SPP Southwest Power Pool

System Impact Study SPP-2002-207
For Transmission Service
Requested By
Cargill - Alliant
From WR To ERCOTN
For a Reserved Amount Of 157 MW
From 1/1/03
To 1/1/04

SPP Coordinated Planning

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1. Executive Summary

Cargill - Alliant has requested a system impact study for long-term Firm Point-to-Point transmission service from WR to ERCOTN. The period of the transaction is from 1/1/03 to 1/1/04. The request is for OASIS reservation 438048, 438051, and 440010 for a total amount of 200 MW. However, the ERCOTN tie can only facilitate 220 MW of imported service. There is currently 13 MW of confirmed service and a 50 MW request in facility study. Therefore, 157 MW will be used as the transfer amount in this impact study.

The principal objective of this study is to identify system problems and potential system modifications necessary to facilitate the additional 157 MW transfer while maintaining system reliability. Analysis was conducted for the requested service period above and for the remaining planning horizon from 1/1/04 to 4/1/09. The additional evaluation of the planning horizon was conducted to determine any future constraints that may limit the renewal of service.

New overloads caused by the 157 MW transfer were identified along with determining the impact of the transfer on any previously assigned and identified facilities.
The WR – ERCOTN 157 MW transfer causes new facility overloads on the SPP transmission system, as well as increasing the loading on previously identified facilities. To provide the 157 MW of service requested, upgrades must be completed for those facilities that limit the ATC to less than 157 MW.

2. Introduction

Cargill - Alliant has requested an impact study for transmission service from WR – 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 157 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 157 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 157 MW transfer on the system. The first analysis was conducted to identify any new overloads caused by the 157 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 and all remaining models available from the 2002-planning horizon.

The first analysis was to study the steady-state analysis impact of the 157 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 WR – ERCOTN 157 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 SPP 2002 Series 2005 Summer Peak, 2005/06 Winter Peak, 2008 Summer Peak and 2008/09 Winter Peak were used to study the impact of the 200 MW transfer on the SPP system during the remaining planning horizon from 1/1/04 to 4/1/09. 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 157 MW transfer. Available solutions are given in the table.

Table 2 documents overloads on Non SPP Regional Tariff participants' transmission systems caused by the 157 MW transfer.

Table 3 documents the 157 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 WR – ERCOTN 157 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
02WP		none				none		
03A		none				none		
03G		none				none		
03G		none				none		
03SP	SPS-SPS	Floydada Interchange 115//69 kV Transformer	40	84.2	110.6	Crosby Interchange - Lubbock East Interchange 115 kV	94	
03FA		none				none		
03WP		none				none		
04G	WFEC-WFEC	Acme - West Norman 69kV	38	99.9	119.8	CANADIAN SW 69/138	0	
04G	WERE-WERE	Auburn - Jeffrey Energy Center 230 kV	565	97.4	102.5	Hoyt - Jeffrey Energy Center 345 kV	80	
05SP		none				none		
05WP		none				none		
08SP		none				none		
08WP		none				none		

Table 2 – Non - SPP Facility Overloads caused by the WR – ERCOTN 157 MW MW Transfer

Study Year	From Area - To Area	Branch Over 100% Rate B	Rate B	BC % Loading	TC % Loading	Outaged Branch Causing Overload
02WP		none				none
03AP	NPPD-WAPA	67134 SIDNEY 4 230 to 67210 SIDXFMR4 230 CKT 1	400	26.2	111.4	54119 O.K.U.-7 345 to 54131 L.E.S.-7 345 CKT1
03G		none				none
03G		none				none
03SP		none				none
03FA		none				none
03WP		none				none
04G		none				none
04G		none				none
05SP		none				none
05WP	AMRN-AMRN	31221 MOBERLY 161 to 31222 MOBERLY 69.0 CKT 2	75	63.9	124.6	30224 CALAWY 1 345 to 30225 CAL G125.0 CKT1
08SP		none				none
08WP		none				none

Table 3 – Previously Identified SPP Facilities Impacted by the WR – ERCOTN 157 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
02WP	WERE-WERE	NORTH AMERICAN PHILIPS 115 KV - NORTH AMERICAN PHILIPS JUNCTION (SOUTH) 115 KV	160.0	95	100.2	EAST MCPHERSON 230 KV - SUMMIT 230 KV	151	Solution Undetermined
02WP	WERE-WERE	Anzio - Fort Junction Switching Station 115kV	92.0	99	100.8	WEST JUNCTION CITY 115 KV - WEST JUNCTION CITY JUNCTION (EAST) 115 KV	99	Solution Undetermined
02WP	WERE-WERE	West Junction City Junction (East) 115 KV - West Junction City Junction (West) 115 kV	141.0	101	103.9	JEFFREY ENERGY CENTER 345 KV - SUMMIT 345 KV	0	Reconductor or redispatch.
02WP	WERE-WERE	North American Philips Junction (South) - West McPherson 115 kV	68.0	103	108.2	EAST MCPHERSON 230 KV - SUMMIT 230 KV	0	Solution Undetermined
02WP	WERE-WERE	East Street - West Emporia 115kV	92.0	107	108.8	MORRIS COUNTY 115 KV - WEST EMPORIA 115 KV	0	Solution Undetermined
02WP	WFEC-WFEC	Goldsby - Oklahoma University SW 69kV	34.0	101	102.5	Acme - West Norman 69kV	0	Solution Undetermined
02WP	WFEC-WFEC	Acme - West Norman 69kV	38.0	102	103.8	Canadian - Goolsby 69KV	0	Solution Undetermined
02WP	WFEC-WFEC	Paoli 138/69kV Transformer	42.0	112	113.9	CANADIAN SW 69/138	0	Solution Undetermined
02WP	WFEC-WFEC	Goldsby - Oklahoma University SW 69kV	34.0	116	117.7	ACME - FRANKLIN SW	0	Solution Undetermined
02WP	WFEC-WFEC	Acme - Franklin SW 69kV	34.0	116	117.8	GOLDSBY - OKLAHOMA UNIVERSITY SW	0	Solution Undetermined
02WP	WFEC-WFEC	Little Axe - Noble 69kV	26.0	118	118.8	Paoli 138/69kV Transformer	0	Solution Undetermi ned
02WP	WFEC-WFEC	Goldsby - Oklahoma University SW 69kV	34.0	143	144.8	Franklin SW 138/69kV Transformer	0	Solution Undetermined
02WP	WFEC-WFEC	Paoli 138/69kV Transformer	42.0	153	154.1	Canadian SW - Noble 69kV	0	Solution Undetermined
02WP	WFEC-WFEC	Acme - Franklin SW 69kV	34.0	158	159.4	CANADIAN SW 69/138	0	Solution Undetermined
03FA	WERE-WERE	North American Philips Junction (South) - West McPherson 115 kV	68.0	98	105.8	EAST MCPHERSON 230 KV - SUMMIT 230 KV	35	Solution Undetermined
03FA	WERE-WERE	Circleville - Hoyt HTI Switching JCT 115kV	97.0	99	104.5	Hoyt - Stranger Creek 345kV	31	Solution Undetermined
03FA	WERE-WERE	Anzio - Fort Junction Switching Station 115kV	92.0	102	104.1	WEST JUNCTION CITY 115 KV - WEST JUNCTION CITY JUNCTION (EAST) 115 KV	0	Solution Undetermined
03FA	WERE-WERE	Exide Junction - Summit 115kV	181.0	103	103.3	Northview - Summit 115kV	0	Reconductor or rerate.
03FA	WERE-WERE	Exide Junction - Summit 115kV	181.0	104	106.1	EAST MCPHERSON 230 KV - SUMMIT 230 KV	0	Solution Undetermined
03FA	WERE-WERE	West Junction City Junction (East) 115 KV - West Junction City Junction (West) 115 kV	141.0	104	106.7	JEFFREY ENERGY CENTER 345 KV - SUMMIT 345 KV	0	Reconductor or redispatch.
03FA	WERE-WERE	Mead - Plaza 69kV	72.0	107	107.4	Evans Energy Center North - Evans Energy Center South 138kV	0	Solution Undetermined
03FA	WFEC-WFEC	Goldsby - Oklahoma University SW 69kV	34.0	114	116.0	Franklin SW 138/69kV Transformer	0	Solution Undetermined
03FA	WFEC-WFEC	Paoli 138/69kV Transformer	42.0	116	117.5	Canadian SW - Noble 69kV	0	Solution Undetermined
03FA	WFEC-WFEC	Acme - Franklin SW 69kV	34.0	128	129.0	CANADIAN SW 69/138	0	Solution Undetermined
03G	WERE-WERE	Circleville - Hoyt HTI Switching JCT 115kV	97.0	96	101.6	Hoyt - Stranger Creek 345kV	108	Solution Undetermined
03G	WERE-WERE	Exide Junction - Summit 115kV	181.0	99	102.6	EAST MCPHERSON 230 KV - SUMMIT 230 KV	28	Solution Undetermined
03G	WERE-WERE	Coffey County No. 4 Vernon - Athens Switching Station 69kV	45.0	102	104.6	ROSE HILL 345 KV - WOLF CREEK 345 KV	157	Westar Transmission Operating Directive 1304.

Table 3-continued – Previously Identified SPP Facilities Impacted by the WR – ERCOTN 157 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
03G	WERE-WERE	Coffey County No. 4 Vernon - Athens Switching Station 69kV	45.0	102	104.8	BENTON 345 KV - WOLF CREEK 345 KV	157	Westar Transmission Operating Directive 1304.
03G	WERE-WERE	Keene - South Alma 115kV	68.0	102	103.9	JEFFREY ENERGY CENTER 230 KV - EAST MANHATTAN 230 KV	0	Solution Undetermined
03G	WERE-WERE	Coffey County No. 4 Vernon - Green 69kV	45.0	103	106.0	ROSE HILL 345 KV - WOLF CREEK 345 KV	157	Westar Transmission Operating Directive 1304.
03G	WERE-WERE	Coffey County No. 4 Vernon - Green 69kV	45.0	103	106.2	BENTON 345 KV - WOLF CREEK 345 KV	157	Westar Transmission Operating Directive 1304.
03G	WERE-WERE	West Junction City Junction (East) 115 KV - West Junction City Junction (West) 115 kV	141.0	109	112.4	JEFFREY ENERGY CENTER 345 KV - SUMMIT 345 KV	0	Reconductor or redispatch.
03G	WERE-WERE	Anzio - Fort Junction Switching Station 115kV	92.0	112	113.3	WEST JUNCTION CITY 115 KV - WEST JUNCTION CITY JUNCTION (EAST) 115 KV	0	Solution Undetermined
03G	WERE-WERE	East Street - West Emporia 115kV	92.0	115	116.1	MORRIS COUNTY 115 KV - WEST EMPORIA 115 KV	0	Solution Undetermined
03G	WERE-WERE	Mead - Plaza 69kV	72.0	115	115.7	Evans Energy Center North - Evans Energy Center South 138kV	0	Solution Undetermined
03G	WFEC-WFEC	Goldsby - Oklahoma University SW 69kV	34.0	112	113.8	Franklin SW 138/69kV Transformer	0	Solution Undetermined
03G	WFEC-WFEC	Acme - Franklin SW 69kV	34.0	124	125.7	CANADIAN SW 69/138	0	Solution Undetermined
03SP	AEPW-AEPW	Pittsburg - Lone Star South 138KV	197.0	100	100.1	CHAPEL HILL REC - WELSH REC	0	Solution Undetermined
03SP	AEPW-AEPW	Fitzhugh 161/69kV Transformer #1	111.0	103	103.1	Fitzhugh 161/69kV Transformer #1	0	Solution Undetermined
03SP	AEPW-AEPW	FLINT CREEK TO ELM SPRING 161KV	312.0	111	111.5	Gentry REC - Flint Creek 161KV	0	Solution Undetermined
03SP	OKGE-OKGE	ADA OC PUMP TAP - LULA 69	48.0	103	102.7	VALLY VIEW TAP 69 - VALLY VIEW 69	0	Solution Undetermined
03SP	OKGE-OKGE	Draper 345/138KV Transformer 1	493.0	103	103.4	DRAPER LAKE 345/138 kv	0	Solution Undetermined
03SP	OKGE-OKGE	Draper 345/138KV Transformer 2	493.0	103	103.4	DRAPER LAKE 345/138 kv	0	Solution Undetermined
03SP	OKGE-OKGE	Beeline - Tibbens 69kV	66.0	104	104.6	BLUEBELL 69/138	0	Solution Undetermined
03SP	OKGE-OKGE	AVEC OZARK - HELBERG 69KV	72.0	146	145.7	Altus - Fitzhugh 69 kV	0	Solution Undetermined
03SP	WERE-WERE	Circleville - Hoyt HTI Switching JCT 115kV	97.0	100	105.3	Hoyt - Stranger Creek 345kV	0	Solution Undetermined
03SP	WERE-WERE	Jarbalo Jct Sw. Sta. - 166th Street 115kV	97.0	103	104.8	Midland Junction - Pentagon 115kV	0	Solution Undetermined
03SP	WERE-WERE	Auburn Road - South Gage 115KV #1	97.0	111	113.1	Hoyt - Jeffery Energy Center 345kV	0	Solution Undetermined
03SP	WERE-WERE	Hutchinson Energy Center - Hutchinson Gas Turbine Station 69kV	130.0	116	119.2	Circle - Hutchinson Gas Turbine Station 115kV	0	Solution Undetermined
03SP	WERE-WERE	Golden Plains Junction - Hesston 69KV	32.0	125	125.5	MID AM JUNCTION TO NEWTON 69KV	0	Solution Undetermined
03SP	WERE-WERE	Gatz - Golden Plains Junction 69kV	32.0	125	125.6	Halstead - Mud Creek Junction 69kV	0	Solution Undetermined
03SP	WERE-WERE	Golden Plains Junction - Hesston 69KV	32.0	126	126.5	MID AM JUNCTION TO MUD CREEK JUNCTION, 69KV	0	Solution Undetermined
03SP	WERE-WERE	Golden Plains Junction - Hesston 69KV	32.0	127	127.7	Halstead - Mud Creek Junction 69kV	0	Solution Undetermined

Table 3-continued – Previously Identified SPP Facilities Impacted by the WR – ERCOTN 157 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
03SP	WFEC-WFEC	Paoli 138/69kV Transformer	42.0	100	101.8	CANADIAN SW 69/138	0	Solution Undetermined
03SP	WFEC-WFEC	Goldsby - Oklahoma University SW 69kV	34.0	112	113.2	Acme - West Norman 69kV	0	Solution Undetermined
03SP	WFEC-WFEC	Acme - West Norman 69kV	38.0	116	117.7	CANADIAN SW 69/138	0	Solution Undetermined
03SP	WFEC-WFEC	Goldsby - Oklahoma University SW 69kV	34.0	124	125.3	ACME - FRANKLIN SW	0	Solution Undetermined
03SP	WFEC-WFEC	Acme - Franklin SW 69kV	34.0	125	126.5	GOLDSBY - OKLAHOMA UNIVERSITY SW	0	Solution Undetermined
03SP	WFEC-WFEC	Goldsby - Oklahoma University SW 69kV	34.0	140	141.2	Franklin SW 138/69kV Transformer	0	Solution Undetermined
03SP	WFEC-WFEC	Acme - Franklin SW 69kV	34.0	163	164.6	CANADIAN SW 69/138	0	Solution Undetermined
03WP	OKGE-OKGE	AVEC OZARK - HELBERG 69KV	72.0	104	103.8	Altus - Fitzhugh 69 kV	0	Solution Undetermined
03WP	WERE-WERE	Circleville - Hoyt HTI Switching JCT 115kV	97.0	96	102.7	Hoyt - Stranger Creek 345kV	90	Solution Undetermined
03WP	WERE-WERE	Exide Junction - Summit 115kV	181.0	100	102.3	EAST MCPHERSON 230 KV - SUMMIT 230 KV	14	Reconductor or rerate.
03WP	WERE-WERE	North American Philips Junction (South) - West McPherson 115 kV	68.0	101	105.7	EAST MCPHERSON 230 KV - SUMMIT 230 KV	0	Solution Undetermined
03WP	WERE-WERE	West Junction City Junction (East) 115 KV - West Junction City Junction (West) 115 kV	141.0	103	106.1	JEFFREY ENERGY CENTER 345 KV - SUMMIT 345 KV	0	Reconductor or redispatch.
03WP	WFEC-WFEC	Acme - West Norman 69kV	38.0	99	100.7	Canadian - Goolsby 69KV	75	Solution Undetermined
03WP	WFEC-WFEC	Goldsby - Oklahoma University SW 69kV	34.0	112	113.0	ACME - FRANKLIN SW	0	Solution Undetermined
03WP	WFEC-WFEC	Acme - Franklin SW 69kV	34.0	112	114.1	GOLDSBY - OKLAHOMA UNIVERSITY SW	0	Solution Undetermined
03WP	WFEC-WFEC	Little Axe - Noble 69kV	26.0	115	116.1	Paoli 138/69kV Transformer	0	Solution Undetermined
03WP	WFEC-WFEC	Goldsby - Oklahoma University SW 69kV	34.0	140	141.1	Franklin SW 138/69kV Transformer	0	Solution Undetermined
03WP	WFEC-WFEC	Paoli 138/69kV Transformer	42.0	152	154.0	Canadian SW - Noble 69kV	0	Solution Undetermined
03WP	WFEC-WFEC	Acme - Franklin SW 69kV	34.0	154	155.3	CANADIAN SW 69/138	0	Solution Undetermined
04G	WERE-WERE	Circleville - Hoyt HTI Switching JCT 115kV	97.0	95	100.3	Hoyt - Stranger Creek 345kV	149	Solution Undetermined
04G	WERE-WERE	Coffey County No. 4 Vernon - Green 69kV	45.0	97	100.8	Wolf Creek - Lacygne 345 KV	157	Westar Transmission Operating Directive 1304.
04G	WERE-WERE	Coffey County No. 4 Vernon - Athens Switching Station 69kV	45.0	98	101.4	ROSE HILL 345 KV - WOLF CREEK 345 KV	157	Westar Transmission Operating Directive 1304.
04G	WERE-WERE	Coffey County No. 4 Vernon - Athens Switching Station 69kV	45.0	98	101.4	BENTON 345 KV - WOLF CREEK 345 KV	157	Westar Transmission Operating Directive 1304.
04G	WERE-WERE	Coffey County No. 4 Vernon - Green 69kV	45.0	100	102.7	ROSE HILL 345 KV - WOLF CREEK 345 KV	157	Westar Transmission Operating Directive 1304.
04G	WERE-WERE	Exide Junction - Summit 115kV	181.0	100	101.7	EAST MCPHERSON 230 KV - SUMMIT 230 KV	16	Solution Undetermined
04G	WERE-WERE	Coffey County No. 4 Vernon - Green 69kV	45.0	100	102.8	BENTON 345 KV - WOLF CREEK 345 KV	157	Westar Transmission Operating Directive 1304.
04G	WERE-WERE	Stull Switch - Tecumseh Hill 115kV	92.0	101	103.9	Hoyt - Stranger Creek 345kV	0	Solution Undetermined
04G	WERE-WERE	West Junction City Junction (East) 115 KV - West Junction City Junction (West) 115 kV	141.0	101	103.2	JEFFREY ENERGY CENTER 345 KV - SUMMIT 345 KV	0	Reconductor or redispatch.

Table 3-continued – Previously Identified SPP Facilities Impacted by the WR – ERCOTN 157 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
04G	WERE-WERE	Anzio - Fort Junction Switching Station 115kV	92.0	101	102.8	WEST JUNCTION CITY 115 KV - WEST JUNCTION CITY JUNCTION (EAST) 115 KV	0	Solution Undetermined
04G	WERE-WERE	Exide Junction - Summit 115kV	181.0	105	105.3	Northview - Summit 115kV	0	Solution Undetermined
04G	WFEC-WFEC	Goldsby - Oklahoma University SW 69kV	34.0	108	110.2	Franklin SW 138/69kV Transformer	0	Solution Undetermined
04G	WFEC-WFEC	Acme - Franklin SW 69kV	34.0	121	122.3	CANADIAN SW 69/138	0	Solution Undetermined
05SP	AEPW-AEPW	Lone Star South 138kV - Wilkes 138KV	316.0	100	100.0	CHAPEL HILL REC - WELSH REC	144	Solution Undetermined
05SP	AEPW-AEPW	Lone Star South 138kV - Wilkes 138KV	316.0	101	101.0	WELSH REC - WILKES 138KV	0	Solution Undetermined
05SP	AEPW-AEPW	BROKEN ARROW 101ST NORTH - ONETA 138KV	210.0	103	103.6	BROKEN ARROW NORTH - NORTH TAP - ONETA 138KV	0	Replace Wavetrap; $30000
05SP	AEPW-AEPW	Fitzhugh 161/69kV Transformer #1	111.0	104	104.6	Fitzhugh 161/69kV Transformer #1	0	Solution Undetermined
05SP	AEPW-AEPW	Pittsburg - Lone Star South 138KV	197.0	107	107.1	Chapel Hill Rec - Petty 138 kV	0	Solution Undetermined
05SP	AEPW-AEPW	Pittsburg - Lone Star South 138KV	197.0	118	118.3	CHAPEL HILL REC - WELSH REC	0	Solution Undetermined
05SP	OKGE-OKGE	Draper 345/138KV Transformer 1	493.0	105	105.6	DRAPER LAKE 345/138 kv	0	Solution Undetermined
05SP	OKGE-OKGE	Draper 345/138KV Transformer 2	493.0	105	105.6	DRAPER LAKE 345/138 kv	0	Solution Undetermined
05SP	OKGE-OKGE	Beeline - Tibbens 69kV	66.0	105	106.5	BLUEBELL 69/138	0	Solution Undetermined
05SP	OKGE-OKGE	ADA OC PUMP TAP - LULA 69	48.0	111	111.0	VALLY VIEW TAP 69 - VALLY VIEW 69	0	Solution Undetermined
05SP	WERE-WERE	Circleville - Hoyt HTI Switching JCT 115kV	97.0	96	100.7	Hoyt - Stranger Creek 345kV	133	Solution Undetermined
05SP	WERE-WERE	Stull Switch - Tecumseh Hill 115kV	92.0	100	102.8	Hoyt - Stranger Creek 345kV	0	Solution Undetermined
05SP	WERE-WERE	Jarbalo Jct Sw. Sta. - 166th Street 115kV	97.0	108	110.3	Midland Junction - Pentagon 115kV	0	Solution Undetermined
05SP	WFEC-OKGE	Franklin Switch - Midwest Tap 138KV	215.0	98	100.7	PHAROAH - WETUMKA4 138	111	Solution Undetermined
05SP	WFEC-OKGE	Franklin Switch - Midwest Tap 138KV	215.0	98	100.8	CROMWELL - WETUMKA4 138	105	Solution Undetermined
05SP	WFEC-WFEC	Franklin SW 138/69kV Transformer	70.0	106	106.7	CANADIAN SW 69/138	0	Solution Undetermined
05SP	WFEC-WFEC	Little Axe - Noble 69kV	26.0	118	119.3	Paoli 138/69kV Transformer	0	Solution Undetermined
05WP	WERE-WERE	NORTH AMERICAN PHILIPS 115 KV - NORTH AMERICAN PHILIPS JUNCTION (SOUTH) 115 KV	160.0	95	100.0	EAST MCPHERSON 230 KV - SUMMIT 230 KV	156	Solution Undetermined
05WP	WERE-WERE	Circleville - Hoyt HTI Switching JCT 115kV	97.0	98	104.2	Hoyt - Stranger Creek 345kV	44	Solution Undetermined
05WP	WERE-WERE	Exide Junction - Summit 115kV	181.0	98	101.1	EAST MCPHERSON 230 KV - SUMMIT 230 KV	91	Solution Undetermined
05WP	WERE-WERE	Anzio - Fort Junction Switching Station 115kV	92.0	101	102.6	WEST JUNCTION CITY 115 KV - WEST JUNCTION CITY JUNCTION (EAST) 115 KV	0	Solution Undetermined
05WP	WERE-WERE	North American Philips Junction (South) - West McPherson 115 kV	68.0	103	108.0	EAST MCPHERSON 230 KV - SUMMIT 230 KV	0	Solution Undetermined
05WP	WERE-WERE	West Junction City Junction (East) 115 KV - West Junction City Junction (West) 115 kV	141.0	104	106.8	JEFFREY ENERGY CENTER 345 KV - SUMMIT 345 KV	0	Reconductor or redispatch.

Table 3-continued – Previously Identified SPP Facilities Impacted by the WR – ERCOTN 157 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
05WP	WFEC-WFEC	Little Axe - Noble 69kV	26.0	106	107.6	Paoli 138/69kV Transformer	0	Solution Undetermined
08SP	AEPW-AEPW	Lone Star South 138kV - Wilkes 138KV	316.0	102	101.8	CHAPEL HILL REC - WELSH REC	0	Solution Undetermined
08SP	AEPW-AEPW	Lone Star South 138kV - Wilkes 138KV	316.0	103	102.9	WELSH REC - WILKES 138KV	0	Solution Undetermined
08SP	AEPW-AEPW	BROKEN ARROW 101ST NORTH - ONETA 138KV	210.0	104	103.6	Bluebell - Bristow 138 KV	0	Solution Undetermined
08SP	AEPW-AEPW	BROKEN ARROW 101ST NORTH - ONETA 138KV	210.0	104	104.0	Cromwell - Wewoka 138 KV	0	Solution Undetermined
08SP	AEPW-AEPW	BROKEN ARROW 101ST NORTH - ONETA 138KV	210.0	104	104.3	Keystone - Silver City 138 KV	0	Solution Undetermined
08SP	AEPW-AEPW	BROKEN ARROW 101ST NORTH - ONETA 138KV	210.0	104	104.3	East Centerton - Flint Creek 345kV	0	Solution Undetermined
08SP	AEPW-AEPW	BROKEN ARROW 101ST NORTH - ONETA 138KV	210.0	104	104.3	East Centerton 345/161kV	0	Solution Undetermined
08SP	AEPW-AEPW	Hugo - Valley Timber 69 kV	48.0	107	106.6	Allen Natural Gas Tap - Tupelo 138 kV	0	Solution Undetermined
08SP	AEPW-AEPW	Fitzhugh 161/69kV Transformer #1	111.0	107	107.7	Fitzhugh 161/69kV Transformer #1	0	Solution Undetermined
08SP	AEPW-AEPW	Pittsburg - Lone Star South 138KV	197.0	116	115.9	Chapel Hill Rec - Petty 138 kV	0	Solution Undetermined
08SP	AEPW-AEPW	BROKEN ARROW 101ST NORTH - ONETA 138KV	210.0	123	123.6	BROKEN ARROW NORTH - NORTH TAP - ONETA 138KV	0	Replace Wavetrap; $30000
08SP	AEPW-AEPW	Pittsburg - Lone Star South 138KV	197.0	128	128.0	CHAPEL HILL REC - WELSH REC	0	Solution Undetermined
08SP	OKGE-OKGE	3rd Street - Arkoma 161kV	335.0	103	103.7	FT SMITH 161 - COLONY 161	0	Solution Undetermined
08SP	OKGE-OKGE	Draper 345/138KV Transformer 1	493.0	107	107.5	DRAPER LAKE 345/138 kv	0	Solution Undetermined
08SP	OKGE-OKGE	Draper 345/138KV Transformer 2	493.0	107	107.5	DRAPER LAKE 345/138 kv	0	Solution Undetermined
08SP	OKGE-OKGE	Beeline - Tibbens 69kV	66.0	107	108.5	BLUEBELL 69/138	0	Solution Undetermined
08SP	OKGE-OKGE	Tinker #4 - Tinker #2 138KV	100.0	119	119.4	Midway - NE 10th 138kV	157	Excluded Per OKGE
08SP	OKGE-OKGE	ADA OC PUMP TAP - LULA 69	48.0	121	121.6	VALLY VIEW TAP 69 - VALLY VIEW 69	0	Solution Undetermined
08SP	OKGE-OKGE	Tinker #4 - Tinker #2 138KV	100.0	140	139.9	HORSESHOE LAKE 138 - MIDWAY 138	157	Excluded Per OKGE
08SP	SWPA-SPRM	Brookline - Springfield 161kV	323.0	108	108.7	Battlefied - Southwest Disposal 161kV	0	Solution Undetermined
08SP	SWPA-SPRM	Brookline - Springfield 161kV	323.0	109	109.5	Southwest - Soutwest Disposal 161kV	0	Solution Undetermined
08SP	WEPL-MIDW	Seward 115/69kV Transformer	44.0	106	107.0	Heizer - Mullergreen 230/115kV Transformer	0	Solution Undetermined
08SP	WERE-WERE	Evans Energy Center North - Chisholm 138KV	382.0	101	101.5	EVANS ENERGY CENTER SOUTH TO LAKERIDGE 138KV	0	Solution Undetermined
08SP	WERE-WERE	Timber Junction - Winfield 69kV	43.0	103	109.1	El Paso - Farber 138 kV	0	Solution Undetermined
08SP	WERE-WERE	Arnold - Midwest Grain Solvents Jct2 69kv	41.0	104	104.1	Arnold - Parallel 115kV	0	Solution Undetermined
08SP	WERE-WERE	Mockingbird Hill Switch - Stull Switch 115kV	92.0	108	110.5	Hoyt - Stranger Creek 345kV	0	Solution Undetermined

Table 3-continued – Previously Identified SPP Facilities Impacted by the WR – ERCOTN 157 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
08SP	WERE-WERE	Circleville – Hoyt HTI Switching JCT 115kV	97.0	108	112.6	Hoyt - Stranger Creek 345kV	0	Solution Undetermined
08SP	WERE-WERE	Gill Energy Center East - Macarthur 69KV	68.0	109	110.4	Gill Energy Center East - Oatville 69 kV	0	Solution Undetermined
08SP	WERE-WERE	Jarbalo Jct Sw. Sta. - 166th Street 115kV	97.0	114	116.1	Midland Junction - Pentagon 115kV	0	Solution Undetermined
08SP	WERE-WERE	Stull Switch - Tecumseh Hill 115kV	92.0	115	117.9	Hoyt - Stranger Creek 345kV	0	Solution Undetermined
08SP	WERE-WERE	Hutchinson Energy Center - Hutchinson Gas Turbine Station 69kV	130.0	184	189.4	Circle - Hutchinson Gas Turbine Station 115kV	0	Solution Undetermined
08SP	WFEC-OKGE	Franklin Switch - Midwest Tap 138KV	215.0	100	101.0	Hollywood - Midwest 138 kV	0	Solution Undetermined
08SP	WFEC-OKGE	Franklin Switch - Midwest Tap 138KV	215.0	109	111.5	PHAROAH - WETUMKA4 138	0	Solution Undetermined
08SP	WFEC-OKGE	Franklin Switch - Midwest Tap 138KV	215.0	110	111.7	CROMWELL - WETUMKA4 138	0	Solution Undetermined
08SP	WFEC-WFEC	Franklin SW 138/69kV Transformer	70.0	111	111.4	CANADIAN SW 69/138	0	Solution Undetermined
08WP	AEPW-AEPW	Pittsburg - Lone Star South 138KV	197.0	109	109.5	CHAPEL HILL REC - WELSH REC	0	Solution Undetermined
08WP	WERE-WERE	Circleville – Hoyt HTI Switching JCT 115kV	97.0	99	104.2	Hoyt - Stranger Creek 345kV	30	Solution Undetermined
08WP	WERE-WERE	Stull Switch - Tecumseh Hill 115kV	92.0	101	104.1	Hoyt - Stranger Creek 345kV	0	Solution Undetermined
08WP	WERE-WERE	Mead - Plaza 69kV	72.0	110	110.7	Evans Energy Center North - Evans Energy Center South 138kV	0	Solution Undetermined

5. Conclusion

The WR – ERCOTN 157 MW transfer causes new facility overloads on the SPP transmission system, as well as increasing the loading on previously identified facilities. To provide the 157 MW of service requested, upgrades must be completed for those facilities given in Tables 1 and 3 that limit the ATC to less than 157 MW.

The final cost assignment of facilities and ATC to Cargill - Alliant 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 – SPP Facility Overloads caused by the WR to ERCOTN 157 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
02WP		none				none		
03A		none				none		
03G		none				none		
03G		none				none		
03SP	SPS-SPS	51518 FLOYD3 115 to 51517 FLOYD2 69.0 CKT 1	40	84.2	110.6	51564 CROSBY3 115 to 51688 LUBE3 115 CKT1	94	none
03FA		none				none		
03WP		none				none		
04G	WFEC-WFEC	56095 WNORMAN269.0 to 55802 ACME 269.0 CKT 1	38	99.9	119.8	55841 CANADNS269.0 to 55842 CANADNS4 138 CKT1	0	none
04G	WERE-WERE	56852 JEC 6 230 to 56851 AUBURN 6 230 CKT 1	565	97.4	102.5	56765 HOYT 7 345 to 56766 JEC N 7 345 CKT1	80	none
05SP		none				none		
05WP		none				none		
08SP		none				none		
08WP		none				none		

Table 3a– Model Data for Previously Identified SPP Facilities Impacted by the WR to ERCOTN 157 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
02WP	WERE-WERE	57372 PHILIPS3 115 to 57374 SPHILPJ3 115 CKT 1	160.0	95	100.2	56872 EMCPHER6 230 to 56873 SUMMIT 6 230 CKT1	151	Solution Undetermined
02WP	WERE-WERE	57321 ANZIO 3 115 to 57328 FT JCT 3 115 CKT 1	92.0	99	100.8	57342 WJCCTY 3 115 to 57343 WJCCTYE3 115 CKT1	99	Solution Undetermined
02WP	WERE-WERE	57343 WJCCTYE3 115 to 57342 WJCCTY 3 115 CKT 1	141.0	101	103.9	56766 JEC N 7 345 to 56773 SUMMIT 7 345 CKT1	0	Reconductor or redispatch.
02WP	WERE-WERE	57374 SPHILPJ3 115 to 57438 WMCPHER3 115 CKT 1	68.0	103	108.2	56872 EMCPHER6 230 to 56873 SUMMIT 6 230 CKT1	0	Solution Undetermined
02WP	WERE-WERE	57301 EAST ST3 115 to 57309 WEMPORI3 115 CKT 1	92.0	107	108.8	57305 MORRIS 3 115 to 57309 WEMPORI3 115 CKT1	0	Solution Undetermined
02WP	WFEC-WFEC	55924 GOLDSBY269.0 to 56018 OU SW 269.0 CKT 1	34.0	101	102.5	55802 ACME 269.0 to 56095 WNORMAN269.0 CKT1	0	Solution Undetermined
02WP	WFEC-WFEC	55802 ACME 269.0 to 56095 WNORMAN269.0 CKT 1	38.0	102	103.8	55841 CANADNS269.0 to 55924 GOLDSBY269.0 CKT1	0	Solution Undetermined
02WP	WFEC-WFEC	56023 PAOLI 4 138 to 56022 PAOLI 269.0 CKT 1	42.0	112	113.9	55841 CANADNS269.0 to 55842 CANADNS4 138 CKT1	0	Solution Undetermined
02WP	WFEC-WFEC	55924 GOLDSBY269.0 to 56018 OU SW 269.0 CKT 1	34.0	116	117.7	55802 ACME 269.0 to 55916 FRNKLNS269.0 CKT1	0	Solution Undetermined
02WP	WFEC-WFEC	55916 FRNKLNS269.0 to 55802 ACME 269.0 CKT 1	34.0	116	117.8	55924 GOLDSBY269.0 to 56018 OU SW 269.0 CKT1	0	Solution Undetermined
02WP	WFEC-WFEC	55976 LIL AXE269.0 to 56011 NOBLE 269.0 CKT 1	26.0	118	118.8	56022 PAOLI 269.0 to 56023 PAOLI 4 138 CKT1	0	Solution Undetermined
02WP	WFEC-WFEC	56018 OU SW 269.0 to 55924 GOLDSBY269.0 CKT 1	34.0	143	144.8	55916 FRNKLNS269.0 to 55917 FRNKLNS4 138 CKT1	0	Solution Undetermined
02WP	WFEC-WFEC	56023 PAOLI 4 138 to 56022 PAOLI 269.0 CKT 1	42.0	153	154.1	55841 CANADNS269.0 to 56011 NOBLE 269.0 CKT1	0	Solution Undetermined
02WP	WFEC-WFEC	55802 ACME 269.0 to 55916 FRNKLNS269.0 CKT 1	34.0	158	159.4	55841 CANADNS269.0 to 55842 CANADNS4 138 CKT1	0	Solution Undetermined
03FA	WERE-WERE	57374 SPHILPJ3 115 to 57438 WMCPHER3 115 CKT 1	68.0	98	105.8	56872 EMCPHER6 230 to 56873 SUMMIT 6 230 CKT1	35	Solution Undetermined
03FA	WERE-WERE	57165 HTI JCT3 115 to 57152 CIRCLVL3 115 CKT 1	97.0	99	104.5	56765 HOYT 7 345 to 56772 STRANGR7 345 CKT1	31	Solution Undetermined
03FA	WERE-WERE	57321 ANZIO 3 115 to 57328 FT JCT 3 115 CKT 1	92.0	102	104.1	57342 WJCCTY 3 115 to 57343 WJCCTYE3 115 CKT1	0	Solution Undetermined
03FA	WERE-WERE	57368 EXIDE J3 115 to 57381 SUMMIT 3 115 CKT 1	181.0	103	103.3	57371 NORTHVW3 115 to 57381 SUMMIT 3 115 CKT1	0	Reconductor or rerate.
03FA	WERE-WERE	57368 EXIDE J3 115 to 57381 SUMMIT 3 115 CKT 1	181.0	104	106.1	56872 EMCPHER6 230 to 56873 SUMMIT 6 230 CKT1	0	Solution Undetermined
03FA	WERE-WERE	57343 WJCCTYE3 115 to 57342 WJCCTY 3 115 CKT 1	141.0	104	106.7	56766 JEC N 7 345 to 56773 SUMMIT 7 345 CKT1	0	Reconductor or redispatch.
03FA	WERE-WERE	57815 MEAD 269.0 to 57829 PLAZA 269.0 CKT 1	72.0	107	107.4	57040 EVANS N4 138 to 57041 EVANS S4 138 CKT1	0	Solution Undetermined
03FA	WFEC-WFEC	55924 GOLDSBY269.0 to 56018 OU SW 269.0 CKT 1	34.0	114	116.0	55916 FRNKLNS269.0 to 55917 FRNKLNS4 138 CKT1	0	Solution Undetermined
03FA	WFEC-WFEC	56023 PAOLI 4 138 to 56022 PAOLI 269.0 CKT 1	42.0	116	117.5	55841 CANADNS269.0 to 56011 NOBLE 269.0 CKT1	0	Solution Undetermined
03FA	WFEC-WFEC	55802 ACME 269.0 to 55916 FRNKLNS269.0 CKT 1	34.0	128	129.0	55841 CANADNS269.0 to 55842 CANADNS4 138 CKT1	0	Solution Undetermined
03FA	WFEC-WFEC	55802 ACME 269.0 to 55916 FRNKLNS269.0 CKT 1	34.0	128	129.0	55841 CANADNS269.0 to 55842 CANADNS4 138 CKT1	0	Solution Undetermined
03G	WERE-WERE	57165 HTI JCT3 115 to 57152 CIRCLVL3 115 CKT 1	97.0	96	101.6	56765 HOYT 7 345 to 56772 STRANGR7 345 CKT1	108	Solution Undetermined
03G	WERE-WERE	57381 SUMMIT 3 115 to 57368 EXIDE J3 115 CKT 1	181.0	99	102.6	56872 EMCPHER6 230 to 56873 SUMMIT 6 230 CKT1	28	Solution Undetermined

Table 3a-continued – Model Data for Previously Identified SPP Facilities Impacted by the WR to ERCOTN 157 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
03G	WERE-WERE	57631 CC4VERN269.0 to 57623 ATHENS 269.0 CKT 1	45.0	102	104.6	56794 ROSEHIL7 345 to 56797 WOLFCRK7 345 CKT1	157	Westar Transmission Operating Directive 1304.
03G	WERE-WERE	57631 CC4VERN269.0 to 57623 ATHENS 269.0 CKT 1	45.0	102	104.8	56791 BENTON 7 345 to 56797 WOLFCRK7 345 CKT1	157	Westar Transmission Operating Directive 1304.
03G	WERE-WERE	57167 KEENE 3 115 to 57339 S ALMA 3 115 CKT 1	68.0	102	103.9	56852 JEC 6 230 to 56861 EMANHAT6 230 CKT1	0	Solution Undetermined
03G	WERE-WERE	57636 GREEN 269.0 to 57631 CC4VERN269.0 CKT 1	45.0	103	106.0	56794 ROSEHIL7 345 to 56797 WOLFCRK7 345 CKT1	157	Westar Transmission Operating Directive 1304.
03G	WERE-WERE	57636 GREEN 269.0 to 57631 CC4VERN269.0 CKT 1	45.0	103	106.2	56791 BENTON 7 345 to 56797 WOLFCRK7 345 CKT1	157	Westar Transmission Operating Directive 1304.
03G	WERE-WERE	57343 WJCCTYE3 115 to 57342 WJCCTY 3 115 CKT 1	141.0	109	112.4	56766 JEC N 7 345 to 56773 SUMMIT 7 345 CKT1	0	Reconductor or redispatch.
03G	WERE-WERE	57321 ANZIO 3 115 to 57328 FT JCT 3 115 CKT 1	92.0	112	113.3	57342 WJCCTY 3 115 to 57343 WJCCTYE3 115 CKT1	0	Solution Undetermined
03G	WERE-WERE	57301 EAST ST3 115 to 57309 WEMPORI3 115 CKT 1	92.0	115	116.1	57305 MORRIS 3 115 to 57309 WEMPORI3 115 CKT1	0	Solution Undetermined
03G	WERE-WERE	57815 MEAD 269.0 to 57829 PLAZA 269.0 CKT 1	72.0	115	115.7	57040 EVANS N4 138 to 57041 EVANS S4 138 CKT1	0	Solution Undetermined
03G	WFEC-WFEC	55924 GOLDSBY269.0 to 56018 OU SW 269.0 CKT 1	34.0	112	113.8	55916 FRNKLNS269.0 to 55917 FRNKLNS4 138 CKT1	0	Solution Undetermined
03G	WFEC-WFEC	55802 ACME 269.0 to 55916 FRNKLNS269.0 CKT 1	34.0	124	125.7	55841 CANADNS269.0 to 55842 CANADNS4 138 CKT1	0	Solution Undetermined
03SP	AEPW-AEPW	53311 PITTSB_4 138 to 53276 LSSOUTH4 138 CKT 1	197.0	100	100.1	53521 CHAPELH4 138 to 53622 WELSHRE4 138 CKT1	1	Solution Undetermined
03SP	AEPW-AEPW	53203 FITZHUG269.0 to 53208 FITZHUG5 161 CKT 2	111.0	103	103.1	53203 FITZHUG269.0 to 53208 FITZHUG5 161 CKT1	0	Solution Undetermined
03SP	AEPW-AEPW	53194 ELMSPRR5 161 to 53139 FLINTCR5 161 CKT 1	312.0	111	111.5	53139 FLINTCR5 161 to 53187 GENTRYR5 161 CKT1	0	Solution Undetermined
03SP	OKGE-OKGE	55190 AOCPT 269.0 to 55191 LULA 269.0 CKT 1	48.0	103	102.7	55181 VALYVUT269.0 to 55182 VALLYVU269.0 CKT1	0	Solution Undetermined
03SP	OKGE-OKGE	54934 DRAPER 7 345 to 54933 DRAPER 4 138 CKT 1	493.0	103	103.4	54933 DRAPER 4 138 to 54934 DRAPER 7 345 CKT2	0	Solution Undetermined
03SP	OKGE-OKGE	54934 DRAPER 7 345 to 54933 DRAPER 4 138 CKT 2	493.0	103	103.4	54934 DRAPER 7 345 to 54933 DRAPER 4 138 CKT1	0	Solution Undetermined
03SP	OKGE-OKGE	55237 TIBBENS269.0 to 55246 BEELINE269.0 CKT 1	66.0	104	104.6	55241 BLUEBEL269.0 to 55242 BLUEBEL4 138 CKT1	0	Solution Undetermined
03SP	OKGE-OKGE	55324 AVECOZK269.0 to 55325 HELBERG269.0 CKT 1	72.0	146	145.7	53203 FITZHUG269.0 to 55330 ALTUS 269.0 CKT1	0	Solution Undetermined
03SP	WERE-WERE	57165 HTI JCT3 115 to 57152 CIRCLVL3 115 CKT 1	97.0	100	105.3	56765 HOYT 7 345 to 56772 STRANGR7 345 CKT1	0	Solution Undetermined
03SP	WERE-WERE	57244 JARBALO3 115 to 57233 166TH 3 115 CKT 1	97.0	103	104.8	57252 MIDLAND3 115 to 57261 PENTAGN3 115 CKT1	0	Solution Undetermined
03SP	WERE-WERE	57151 AUBURN 3 115 to 57179 S GAGEW3 115 CKT 2	97.0	111	113.1	56765 HOYT 7 345 to 56766 JEC N 7 345 CKT1	0	Solution Undetermined
03SP	WERE-WERE	57514 HEC GT 269.0 to 57513 HEC 269.0 CKT 1	130.0	116	119.2	57413 CIRCLE 3 115 to 57421 HEC GT 3 115 CKT1	0	Solution Undetermined
03SP	WERE-WERE	57737 HESSTON269.0 to 57735 GOLDPLJ269.0 CKT 1	32.0	125	125.5	57741 MID AMJ269.0 to 57745 NEWTON 269.0 CKT1	0	Solution Undetermined
03SP	WERE-WERE	57735 GOLDPLJ269.0 to 57733 GATZ 269.0 CKT 1	32.0	125	125.6	57736 HALSTED269.0 to 57744 MUDCRKJ269.0 CKT1	0	Solution Undetermined
03SP	WERE-WERE	57737 HESSTON269.0 to 57735 GOLDPLJ269.0 CKT 1	32.0	126	126.5	57741 MID AMJ269.0 to 57744 MUDCRKJ269.0 CKT1	0	Solution Undetermined
03SP	WERE-WERE	57737 HESSTON269.0 to 57735 GOLDPLJ269.0 CKT 1	32.0	127	127.7	57736 HALSTED269.0 to 57744 MUDCRKJ269.0 CKT1	0	Solution Undetermined
03SP	WFEC-WFEC	56023 PAOLI 4 138 to 56022 PAOLI 269.0 CKT 1	42.0	100	101.8	55841 CANADNS269.0 to 55842 CANADNS4 138 CKT1	0	Solution Undetermined

Table 3a-continued – Model Data for Previously Identified SPP Facilities Impacted by the WR to ERCOTN 157 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
03SP	WFEC-WFEC	55924 GOLDSBY269.0 to 56018 OU SW 269.0 CKT 1	34.0	112	113.2	55802 ACME 269.0 to 56095 WNORMAN269.0 CKT1	0	Solution Undetermined
03SP	WFEC-WFEC	56095 WNORMAN269.0 to 55802 ACME 269.0 CKT 1	38.0	116	117.7	55841 CANADNS269.0 to 55924 GOLDSBY269.0 CKT1	0	Solution Undetermined
03SP	WFEC-WFEC	55924 GOLDSBY269.0 to 56018 OU SW 269.0 CKT 1	34.0	124	125.3	55802 ACME 269.0 to 55916 FRNKLNS269.0 CKT1	0	Solution Undetermined
03SP	WFEC-WFEC	55916 FRNKLNS269.0 to 55802 ACME 269.0 CKT 1	34.0	125	126.5	55924 GOLDSBY269.0 to 56018 OU SW 269.0 CKT1	0	Solution Undetermined
03SP	WFEC-WFEC	56018 OU SW 269.0 to 55924 GOLDSBY269.0 CKT 1	34.0	140	141.2	55916 FRNKLNS269.0 to 55917 FRNKLNS4 138 CKT1	0	Solution Undetermined
03SP	WFEC-WFEC	55802 ACME 269.0 to 55916 FRNKLNS269.0 CKT 1	34.0	163	164.6	55841 CANADNS269.0 to 55842 CANADNS4 138 CKT1	0	Solution Undetermined
03WP	OKGE-OKGE	55324 AVECOZK269.0 to 55325 HELBERG269.0 CKT 1	72.0	104	103.8	53203 FITZHUG269.0 to 55330 ALTUS 269.0 CKT1	0	Solution Undetermined
03WP	WERE-WERE	57165 HTI JCT3 115 to 57152 CIRCLVL3 115 CKT 1	97.0	96	102.7	56765 HOYT 7 345 to 56772 STRANGR7 345 CKT1	90	Solution Undetermined
03WP	WERE-WERE	57368 EXIDE J3 115 to 57381 SUMMIT 3 115 CKT 1	181.0	100	102.3	56872 EMCPHER6 230 to 56873 SUMMIT 6 230 CKT1	14	Reconductor or rerate.
03WP	WERE-WERE	57374 SPH ILPJ3 115 to 57438 WMCPHER3 115 CKT 1	68.0	101	105.7	56872 EMCPHER6 230 to 56873 SUMMIT 6 230 CKT1	0	Solution Undetermined
03WP	WERE-WERE	57342 WJCCTY 3 115 to 57343 WJCCTYE3 115 CKT 1	141.0	103	106.1	56766 JEC N 7 345 to 56773 SUMMIT 7 345 CKT1	0	Reconductor or redispatch.
03WP	WFEC-WFEC	55802 ACME 269.0 to 56095 WNORMAN269.0 CKT 1	38.0	99	100.7	55841 CANADNS269.0 to 55924 GOLDSBY269.0 CKT1	75	Solution Undetermined
03WP	WFEC-WFEC	55924 GOLDSBY269.0 to 56018 OU SW 269.0 CKT 1	34.0	112	113.0	55802 ACME 269.0 to 55916 FRNKLNS269.0 CKT1	0	Solution Undetermined
03WP	WFEC-WFEC	55916 FRNKLNS269.0 to 55802 ACME 269.0 CKT 1	34.0	112	114.1	55924 GOLDSBY269.0 to 56018 OU SW 269.0 CKT1	0	Solution Undetermined
03WP	WFEC-WFEC	55976 LIL AXE269.0 to 56011 NOBLE 269.0 CKT 1	26.0	115	116.1	56022 PAOLI 269.0 to 56023 PAOLI 4 138 CKT1	0	Solution Undetermined
03WP	WFEC-WFEC	56018 OU SW 269.0 to 55924 GOLDSBY269.0 CKT 1	34.0	140	141.1	55916 FRNKLNS269.0 to 55917 FRNKLNS4 138 CKT1	0	Solution Undetermined
03WP	WFEC-WFEC	56023 PAOLI 4 138 to 56022 PAOLI 269.0 CKT 1	42.0	152	154.0	55841 CANADNS269.0 to 56011 NOBLE 269.0 CKT1	0	Solution Undetermined
03WP	WFEC-WFEC	55802 ACME 269.0 to 55916 FRNKLNS269.0 CKT 1	34.0	154	155.3	55841 CANADNS269.0 to 55842 CANADNS4 138 CKT1	0	Solution Undetermined
04G	WERE-WERE	57165 HTI JCT3 115 to 57152 CIRCLVL3 115 CKT 1	97.0	95	100.3	56765 HOYT 7 345 to 56772 STRANGR7 345 CKT1	149	Solution Undetermined
04G	WERE-WERE	57636 GREEN 269.0 to 57631 CC4VERN269.0 CKT 1	45.0	97	100.8	56797 WOLFCRK7 345 to 57981 LACYGNE7 345 CKT1	157	Westar Transmission Operating Directive 1304.
04G	WERE-WERE	57631 CC4VERN269.0 to 57623 ATHENS 269.0 CKT 1	45.0	98	101.4	56794 ROSEHIL7 345 to 56797 WOLFCRK7 345 CKT1	157	Westar Transmission Operating Directive 1304.
04G	WERE-WERE	57631 CC4VERN269.0 to 57623 ATHENS 269.0 CKT 1	45.0	98	101.4	56791 BENTON 7 345 to 56797 WOLFCRK7 345 CKT1	157	Westar Transmission Operating Directive 1304.
04G	WERE-WERE	57636 GREEN 269.0 to 57631 CC4VERN269.0 CKT 1	45.0	100	102.7	56794 ROSEHIL7 345 to 56797 WOLFCRK7 345 CKT1	157	Westar Transmission Operating Directive 1304.
04G	WERE-WERE	57381 SUMMIT 3 115 to 57368 EXIDE J3 115 CKT 1	181.0	100	101.7	56872 EMCPHER6 230 to 56873 SUMMIT 6 230 CKT1	16	Solution Undetermined
04G	WERE-WERE	57636 GREEN 269.0 to 57631 CC4VERN269.0 CKT 1	45.0	100	102.8	56791 BENTON 7 345 to 56797 WOLFCRK7 345 CKT1	157	Westar Transmission Operating Directive 1304.
04G	WERE-WERE	57182 TECHILE3 115 to 57270 STULL T3 115 CKT 1	92.0	101	103.9	56765 HOYT 7 345 to 56772 STRANGR7 345 CKT1	0	Solution Undetermined
04G	WERE-WERE	57343 WJCCTYE3 115 to 57342 WJCCTY 3 115 CKT 1	141.0	101	103.2	56766 JEC N 7 345 to 56773 SUMMIT 7 345 CKT1	0	Reconductor or redispatch.
04G	WERE-WERE	57321 ANZIO 3 115 to 57328 FT JCT 3 115 CKT 1	92.0	101	102.8	57342 WJCCTY 3 115 to 57343 WJCCTYE3 115 CKT1	0	Solution Undetermined

Table 3a-continued – Model Data for Previously Identified SPP Facilities Impacted by the WR to ERCOTN 157 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
04G	WERE-WERE	57368 EXIDE J3 115 to 57381 SUMMIT 3 115 CKT 1	181.0	105	105.3	57371 NORTHVW3 115 to 57381 SUMMIT 3 115 CKT1	0	Solution Undetermined
04G	WFEC-WFEC	55924 GOLDSBY269.0 to 56018 OU SW 269.0 CKT 1	34.0	108	110.2	55916 FRNKLNS269.0 to 55917 FRNKLNS4 138 CKT1	0	Solution Undetermined
04G	WFEC-WFEC	55802 ACME 269.0 to 55916 FRNKLNS269.0 CKT 1	34.0	121	122.3	55841 CANADNS269.0 to 55842 CANADNS4 138 CKT1	0	Solution Undetermined
05SP	AEPW-AEPW	53276 LSSOUTH4 138 to 53619 WILKES 4 138 CKT 1	316.0	100	100.0	53521 CHAPELH4 138 to 53622 WELSHRE4 138 CKT1	144	Solution Undetermined
05SP	AEPW-AEPW	53276 LSSOUTH4 138 to 53619 WILKES 4 138 CKT 1	316.0	101	101.0	53619 WILKES 4 138 to 53622 WELSHRE4 138 CKT1	0	Solution Undetermined
05SP	AEPW-AEPW	53818 ONETA--4 138 to 53781 BA101-N4 138 CKT 1	210.0	103	103.6	53797 BANNTAP4 138 to 53818 ONETA--4 138 CKT1	0	Replace Wavetrap; $30000
05SP	AEPW-AEPW	53203 FITZHUG269.0 to 53208 FITZHUG5 161 CKT 1	111.0	104	104.6	53203 FITZHUG269.0 to 53208 FITZHUG5 161 CKT2	0	Solution Undetermined
05SP	AEPW-AEPW	53311 PITTSB_4 138 to 53276 LSSOUTH4 138 CKT 1	197.0	107	107.1	53308 PETTY 4 138 to 53521 CHAPELH4 138 CKT1	0	Solution Undetermined
05SP	AEPW-AEPW	53311 PITTSB_4 138 to 53276 LSSOUTH4 138 CKT 1	197.0	118	118.3	53521 CHAPELH4 138 to 53622 WELSHRE4 138 CKT1	0	Solution Undetermined
05SP	OKGE-OKGE	54934 DRAPER 7 345 to 54933 DRAPER 4 138 CKT 1	493.0	105	105.6	54933 DRAPER 4 138 to 54934 DRAPER 7 345 CKT2	0	Solution Undetermined
05SP	OKGE-OKGE	54934 DRAPER 7 345 to 54933 DRAPER 4 138 CKT 2	493.0	105	105.6	54934 DRAPER 7 345 to 54933 DRAPER 4 138 CKT1	0	Solution Undetermined
05SP	OKGE-OKGE	55237 TIBBENS269.0 to 55246 BEELINE269.0 CKT 1	66.0	105	106.5	55241 BLUEBEL269.0 to 55242 BLUEBEL4 138 CKT1	0	Solution Undetermined
05SP	OKGE-OKGE	55190 AOCPT 269.0 to 55191 LULA 269.0 CKT 1	48.0	111	111.0	55181 VALYVUT269.0 to 55182 VALLYVU269.0 CKT1	0	Solution Undetermined
05SP	WERE-WERE	57165 HTI JCT3 115 to 57152 CIRCLVL3 115 CKT 1	97.0	96	100.7	56765 HOYT 7 345 to 56772 STRANGR7 345 CKT1	133	Solution Undetermined
05SP	WERE-WERE	57182 TECHILE3 115 to 57270 STULL T3 115 CKT 1	92.0	100	102.8	56765 HOYT 7 345 to 56772 STRANGR7 345 CKT1	0	Solution Undetermined
05SP	WERE-WERE	57244 JARBALO3 115 to 57233 166TH 3 115 CKT 1	97.0	108	110.3	57252 MIDLAND3 115 to 57261 PENTAGN3 115 CKT1	0	Solution Undetermined
05SP	WFEC-OKGE	55917 FRNKLNS4 138 to 54946 MIDWEST4 138 CKT 1	215.0	98	100.7	56026 PHAROAH4 138 to 56084 WETUMKA4 138 CKT1	111	Solution Undetermined
05SP	WFEC-OKGE	55917 FRNKLNS4 138 to 54946 MIDWEST4 138 CKT 1	215.0	98	100.8	55869 CROMWEL4 138 to 56084 WETUMKA4 138 CKT1	105	Solution Undetermined
05SP	WFEC-WFEC	55917 FRNKLNS4 138 to 55916 FRNKLNS269.0 CKT 1	70.0	106	106.7	55841 CANADNS269.0 to 55842 CANADNS4 138 CKT1	0	Solution Undetermined
05SP	WFEC-WFEC	55976 LIL AXE269.0 to 56011 NOBLE 269.0 CKT 1	26.0	118	119.3	56022 PAOLI 269.0 to 56023 PAOLI 4 138 CKT1	0	Solution Undetermined
05WP	WERE-WERE	57372 PHILIPS3 115 to 57374 SPHILPJ3 115 CKT 1	160.0	95	100.0	56872 EMCPHER6 230 to 56873 SUMMIT 6 230 CKT1	156	Solution Undetermined
05WP	WERE-WERE	57165 HTI JCT3 115 to 57152 CIRCLVL3 115 CKT 1	97.0	98	104.2	56765 HOYT 7 345 to 56772 STRANGR7 345 CKT1	44	Solution Undetermined
05WP	WERE-WERE	57381 SUMMIT 3 115 to 57368 EXIDE J3 115 CKT 1	181.0	98	101.1	56872 EMCPHER6 230 to 56873 SUMMIT 6 230 CKT1	91	Solution Undetermined
05WP	WERE-WERE	57381 SUMMIT 3 115 to 57368 EXIDE J3 115 CKT 1	181.0	98	101.1	56872 EMCPHER6 230 to 56873 SUMMIT 6 230 CKT1	91	Solution Undetermined
05WP	WERE-WERE	57321 ANZIO 3 115 to 57328 FT JCT 3 115 CKT 1	92.0	101	102.6	57342 WJCCTY 3 115 to 57343 WJCCTYE3 115 CKT1	0	Solution Undetermined
05WP	WERE-WERE	57374 SPHILPJ3 115 to 57438 WMCPHER3 115 CKT 1	68.0	103	108.0	56872 EMCPHER6 230 to 56873 SUMMIT 6 230 CKT1	0	Solution Undetermined
05WP	WERE-WERE	57343 WJCCTYE3 115 to 57342 WJCCTY 3 115 CKT 1	141.0	104	106.8	56766 JEC N 7 345 to 56773 SUMMIT 7 345 CKT1	0	Reconductor or redispatch.
05WP	WFEC-WFEC	55976 LIL AXE269.0 to 56011 NOBLE 269.0 CKT 1	26.0	106	107.6	56022 PAOLI 269.0 to 56023 PAOLI 4 138 CKT1	0	Solution Undetermined

Table 3a-continued – Model Data for Previously Identified SPP Facilities Impacted by the WR to ERCOTN 157 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
08SP	AEPW-AEPW	53276 LSSOUTH4 138 to 53619 WILKES 4 138 CKT 1	316.0	102	101.8	53521 CHAPELH4 138 to 53622 WELSHRE4 138 CKT1	0	Solution Undetermined
08SP	AEPW-AEPW	53276 LSSOUTH4 138 to 53619 WILKES 4 138 CKT 1	316.0	103	102.9	53619 WILKES 4 138 to 53622 WELSHRE4 138 CKT1	0	Solution Undetermined
08SP	AEPW-AEPW	53818 ONETA--4 138 to 53781 BA101-N4 138 CKT 1	210.0	104	103.6	55035 BRISTOW4 138 to 55242 BLUEBEL4 138 CKT1	0	Solution Undetermined
08SP	AEPW-AEPW	53818 ONETA--4 138 to 53781 BA101-N4 138 CKT 1	210.0	104	104.0	55869 CROMWEL4 138 to 56094 WEWOKA 4 138 CKT1	0	Solution Undetermined
08SP	AEPW-AEPW	53818 ONETA--4 138 to 53781 BA101-N4 138 CKT 1	210.0	104	104.3	52810 KEYSTON4 138 to 96140 4SILVCTY 138 CKT1	0	Solution Undetermined
08SP	AEPW-AEPW	53818 ONETA--4 138 to 53781 BA101-N4 138 CKT 1	210.0	104	104.3	53140 FLINTCR7 345 to 53172 ECNTRTN7 345 CKT1	0	Solution Undetermined
08SP	AEPW-AEPW	53818 ONETA--4 138 to 53781 BA101-N4 138 CKT 1	210.0	104	104.3	53133 ECNTRTN5 161 to 53172 ECNTRTN7 345 CKT1	0	Solution Undetermined
08SP	AEPW-AEPW	54019 VALYTIM269.0 to 54018 HUGO---269.0 CKT 1	48.0	107	106.6	52800 TUPELO 4 138 to 54006 ALLENGT4 138 CKT1	0	Solution Undetermined
08SP	AEPW-AEPW	53203 FITZHUG269.0 to 53208 FITZHUG5 161 CKT 2	111.0	107	107.7	53203 FITZHUG269.0 to 53208 FITZHUG5 161 CKT1	0	Solution Undetermined
08SP	AEPW-AEPW	53311 PITTSB_4 138 to 53276 LSSOUTH4 138 CKT 1	197.0	116	115.9	53308 PETTY 4 138 to 53521 CHAPELH4 138 CKT1	0	Solution Undetermined
08SP	AEPW-AEPW	53818 ONETA--4 138 to 53781 BA101-N4 138 CKT 1	210.0	123	123.6	53797 BANNTAP4 138 to 53818 ONETA--4 138 CKT1	0	Replace Wavetrap; $30000
08SP	AEPW-AEPW	53311 PITTSB_4 138 to 53276 LSSOUTH4 138 CKT 1	197.0	128	128.0	53521 CHAPELH4 138 to 53622 WELSHRE4 138 CKT1	0	Solution Undetermined
08SP	OKGE-OKGE	55308 3RDST 5 161 to 55306 ARKOMA 5 161 CKT 1	335.0	103	103.7	55300 FTSMITH5 161 to 55345 COLONY 5 161 CKT1	0	Solution Undetermined
08SP	OKGE-OKGE	54934 DRAPER 7 345 to 54933 DRAPER 4 138 CKT 1	493.0	107	107.5	54933 DRAPER 4 138 to 54934 DRAPER 7 345 CKT2	0	Solution Undetermined
08SP	OKGE-OKGE	54934 DRAPER 7 345 to 54933 DRAPER 4 138 CKT 2	493.0	107	107.5	54934 DRAPER 7 345 to 54933 DRAPER 4 138 CKT1	0	Solution Undetermined
08SP	OKGE-OKGE	55237 TIBBENS269.0 to 55246 BEELINE269.0 CKT 1	66.0	107	108.5	55241 BLUEBEL269.0 to 55242 BLUEBEL4 138 CKT1	0	Solution Undetermined
08SP	OKGE-OKGE	54990 TINKER24 138 to 54988 TINKER44 138 CKT 1	100.0	119	119.4	54964 NE10TH 4 138 to 54966 MIDWAY 4 138 CKT1	157	Excluded Per OKGE
08SP	OKGE-OKGE	55190 AOCPT 269.0 to 55191 LULA 269.0 CKT 1	48.0	121	121.6	55181 VALYVUT269.0 to 55182 VALLYVU269.0 CKT1	0	Solution Undetermined
08SP	OKGE-OKGE	54988 TINKER44 138 to 54990 TINKER24 138 CKT 1	100.0	140	139.9	54941 HSL 4 138 to 54966 MIDWAY 4 138 CKT1	157	Excluded Per OKGE
08SP	SWPA-SPRM	52692 SPRGFLD5 161 to 59969 BRKLNE 5 161 CKT 1	323.0	108	108.7	59959 BATFLD 5 161 to 59960 SWDISP 5 161 CKT1	0	Solution Undetermined
08SP	SWPA-SPRM	52692 SPRGFLD5 161 to 59969 BRKLNE 5 161 CKT 1	323.0	109	109.5	59954 SWPS 5 161 to 59960 SWDISP 5 161 CKT1	0	Solution Undetermined
08SP	WEPL-MIDW	58792 SEWARD 3 115 to 56565 SEWARD 269.0 CKT 1	44.0	106	107.0	56601 HEIZER 3 115 to 58779 MULGREN6 230 CKT1	0	Solution Undetermined
08SP	WERE-WERE	57040 EVANS N4 138 to 57035 CHISHLM4 138 CKT 1	382.0	101	101.5	57041 EVANS S4 138 to 57053 LAKERDG4 138 CKT1	0	Solution Undetermined
08SP	WERE-WERE	57558 TIMBJCT269.0 to 57561 WINFLD 269.0 CKT 1	43.0	103	109.1	57039 ELPASO 4 138 to 57042 FARBER 4 138 CKT1	0	Solution Undetermined
08SP	WERE-WERE	57479 MWSOLJ2269.0 to 57471 ARNOLD 269.0 CKT 1	41.0	104	104.1	57211 ARNOLD 3 115 to 57218 PARALEL3 115 CKT1	0	Solution Undetermined
08SP	WERE-WERE	57270 STULL T3 115 to 57253 MOCKBRD3 115 CKT 1	92.0	108	110.5	56765 HOYT 7 345 to 56772 STRANGR7 345 CKT1	0	Solution Undetermined
08SP	WERE-WERE	57165 HTI JCT3 115 to 57152 CIRCLVL3 115 CKT 1	97.0	108	112.6	56765 HOYT 7 345 to 56772 STRANGR7 345 CKT1	0	Solution Undetermined
08SP	WERE-WERE	57795 GILL E 269.0 to 57813 MACARTH269.0 CKT 1	68.0	109	110.4	57795 GILL E 269.0 to 57825 OATVILL269.0 CKT1	0	Solution Undetermined

Table 3a-continued – Model Data for Previously Identified SPP Facilities Impacted by the WR to ERCOTN 157 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
08SP	WERE-WERE	57244 JARBALO3 115 to 57233 166TH 3 115 CKT 1	97.0	114	116.1	57252 MIDLAND3 115 to 57261 PENTAGN3 115 CKT1	0	Solution Undetermined
08SP	WERE-WERE	57182 TECHILE3 115 to 57270 STULL T3 115 CKT 1	92.0	115	117.9	56765 HOYT 7 345 to 56772 STRANGR7 345 CKT1	0	Solution Undetermined
08SP	WERE-WERE	57514 HEC GT 269.0 to 57513 HEC 269.0 CKT 1	130.0	184	189.4	57413 CIRCLE 3 115 to 57421 HEC GT 3 115 CKT1	0	Solution Undetermined
08SP	WFEC-OKGE	55917 FRNKLNS4 138 to 54946 MIDWEST4 138 CKT 1	215.0	100	101.0	54946 MIDWEST4 138 to 54953 HOLLYWD4 138 CKT1	0	Solution Undetermined
08SP	WFEC-OKGE	55917 FRNKLNS4 138 to 54946 MIDWEST4 138 CKT 1	215.0	109	111.5	56026 PHAROAH4 138 to 56084 WETUMKA4 138 CKT1	0	Solution Undetermined
08SP	WFEC-OKGE	55917 FRNKLNS4 138 to 54946 MIDWEST4 138 CKT 1	215.0	110	111.7	55869 CROMWEL4 138 to 56084 WETUMKA4 138 CKT1	0	Solution Undetermined
08SP	WFEC-WFEC	55916 FRNKLNS269.0 to 55917 FRNKLNS4 138 CKT 1	70.0	111	111.4	55841 CANADNS269.0 to 55842 CANADNS4 138 CKT1	0	Solution Undetermined
08SP	WFEC-WFEC	55917 FRNKLNS4 138 to 55916 FRNKLNS269.0 CKT 1	70.0	111	111.4	55841 CANADNS269.0 to 55842 CANADNS4 138 CKT1	0	Solution Undetermined
08WP	AEPW-AEPW	53311 PITTSB_4 138 to 53276 LSSOUTH4 138 CKT 1	197.0	109	109.5	53521 CHAPELH4 138 to 53622 WELSHRE4 138 CKT1	0	Solution Undetermined
08WP	WERE-WERE	57165 HTI JCT3 115 to 57152 CIRCLVL3 115 CKT 1	97.0	99	104.2	56765 HOYT 7 345 to 56772 STRANGR7 345 CKT1	30	Solution Undetermined
08WP	WERE-WERE	57182 TECHILE3 115 to 57270 STULL T3 115 CKT 1	92.0	101	104.1	56765 HOYT 7 345 to 56772 STRANGR7 345 CKT1	0	Solution Undetermined
08WP	WERE-WERE	57815 MEAD 269.0 to 57829 PLAZA 269.0 CKT 1	72.0	110	110.7	57040 EVANS N4 138 to 57041 EVANS S4 138 CKT1	0	Solution Undetermined