



SPP *Southwest
Power Pool*

*System Impact Study SPP-2001-278
For Transmission Service
Requested By
OGE Energy Resources, Inc.*

From KCPL to WFEC

*For a Reserved Amount Of 100MW
From 11/1/01
To 11/1/02*

SPP Transmission Planning

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1. Executive Summary

OGE Energy Resources, Inc. has requested a system impact study for long-term Firm Point-to-Point transmission service from KCPL to WFEC. The period of the transaction is from 11/1/01 to 11/1/02. The request is for reservations 288710 and 288711 for 100MW.

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 100MW.

New overloads caused by the 100MW transfer were identified along with determining the impact of the transfer on any previously assigned and identified facilities.

2. Introduction

OGE Energy Resources, Inc. has requested an impact study for transmission service from KCPL control area with a Point of Delivery of WFEC.

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 100MW. 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 100MW 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 100MW.

3. Study Methodology

A. Description

Two analyses were conducted to determine the impact of the 100MW transfer on the system. The first analysis was conducted to identify any new overloads caused by the 100MW 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 100MW 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 two seasonal models to study the 100MW request. The SPP 2001 Series Cases 2001/02 Winter Peak and 2002 Summer Peak were used to study the impact of the 100MW transfer on the SPP system during the transaction period of 11/1/01 to 11/1/02.

Seasonal Case	2001/02 Winter Peak	2002 Summer Peak
Abbreviation	01WP	02SP

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

A. Study Analysis Results

Table 1 shows the new facility overloads caused by the 100MW transfer. Upgrades associated with these new overloads can be directly assigned to the KCPL to WFEC 100MW transfer.

Table 2 documents overloads on Non SPP Regional Tariff participants' transmission systems caused by the 100MW transfer.

Table 3 documents the 100MW transfer impact on previously assigned and identified facilities.

Table 1 – Overloads Caused by 100MW KCPL to WFEC Transfer

Study Year	From Area - To Area	Branch Over 100% Rate B	RATEB	BC % Loading	TC %Loading	Outaged Branch That Caused Overload	ATC (MW)
01WP		NONE				NONE	
02SP	WERE-WERE	WEAVER TO ROSE HILL JCT, 69KV 57604 WEAVER 269.0 to 57837 RH JCT 269.0 CKT 1	43	97.9	100.2	EL PASO TO FARBER, 138KV 57039 ELPASO 4 138 to 57042 FARBER 4 138 CKT1	90

Table 2 – Non - SPP Facility Overloads caused by the KCPL to WFEC 100MW Transfer

Study Year	From Area - To Area	Branch Over 100% Rate B	RATEB	BC % Loading	TC %Loading	Outaged Branch That Caused Overload	ATC (MW)
01WP		NONE				NONE	
02SP	EES-EES	98107 8RICHARD 500 to 98108 4RICHARD 138 CKT 2	750	100.0	100.2	98107 8RICHARD 500 to 98108 4RICHARD 138 CKT1	0

Table 3 – Previously Assigned and Identified SPP Facilities Impacted by the KCPL to WFEC 100MW Transfer.

Study Year	From Area - To Area	Branch Over 100% RateB	RATE B or Flowgate Rating	BC % Loading	TC % Loading	ATC (MW)	Outaged Branch That Caused Overload	Assignment
01WP	WERE-WERE	EXIDE TO SUMMIT JCT, 115KV 57368 EXIDE J3 115 to 57381 SUMMIT 3 115 CKT 1	181	100.2	100.4	0	EAST MCPHERSON TO SUMMIT, 230KV 56872 EMCIPHER6 230 to 56873 SUMMIT 6 230 CKT1	1999-017
01WP	WERE-WERE	NA PHILIPS TO NA PHILIPS JCT S, 115KV 57372 PHILIPS3 115 to 57374 SPHILPJ3 115 CKT 1	160	100.2	100.6	0	EAST MCPHERSON TO SUMMIT, 230KV 56873 SUMMIT 6 230 to 56872 EMCIPHER6 230 CKT1	SPP Flowgate
02SP	EES-EES	WEBRE TO RICHARD, 500KV 98430 8WEBRE 500 to 98107 8RICHARD 500 CKT 1	1250	109.7	110.1	0	Non-Contingent Flowgate	EES Flowgate

5. Conclusion

The previously assigned and identified facilities limit the ATC to zero in the 2001/2002 Winter and 2002 Summer due to the inability to upgrade the thermal constraints as required. Those facilities that have an ATC of zero are given below.

- For the 2001/2002 Winter (12/1/01-4/1/02), the ATC is zero due to the loading of the Philips to South Philips, Summit to East McPherson Flowgate and the Exide to Summit Junction, Summit to East McPherson Flowgate. Upgrades for these facilities cannot be completed by 11/1/01.
- For the 2002 Summer (6/1/02-10/1/02), the ATC is zero due to the Webre to Richard Flowgate. Upgrades for these facilities cannot be completed by 6/1/02.

The KCPL to WFEC 100MW transfer is limited to zero ATC on one or more facilities, and the time frame of the limitation is such that facilities cannot be upgraded; therefore, the request for yearly service from KCPL to WFEC must be refused.

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 –1.0
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