



SPP *Southwest Power Pool*

***System Impact Study
For Network Service
Requested By
Empire District Electric Company***

***From 9/1/02
To 4/1/08***

This Study is an extension of
(SPP-2001-250 275856) a 1300MW request
from 4/1/03 to 4/1/08 and
includes requests:
344544-1300MW, 9/1/02 to 4/1/08
344546-80MW KCPL to EMDE, 9/1/02-4/1/08
344550-162MW WERE to EMDE, 9/1/02-4/1/08

SPP Transmission Planning

Table of Contents

1. EXECUTIVE SUMMARY	3
2. INTRODUCTION	3
3. STUDY METHODOLOGY	4
A. DESCRIPTION.....	4
B. MODEL UPDATES.....	4
C. STEADY-STATE CONTINGENCY ANALYSIS AND GENERATION SENSITIVITY ANALYSIS	4
4. STUDY RESULTS	5
A. STUDY ANALYSIS RESULTS.....	5
TABLE 1 – THE EMPIRE DISTRICT COMPANY – VOLTAGE BELOW 10% OF NOMINAL	6
TABLE 2 – THE EMPIRE DISTRICT ELECTRIC COMPANY NETWORK FACILITIES WITH THERMAL LOADING ABOVE 100% RATE B.....	7
TABLE 3 – THE EMPIRE DISTRICT ELECTRIC COMPANY NETWORK FACILITIES IDENTIFIED AS LIMITS IN THE MUST GENERATION SENSITIVITY ANALYSIS	8
TABLE 4 – NON – SPP FACILITIES NETWORK FACILITIES IDENTIFIED AS LIMITS IN THE MUST GENERATION SENSITIVITY ANALYSIS.....	9
5. CONCLUSION	11
APPENDIX A	13

1. Executive Summary

The Empire District Electric Company has requested Transmission Service for Network Integration Transmission Service. The period of the Network Service is from 9/1/02 to 4/1/08. The request is for reservation 344544. Request 275856 from 4-1-03 to 4-1-08 is for the same amount of service and has been studied and the results reported in SPP-2001-250 request 344546 (80MW KCPL to EMDE) and 344550 (162MW WERE to EMDE) were modeled in the 2002 series models and did not need to be studied separately. Request 343768 (100MW CSWS to EMDE) has been studied separately because it is an addition to the network resources. Request 318877 (150MW SECI to EMDE) cannot be studied as this time. The tables in this report are an addition to the findings already stated in SPP-2001-250.

The principal objective of this study is to identify system constraints and potential system modifications necessary to provide the applied for Network Service while maintaining system reliability. Tables 1 and 2 document Network Facilities within Empire District Electric Company identified as having voltage and thermal violations. Table 3 summarizes the Network Facility Limits identified in the Generation Sensitivity Analysis.

2. Introduction

Empire District Electric Company has requested an impact study for Network Integration Transmission Service. The transmission service runs from 9/1/02 to 4/1/08.

The principal objective of the study is to identify the restraints on the SPP Regional Tariff System, which includes the Empire District Electric Company Transmission System that limit the Network Integration Transmission Service. This study includes a steady-state contingency analysis (PSS/E function ACCC) and PTI's MUST Generation Sensitivity Analysis.

The steady-state analysis considers transmission line loading and transmission bus voltages for outages of transmission lines and transformers on the Empire District Electric Company system.

The Generation Sensitivity analysis shows the amount of First Contingency Incremental Transfer Capabilities (FCITC) between the specified designated Network Resources and Network Loads and what the limitations are, if any, for a given generation dispatch to serve load.

3. Study Methodology

A. Description

The system impact study consists of two analyses. PSS/E's ACCC steady-state contingency analysis was used to identify any system criteria violations on the Empire District Electric Company Transmission System. Power Technologies Inc.'s MUST software Generation Sensitivity function was used to identify any SPP system overloads caused by the worst dispatch of the Designated Network Resources to serve the designated Network Load.

The steady-state analysis and generation sensitivity was done to ensure current SPP Criteria and NERC Planning Standards requirements are fulfilled. The Southwest Power Pool (SPP) conforms to the NERC Planning Standards, which provide the strictest requirements, related to voltage violations and thermal overloads during normal conditions and during a contingency. It requires that all facilities be within normal operating ratings for normal system conditions and within emergency ratings after a contingency.

B. Model Updates

SPP used three seasonal models to study the Empire District Electric Company Network Integration Transmission Service. The SPP 2002 Series Cases used are as follows. The 2002 Summer Peak, 2002 Fall Peak and 2002 Winter Peak were used to study the impact of the Network Service on the SPP system during the transmission request period of 9/1/02 to 9/1/03. The period of 9/1/03 to 4/1/08 has been studied in SPP-2001-250 and was not repeated here.

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 2002 base case series models. These modified models were then used in the steady-state contingency analysis. For the Generation Sensitivity analysis, the models were further adjusted to model the designated Network Resource of Empire District Electric Company designated Network Resources and Network Loads to model a 100MW transfer from the Network Resources to the Network Load.

C. Steady-state Contingency Analysis and Generation Sensitivity 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 Empire District Electric Company facility thermal and voltage violations during a contingency. The PSS/E options chosen to conduct the Impact Study analysis can be found in Appendix A.

The MUST Generation Sensitivity Analysis was used to determine any thermal constraints due to specific generation dispatches of the designated Network Resources. The analysis requires the modeling of a transfer, in this case the transfer from Network Resources to Network Load. To overcome this limitation, the power flow model was modified to provide room for a 100MW 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 to the Designated Network Load.

4. Study Results

A. Study 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 the transmission owners.

Table 1 contains the voltage violations found above and below ten percent of the nominal voltages respectively for normal and 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 Empire District Electric Company Network Facilities overloaded above 100% of their emergency ratings.

The remaining tables that follow Tables 1 and 2 contain the results of the Generation Sensitivity Analysis. Table 3 contains the Network Facilities that limit the studied 100MW transfer from Network Resources to Network Load for all five of the cases studied. For each numbered constraint found in Table 3, a generation adjustment table documents the dispatches that cause these reduced FCITCs. The limitation of the MUST Generation Sensitivity is that it requires a transfer. To overcome this limitation, the models were adjusted appropriately to allow room for a 100MW transfer from the Network Resources to the Network Load.

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 dispatch found in the Limiting Constraints Generator adjustments page. The Base FCITC is the FCITC that results from a dispatch using fixed generator participation factors, which are easily calculated from a generator's Pgen or Porig and Pmax and the total generation available for dispatch. The Study Flow column is the flow on the line when the Worst Dispatch FCITC number is used with fixed generator participation factors, which has a flow less than the limit. In addition, the fix generator participation factor dispatch has the specified OTDF shown in Table 3.

Table 1 – THE EMPIRE DISTRICT COMPANY – Voltage below 10% of nominal.

CASE	BUS #	AREA 544 BUSES WITH VOLTAGES LESS THAN 0.9500 PU:	KV	V(PU) AFTER CONTINGENCY	V(PU) BEFORE CONTINGENCY	CONTINGENCY - OPEN BRANCH FROM BUS TO BUS	CKT	MITIGATION PLAN, SOLUTION
02SP	59578	SUB 355 - AURORA WEST	69	0.7876	0.9939	59537 SUB124 - AURORA H.T. TO 59578 SUB355 - AURORA WEST	1	Corrected by Currently under-construction Chesapeake Project
02SP	59606	SUB 420 - MT. VERNON EAST	69	0.7967	0.9742	59537 SUB124 - AURORA H.T. TO 59578 SUB355 - AURORA WEST	1	Corrected by Currently under-construction Chesapeake Project
02SP	59577	SUB351 - MOUNT VERNON EAST	69	0.7985	0.9728	59537 SUB124 - AURORA H.T. TO 59578 SUB355 - AURORA WEST	1	Corrected by Currently under-construction Chesapeake Project
02SP	59424	SUB364 - RESCUE EXPLORER	69	0.8070	0.9644	59537 SUB124 - AURORA H.T. TO 59578 SUB355 - AURORA WEST	1	Corrected by Currently under-construction Chesapeake Project
02SP	59553	SUB262 - ALBATROSS	69	0.8130	0.9694	59537 SUB124 - AURORA H.T. TO 59578 SUB355 - AURORA WEST	1	Corrected by Currently under-construction Chesapeake Project
02SP	59573	SUB 338 - HEATONVILLE CHEROKEE	69	0.8312	0.9703	59537 SUB124 - AURORA H.T. TO 59578 SUB355 - AURORA WEST	1	Corrected by Currently under-construction Chesapeake Project
02SP	59552	SUB 260 - LAWRENCEBURG SHELL	69	0.8588	0.9722	59537 SUB124 - AURORA H.T. TO 59578 SUB355 - AURORA WEST	1	Corrected by Currently under-construction Chesapeake Project
02SP	59606	SUB 420 - MT. VERNON EAST	69	0.8616	0.9742	59578 SUB355 - AURORA WEST TO 59606 SUB420 - MT. VERNON EAST	1	Corrected by Currently under-construction Chesapeake Project
02SP	59577	SUB351 - MOUNT VERNON EAST	69	0.8624	0.9728	59578 SUB355 - AURORA WEST TO 59606 SUB420 - MT. VERNON EAST	1	Corrected by Currently under-construction Chesapeake Project
02SP	59424	SUB364 - RESCUE EXPLORER	69	0.8652	0.9644	59578 SUB355 - AURORA WEST TO 59606 SUB420 - MT. VERNON EAST	1	Corrected by Currently under-construction Chesapeake Project
02SP	59553	SUB262 - ALBATROSS	69	0.8707	0.9694	59578 SUB355 - AURORA WEST TO 59606 SUB420 - MT. VERNON EAST	1	Corrected by Currently under-construction Chesapeake Project
02SP	59573	SUB 338 - HEATONVILLE CHEROKEE	69	0.8828	0.9703	59578 SUB355 - AURORA WEST TO 59606 SUB420 - MT. VERNON EAST	1	Corrected by Currently under-construction Chesapeake Project
02SP	59604	SUB 415 - BLACKHAWK JCT.	69	0.8830	1.0016	59604 SUB415 - BLACKHAWK JCT. TO 96673 AEC JAMESVILLE	1	Install 69 kV Capacitor Bank at Ozark Southeast #434 Will be installed by 12/01/2002
02SP	59570	SUB 330 - OZARK NORTHWEST	69	0.8831	0.9969	59604 SUB415 - BLACKHAWK JCT. TO 96673 AEC JAMESVILLE	1	Install 69 kV Capacitor Bank at Ozark Southeast #434 Will be installed by 12/01/2002
02SP	59570	SUB 330 - OZARK NORTHWEST	69	0.8857	0.9969	59570 SUB330 - OZARK NW TO 59604 SUB415 - BLACKHAWK JCT.	1	Install 69 kV Capacitor Bank at Ozark Southeast #434 Will be installed by 12/01/2002
02SP	59609	SUB 434 - OZARK SOUTHEAST	69	0.8877	0.9925	59604 SUB415 - BLACKHAWK JCT. TO 96673 AEC JAMESVILLE	1	Install 69 kV Capacitor Bank at Ozark Southeast #434 Will be installed by 12/01/2002
02SP	59609	SUB 434 - OZARK SOUTHEAST	69	0.8901	0.9925	59570 SUB330 - OZARK NW TO 59604 SUB415 - BLACKHAWK JCT.	1	Install 69 kV Capacitor Bank at Ozark Southeast #434 Will be installed by 12/01/2002
02SP	59535	SUB 114 - NIXA NORTH	69	0.8901	0.9956	59604 SUB415 - BLACKHAWK JCT. TO 96673 AEC JAMESVILLE	1	Install 69 kV Capacitor Bank at Ozark Southeast #434 Will be installed by 12/01/2002
02FA	59578	SUB 355 - AURORA WEST	69	0.8644	0.9981	59537 SUB124 - AURORA H.T. TO 59578 SUB355 - AURORA WEST	1	Corrected by Currently under-construction Chesapeake Project
02FA	59606	SUB 420 - MT. VERNON EAST	69	0.8698	0.9834	59537 SUB124 - AURORA H.T. TO 59578 SUB355 - AURORA WEST	1	Corrected by Currently under-construction Chesapeake Project
02FA	59577	SUB351 - MOUNT VERNON EAST	69	0.8708	0.9824	59537 SUB124 - AURORA H.T. TO 59578 SUB355 - AURORA WEST	1	Corrected by Currently under-construction Chesapeake Project
02FA	59424	SUB364 - RESCUE EXPLORER	69	0.8749	0.9750	59537 SUB124 - AURORA H.T. TO 59578 SUB355 - AURORA WEST	1	Corrected by Currently under-construction Chesapeake Project
02FA	59553	SUB262 - ALBATROSS	69	0.8802	0.9797	59537 SUB124 - AURORA H.T. TO 59578 SUB355 - AURORA WEST	1	Corrected by Currently under-construction Chesapeake Project
02FA	59573	SUB 338 - HEATONVILLE CHEROKEE	69	0.8925	0.9808	59537 SUB124 - AURORA H.T. TO 59578 SUB355 - AURORA WEST	1	Corrected by Currently under-construction Chesapeake Project
02WP	59568	SUB 324 - STOCKTON NORTHWEST	69	0.8649	1.005	59568 SUB 324 - STOCKTON NORTHWEST TO 59616 SUB 631 - STOCKTON CITY	1	Invalid Contingency
02WP	59425	SUB 209 - HERMITAGE	69	0.8964	0.9899	59464/59528 SUB 73 - BOLIVAR BURNS 161/69KV TRANSFORMER	1	Local problem will install Capacitor to correct in 2004
02WP	59434	SUB 409 - BUFFALO SOUTH	69	0.8968	0.9686	59464/59528 SUB 73 - BOLIVAR BURNS 161/69KV TRANSFORMER	1	Local problem will install Capacitor to correct in 2004

Table 2 – The Empire District Electric Company Network Facilities with Thermal Loading above 100% Rate B

STUDY YEAR	OVERLOADED BRANCH	RATE B (MVA)	% LOADING	OUTAGED BRANCH	MITIGATION PLAN, SOLUTION
02SP	SUB 217 - FAIRPLAY EAST 69/34.5KV TRANSFORMER 59545 FRP217 269.0 FAIRPLAY	5	138.6	SUB 324 - STOCKTON NORTHWEST TO SUB 631 - STOCKTON CITY, 69KV 59568 STK324 269. TO 59616 STK631J269. CKT 1	Rating of Transformer should be 6 MVA Install a 2 nd 6 MVA auto-xfmr in parallel with existing auto- xfmr at Fairplay
02SP	SUB 217 - FAIRPLAY EAST 69/34.5KV TRANSFORMER 59545 FRP217 269.0 FAIRPLAY	5	138.5	SUB 324 - STOCKTON NORTHWEST 69/34.5KV TRANSFORMER 59568 STK324 269. TO 59638 STK324 134. CKT 1	Rating of Transformer should be 6 MVA Install a 2 nd 6 MVA auto-xfmr in parallel with existing auto- xfmr at Fairplay
02SP	SUB 145 - JOPLIN WEST 7TH TO SUB 439 - STATELINE, 161KV 59470 JOP145 5 161 59498 STL439 5 161 1	268	121.7	SUB 389 - JOPLIN SOUTHWEST TO SUB 439 - STATELINE, 161KV 59483 JOP389 5161 TO 59498 STL439 5161 CKT 1 SUB 389 - JOPLIN SOUTHWEST TO SUB 439 - STATELINE, 161KV 59483 JOP389 5161 TO 59498 STL439 5161 CKT 2	Invalid Contingency Invalid Contingency
02SP	SUB 110 - ORONOGO JCT. TO SUB 432 - JOPLIN OAKLAND NORTH, 161KV 59467 ORO110 5 161 59494 OAK432 5 161 1	214	113.5	SUB 389 - JOPLIN SOUTHWEST TO SUB 439 - STATELINE, 161KV 59483 JOP389 5161 TO 59498 STL439 5161 CKT 1 SUB 389 - JOPLIN SOUTHWEST TO SUB 439 - STATELINE, 161KV 59483 JOP389 5161 TO 59498 STL439 5161 CKT 2	Invalid Contingency Invalid Contingency
02SP	SUB 124 - AURORA H.T. 161/69KV TRANSFORMER 59468 AUR124 5 161 AURORA3	41.7	112.5	SUB 383 - MONETT 161/69KV TRANSFORMER 59480 MON383 5161 TO 59591 MON383 269. CKT 1	Corrected by Currently under- construction Chesapeake Project
02SP	SUB 109 - ATLAS JCT. TO SUB 432 - JOPLIN OAKLAND NORTH, 161KV 59466 ATL109 5 161 59494 OAK432 5 161 1	214	105.7	SUB 389 - JOPLIN SOUTHWEST TO SUB 439 - STATELINE, 161KV 59483 JOP389 5161 TO 59498 STL439 5161 CKT 1 SUB 389 - JOPLIN SOUTHWEST TO SUB 439 - STATELINE, 161KV 59483 JOP389 5161 TO 59498 STL439 5161 CKT 2	Invalid Contingency Invalid Contingency
02FA	SUB 110 - ORONOGO JCT. TO SUB 432 - JOPLIN OAKLAND NORTH, 161KV 59467*ORO110 5 161 59494 OAK432 5 161 1	214	100.9	SUB 389 - JOPLIN SOUTHWEST TO SUB 439 - STATELINE, 161KV 59483 JOP389 5161 TO 59498 STL439 5161 CKT 1 SUB 389 - JOPLIN SOUTHWEST TO SUB 439 - STATELINE, 161KV 59483 JOP389 5161 TO 59498 STL439 5161 CKT 2	Invalid Contingency Invalid Contingency
02WP	SUB 217 - FAIRPLAY EAST 69/34.5KV TRANSFORMER 59545*FRP217 269.0 FAIRPLAY	5	177.7	SUB 324 - STOCKTON NORTHWEST TO SUB 631 - STOCKTON CITY, 69KV 59568 STK324 269 TO 59616 STK631J269 CKT 1	Rating of Transformer should be 6 MVA Install a 2 nd 6 MVA auto-xfmr in parallel with existing auto- xfmr at Fairplay
02WP	SUB 217 - FAIRPLAY EAST 69/34.5KV TRANSFORMER 59545*FRP217 269.0 FAIRPLAY	5	177.1	SUB 324 - STOCKTON NORTHWEST 69/34.5KV TRANSFORMER 59568 STK324 269 TO 59638 STK324 134.5 TO 59718 STK324T112.5 CKT 1	Rating of Transformer should be 6 MVA Install a 2 nd 6 MVA auto-xfmr in parallel with existing auto- xfmr at Fairplay
02WP	SUB 217 - FAIRPLAY EAST 69/34.5KV TRANSFORMER 59545*FRP217 269.0 FAIRPLAY	5	109.4	SUB 418 - AEC STOCKTON TO SUB 631 - STOCKTON CITY, 69KV 59605 STK418 269 TO 59614 SK631CJ269 CKT 1	Rating of Transformer should be 6 MVA Install a 2 nd 6 MVA auto-xfmr in parallel with existing auto- xfmr at Fairplay
02WP	SUB 217 - FAIRPLAY EAST 69/34.5KV TRANSFORMER 59545*FRP217 269.0 FAIRPLAY	5	109.4	SUB 631 - STOCKTON CITY TO SUB 631 - STOCKTON CITY, 69KV 59614 SK631CJ269 TO 59616 STK631J269 CKT 1	Rating of Transformer should be 6 MVA Install a 2 nd 6 MVA auto-xfmr in parallel with existing auto- xfmr at Fairplay
02WP	SUB 217 - FAIRPLAY EAST 69/34.5KV TRANSFORMER 59545*FRP217 269.0 FAIRPLAY	5	109.4	SUB 418 - AEC STOCKTON 161/69KV TRANSFORMER 59605 STK418 269 TO 96118 5STKAEC 161 TO 59719 STK418 112.5 CKT 1	Rating of Transformer should be 6 MVA Install a 2 nd 6 MVA auto-xfmr in parallel with existing auto- xfmr at Fairplay
02WP	SUB 324 - STOCKTON NORTHWEST 69/34.5KV TRANSFORMER 59568*STK324 269.0 STOCK34	9.4	106.0	SUB 217 - FAIRPLAY EAST 69/34.5KV TRANSFORMER 59545 FRP217 269 TO 59635 FRP217 134.5 TO 59717 FRP217T112.5 CKT 1	Local Problem investigating re-rating transformer

Table 3 – The Empire District Electric Company 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	Owner
02SP	1	28.5	37.7	59468/99912(3) AURORA	161/69KV XFMR	40.4	41.7	41.4	0.0335	0.208	59480 MON383 5 161 to 99898 STAR BUS1.00 1	see above	EDE	
02SP	2	31	40.9	59468/99912(3) AURORA	161/69KV XFMR	40.3	41.7	41.4	0.0335	-0.208	59591 MON383 269.0 to 99898 STAR BUS1.00 1	see above	EDE	
02SP	3	31.5	41.6	59537/99912(3) AURORA	161/69KV XFMR	-40.3	-41.7	-41.4	-0.0335	-0.208	59480 MON383 5 161 to 99898 STAR BUS1.00 1	see above	EDE	
02SP	4	34	44.8	59537/99912(3) AURORA	161/69KV XFMR	-40.2	-41.7	-41.3	-0.0335	0.208	59591 MON383 269.0 to 99898 STAR BUS1.00 1	see above	EDE	

Table 4 – NON – SPP FACILITIES 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	Owner	
02SP	5	36.1	40.6	96089/96673(2) JAMESVILLE 161/69KV XFMR	54.9	56	55.9	0.027	0.4265	96089 5JAMESV 161 to 96673 2JAMESV 69.0 1	Non SPP member	AEC	

Generation Adjustment Tables For Limits Found In Generation Sensitivity Analysis

2002 Summer Peak Generator Adjustment For Limiting Constraint Number 1 Contingency: 59480 MON383 5 161 99898 STAR BUS1.00 1								2002 Summer Peak Generator Adjustment For Limiting Constraint Number 2 Contingency: 59591 MON383 269.0 99898 STAR BUS1.00 1							
Generator bus	Worst Dispatch	Study PF	Generation Outage PF	P min	P max	P orig	P new	Generator bus	Worst Dispatch	Study PF	Generation Outage PF	P min	P max	P orig	P new
59644 R7G167	--	1	0.0359	0.029	0	38	28.9	59644 R7G167	--	1.1	0.0359	0.029	0	38	28.9
59645 R8G167	--	1.8	0.0635	0.029	0	53	36.9	59645 R8G167	--	2	0.0635	0.029	0	53	36.9
59647 R10G167	--	1.3	0.0457	0.032	0	17	5.4	59647 R10G167	--	1.4	0.0457	0.032	0	17	5.4
59648 OZD312	--	0.2	0.0061	0.037	0	16	14.5	59648 OZD312	--	0.2	0.0061	0.037	0	16	14.5
59649 A1G349	--	2.7	0.0942	0.033	0	191	167.1	59649 A1G349	--	2.9	0.0942	0.033	0	191	167.1
59651 L1G382	17.7	2	0.07	0.044	0	90	72.3	59651 L1G382	17.7	2.2	0.07	0.044	0	90	72.3
59652 L2G382	10.8	2	0.07	0.044	0	90	72.3	59652 L2G382	13.3	2.2	0.07	0.044	0	90	72.3
59655 S1G439	--	4	0.1392	0.033	0	103	67.8	59655 S1G439	--	4.3	0.1392	0.033	0	103	67.8
59658 S4G439	--	4.2	0.1476	0.033	0	200	162.6	59658 S4G439	--	4.6	0.1476	0.033	0	200	162.6
59696 S2G EMDE	--	3.4	0.1178	0.033	0	75	45.2	59696 S2G EMDE	--	3.7	0.1178	0.033	0	75	45.2
59698 S3G EMDE	--	3.4	0.1178	0.033	0	75	45.2	59698 S3G EMDE	--	3.7	0.1178	0.033	0	75	45.2
59687 JECU1EMD	--	0.6	0.0206	0.029	0	54	48.8	59687 JECU1EMD	--	0.6	0.0206	0.029	0	54	48.8
59689 JECU2EMD	--	0.6	0.0206	0.029	0	54	48.8	59689 JECU2EMD	--	0.6	0.0206	0.029	0	54	48.8
59693 JECU3EMD	--	0.6	0.0206	0.029	0	54	48.8	59693 JECU3EMD	--	0.6	0.0206	0.029	0	54	48.8
59695 IATG1EMD	--	0.9	0.0305	0.029	0	80	72.3	59695 IATG1EMD	--	0.9	0.0305	0.029	0	80	72.3

2002 Summer Peak Generator Adjustment For Limiting Constraint Number 3 Contingency: 59480 MON383 5 161 99898 STAR BUS1.00 1								2002 Summer Peak Generator Adjustment For Limiting Constraint Number 4 Contingency: 59591 MON383 269.0 99898 STAR BUS1.00 1							
Generator bus	Worst Dispatch	Study PF	Generation Outage PF	P min	P max	P orig	P new	Generator bus	Worst Dispatch	Study PF	Generation Outage PF	P min	P max	P orig	P new
59644 R7G167	--	1.1	0.0359	-0.03	0	38	28.9	59644 R7G167	--	1.2	0.0359	-0.03	0	38	28.9
59645 R8G167	--	2	0.0635	-0.03	0	53	36.9	59645 R8G167	--	2.2	0.0635	-0.03	0	53	36.9
59647 R10G167	--	1.4	0.0457	-0.03	0	17	5.4	59647 R10G167	--	1.6	0.0457	-0.03	0	17	5.4
59648 OZD312	--	0.2	0.0061	-0.04	0	16	14.5	59648 OZD312	--	0.2	0.0061	-0.04	0	16	14.5
59649 A1G349	--	3	0.0942	-0.03	0	191	167.1	59649 A1G349	--	3.2	0.0942	-0.03	0	191	167.1
59651 L1G382	17.7	2.2	0.07	-0.04	0	90	72.3	59651 L1G382	17.7	2.4	0.07	-0.04	0	90	72.3
59652 L2G382	13.7	2.2	0.07	-0.04	0	90	72.3	59652 L2G382	16.2	2.4	0.07	-0.04	0	90	72.3
59655 S1G439	--	4.4	0.1392	-0.03	0	103	67.8	59655 S1G439	--	4.7	0.1392	-0.03	0	103	67.8
59658 S4G439	--	4.6	0.1476	-0.03	0	200	162.6	59658 S4G439	--	5	0.1476	-0.03	0	200	162.6
59696 S2G EMDE	--	3.7	0.1178	-0.03	0	75	45.2	59696 S2G EMDE	--	4	0.1178	-0.03	0	75	45.2
59698 S3G EMDE	--	3.7	0.1178	-0.03	0	75	45.2	59698 S3G EMDE	--	4	0.1178	-0.03	0	75	45.2
59687 JECU1EMD	--	0.6	0.0206	-0.03	0	54	48.8	59687 JECU1EMD	--	0.7	0.0206	-0.03	0	54	48.8
59689 JECU2EMD	--	0.6	0.0206	-0.03	0	54	48.8	59689 JECU2EMD	--	0.7	0.0206	-0.03	0	54	48.8
59693 JECU3EMD	--	0.6	0.0206	-0.03	0	54	48.8	59693 JECU3EMD	--	0.7	0.0206	-0.03	0	54	48.8
59695 IATG1EMD	--	1	0.0305	-0.03	0	80	72.3	59695 IATG1EMD	--	1	0.0305	-0.03	0	80	72.3

Generation Adjustment Tables For Limits Found In Generation Sensitivity Analysis

2002 Summer Peak							
Generator Adjustment For Limiting Constraint Number 5							
Contingency: 96089 5JAMESV 161 96673 2JAMESV 69.0 1							
Generator bus	Worst Dispatch	Study PF	Generation Outage PF	P min	P max	P orig	P new
59644 R7G167	--	1.3	0.0359	0.026	0	38	28.9
59645 R8G167	--	2.3	0.0635	0.026	0	53	36.9
59647 R10G167	--	1.7	0.0457	0.027	0	17	5.4
59648 OZD312	1.5	0.2	0.0061	0.028	0	16	14.5
59649 A1G349	11.2	3.4	0.0942	0.028	0	191	167.1
59651 L1G382	--	2.5	0.07	0.026	0	90	72.3
59652 L2G382	--	2.5	0.07	0.026	0	90	72.3
59655 S1G439	--	5	0.1392	0.026	0	103	67.8
59658 S4G439	--	5.3	0.1476	0.026	0	200	162.6
59696 S2G EMDE	--	4.3	0.1178	0.026	0	75	45.2
59698 S3G EMDE	--	4.3	0.1178	0.026	0	75	45.2
59687 JECU1EMD	5.2	0.7	0.0206	0.032	0	54	48.8
59689 JECU2EMD	5.2	0.7	0.0206	0.032	0	54	48.8
59693 JECU3EMD	5.2	0.7	0.0206	0.032	0	54	48.8
59695 IATG1EMD	7.7	1.1	0.0305	0.032	0	80	72.3

5. Conclusion

No facilities in SPP restrict the requested Network Integration Transmission Service by Empire District Electric Company; therefore, request 344544, 344546 and 344550 will be accepted.

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 – 1.0
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