



SPP *Southwest Power Pool*

*System Impact Study
SPP-2003-082-1
For Transmission Service
Requested By
Cargill - Alliant*

From WR 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 WR 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 495368 and 495370. 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 WR 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 WR to ERCOTN 200 MW request.

Seven seasonal models were used to study the WR 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 WR 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 WR 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	54	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	WERE-WERE	57623 ATHENS 2 69 57631 CC4VERN2 69 1	43	56791 BENTON 7 345 56797 WOLFCRK7 345 1	0	Westar Transmission Operating Directive 1304, Overload of the Athens to Wolf Creek 69 kV Line	\$ -
04G	WERE-WERE	57151 AUBURN 3 115 57179 S GAGEW3 115 1	75	56765 HOYT 7 345 56766 JEC N 7 345 1	0	May be relieved due to WERE Operating Directive 400, Outage of Hoyt - Jeffery Energy Center 345KV	\$ -
04G	WERE-WERE	56851 AUBURN 6 230 *B016 AUBRN77X 1 1	306	56765 HOYT 7 345 56766 JEC N 7 345 1	125	May be relieved due to WERE Operating Directive 400, Outage of Hoyt - Jeffery Energy Center 345KV	\$ -
04G	WERE-WERE	57152 CIRCLVL3 115 57165 HTI JCT3 115 1	95	56765 HOYT 7 345 56772 STRANGR7 345 1	52	May be relieved due to WERE Operating Directive 803, Outage of Hoyt - Stranger Creek 345KV	\$ -
04G	WERE-WERE	57631 CC4VERN2 69 57636 GREEN 2 69 1	43	56791 BENTON 7 345 56797 WOLFCRK7 345 1	0	Westar Transmission Operating Directive 1304, Overload of the Athens to Wolf Creek 69 kV Line	\$ -
04G	WERE-WERE	57631 CC4VERN2 69 57636 GREEN 2 69 1	43	56794 ROSEHIL7 345 56797 WOLFCRK7 345 1	0	Westar Transmission Operating Directive 1304, Overload of the Athens to Wolf Creek 69 kV Line	\$ -
04G	AEPW-AEPW	54023 OKMULGE4 138 54049 EC.HEN-4 138 1	104	54023 OKMULGE4 138 54057 KELCO 4 138 1	152	Replace Okmulgee Wavetrap	\$ 40,000
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
04SP	WFEC-WFEC	55802 ACME 2 69 56095 WNORMAN2 69 1	38	55841 CANADNS2 69 55842 CANADNS4 138 1	0	See Previous	\$ -
04SP	WERE-WERE	56851 AUBURN 6 230 *B016 AUBRN77X 1 1	304	56765 HOYT 7 345 56766 JEC N 7 345 1	0	May be relieved due to WERE Operating Directive 400, Outage of Hoyt - Jeffery Energy Center 345KV	\$ -
04SP	SWPS-SWPS	51014 OSAGE--3 115 51080 CANYNE3 115 1	99	50993 BUSHLND6 230 51111 DFSMTH6 230 1	67	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	WERE-WERE	57413 CIRCLE 3 115 57421 HEC GT 3 115 1	152	57513 HEC 2 69 57514 HEC GT 2 69 1	196	May be relieved due to WERE Operating Directive 1306, Outage of Hutchinson Energy Center - Hutchinson Gas Turbine Station 69KV	\$ -
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	Replace Weleetka Wavetrap	\$ 40,000
04SP	AEPW-AEPW	53139 FLINTCR5 161 53170 TONTITN5 161 1	311	53139 FLINTCR5 161 53154 CHAMSPR5 161 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	55300 FTSMITH5 161 55305 FTSMITH8 500 1	475	55300 FTSMITH5 161 55302 FTSMITH7 345 1	0	Convert Ft. Smith 161kv to 1-1/2 breaker design and install 2nd 500-161kV transformer bank.	\$ 7,000,000
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	WERE-WERE	57513 HEC 2 69 57514 HEC GT 2 69 1	134	57413 CIRCLE 3 115 57421 HEC GT 3 115 1	129	May be relieved due to WERE Operating Directive 1204, Outage of Circle - Hutchinson Gas Turbine Station 115KV	\$ -
04SP	WERE-WERE	57250 LWRNCHL3 115 *B101 LAWHL29X 1 1	302	56853 LAWHILL6 230 56855 MIDLAND6 230 1	0	May be relieved due to WERE Operating Directive 901, Outage of Lawrence Hill - Midland Junction 230KV	\$ -
04SP	SWPS-SWPS	51020 RANDALL3 115 51082 PALODU 3 115 1	99	51041 AMARLS6 230 51321 SWISHER6 230 1	192	Rebuild 9 miles of 115 kV circuit with 397 ACSR on T-0-102 structures.	\$ 1,170,000
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	\$ -
04SP	WERE-WERE	57604 WEAVER 2 69 57837 RH JCT 2 69 1	43	57039 ELPASO 4 138 57042 FARBEN 4 138 1	0	Move Rose Hill Jct. 69 kV load to Rose Hill 345/138 kV substation. Requires new transformer bay and a new 25 MVA 138-12 kV transformer.	\$ 1,400,000

Table 1 - continued – SPP facility overloads identified for the WR 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	53849 TERNITP4 138 53869 VERDIGS4 138 1	149	53857 OWASSOS4 138 53945 N.E.S.-4 138 1	0	Solution Undetermined	N/A
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	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	OKGE-OKGE	54852 SLVRLAK4 138 54854 PANTHER4 138 1	286	54873 LONEOAK4 138 54879 NORTHWT4 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	60	Replace Sand Springs switches 1314, 1315, & 1316	\$ 75,000
04WP	WERE-WERE	56851 AUBURN 6 230 *B014 AUBRN77X 1 1	306	56765 HOYT 7 345 56766 JEC N 7 345 1	83	May be relieved due to WERE Operating Directive 400, Outage of Hoyt - Jeffery Energy Center 345KV	\$ -
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	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	\$ -
04WP	WERE-WERE	57152 CIRCLVL3 115 57331 KING HL3 115 1	90	56765 HOYT 7 345 56772 STRANGR7 345 1	176	May be relieved due to WERE Operating Directive 803, Outage of Hoyt - Stranger Creek 345KV	\$ -
04WP	SWPA-SWPA	52774 EUFAULA4 138 *B051 EUFAULA1 1 1	105	52752 GORE 5 161 52790 WELEETK5 161 1	0	See Previous	\$ -
04WP	OKGE-OKGE	54852 SLVRLAK4 138 54854 PANTHER4 138 1	286	54873 LONEOAK4 138 54879 NORTHWT4 138 1	0	Upgrade completed by OKGE. Rate A/B = 478/478MVA	\$ -
09SP	WERE-WERE	56851 AUBURN 6 230 *B015 AUBRN77X 1 1	304	56765 HOYT 7 345 56766 JEC N 7 345 1	0	May be relieved due to WERE Operating Directive 400, Outage of Hoyt - Jeffery Energy Center 345KV	\$ -
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	WERE-WERE	57588 CHASE 2 69 57605 WHITE J2 69 1	42	57604 WEAVER 2 69 *B188 WEAVER2X 1 1	0	May be relieved due to WERE Operating Directive 634, Outage of Weaver 138/69/13.2KV Transformer	\$ -
09SP	OKGE-OKGE	54715 WOODRNG7 345 54901 CIMARON7 345 1	717	54880 NORTHWT7 345 54881 SPRNGCK7 345 1	17	OKGE Planned Upgrade November 2003	\$ -
09SP	KACP-KACP	57978 CRAIG 5 161 58048 COLLEGE5 161 1	330	58033 BRKRIDG5 161 58047 OVERLPK5 161 1	0	Reconductor 4 miles with 1192.5 ACSS, 558 normal/emergency rating and upgrade breaker.	\$ 700,000
09SP	OKGE-WFEC	54946 MIDWEST4 138 55917 FRNKLNS4 138 1	185	54948 CEDARLN4 138 54949 SOONRTP4 138 1	0	See Previous	\$ -
09SP	OKGE-OKGE	55300 FTSMITH5 161 55302 FTSMITH7 345 1	489	55300 FTSMITH5 161 55305 FTSMITH8 500 1	64	See Previous	\$ -
09SP	OKGE-OKGE	55300 FTSMITH5 161 55305 FTSMITH8 500 1	474	55300 FTSMITH5 161 55302 FTSMITH7 345 1	0	See Previous	\$ -
09SP	WERE-WERE	57796 GILL W 2 69 57830 PECK 2 69 1	35	57039 ELPASO 4 138 57042 FARBER 4 138 1	0	Repole 10.1 miles and keep existing conductor.	\$ 3,100,000
09SP	WERE-WERE	57796 GILL W 2 69 *B058 GEC3 GSU 1 1	136	57045 GILL W 4 138 57046 GILL S 4 138 1	147	Solution Undetermined	N/A
09SP	SWPS-SWPS	51082 PALODU 3 115 51302 HAPPY3 115 1	98	51041 AMARLS6 230 51321 SWISHER6 230 1	111	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	154	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.	\$ -

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

Study Year	From Area - To Area	Branch Over 100% Rate B	Rate B	Outaged Branch Causing Overload	ATC	Solution	Estimated Cost
09SP	WERE-WERE	57419 HEC 3 115 *B081 HEC 122X 1 1	123	57413 CIRCLE 3 115 57421 HEC GT 3 115 1	118	May be relieved due to WERE Operating Directive 1204, Outage of Circle - Hutchinson Gas Turbine Station 115KV	\$ -
09SP	WERE-WERE	57808 HYDRJN2 69 57813 MACARTH2 69 1	63	57784 CANAL 2 69 57838 RUTAN 2 69 1	177	Rebuild 2.21-mile line	\$ 1,396,000
09SP	WERE-WERE	57808 HYDRJN2 69 57824 OAKLAWN2 69 1	63	57784 CANAL 2 69 57838 RUTAN 2 69 1	184	Rebuild 1.39-mile line	\$ 836,000
09SP	WERE-WERE	57250 LWRNCHL3 115 57280 WREN 3 115 1	139	57234 BISMAR3 115 57236 COOP 3 115 1	0	May be relieved due to WERE Operating Directive 1210, Outage of Bismark Jct Swi Sta - Farmer's Consumer CO-OP 115KV	\$ -
09SP	WERE-WERE	57250 LWRNCHL3 115 *B101 LAWHL29X 1 1	302	56853 LAWHILL6 230 56855 MIDLAND6 230 1	0	May be relieved due to WERE Operating Directive 901, Outage of Lawrence Hill - Midland Junction 230KV	\$ -
09SP	SWPS-SWPS	51014 OSAGE--3 115 51018 MANHTP3 115 1	158	50915 NICHOL6 230 51041 AMARLS6 230 1	129	Solution Undetermined	N/A
09SP	SWPS-SWPS	51020 RANDALL3 115 51082 PALODU 3 115 1	98	51041 AMARLS6 230 51321 SWISHER6 230 1	0	See Previous	\$ -
09SP	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	\$ -
09SP	WERE-WERE	57550 RICHLAN2 69 57837 RH JCT 2 69 1	43	57039 ELPASO 4 138 57042 FARBER 4 138 1	180	Solution Undetermined	N/A
09SP	WERE-WERE	57604 WEAVER 2 69 57837 RH JCT 2 69 1	43	57039 ELPASO 4 138 57042 FARBER 4 138 1	151	See Previous	\$ -
09SP	MIDW-WEPL	56565 SEWARD 2 69 58792 SEWARD 3 115 1	44	56601 HEIZER 3 115 58779 MULGREN6 230 1	0	Solution Undetermined	N/A
09SP	AEPW-AEPW	53849 TERNITP4 138 53869 VERDIGS4 138 1	150	53857 OWASSOS4 138 53945 N.E.S.-4 138 1	0	Solution Undetermined	N/A
09SP	WERE-WERE	57438 WMCPHER3 115 57439 WHEATLD3 115 1	70	57413 CIRCLE 3 115 57432 RICE 3 115 1	0	Solution Undetermined	N/A
09WP	WERE-WERE	57623 ATHENS 2 69 57631 CC4VERN2 69 1	43	56791 BENTON 7 345 56797 WOLFCRK7 345 1	5	Westar Transmission Operating Directive 1304, Overload of the Athens to Wolf Creek 69 kV Line	\$ -
09WP	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	\$ -
09WP	WERE-WERE	57152 CIRCLVL3 115 57331 KING HL3 115 1	90	56765 HOYT 7 345 56772 STRANGR7 345 1	109	May be relieved due to WERE Operating Directive 803, Outage of Hoyt - Stranger Creek 345KV	\$ -
09WP	WERE-WERE	57631 CC4VERN2 69 57636 GREEN 2 69 1	43	56791 BENTON 7 345 56797 WOLFCRK7 345 1	0	Westar Transmission Operating Directive 1304, Overload of the Athens to Wolf Creek 69 kV Line	\$ -
09WP	SWPA-SWPA	52774 EUFAULA4 138 *B052 EUFAULA1 1 1	105	52752 GORE 5 161 52790 WELEETK5 161 1	119	See Previous	\$ -
09WP	AEPW-AEPW	53139 FLINTCR5 161 53170 TONTITN5 161 1	331	53139 FLINTCR5 161 53154 CHAMSPR5 161 1	134	See Previous	\$ -
09WP	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	\$ -
Total Estimated Cost							\$ 32,478,820