SPP Southwest Power Pool

System Impact Study For Transmission Service Requested By Cargill-Alliant, LLC

From KCPL to ERCOTE

For a Reserved Amount Of 300MW From 1/1/02 To 1/1/03

SPP Transmission Planning

SPP IMPACT STUDY (#SPP-2001-022)
April 20, 2001

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1. Executive Summary

Cargill-Alliant, LLC has requested a system impact study for long-term Firm Point-to-Point transmission service from KCPL to ERCOTE. The period of the transaction is from 1/1/02 to 1/1/03. The request is for reservations 231281-231386, totaling 300MW.

The principal objective of this study is to identify system problems and potential system modifications necessary to facilitate the additional 300MW transfer while maintaining system reliability.

Using updated models, the study was performed to determine the impact of the 300MW transfer on all SPP and Non-SPP facilities.

2. Introduction

Cargill-Alliant, LLC has requested an impact study for transmission service from KCPL control area with a sink of ERCOTE.

The principal objective of this study is to identify the restraints on the SPP Regional Tariff System that may limit the transfer too less than 300MW. New overloads caused by the 300MW transfer are documented.

The 300MW transaction from KCPL to ERCOTE has a positive response on the Webre – Richard, 500kV circuit. For the spring and summer months of 2002, the flow on this line exceeds the 1250MW that the facility is monitored at to ensure system reliability. Any transactions that impact the Webre-Richard facility will have zero ATC during the spring and summer months.

The 300MW transfer also causes new overloads to occur in the SPP system, as well as overloading non-SPP facilities. These overloaded facilities are given in Tables 1 and 3 in the report.

3. Study Methodology

A. Description

The 300MW transfer request was studied to determine the impact of the transfer on the transmission system. Transfers in the KCPL to ERCOTE transfer direction create a positive response on the Webre – Richard flowgate. The impact on this circuit by the 300MW transfer was monitored.

An analyses was also conducted to determine if any additional SPP or Non – SPP facilities are overloaded by the 300MW transfer.

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.

B. Model Updates

SPP used five seasonal models to study the 300MW request. The SPP 2001 Series Cases 2002 April (Spring Minimum), 2002 Spring Peak, 2002 Summer Peak, 2002 Fall Peak, and 2002/03 Winter Peak were used to study the impact of the 300MW transfer on the SPP system during the transaction period of 1/1/02 to 1/2/03.

Seasonal Case	2002 April	2002 Spring Peak	2002 Summer Peak	2002 Fall Peak	2002 Winter Peak
Abbreviation	02AP	02G	02SP	02FA	02WP

The chosen base case models were modified to reflect the most current modeling information. The cases were modified to reflect future firm transfers during the request period that were not already included in the January 2001 base case series models.

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 thru 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 the circuit with and without the studied transfer, any SPP identification or assignment of the event, and any solutions received from the transmission owners.

Table 1 documents the new facility overloads on SPP Regional Tariff participants' transmission systems caused by the 300MW transfer. The overloaded Fulton to Hope, 115kV circuit, and Weleetka 138/69kV transformer have previously been assigned to other studies. However, these upgrades are not due to be completed until after the end date of the 300MW request.

Table 2 documents the flowgates that are impacted by the 300MW transfer. The KCPL to ERCOTE transfer increases the flow on the already overloaded Webre – Richard, 500kV circuit for the 2002 spring and summer seasons.

Table 3 documents the new facility overloads on Non – SPP Tariff participants' transmission systems.

Table 1 - SPP Facility Overloads Caused by the KCPL to ERCOTE 300MW Transfer

Study Year	From Area - To Area	Branch Over 100% Rate B	RATEB	BC % I Loading	TC % I Loading	Outaged Branch That Caused Overload	Initial Limit, Available Solution and Cost, or Previous Assignment
		Fulton to Hope, 115kV				**Dolet Hills to Southwest Shreveport, 345kV**	Assigned to SPP-2000-137 - 06SP Replace circuit switcher & CTs at Hope $80,000
02SP	AEPW-AEPW	53374 FULTON 3 115 to 53383 HOPE 3 115 CKT 1	174	95.0	101.5	50045 DOLHILL7 345 to 53454 SW SHV 7 345 CKT1	
		Weleetka 138/69kV Tr				**Weleetka 138/69kV Tr**	
02SP	AEPW-AEPW	54028 WELETK4 138 to 54029 WELEETK269.0 CKT 2	36	99.1	100.1	54028 WELETK4 138 to 54029 WELEETK269.0 CKT1	Assigned to SPP-1999-017 - 05SP
		West Junction City to West Junction City Junction, 115kV				**Jefferson Energy Center to Summit, 345kV Tr**	Western Resources Operating Directive # 0402
02WP	WERE-WERE	57342 WJCCTY 3 115 to 57344 WJCCTYW3 115 CKT 1	141	99.9	100.2	56766 JEC N 7 345 to 56773 SUMMIT 7 345 CKT1	

Table 2 – Flowgates Impacted by the KCPL To ERCOTE 300MW Transfer

Study Year	From Area - To Area	Branch Over 100% Rate B	Flowgate Rating	BC % I Loading	TC % I Loading	Outaged Branch That Caused Overload	Initial Limit, Available Solution and Cost, or Previous Assignment
		Webre to Richard, 500kV					
02G	EES - EES	98430 8WEBRE 500 to 98107 8RICHARD 500 CKT 1	1250	105.7	108.6	Non - Contingent Overload	Undetermined
		Webre to Richard, 500kV					
02SP	EES - EES	98430 8WEBRE 500 to 98107 8RICHARD 500 CKT 1	1250	108.7	111.6	Non - Contingent Overload	Undetermined
		Wilburt to Livonia, 138kV				**Webre to Richard, 500kV**	
02WP	EES - EES	98411 4WILBT 138 to 98410 4LIVON 138 CKT 1	289	97.9	101.6	98107 8RICHARD 500 to 98430 8WEBRE 500 CKT1	Undetermined
		Mansfield to International Paper, 138kV				**Dolet Hills to Southwest Shreveport, 345kV**	
02WP	CELE-CELE	50113 MANSFLD4 138 to 50090 IPAPER 4 138 CKT 1	260	82.7	90.7	50045 DOLHILL7 345 to 53454 SW SHV 7 345 CKT1	Undetermined

Table 3 - Non - SPP Facility Overloads Caused by the KCPL to ERCOTE 300MW Transfer

Study Year	From Area - To Area	Branch Over 100% Rate B	RATEB	BC % I Loading	TC % I Loading	Outaged Branch That Caused Overload
02G	EES-EES	98184 4DUBOIN 138 to 98185 4BUWHSE 138 CKT 1	112	99.7	102.0	98107 8RICHARD 500 to 98430 8WEBRE 500 CKT1
02G	EES-EES	99276 3SMACKO 115 to 99235 3CAMDMG 115 CKT 1	98	99.1	100.6	99309 8MCNEIL 500 to 99310 3MCNEIL 115 CKT1
02G	EES-EES	99280 3TAYLOR 115 to 99264 3MAG-DW 115 CKT 1	159	99.0	101.2	99308 3MAG-E 115 to 99310 3MCNEIL 115 CKT1
02G	EES-EES	99310 3MCNEIL 115 to 99230 3COUCH 115 CKT 1	167	97.0	103.7	99266 3MAG-ST 115 to 99308 3MAG-E 115 CKT1
02SP	MIPU-MIPU	59288 RGAFB 269.0 to 59284 GRDVWTP269.0 CKT 1	53	99.9	100.1	59294 HSNVLS 269.0 to 59295 HSNVL 269.0 CKT1
02SP	NPPD-NPPD	64203 N.PLATT4 230 to 64201 N.PLT8 Y 230 CKT 1	187	98.9	100.8	64102 GENTLMN3 345 to 64238 REDWILO3 345 CKT1
02SP	AECI-AMRN	96079 5FREDTN 161 to 30583 FRED TAP 161 CKT 1	56	99.2	100.4	31510 PILTMA 161 to 97273 2PILOTK 69.0 CKT1
02SP	EES-EES	98107 8RICHARD 500 to 98430 8WEBRE 500 CKT 1	1732	99.0	101.8	98937 8B.WLSN 500 to 99203 8PERYVIL 500 CKT1
02SP	EES-EES	99171 3SPRINGH 115 to 99280 3TAYLOR 115 CKT 1	120	99.5	102.1	99249 3EMERSN 115 to 99288 3KERLIN* 115 CKT1
02SP	EES-EES	99172 3SAREPT 115 to 99171 3SPRINGH 115 CKT 1	120	100.0	102.5	99266 3MAG-ST 115 to 99308 3MAG-E 115 CKT1
02SP	EES-EES	99264 3MAG-DW 115 to 99230 3COUCH 115 CKT 1	108	99.6	101.6	99182 3DANVLL 115 to 99188 3JNSBRO 115 CKT1
02SP	EES-EES	99351 3ARKLA 115 to 99403 3HSEHVW 115 CKT 1	266	99.4	101.5	99398 3BUTERF 115 to 99404 3HSEHVE 115 CKT1
02SP	EES-EES	99397 3BISMRK 115 to 99403 3HSEHVW 115 CKT 1	98	92.0	102.4	53374 FULTON 3 115 to 53383 HOPE 3 115 CKT1
02FA	EES-LAGN	98522 3TEREBN 115 to 97311 GRENWD 3 115 CKT 1	227	98.3	102.1	98107 8RICHARD 500 to 98430 8WEBRE 500 CKT1
02FA	EES-EES	98410 4LIVON 138 to 98147 4L-642TP 138 CKT 1	289	97.9	101.7	98107 8RICHARD 500 to 98430 8WEBRE 500 CKT1
02FA	EES-EES	98108 4RICHARD 138 to 98031 4JENNGS 138 CKT 1	159	98.3	101.1	97916 8NELSON 500 to 98107 8RICHARD 500 CKT1
02FA	EES-EES	99235 3CAMDMG 115 to 99276 3SMACKO 115 CKT 1	98	99.0	100.5	99309 8MCNEIL 500 to 99310 3MCNEIL 115 CKT1
02WP	AMRN-AMRN	30999 MAKANDA 138 to 31383 ORDILL 138 CKT 1	180	99.6	100.3	30292 CARBD NW 138 to 30666 GRAND TW 138 CKT1
02WP	AMRN-AMRN	31383 ORDILL 138 to 31026 MARIONSA 138 CKT 1	180	99.8	100.3	30666 GRAND TW 138 to 32293 CAMBL TP 138 CKT1
02WP	EES-LAGN	98522 3TEREBN 115 to 97311 GRENWD 3 115 CKT 1	227	97.1	100.5	98107 8RICHARD 500 to 98430 8WEBRE 500 CKT1

5. Conclusion

The results of the study show that the KCPL – ERCOTE transfer causes new overloads on the SPP system.

In addition to causing new overloads on the SPP and Non – SPP system, the 300MW transfer from KCPL to ERCOTE impacts the Webre – Richard flowgate. The ATC is zero for the 2002 spring and summer months over the Webre – Richard flowgate. Therefore, there is no available capacity for the 300MW transfer during this time period.

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 –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. 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