



SPP *Southwest Power Pool*

*System Impact Study
SPP-2003-081-1
For Transmission Service
Requested By
Cargill - Alliant*

From GRDA To ERCOTN

*For a Reserved Amount Of
200 MW From 1/1/2005 To 1/1/2006*

SPP Engineering, Tariff Studies

System Impact Study

Cargill – Alliant has requested a system impact study for Point-to-Point transmission service from GRDA to ERCOTN for 200 MW. The period of the service requested is from 1/1/2005 to 1/1/2006. The OASIS reservation numbers are 495365 and 495367. The principal objective of this study is to identify system constraints on the SPP Regional Tariff System and potential system facility upgrades that may be necessary to provide the requested service.

The GRDA to ERCOTN request was studied to determine the facility upgrades required based on the actual queue position of the request with only those higher priority requests in Facility Study mode included in the models. Higher priority requests still in study mode that have not gone to facility study mode were not included in the models. The results of the transfer analysis are documented in Table 1. The results given in Table 1 include upgrades that may be assigned to higher priority requests. The results of this study gives the customer an estimated cost of the facility upgrades that may be required in order to accommodate the GRDA to ERCOTN 200 MW request.

Seven seasonal models were used to study the GRDA to ERCOTN 200 MW request for the requested service period. The SPP 2003 Series Cases 2004 April Min (04AP), 2004 Spring Peak (04G), 2004 Summer Peak (04SP), 2004 Fall Peak (04FA), 2004/05 Winter Peak (04WP), 2009 Summer Peak (09SP), and 2009/10 Winter Peak (09WP) were used to study the impact of the 200 MW request on the SPP system during a the requested service period of 1/1/2005 to 1/1/2006. The chosen base case models were modified to reflect the most current modeling information. The cases were modified to reflect firm transfers during the requested service period that were not already included in the January 2003 base case series models.

PTI's MUST First Contingency Incremental Transfer Capability (FCITC) DC analysis was used to study the request. The MUST option to convert MVA branch ratings to estimated MW ratings was used to partially compensate for reactive loading.

With only the higher priority requests that have signed Facility Study Agreements included in the models, the study results of the GRDA to ERCOTN 200 MW transfer show that limiting constraints exist. Due to the limiting constraints identified, the Transmission Service Request cannot be granted. Any solutions, upgrades, and costs provided in the System Impact Study are planning estimates only. The final ATC and upgrades required may vary from these results due to the status of higher priority requests, unknown facility upgrades and proposed transmission plans that will be identified during the facility study process, and the final results of the full AC analysis. Execution of a Facility Study Agreement is now required to maintain queue position. The final upgrade solutions and cost assignments will be determined upon the completion of the facility study.

Table 1 – SPP facility overloads identified for the GRDA to ERCOTN transfer

Study Year	From Area - To Area	Branch Over 100% Rate B	Rate B	Outaged Branch Causing Overload	ATC	Solution	Estimated Cost
04AP	WFEC-WFEC	55802 ACME 2 69 55916 FRNKLNS2 69 1	34	55841 CANADNS2 69 55842 CANADNS4 138 1	0	Acme Jct to Acme Sub: Upgrade From 3/0 To 795MCM.	\$ 857,820
04AP	WFEC-WFEC	55802 ACME 2 69 56095 WNORMAN2 69 1	38	55841 CANADNS2 69 55842 CANADNS4 138 1	49	Acme Sub > West Norman: Upgrade from 3/0 to 795 ACSR	\$ 525,000
04G	WFEC-WFEC	55802 ACME 2 69 55916 FRNKLNS2 69 1	34	55841 CANADNS2 69 55842 CANADNS4 138 1	0	See Previous	\$ -
04G	AEPW-AEPW	54023 OKMULGE4 138 54049 EC.HEN-4 138 1	104	54023 OKMULGE4 138 54057 KELCO 4 138 1	86	Replace Okmulgee Wavetrap	\$ 40,000
04G	AEPW-AEPW	54028 WELETK4 138 54049 EC.HEN-4 138 1	104	54023 OKMULGE4 138 54057 KELCO 4 138 1	188	Replace Weleetka Wavetrap	\$ 40,000
04G	WERE-WERE	57039 ELPASO 4 138 57046 GILL S 4 138 1	210	57040 EVANS N4 138 57041 EVANS S4 138 1	0	Solution Undetermined	N/A
04G	SWPA-SWPA	52774 EUFAULA4 138 *B053 EUFAULA1 1 1	105	52752 GORE 5 161 52790 WELEETK5 161 1	0	Replace Eufaula Transformer	\$ 2,000,000
04G	WERE-WERE	57374 SPHILPJ3 115 57438 WMCIPHER3 115 1	67	56872 EMCIPHER6 230 56873 SUMMIT 6 230 1	6	Tear down double circuit, build single circuit with 1192.5 ACSR.	\$ 7,800,000
04SP	WFEC-WFEC	55802 ACME 2 69 56095 WNORMAN2 69 1	38	55841 CANADNS2 69 55924 GOLDSBY2 69 1	0	See Previous	\$ -
04SP	OKGE-OKGE	55237 TIBBENS2 69 55246 BEELINE2 69 1	66	55241 BLUEBEL2 69 55242 BLUEBEL4 138 1	0	OKGE Planned Upgrade for 2008. Possible expediting of in-service date.	N/A
04SP	SWPS-SWPS	51014 OSAGE--3 115 51080 CANYNE3 115 1	99	50993 BUSHLND6 230 51111 DFSMTH6 230 1	78	Rebuild 13 miles of 115 kV circuit with 397 ACSR on T-0-102 structures.	\$ 1,910,000
04SP	AEPW-GRRD	53802 CATOOSA4 138 54438 CATSAGR5 161 1	150	53802 CATOOSA4 138 54438 CATSAGR5 161 2	0	None - GRDA Mitigation Plan	\$ -
04SP	AEPW-GRRD	53802 CATOOSA4 138 54438 CATSAGR5 161 2	150	53802 CATOOSA4 138 54438 CATSAGR5 161 1	0	None - GRDA Mitigation Plan	\$ -
04SP	GRRD-GRRD	54427 COLINS 5 161 54476 COLNSGR2 69 1	50	54427 COLINS 5 161 54476 COLNSGR2 69 2	0	Solution Undetermined	N/A
04SP	AEPW-AEPW	53133 ECNTRTN5 161 53187 GENTRYR5 161 1	353	53139 FLINTCR5 161 53170 TONTITN5 161 1	0	Rebuild 19.16 miles of 2-397.5 ACSR with 2156 ACSR. Replace East Centerton Wavetrap & jumpers	\$ 8,000,000
04SP	AEPW-AEPW	54023 OKMULGE4 138 54049 EC.HEN-4 138 1	105	54017 HENRYET4 138 54057 KELCO 4 138 1	0	See Previous	\$ -
04SP	AEPW-AEPW	54028 WELETK4 138 54049 EC.HEN-4 138 1	105	54023 OKMULGE4 138 54057 KELCO 4 138 1	0	See Previous	\$ -
04SP	AEPW-AEPW	53139 FLINTCR5 161 53187 GENTRYR5 161 1	354	53139 FLINTCR5 161 53170 TONTITN5 161 1	0	Rebuild 1.09 miles of 2-397.5 ACSR with 2156 ACSR. Replace Flint Creek wavetrap & jumpers	\$ 450,000
04SP	AEPW-AEPW	53139 FLINTCR5 161 53170 TONTITN5 161 1	311	53155 CHAMSPR7 345 53756 CLARKSV7 345 1	0	Rebuild 16.3 miles of 2-297 ACSR with 2156 ACSR. Replace Flint Creek wavetrap & jumpers. Replace Flint Creek switch # 1K75	\$ 8,200,000
04SP	OKGE-WFEC	54946 MIDWEST4 138 55917 FRNKLNS4 138 1	186	55869 CROMWEL4 138 56084 WETUMKA4 138 1	0	Replace 800 amp wavetrap with 2000 amp wavetrap at Franklin Switch and 795ACSR jumpers with 1590ACSR, connectors	\$ 24,000
04SP	OKGE-OKGE	54941 HSL 4 138 54973 RENO 4 138 1	287	54941 HSL 4 138 54966 MIDWAY 4 138 1	0	Replace switches & ct's at Horseshoe Lake in 2004 at OKGE expense.	\$ -
04SP	OKGE-OKGE	54852 SLVRLAK4 138 54854 PANTHER4 138 1	286	54873 LONEOAK4 138 54879 NORTWST4 138 1	0	Upgrade completed by OKGE. Rate A/B = 478/478MVA	\$ -
04FA	AEPW-AEPW	53823 T.S.E.-4 138 53841 21STTAP4 138 1	171	53819 ONETA--7 345 53955 N.E.S.-7 345 1	82	In house upgrade scheduled for May 2004. New Summer Rate B = 235MVA. New Other Rate B = 263MVA.	\$ -
04FA	AEPW-AEPW	53783 LLAN ET4 138 53802 CATOOSA4 138 1	234	53758 BA81---4 138 53781 BA101-N4 138 1	0	Incorrect rating in the non-summer cases. Rate A/B = 237/265MVA	\$ -
04FA	AEPW-GRRD	53802 CATOOSA4 138 54438 CATSAGR5 161 1	150	53802 CATOOSA4 138 54438 CATSAGR5 161 2	116	None - GRDA Mitigation Plan	\$ -
04FA	AEPW-GRRD	53802 CATOOSA4 138 54438 CATSAGR5 161 2	150	53802 CATOOSA4 138 54438 CATSAGR5 161 1	112	None - GRDA Mitigation Plan	\$ -
04FA	WERE-WERE	57039 ELPASO 4 138 57046 GILL S 4 138 1	210	57040 EVANS N4 138 57041 EVANS S4 138 1	0	Solution Undetermined	N/A
04FA	WERE-WERE	57368 EXIDE J3 115 57372 PHILIPS3 115 1	196	56872 EMCIPHER6 230 56873 SUMMIT 6 230 1	0	Rebuild and reconductor 0.34 miles with 1192 ACSR.	\$ 95,200
04FA	WERE-WERE	57368 EXIDE J3 115 57381 SUMMIT 3 115 1	196	56872 EMCIPHER6 230 56873 SUMMIT 6 230 1	0	Rebuild and reconductor 4.94 miles with 1192 ACSR.	\$ 1,100,000
04FA	WERE-WERE	57372 PHILIPS3 115 57374 SPHILPJ3 115 1	156	56872 EMCIPHER6 230 56873 SUMMIT 6 230 1	0	Rebuild 0.88 miles and reconductor with 1192.5 ACSR.	\$ 417,200
04FA	WERE-WERE	57374 SPHILPJ3 115 57438 WMCIPHER3 115 1	66	56872 EMCIPHER6 230 56873 SUMMIT 6 230 1	0	See Previous	\$ -
04FA	WERE-WERE	57374 SPHILPJ3 115 57438 WMCIPHER3 115 2	90	56872 EMCIPHER6 230 56873 SUMMIT 6 230 1	0	See Previous	\$ -
04FA	OKGE-OKGE	54852 SLVRLAK4 138 54854 PANTHER4 138 1	286	54873 LONEOAK4 138 54879 NORTWST4 138 1	0	Upgrade completed by OKGE. Rate A/B = 478/478MVA	\$ -
04FA	AEPW-AEPW	53824 SHEFFD-4 138 53827 S.S.--4 138 1	139	53769 WEKIWA-4 138 53835 WED-TAP4 138 1	0	Replace Sand Springs switch 1306, 1307, & 1308	\$ 75,000
04FA	AEPW-AEPW	53827 S.S.--4 138 53835 WED-TAP4 138 1	143	53769 WEKIWA-4 138 53824 SHEFFD-4 138 1	28	Replace Sand Springs switches 1314, 1315, & 1316	\$ 75,000
04WP	AEPW-AEPW	53783 LLAN ET4 138 53802 CATOOSA4 138 1	234	53819 ONETA--7 345 53955 N.E.S.-7 345 1	0	Incorrect rating in the non-summer cases. Rate A/B = 237/265MVA	\$ -
04WP	AEPW-GRRD	53802 CATOOSA4 138 54438 CATSAGR5 161 1	150	53802 CATOOSA4 138 54438 CATSAGR5 161 2	0	None - GRDA Mitigation Plan	\$ -
04WP	AEPW-GRRD	53802 CATOOSA4 138 54438 CATSAGR5 161 2	150	53802 CATOOSA4 138 54438 CATSAGR5 161 1	0	None - GRDA Mitigation Plan	\$ -
04WP	GRRD-GRRD	54427 COLINS 5 161 54476 COLNSGR2 69 1	50	54427 COLINS 5 161 54476 COLNSGR2 69 2	37	Solution Undetermined	N/A
04WP	AEPW-AEPW	54023 OKMULGE4 138 54049 EC.HEN-4 138 1	105	54023 OKMULGE4 138 54057 KELCO 4 138 1	136	See Previous	\$ -
04WP	WERE-WERE	57039 ELPASO 4 138 57046 GILL S 4 138 1	210	57040 EVANS N4 138 57041 EVANS S4 138 1	0	Solution Undetermined	N/A
04WP	SWPA-SWPA	52774 EUFAULA4 138 *B051 EUFAULA1 1 1	105	52752 GORE 5 161 52790 WELEETK5 161 1	0	Replace Eufaula Transformer	\$ 2,000,000
04WP	AEPW-AEPW	53139 FLINTCR5 161 53170 TONTITN5 161 1	334	53133 ECNTRTN5 161 53187 GENTRYR5 161 1	0	See Previous	\$ -

Table 1 - continued – SPP facility overloads identified for the GRDA to ERCOTN transfer

Study Year	From Area - To Area	Branch Over 100% Rate B	Rate B	Outaged Branch Causing Overload	ATC	Solution	Estimated Cost
04WP	WERE-WERE	57372 PHILIPS3 115 57374 SPHILPJ3 115 1	156	56872 EMCIPHER6 230 56873 SUMMIT 6 230 1	0	See Previous	\$ -
04WP	WERE-WERE	57374 SPHILPJ3 115 57438 WMCIPHER3 115 1	66	56872 EMCIPHER6 230 56873 SUMMIT 6 230 1	0	See Previous	\$ -
04WP	WERE-WERE	57374 SPHILPJ3 115 57438 WMCIPHER3 115 2	90	56872 EMCIPHER6 230 56873 SUMMIT 6 230 1	0	See Previous	\$ -
04WP	OKGE-OKGE	54852 SLVRLAK4 138 54854 PANTHER4 138 1	286	54873 LONEOAK4 138 54879 NORTWST4 138 1	0	Upgrade completed by OKGE. Rate A/B = 478/478MVA	\$ -
04WP	AEPW-AEPW	53824 SHEFFD-4 138 53827 S.S.---4 138 1	140	53769 WEKIWA-4 138 53835 WED-TAP4 138 1	198	See Previous	\$ -
09SP	SWPS-SWPS	51014 OSAGE--3 115 51080 CANYNE3 115 1	99	50993 BUSHLND6 230 51111 DFSMTH6 230 1	0	See Previous	\$ -
09SP	AEPW-GRRD	53802 CATOOSA4 138 54438 CATSAGR5 161 1	150	53802 CATOOSA4 138 54438 CATSAGR5 161 2	0	None - GRDA Mitigation Plan	\$ -
09SP	AEPW-GRRD	53802 CATOOSA4 138 54438 CATSAGR5 161 2	150	53802 CATOOSA4 138 54438 CATSAGR5 161 1	0	None - GRDA Mitigation Plan	\$ -
09SP	AEPW-AEPW	53139 FLINTCR5 161 53154 CHAMSPR5 161 1	333	53155 CHAMSPR7 345 53756 CLARKSV7 345 1	0	Rebuild 14.33 Miles with 2156 ACSR and Replace Terminal Equipment	\$ 7,200,000
09SP	OKGE-OKGE	54715 WOODRNG7 345 54901 CIMARON7 345 1	717	54880 NORTWST7 345 54881 SPRNGCK7 345 1	32	OKGE Planned Upgrade November 2003	\$ -
09SP	GRRD-GRRD	54427 COLINS 5 161 54476 COLNSGR2 69 1	50	54427 COLINS 5 161 54476 COLNSGR2 69 2	0	Solution Undetermined	N/A
09SP	GRRD-GRRD	54427 COLINS 5 161 54476 COLNSGR2 69 2	56	54427 COLINS 5 161 54476 COLNSGR2 69 1	0	Solution Undetermined	N/A
09SP	AEPW-AEPW	53133 ECNTRTN5 161 53187 GENTRYR5 161 1	353	52680 BEAVER 5 161 53191 AVOCA--5 161 1	0	See Previous	\$ -
09SP	AEPW-AEPW	53170 TONTITN5 161 53194 ELMSPRR5 161 1	335	53131 DYESS 5 161 53170 TONTITN5 161 1	0	Rebuild 1.6 miles of 2-397 ACSR with 2156 ACSR. Replace Elm Springs Switch and Strain Bus	\$ 1,000,000
09SP	AEPW-AEPW	53139 FLINTCR5 161 53187 GENTRYR5 161 1	350	99797 5HARR-S 161 99811 5HARR-E 161 1	0	See Previous	\$ -
09SP	AEPW-AEPW	53139 FLINTCR5 161 53170 TONTITN5 161 1	307	53133 ECNTRTN5 161 53185 BENTVJ_5 161 1	0	See Previous	\$ -
09SP	OKGE-WFEC	54946 MIDWEST4 138 55917 FRNKLNS4 138 1	185	54948 CEDARLN4 138 54949 SOONRTP4 138 1	0	See Previous	\$ -
09SP	SWPS-SWPS	51082 PALODU 3 115 51302 HAPPY3 115 1	98	51041 AMARLS6 230 51321 SWISHER6 230 1	130	Rebuild 24 miles of 115 kV circuit with 397 ACSR on T-0-102 structures.	\$ 3,130,000
09SP	OKGE-OKGE	54941 HSL 4 138 54966 MIDWAY 4 138 1	286	54941 HSL 4 138 54973 RENO 4 138 1	89	Solution Undetermined	N/A
09SP	OKGE-OKGE	54941 HSL 4 138 54973 RENO 4 138 1	287	54839 BRYANT 4 138 54840 JONESTP4 138 1	0	Replace switches & ct's at Horseshoe Lake in 2004 at OKGE expense.	\$ -
09SP	SWPS-SWPS	51014 OSAGE--3 115 51018 MANHTP3 115 1	158	50915 NICHOL6 230 51041 AMARLS6 230 1	149	Solution Undetermined	N/A
09SP	SWPS-SWPS	51020 RANDALL3 115 51082 PALODU 3 115 1	98	51041 AMARLS6 230 51321 SWISHER6 230 1	0	Rebuild 9 miles of 115 kV circuit with 397 ACSR on T-0-102 structures.	\$ 1,170,000
09WP	SWPA-WFEC	52802 S BROWN4 138 56044 RUSSETT4 138 1	95	52802 S BROWN4 138 55157 BROWN 4 138 1	198	Solution Undetermined	N/A
09WP	AEPW-GRRD	53802 CATOOSA4 138 54438 CATSAGR5 161 1	150	53802 CATOOSA4 138 54438 CATSAGR5 161 2	181	None - GRDA Mitigation Plan	\$ -
09WP	AEPW-GRRD	53802 CATOOSA4 138 54438 CATSAGR5 161 2	150	53802 CATOOSA4 138 54438 CATSAGR5 161 1	178	None - GRDA Mitigation Plan	\$ -
09WP	GRRD-GRRD	54427 COLINS 5 161 54476 COLNSGR2 69 1	50	54427 COLINS 5 161 54476 COLNSGR2 69 2	0	Solution Undetermined	N/A
09WP	AEPW-AEPW	53133 ECNTRTN5 161 53187 GENTRYR5 161 1	367	53139 FLINTCR5 161 53170 TONTITN5 161 1	0	See Previous	\$ -
09WP	SWPA-SWPA	52774 EUFAULA4 138 *B052 EUFAULA1 1 1	105	52752 GORE 5 161 52790 WELEETK5 161 1	66	Replace Eufaula Transformer	\$ 2,000,000
09WP	WERE-WERE	57368 EXIDE J3 115 57381 SUMMIT 3 115 1	195	56872 EMCIPHER6 230 56873 SUMMIT 6 230 1	0	See Previous	\$ -
09WP	AEPW-AEPW	53139 FLINTCR5 161 53187 GENTRYR5 161 1	361	53139 FLINTCR5 161 53170 TONTITN5 161 1	0	See Previous	\$ -
09WP	AEPW-AEPW	53139 FLINTCR5 161 53170 TONTITN5 161 1	331	53154 CHAMSPR5 161 53170 TONTITN5 161 1	0	See Previous	\$ -
09WP	WERE-WERE	57372 PHILIPS3 115 57374 SPHILPJ3 115 1	160	56872 EMCIPHER6 230 56873 SUMMIT 6 230 1	0	See Previous	\$ -
09WP	WERE-WERE	57374 SPHILPJ3 115 57438 WMCIPHER3 115 1	68	56872 EMCIPHER6 230 56873 SUMMIT 6 230 1	0	See Previous	\$ -
09WP	WERE-WERE	57374 SPHILPJ3 115 57438 WMCIPHER3 115 2	92	56872 EMCIPHER6 230 56873 SUMMIT 6 230 1	0	See Previous	\$ -
							\$ 48,109,220