



# **SPP** *Southwest Power Pool*

*System Impact Study  
SPP-2003-077-1  
For Transmission Service  
Requested By  
Cargill - Alliant*

*From BLKW To ERCOTN*

*For a Reserved Amount Of  
100MW From 1/1/2004 To 1/1/2005*

*SPP Engineering, Tariff Studies*

## **System Impact Study**

Cargill - Alliant has requested a system impact study for long-term Firm Point-to-Point transmission service from BLKW to ERCOTN for 100 MW. The period of the service requested is from 1/1/2004 to 1/1/2005. The OASIS reservation numbers are 495355 and 495356. 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 BLKW to ERCOTN request was studied using two System Scenarios to determine the potential facility upgrades required. The results of the transfer analyses are documented in Tables 1 and 2 of the report. Table 1 summarizes the results of the Scenario 1 system impact analysis. Table 2 summarizes the results of the Scenario 2 system impact analysis. The results of this study gives the customer an estimated cost of the facility upgrades that may be required in order to accommodate the BLKW to ERCOTN 100 MW request.

Six seasonal models were used to study the BLKW to ERCOTN 50 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 100 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. From the six seasonal models, two system scenarios were developed. Scenario 1 includes confirmed West to East transfers not already included in the January 2003 base case series models, SPS Exporting, and the Lamar HVDC Tie flowing from SPS to Lamar. Scenario 2 includes confirmed East to West transfers not already included in the January 2003 base case series models, SPS Importing, and the Lamar HVDC Tie flowing from Lamar to SPS. The Lamar HVDC Tie is modeled starting in the 04WP based on a 12/1/2004 in service date.

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

The study results of the BLKW to ERCOTN 100 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 unknown facility upgrades and proposed transmission plans that will be identified during the facility study process and the final results of the full thermal and voltage AC analysis. Evaluation of rollover rights for future years was not performed. Rollover 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 BLKW to ERCOTN transfer using System Scenario 1

Study Year	From Area - To Area	Branch Over 100% Rate B	Rate B	Pre Transfer Loading	TDF %	Outaged Branch Causing Overload	ATC	Solution	Estimated Cost
03WP	WERE-WERE	57151 AUBURN 3 115 57179 S GAGEW3 115 1	75	82	0.2	56765 HOYT 7 345 56766 JEC N 7 345 1	0	May be relieved due to WERE Operating Guide 400 - Outage of Hoyt to Jeffery Energy Center 345kV	\$ -
04G	WERE-WERE	57151 AUBURN 3 115 57179 S GAGEW3 115 1	75	87	0.2	56765 HOYT 7 345 56766 JEC N 7 345 1	0	May be relieved due to WERE Operating Guide 400 - Outage of Hoyt to Jeffery Energy Center 345kV	\$ -
04G	WERE-WERE	57151 AUBURN 3 115 57179 S GAGEW3 115 2	97	102	0.2	56765 HOYT 7 345 56766 JEC N 7 345 1	0	May be relieved due to WERE Operating Guide 400 - Outage of Hoyt to Jeffery Energy Center 345kV	\$ -
04G	WERE-WERE	56851 AUBURN 6 230 *B016 AUBRN77X 1 1	306	327	0.1	56765 HOYT 7 345 56766 JEC N 7 345 1	0	May be relieved due to WERE Operating Guide 400 - Outage of Hoyt to Jeffery Energy Center 345kV	\$ -
04G	WERE-WERE	57631 CC4VERN2 69 57636 GREEN 2 69 1	43	43	0.1	56791 BENTON 7 345 56797 WOLFCKR7 345 1	23	May be relieved due to WERE Operating Guide 300 - Outage of Benton - Wolf Creek 345kV	\$ -
04G	AEPW-AEPW	54023 OKMULGE4 138 54049 EC.HEN-4 138 1	103	112	0.4	54023 OKMULGE4 138 54057 KELCO 4 138 1	0	Replace Okmulgee Wavetrap	\$ 40,000
04G	AEPW-AEPW	54028 WELETK4 138 54049 EC.HEN-4 138 1	103	108	0.4	54023 OKMULGE4 138 54057 KELCO 4 138 1	0	Replace Weleetka Wavetrap	\$ 40,000
04G	WERE-WERE	57735 GOLDPLJ2 69 57737 HESSTON2 69 1	32	32	0.2	57736 HALSTED2 69 57744 MUDCRKJ2 69 1	15	None - Local area problem within Newton division	\$ -
04SP	WERE-WERE	56851 AUBURN 6 230 *B016 AUBRN77X 1 1	304	373	0.2	56765 HOYT 7 345 56766 JEC N 7 345 1	0	May be relieved due to WERE Operating Guide 400 - Outage of Hoyt to Jeffery Energy Center 345kV	\$ -
04SP	OKGE-OKGE	55237 TIBBENS2 69 55246 BEELINE2 69 1	66	67	0.1	55241 BLUEBEL2 69 55242 BLUEBEL4 138 1	0	Possible Expediting of OKGE Planned Upgrade	N/A
04SP	WFEC-WFEC	55846 CARTERJ2 69 55876 DILL JT2 69 1	24	26	0.6	56027 PINERDG2 69 56088 WASHITA2 69 1	0	Current WFEC Work Plan to Reconductor from 4/0 to 795 - Complete by 2004 Winter	-
04SP	WERE-WERE	57588 CHASE 2 69 57605 WHITE J2 69 1	43	46	0.1	56991 WEAVER 4 138 *B183 WEAVER2X 1 1	0	May be relieved due to WERE Operating Guide 634 - Outage of Weaver 138/69kV Transformer	\$ -
04SP	WERE-WERE	57153 COLINE 3 115 *B034 COLINE5X 1 1	66	73	0.1	56765 HOYT 7 345 56772 STRANGR7 345 1	0	May be relieved due to WERE Operating Guide 803 - Outage of Hoyt to Stranger 345kV	\$ -
04SP	AEPW-WFEC	54122 ELKCTY-2 69 55897 ELKCITY2 69 1	38	38	0.6	56027 PINERDG2 69 56088 WASHITA2 69 1	53	EIK(AEPW)>Elk WFEC: Upgrade 4/0 to 795 ACSR	\$ 414,000
04SP	AEPW-AEPW	53139 FLINTCR5 161 53170 TONTITN5 161 1	311	415	0.1	53139 FLINTCR5 161 53187 GENTRYR5 161 1	0	Rebuild 16.3 miles of 2-297 ACSR with 2156 ACSR. Replace Flint Creek wavetrap & jumpers, switch # 1K75	\$ 8,200,000
04SP	WERE-WERE	57795 GILL E 2 69 57813 MACARTH2 69 1	68	71	0.1	57795 GILL E 2 69 57825 OATVILL2 69 1	0	Replace substation bus and jumpers at MacArthur 69 kV.	\$ 22,000
04SP	WERE-WERE	57795 GILL E 2 69 57825 OATVILL2 69 1	71	80	0.1	57795 GILL E 2 69 57813 MACARTH2 69 1	0	Replace disconnect switches at Gill 69 kV (use 800 A.), Replace line switch at Oatville 69 kV (use 800 A.).	\$ 45,000
04SP	OKGE-OKGE	54941 HSL 4 138 54973 RENO 4 138 1	287	296	0.1	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	56853 LAWHILL6 230 *B101 LAWHL29X 1 1	298	339	0.1	56853 LAWHILL6 230 56855 MIDLAND6 230 1	0	May be relieved due to WERE Operating Guide 901 - Outage of Lawrence Hill - Midland Junction 230kV	\$ -
04SP	WERE-WERE	56855 MIDLAND6 230 *B114 MIDJ126X 1 1	308	311	0.1	57250 LWRNCHL3 115 *B101 LAWHL29X 1 1	0	May be relieved due to WERE Operating Guide 631 - Outage of Lawrence Hill 230/115kV Transformer	\$ -
04SP	WERE-WERE	57182 TECHILE3 115 57270 STULL T3 115 1	92	94	0.4	56765 HOYT 7 345 56772 STRANGR7 345 1	0	May be relieved due to WERE Operating Guide 803 - Outage of Hoyt to Stranger 345kV	\$ -
04WP	AEPW-AEPW	54023 OKMULGE4 138 54049 EC.HEN-4 138 1	104	108	0.8	54023 OKMULGE4 138 54057 KELCO 4 138 1	0	See Previous	\$ -
04WP	AEPW-AEPW	54121 ELKCTY-4 138 54153 ELKCITY6 230 1	261	241	32.8	Multiple Outage Contingency 54119 O.K.U.-7 345 to 51534 TUCO7 345 CKT 1 51534 TUCO7 345 to 51533 TUCO6 230 CKT 1	60	Replace free standing metering CT. Replace switches 1302, 1303, 1306, & 1307. Changeout breaker 1305A	\$ 300,000
04WP	AEPW-AEPW	53139 FLINTCR5 161 53170 TONTITN5 161 1	334	347	0.1	53139 FLINTCR5 161 53187 GENTRYR5 161 1	0	See Previous	\$ -
04WP	WFEC-WFEC	55976 LIL AXE2 69 56011 NOBLE 2 69 1	26	26	0.1	56022 PAOLI 2 69 56023 PAOLI 4 138 1	0	Solution Undetermined	N/A
<b>Total Estimated Cost</b>									<b>\$ 9,061,000</b>

**Table 2** – SPP facility overloads identified for the BLKW to ERCOTN transfer using System Scenario 2

Study Year	From Area - To Area	Branch Over 100% Rate B	Rate B	Pre Transfer Loading	TDF %	Outaged Branch Causing Overload	ATC	Solution	Estimated Cost
03WP	WERE-WERE	57151 AUBURN 3 115 57179 S GAGEW3 115 1	75	87	0.2	56765 HOYT 7 345 56766 JEC N 7 345 1	0	May be relieved due to WERE Operating Guide 400 - Outage of Hoyt to Jeffery Energy Center 345kV	\$ -
03WP	WERE-WERE	57151 AUBURN 3 115 57179 S GAGEW3 115 2	97	101	0.2	56765 HOYT 7 345 56766 JEC N 7 345 1	0	May be relieved due to WERE Operating Guide 400 - Outage of Hoyt to Jeffery Energy Center 345kV	\$ -
03WP	WERE-WERE	56851 AUBURN 6 230 *B014 AUBRN77X 1 1	307	313	0.1	56765 HOYT 7 345 56766 JEC N 7 345 1	0	May be relieved due to WERE Operating Guide 400 - Outage of Hoyt to Jeffery Energy Center 345kV	\$ -
04G	WERE-WERE	57623 ATHENS 2 69 57631 CC4VERN2 69 1	43	43	0.1	56791 BENTON 7 345 56797 WOLFCRK7 345 1	0	May be relieved due to WERE Operating Guide 300 - Outage of Benton - Wolf Creek 345kV	\$ -
04G	WERE-WERE	57151 AUBURN 3 115 57179 S GAGEW3 115 1	75	76	0.2	56765 HOYT 7 345 56766 JEC N 7 345 1	0	May be relieved due to WERE Operating Guide 400 - Outage of Hoyt to Jeffery Energy Center 345kV	\$ -
04G	WERE-WERE	57631 CC4VERN2 69 57636 GREEN 2 69 1	43	45	0.1	56791 BENTON 7 345 56797 WOLFCRK7 345 1	0	May be relieved due to WERE Operating Guide 300 - Outage of Benton - Wolf Creek 345kV	\$ -
04G	SWPA-SWPA	52774 EUFAULA4 138 *B053 EUFAULA1 1 1	105	106	0.4	52752 GORE 5 161 52790 WELEETK5 161 1	0	Replace Eufaula Transformer	\$ 2,000,000
04SP	WERE-WERE	56851 AUBURN 6 230 *B016 AUBRN77X 1 1	304	349	0.2	56765 HOYT 7 345 56766 JEC N 7 345 1	0	May be relieved due to WERE Operating Guide 400 - Outage of Hoyt to Jeffery Energy Center 345kV	\$ -
04SP	OKGE-OKGE	55237 TIBBENS2 69 55246 BEELINE2 69 1	66	70	0.1	55241 BLUEBEL2 69 55242 BLUEBEL4 138 1	0	Identified for Scenario 1	\$ -
04SP	AEPW-GRRD	53802 CATOOSA4 138 54438 CATSAGR5 161 1	150	159	0.4	53802 CATOOSA4 138 54438 CATSAGR5 161 2	0	None - GRDA Mitigation Plan	\$ -
04SP	AEPW-GRRD	53802 CATOOSA4 138 54438 CATSAGR5 161 2	150	160	0.4	53802 CATOOSA4 138 54438 CATSAGR5 161 1	0	None - GRDA Mitigation Plan	\$ -
04SP	WERE-WERE	57588 CHASE 2 69 57605 WHITE J2 69 1	43	49	0.1	56991 WEAVER 4 138 *B183 WEAVER2X 1 1	0	May be relieved due to WERE Operating Guide 634 - Outage of Weaver 138/69kV Transformer	\$ -
04SP	AEPW-AEPW	54023 OKMULGE4 138 54049 EC.HEN-4 138 1	105	115	0.4	54023 OKMULGE4 138 54057 KELCO 4 138 1	0	Identified for Scenario 1	\$ -
04SP	AEPW-AEPW	54028 WELETK4 138 54049 EC.HEN-4 138 1	105	110	0.4	54023 OKMULGE4 138 54057 KELCO 4 138 1	0	Identified for Scenario 1	\$ -
04SP	AEPW-AEPW	53139 FLINTCR5 161 53170 TONTITN5 161 1	311	408	0.1	53139 FLINTCR5 161 53187 GENTRYR5 161 1	0	Identified for Scenario 1	\$ -
04SP	OKGE-OKGE	55300 FTSMITH5 161 55305 FTSMITH8 500 1	475	476	0.3	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	304	0.1	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	53142 HUNTING2 69 53202 MIDLREA2 69 1	36	36	0.1	55262 AES 5 161 55264 TARBY 5 161 1	0	Solution Undetermined	N/A
04SP	WERE-WERE	56853 LAWHILL6 230 *B101 LAWHL29X 1 1	298	315	0.1	56853 LAWHILL6 230 56855 MIDLAND6 230 1	0	May be relieved due to WERE Operating Guide 901 - Outage of Lawrence Hill - Midland Junction 230kV	\$ -
04SP	SWPS-SWPS	51418 PLANTX3 115 51419 PLANTX6 230 1	252	246	8.4	51466 LAMBCO3 115 51467 LAMBCO6 230 1	70	Solution Undetermined	N/A
04SP	WERE-WERE	57604 WEAVER 2 69 57837 RH JCT 2 69 1	43	44	0.2	57039 ELPASO 4 138 57042 FARBER 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
04SP	AEPW-AEPW	53849 TERNITP4 138 53869 VERDIGS4 138 1	149	156	0.2	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	245	0.8	53819 ONETA--7 345 53955 N.E.S.-7 345 1	0	Incorrect rating in the non-summer cases. Rate A/B = 237/265MVA	\$ -
04FA	AEPW-AEPW	53824 SHEFFD-4 138 53827 S.S.---4 138 1	139	139	0.6	53769 WEKIWA-4 138 53835 WED-TAP4 138 1	0	Replace Sand Springs switch 1306, 1307, & 1308	\$ 75,000
04WP	AEPW-AEPW	53783 LLAN ET4 138 53802 CATOOSA4 138 1	234	235	1.1	53767 WEKIWA-7 345 53866 T.NO.--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	163	0.6	53802 CATOOSA4 138 54438 CATSAGR5 161 2	0	None - GRDA Mitigation Plan	\$ -
04WP	AEPW-GRRD	53802 CATOOSA4 138 54438 CATSAGR5 161 2	150	164	0.6	53802 CATOOSA4 138 54438 CATSAGR5 161 1	0	None - GRDA Mitigation Plan	\$ -
04WP	SWPA-SWPA	52774 EUFAULA4 138 *B051 EUFAULA1 1 1	105	121	0.7	52752 GORE 5 161 52790 WELEETK5 161 1	0	See Previous	\$ -
04WP	AEPW-AEPW	53139 FLINTCR5 161 53170 TONTITN5 161 1	334	340	0.1	53139 FLINTCR5 161 53187 GENTRYR5 161 1	0	Identified for Scenario 1	\$ -
04WP	WFEC-WFEC	55976 LIL AXE2 69 56011 NOBLE 2 69 1	26	28	0.1	56022 PAOLI 2 69 56023 PAOLI 4 138 1	0	Solution Undetermined	N/A
Total Estimated Cost									\$10,475,000