0427	0	344	324	
56656 LACG2WR 24.0	--	0.0975	-0.0427	0	337	317	
56658 S2GWR 18.0	--	0.0174	-0.0391	0	60	57	
56660 S3GWR 18.0	--	0.0174	-0.0391	0	60	57	
56665 S4GWR 18.0	--	0.0231	-0.0391	0	80	75	

2001 Winter Peak Generator Adjustments For Limiting Constraint Number 3 57372 PHILIPS3 115 57374 SPHILPJ3 115 1							
Generator bus	Worst Dispatch	Study PF	Generation Outage PF	Pmin	Pmax	Porig	Pnew
56651 JEC U1 26.0	--	0.191	0.0551	250	744	622	
56652 JEC U2 26.0	58.6	0.191	0.0558	250	740	622	680.6
56653 JEC U3 26.0	120	0.191	0.0558	250	742	622	742
56663 LEC U5 24.0	--	0.1	0.043	125	394	314	
56672 TEC U8 16.0	--	0.0347	0.0469	52	158	113	
56734 GEC U4 14.4	--	0.0275	0.0154	23	106	90	
57561 WINFLD 269.0	--	0.0043	0.0192	0	40.2	14	
57632 CHANUTE269.0	--	0.0057	0.0243	0	38.6	19	
56654 LACG1WR 22.0	--	0.0995	0.0303	0	344	324	
56656 LACG2WR 24.0	--	0.0975	0.0303	0	337	317	
56658 S2GWR 18.0	--	0.0174	0.0232	0	60	57	
56660 S3GWR 18.0	--	0.0174	0.0232	0	60	57	
56665 S4GWR 18.0	--	0.0231	0.0232	0	80	75	

## Generation Adjustment Tables For Limits Found In the Generation Sensitivity Analysis

2002 Summer Peak Generator Adjustments For Limiting Constraint Number 4 57513 HEC 269.0 57514 HEC GT 269.0 1							
Generator bus	Worst Dispatch	Study PF	Generation Outage PF	Pmin	Pmax	Porig	Pnew
56651 JEC U1 26.0	--	0.126	0	250	744	655	
56652 JEC U2 26.0	--	0.126	0	250	740	655	
56653 JEC U3 26.0	--	0.126	0	250	742	655	
56661 LEC U3 14.4	--	0.0093	0	25	59	48	
56662 LEC U4 14.4	--	0.0167	0	40	119	87	
56663 LEC U5 24.0	--	0.0655	0	125	394	329.8	
56671 TEC U7 14.4	--	0.013	0	30	85	67	
56672 TEC U8 16.0	--	0.0222	0	52	158	116	
56681 AEC GT1 13.8	--	0.0111	0	20	66	58	
56693 HEC U3 14.4	--	0.0046	0	5	31	24	
56694 HEC U4 18.0	--	0.0324	0	40	191	169	
56695 HEC GT1 13.8	1	0.0083	-1	20	52	43	44
56696 HEC GT2 13.8	--	0.0083	-1	20	52	43	
56697 HEC GT3 13.8	--	0.0083	-1	20	52	43	
56701 MCPH PLT12.5	--	0.0048	0	5	27	25	
56704 MCPHGT3 13.8	--	0.0093	0	20	50	48	
56705 MCPHGT4 13.8	--	0.0148	0	20	79	77	
56711 NEC U3 12.0	--	0.0111	0	20	67	58	
56721 EEC U1 16.0	--	0.0222	0	30	151	116	
56722 EEC U2 24.0	--	0.0612	0	55	383	318	
56723 EEC GT1 13.8	--	0.0148	0	50	80	77	
56724 EEC GT2 13.8	--	0.0148	0	50	80	77	
56725 EEC GT3 18.0	--	0.0278	0	90	154	144	
56731 GEC U1 12.5	--	0.0074	0	17	43	39	
56732 GEC U2 12.5	--	0.012	0	18	74	63	
56733 GEC U3 14.4	--	0.0185	0	22	112	96	
56734 GEC U4 14.4	--	0.0185	0	23	106	96	
57561 WINFLD 269.0	--	0.0072	0	0	40.2	38	
57632 CHANUTE269.0	--	0.0068	0	0	38.6	35	
56654 LACG1WR 22.0	--	0.0637	0	0	344	331	
56656 LACG2WR 24.0	--	0.0625	0	0	337	325	
56658 S2GWR 18.0	--	0.0111	0	0	60	58	
56660 S3GWR 18.0	--	0.0111	0	0	60	58	
56665 S4GWR 18.0	--	0.0148	0	0	80	77	
56669 CHILWR 69.0	--	0.0026	0	0	14	13	

2002 Summer Peak Generator Adjustments For Limiting Constraint Number 5 57250 LWRNCHL3 115 57280 WREN 3 115 1							
Generator bus	Worst Dispatch	Study PF	Generation Outage PF	Pmin	Pmax	Porig	Pnew
56651 JEC U1 26.0	--	0.126	0.0193	250	744	655	
56652 JEC U2 26.0	--	0.126	0.0195	250	740	655	
56653 JEC U3 26.0	--	0.126	0.0195	250	742	655	
56661 LEC U3 14.4	--	0.0093	0.1416	25	59	48	
56662 LEC U4 14.4	25.8	0.0167	0.1445	40	119	87	112.8
56663 LEC U5 24.0	--	0.0655	0.1016	125	394	329.8	
56671 TEC U7 14.4	--	0.013	-0.014	30	85	67	
56672 TEC U8 16.0	--	0.0222	-0.014	52	158	116	
56681 AEC GT1 13.8	--	0.0111	0.0183	20	66	58	
56693 HEC U3 14.4	--	0.0046	0.0203	5	31	24	
56694 HEC U4 18.0	--	0.0324	0.0203	40	191	169	
56695 HEC GT1 13.8	--	0.0083	0.0203	20	52	43	
56696 HEC GT2 13.8	--	0.0083	0.0203	20	52	43	
56697 HEC GT3 13.8	--	0.0083	0.0203	20	52	43	
56701 MCPH PLT12.5	--	0.0048	0.0202	5	27	25	
56704 MCPHGT3 13.8	--	0.0093	0.0202	20	50	48	
56705 MCPHGT4 13.8	--	0.0148	0.0202	20	79	77	
56711 NEC U3 12.0	--	0.0111	0.0204	20	67	58	
56721 EEC U1 16.0	--	0.0222	0.021	30	151	116	
56722 EEC U2 24.0	--	0.0612	0.021	55	383	318	
56723 EEC GT1 13.8	--	0.0148	0.021	50	80	77	
56724 EEC GT2 13.8	--	0.0148	0.021	50	80	77	
56725 EEC GT3 18.0	--	0.0278	0.021	90	154	144	
56731 GEC U1 12.5	--	0.0074	0.021	17	43	39	
56732 GEC U2 12.5	--	0.012	0.021	18	74	63	
56733 GEC U3 14.4	--	0.0185	0.021	22	112	96	
56734 GEC U4 14.4	--	0.0185	0.021	23	106	96	
57561 WINFLD 269.0	--	0.0072	0.0208	0	40.2	38	
57632 CHANUTE269.0	--	0.0068	0.0203	0	38.6	35	
56654 LACG1WR 22.0	--	0.0637	0.0204	0	344	331	
56656 LACG2WR 24.0	--	0.0625	0.0204	0	337	325	
56658 S2GWR 18.0	--	0.0111	0.0202	0	60	58	
56660 S3GWR 18.0	--	0.0111	0.0202	0	60	58	
56665 S4GWR 18.0	--	0.0148	0.0202	0	80	77	
56669 CHILWR 69.0	--	0.0026	0.0205	0	14	13	

## Generation Adjustment Tables For Limits Found In the Generation Sensitivity Analysis

2002 Summer Peak Generator Adjustments For Limiting Constraint Number 6 57153 COLINE 3 115 57180 TEC E 3 115 1							
Generator bus	Worst Dispatch	Study PF	Generation Outage PF	Pmin	Pmax	Porig	Pnew
56651 JEC U1 26.0	--	0.126	0.0064	250	744	655	
56652 JEC U2 26.0	--	0.126	0.0077	250	740	655	
56653 JEC U3 26.0	--	0.126	0.0077	250	742	655	
56661 LEC U3 14.4	--	0.0093	0.0084	25	59	48	
56662 LEC U4 14.4	--	0.0167	0.0085	40	119	87	
56663 LEC U5 24.0	--	0.0655	0.0077	125	394	329.8	
56671 TEC U7 14.4	18	0.013	-0.8873	30	85	67	85
56672 TEC U8 16.0	8.7	0.0222	-0.8873	52	158	116	124.7
56681 AEC GT1 13.8	--	0.0111	0.0049	20	66	58	
56693 HEC U3 14.4	--	0.0046	0.0069	5	31	24	
56694 HEC U4 18.0	--	0.0324	0.0069	40	191	169	
56695 HEC GT1 13.8	--	0.0083	0.0069	20	52	43	
56696 HEC GT2 13.8	--	0.0083	0.0069	20	52	43	
56697 HEC GT3 13.8	--	0.0083	0.0069	20	52	43	
56701 MCPH PLT12.5	--	0.0048	0.0067	5	27	25	
56704 MCPHGT3 13.8	--	0.0093	0.0067	20	50	48	
56705 MCPHGT4 13.8	--	0.0148	0.0068	20	79	77	
56711 NEC U3 12.0	--	0.0111	0.0083	20	67	58	
56721 EEC U1 16.0	--	0.0222	0.008	30	151	116	
56722 EEC U2 24.0	--	0.0612	0.008	55	383	318	
56723 EEC GT1 13.8	--	0.0148	0.008	50	80	77	
56724 EEC GT2 13.8	--	0.0148	0.008	50	80	77	
56725 EEC GT3 18.0	--	0.0278	0.008	90	154	144	
56731 GEC U1 12.5	--	0.0074	0.008	17	43	39	
56732 GEC U2 12.5	--	0.012	0.008	18	74	63	
56733 GEC U3 14.4	--	0.0185	0.008	22	112	96	
56734 GEC U4 14.4	--	0.0185	0.008	23	106	96	
57561 WINFLD 269.0	--	0.0072	0.0081	0	40.2	38	
57632 CHANUTE269.0	--	0.0068	0.0082	0	38.6	35	
56654 LACG1WR 22.0	--	0.0637	0.0083	0	344	331	
56656 LACG2WR 24.0	--	0.0625	0.0083	0	337	325	
56658 S2GWR 18.0	--	0.0111	0.0083	0	60	58	
56660 S3GWR 18.0	--	0.0111	0.0083	0	60	58	
56665 S4GWR 18.0	--	0.0148	0.0083	0	80	77	
56669 CHILWR 69.0	--	0.0026	0.0086	0	14	13	

2002 Summer Peak Generator Adjustments For Limiting Constraint Number 7 57738 MAHANNA269.0 57745 NEWTON 269.0 1							
Generator bus	Worst Dispatch	Study PF	Generation Outage PF	Pmin	Pmax	Porig	Pnew
56651 JEC U1 26.0	--	0.126	0.0202	250	744	655	
56652 JEC U2 26.0	4.7	0.126	0.0202	250	740	655	659.7
56653 JEC U3 26.0	--	0.126	0.0202	250	742	655	
56661 LEC U3 14.4	--	0.0093	0.0202	25	59	48	
56662 LEC U4 14.4	--	0.0167	0.0202	40	119	87	
56663 LEC U5 24.0	--	0.0655	0.0202	125	394	329.8	
56671 TEC U7 14.4	--	0.013	0.0202	30	85	67	
56672 TEC U8 16.0	--	0.0222	0.0202	52	158	116	
56681 AEC GT1 13.8	--	0.0111	0.0202	20	66	58	
56693 HEC U3 14.4	--	0.0046	0.0202	5	31	24	
56694 HEC U4 18.0	--	0.0324	0.0202	40	191	169	
56695 HEC GT1 13.8	--	0.0083	0.0202	20	52	43	
56696 HEC GT2 13.8	--	0.0083	0.0202	20	52	43	
56697 HEC GT3 13.8	--	0.0083	0.0202	20	52	43	
56701 MCPH PLT12.5	--	0.0048	0.0202	5	27	25	
56704 MCPHGT3 13.8	--	0.0093	0.0202	20	50	48	
56705 MCPHGT4 13.8	--	0.0148	0.0202	20	79	77	
56711 NEC U3 12.0	--	0.0111	0.0202	20	67	58	
56721 EEC U1 16.0	--	0.0222	0.0202	30	151	116	
56722 EEC U2 24.0	--	0.0612	0.0202	55	383	318	
56723 EEC GT1 13.8	--	0.0148	0.0202	50	80	77	
56724 EEC GT2 13.8	--	0.0148	0.0202	50	80	77	
56725 EEC GT3 18.0	--	0.0278	0.0202	90	154	144	
56731 GEC U1 12.5	--	0.0074	0.0202	17	43	39	
56732 GEC U2 12.5	11	0.012	0.0202	18	74	63	74
56733 GEC U3 14.4	16	0.0185	0.0202	22	112	96	112
56734 GEC U4 14.4	--	0.0185	0.0202	23	106	96	
57561 WINFLD 269.0	--	0.0072	0.0202	0	40.2	38	
57632 CHANUTE269.0	--	0.0068	0.0202	0	38.6	35	
56654 LACG1WR 22.0	--	0.0637	0.0202	0	344	331	
56656 LACG2WR 24.0	--	0.0625	0.0202	0	337	325	
56658 S2GWR 18.0	--	0.0111	0.0202	0	60	58	
56660 S3GWR 18.0	--	0.0111	0.0202	0	60	58	
56665 S4GWR 18.0	--	0.0148	0.0202	0	80	77	
56669 CHILWR 69.0	--	0.0026	0.0202	0	14	13	

## Generation Adjustment Tables For Limits Found In the Generation Sensitivity Analysis

2002 Summer Peak Generator Adjustments For Limiting Constraint Number 8 57151 AUBURN 3 115 57179 S GAGEW3 115 1							
Generator bus	Worst Dispatch	Study PF	Generation Outage PF	Pmin	Pmax	Porig	Pnew
56651 JEC U1 26.0	25.3	0.126	0.051	250	744	655	680.3
56652 JEC U2 26.0	--	0.126	0.0449	250	740	655	
56653 JEC U3 26.0	--	0.126	0.0449	250	742	655	
56661 LEC U3 14.4	--	0.0093	-0.0102	25	59	48	
56662 LEC U4 14.4	--	0.0167	-0.0105	40	119	87	
56663 LEC U5 24.0	--	0.0655	-0.0015	125	394	329.8	
56671 TEC U7 14.4	--	0.013	-0.0713	30	85	67	
56672 TEC U8 16.0	--	0.0222	-0.0713	52	158	116	
56681 AEC GT1 13.8	8	0.0111	0.0542	20	66	58	66
56693 HEC U3 14.4	--	0.0046	0.0326	5	31	24	
56694 HEC U4 18.0	--	0.0324	0.0326	40	191	169	
56695 HEC GT1 13.8	--	0.0083	0.0326	20	52	43	
56696 HEC GT2 13.8	--	0.0083	0.0326	20	52	43	
56697 HEC GT3 13.8	--	0.0083	0.0326	20	52	43	
56701 MCPH PLT12.5	--	0.0048	0.0359	5	27	25	
56704 MCPHGT3 13.8	--	0.0093	0.0359	20	50	48	
56705 MCPHGT4 13.8	--	0.0148	0.0357	20	79	77	
56711 NEC U3 12.0	--	0.0111	0.0034	20	67	58	
56721 EEC U1 16.0	--	0.0222	0.0076	30	151	116	
56722 EEC U2 24.0	--	0.0612	0.0076	55	383	318	
56723 EEC GT1 13.8	--	0.0148	0.0076	50	80	77	
56724 EEC GT2 13.8	--	0.0148	0.0076	50	80	77	
56725 EEC GT3 18.0	--	0.0278	0.0076	90	154	144	
56731 GEC U1 12.5	--	0.0074	0.0075	17	43	39	
56732 GEC U2 12.5	--	0.012	0.0075	18	74	63	
56733 GEC U3 14.4	--	0.0185	0.0076	22	112	96	
56734 GEC U4 14.4	--	0.0185	0.0076	23	106	96	
57561 WINFLD 269.0	--	0.0072	0.0064	0	40.2	38	
57632 CHANUTE269.0	--	0.0068	0.0035	0	38.6	35	
56654 LACG1WR 22.0	--	0.0637	0.0017	0	344	331	
56656 LACG2WR 24.0	--	0.0625	0.0017	0	337	325	
56658 S2GWR 18.0	--	0.0111	0.0029	0	60	58	
56660 S3GWR 18.0	--	0.0111	0.0029	0	60	58	
56665 S4GWR 18.0	--	0.0148	0.0029	0	80	77	
56669 CHILWR 69.0	--	0.0026	-0.0011	0	14	13	

2002 Summer Peak Generator Adjustments For Limiting Constraint Number 9 56853 LAWHILL6 230 57250 LWRNCHL3 115 1							
Generator bus	Worst Dispatch	Study PF	Generation Outage PF	Pmin	Pmax	Porig	Pnew
56651 JEC U1 26.0	--	0.126	0.0541	250	744	655	
56652 JEC U2 26.0	--	0.126	0.0451	250	740	655	
56653 JEC U3 26.0	--	0.126	0.0451	250	742	655	
56661 LEC U3 14.4	--	0.0093	-0.3318	25	59	48	
56662 LEC U4 14.4	--	0.0167	-0.3351	40	119	87	
56663 LEC U5 24.0	36.2	0.0655	0.4256	125	394	329.8	365.9
56671 TEC U7 14.4	--	0.013	0.029	30	85	67	
56672 TEC U8 16.0	--	0.0222	0.029	52	158	116	
56681 AEC GT1 13.8	--	0.0111	0.0574	20	66	58	
56693 HEC U3 14.4	--	0.0046	0.052	5	31	24	
56694 HEC U4 18.0	--	0.0324	0.052	40	191	169	
56695 HEC GT1 13.8	--	0.0083	0.052	20	52	43	
56696 HEC GT2 13.8	--	0.0083	0.052	20	52	43	
56697 HEC GT3 13.8	--	0.0083	0.052	20	52	43	
56701 MCPH PLT12.5	--	0.0048	0.0535	5	27	25	
56704 MCPHGT3 13.8	--	0.0093	0.0535	20	50	48	
56705 MCPHGT4 13.8	--	0.0148	0.0534	20	79	77	
56711 NEC U3 12.0	--	0.0111	0.0238	20	67	58	
56721 EEC U1 16.0	--	0.0222	0.0366	30	151	116	
56722 EEC U2 24.0	--	0.0612	0.0366	55	383	318	
56723 EEC GT1 13.8	--	0.0148	0.0366	50	80	77	
56724 EEC GT2 13.8	--	0.0148	0.0366	50	80	77	
56725 EEC GT3 18.0	--	0.0278	0.0366	90	154	144	
56731 GEC U1 12.5	--	0.0074	0.0354	17	43	39	
56732 GEC U2 12.5	--	0.012	0.0354	18	74	63	
56733 GEC U3 14.4	--	0.0185	0.0355	22	112	96	
56734 GEC U4 14.4	--	0.0185	0.0355	23	106	96	
57561 WINFLD 269.0	--	0.0072	0.0325	0	40.2	38	
57632 CHANUTE269.0	--	0.0068	0.0242	0	38.6	35	
56654 LACG1WR 22.0	--	0.0637	0.0205	0	344	331	
56656 LACG2WR 24.0	--	0.0625	0.0205	0	337	325	
56658 S2GWR 18.0	--	0.0111	0.0216	0	60	58	
56660 S3GWR 18.0	--	0.0111	0.0216	0	60	58	
56665 S4GWR 18.0	--	0.0148	0.0216	0	80	77	
56669 CHILWR 69.0	--	0.0026	0.0099	0	14	13	

## Generation Adjustment Tables For Limits Found In the Generation Sensitivity Analysis

2002 Summer Peak Generator Adjustments For Limiting Constraint Number 10 56853 LAWHILL6 230 57250 LWRNCHL3 115 1							
Generator bus	Worst Dispatch	Study PF	Generation Outage PF	Pmin	Pmax	Porig	Pnew
56651 JEC U1 26.0	--	0.126	0.0541	250	744	655	
56652 JEC U2 26.0	--	0.126	0.0451	250	740	655	
56653 JEC U3 26.0	--	0.126	0.0451	250	742	655	
56661 LEC U3 14.4	--	0.0093	-0.3318	25	59	48	
56662 LEC U4 14.4	--	0.0167	-0.3351	40	119	87	
56663 LEC U5 24.0	36.4	0.0655	0.4256	125	394	329.8	366.1
56671 TEC U7 14.4	--	0.013	0.029	30	85	67	
56672 TEC U8 16.0	--	0.0222	0.029	52	158	116	
56681 AEC GT1 13.8	--	0.0111	0.0574	20	66	58	
56693 HEC U3 14.4	--	0.0046	0.052	5	31	24	
56694 HEC U4 18.0	--	0.0324	0.052	40	191	169	
56695 HEC GT1 13.8	--	0.0083	0.052	20	52	43	
56696 HEC GT2 13.8	--	0.0083	0.052	20	52	43	
56697 HEC GT3 13.8	--	0.0083	0.052	20	52	43	
56701 MCPH PLT12.5	--	0.0048	0.0535	5	27	25	
56704 MCPHGT3 13.8	--	0.0093	0.0535	20	50	48	
56705 MCPHGT4 13.8	--	0.0148	0.0534	20	79	77	
56711 NEC U3 12.0	--	0.0111	0.0238	20	67	58	
56721 EEC U1 16.0	--	0.0222	0.0366	30	151	116	
56722 EEC U2 24.0	--	0.0612	0.0366	55	383	318	
56723 EEC GT1 13.8	--	0.0148	0.0366	50	80	77	
56724 EEC GT2 13.8	--	0.0148	0.0366	50	80	77	
56725 EEC GT3 18.0	--	0.0278	0.0366	90	154	144	
56731 GEC U1 12.5	--	0.0074	0.0354	17	43	39	
56732 GEC U2 12.5	--	0.012	0.0354	18	74	63	
56733 GEC U3 14.4	--	0.0185	0.0355	22	112	96	
56734 GEC U4 14.4	--	0.0185	0.0355	23	106	96	
57561 WINFLD 269.0	--	0.0072	0.0325	0	40.2	38	
57632 CHANUTE269.0	--	0.0068	0.0242	0	38.6	35	
56654 LACG1WR 22.0	--	0.0637	0.0205	0	344	331	
56656 LACG2WR 24.0	--	0.0625	0.0205	0	337	325	
56658 S2GWR 18.0	--	0.0111	0.0216	0	60	58	
56660 S3GWR 18.0	--	0.0111	0.0216	0	60	58	
56665 S4GWR 18.0	--	0.0148	0.0216	0	80	77	
56669 CHILWR 69.0	--	0.0026	0.0099	0	14	13	

2002 Summer Peak Generator Adjustments For Limiting Constraint Number 11 56851 AUBURN 6 230 57151 AUBURN 3 115 1							
Generator bus	Worst Dispatch	Study PF	Generation Outage PF	Pmin	Pmax	Porig	Pnew
56651 JEC U1 26.0	43.5	0.126	0.1109	250	744	655	698.5
56652 JEC U2 26.0	--	0.126	0.0883	250	740	655	
56653 JEC U3 26.0	--	0.126	0.0883	250	742	655	
56661 LEC U3 14.4	--	0.0093	0.0168	25	59	48	
56662 LEC U4 14.4	--	0.0167	0.0161	40	119	87	
56663 LEC U5 24.0	--	0.0655	0.0383	125	394	329.8	
56671 TEC U7 14.4	--	0.013	-0.1797	30	85	67	
56672 TEC U8 16.0	--	0.0222	-0.1797	52	158	116	
56681 AEC GT1 13.8	--	0.0111	-0.0089	20	66	58	
56693 HEC U3 14.4	--	0.0046	0.0453	5	31	24	
56694 HEC U4 18.0	--	0.0324	0.0453	40	191	169	
56695 HEC GT1 13.8	--	0.0083	0.0453	20	52	43	
56696 HEC GT2 13.8	--	0.0083	0.0453	20	52	43	
56697 HEC GT3 13.8	--	0.0083	0.0453	20	52	43	
56701 MCPH PLT12.5	--	0.0048	0.0436	5	27	25	
56704 MCPHGT3 13.8	--	0.0093	0.0436	20	50	48	
56705 MCPHGT4 13.8	--	0.0148	0.0442	20	79	77	
56711 NEC U3 12.0	--	0.0111	0.0536	20	67	58	
56721 EEC U1 16.0	--	0.0222	0.0533	30	151	116	
56722 EEC U2 24.0	--	0.0612	0.0533	55	383	318	
56723 EEC GT1 13.8	--	0.0148	0.0533	50	80	77	
56724 EEC GT2 13.8	--	0.0148	0.0533	50	80	77	
56725 EEC GT3 18.0	--	0.0278	0.0533	90	154	144	
56731 GEC U1 12.5	--	0.0074	0.053	17	43	39	
56732 GEC U2 12.5	--	0.012	0.053	18	74	63	
56733 GEC U3 14.4	--	0.0185	0.0529	22	112	96	
56734 GEC U4 14.4	--	0.0185	0.0529	23	106	96	
57561 WINFLD 269.0	--	0.0072	0.0528	0	40.2	38	
57632 CHANUTE269.0	--	0.0068	0.0535	0	38.6	35	
56654 LACG1WR 22.0	--	0.0637	0.0557	0	344	331	
56656 LACG2WR 24.0	--	0.0625	0.0557	0	337	325	
56658 S2GWR 18.0	--	0.0111	0.0535	0	60	58	
56660 S3GWR 18.0	--	0.0111	0.0535	0	60	58	
56665 S4GWR 18.0	--	0.0148	0.0535	0	80	77	
56669 CHILWR 69.0	--	0.0026	0.0521	0	14	13	

## Generation Adjustment Tables For Limits Found In the Generation Sensitivity Analysis

2002 Summer Peak Generator Adjustments For Limiting Constraint Number 12 57151 AUBURN 3 115 57166 INDIANH3 115 1							
Generator bus	Worst Dispatch	Study PF	Generation Outage PF	Pmin	Pmax	Porig	Pnew
56651 JEC U1 26.0	60.5	0.126	0.0465	250	744	655	715.5
56652 JEC U2 26.0	--	0.126	0.0381	250	740	655	
56653 JEC U3 26.0	--	0.126	0.0381	250	742	655	
56661 LEC U3 14.4	--	0.0093	-0.0002	25	59	48	
56662 LEC U4 14.4	--	0.0167	-0.0005	40	119	87	
56663 LEC U5 24.0	--	0.0655	0.007	125	394	329.8	
56671 TEC U7 14.4	--	0.013	-0.0783	30	85	67	
56672 TEC U8 16.0	--	0.0222	-0.0783	52	158	116	
56681 AEC GT1 13.8	8	0.0111	0.0547	20	66	58	66
56693 HEC U3 14.4	--	0.0046	0.0346	5	31	24	
56694 HEC U4 18.0	--	0.0324	0.0346	40	191	169	
56695 HEC GT1 13.8	--	0.0083	0.0346	20	52	43	
56696 HEC GT2 13.8	--	0.0083	0.0346	20	52	43	
56697 HEC GT3 13.8	--	0.0083	0.0346	20	52	43	
56701 MCPH PLT12.5	--	0.0048	0.037	5	27	25	
56704 MCPHGT3 13.8	--	0.0093	0.037	20	50	48	
56705 MCPHGT4 13.8	--	0.0148	0.0368	20	79	77	
56711 NEC U3 12.0	--	0.0111	0.0195	20	67	58	
56721 EEC U1 16.0	--	0.0222	0.0201	30	151	116	
56722 EEC U2 24.0	--	0.0612	0.0201	55	383	318	
56723 EEC GT1 13.8	--	0.0148	0.0201	50	80	77	
56724 EEC GT2 13.8	--	0.0148	0.0201	50	80	77	
56725 EEC GT3 18.0	--	0.0278	0.0201	90	154	144	
56731 GEC U1 12.5	--	0.0074	0.02	17	43	39	
56732 GEC U2 12.5	--	0.012	0.02	18	74	63	
56733 GEC U3 14.4	--	0.0185	0.0201	22	112	96	
56734 GEC U4 14.4	--	0.0185	0.0201	23	106	96	
57561 WINFLD 269.0	--	0.0072	0.0197	0	40.2	38	
57632 CHANUTE269.0	--	0.0068	0.0194	0	38.6	35	
56654 LACG1WR 22.0	--	0.0637	0.0198	0	344	331	
56656 LACG2WR 24.0	--	0.0625	0.0198	0	337	325	
56658 S2GWR 18.0	--	0.0111	0.0194	0	60	58	
56660 S3GWR 18.0	--	0.0111	0.0194	0	60	58	
56665 S4GWR 18.0	--	0.0148	0.0194	0	80	77	
56669 CHILWR 69.0	--	0.0026	0.0185	0	14	13	

2002 Summer Peak Generator Adjustments For Limiting Constraint Number 13 56851 AUBURN 6 230 57151 AUBURN 3 115 1							
Generator bus	Worst Dispatch	Study PF	Generation Outage PF	Pmin	Pmax	Porig	Pnew
56651 JEC U1 26.0	79.3	0.126	0.1175	250	744	655	734.3
56652 JEC U2 26.0	--	0.126	0.0762	250	740	655	
56653 JEC U3 26.0	--	0.126	0.0762	250	742	655	
56661 LEC U3 14.4	--	0.0093	0.0316	25	59	48	
56662 LEC U4 14.4	--	0.0167	0.0309	40	119	87	
56663 LEC U5 24.0	--	0.0655	0.0531	125	394	329.8	
56671 TEC U7 14.4	--	0.013	-0.1246	30	85	67	
56672 TEC U8 16.0	--	0.0222	-0.1246	52	158	116	
56681 AEC GT1 13.8	--	0.0111	-0.0448	20	66	58	
56693 HEC U3 14.4	--	0.0046	0.0278	5	31	24	
56694 HEC U4 18.0	--	0.0324	0.0278	40	191	169	
56695 HEC GT1 13.8	--	0.0083	0.0278	20	52	43	
56696 HEC GT2 13.8	--	0.0083	0.0278	20	52	43	
56697 HEC GT3 13.8	--	0.0083	0.0278	20	52	43	
56701 MCPH PLT12.5	--	0.0048	0.0249	5	27	25	
56704 MCPHGT3 13.8	--	0.0093	0.0249	20	50	48	
56705 MCPHGT4 13.8	--	0.0148	0.0257	20	79	77	
56711 NEC U3 12.0	--	0.0111	0.0491	20	67	58	
56721 EEC U1 16.0	--	0.0222	0.0502	30	151	116	
56722 EEC U2 24.0	--	0.0612	0.0502	55	383	318	
56723 EEC GT1 13.8	--	0.0148	0.0502	50	80	77	
56724 EEC GT2 13.8	--	0.0148	0.0502	50	80	77	
56725 EEC GT3 18.0	--	0.0278	0.0502	90	154	144	
56731 GEC U1 12.5	--	0.0074	0.0496	17	43	39	
56732 GEC U2 12.5	--	0.012	0.0496	18	74	63	
56733 GEC U3 14.4	--	0.0185	0.0495	22	112	96	
56734 GEC U4 14.4	--	0.0185	0.0495	23	106	96	
57561 WINFLD 269.0	--	0.0072	0.0493	0	40.2	38	
57632 CHANUTE269.0	--	0.0068	0.0491	0	38.6	35	
56654 LACG1WR 22.0	--	0.0637	0.0506	0	344	331	
56656 LACG2WR 24.0	--	0.0625	0.0506	0	337	325	
56658 S2GWR 18.0	--	0.0111	0.0486	0	60	58	
56660 S3GWR 18.0	--	0.0111	0.0486	0	60	58	
56665 S4GWR 18.0	--	0.0148	0.0486	0	80	77	
56669 CHILWR 69.0	--	0.0026	0.0455	0	14	13	

## Generation Adjustment Tables For Limits Found In the Generation Sensitivity Analysis

2002 Summer Peak Generator Adjustments For Limiting Constraint Number 14 57786 CHISHLM269.0 57832 RIPLEYM269.0 1							
Generator bus	Worst Dispatch	Study PF	Generation Outage PF	Pmin	Pmax	Porig	Pnew
56651 JEC U1 26.0	--	0.126	0.0332	250	744	655	
56652 JEC U2 26.0	--	0.126	0.0332	250	740	655	
56653 JEC U3 26.0	--	0.126	0.0332	250	742	655	
56661 LEC U3 14.4	11	0.0093	0.0335	25	59	48	59
56662 LEC U4 14.4	32	0.0167	0.0335	40	119	87	119
56663 LEC U5 24.0	1.2	0.0655	0.0335	125	394	329.8	331
56671 TEC U7 14.4	--	0.013	0.0334	30	85	67	
56672 TEC U8 16.0	--	0.0222	0.0334	52	158	116	
56681 AEC GT1 13.8	--	0.0111	0.0324	20	66	58	
56693 HEC U3 14.4	--	0.0046	0.0306	5	31	24	
56694 HEC U4 18.0	--	0.0324	0.0306	40	191	169	
56695 HEC GT1 13.8	--	0.0083	0.0306	20	52	43	
56696 HEC GT2 13.8	--	0.0083	0.0306	20	52	43	
56697 HEC GT3 13.8	--	0.0083	0.0306	20	52	43	
56701 MCPH PLT12.5	--	0.0048	0.0313	5	27	25	
56704 MCPHGT3 13.8	--	0.0093	0.0313	20	50	48	
56705 MCPHGT4 13.8	--	0.0148	0.0313	20	79	77	
56711 NEC U3 12.0	9	0.0111	0.0345	20	67	58	67
56721 EEC U1 16.0	--	0.0222	0.0263	30	151	116	
56722 EEC U2 24.0	--	0.0612	0.0263	55	383	318	
56723 EEC GT1 13.8	--	0.0148	0.0261	50	80	77	
56724 EEC GT2 13.8	--	0.0148	0.0261	50	80	77	
56725 EEC GT3 18.0	--	0.0278	0.0261	90	154	144	
56731 GEC U1 12.5	--	0.0074	-0.0458	17	43	39	
56732 GEC U2 12.5	--	0.012	-0.0458	18	74	63	
56733 GEC U3 14.4	--	0.0185	-0.0232	22	112	96	
56734 GEC U4 14.4	--	0.0185	-0.0158	23	106	96	
57561 WINFLD 269.0	--	0.0072	0.0206	0	40.2	38	
57632 CHANUTE269.0	3.6	0.0068	0.0357	0	38.6	35	38.6
56654 LACG1WR 22.0	13	0.0637	0.0339	0	344	331	344
56656 LACG2WR 24.0	12	0.0625	0.0339	0	337	325	337
56658 S2GWR 18.0	2	0.0111	0.0335	0	60	58	60
56660 S3GWR 18.0	2	0.0111	0.0335	0	60	58	60
56665 S4GWR 18.0	3	0.0148	0.0335	0	80	77	80
56669 CHILWR 69.0	1	0.0026	0.0335	0	14	13	14

2002 Summer Peak Generator Adjustments For Limiting Constraint Number 15 57372 PHILIPS3 115 57374 SPHILPJ3 115 1							
Generator bus	Worst Dispatch	Study PF	Generation Outage PF	Pmin	Pmax	Porig	Pnew
56651 JEC U1 26.0	--	0.126	-0.0093	250	744	655	
56652 JEC U2 26.0	--	0.126	-0.0183	250	740	655	
56653 JEC U3 26.0	--	0.126	-0.0183	250	742	655	
56661 LEC U3 14.4	--	0.0093	-0.0143	25	59	48	
56662 LEC U4 14.4	--	0.0167	-0.0143	40	119	87	
56663 LEC U5 24.0	--	0.0655	-0.014	125	394	329.8	
56671 TEC U7 14.4	--	0.013	-0.0073	30	85	67	
56672 TEC U8 16.0	--	0.0222	-0.0073	52	158	116	
56681 AEC GT1 13.8	--	0.0111	0.3649	20	66	58	
56693 HEC U3 14.4	7	0.0046	-0.16	5	31	24	31
56694 HEC U4 18.0	22	0.0324	-0.1603	40	191	169	191
56695 HEC GT1 13.8	9	0.0083	-0.16	20	52	43	52
56696 HEC GT2 13.8	9	0.0083	-0.1601	20	52	43	52
56697 HEC GT3 13.8	9	0.0083	-0.1602	20	52	43	52
56701 MCPH PLT12.5	2	0.0048	-0.2186	5	27	25	27
56704 MCPHGT3 13.8	2	0.0093	-0.2186	20	50	48	50
56705 MCPHGT4 13.8	2	0.0148	-0.2064	20	79	77	79
56711 NEC U3 12.0	--	0.0111	-0.024	20	67	58	
56721 EEC U1 16.0	--	0.0222	-0.0255	30	151	116	
56722 EEC U2 24.0	--	0.0612	-0.0255	55	383	318	
56723 EEC GT1 13.8	--	0.0148	-0.0255	50	80	77	
56724 EEC GT2 13.8	--	0.0148	-0.0255	50	80	77	
56725 EEC GT3 18.0	--	0.0278	-0.0255	90	154	144	
56731 GEC U1 12.5	--	0.0074	-0.0267	17	43	39	
56732 GEC U2 12.5	3.1	0.012	-0.0267	18	74	63	66.1
56733 GEC U3 14.4	16	0.0185	-0.0272	22	112	96	112
56734 GEC U4 14.4	10	0.0185	-0.0273	23	106	96	106
57561 WINFLD 269.0	--	0.0072	-0.0259	0	40.2	38	
57632 CHANUTE269.0	--	0.0068	-0.0239	0	38.6	35	
56654 LACG1WR 22.0	--	0.0637	-0.0217	0	344	331	
56656 LACG2WR 24.0	--	0.0625	-0.0217	0	337	325	
56658 S2GWR 18.0	--	0.0111	-0.0243	0	60	58	
56660 S3GWR 18.0	--	0.0111	-0.0243	0	60	58	
56665 S4GWR 18.0	--	0.0148	-0.0243	0	80	77	
56669 CHILWR 69.0	--	0.0026	-0.0233	0	14	13	



## Generation Adjustment Tables For Limits Found In the Generation Sensitivity Analysis

2002 Summer Peak Generator Adjustments For Limiting Constraint Number 16 57786 CHISHLM269.0 57832 RIPLEYM269.0 1							
Generator bus	Worst Dispatch	Study PF	Generation Outage PF	Pmin	Pmax	Porig	Pnew
56651 JEC U1 26.0	--	0.126	0.0332	250	744	655	
56652 JEC U2 26.0	--	0.126	0.0332	250	740	655	
56653 JEC U3 26.0	--	0.126	0.0332	250	742	655	
56661 LEC U3 14.4	11	0.0093	0.0335	25	59	48	59
56662 LEC U4 14.4	32	0.0167	0.0335	40	119	87	119
56663 LEC U5 24.0	54.5	0.0655	0.0334	125	394	329.8	384.3
56671 TEC U7 14.4	--	0.013	0.0334	30	85	67	
56672 TEC U8 16.0	--	0.0222	0.0334	52	158	116	
56681 AEC GT1 13.8	--	0.0111	0.0324	20	66	58	
56693 HEC U3 14.4	--	0.0046	0.0306	5	31	24	
56694 HEC U4 18.0	--	0.0324	0.0306	40	191	169	
56695 HEC GT1 13.8	--	0.0083	0.0306	20	52	43	
56696 HEC GT2 13.8	--	0.0083	0.0306	20	52	43	
56697 HEC GT3 13.8	--	0.0083	0.0306	20	52	43	
56701 MCPH PLT12.5	--	0.0048	0.0313	5	27	25	
56704 MCPHGT3 13.8	--	0.0093	0.0313	20	50	48	
56705 MCPHGT4 13.8	--	0.0148	0.0313	20	79	77	
56711 NEC U3 12.0	9	0.0111	0.0345	20	67	58	67
56721 EEC U1 16.0	--	0.0222	0.0263	30	151	116	
56722 EEC U2 24.0	--	0.0612	0.0263	55	383	318	
56723 EEC GT1 13.8	--	0.0148	0.0261	50	80	77	
56724 EEC GT2 13.8	--	0.0148	0.0261	50	80	77	
56725 EEC GT3 18.0	--	0.0278	0.0261	90	154	144	
56731 GEC U1 12.5	--	0.0074	-0.0458	17	43	39	
56732 GEC U2 12.5	--	0.012	-0.0458	18	74	63	
56733 GEC U3 14.4	--	0.0185	-0.0232	22	112	96	
56734 GEC U4 14.4	--	0.0185	-0.0158	23	106	96	
57561 WINFLD 269.0	--	0.0072	0.0206	0	40.2	38	
57632 CHANUTE269.0	3.6	0.0068	0.0357	0	38.6	35	38.6
56654 LACG1WR 22.0	13	0.0637	0.0339	0	344	331	344
56656 LACG2WR 24.0	12	0.0625	0.0339	0	337	325	337
56658 S2GWR 18.0	2	0.0111	0.0335	0	60	58	60
56660 S3GWR 18.0	2	0.0111	0.0335	0	60	58	60
56665 S4GWR 18.0	3	0.0148	0.0335	0	80	77	80
56669 CHILWR 69.0	1	0.0026	0.0335	0	14	13	14

2002 Summer Peak Generator Adjustments For Limiting Constraint Number 17 56851 AUBURN 6 230 56852 JEC 6 230 1							
Generator bus	Worst Dispatch	Study PF	Generation Outage PF	Pmin	Pmax	Porig	Pnew
56651 JEC U1 26.0	89	0.126	-0.3551	250	744	655	744
56652 JEC U2 26.0	72.5	0.126	-0.2832	250	740	655	727.5
56653 JEC U3 26.0	--	0.126	-0.2832	250	742	655	
56661 LEC U3 14.4	--	0.0093	0.0759	25	59	48	
56662 LEC U4 14.4	--	0.0167	0.0759	40	119	87	
56663 LEC U5 24.0	--	0.0655	0.0814	125	394	329.8	
56671 TEC U7 14.4	--	0.013	0.0999	30	85	67	
56672 TEC U8 16.0	--	0.0222	0.0999	52	158	116	
56681 AEC GT1 13.8	--	0.0111	-0.1248	20	66	58	
56693 HEC U3 14.4	--	0.0046	-0.1195	5	31	24	
56694 HEC U4 18.0	--	0.0324	-0.1197	40	191	169	
56695 HEC GT1 13.8	--	0.0083	-0.1195	20	52	43	
56696 HEC GT2 13.8	--	0.0083	-0.1196	20	52	43	
56697 HEC GT3 13.8	--	0.0083	-0.1197	20	52	43	
56701 MCPH PLT12.5	--	0.0048	-0.1313	5	27	25	
56704 MCPHGT3 13.8	--	0.0093	-0.1313	20	50	48	
56705 MCPHGT4 13.8	--	0.0148	-0.1317	20	79	77	
56711 NEC U3 12.0	--	0.0111	0.0165	20	67	58	
56721 EEC U1 16.0	--	0.0222	0.0012	30	151	116	
56722 EEC U2 24.0	--	0.0612	0.0012	55	383	318	
56723 EEC GT1 13.8	--	0.0148	0.0012	50	80	77	
56724 EEC GT2 13.8	--	0.0148	0.0012	50	80	77	
56725 EEC GT3 18.0	--	0.0278	0.0012	90	154	144	
56731 GEC U1 12.5	--	0.0074	0.0012	17	43	39	
56732 GEC U2 12.5	--	0.012	0.0012	18	74	63	
56733 GEC U3 14.4	--	0.0185	0.0006	22	112	96	
56734 GEC U4 14.4	--	0.0185	0.0005	23	106	96	
57561 WINFLD 269.0	--	0.0072	0.0048	0	40.2	38	
57632 CHANUTE269.0	--	0.0068	0.0161	0	38.6	35	
56654 LACG1WR 22.0	--	0.0637	0.0261	0	344	331	
56656 LACG2WR 24.0	--	0.0625	0.0261	0	337	325	
56658 S2GWR 18.0	--	0.0111	0.0176	0	60	58	
56660 S3GWR 18.0	--	0.0111	0.0176	0	60	58	
56665 S4GWR 18.0	--	0.0148	0.0176	0	80	77	
56669 CHILWR 69.0	--	0.0026	0.0266	0	14	13	

## Generation Adjustment Tables For Limits Found In the Generation Sensitivity Analysis

2002 Winter Peak Generator Adjustments For Limiting Constraint Number 18 57163 HOYT 3 115 57165 HTI JCT3 115 1							
Generator bus	Worst Dispatch	Study PF	Generation Outage PF	Pmin	Pmax	Porig	Pnew
56651 JEC U1 26.0	--	0.1932	0.0366	250	744	646	
56652 JEC U2 26.0	--	0.1932	0.0417	250	740	646	
56653 JEC U3 26.0	31.7	0.1932	0.0417	250	742	646	677.7
56663 LEC U5 24.0	--	0.0938	0.0152	125	394	303.6	
56672 TEC U8 16.0	--	0.0338	0.0397	52	158	113	
56721 EEC U1 16.0	--	0.0338	-0.0103	30	151	113	
57561 WINFLD 269.0	--	0.0052	-0.0141	0	40.2	17	
57632 CHANUTE269.0	--	0.0052	-0.0148	0	38.6	17	
56654 LACG1WR 22.0	--	0.097	-0.0106	0	344	325	
56656 LACG2WR 24.0	--	0.0951	-0.0106	0	337	318	
56658 S2GWR 18.0	--	0.0169	-0.0153	0	60	57	
56660 S3GWR 18.0	--	0.0169	-0.0153	0	60	57	
56665 S4GWR 18.0	--	0.0226	-0.0153	0	80	75	

2002 Winter Peak Generator Adjustments For Limiting Constraint Number 19 57368 EXIDE J3 115 57381 SUMMIT 3 115 1							
Generator bus	Worst Dispatch	Study PF	Generation Outage PF	Pmin	Pmax	Porig	Pnew
56651 JEC U1 26.0	--	0.1932	-0.0522	250	744	646	
56652 JEC U2 26.0	94	0.1932	-0.0586	250	740	646	740
56653 JEC U3 26.0	15.9	0.1932	-0.0586	250	742	646	661.9
56663 LEC U5 24.0	--	0.0938	-0.0462	125	394	303.6	
56672 TEC U8 16.0	--	0.0338	-0.0448	52	158	113	
56721 EEC U1 16.0	--	0.0338	-0.0372	30	151	113	
57561 WINFLD 269.0	--	0.0052	-0.0359	0	40.2	17	
57632 CHANUTE269.0	--	0.0052	-0.0386	0	38.6	17	
56654 LACG1WR 22.0	--	0.097	-0.0417	0	344	325	
56656 LACG2WR 24.0	--	0.0951	-0.0417	0	337	318	
56658 S2GWR 18.0	--	0.0169	-0.038	0	60	57	
56660 S3GWR 18.0	--	0.0169	-0.038	0	60	57	
56665 S4GWR 18.0	--	0.0226	-0.038	0	80	75	

2002 Winter Peak Generator Adjustments For Limiting Constraint Number 20 57372 PHILIPS3 115 57374 SPHILPJ3 115 1							
Generator bus	Worst Dispatch	Study PF	Generation Outage PF	Pmin	Pmax	Porig	Pnew
56651 JEC U1 26.0	--	0.1932	0.0532	250	744	646	
56652 JEC U2 26.0	63.7	0.1932	0.0539	250	740	646	709.7
56653 JEC U3 26.0	96	0.1932	0.0539	250	742	646	742
56663 LEC U5 24.0	--	0.0938	0.0411	125	394	303.6	
56672 TEC U8 16.0	--	0.0338	0.0451	52	158	113	
56721 EEC U1 16.0	--	0.0338	0.0196	30	151	113	
57561 WINFLD 269.0	--	0.0052	0.0173	0	40.2	17	
57632 CHANUTE269.0	--	0.0052	0.0224	0	38.6	17	
56654 LACG1WR 22.0	--	0.097	0.0284	0	344	325	
56656 LACG2WR 24.0	--	0.0951	0.0284	0	337	318	
56658 S2GWR 18.0	--	0.0169	0.0214	0	60	57	
56660 S3GWR 18.0	--	0.0169	0.0214	0	60	57	
56665 S4GWR 18.0	--	0.0226	0.0214	0	80	75	

2002 Winter Peak Generator Adjustments For Limiting Constraint Number 21 57152 CIRCLVL3 115 57165 HTI JCT3 115 1							
Generator bus	Worst Dispatch	Study PF	Generation Outage PF	Pmin	Pmax	Porig	Pnew
56651 JEC U1 26.0	--	0.1932	-0.0352	250	744	646	
56652 JEC U2 26.0	94	0.1932	-0.0403	250	740	646	740
56653 JEC U3 26.0	74.7	0.1932	-0.0403	250	742	646	720.7
56663 LEC U5 24.0	--	0.0938	-0.0138	125	394	303.6	
56672 TEC U8 16.0	--	0.0338	-0.0383	52	158	113	
56721 EEC U1 16.0	--	0.0338	0.0117	30	151	113	
57561 WINFLD 269.0	--	0.0052	0.0154	0	40.2	17	
57632 CHANUTE269.0	--	0.0052	0.0161	0	38.6	17	
56654 LACG1WR 22.0	--	0.097	0.012	0	344	325	
56656 LACG2WR 24.0	--	0.0951	0.012	0	337	318	
56658 S2GWR 18.0	--	0.0169	0.0166	0	60	57	
56660 S3GWR 18.0	--	0.0169	0.0166	0	60	57	
56665 S4GWR 18.0	--	0.0226	0.0166	0	80	75	

## Generation Adjustment Tables For Limits Found In the Generation Sensitivity Analysis

2002 Winter Peak Generator Adjustments For Limiting Constraint Number 22 57151 AUBURN 3 115 57166 INDIANH3 115 1							
Generator bus	Worst Dispatch	Study PF	Generation Outage PF	Pmin	Pmax	Porig	Pnew
56651 JEC U1 26.0	98	0.1932	0.066	250	744	646	744
56652 JEC U2 26.0	90.4	0.1932	0.0589	250	740	646	736.4
56653 JEC U3 26.0	--	0.1932	0.0589	250	742	646	
56663 LEC U5 24.0	--	0.0938	0.0083	125	394	303.6	
56672 TEC U8 16.0	--	0.0338	-0.0536	52	158	113	
56721 EEC U1 16.0	--	0.0338	0.012	30	151	113	
57561 WINFLD 269.0	--	0.0052	0.0097	0	40.2	17	
57632 CHANUTE269.0	--	0.0052	0.0055	0	38.6	17	
56654 LACG1WR 22.0	--	0.097	0.003	0	344	325	
56656 LACG2WR 24.0	--	0.0951	0.003	0	337	318	
56658 S2GWR 18.0	--	0.0169	0.0045	0	60	57	
56660 S3GWR 18.0	--	0.0169	0.0045	0	60	57	
56665 S4GWR 18.0	--	0.0226	0.0045	0	80	75	

**Table 4** – SPP and Non-SPP Network Facilities identified as limits in the MUST Linear FCITC Analysis (External Network Resources to Internal Network Resources)

Study Case	From	To	Transfer Level	FCITC	Owner	Limiting Constraint	Rating	Zero Transfer		% Of Rating	Transfer		% Of Rating	Contingency	TDF	LODF	PTDF	Assignment, Mitigation Plan, or Solution
								Normal	Cont		Normal	Cont						
01WP	AEP_EX	WR_IM_1	50.0			None												
01WP	CIN_EX	WR_IM_1	50.0			None												
01WP	MEC_EX	WR_IM_1	50.0			None												
01WP	OPPD_EX	WR_IM_1	200.0			None												
01WP	MOPEP_EX	WR_IM_1	60.0			None												
02SP	OPPD_EX	WR_IM_1	200.0			None												
02SP	AEP_EX	WR_IM_1	50.0			None												
02SP	CIN_EX	WR_IM_1	50.0			None												
02SP	MEC_EX	WR_IM_1	50.0			None												
02SP	MOPEP_EX	WR_IM_1	20.0			None												
02SP	OPPD_EX	WR_IM_2	200.0	92.7	WR	57301 EAST ST3 115 57309 WEMPORIS 115 1	92	49.8	90.8	98.7	51.9	93.5	101.6	56863 MORRIS 6 230 57305 MORRIS 3 115 1	0.013	0.433	0.010	Directive 625
02SP	AEP_EX	WR_IM_2	50.0			None												
02SP	CIN_EX	WR_IM_2	50.0			None												
02SP	MEC_EX	WR_IM_2	50.0			None												
02SP	MOPEP_EX	WR_IM_2	20.0			None												
02WP	OPPD_EX	WR_IM_1	200.0			None												
02WP	AEP_EX	WR_IM_1	50.0			None												
02WP	CIN_EX	WR_IM_1	50.0			None												
02WP	MEC_EX	WR_IM_1	50.0			None												
02WP	MOPEP_EX	WR_IM_1	60.0			None												

## **5. Conclusion**

The results of the study show that the applied for Network Integration Transmission Service by Western Resources from 1/1/02 to 1/1/03 can be accepted. The Western Resources Network Facilities identified in the System Impact Study were addressed and mitigated by Western Resources. The Transmission Operating Directives used to mitigate the Western Resources limitations are on file at SPP.

## 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 – 1 MW
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