



*System Impact Study
For Redirect of Transmission Service
Requested By
Southwestern Public Service Co.
(SPSM)*

From SPS To OKGE

*For a Reserved Amount Of 50 MW
From 1/1/02
To 1/1/12*

SPP Coordinated Planning

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1. Executive Summary

Southwestern Public Service Co. (SPSM) has requested a system impact study for long-term Firm Point-to-Point transmission service from Southwestern Public Service (SPS) to Oklahoma Gas & Electric (OKGE). The period of the transaction is from 1/1/02 to 1/1/12. The request is for OASIS reservation 297119 in the amount of 50 MW, which is a redirect of reservation 297069.

Due to the existence of higher priority requests starting on or after 1/1/2003, the SPSM Point-to-Point transmission service redirect can only be evaluated for the first year of service. In order to determine if service is available from the start date of 1/1/2002 through a period ending 1/1/2003, this study was performed. For the remaining period of the transaction from 1/1/2003 to 1/1/2012, higher priority requests exist and are currently being evaluated.

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.

The SPS to OKGE 50 MW transfer can be accepted for the first year of service from 1/1/2002 to 1/1/2003. The remaining service from 1/1/2003 to 1/1/2012 will require evaluation when the higher priority requests are resolved.

2. Introduction

Southwestern Public Service Co. (SPSM) requested an impact study for transmission service redirect from SPS 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 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 five seasonal models to study the 50 MW request. The SPP 2001 Series Cases: 2001/02 Winter Peak, 2002 Spring Peak, 2002 Summer Peak, 2002 Fall Peak, and 2002/03 Winter Peak were used to study the impact of the 50 MW transfer on the SPP system during the first year of service from 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

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. No new overloads were identified.

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.

Table 1 - SPP Facility Overloads caused by the SPS to OKGE 50 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	ATC	Solution
01WP		NONE					50	
02G		NONE					50	
02SP		NONE					50	
02FA		NONE					50	
02WP		NONE					50	

Table 2 – Non-SPP Facility Overloads caused by the SPS to OKGE 50 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
01WP		NONE				
02G		NONE				
02SP		NONE				
02FA		NONE				
02WP		NONE				

Table 3 – Previously Assigned and Identified SPP Facilities Impacted by the SPS to OKGE 50 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	ATC	Assignment
01WP		NONE					50	
02G		NONE					50	
02SP	SPS-SPS	KINGSMILL 115/69KV TRANSFORMER 50808 KNGSML3 115 to 50807 KNGSML2 69.0 CKT 1	75	111.2	112.0	GRAPEVINE TO NICHOLS, 230KV 50827 GRAPEVN6 230 to 50915 NICHOL6 230 CKT1	50	New Summer Emergency Rating 86.3MVA 15.1% Increase
02SP	WFEC-WFEC	MOREWOOD SW 161/69KV TRANSFORMER 56001 MORWODS4 138 to 56000 MORWODS269.0 CKT 1	33	99.8	100.5	ELK CITY 138/69KV TRANSFORMER 54121 ELKCTY-4 138 to 54122 ELKCTY-269.0 CKT1	50	Assigned To 2001-198 Estimated In-Service Date 6/1/02
02FA		NONE					50	
02WP	SPS-SPS	KINGSMILL 115/69KV TRANSFORMER 50808 KNGSML3 115 to 50807 KNGSML2 69.0 CKT 1	75	98.9	100.8	GRAPEVINE TO NICHOLS, 230KV 50827 GRAPEVN6 230 to 50915 NICHOL6 230 CKT1	50	New Winter Emergency Rating 86.3MVA 15.1% Increase

5. Conclusion

No facilities in SPP restrict the requested SPS to OKGE 50 MW redirect for the first year of service; therefore, it will be accepted from 1/1/2002 to 1/1/2003.

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 – 1 MW
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