SPP Southwest Power Pool

System Impact Study SPP-2003-103-1 For Transmission Service Requested By Westar Energy

From SPA To WR

For a Reserved Amount Of 1 MW From 7/1/2003 To 7/1/2007

SPP Tariff Studies

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1. Executive Summary

Westar Energy has requested a system impact study for Point-to-Point Service from SPA to WR for 1 MW. The requested period of service is from 7/1/03 to 7/1/07. The SWPP OASIS Reservation number is 503917.

The principal objective of this study is to identify current system limitations using AC analyses and to determine the system upgrades necessary to provide the requested service.

Table 1 lists the SPP Facility Overloads caused or impacted by the requested service and includes solutions with engineering and construction costs to alleviate the limiting facilities. **Table 2** includes Non - SPP Facility Overloads caused or impacted by the requested service.

The SPA to WR 1 MW transfer does not create any new overloads or additional impacts on facilities requiring upgrades. Therefore, the service will be accepted.

2. Introduction

Westar Energy has requested a system impact study for Point-to-Point Service from SPA to WR for 1 MW. The principal objective of this study is to identify the restraints on the SPP Regional Tariff System that may limit the requested service and determine the least cost solutions required to alleviate the limiting facilities.

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 1 MW transfer and the impact of the required upgrades for service on transmission line loading and transmission bus voltages for outages of single and selected multiple transmission lines and transformers on the SPP systems and first tier Non - SPP systems.

3. Study Methodology

A. Description

The system impact analysis was conducted to determine the steady-state impact of the 1 MW transfer on the SPP and first tier Non - SPP systems. The steady-state analysis was done to ensure current SPP Criteria and NERC Planning Standards requirements are fulfilled. The Southwest Power Pool conforms to the NERC Planning Standards, which provide the strictest requirements, related to voltage violations and thermal overloads during normal conditions and during a contingency. It requires that all facilities be within normal operating ratings for normal system conditions and within emergency ratings after a contingency.

B. Model Updates

SPP used nine seasonal models to study the SPA to WR 1 MW transfer for the requested service period. The SPP 2003 Series Cases 2003 Fall Peak (03FA), 2003 Winter Peak (03WP), 2004 April Minimum (04AP), 2004 Spring Peak (04G), 2004 Summer Peak (04SP), 2004 Fall Peak (04FA), 2004 Winter Peak (04WP), 2009 Summer Peak (09SP), and 2009/10 Winter Peak (09WP) were used to study the impact of the 1 MW transfer on the SPP system during the requested service period of 7/1/2003 to 7/1/2007 and the extended service period to determine possible limitations on renewal of service.

The chosen base case models were modified to reflect the most current modeling information. The base case models include confirmed transfers not already included in the January 2003 base case series models.

C. Transfer Analysis

Using the selected cases both with and without the requested transfer modeled, the PSS/E Activity ACCC was run on the cases and compared to determine the facility overloads caused or impacted by the transfer. The PSS/E options chosen to conduct the analysis can be found in Appendix A.

D. Upgrade Analysis

An upgrade analysis was not required for the 1 MW SPA to WR transfer.

4. Study Results

A. Study Analysis Results

Tables 1 and 2 contain the steady-state analysis results of the System Impact Study. The tables identify the seasonal case in which the event occurred, the facility control area location, applicable ratings of the overloaded facility, the loading percentage with and without the studied transfer, and the estimated ATC value using interpolation if calculated. Comments are provided in the tables to document any SPP or Non - SPP identification or assignment of the event, existing mitigations plans or criteria to disregard the event as a limiting constraint, upgrades and costs to mitigate a limiting constraint, or any specific study procedures associated with modeling an event.

Table 1 lists the SPP Facility Overloads caused or impacted by the 1 MW transfer. Solutions with engineering and construction costs are provided in the tables.

Table 2 lists overloads on fist tier Non - SPP Regional Tariff participants' transmission systems caused or impacted by the 1 MW transfer.

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

Table 1 – SPP Facilities Impacted by the SPA to WR 1 MW Transfer

Study Case	From Area	To Area	Monitored Branch Over 100% Rating	Rating <MVA>	BC % Loading	TC % Loading	Outaged Branch Causing Overload	ATC (MW)	Solution	Estimated Cost
03FA			NONE				NONE	1		
03WP			NONE				NONE	1		
04AP			NONE				NONE	1		
04G			NONE				NONE	1		
04SP			NONE				NONE	1		
04FA			NONE				NONE	1		
04WP			NONE				NONE	1		
09SP			NONE				NONE	1		
09WP			NONE				NONE	1		

Table 2 – Non-SPP Facilities Impacted by the SPA to WR 1 MW Transfer

Study Case	From Area	To Area	Monitored Branch Over 100% Rating	Rating <MVA>	BC % Loading	TC % Loading	Outaged Branch Causing Overload	ATC (MW)	Solution	Estimated Cost
03FA			NONE				NONE	1		
03WP			NONE				NONE	1		
04AP			NONE				NONE	1		
04G			NONE				NONE	1		
04SP			NONE				NONE	1		
04FA			NONE				NONE	1		
04WP			NONE				NONE	1		
09SP			NONE				NONE	1		
09WP			NONE				NONE	1		

5. Conclusion

The SPA to WR 1 MW transfer does not create any new overloads or additional impacts on facilities requiring upgrades. Therefore, the service 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 – 1mw
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

Table 1a – SPP Facilities Impacted by the SPA to WR 1 MW Transfer

Study Case	From Area	To Area	Monitored Branch Over 100% Rating	Rating <MVA>	BC % Loading	TC % Loading	Outaged Branch Causing Overload	ATC (MW)	Solution	Estimated Cost
03FA			NONE				NONE	1		
03WP			NONE				NONE	1		
04AP			NONE				NONE	1		
04G			NONE				NONE	1		
04SP			NONE				NONE	1		
04FA			NONE				NONE	1		
04WP			NONE				NONE	1		
09SP			NONE				NONE	1		
09WP			NONE				NONE	1		