



SPP *Southwest Power Pool*

***System Impact Study SPP-2001-169r
For Transmission Service
Requested By
Southwestern Public Service
Company***

From SPS to BLKW

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

**Revision to SPP-2001-169
August 13, 2001**

SPP Transmission Planning

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Revised August 13, 2001 to reflect changes made to the modeling of the Blackwater and Eddy County DC Ties.

1. Executive Summary

Southwestern Public Service Company has requested a system impact study for long-term Firm Point-to-Point transmission service from SPS to BLKW. The period of the transaction is from 1/1/02 to 1/1/03. The request is for OASIS reservation 252077 for 50MW.

The following is a revision of the original study to correct the reactive power flow at the Blackwater tie.

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.

There were no facilities found that restricted the SPS to BLKW 50MW renewal.

The Blackwater tie was modeled with 150MW of service in the base cases. The Eddy County tie was modeled with only 35MW coming into Eddy County from SPS. This reflects the renewal order of the possible renewals of the SPS to Eddy and Blackwater DC Tie requests.

The table below shows the loading on the Roosevelt to Tolk, 230kV lines with 200MW of service from SPS to Blackwater and 35MW from SPS to Eddy.

Study Year	From Area - To Area	Branch Over 100% Rate B	Rate B	BC % Loading	TC % Loading	Outaged Branch Causing Overload
02SP	SPS-SPS	ROOSEVELT COUNTY TO TOLK, 230KV CKT 1 51203 ROOSEVL6 230 to 51437 TOLKW6 230 CKT 1	451	89.8	99.1	ROOSEVELT COUNTY TO TOLK, 230KV CKT 2 51203 ROOSEVL6 230 to 51435 TOLKE6 230 CKT2
02SP	SPS-SPS	ROOSEVELT COUNTY TO TOLK, 230KV CKT 2 51203 ROOSEVL6 230 to 51435 TOLKE6 230 CKT 2	451	89.6	98.9	ROOSEVELT COUNTY TO TOLK, 230KV CKT 1 51203 ROOSEVL6 230 to 51437 TOLKW6 230 CKT1

The increase in loading on these lines is not a limiting constraint for the 50MW SPS to BLKW renewal; however, these lines may appear as limiting constraints for the studies of the remaining SPS to Eddy County renewals.

2. Introduction

Southwestern Public Service Company has requested an impact study for transmission service from SPS control area with a sink of BLKW.

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

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

ATC analyses shows the amount of First Contingency Incremental Transfer Capabilities (FCITC) between the given study systems and what the limitations are, if any, for transferring up to 50MW.

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 five seasonal models to study the 50MW request. The SPP 2001 Series Cases 2001/02 Winter Peak, 2002 Spring, 2002 Summer Peak, 2002 Fall, and 2001/03 Winter Peak were used to study the impact of the 50MW transfer on the SPP system during the transaction period of 1/01/02 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.

The Eddy County and Blackwater DC ties were modeled in the base cases as shown in the table below.

Reservation	Source	Sink	01/02 WP	02G	02SP	02FA	02/03WP
SPS OASIS # 225223	SPS	PNM_BLKW	150MW	150MW	150MW	150MW	150MW
SPS OASIS # 225228	SPS	EPE_EDDY	35MW	35MW	35MW	35MW	35MW

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. Upgrades associated with these new overloads can be directly assigned to the SPS to BLKW 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.

Table 1 – SPP Facility Overloads caused by the SPS to BLKW 50MW Transfer

Study Year	From Area - To Area	Branch Over 100% Rate B	Rate B	BC % Loading	TC % Loading	Outaged Branch Causing Overload	ATC (MW)
01WP		NONE				NONE	50
02G		NONE				NONE	50
02SP		NONE				NONE	50
02FA		NONE				NONE	50
02WP		NONE				NONE	50

Table 2 – Non - SPP Facility Overloads caused by the SPS to BLKW 50MW Transfer

Study Year	From Area - To Area	Branch Over 100% Rate B	Rate B	BC % Loading	TC % Loading	Outaged Branch Causing Overload	ATC (MW)
01WP		NONE				NONE	50
02G		NONE				NONE	50
02SP		NONE				NONE	50
02FA		NONE				NONE	50
02WP		NONE				NONE	50

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

Study Year	From Area - To Area	Branch Over 100% Rate B	Rate B	BC % Loading	TC % Loading	Outaged Branch Causing Overload	ATC (MW)
01WP		NONE				NONE	50
02G		NONE				NONE	50
02SP		NONE				NONE	50
02FA		NONE				NONE	50
02WP		NONE				NONE	50

5. Conclusion

We found no facilities in SPP to restrict the requested SPS to BLKW 50MW 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 automatically
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