



***System Impact Study SPP-2001-239
For Transmission Service***

***Requested By
Cargill-Alliant, LLC***

***From Grand River Dam Authority To
Entergy***

***For a Reserved Amount Of 250MW
From 10/1/01
To 10/1/02***

SPP Transmission Planning

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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 Grand River Dam Authority to Entergy. The period of the transaction is from 10/1/01 to 10/1/02. The request is for OASIS reservations 273621, and 276440 - 276443, totaling 250MW.

The principal objective of this study is to identify system problems and potential system modifications necessary to facilitate the additional 250MW transfer while maintaining system reliability.

New overloads caused by the 250MW transfer were identified along with determining the impact of the transfer on any previously assigned and identified facilities.

The GRDA to EES transfer impacts several facilities that have been identified as limiting constraints for previously studied transfers. Due to the inability to upgrade these limiting constraints within the reservation period using normal construction practices, the ATC is zero for the requested GRDA to EES 250MW transfer.

2. Introduction

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

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 250 MW. This study includes steady-state contingency analyses (PSS/E function ACCC) and Available Transfer Capability (ATC) analyses.

The steady-state analyses consider the impact of the 250 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.

ATC analyses shows the amount of First Contingency Incremental Transfer Capabilities (FCITC) between the given study systems and what the limitations are, if any, for transferring up to 250 MW.

3. Study Methodology

A. Description

Two analyses were conducted to determine the impact of the 250MW transfer on the system. The first analysis was conducted to identify any new overloads caused by the 250MW transfer. The second analysis was done to ensure that available capacity exists on previously identified circuits.

The first analysis was to study the steady-state analysis impact of the 250MW 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 three seasonal models to study the 250MW request. The SPP 2001 Series Cases 2001/02 Winter Peak, 2002 Spring, and 2002 Summer Peak were used to study the impact of the 250MW transfer on the SPP system during the transaction period of 10/01/01 to 10/1/02.

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, 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 facility overloads caused by the 250MW transfer. Upgrades associated with these new overloads can be directly assigned to the MEC to EES 250MW transfer.

Table 2 documents overloads on Non SPP Regional Tariff participants' transmission systems caused by the 250MW transfer.

Table 3 documents the 250MW transfer impact on previously assigned and identified facilities. Available estimated in-service dates for the completion of the previously assigned upgrades are given in the table.

Table 1 – SPP Facility Overloads caused by the GRDA to EES 250MW Transfer

Study Year	From Area - To Area	Branch Over 100% Rate B	Rate B	BC % Loading	TC % Loading	Outaged Branch That Caused Overload	ATC (MW)
02G	WERE-WERE	HOYT TO HOYT HTI SWITCHING JUNCTION, 115KV 57163 HOYT 3 115 to 57165 HTI JCT3 115 CKT 1	92	99.7	101.0	IATAN TO ST. JOE, 345KV 57982 IATAN 7 345 to 69702 ST JOE 3 345 CKT1	56
02SP	GRRD-GRRD	PENSACOLA TO GRAY TAP, 69KV 54428 PENZA 269.0 to 54465 GRAY TP269.0 CKT 1	47	97.8	108.5	FLINT CREEK TO GRDA, 345KV 53140 FLINTCR7 345 to 54450 GRDA1 7 345 CKT1	52
02SP	WERE-WERE	HOYT TO HOYT HTI SWITCHING JUNCTION, 115KV 57163 HOYT 3 115 to 57165 HTI JCT3 115 CKT 1	92	99.8	100.7	KNB HILL TO GREENLEAF, 115KV 57332 KNOB HL3 115 to 58765 GRNLEAF3 115 CKT1	66
02SP	GRRD-GRRD	COLLINSVILLE 161/69KV TR 54427 COLINS 5 161 to 54476 COLNSGR269.0 CKT 1	50	98.8	102.2	COLLINSVILLE 161/69KV TR CK 2 54427 COLINS 5 161 to 54476 COLNSGR269.0 CKT2	89
02SP	GRRD-GRRD	ZENA TAP TO JAY, 69KV 54467 ZENA TP269.0 to 54520 JAY GR 269.0 CKT 1	47	94.3	104.8	KANSAS TAP TO KANSAS, 161KV 54514 KANSATP5 161 to 54516 KANSAS 5 161 CKT1	137
02SP	WERE-WERE	HOYT HTI SWITCHING JUNCTION TO CIRCLEVILLE, 115KV 57165 HTI JCT3 115 to 57152 CIRCLVL3 115 CKT 1	92	99.5	100.4	JEFFERGY ENERGY CENTER TO EAST MANHATTAN, 230KV 56852 JEC 6 230 to 56861 EMANHAT6 230 CKT1	140
02SP	GRRD-GRRD	AFTON 161/69KV TR 54432 AFTON 5 161 to 54433 AFTON 269.0 CKT 1	50	93.1	102.0	MIAMI TO AFTON, 161KV 54431 MIAMI 5 161 to 54432 AFTON 5 161 CKT1	194
02SP	SWPA-SWPA	BUFORD TAP TO BULL SHOALS, 161LV 52661 BUFRDTP5 161 to 52660 BULL SH5 161 CKT 1	167	94.1	100.7	BULL SHOALS TO MIDWAY, 161KV 52660 BULL SH5 161 to 99825 5MIDWAY# 161 CKT1	224

Table 2 – Non - SPP Facility Overloads caused by the GRDA to EES 250MW Transfer

Study Year	From Area - To Area	Branch Over 100% Rate B	Rate B	BC % Loading	TC % Loading	Outaged Branch That Caused Overload
01WP	SWPA-AECI	52690 CARTHG 269.0 to 96751 2REEDS 69.0 CKT 1	43	97.7	101.1	59479 LAR382 5 161 to 59480 MON383 5 161 CKT1
01WP	EES-EES	97919 6VERDINE 230 to 97917 6NELSN 230 CKT 1	470	99.4	100.1	97304 MOSBLF 6 230 to 97917 6NELSN 230 CKT1
01WP	EES-EES	99066 3DEXTER* 115 to 98489 3BOGLSA 115 CKT 1	80	99.9	101.8	99040 3NORFLD 115 to 99041 3MCCOMB 115 CKT1
01WP	EES-EES	99389 4MURFRE 138 to 99387 3MURF-S 115 CKT 1	60	96.9	101.2	99294 7ELDEHV 345 to 99295 8ELDEHV 500 CKT1
01WP	EES-EES	99389 4MURFRE 138 to 99387 3MURF-S 115 CKT 1	60	97.0	101.3	53424 LONGWD 7 345 to 99294 7ELDEHV 345 CKT1
01WP	CELE-EES	50024 CARROLL4 138 to 99167 3RINGLD 115 CKT 1	125	99.7	100.7	99294 7ELDEHV 345 to 99295 8ELDEHV 500 CKT1
01WP	CELE-EES	50024 CARROLL4 138 to 99167 3RINGLD 115 CKT 1	125	99.6	100.5	53424 LONGWD 7 345 to 99294 7ELDEHV 345 CKT1
02G	AECI-AECI	96120 5THMHIL 161 to 96172 2TMHILL 69.0 CKT 1	84	99.6	100.4	96044 7MCCRED 345 to 96049 7THOMHL 345 CKT1
02SP	EES-EES	97618 4NEWTONB 138 to 97768 4HLYSPG# 138 CKT 1	112	98.7	100.6	53526 CROCKET7 345 to 97513 7GRIMES 345 CKT1
02SP	EES-EES	98273 4OAKGROV 138 to 98283 T300/331 138 CKT 1	135	99.3	100.2	98232 6RVRBN 230 to 98234 6FANCY 230 CKT1
02SP	EES-EES	99556 3LR-WAL 115 to 99548 3LR-PIN 115 CKT 1	159	99.8	100.3	99570 3MAUMEL* 115 to 99581 3NLR-LV 115 CKT1
02SP	EES-SWPA	99825 5MIDWAY# 161 to 52660 BULL SH5 161 CKT 1	162	99.5	102.5	99798 5BATEVL 161 to 99808 5CUSHMN 161 CKT1
02SP	EMDE-EMDE	59472 TIP292 5 161 to 59480 MON383 5 161 CKT 1	157	97.8	102.1	59479 LAR382 5 161 to 59480 MON383 5 161 CKT1
02SP	EMDE-EMDE	59480 MON383 5 161 to 59468 AUR124 5 161 CKT 1	157	99.8	103.4	59478 DAD368 5 161 to 96101 5MORGAN 161 CKT1
02SP	GRRD-GRRD	54467 ZENA TP269.0 to 54520 JAY GR 269.0 CKT 1	47	94.3	104.8	54514 KANSATP5 161 to 54516 KANSAS 5 161 CKT1
02SP	MIPU-AECI	59217 WINDSR 5 161 to 96071 5CLINTN 161 CKT 1	123	98.8	100.7	58062 SALSBRY5 161 to 58064 NORTON-5 161 CKT1
02SP	NPPD-NPPD	64181 MAXWELL7 115 to 64039 CALAWAY7 115 CKT 1	105	100.0	100.2	64037 C.CREEK4 230 to 64203 N.PLATT4 230 CKT1
02SP	SWPA-AECI	52690 CARTHG 269.0 to 96751 2REEDS 69.0 CKT 1	36	99.3	104.4	52680 BEAVER 5 161 to 53136 EUREKA 5 161 CKT1
02SP	SWPA-SWPA	52661 BUFRDTP5 161 to 52660 BULL SH5 161 CKT 1	167	94.1	100.7	52660 BULL SH5 161 to 99825 5MIDWAY# 161 CKT1

Table 3 – Previously Assigned and Identified SPP Facilities Impacted by the GRDA to EES 250MW Transfer.

Study Year	From Area - To Area	Branch Over 100% Rate B	Rate B	BC % Loading	TC % Loading	Outaged Branch Causing Overload	Assignment	ATC (MW)
01WP	AEPW-AEPW	EAST ROGERS TO DYESS, 161KV 53135 EROGERS5 161 to 53131 DYESS 5 161 CKT 1	245	103.0	106.3	FLINT CREEK TO GENTRY, 161KV 53139 FLINTCR5 161 to 53187 GENTRYR5 161 CKT1	SPP Flowgate	0
02G	SWPA-SWPA	ROBERT S. KERR TO VAN BUREN 52782 RS KERR5 161 to 52722 VAN BUR5 161 CKT 1	167	97.2	100.5	BONANZA TAP TO AES, 161KV 55261 BONANZT5 161 to 55262 AES 5 161 CKT1	Previously Identified	215
02SP	SWPA-SWPA	ROBERT S. KERR TO VAN BUREN 52782 RS KERR5 161 to 52722 VAN BUR5 161 CKT 1	167	103.4	106.7	BONANZA TAP TO AES, 161KV 55261 BONANZT5 161 to 55262 AES 5 161 CKT1	Previously Identified	0
02SP	AEPW-AEPW	TATUM TO CHEROKEE REC 138KV 53611 TATUM 4 138 to 53522 CHEROKE4 138 CKT 1	209	102.0	103.5	Multiple Outage Contingency SOUTHWEST SHREVEPORT to LONGWOOD, 345KV 53454 SW SHV 7 345 to 53424 LONGWD 7 345 CKT 1 SOUTHWEST SHREVEPORT to DIANA, 345KV 53454 SW SHV 7 345 to 53528 DIANA 7 345 CKT 1	Upgrade Assigned to SPP-2000-086 150680 Est. In-Service Date 2/1/2003	0
02SP	AEPW-AEPW	NORAM TO LONGWOOD, 138KV 53473 NORAM 4 138 to 53423 LONGWD 4 138 CKT 1	234	100.7	102.0	Multiple Outage Contingency SOUTHWEST SHREVEPORT to LONGWOOD, 345KV 53454 SW SHV 7 345 to 53424 LONGWD 7 345 CKT 1 SOUTHWEST SHREVEPORT to DIANA, 345KV 53454 SW SHV 7 345 to 53528 DIANA 7 345 CKT 1	Previously Identified	0
02SP	EMDE-EMDE	TIPTON FORD TO MONETT, 161KV 59472 TIP292 5 161 to 59480 MON383 5 161 CKT 1	157	97.8	102.1	LARUSSEL TO MONETT, 161KV 59479 LAR382 5 161 to 59480 MON383 5 161 CKT1	Upgrade Assigned to SPP-2000-086 150680 Est. In-Service Date 5/1/2003	128
02SP	AEPW-AEPW	NORAM TO RAINES, 138KV 53473 NORAM 4 138 to 53439 RAINES 4 138 CKT 1	234	99.1	100.4	Multiple Outage Contingency SOUTHWEST SHREVEPORT to LONGWOOD, 345KV 53454 SW SHV 7 345 to 53424 LONGWD 7 345 CKT 1 SOUTHWEST SHREVEPORT to DIANA, 345KV 53454 SW SHV 7 345 to 53528 DIANA 7 345 CKT 1	Previously Identified	165
02SP	AEPW-AEPW	GENTRY REC TO FLINT CREEK, 161KV 53187 GENTRYR5 161 to 53139 FLINTCR5 161 CKT 1	354	97.4	100.2	DYESS TO E. ROGERS, 161KV 53131 DYESS 5 161 to 53135 EROGERS5 161 CKT1	Upgrade Assigned to SPP-2000-003 163958 Est. In-Service Date 6/1/2004	228
02SP	AEPW-AEPW	EAST CENTERTON TO GENTRY REC, 161KV 53133 ECNTRTN5 161 to 53187 GENTRYR5 161 CKT 1	335	101.0	104.0	DYESS TO E. ROGERS, 161KV 53131 DYESS 5 161 to 53135 EROGERS5 161 CKT1	Upgrade Assigned to SPP-2000-086 150680 Est. In-Service Date 4/1/2002	250

5. Conclusion

The previously assigned and identified facilities limit the ATC to zero due to the inability to upgrade the constraints as required. Those facilities that have an ATC of zero are given below.

- For the 2001/2002 Winter, the ATC is zero due to the loading of the East Rogers to Dyess, Flint Creek to Gentry flowgate.
- For the 2002 Summer, the ATC is zero due to the loading of the Cherokee to Tatum 138kV line, the Noram to Longwood 138kV line, and the R.S. Kerr to Van Buren 161kV line. The estimated in service date of the Cherokee to Tatum 138kV line upgrade is 2/1/2003. No upgrades have been assigned for the Noram to Longwood and R.S. Kerr to Van Buren overloads.

Given the estimated in service dates of these Upgrades, the ATC of the existing transmission system cannot be increased as required to provide continuous service over the reservation period. Therefore, the requested reservations will be refused.

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 automatically
4. Solution options - Phase shift adjustment
 - Flat start
 - Lock DC taps
 - Lock switched shunts

ACCC CASES:

Solutions – AC contingency checking (ACCC)

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

Newton Solution:

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