



***System Impact Study SPP-2001-170
For Transmission Service
Requested By
Tenaska Power Service Co.***

From OPPD To EES

***For a Reserved Amount Of 50MW
From 1/1/02
To 1/1/03***

SPP Coordinated Planning

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1. Executive Summary

Tenaska Power Service Co. has requested a system impact study for long-term Firm Point-to-Point transmission service from OPPD to EES. The period of the transaction is from 1/1/02 to 1/1/03. The request is for OASIS reservation 252535, totaling 50MW.

The principal objective of this study is to identify system problems and potential system modifications necessary to facilitate the additional 50MW transfer while maintaining system reliability.

New overloads caused by the 50MW transfer were identified along with determining the impact of the transfer on any previously assigned and identified facilities.

The OPPD to EES transfer impacts facilities that have been identified as limiting constraints for previously studied transfers. Due to the inability to upgrade these limiting constraints within the reservation period using normal construction practices, the ATC is zero for the requested OPPD to EES 50MW transfer.

2. Introduction

Tenaska Power Service Co. has requested an impact study for transmission service from OPPD control area with a point-of-delivery of Entergy.

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 50 MW. This study includes steady-state contingency analyses (PSS/E function ACCC) and Available Transfer Capability (ATC) analyses.

The steady-state analyses consider the impact of the 50 MW transfer on transmission line loading and transmission bus voltages for outages of single and selected multiple transmission lines and transformers on the SPP system.

3. Study Methodology

A. Description

Two analyses were conducted to determine the impact of the 50MW transfer on the system. The first analysis was conducted to identify any new overloads caused by the 50MW transfer. The second analysis was done to ensure that available capacity exists on previously identified circuits.

The first analysis was to study the steady-state analysis impact of the 50MW transfer on the SPP system. The second step was to study Available Transfer Capability (ATC) of the facilities identified in the steady-state analysis impact. The steady-state analysis was done to ensure current SPP Criteria and NERC Planning Standards requirements are fulfilled. The Southwest Power Pool (SPP) conforms to the NERC Planning Standards, which provide the strictest requirements, related to thermal overloads with a contingency. It requires that all facilities be within emergency ratings after a contingency.

The second analysis was done to determine the impact of the transfer on previously assigned and identified facilities.

B. Model Updates

SPP used three seasonal models to study the 50MW request. The SPP 2001 Series Cases 2001/02 Winter Peak, 2002 Summer Peak, and 2002/03 Winter Peak were used to study the impact of the 50MW transfer on the SPP system during the transaction period of 1/1/02 to 1/1/03.

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 request period that were not already included in the January 2001 base case series models.

C. Transfer Analysis

Using the created models and the ACCC function of PSS/E, single and select double contingency outages were analyzed. Then full AC solution was used to obtain the most accurate results possible. Any facility overloaded, using MVA ratings, in the transfer case and not overloaded in the base case was flagged. The PSS/E options chosen to conduct the Impact Study analysis can be found in Appendix A.

4. Study Results

A. Study Analysis Results

Tables 1, 2, and 3 contain the analysis results of the System Impact Study. The tables identify 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 new facility overloads caused by the 50MW transfer

Table 2 documents overloads on Non SPP Regional Tariff participants' transmission systems caused by the 50MW transfer.

Table 3 documents the 50MW transfer impact on previously assigned and identified facilities. Available estimated in-service dates for the completion of the previously assigned upgrades are given in the table.

Table 1 – SPP Facility Overloads caused by the OPPD to EES 50MW Transfer

Study Year	From Area To Area	Branch Over 100% RateB	RATE B	BC %Loading	TC %Loading	Outaged Branch That Caused Overload	ATC (MW)	Solution
01WP		NONE						
02SP	WERE-WERE	166TH TO JAGGARD JUNCTION, 115KV 57233 166TH 3 115 to 57243 JAGGARD3 115 CKT 1	119	99.8	100.4	STRANGER CREEK TO CRAIG, 345KV 56772 STRANGR7 345 to 57977 CRAIG 7 345 CKT1	50	Western Resources Operating Directive 800
02WP		NONE						

Table 2 – Non - SPP Facility Overloads caused by the OPPD to EES 50MW Transfer

Study Year	From Area To Area	Branch Over 100% RateB	RATE B	BC %Loading	TC %Loading	Outaged Branch That Caused Overload
01WP		NONE				
02SP		NONE				
02WP	AECI-AECI	96071 5CLINTN 161 to 96692 2CLINTN 69.0 CKT 1	25	99.8	100.2	96071 5CLINTN 161 to 96692 2CLINTN 69.0 CKT3

Table 3 – Previously Assigned and Identified SPP Facilities Impacted by the OPPD to EES 50MW Transfer.

Study Year	From Area To Area	Branch Over 100% RateB	RATE B	BC %Loading	TC %Loading	Outaged Branch That Caused Overload	ATC (MW)	Assignment
01WP		NONE						
02SP	AEPW-AEPW	TATUM TO CHEROKEE REC 138KV 53611 TATUM 4 to 53522 CHEROKEE4 1	209	101.1	101.3	Multiple Outage Contingency SOUTHWEST SHREVEPORT to LONGWOOD, 345KV 53454 SW SHV 7 345 to 53424 LONGWD 7 345 CKT 1 SOUTHWEST SHREVEPORT to DIANA, 345KV 53454 SW SHV 7 345 to 53528 DIANA 7 345 CKT 1	0	Upgrade Assigned to SPP-2000-086 150680 Est. In-Service Date 2/1/2003
02SP	AEPW-AEPW	LONGWOOD TO NORAM, 138KV 53423 LONGWD 4 138 53473 NORAM 4 138 1	234	100.1	100.3	Multiple Outage Contingency SOUTHWEST SHREVEPORT to LONGWOOD, 345KV 53454 SW SHV 7 345 to 53424 LONGWD 7 345 CKT 1 SOUTHWEST SHREVEPORT to DIANA, 345KV 53454 SW SHV 7 345 to 53528 DIANA 7 345 CKT 1	0	Identified in SPP-2000-108 212202
02WP		NONE						

5. Conclusion

The previously assigned and identified facilities limit the ATC to zero due to the inability to upgrade the constraints as required. For the 2002 Summer (6/1/02-10/1/02), the ATC is zero due to the loading of the Cherokee to Tatum 138kV line and the Longwood to Noram 138kV line. The estimated in service date of the Cherokee to Tatum 138kV line upgrade is 2/1/2003. No upgrade has been assigned for the Longwood to Noram 138kV overload.

The OPPD to EES 50MW reservation is limited to zero ATC on one or more facilities, and the time frame of the limitation is such that facilities cannot be upgraded; therefore, the request must be refused.

Appendix A

PSS/E CHOICES IN RUNNING LOAD FLOW PROGRAM AND ACCC

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

ACCC CASES:

Solutions – AC contingency checking (ACCC)

1. MW mismatch tolerance – 0.5
2. Contingency case rating – Rate B
3. Percent of rating – 100
4. Output code – Summary
5. Min flow change in overload report – 1mw
6. Excl'd cases w/ no overloads form report – YES
7. Exclude interfaces from report – NO
8. Perform voltage limit check – YES
9. Elements in available capacity table – 60000
10. Cutoff threshold for available capacity table – 99999.0
11. Min. contng. case Vltg chng for report – 0.02
12. Sorted output – None

Newton Solution:

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