SPP Southwest Power Pool

System Impact Study SPP-2002-197
For Transmission Service
Requested By
Rainbow Energy Marketing

From OPPD To ERCOTN

For a Reserved Amount Of 50MW
From 12/1/02
To 1/1/05

SPP Coordinated Planning

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1. Executive Summary

Rainbow Energy Marketing has requested a system impact study for long-term Firm Point-to-Point transmission service from OPPD to ERCOTN. The period of the transaction is from 12/1/02 to 1/1/05. The request is for OASIS reservation 427479 for a total amount of 50 MW.

The principal objective of this study is to identify system problems and potential system modifications necessary to facilitate the additional 50 MW transfer while maintaining system reliability.

New overloads caused by the 50 MW transfer were identified along with determining the impact of the transfer on any previously assigned and identified facilities.

The OPPD – ERCOTN 50 MW transfer causes new facility overloads on the SPP transmission system, as well as increasing the loading on previously identified facilities. To provide the 50 MW of service requested, upgrades must be completed for those facilities that limit the ATC to less than 50 MW.

2. Introduction

Cargill - Alliant has requested an impact study for transmission service from OPPD – ERCOTN.

The principal objective of this study is to identify the restraints on the SPP Regional Tariff System that may limit the transfer to less than 50 MW. This study includes steady-state contingency analyses (PSS/E function ACCC) and Available Transfer Capability (ATC) analyses for the requested service period and the remaining planning horizon.

The steady-state analyses consider the impact of the 50 MW transfer on transmission line loading and transmission bus voltages for outages of single and selected multiple transmission lines and transformers on the SPP system.

3. Study Methodology

A. Description

Two analyses were conducted to determine the impact of the 50 MW transfer on the system. The first analysis was conducted to identify any new overloads caused by the 50 MW transfer. The second analysis was done to ensure that available capacity exists on previously identified circuits. Both analyses were performed on the models available for the requested service period.

The first analysis was to study the steady-state analysis impact of the 50 MW transfer on the SPP system. The second step was to study Available Transfer Capability (ATC) of the facilities identified in the steady-state analysis impact. The steady-state analysis 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 thermal overloads with a contingency. It requires that all facilities be within emergency ratings after a contingency.

The second analysis was done to determine the impact of the transfer on previously assigned and identified facilities.

B. Model Updates

SPP used eleven seasonal models to study the OPPD – ERCOTN 50 MW transfers for their requested service periods and the remaining planning horizon. The SPP 2002 Series Cases 2002/03 Winter Peak, 2003 April Minimum, 2003 Spring Peak, 2003 Summer Peak, 2003 Fall Peak, 2003/04 Winter Peak and 2004 Spring Peak were used to study the impact of the 200 MW transfer on the SPP system during the requested service period of 1/1/03 to 1/1/05. The Spring Peak models apply to April and May, the Summer Peak models apply to June through September, the Fall Peak models apply to October and November, and the Winter Peak models apply to December through March.

The chosen base case models were modified to reflect the most current modeling information. The cases were modified to reflect future firm transfers during the requested service period that were not already included in the January 2002 base case series models.

C. Transfer Analysis

Using the created models and the ACCC function of PSS\E, single and select double contingency outages were analyzed. Then full AC solution was used to obtain the most accurate results possible. Any facility overloaded, using MVA ratings, in the transfer case and not overloaded in the base case was flagged. The PSS/E options chosen to conduct the Impact Study analysis can be found in Appendix A.

4. Study Results

A. Study Analysis Results

Tables 1, 2, and 3 contain the analysis results of the System Impact Study. The tables identify the seasonal case in which the event occurred; the emergency rating of the overloaded circuit (Rate B), the contingent loading percentage of circuit with and without the studied transfer, the estimated ATC value using interpolation if calculated, any SPP identification or assignment of the event, and any solutions received from the transmission owners.

Table 1 shows the new SPP facility overloads caused by the 50 MW transfer. Available solutions are given in the table.

Table 2 documents overloads on Non SPP Regional Tariff participants' transmission systems caused by the 50 MW transfer.

Table 3 documents the 50 MW transfer impact on previously assigned and identified SPP facilities. Available solutions are given in the table.

Tables 1a and 3a of Appendix B documents the modeling representation of the events identified in Tables 1 and 3 respectively to include bus numbers and bus names.

Table 1 – SPP Facility Overloads caused by the OPPD – ERCOTN 50 MW Transfer

Study Year	From Area - To Area	Branch Over 100% Rate B	Rate B	BC % Loading	TC % Loading	Outaged Branch Causing Overload	ATC (MW)	Comment
03WP	WERE-WERE	North American Philips Junction (South) - West McPherson 115 kV	68	99.8	100.6	East McPherson - Summit 230kV	13	

Table 2 – Non - SPP Facility Overloads caused by the OPPD – ERCOTN 50 MW Transfer

Study Year	From Area - To Area	Branch Over 100% Rate B	Rate B	BC % Loading	TC % Loading	Outaged Branch Causing Overload
03SP	AECI-AECI	96096 5MARIES 161 to 97184 2MARIES 69.0 CKT 1	25	99.2	100.8	96096 5MARIES 161 to 97184 2MARIES 69.0 CKT2

Table 3 – Previously Identified SPP Facilities Impacted by the OPPD – ERCOTN 50 MW Transfer

Study Year	From Area - To Area	Branch Over 100% Rate B	Rate B	BC % Loading	TC % Loading	Outaged Branch Causing Overload	ATC (MW)	Comment
03WP	WERE-WERE	North American Philips Junction (South) - West McPherson 115 kV	68	99.8	100.6	East McPherson - Summit 230kV	0	Solution Undetermined
04G	WERE-WERE	West Junction City Junction (East) 115 KV - West Junction City Junction (West) 115 kV	141	100.2	100.7	Jeffrey Energy Center - Summit 345kV	50	Westar Transmission Operating Directive 402
02WP	WFEC-WFEC	Goldsby - Oklahoma University SW 69kV	34	100.3	100.8	Acme - West Norman 69kV	0	Solution Undetermined
02WP	WERE-WERE	West Junction City Junction (East) 115 KV - West Junction City Junction (West) 115 kV	141	100.6	101.0	Jeffrey Energy Center - Summit 345kV	50	Westar Transmission Operating Directive 402
04G	WERE-WERE	Anzio - Fort Junction Switching Station 115kV	92	100.9	101.2	West Junction City Junction (East) 115 KV - West Junction City Junction (West) 115 kV	50	Westar Transmission Operating Directive 1217
03G	WERE-WERE	Coffey County No. 4 Vernon - Athens Switching Station 69kV	45	101.1	101.5	Rose Hill - Wolf Creek 345kV	50	Westar Transmission Operating Directive 1304
03G	WERE-WERE	Coffey County No. 4 Vernon - Athens Switching Station 69kV	45	101.3	101.7	Benton - Wolf Creek 345kV	50	Westar Transmission Operating Directive 1304
03G	WERE-WERE	Keene - South Alma 115kV	68	102.0	102.1	Jeffrey Energy Center - East Manhattan 230kV	50	Westar Transmission Operating Directive 900
03G	WERE-WERE	Keene - South Alma 115kV	68	102.0	102.1	Jeffrey Energy Center - East Manhattan 230kV	50	Westar Transmission Operating Directive 900
03FA	WERE-WERE	Anzio - Fort Junction Switching Station 115kV	92	102.0	102.3	West Junction City Junction (East) 115 KV - West Junction City Junction (West) 115 kV	50	Westar Transmission Operating Directive 1217
02WP	WFEC-WFEC	Acme - West Norman 69kV	38	102.1	102.5	Canadian SW 138/69kV Transformer	0	Solution Undetermined
03SP	WERE-WERE	Jarbalo Jct Sw. Sta. - 166th Street 115kV	97	102.4	102.6	Midland Junction - Pentagon 115kV	50	Westar Transmission Operating Directive 1202
03FA	WERE-WERE	Exide Junction - Summit 115kV	181	102.7	102.8	Northview - Summit 115kV	0	Solution Undetermined
03SP	AEPW-AEPW	Fitzhugh 161/69kV Transformer #1	111	102.7	102.8	Fitzhugh 161/69kV Transformer #1	0	Solution Undetermined
03G	WERE-WERE	Coffey County No. 4 Vernon - Green 69kV	45	102.5	102.9	Rose Hill - Wolf Creek 345kV	50	Westar Transmission Operating Directive 1304
02WP	WERE-WERE	North American Philips Junction (South) - West McPherson 115 kV	68	102.2	102.9	East McPherson - Summit 230kV	0	Solution Undetermined
03G	WERE-WERE	Coffey County No. 4 Vernon - Green 69kV	45	102.7	103.1	Benton - Wolf Creek 345kV	50	Westar Transmission Operating Directive 1304
03WP	WERE-WERE	West Junction City Junction (East) 115 KV - West Junction City Junction (West) 115 kV	141	102.7	103.1	Jeffrey Energy Center - Summit 345kV	50	Westar Transmission Operating Directive 402
03SP	OKGE-OKGE	Draper Lake 345/138kV Transformer #2	493	103.1	103.2	Draper Lake 345/138kV Transformer #2	50	OKGE Mitigation Plan to Increase Rating to 591 MVA by 2004
03SP	OKGE-OKGE	Beeline - Tibbens 69kV	66	103.1	103.5	Bluebell 138/69kV Transformer	50	OKGE Transmission Operating Directive
03FA	WERE-WERE	West Junction City Junction (East) 115 KV - West Junction City Junction (West) 115 kV	141	103.5	104.0	Jeffrey Energy Center - Summit 345kV	50	Westar Transmission Operating Directive 402
03SP	KACP-KACP	Hawthorne - Randolph 161kV	335	104.4	104.5	Levee - Neast 161kV	50	Solution Undetermined, 05SP Rate B = 588MVA
04G	WERE-WERE	Exide Junction - Summit 115kV	181	104.7	104.8	Northview - Summit 115kV	0	Solution Undetermined
03FA	WERE-WERE	Mead - Plaza 69kV	72	106.6	106.7	Evans Energy Center North - Evans Energy Center South 138kV	0	Solution Undetermined
02WP	WERE-WERE	East Street - West Emporia 115kV	92	106.7	107.1	Morris County - West Emporia 115kV	50	Westar Transmission Operating Directive 1209
04G	WFEC-WFEC	Goldsby - Oklahoma University SW 69kV	34	108.0	108.5	Franklin SW 138/69kV Transformer	0	Solution Undetermined
03G	WERE-WERE	West Junction City Junction (East) 115 KV - West Junction City Junction (West) 115 kV	141	108.9	109.4	Jeffrey Energy Center - Summit 345kV	50	Westar Transmission Operating Directive 402
03SP	WFEC-WFEC	Goldsby - Oklahoma University SW 69kV	34	111.0	111.5	Acme - West Norman 69kV	0	Solution Undetermined
03G	WERE-WERE	Anzio - Fort Junction Switching Station 115kV	92	111.2	111.6	West Junction City Junction (East) 115 KV - West Junction City Junction (West) 115 kV	50	Westar Transmission Operating Directive 1217
03G	WFEC-WFEC	Goldsby - Oklahoma University SW 69kV	34	111.5	111.8	Franklin SW 138/69kV Transformer	0	Solution Undetermined

Table 3-continued – Model Data for Previously Identified SPP Facilities Impacted by the OPPD to ERCOTN 50 MW Transfer

Study Year	From Area - To Area	Branch Over 100% Rate B	Rate B	BC % Loading	TC % Loading	Outaged Branch Causing Overload	ATC (MW)	Comment
03WP	WFEC-WFEC	Goldsby - Oklahoma University SW 69kV	34	111.4	111.9	Acme - Franklin SW 69kV	0	Solution Undetermined
02WP	WFEC-WFEC	Paoli 138/69kV Transformer	42	112.1	112.2	Canadian SW 138/69kV Transformer	0	Solution Undetermined
03WP	WFEC-WFEC	Acme - Franklin SW 69kV	34	112.0	112.5	Goldsby - Oklahoma University SW 69kV	0	Solution Undetermined
03FA	WFEC-WFEC	Goldsby - Oklahoma University SW 69kV	34	113.8	114.3	Franklin SW 138/69kV Transformer	0	Solution Undetermined
03WP	WFEC-WFEC	Paoli 138/69kV Transformer	42	114.4	114.5	Canadian SW 138/69kV Transformer	0	Solution Undetermined
03G	WERE-WERE	East Street - West Emporia 115kV	92	114.5	114.9	Morris County - West Emporia 115kV	50	Westar Transmission Operating Directive 1209
03WP	WFEC-WFEC	Little Axe - Noble 69kV	26	114.8	115.1	Paoli 138/69kV Transformer	0	Solution Undetermined
03FA	WFEC-WFEC	Paoli 138/69kV Transformer	42	115.7	115.8	Canadian SW - Noble 69kV	0	Solution Undetermined
02WP	WFEC-WFEC	Goldsby - Oklahoma University SW 69kV	34	115.5	116.0	Acme - Franklin SW 69kV	0	Solution Undetermined
03SP	WERE-WERE	Hutchinson Gas Turbine Station - Hutchinson Energy Center 69KV	130	115.9	116.1	Hutchinson Gas Turbine Station - Hutchinson Energy Center 69KV	50	TRNSMISSION OPERATING DIRECTIVE 613
03SP	WERE-WERE	Hutchinson Gas Turbine Station - Hutchinson Energy Center 69KV	130	115.9	116.1	Circle - Hutchinson Gas Turbine Station 115KV	50	TRNSMISSION OPERATING DIRECTIVE 613
02WP	WFEC-WFEC	Acme - Franklin SW 69kV	34	115.6	116.1	Goldsby - Oklahoma University SW 69kV	0	Solution Undetermined
03SP	WFEC-WFEC	Acme - West Norman 69kV	38	116.0	116.4	Canadian SW - Goldsby 69kV	0	Solution Undetermined
02WP	WFEC-WFEC	Little Axe - Noble 69kV	26	117.4	117.7	Paoli 138/69kV Transformer	0	Solution Undetermined
04G	WFEC-WFEC	Acme - Franklin SW 69kV	34	120.0	120.5	Canadian SW 138/69kV Transformer	0	Solution Undetermined
03SP	WFEC-WFEC	Goldsby - Oklahoma University SW 69kV	34	123.2	123.7	Acme - Franklin SW 69kV	0	Solution Undetermined
03G	WFEC-WFEC	Acme - Franklin SW 69kV	34	123.3	123.8	Canadian SW 138/69kV Transformer	0	Solution Undetermined
03SP	WFEC-WFEC	Acme - Franklin SW 69kV	34	124.4	124.9	Goldsby - Oklahoma University SW 69kV	0	Solution Undetermined
03FA	WFEC-WFEC	Acme - Franklin SW 69kV	34	127.0	127.6	Canadian SW 138/69kV Transformer	0	Solution Undetermined
03SP	WFEC-WFEC	Paoli 138/69kV Transformer	42	127.8	128.0	Canadian SW - Noble 69kV	0	Solution Undetermined
03WP	WFEC-WFEC	Goldsby - Oklahoma University SW 69kV	34	139.3	139.6	Franklin SW 138/69kV Transformer	0	Solution Undetermined
03SP	WFEC-WFEC	Goldsby - Oklahoma University SW 69kV	34	139.0	139.6	Franklin SW 138/69kV Transformer	0	Solution Undetermined
02WP	WFEC-WFEC	Goldsby - Oklahoma University SW 69kV	34	142.8	143.3	Franklin SW 138/69kV Transformer	0	Solution Undetermined
02WP	WFEC-WFEC	Paoli 138/69kV Transformer	42	152.5	152.6	Canadian SW - Noble 69kV	0	Solution Undetermined

5. Conclusion

The OPPD – ERCOTN 50 MW transfer causes new facility overloads on the SPP transmission system, as well as increasing the loading on previously identified facilities. To provide the 50 MW of service requested, upgrades must be completed for those facilities given in Tables 1 and 3 that limit the ATC to less than 50 MW.

The final cost assignment of facilities and ATC to Rainbow Energy Marketing will be determined upon the completion of a facility study.

Appendix A

PSS/E CHOICES IN RUNNING LOAD FLOW PROGRAM AND ACCC

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

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

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

Appendix B

Table 1a – Model Data for Previously Identified SPP Facilities Impacted by the OPPD to ERCOTN 50 MW Transfer

Study Year	From Area - To Area	Branch Over 100% Rate B	Branch Over 100% Rate B	Rate B	BC % Loading	TC % Loading	Outaged Branch Causing Overload	Outaged Branch Causing Overload	ATC (MW)	Comment
03WP	WERE-WERE	57374 SPHILPJ3 115 to 57438 WMCPHER3 115 CKT 1	North American Philips Junction (South) - West McPherson 115 kV	68	99.8	100.6	56872 EMCPHER6 230 to 56873 SUMMIT 6 230 CKT1	East McPherson - Summit 230kV	13	

Table 3a-continued – Model Data for Previously Identified SPP Facilities Impacted by the OPPD to ERCOTN 50 MW Transfer

Study Year	From Area - To Area	Branch Over 100% Rate B	Branch Over 100% Rate B	Rate B	BC % Loading	TC % Loading	Outaged Branch Causing Overload	Outaged Branch Causing Overload	ATC (MW)	Comment
03WP	WERE-WERE	North American Philips Junction (South) - West McPherson 115 kV	57374 SPHILPJ3 115 to 57438 WMCPHER3 115 CKT 1	68	99.8	100.6	East McPherson - Summit 230kV	56872 EMCPHER6 230 to 56873 SUMMIT 6 230 CKT1	0	Solution Undetermined
04G	WERE-WERE	West Junction City Junction (East) 115 KV - West Junction City Junction (West) 115 kV	57343 WJCCTYE3 115 to 57342 WJCCTY 3 115 CKT 1	141	100.2	100.7	Jeffrey Energy Center - Summit 345kV	56766 JEC N 7 345 to 56773 SUMMIT 7 345 CKT1	50	Westar Transmission Operating Directive 402
02WP	WFEC-WFEC	Goldsby - Oklahoma University SW 69kV	55924 GOLDSBY269.0 to 56018 OU SW 269.0 CKT 1	34	100.3	100.8	Acme - West Norman 69kV	55802 ACME 269.0 to 56095 WNORMAN269.0 CKT1	0	Solution Undetermined
02WP	WERE-WERE	West Junction City Junction (East) 115 KV - West Junction City Junction (West) 115 kV	57343 WJCCTYE3 115 to 57342 WJCCTY 3 115 CKT 1	141	100.6	101.0	Jeffrey Energy Center - Summit 345kV	56766 JEC N 7 345 to 56773 SUMMIT 7 345 CKT1	50	Westar Transmission Operating Directive 402
04G	WERE-WERE	Anzio - Fort Junction Switching Station 115kV	57321 ANZIO 3 115 to 57328 FT JCT 3 115 CKT 1	92	100.9	101.2	West Junction City Junction (East) 115 KV - West Junction City Junction (West) 115 kV	57342 WJCCTY 3 115 to 57343 WJCCTYE3 115 CKT1	50	Westar Transmission Operating Directive 1217
03G	WERE-WERE	Coffey County No. 4 Vernon - Athens Switching Station 69kV	57631 CC4VERN269.0 to 57623 ATHENS 269.0 CKT 1	45	101.1	101.5	Rose Hill - Wolf Creek 345kV	56794 ROSEHIL7 345 to 56797 WOLFCRK7 345 CKT1	50	Westar Transmission Operating Directive 1304
03G	WERE-WERE	Coffey County No. 4 Vernon - Athens Switching Station 69kV	57631 CC4VERN269.0 to 57623 ATHENS 269.0 CKT 1	45	101.3	101.7	Benton - Wolf Creek 345kV	56791 BENTON 7 345 to 56797 WOLFCRK7 345 CKT1	50	Westar Transmission Operating Directive 1304
03G	WERE-WERE	Keene - South Alma 115kV	57167 KEENE 3 115 to 57339 S ALMA 3 115 CKT 1	68	102.0	102.1	Jeffrey Energy Center - East Manhattan 230kV	56852 JEC 6 230 to 56861 EMANHAT6 230 CKT1	50	Westar Transmission Operating Directive 900
03G	WERE-WERE	Keene - South Alma 115kV	57167 KEENE 3 115 to 57339 S ALMA 3 115 CKT 1	68	102.0	102.1	Jeffrey Energy Center - East Manhattan 230kV	56852 JEC 6 230 to 56861 EMANHAT6 230 CKT1	50	Westar Transmission Operating Directive 900
03FA	WERE-WERE	Anzio - Fort Junction Switching Station 115kV	57321 ANZIO 3 115 to 57328 FT JCT 3 115 CKT 1	92	102.0	102.3	West Junction City Junction (East) 115 KV - West Junction City Junction (West) 115 kV	57342 WJCCTY 3 115 to 57343 WJCCTYE3 115 CKT1	50	Westar Transmission Operating Directive 1217
02WP	WFEC-WFEC	Acme - West Norman 69kV	55802 ACME 269.0 to 56095 WNORMAN269.0 CKT 1	38	102.1	102.5	Canadian SW 138/69kV Transformer	55841 CANADNS269.0 to 55924 GOLDSBY269.0 CKT1	0	Solution Undetermined
03SP	WERE-WERE	Jarbalo Jct Sw. Sta. - 166th Street 115kV	57244 JARBALO3 115 to 57233 166TH 3 115 CKT 1	97	102.4	102.6	Midland Junction - Pentagon 115kV	57252 MIDLAND3 115 to 57261 PENTAGN3 115 CKT1	50	Westar Transmission Operating Directive 1202
03FA	WERE-WERE	Exide Junction - Summit 115kV	57368 EXIDE J3 115 to 57381 SUMMIT 3 115 CKT 1	181	102.7	102.8	Northview - Summit 115kV	57371 NORTHVW3 115 to 57381 SUMMIT 3 115 CKT1	0	Solution Undetermined
03SP	AEPW-AEPW	Fitzhugh 161/69kV Transformer #1	53208 FITZHUG5 161 to 53203 FITZHUG269.0 CKT 2	111	102.7	102.8	Fitzhugh 161/69kV Transformer #1	53203 FITZHUG269.0 to 53208 FITZHUG5 161 CKT1	0	Solution Undetermined
03G	WERE-WERE	Coffey County No. 4 Vernon - Green 69kV	57636 GREEN 269.0 to 57631 CC4VERN269.0 CKT 1	45	102.5	102.9	Rose Hill - Wolf Creek 345kV	56794 ROSEHIL7 345 to 56797 WOLFCRK7 345 CKT1	50	Westar Transmission Operating Directive 1304
02WP	WERE-WERE	North American Philips Junction (South) - West McPherson 115 kV	57374 SPHILPJ3 115 to 57438 WMCPHER3 115 CKT 1	68	102.2	102.9	East McPherson - Summit 230kV	56872 EMCPHER6 230 to 56873 SUMMIT 6 230 CKT1	0	Solution Undetermined
03G	WERE-WERE	Coffey County No. 4 Vernon - Green 69kV	57636 GREEN 269.0 to 57631 CC4VERN269.0 CKT 1	45	102.7	103.1	Benton - Wolf Creek 345kV	56791 BENTON 7 345 to 56797 WOLFCRK7 345 CKT1	50	Westar Transmission Operating Directive 1304
03WP	WERE-WERE	West Junction City Junction (East) 115 KV - West Junction City Junction (West) 115 kV	57342 WJCCTY 3 115 to 57343 WJCCTYE3 115 CKT 1	141	102.7	103.1	Jeffrey Energy Center - Summit 345kV	56766 JEC N 7 345 to 56773 SUMMIT 7 345 CKT1	50	Westar Transmission Operating Directive 402
03SP	OKGE-OKGE	Draper Lake 345/138kV Transformer #2	54934 DRAPER 7 345 to 54933 DRAPER 4 138 CKT 2	493	103.1	103.2	Draper Lake 345/138kV Transformer #2	54934 DRAPER 7 345 to 54933 DRAPER 4 138 CKT1	50	OKGE Mitigation Plan to Increase Rating to 591 MVA by 2004
03SP	OKGE-OKGE	Beeline - Tibbens 69kV	55237 TIBBENS269.0 to 55246 BEELINE269.0 CKT 1	66	103.1	103.5	Bluebell 138/69kV Transformer	55241 BLUEBEL269.0 to 55242 BLUEBEL4 138 CKT1	50	OKGE Transmission Operating Directive
03FA	WERE-WERE	West Junction City Junction (East) 115 KV - West Junction City Junction (West) 115 kV	57343 WJCCTYE3 115 to 57342 WJCCTY 3 115 CKT 1	141	103.5	104.0	Jeffrey Energy Center - Summit 345kV	56766 JEC N 7 345 to 56773 SUMMIT 7 345 CKT1	50	Westar Transmission Operating Directive 402
03SP	KACP-KACP	Hawthorne - Randolph 161kV	58027 RANDLPH5 161 to 57973 HAWTHRN5 161 CKT 1	335	104.4	104.5	Levee - Neast 161kV	57985 NEAST 5 161 to 58011 CHOUTEU5 161 CKT1	50	Solution Undetermined, 05SP Rate B = 588MVA
04G	WERE-WERE	Exide Junction - Summit 115kV	57368 EXIDE J3 115 to 57381 SUMMIT 3 115 CKT 1	181	104.7	104.8	Northview - Summit 115kV	57371 NORTHVW3 115 to 57381 SUMMIT 3 115 CKT1	0	Solution Undetermined
03FA	WERE-WERE	Mead - Plaza 69kV	57815 MEAD 269.0 to 57829 PLAZA 269.0 CKT 1	72	106.6	106.7	Evans Energy Center North - Evans Energy Center South 138kV	57040 EVANS N4 138 to 57041 EVANS S4 138 CKT1	0	Solution Undetermined
02WP	WERE-WERE	East Street - West Emporia 115kV	57301 EAST ST3 115 to 57309 WEMPORI3 115 CKT 1	92	106.7	107.1	Morris County - West Emporia 115kV	57305 MORRIS 3 115 to 57309 WEMPORI3 115 CKT1	50	Westar Transmission Operating Directive 1209
04G	WFEC-WFEC	Goldsby - Oklahoma University SW 69kV	55924 GOLDSBY269.0 to 56018 OU SW 269.0 CKT 1	34	108.0	108.5	Franklin SW 138/69kV Transformer	55916 FRNKLNS269.0 to 55917 FRNKLNS4 138 CKT1	0	Solution Undetermined
03G	WERE-WERE	West Junction City Junction (East) 115 KV - West Junction City Junction (West) 115 kV	57343 WJCCTYE3 115 to 57342 WJCCTY 3 115 CKT 1	141	108.9	109.4	Jeffrey Energy Center - Summit 345kV	56766 JEC N 7 345 to 56773 SUMMIT 7 345 CKT1	50	Westar Transmission Operating Directive 402
03SP	WFEC-WFEC	Goldsby - Oklahoma University SW 69kV	55924 GOLDSBY269.0 to 56018 OU SW 269.0 CKT 1	34	111.0	111.5	Acme - West Norman 69kV	55802 ACME 269.0 to 56095 WNORMAN269.0 CKT1	0	Solution Undetermined
03G	WERE-WERE	Anzio - Fort Junction Switching Station 115kV	57321 ANZIO 3 115 to 57328 FT JCT 3 115 CKT 1	92	111.2	111.6	West Junction City Junction (East) 115 KV - West Junction City Junction (West) 115 kV	57342 WJCCTY 3 115 to 57343 WJCCTYE3 115 CKT1	50	Westar Transmission Operating Directive 1217
03G	WFEC-WFEC	Goldsby - Oklahoma University SW 69kV	55924 GOLDSBY269.0 to 56018 OU SW 269.0 CKT 1	34	111.5	111.8	Franklin SW 138/69kV Transformer	55916 FRNKLNS269.0 to 55917 FRNKLNS4 138 CKT1	0	Solution Undetermined

Table 3a-continued – Model Data for Previously Identified SPP Facilities Impacted by the OPPD to ERCOTN 50 MW Transfer

Study Year	From Area - To Area	Branch Over 100% Rate B	Branch Over 100% Rate B	Rate B	BC % Loading	TC % Loading	Outaged Branch Causing Overload	Outaged Branch Causing Overload	ATC (MW)	Comment
03WP	WFEC-WFEC	Goldsby - Oklahoma University SW 69kV	55924 GOLDSBY269.0 to 56018 OU SW 269.0 CKT 1	34	111.4	111.9	Acme - Franklin SW 69kV	55802 ACME 269.0 to 55916 FRNKLNS269.0 CKT1	0	Solution Undetermined
02WP	WFEC-WFEC	Paoli 138/69kV Transformer	56023 PAOLI 4 138 to 56022 PAOLI 269.0 CKT 1	42	112.1	112.2	Canadian SW 138/69kV Transformer	55841 CANADNS269.0 to 55842 CANADNS4 138 CKT1	0	Solution Undetermined
03WP	WFEC-WFEC	Acme - Franklin SW 69kV	55916 FRNKLNS269.0 to 55802 ACME 269.0 CKT 1	34	112.0	112.5	Goldsby - Oklahoma University SW 69kV	55924 GOLDSBY269.0 to 56018 OU SW 269.0 CKT1	0	Solution Undetermined
03FA	WFEC-WFEC	Goldsby - Oklahoma University SW 69kV	55924 GOLDSBY269.0 to 56018 OU SW 269.0 CKT 1	34	113.8	114.3	Franklin SW 138/69kV Transformer	55916 FRNKLNS269.0 to 55917 FRNKLNS4 138 CKT1	0	Solution Undetermined
03WP	WFEC-WFEC	Paoli 138/69kV Transformer	56023 PAOLI 4 138 to 56022 PAOLI 269.0 CKT 1	42	114.4	114.5	Canadian SW 138/69kV Transformer	55841 CANADNS269.0 to 55842 CANADNS4 138 CKT1	0	Solution Undetermined
03G	WERE-WERE	East Street - West Emporia 115kV	57301 EAST ST3 115 to 57309 WEMPORI3 115 CKT 1	92	114.5	114.9	Morris County - West Emporia 115kV	57305 MORRIS 3 115 to 57309 WEMPORI3 115 CKT1	50	Westar Transmission Operating Directive 1209
03WP	WFEC-WFEC	Little Axe - Noble 69kV	55976 LIL AXE269.0 to 56011 NOBLE 269.0 CKT 1	26	114.8	115.1	Paoli 138/69kV Transformer	56022 PAOLI 269.0 to 56023 PAOLI 4 138 CKT1	0	Solution Undetermined
03FA	WFEC-WFEC	Paoli 138/69kV Transformer	56023 PAOLI 4 138 to 56022 PAOLI 269.0 CKT 1	42	115.7	115.8	Canadian SW - Noble 69kV	55841 CANADNS269.0 to 56011 NOBLE 269.0 CKT1	0	Solution Undetermined
02WP	WFEC-WFEC	Goldsby - Oklahoma University SW 69kV	55924 GOLDSBY269.0 to 56018 OU SW 269.0 CKT 1	34	115.5	116.0	Acme - Franklin SW 69kV	55802 ACME 269.0 to 55916 FRNKLNS269.0 CKT1	0	Solution Undetermined
03SP	WERE-WERE	Hutchinson Gas Turbine Station - Hutchinson Energy Center 69KV	57514 HEC GT 269.0 to 57513 HEC 269.0 CKT 1	130	115.9	116.1	Hutchinson Gas Turbine Station - Hutchinson Energy Center 69KV	57413 CIRCLE 3 115 to 57421 HEC GT 3 115 CKT1	50	TRNSMISSION OPERATING DIRECTIVE 613
03SP	WERE-WERE	Hutchinson Gas Turbine Station - Hutchinson Energy Center 69KV	57514 HEC GT 269.0 to 57513 HEC 269.0 CKT 1	130	115.9	116.1	Circle - Hutchinson Gas Turbine Station 115KV	57413 CIRCLE 3 115 to 57421 HEC GT 3 115 CKT1	50	TRNSMISSION OPERATING DIRECTIVE 613
02WP	WFEC-WFEC	Acme - Franklin SW 69kV	55916 FRNKLNS269.0 to 55802 ACME 269.0 CKT 1	34	115.6	116.1	Goldsby - Oklahoma University SW 69kV	55924 GOLDSBY269.0 to 56018 OU SW 269.0 CKT1	0	Solution Undetermined
03SP	WFEC-WFEC	Acme - West Norman 69kV	56095 WNORMAN269.0 to 55802 ACME 269.0 CKT 1	38	116.0	116.4	Canadian SW - Goldsby 69kV	55841 CANADNS269.0 to 55924 GOLDSBY269.0 CKT1	0	Solution Undetermined
02WP	WFEC-WFEC	Little Axe - Noble 69kV	55976 LIL AXE269.0 to 56011 NOBLE 269.0 CKT 1	26	117.4	117.7	Paoli 138/69kV Transformer	56022 PAOLI 269.0 to 56023 PAOLI 4 138 CKT1	0	Solution Undetermined
04G	WFEC-WFEC	Acme - Franklin SW 69kV	55802 ACME 269.0 to 55916 FRNKLNS269.0 CKT 1	34	120.0	120.5	Canadian SW 138/69kV Transformer	55841 CANADNS269.0 to 55842 CANADNS4 138 CKT1	0	Solution Undetermined
03SP	WFEC-WFEC	Goldsby - Oklahoma University SW 69kV	55924 GOLDSBY269.0 to 56018 OU SW 269.0 CKT 1	34	123.2	123.7	Acme - Franklin SW 69kV	55802 ACME 269.0 to 55916 FRNKLNS269.0 CKT1	0	Solution Undetermined
03G	WFEC-WFEC	Acme - Franklin SW 69kV	55802 ACME 269.0 to 55916 FRNKLNS269.0 CKT 1	34	123.3	123.8	Canadian SW 138/69kV Transformer	55841 CANADNS269.0 to 55842 CANADNS4 138 CKT1	0	Solution Undetermined
03SP	WFEC-WFEC	Acme - Franklin SW 69kV	55916 FRNKLNS269.0 to 55802 ACME 269.0 CKT 1	34	124.4	124.9	Goldsby - Oklahoma University SW 69kV	55924 GOLDSBY269.0 to 56018 OU SW 269.0 CKT1	0	Solution Undetermined
03FA	WFEC-WFEC	Acme - Franklin SW 69kV	55802 ACME 269.0 to 55916 FRNKLNS269.0 CKT 1	34	127.0	127.6	Canadian SW 138/69kV Transformer	55841 CANADNS269.0 to 55842 CANADNS4 138 CKT1	0	Solution Undetermined
03SP	WFEC-WFEC	Paoli 138/69kV Transformer	56023 PAOLI 4 138 to 56022 PAOLI 269.0 CKT 1	42	127.8	128.0	Canadian SW - Noble 69kV	55841 CANADNS269.0 to 56011 NOBLE 269.0 CKT1	0	Solution Undetermined
03WP	WFEC-WFEC	Goldsby - Oklahoma University SW 69kV	56018 OU SW 269.0 to 55924 GOLDSBY269.0 CKT 1	34	139.3	139.6	Franklin SW 138/69kV Transformer	55916 FRNKLNS269.0 to 55917 FRNKLNS4 138 CKT1	0	Solution Undetermined
03SP	WFEC-WFEC	Goldsby - Oklahoma University SW 69kV	56018 OU SW 269.0 to 55924 GOLDSBY269.0 CKT 1	34	139.0	139.6	Franklin SW 138/69kV Transformer	55916 FRNKLNS269.0 to 55917 FRNKLNS4 138 CKT1	0	Solution Undetermined
02WP	WFEC-WFEC	Goldsby - Oklahoma University SW 69kV	56018 OU SW 269.0 to 55924 GOLDSBY269.0 CKT 1	34	142.8	143.3	Franklin SW 138/69kV Transformer	55916 FRNKLNS269.0 to 55917 FRNKLNS4 138 CKT1	0	Solution Undetermined
02WP	WFEC-WFEC	Paoli 138/69kV Transformer	56023 PAOLI 4 138 to 56022 PAOLI 269.0 CKT 1	42	152.5	152.6	Canadian SW - Noble 69kV	55841 CANADNS269.0 to 56011 NOBLE 269.0 CKT1	0	Solution Undetermined