SPP Southwest Power Pool

System Impact Study SPP-2001-096
For Transmission Service
Requested By
Southern Company Energy Marketing

From OPPD To ERCOTN

For a Reserved Amount Of 50 MW
From 1/1/03
To 1/1/04

SPP Coordinated Planning

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1. Executive Summary

Southern Company Energy Marketing (SCEM) has requested a system impact study for long-term Firm Point-to-Point transmission service from OPPD to ERCOTN. The period of the transaction is from 1/1/03 to 1/1/04. The request is for OASIS reservation 242747, totaling 50 MW.

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

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

No facilities in SPP restrict the requested OPPD to ERCOTN 50 MW reservation; therefore, it will be accepted.

2. Introduction

Southern Company Energy Marketing (SCEM) has requested an impact study for transmission service from OPPD to ERCOTN.

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 50 MW transfer on the system. The first analysis was conducted to identify any new overloads caused by the 50 MW 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 50 MW 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 six seasonal models to study the OPPD to ERCOTN 50 MW transfer. The SPP 2002 Series Cases: 2002/03 Winter Peak, 2003 April Minimum, 2003 Spring Peak, 2003 Summer Peak, 2003 Fall Peak, and 2003/04 Winter Peak were used to study the impact of the 50 MW transfer on the SPP system during the transaction period of 1/1/03 to 1/1/04.

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

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 50 MW transfer. Available solutions are given in the table.

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

Table 3 documents the 50 MW transfer impact on previously assigned and identified facilities. Available solutions are given in the table.

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

Study Year	From Area To Area	Branch Over 100% Rate B	Rate B	BC %Loading	TC %Loading	Outaged Branch That Caused Overload	ATC	Solution
02WP		**No Branches Identified**					50	
03AP		**No Branches Identified**					50	
03G		**No Branches Identified**					50	
03SP		**No Branches Identified**					50	
03FA		**No Branches Identified**					50	
03WP		**No Branches Identified**					50	

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

Study Year	From Area To Area	Branch Over 100% Rate B	Rate B	BC %Loading	TC %Loading	Outaged Branch That Caused Overload
02WP		No Branches Identified				
03AP		No Branches Identified				
03G	AECI-AECI	96090 5KINGDM 161 to 96517 2KINGDM 69.0 CKT 2	25	99.1	100.7	96090 5KINGDM 161 to 96517 2KINGDM 69.0 CKT3
03G	AECI-AECI	96090 5KINGDM 161 to 96517 2KINGDM 69.0 CKT 3	25	99.1	100.6	96090 5KINGDM 161 to 96517 2KINGDM 69.0 CKT2
03SP		No Branches Identified				
03FA		No Branches Identified				
03WP		No Branches Identified				

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

Study Year	From Area To Area	Branch Over 100% Rate B	Rate B	BC %Loading	TC %Loading	Outaged Branch That Caused Overload	ATC	Assignment
02WP		No Branches Identified					50	
03AP		No Branches Identified					50	
03G		No Branches Identified					50	
03SP		No Branches Identified					50	
03FA		No Branches Identified					50	
03WP		No Branches Identified					50	

5. Conclusion

No facilities in SPP restrict the requested OPPD to ERCOTN 50 MW reservation; therefore, it 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