



***System Impact Study SPP-2002-221
For Transmission Service
Requested By
Calpine Energy Services L.P.***

From CSWS To OKGE

***For a Reserved Amount Of 110 MW
From 1/1/03
To 1/1/04***

SPP Coordinated Planning

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1. Executive Summary

Calpine Energy Services L.P. (CALP) has requested a system impact study for long-term Firm Point-to-Point transmission service from CSWS to OKGE. The period of the transaction is from 1/1/03 to 1/1/04. The request is for OASIS reservation 441996 for an amount of 110 MW.

This study was performed to identify constraints on the SPP Regional Tariff Transmission System that result in zero ATC for the 110 MW transfer. The CSWS to OKGE 110 MW transfer impacts previously identified facilities that have been determined to have an ATC of zero in the 2003 summer months. An abbreviated analysis was conducted for the requested service period from 1/1/03 to 1/1/04 and no analysis was conducted for the remaining planning horizon from 1/1/04 to 4/1/09 to save on time and cost of conducting a full study resulting in the same conclusion. For the requested service period, higher priority requests exist and are currently being evaluated. Analysis for the requested service is provided without the higher priority requests included.

The CSWS to OKGE transfer impacts previously identified facilities that limit the ATC to zero during the 2003 summer months. These facilities cannot be relieved through system upgrades in the time period available; therefore, the request will be refused.

2. Introduction

Calpine Energy Services L.P. has requested a system impact study for long-term Firm Point-to-Point transmission service from CSWS to OKGE.

The principal objective of this study is to identify the restraints on the SPP Regional Tariff System that may limit the transfer to less than 110 MW. This study includes an abbreviated steady-state contingency analysis using PSS/E and Available Transfer Capability (ATC) analysis for the requested service period.

The abbreviated steady-state analysis considers the impact of the 110 MW transfer on the previously identified facilities that limit the ATC to zero.

3. Study Methodology

A. Description

An abbreviated analysis was done to determine available capacity on previously identified circuits.

B. Model Updates

The SPP 2002 Series Cases 2003 Summer was used to study the impact of a 110 MW transfer on the SPP system during the requested service period of 1/1/03 to 1/1/04. The Summer Peak models apply to the months of June through September.

The chosen base case models were modified to reflect the most current modeling information. The cases were modified to reflect future firm transfers during the requested service period that were not already included in the January 2002 base case series models.

C. Transfer Analysis

Using the created models, the loading was determined for those facilities that have previously been identified as having an ATC of zero. The PSS/E options chosen to conduct the Impact Study analysis can be found in Appendix A.

4. Study Results

A. Study Analysis Results

Table 1 contains the analysis results of the System Impact Study. The table identifies the seasonal case in which the event occurred; the emergency rating of the overloaded circuit (Rate B), the contingent loading percentage of circuit with and without the studied transfer, the estimated ATC value using interpolation if calculated, any SPP identification or assignment of the event, and any solutions received from the transmission owners.

Table 1 shows the impact of the CSWS to OKGE 110 MW transfer on the previously identified facilities that have an ATC of zero. Available solutions are given in the table.

Table 1a of Appendix B documents the modeling representation of the events identified in Table 1 to include bus numbers and bus names.

Table 1 – Previously Identified Facilities Impacted by the CSWS to OKGE 110 MW Transfer that Limit the ATC to Zero.

Study Year	From Area - To Area	Branch Over 100% Rate B	Rate B	BC % Loading	TC % Loading	Outaged Branch Causing Overload	ATC (MW)	Comment
03SP	AEPW-AEPW	Dyess - East Rogers 161kV	244	100.4	100.6	Flint Creek - Gentry REC 161kV	0	AEPW Planned Tontitown Project In-Service Date 2005 SP
03SP	AEPW-AEPW	Elm Springs - Flint Creek 161kV	312	114.7	115.5	Flint Creek - Gentry REC 161kV	0	AEPW Planned Tontitown Project In-Service Date 2005 SP
03SP	EES-SWPA	Bull Shoals - Midway 161kV	162	111.8	112.6	Buford Tap - Bull Shoals 161kV	0	Replace disconnect switches, metering CTs and wave trap at Bull Shoals by SPA. 12 Month Lead Time
03SP	EES-SWPA	Bull Shoals - Midway 161kV	162	105.3	105.7	Ises - Morefield 161kV	0	Replace disconnect switches, metering CTs and wave trap at Bull Shoals by SPA. 12 Month Lead Time
03SP	AEPW-AEPW	Flint Creek - Gentry REC 161kV	353	107.7	108.2	Elm Springs - Flint Creek 161kV	0	Rebuild 1.09 miles of 2-397.5 ACSR with 2156 ACSR. Replace wavetrap jumpers by AEPW. 12 Month Lead Time
03SP	AEPW-AEPW	Flint Creek - Gentry REC 161kV	353	100.8	101.2	Dyess - East Rogers 161kV	0	Rebuild 1.09 miles of 2-397.5 ACSR with 2156 ACSR. Replace wavetrap jumpers by AEPW. 12 Month Lead Time
03SP	AEPW-AEPW	East Centeron - Gentry REC 161kV	353	105.4	105.9	Elm Springs - Flint Creek 161kV	0	Rebuild 19.16 miles of 2-397.5 ACSR with 2156 ACSR by AEPW. 30 Month Lead Time
03SP	KACP-KACP	La Cygne - Stilwell 345kV	1251	105.5	105.6	La Cygne - West Gardner 345kV	0	Build new substation with 345/161kV 400 Mva transformer. Tap Wolf Creek to LaCygne 345kV line and Centerville to Paola 161kV line. 24 Month Lead Time

5. Conclusion

The CSWS to OKGE transfer impacts previously identified facilities that limit the ATC to zero during the 2003 summer months. These facilities cannot be relieved through system upgrades in the time period available; therefore, the request will be refused.

Appendix A

PSS/E CHOICES IN RUNNING LOAD FLOW PROGRAM

BASE CASES:

Solutions - Fixed slope decoupled Newton-Raphson solution (FDNS)

1. Tap adjustment – Stepping
2. Area interchange control – Tie lines only
3. Var limits – Apply immediately
4. Solution options - Phase shift adjustment
 - Flat start
 - Lock DC taps
 - Lock switched shunts

Appendix B

Table 1a – Modeling Data for Previously Identified Facilities Impacted by the CSWS to OKGE 110 MW Transfer that Limit the ATC to Zero

Study Year	From Area - To Area	Branch Over 100% Rate B	Rate B	BC % Loading	TC % Loading	Outaged Branch Causing Overload	ATC (MW)	Comment
03SP	AEPW-AEPW	53131 DYESS 5 161 to 53135 EROGERS5 161 CKT 1	244	100.4	100.6	53139 FLINTCR5 161 to 53187 GENTRYR5 161 CKT1	0	AEPW Planned Tontitown Project In-Service Date 2005 SP
03SP	AEPW-AEPW	53194 ELMSPRR5 161 to 53139 FLINTCR5 161 CKT 1	312	114.7	115.5	53139 FLINTCR5 161 to 53187 GENTRYR5 161 CKT1	0	AEPW Planned Tontitown Project In-Service Date 2005 SP
03SP	EES-SWPA	99825 5MIDWAY# 161 to 52660 BULL SH5 161 CKT 1	162	111.8	112.6	52660 BULL SH5 161 to 52661 BUFRDTP5 161 CKT1	0	Replace disconnect switches, metering CTs and wave trap at Bull Shoals by SPA. 12 Month Lead Time
03SP	EES-SWPA	99825 5MIDWAY# 161 to 52660 BULL SH5 161 CKT 1	162	105.3	105.7	99817 5ISES 1 161 to 99826 5MORFLD 161 CKT1	0	Replace disconnect switches, metering CTs and wave trap at Bull Shoals by SPA. 12 Month Lead Time
03SP	AEPW-AEPW	53187 GENTRYR5 161 to 53139 FLINTCR5 161 CKT 1	353	107.7	108.2	53139 FLINTCR5 161 to 53194 ELMSPRR5 161 CKT1	0	Rebuild 1.09 miles of 2-397.5 ACSR with 2156 ACSR. Replace wavetrap jumpers by AEPW. 12 Month Lead Time
03SP	AEPW-AEPW	53187 GENTRYR5 161 to 53139 FLINTCR5 161 CKT 1	353	100.8	101.2	53131 DYESS 5 161 to 53135 EROGERS5 161 CKT1	0	Rebuild 1.09 miles of 2-397.5 ACSR with 2156 ACSR. Replace wavetrap jumpers by AEPW. 12 Month Lead Time
03SP	AEPW-AEPW	53133 ECNTRTN5 161 to 53187 GENTRYR5 161 CKT 1	353	105.4	105.9	53139 FLINTCR5 161 to 53194 ELMSPRR5 161 CKT1	0	Rebuild 19.16 miles of 2-397.5 ACSR with 2156 ACSR by AEPW. 30 Month Lead Time
03SP	KACP-KACP	57968 STILWEL7 345 to 57981 LACYGNE7 345 CKT 1	1251	105.5	105.6	57965 W.GRDNR7 345 to 57981 LACYGNE7 345 CKT1	0	Build new substation with 345/161kV 400 Mva transformer. Tap Wolf Creek to LaCygne 345kV line and Centerville to Paola 161kV line. 24 Month Lead Time