SPP Southwest Power Pool

System Impact Study SPP-2002-032
For Transmission Service
Requested By
Tenaska Power Service Co.

From AEPW to ERCOTN

For a Reserved Amount Of 15 MW
From 6/1/02
To 6/1/03

SPP Coordinated Planning

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1. Executive Summary

Tenaska Power Service Co. (TNSK) has requested a system impact study for long-term Firm Point-to-Point transmission service from AEPW to ERCOTN. The period of the transaction is from 6/1/02 to 6/1/03. The request is for OASIS reservation #338221 in the amount of 15 MW.

The principal objective of this study is to identify the system limitations and potential system modifications necessary to facilitate the additional 15 MW transfer while maintaining system reliability.

No facilities in SPP restrict the requested AEPW to ERCOTN 15MW reservation; therefore the reservation will be accepted.

2. Introduction

Tenaska Power Service Co. (TNSK) has requested an impact study for transmission service from AEPW to ERCOTN.

The principal objective of this study is to identify the restraints on the SPP Regional Tariff System that may limit the transfer of 15 MW. This study includes the steady-state contingency analyses (PSS/E function ACCC), and Available Transfer Capability (ATC) analyses.

The steady-state analyses considered the impact of the 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 15 MW transfer on the system. The first analysis was conducted to identify any new overloads caused by the 15 MW transfer. The second analysis was done to ensure that available capacity exists on previously identified circuits.

The first analysis studied the steady-state analysis impact of the 15 MW transfer on the SPP system. The second analysis studied 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.

B. Model Updates

SPP used five seasonal models to study the 15 MW request. The SPP 2002 Series Cases: 2002 Summer Peak, 2002 Fall Peak, 2002/03 Winter Peak, 2003 April Minimum, and 2003 Spring Peak were used to study the impact of the 15 MW transfer on the SPP system during the period from 6/1/02 to 6/1/03.

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 2002 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

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 15 MW transfer. Upgrades associated with these new overloads can be directly assigned to the AEPW to ERCOTN 15 MW transfer.

Table 2 documents overloads on Non SPP Regional Tariff participants' transmission systems caused by the 15 MW transfer.

Table 3 documents the 15 MW transfer impact on previously assigned and identified facilities.

Table 1 - SPP Facility Overloads caused by the AEPW to ERCOTN 15 MW Transfer

Study Year	From Area To Area	Branch Over 100% Rate B	Rate B <MVA>	BC %Loading	Transfer Case %Loading	Outaged Branch That Caused Overload	ATC	Solution
02SP		NONE					15	
02FA		NONE					15	
02WP		NONE					15	
03AP		NONE					15	
03G		NONE					15	

Table 2 – Non-SPP Facility Overloads caused by the AEPW to ERCOTN 15 MW Transfer

Study Year	From Area To Area	Branch Over 100% Rate B	Rate B <MVA>	No Transfer %Loading	Transfer Case %Loading	Outaged Branch That Caused Overload
02SP		NONE				
02FA		NONE				
02WP		NONE				
03AP		NONE				
03G		NONE				

Table 3 – Previously Assigned and Identified SPP Facilities Impacted by the AEPW to ERCOTN 15 MW Transfer

Study Year	From Area To Area	Branch Over 100% Rate B	Rate B	No Transfer %Loading	Transfer Case %Loading	Outaged Branch That Caused Overload	ATC	Assignment
02SP		NONE					15	
02FA		NONE					15	
02WP		NONE					15	
03AP		NONE					15	
03G		NONE					15	

5. Conclusion

No facilities in SPP restrict the requested AEPW to ERCOTN 15MW reservation; therefore the reservation will be accepted.

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 - X 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 – 1 MW
6. Excld 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 - X Phase shift adjustment
   _ Flat start
   _ Lock DC taps
   _ Lock switched shunts