



# **SPP** *Southwest Power Pool*

*System Impact Study  
SPP-2003-042-1  
For Transmission Service  
Requested By  
Cargill - Alliant*

*From KCPL To ERCOTN*

*For a Reserved Amount Of 100MW  
From 1/1/2004 To 1/1/2007*

*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 KCPL to ERCOTN. The period of the transaction is from 1/1/2004 to 1/1/2007. The request is for OASIS reservation 482567 for an amount of 100 MW.

The principal objective of this study is to identify constraints on the SPP Regional Tariff System and potential facility upgrades that may be necessary to facilitate the additional 100 MW of service requested.

The KCPL to ERCOTN transfer 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 that have not gone to facility study were not included in the models. The results of the transfer analysis are documented in Table 1 of the report. 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 facility upgrades that may be required in order to accommodate the 100 MW KCPL to ERCOTN request.

SPP used eight seasonal models to study the KCPL to ERCOTN 100 MW transfer 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), 2004/05 Winter Peak (04WP), 2009 Summer Peak (09SP) and 2009/10 Winter Peak (09WP) were used to study the impact of the 100 MW transfer on the SPP system during a the requested service period of 1/1/2004 to 1/1/2007. The Spring Peak models apply to April and May, the Summer Peak models apply to June through September, the Fall Peak models apply to October and November, and the Winter Peak models apply to December through March. 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.

With only the higher priority requests that have signed Facility Study Agreements included in the models, the study results of the KCPL to ERCOTN 100 MW show that a limiting constraint exists. Due to the limiting constraint identified, the Transmission Service Request cannot be granted. These results do not include an evaluation of potential constraints in the planning horizon beyond the reservation period that may limit the right to renew service. The upgrades and cost 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 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 KCPL 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	ACME - FRANKLIN SW 69KV	34	CANADIAN SW 138/69KV TRANSFORMER	0	Acme Jct to Acme Sub: Upgrade From 3/0 To 795MCM. Upgrade by WFEC schedules for 04SP	\$ -
03WP	WFEC-WFEC	ACME - WEST NORMAN 69KV	38	CANADIAN SW 138/69KV TRANSFORMER	0	Acme Sub > West Norman: Upgrade from 3/0 to 795 ACSR. Upgrade by WFEC scheduled for 04WP	\$ -
03WP	AEPW-AEPW	CATOOSA - LYNN LANE EAST TAP 138KV	234	NORTHEAST STA - ONETA 345KV	0	Incorrect rating in the non-summer cases.	\$ -
03WP	AEPW-GRRD	CATOOSA 161/138KV TRANSFORMER CKT 1	150	CATOOSA 161/138KV TRANSFORMER CKT 2	0	None - GRDA Mitigation Plan	\$ -
03WP	AEPW-GRRD	CATOOSA 161/138KV TRANSFORMER CKT 2	150	CATOOSA 161/138KV TRANSFORMER CKT 1	0	None - GRDA Mitigation Plan	\$ -
03WP	WERE-WERE	N.A. PHILIPS JCT (SOUTH) - W MCPHERSON 115KV CKT 1	67	EAST MCPHERSON - SUMMIT 230KV	0	Tear down double circuit, build single circuit with 1192.5 ACSR.	\$ 7,800,000
04AP	WFEC-WFEC	ACME - FRANKLIN SW 69KV	34	CANADIAN SW 138/69KV TRANSFORMER	0	See Previous	\$ -
04AP	WFEC-WFEC	ACME - WEST NORMAN 69KV	38	CANADIAN SW 138/69KV TRANSFORMER	69	See Previous	\$ -
04G	WFEC-WFEC	ACME - FRANKLIN SW 69KV	34	CANADIAN SW 138/69KV TRANSFORMER	0	See Previous	\$ -
04G	WERE-WERE	ANZIO - FORT JCT SWI STA 115KV	92	WEST JCT CITY - WEST JCT CITY JCT (EAST) 115KV	0	WERE Operating Directive 1217, Outage of the Fort JCT - West JCT City 115KV Line	\$ -
04G	WERE-WERE	AUBURN ROAD - KEENE 115KV	68	EAST MANHATTAN - JEC 230KV	0	WERE Operating Directive 900, Outage of the E MANHATTAN - JEC 230KV Line	\$ -
04G	WERE-WERE	EAST STREET - WEST EMPORIA 115KV	92	MORRIS CO - WEST EMPORIA 115KV	74	WERE Operating Directive 1209, Outage of the Morris CO - West Emporia 115KV Line	\$ -
04G	WERE-WERE	KEENE - SOUTH ALMA 115KV	68	EAST MANHATTAN - JEC 230KV	0	WERE Operating Directive 900, Outage of the E MANHATTAN - JEC 230KV Line	\$ -
04G	WERE-WERE	N.A. PHILIPS JCT (SOUTH) - W MCPHERSON 115KV CKT 1	67	EAST MCPHERSON - SUMMIT 230KV	11	See Previous	\$ -
04SP	WFEC-WFEC	ACME - WEST NORMAN 69KV	38	CANADIAN SW 138/69KV TRANSFORMER	0	See Previous	\$ -
04SP	WERE-WERE	AUBURN ROAD - KEENE 115KV	68	EAST MANHATTAN - JEC 230KV	0	WERE Operating Directive 900, Outage of the E MANHATTAN - JEC 230KV Line	\$ -
04SP	OKGE-OKGE	BEELINE - TIBBENS 69KV	66	BLUEBELL 138/69KV TRANSFORMER	0	Solution Undetermined	N/A
04SP	SWPS-SWPS	CANYON EAST - OSAGE SWI STA 115KV	98	BUSHLAND INTRCHNG - DEAF SMITH INTRCHNG 230KV	0	Rebuild 13 miles of 115 kV circuit with 397 ACSR on T-0-102 structures.	\$ 1,910,000
04SP	AEPW-GRRD	CATOOSA 161/138KV TRANSFORMER CKT 1	150	CATOOSA 161/138KV TRANSFORMER CKT 2	0	None - GRDA Mitigation Plan	\$ -
04SP	AEPW-GRRD	CATOOSA 161/138KV TRANSFORMER CKT 2	150	CATOOSA 161/138KV TRANSFORMER CKT 1	0	None - GRDA Mitigation Plan	\$ -
04SP	AEPW-AEPW	EAST CENTRAL HENRYETTA - OKMULGEE 138KV	105	HENRYET4 - KELCO 138KV	0	Replace Okmulgee Wavetrap	\$ 40,000
04SP	AEPW-AEPW	EAST CENTRAL HENRYETTA - WELEETKA 138KV	104	HENRYET4 - KELCO 138KV	0	Replace Weleetka Wavetrap	\$ 40,000
04SP	AEPW-AEPW	FLINT CREEK - TONTITOWN 161KV	311	CHAMBER SPRINGS - FLINT CREEK 161KV	0	May have multiple upgrades required.	\$ -
04SP	OKGE-OKGE	HORSESHOE LAKE - RENO 138KV	287	HORSESHOE LAKE - MIDWAY 138KV	0	Replace switches & ct's at Horseshoe Lake in 2004 by OKGE	\$ -
04SP	SWPS-SWPS	PALODU - RANDALL CO INTRCHNG 115KV	99	AMARILLO S INTRCHNG - SWISHER CO INTRCHNG 230KV	44	Rebuild 9 mi of 115 kV with 397 ACSR on T-0-102 structures.	\$ 1,170,000
04SP	OKGE-OKGE	PANTHER - SILVER LAKE 138KV	286	LONEOK - NORTHWEST 138KV	0	Upgrade completed by OKGE. Rate A/B = 478/478MVA	\$ -
04SP	WERE-WERE	ROSE HILL JCT - WEAVER 69KV	43	EL PASO - FARBER 138KV	0	Move Rose Hill Jct. 69 kV load to Rose Hill 345/138 kV subSTA. Requires new transformer bay and a new 25 MVA 138-12 kV transformer.	\$ 1,400,000
04SP	AEPW-AEPW	TERRA NITROGEN TAP - VERDIGRIS 138KV	149	NORTHEAST STA - OWASSO SOUTH 138KV	0	Solution Undetermined	N/A
04FA	WERE-WERE	ANZIO - FORT JCT SWI STA 115KV	92	WEST JCT CITY - WEST JCT CITY JCT (EAST) 115KV	0	WERE Operating Directive 1217, Outage of the Fort JCT - West JCT City 115KV Line	\$ -
04FA	WERE-WERE	AUBURN ROAD - KEENE 115KV	68	EAST MANHATTAN - JEC 230KV	0	WERE Operating Directive 900, Outage of the E MANHATTAN - JEC 230KV Line	\$ -
04FA	AEPW-AEPW	CATOOSA - LYNN LANE EAST TAP 138KV	234	BROKEN ARROW 101ST NORTH - ONETA 138KV	0	Incorrect rating in the non-summer cases.	\$ -
04FA	WERE-WERE	EAST STREET - WEST EMPORIA 115KV	92	MORRIS CO - WEST EMPORIA 115KV	0	WERE Operating Directive 1209, Outage of the Morris CO - West Emporia 115KV Line	\$ -
04FA	WERE-WERE	EXIDE JCT - N.A. PHILIPS 115KV	196	EAST MCPHERSON - SUMMIT 230KV	17	Rebuild and reconductor 0.34 miles with 1192 ACSR.	\$ 95,200
04FA	WERE-WERE	EXIDE JCT - SUMMIT 115KV	196	EAST MCPHERSON - SUMMIT 230KV	0	Rebuild and reconductor 4.94 miles with 1192 ACSR.	\$ 1,100,000
04FA	WERE-WERE	FORT JCT SWI STA - MCDOWELL CREEK SWI STA 115KV	68	JEFFERY ENERGY CENTER - SUMMIT 345KV	0	WERE Operating Directive 402, Outage of the JEC - Summit 345KV Line	\$ -

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

Study Year	From Area - To Area	Branch Over 100% Rate B	Rate B	Outaged Branch Causing Overload	ATC	Solution	Estimated Cost
04FA	WERE-WERE	KEENE - SOUTH ALMA 115KV	68	EAST MANHATTAN - JEC 230KV	0	WERE Operating Directive 900, Outage of the E MANHATTAN - JEC 230KV Line	\$ -
04FA	WERE-WERE	N.A. PHILIPS - N.A. PHILIPS JCT (SOUTH) 115KV	155	EAST MCPHERSON - SUMMIT 230KV	0	Rebuild 0.88 miles and reconductor with 1192.5 ACSR.	\$ 417,200
04FA	WERE-WERE	N.A. PHILIPS JCT (SOUTH) - W MCPHERSON 115KV CKT 1	66	EAST MCPHERSON - SUMMIT 230KV	0	See Previous	\$ -
04FA	WERE-WERE	N.A. PHILIPS JCT (SOUTH) - W MCPHERSON 115KV CKT 2	90	EAST MCPHERSON - SUMMIT 230KV	0	See Previous	\$ -
04FA	OKGE-OKGE	PANTHER - SILVER LAKE 138KV	286	LONEOAK - NORTHWEST 138KV	0	Upgrade completed by OKGE. Rate A/B = 478/478MVA	\$ -
04FA	AEPW-AEPW	SAND SPRINGS - SHEFFIELD 138KV	139	WEKIWA - WEST EDISON TAP 138KV	23	Replace Sand Springs switch 1306, 1307, & 1308	\$ 75,000
04FA	AEPW-AEPW	SAND SPRINGS - WEST EDISON TAP 138KV	143	SHEFFIELD - WEKIWA 138KV	78	Replace Sand Springs switches 1314, 1315, & 1316	\$ 75,000
04WP	AEPW-AEPW	CATOOSA - LYNN LANE EAST TAP 138KV	234	TULSA NORTH - WEKIWA 345KV	7	Incorrect rating in the non-summer cases.	\$ -
04WP	AEPW-GRRD	CATOOSA 161/138KV TRANSFORMER CKT 1	150	CATOOSA 161/138KV TRANSFORMER CKT 2	0	None - GRDA Mitigation Plan	\$ -
04WP	AEPW-GRRD	CATOOSA 161/138KV TRANSFORMER CKT 2	150	CATOOSA 161/138KV TRANSFORMER CKT 1	0	None - GRDA Mitigation Plan	\$ -
04WP	AEPW-AEPW	EAST CENTRAL HENRYETTA - OKMULGEE 138KV	105	KELCO - OKMULGEE 138KV	69	See Previous	\$ -
04WP	WERE-WERE	N.A. PHILIPS - N.A. PHILIPS JCT (SOUTH) 115KV	156	EAST MCPHERSON - SUMMIT 230KV	0	See Previous	\$ -
04WP	WERE-WERE	N.A. PHILIPS JCT (SOUTH) - W MCPHERSON 115KV CKT 1	66	EAST MCPHERSON - SUMMIT 230KV	0	See Previous	\$ -
04WP	WERE-WERE	N.A. PHILIPS JCT (SOUTH) - W MCPHERSON 115KV CKT 2	90	EAST MCPHERSON - SUMMIT 230KV	0	See Previous	\$ -
04WP	OKGE-OKGE	PANTHER - SILVER LAKE 138KV	286	LONEOAK - NORTHWEST 138KV	0	Upgrade completed by OKGE. Rate A/B = 478/478MVA	\$ -
09SP	KACP-KACP	BLUE VALLEY - WINCHESTER JCT SOUTH 161KV	222	LEEDS - MIDTOWN 161KV	0	replace 800A wavetrapp with 1200A wavetrapp at Blue Valley	\$ 8,000
09SP	SWPS-SWPS	CANYON EAST - OSAGE SWI STA 115KV	99	BUSHLAND INTRCHNG - DEAF SMITH INTRCHNG 230KV	0	See Previous	\$ -
09SP	AEPW-GRRD	CATOOSA 161/138KV TRANSFORMER CKT 1	150	CATOOSA 161/138KV TRANSFORMER CKT 2	99	None - GRDA Mitigation Plan	\$ -
09SP	AEPW-GRRD	CATOOSA 161/138KV TRANSFORMER CKT 2	150	CATOOSA 161/138KV TRANSFORMER CKT 1	75	None - GRDA Mitigation Plan	\$ -
09SP	OKGE-OKGE	CIMARRON - WOODRING 345KV	717	NORTHWEST - SPRING CREEK 345KV	95	OKGE Planned Upgrade 03WP	\$ -
09SP	AEPW-AEPW	EAST CENTERTON - GENTRY REC 161KV	353	AVOCA - BEAVER 161KV	0	Rebuild 19.16 miles of 2-397.5 ACSR with 2156 ACSR. Replace East Centerton Wavetrapp & jumpers	\$ 8,000,000
09SP	AEPW-AEPW	EAST CENTRAL HENRYETTA - OKMULGEE 138KV	104	KELCO - OKMULGEE 138KV	0	See Previous	\$ -
09SP	AEPW-AEPW	FLINT CREEK - GENTRY REC 161KV	350	AVOCA - BEAVER 161KV	0	Rebuild 1.09 miles of 2-397.5 ACSR with 2156 ACSR. Replace Flint Creek wavetrapp & jumpers	\$ 450,000
09SP	OKGE-WFEC	FRANKLIN SW - MIDWEST TAP 138KV	210	CROMWELL - WETUMKA 138KV	0	Replace 800 amp wavetrapp with 2000 amp wavetrapp at Franklin Switch and 795ACSR jumpers with 1590ACSR, connectors	\$ 24,000
09SP	OKGE-OKGE	FT SMITH 345/161KV TRANSFORMER	489	FT SMITH 500/161KV TRANSFORMER	0	Convert Ft. Smith 161kv to 1-1/2 breaker design and install 2nd 500-161KV transformer bank.	\$ 7,000,000
09SP	OKGE-OKGE	FT SMITH 500/161KV TRANSFORMER	474	FT SMITH 345/161KV TRANSFORMER	0	See Previous	\$ -
09SP	WERE-WERE	GILL ENERGY CENTER WEST - PECK 69KV	35	EL PASO - FARBEN 138KV	0	Repole 10.1 miles and keep existing conductor.	\$ 3,100,000
09SP	OKGE-OKGE	HORSESHOE LAKE - JONES TAP 138KV	287	HORSESHOE LAKE - MIDWAY 138KV	0	Replace switches & ct's at Horseshoe Lake in 2004 by OKGE	\$ -
09SP	OKGE-OKGE	HORSESHOE LAKE - RENO 138KV	287	HORSESHOE LAKE - JONES TAP 138KV	0	Replace switches & ct's at Horseshoe Lake in 2004 by OKGE	\$ -
09SP	OKGE-OKGE	MORRISON - STILLWATER 138KV	191	NORTHWEST - SPRING CREEK 345KV	0	Incorrect Rating in Model	\$ -
09SP	SWPS-SWPS	PALODU - RANDALL CO INTRCHNG 115KV	98	AMARILLO S INTRCHNG - SWISHER CO INTRCHNG 230KV	11	See Previous	\$ -
09SP	OKGE-OKGE	PANTHER - SILVER LAKE 138KV	286	LONEOAK - NORTHWEST 138KV	0	Upgrade completed by OKGE. Rate A/B = 478/478MVA	\$ -
09SP	AEPW-AEPW	TERRA NITROGEN TAP - VERDIGRIS 138KV	150	NORTHEAST STA - OWASSO SOUTH 138KV	0	Solution Undetermined	N/A
09WP	WERE-WERE	ANZIO - FORT JCT SWI STA 115KV	92	WEST JCT CITY - WEST JCT CITY JCT (EAST) 115KV	0	WERE Operating Directive 1217, Outage of the Fort JCT - West JCT City 115KV Line	\$ -
09WP	WERE-WERE	EXIDE JCT - SUMMIT 115KV	195	EAST MCPHERSON - SUMMIT 230KV	0	See Previous	\$ -
09WP	WERE-WERE	FORT JCT SWI STA - MCDOWELL CREEK SWI STA 115KV	67	JEFFERY ENERGY CENTER - SUMMIT 345KV	0	WERE Operating Directive 402, Outage of the JEC - Summit 345KV Line	\$ -
09WP	WERE-WERE	N.A. PHILIPS - N.A. PHILIPS JCT (SOUTH) 115KV	160	EAST MCPHERSON - SUMMIT 230KV	0	See Previous	\$ -
09WP	WERE-WERE	N.A. PHILIPS JCT (SOUTH) - W MCPHERSON 115KV CKT 1	68	EAST MCPHERSON - SUMMIT 230KV	0	See Previous	\$ -
09WP	WERE-WERE	N.A. PHILIPS JCT (SOUTH) - W MCPHERSON 115KV CKT 2	92	EAST MCPHERSON - SUMMIT 230KV	0	See Previous	\$ -
09WP	OKGE-OKGE	PANTHER - SILVER LAKE 138KV	286	LONEOAK - NORTHWEST 138KV	0	Upgrade completed by OKGE. Rate A/B = 478/478MVA	\$ -
Total							\$ 32,704,400