



SPP *Southwest Power Pool*

*System Impact Study
SPP-2003-089-1
For Transmission Service
Requested By
Cargill - Alliant*

From OKGE To ERCOTN

*For a Reserved Amount Of
200 MW From 1/1/2004 To 1/1/2005*

SPP Engineering, Tariff Studies

System Impact Study

Cargill – Alliant has requested a system impact study for Point-to-Point transmission service from OKGE to ERCOTN for 200 MW. The period of the service requested is from 1/1/2004 to 1/1/2005. The OASIS reservation numbers are 495388 and 495389. 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 OKGE 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 OKGE to ERCOTN 200 MW request.

Six seasonal models were used to study the OKGE to ERCOTN 200 MW request for the requested service period. The SPP 2003 Series Cases 2003/04 Winter Peak (03WP), 2004 April Min (04AP), 2004 Spring Peak (04G), 2004 Summer Peak (04SP), 2004 Fall Peak (04FA) and 2004/05 Winter Peak (04WP) were used to study the impact of the 200 MW request on the SPP system during a the requested service period of 1/1/2004 to 1/1/2005. 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 OKGE 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. Evaluation of the right to renew service for future years was not performed. Renewal rights will be evaluated as part of the facility study. 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 OKGE to ERCOTN transfer

Study Year	From Area - To Area	Branch Over 100% Rate B	Rate B	Outaged Branch Causing Overload	ATC	Solution	Estimated Cost
03WP	WFEC-WFEC	55802 ACME 2 69 55916 FRNKLS2 69 1	34	55841 CANADNS2 69 55924 GOLDSBY2 69 1	0	Acme Jct to Acme Sub: Upgrade From 3/0 To 795MCM.	\$ 857,820
03WP	WFEC-WFEC	55802 ACME 2 69 56095 WNORMAN2 69 1	38	55841 CANADNS2 69 55842 CANADNS4 138 1	0	Acme Sub > West Norman: Upgrade from 3/0 to 795 ACSR	\$ 525,000
03WP	WFEC-WFEC	55841 CANADNS2 69 56011 NOBLE 2 69 1	38	56022 PAOLI 2 69 56023 PAOLI 4 138 1	0	WFEC Upgrade In-Service 04WP	\$ -
03WP	WERE-WERE	57152 CIRCLVL3 115 57165 HTI JCT3 115 1	95	56861 EMANHAT6 230 58758 CONCORD6 230 1	0	Solution Undetermined	N/A
03WP	WERE-WERE	57152 CIRCLVL3 115 57331 KING HL3 115 1	90	56861 EMANHAT6 230 58758 CONCORD6 230 1	0	Solution Undetermined	N/A
03WP	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
03WP	WERE-WERE	57217 KELLY 3 115 57331 KING HL3 115 1	88	57982 IATAN 7 345 59199 ST JOE 3 345 1	0	Solution Undetermined	N/A
03WP	WFEC-WFEC	55976 LIL AXE2 69 56011 NOBLE 2 69 1	26	56022 PAOLI 2 69 56023 PAOLI 4 138 1	0	WFEC Upgrade In-Service 04WP	\$ -
03WP	SWPA-SWPA	52648 NORFORK5 161 52650 NORFORK2 69 1	25	52648 NORFORK5 161 52650 NORFORK2 69 2	0	Replace Norfolk Transformer	\$ 1,300,000
03WP	WERE-WERE	57372 PHILIPS3 115 57374 SPHILPJ3 115 1	159	56872 EMCIPHER6 230 56873 SUMMIT 6 230 1	0	Rebuild 0.88 miles and reconductor with 1192.5 ACSR.	\$ 417,200
03WP	WERE-WERE	57374 SPHILPJ3 115 57438 WMCPHER3 115 1	67	56872 EMCIPHER6 230 56873 SUMMIT 6 230 1	0	Tear down double circuit, build single circuit with 1192.5 ACSR.	\$ 7,800,000
03WP	WFEC-WFEC	56022 PAOLI 2 69 56023 PAOLI 4 138 1	42	55841 CANADNS2 69 56011 NOBLE 2 69 1	0	WFEC Upgrade In-Service 04WP	\$ -
03WP	WERE-WERE	57342 WJCCTY 3 115 57343 WJCCTYE3 115 1	140	56773 SUMMIT 7 345 *B166 SUMMIT1X 1 1	0	May be relieved due to WERE Operating Directive 617, Outage of Summit 345/230/14.4KV Transformer	\$ -
04AP	WFEC-WFEC	55802 ACME 2 69 55916 FRNKLS2 69 1	34	55841 CANADNS2 69 55924 GOLDSBY2 69 1	0	See Previous	\$ -
04AP	WFEC-WFEC	55802 ACME 2 69 56095 WNORMAN2 69 1	38	55841 CANADNS2 69 55842 CANADNS4 138 1	0	See Previous	\$ -
04G	WFEC-WFEC	55802 ACME 2 69 55916 FRNKLS2 69 1	34	55841 CANADNS2 69 55924 GOLDSBY2 69 1	0	See Previous	\$ -
04G	WERE-WERE	57151 AUBURN 3 115 57167 KEENE 3 115 1	68	56852 JEC 6 230 56861 EMANHAT6 230 1	0	May be relieved due to WERE Operating Directive 900, Outage of East Manhattan - Jeffrey Energy Center 230KV	\$ -
04G	WERE-WERE	57786 CHISLM2 69 57832 RIPLEYM2 69 1	128	57040 EVANS N4 138 57041 EVANS S4 138 1	0	Solution Undetermined	N/A
04G	WERE-WERE	57412 ARKVALJ3 115 57413 CIRCLE 3 115 1	68	57413 CIRCLE 3 115 57415 DAVIS 3 115 1	0	May be relieved due to WERE Operating Directive 1205, Outage of Circle - Davis 115KV	\$ -
04G	WERE-WERE	57152 CIRCLVL3 115 57165 HTI JCT3 115 1	95	56765 HOYT 7 345 56772 STRANGR7 345 1	0	May be relieved due to WERE Operating Directive 803, Outage of Hoyt - Stranger Creek 345KV	\$ -
04G	WERE-WERE	57152 CIRCLVL3 115 57331 KING HL3 115 1	90	56765 HOYT 7 345 56772 STRANGR7 345 1	0	May be relieved due to WERE Operating Directive 803, Outage of Hoyt - Stranger Creek 345KV	\$ -
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	WERE-WERE	57217 KELLY 3 115 57331 KING HL3 115 1	89	56765 HOYT 7 345 56772 STRANGR7 345 1	0	May be relieved due to WERE Operating Directive 803, Outage of Hoyt - Stranger Creek 345KV	\$ -
04SP	WERE-WERE	57182 TECHILE3 115 57187 27CROCO3 115 1	67	56851 AUBURN 6 230 *B016 AUBRN77X 1 1	0	May be relieved due to WERE Operating Directive 618, Outage of Auburn Road 230/115/13.8KV Transformer	\$ -
04SP	WERE-WERE	57412 ARKVALJ3 115 57435 3 VANBU3 115 1	68	57413 CIRCLE 3 115 57415 DAVIS 3 115 1	0	May be relieved due to WERE Operating Directive 1205, Outage of Circle - Davis 115KV	\$ -
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	55177 PARKLN 2 69 55187 AHLOSTP2 69 1	72	55177 PARKLN 2 69 55182 VALLYVU2 69 1	0	Solution Undetermined	N/A
04SP	WERE-WERE	56851 AUBURN 6 230 *B016 AUBRN77X 1 1	304	56852 JEC 6 230 56861 EMANHAT6 230 1	0	May be relieved due to WERE Operating Directive 900, Outage of East Manhattan - Jeffrey Energy Center 230KV	\$ -
04SP	AEPW-AEPW	53249 BANN 2 69 53269 KINGHWY2 69 1	72	53249 BANN 2 69 53312 REDLICK2 69 1	0	Replace switch 8965 @ Kings Highway	\$ 60,000
04SP	AEPW-AEPW	53515 BIGSNDY2 69 53589 PERDUE 2 69 1	85	53590 PERDUE 4 138 53666 LHAWKIN4 138 1	0	Rebuild 5.4 miles of 477 ACSR with 1272 ACSR.	\$ 2,200,200
04SP	SWPS-SWPS	51014 OSAGE--3 115 51080 CANYNE3 115 1	99	50993 BUSHLND6 230 51111 DFSMTH6 230 1	165	Rebuild 13 miles of 115 kV circuit with 397 ACSR on T-0-102 structures.	\$ 1,910,000
04SP	AEPW-AEPW	53154 CHAMSPR5 161 53170 TONTITN5 161 1	247	53154 CHAMSPR5 161 53195 FARMGNTN5 161 1	0	Rebuild 12 miles with 2156MCM ACSR. Replace Chamber Springs wavetrap & reset relays.	\$ 7,200,000
04SP	WERE-WERE	57786 CHISLM2 69 57832 RIPLEYM2 69 1	128	57012 HALSTDS4 138 57065 SG12COL4 138 1	0	Solution Undetermined	N/A
04SP	WERE-WERE	57786 CHISLM2 69 57832 RIPLEYM2 69 1	128	57040 EVANS N4 138 57065 SG12COL4 138 1	0	Solution Undetermined	N/A
04SP	WERE-WERE	57412 ARKVALJ3 115 57413 CIRCLE 3 115 1	68	57413 CIRCLE 3 115 57415 DAVIS 3 115 1	0	May be relieved due to WERE Operating Directive 1205, Outage of Circle - Davis 115KV	\$ -
04SP	OKGE-OKGE	54933 DRAPER 4 138 54934 DRAPER 7 345 1	490	54933 DRAPER 4 138 54934 DRAPER 7 345 2	0	Add third 345 - 138 kV transformer at Draper in 2008 at OKGE expense and use the operating directive until 2008.	\$ -
04SP	OKGE-OKGE	54933 DRAPER 4 138 54934 DRAPER 7 345 2	490	54933 DRAPER 4 138 54934 DRAPER 7 345 1	0	Add third 345 - 138 kV transformer at Draper in 2008 at OKGE expense and use the operating directive until 2008.	\$ -

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

Study Year	From Area - To Area	Branch Over 100% Rate B	Rate B	Outaged Branch Causing Overload	ATC	Solution	Estimated Cost
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 Wavetraps & jumpers	\$ 8,000,000
04SP	SWPS-SWPS	50955 EASTPL2 69 50956 EASTPL3 115 1	46	50983 WTRFLT2 69 51001 COULTER2 69 1	0	Solution Undetermined	N/A
04SP	SWPS-SWPS	50955 EASTPL2 69 50956 EASTPL3 115 2	46	50983 WTRFLT2 69 51001 COULTER2 69 1	0	Solution Undetermined	N/A
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 wavetraps & jumpers	\$ 450,000
04SP	AEPW-AEPW	53139 FLINTCR5 161 53170 TONTITN5 161 1	311	53155 CHAMSPR7 345 53756 CLARKSV7 345 1	0	May have multiple upgrades required.	\$ -
04SP	OKGE-WFEC	54946 MIDWEST4 138 55917 FRNKLSN4 138 1	187	55814 ANADARK4 138 56031 POCASET4 138 1	0	Replace 800 amp wavetraps with 2000 amp wavetraps at Franklin Switch and 795ACSR jumpers with 1590ACSR, connectors	\$ 24,000
04SP	WERE-WERE	57733 GATZ 2 69 57735 GOLDPLJ2 69 1	32	57736 HALSTED2 69 57744 MUDCRKJ2 69 1	0	None - Local area problem within Newton division	\$ -
04SP	WERE-WERE	57735 GOLDPLJ2 69 57737 HESSTON2 69 1	32	57736 HALSTED2 69 57744 MUDCRKJ2 69 1	0	None - Local area problem within Newton division	\$ -
04SP	WERE-WERE	57012 HALSTDS4 138 *B077 HALSTD1X 1 1	55	57011 HALSTDN4 138 57012 HALSTDS4 138 1	0	Solution Undetermined	N/A
04SP	MIPU-MIPU	59295 HSNVL 2 69 59296 HSNVLSW2 69 1	52	59225 PHILL 5 161 59280 PHILL 2 69 1	0	Solution Undetermined	N/A
04SP	SWPS-SWPS	50949 HASTNGS2 69 50961 VB1TAP2 69 1	59	51001 COULTER2 69 51002 COULTER3 115 1	0	Solution Undetermined	N/A
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	AEPW-AEPW	53571 MARSHL-4 138 53623 MARAUTO2 69 1	107	53571 MARSHL-4 138 53623 MARAUTO2 69 2	0	See Previous	\$ -
04SP	AEPW-AEPW	53571 MARSHL-4 138 53623 MARAUTO2 69 2	107	53571 MARSHL-4 138 53623 MARAUTO2 69 1	0	Replace 755 ACAR Strain Bus. Replace 1033 AAC Jumpers.	\$ 40,000
04SP	OKGE-OKGE	55221 MUSKOGEE2 69 55222 MUSKOGEE5 161 1	41	55221 MUSKOGEE2 69 55222 MUSKOGEE5 161 3	0	Replace the existing 2- 41MVA 161/69 kV transformers with 1-100MVA in approximately 2005 at OKGE expense.	\$ -
04SP	OKGE-OKGE	55221 MUSKOGEE2 69 55222 MUSKOGEE5 161 2	41	55221 MUSKOGEE2 69 55222 MUSKOGEE5 161 3	0	Replace the existing 2- 41MVA 161/69 kV transformers with 1-100MVA in approximately 2005 at OKGE expense.	\$ -
04SP	AEPW-AEPW	53583 NWHENDR2 69 53595 POYNTER2 69 1	72	53530 EVENSID2 69 53583 NWHENDR2 69 1	0	Rebuild 3.22 miles of 397 ACSR with 1272 ACSR. Replace riser jumpers @ NW Henderson. Replace breaker & switches @ Poynter	\$ 1,500,000
04SP	SWPS-SWPS	50937 NORTHW2 69 50938 NORTHW3 115 1	45	50955 EASTPL2 69 50961 VB1TAP2 69 1	0	Solution Undetermined	N/A
04SP	WFEC-WFEC	56022 PAOLI 2 69 56023 PAOLI 4 138 1	42	55841 CANADNS2 69 56011 NOBLE 2 69 1	58	WFEC Upgrade In-Service 04WP	\$ -
04FA	WERE-WERE	57151 AUBURN 3 115 57167 KEENE 3 115 1	68	56852 JEC 6 230 56861 EMANHAT6 230 1	0	May be relieved due to WERE Operating Directive 900, Outage of East Manhattan - Jeffrey Energy Center 230KV	\$ -
04FA	WERE-WERE	57786 CHISHLM2 69 57832 RIPLEYM2 69 1	128	57040 EVANS N4 138 57041 EVANS S4 138 1	0	Solution Undetermined	N/A
04FA	WERE-WERE	57412 ARKVALJ3 115 57413 CIRCLE 3 115 1	68	57413 CIRCLE 3 115 57415 DAVIS 3 115 1	0	May be relieved due to WERE Operating Directive 1205, Outage of Circle - Davis 115KV	\$ -
04FA	WERE-WERE	57152 CIRCLVL3 115 57165 HTI JCT3 115 1	95	56765 HOYT 7 345 56772 STRANGR7 345 1	0	May be relieved due to WERE Operating Directive 803, Outage of Hoyt - Stranger Creek 345KV	\$ -
04FA	WERE-WERE	57152 CIRCLVL3 115 57331 KING HL3 115 1	90	56765 HOYT 7 345 56772 STRANGR7 345 1	0	May be relieved due to WERE Operating Directive 803, Outage of Hoyt - Stranger Creek 345KV	\$ -
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	57217 KELLY 3 115 57331 KING HL3 115 1	89	56765 HOYT 7 345 56772 STRANGR7 345 1	0	May be relieved due to WERE Operating Directive 803, Outage of Hoyt - Stranger Creek 345KV	\$ -
04FA	SWPS-SWPS	50937 NORTHW2 69 50938 NORTHW3 115 1	45	50955 EASTPL2 69 50961 VB1TAP2 69 1	157	Solution Undetermined	N/A
04FA	WERE-WERE	57342 WJCCTY 3 115 57343 WJCCTYE3 115 1	141	56773 SUMMIT 7 345 *B168 SUMMIT1X 1 1	0	May be relieved due to WERE Operating Directive 617, Outage of Summit 345/230/14.4KV Transformer	\$ -
04WP	WERE-WERE	57152 CIRCLVL3 115 57165 HTI JCT3 115 1	95	56861 EMANHAT6 230 56758 CONCORD6 230 1	0	Solution Undetermined	N/A
04WP	WERE-WERE	57152 CIRCLVL3 115 57331 KING HL3 115 1	90	56861 EMANHAT6 230 56758 CONCORD6 230 1	0	Solution Undetermined	N/A
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	WERE-WERE	57217 KELLY 3 115 57331 KING HL3 115 1	88	56765 HOYT 7 345 56772 STRANGR7 345 1	0	May be relieved due to WERE Operating Directive 803, Outage of Hoyt - Stranger Creek 345KV	\$ -
04WP	WFEC-WFEC	55976 LIL AXE2 69 56011 NOBLE 2 69 1	26	56022 PAOLI 2 69 56023 PAOLI 4 138 1	0	WFEC Upgrade In-Service 04WP	\$ -
04WP	SWPA-SWPA	52648 NORFORK5 161 52650 NORFORK2 69 1	25	52648 NORFORK5 161 52650 NORFORK2 69 2	0	See Previous	\$ -
04WP	WFEC-WFEC	56022 PAOLI 2 69 56023 PAOLI 4 138 1	42	55841 CANADNS2 69 56011 NOBLE 2 69 1	96	WFEC Upgrade In-Service 04WP	\$ -
Total Estimated Cost							\$ 32,284,220