SPP Southwest Power Pool

System Impact Study SPP-2001-162
For Transmission Service
Requested By
AEPW Marketing

From CLEC to AEPW

For a Reserved Amount Of 50MW
From 6/1/01
To 9/1/01

SPP Transmission Planning

Table of Contents

1. Executive Summary

AEPW Marketing has requested a system impact study for Monthly Firm transmission service from CLEC to AEPW. The period of the transaction is from 6/1/01 to 9/1/01. The request is for reservation 247719 for the amount of 50MW.

The 50MW transaction from CLEC to AEPW has a positive response on the Fort Smith 500/161kV Tr, Fort Smith 500/345kV Tr flowgate and the Muskogee to Clarksville, Muskogee to Riverside Station flowgate. The impact of this transfer on the Fort Smith 500/161kV transformer will cause an overload for the loss Fort Smith 500/345kV transformer during the time period of this request. The impact of this transfer on the Muskogee to Clarksville, 345kV line will cause an overload for the loss of the Muskogee to Riverside Station, 345kV line during the time period of this request. To provide the ATC that is necessary for this transfer, the impact on these flowgates must be relieved.

It has been determined that there is not sufficient time available to complete any upgrades to the system that would relieve these flowgates.

Redispatch was looked at as an option to relieving the impact on the Fort Smith 500/161kV Tr, Fort Smith 500/345kV Tr and Muskogee to Clarksville, Muskogee to Riverside Station flowgates caused by the 50MW transfer.

The Transmission Owners were given the opportunity to participate in the redispatch of their generation resources in order to relieve a system constraint caused by a transfer. Those companies owning units, which through increasing or decreasing generation will relieve the impact on the Fort Smith 500/161kV Tr, Fort Smith 500/345kV Tr and Muskogee to Clarksville, Muskogee to Riverside Station flowgates, declined to participate in redispatching. There are no additional options available to relieve the impact on these flowgates caused by the 50MW CLEC to AEPW transfer.

2. Introduction

AEPW Marketing has requested an impact study for transmission service from CLEC control area with a sink of AEPW.

The Fort Smith 500/161kV Tr, Fort Smith 500/345kV Tr flowgate has been identified as a limiting constraint for the CLEC to AEPW transfer. For this flowgate, the Fort Smith 500/161kV transformer is monitored during the loss of the Fort Smith 500/345kV transformer. It has been determined that the 50MW transfer from CLEC to AEPW will cause the 500/161kV transformer to overload should the loss of the 500/345kV transformer occur.

The 50MW transfer is also limited by the Muskogee to Clarksville, Muskogee to Riverside Station flowgate. For this flowgate, the Muskogee to Clarksville, 345kV line is monitored during the loss of the Muskogee to Riverside Station, 345kV line. The CLEC to AEPW transfer will cause Muskogee to Clarksville to overload during the Muskogee to Riverside Station outage.

There are no facility upgrades available to relieve these flowgates that can be completed in the time period available. This impact study reviews redispatch as an option to relieving the transmission restraints.

3. Study Methodology

A. Description

Southwest Power Pool used the NERC Generator Sensitivity Factor (GSF) Viewer to obtain possible unit pairings that would relieve the constraint. The GSF viewer calculates impacts on monitored facilities for all units above 20MW in the Eastern Interconnection. The Fort Smith 500/161kV Tr, Fort Smith 500/345kV Tr and Muskogee to Clarksville, Muskogee to Riverside Station flowgates are included in the flowgate list.

B. Model Updates

The 2001 Southwest Power Pool Summer Peak model was used for the study. This model was updated to reflect the most current information available.

C. Transfer Analysis

Using the short-term calculator, the limiting constraint for the transfer is identified. The response factor of the transfer on that constraint is also determined.

4. Study Results

A. Study Analysis Results

NERC calculates shift factors on specified facilities for all generation units over 20MW in the Eastern Interconnection. NERC also provides a list of the Top 100 Relief pairs for a specified constraint. These generation shift factors were reviewed for impacts on the Fort Smith 500/161kV Tr, Fort Smith 500/345kV Tr flowgate and the Muskogee to Clarksville, Muskogee to Riverside Station flowgate for the redispatch assessment. SPP generators with both negative and positive impacts were available. Those with negative impacts would reduce transformer flows when unit output in increased. The generators with positive impacts would increase flows when unit output is increased and reduce flows when unit output is decreased. There are several redispatch options within SPP for pairing units with positive impacts to units with negative impacts.

The distribution factor on the Fort Smith 500/161kV Tr, Fort Smith 500/345kV Tr flowgate for the CLEC to AEPW transfer is 12.4%. A redispatch would be required to relieve the 6.2MW impact on the constraint under emergency conditions.

The distribution factor on the Muskogee to Clarksville, Muskogee to Riverside Station flowgate for the CLEC to AEPW transfer is 10.5%. A redispatch would be required to relieve the 5.3MW impact on the constraint under emergency conditions.

Table 1 documents the SPP generators top 40 relief pairs for the Fort Smith 500/161kV Tr, Fort Smith 500/345kV Tr flowgate.

Table 2 documents the SPP generators top 40 relief pairs for the Muskogee to Clarksville, Muskogee to Riverside Station flowgate.

Table 1: Top 40 Relief Pairs of SPP Generators for Fort Smith 500/161kV Tr, Fort Smith 500/345kV Tr Flowgate

Source	Sink	Factor	Source	Sink	Factor	Source	Sink	Factor
OKGE_AES 2G13.8_1	SPA_GF #1 113.8_1	-43.7	OKGE_AES 2G13.8_1	SPA_GF #2 213.8_2	-43.7	OKGE_AES 1G13.8_1	SPA_GF #2 213.8_2	-43.7
OKGE_AES 1G13.8_1	CSWS_WELSH1-118.0_1	-36	SPA_RSK3&4 113.8_4	CSWS_WELSH1-118.0_1	-33.3	SPA_RSK3&4 113.8_4	SPA_DAR1&2 113.8_1	-33.6
SPA_RSK1&2 113.8_1	SPA_DAR1&2 113.8_1	-33.6	SPA_RSK1&2 113.8_1	CSWS_CONSTM1 13.8_1	-33.7	CSWS_L&D13 269.0_1	CSWS_CONSTM1 13.8_1	-32
CSWS_L&D13 269.0_1	CSWS_LONSTAR269.0_1	-32.2	CSWS_OZARK S269.0_1	CSWS_LONSTAR269.0_1	-24.3	CSWS_OZARK S269.0_1	CSWS_WILKE3-122.0_1	-24.6
SPA_OZK345 113.8_5	CSWS_WILKE3-122.0_1	-22.1	SPA_OZK345 113.8_5	CSWS_PIRKEY 123.4_1	-22.2	SPA_TEN1&2 113.8_2	CSWS_PIRKEY 123.4_1	-19
SPA_TEN1&2 113.8_2	CSWS_ESTGNC1 13.8_1	-19	SPA_WEB123 113.8_3	CSWS_ESTGNC1 13.8_1	-19	SPA_WEB123 113.8_3	CSWS_ESTGNA1 13.8_1	-19
SPA_EUF #1 113.8_1	CSWS_ESTGNA1 13.8_1	-18	SPA_EUF #1 113.8_1	CSWS_KNOXL4-113.8_1	-18.1	SPA_EUF #2 113.8_2	CSWS_KNOXL4-113.8_1	-17.8
SPA_EUF #2 113.8_2	CSWS_TENGAS 118.0_1	-18	OKGE_MUSKOG3G17.1_1	CSWS_TENGAS 118.0_1	-17.3	OKGE_MUSKOG3G17.1_1	CSWS_TENSTM 123.0_1	-17.3
OKGE_MUSKOG6G24.0_1	CSWS_TENSTM 123.0_1	-16.8	OKGE_MUSKOG6G24.0_1	CSWS_LIEBR3-113.8_1	-17.3	OKGE_MUSKOG5G18.0_1	CSWS_LIEBR3-113.8_1	-17.3
OKGE_MUSKOG5G18.0_1	CSWS_LIEBR2-113.8_1	-17.3	OKGE_MUSKOG4G18.0_1	CSWS_LIEBR2-113.8_1	-17.3	OKGE_MUSKOG4G18.0_1	CSWS_LIEBR1-113.8_1	-17.3
CSWS_COGEN 3 18.0_S	CSWS_LIEBR1-113.8_1	-14.9	CSWS_COGEN 3 18.0_S	CSWS_ARSHILL114.8_1	-15	CSWS_COGEN 3 18.0_G	CSWS_ARSHILL114.8_1	-15
CSWS_COGEN 3 18.0_G	CSWS_FULTGEN3 115_1	-16.2	CSWS_CALGT2-218.0_1	CSWS_FULTGEN3 115_1	-16	CSWS_CALGT2-218.0_1	SPA_SIKGEN 113.8_1	-16
CSWS_CALGT2-118.0_1	SPA_SIKGEN 113.8_1	-16	CSWS_CALSTM 218.0_1	SPA_SIKGEN 113.8_1	-16	CSWS_CALGT2-118.0_1	SPA_KENNETT269.0_1	-16.8
CSWS_CALSTM 218.0_1	SPA_KENNETT269.0_1	-16.8						

Table 2: Top 40 Relief Pairs of SPP Generators for Muskogee to Clarksville, Muskogee to Riverside Station Flowgate

Source	Sink	Factor	Source	Sink	Factor	Source	Sink	Factor
CSWS_CALSTM 118.0_1	OKGE_MUSKOG6G24.0_1	-68.1	CSWS_CALGT1-118.0_1	OKGE_MUSKOG6G24.0_1	-68.1	CSWS_CALGT1-218.0_1	OKGE_MUSKOG6G24.0_1	-68.1
CSWS_CALSTM 218.0_1	OKGE_MUSKOG6G24.0_1	-68.1	CSWS_CALGT2-118.0_1	OKGE_MUSKOG6G24.0_1	-68.1	CSWS_CALGT2-218.0_1	OKGE_MUSKOG6G24.0_1	-68.1
CSWS_CALSTM 118.0_1	OKGE_MUSKOG5G18.0_1	-68.1	CSWS_CALGT1-118.0_1	OKGE_MUSKOG5G18.0_1	-68.1	CSWS_CALGT1-218.0_1	OKGE_MUSKOG5G18.0_1	-68.1
CSWS_CALSTM 218.0_1	OKGE_MUSKOG5G18.0_1	-68.1	CSWS_CALGT2-118.0_1	OKGE_MUSKOG5G18.0_1	-68.1	CSWS_CALGT2-218.0_1	OKGE_MUSKOG5G18.0_1	-68.1
CSWS_CALSTM 118.0_1	OKGE_MUSKOG4G18.0_1	-68.1	CSWS_CALGT1-118.0_1	OKGE_MUSKOG4G18.0_1	-68.1	CSWS_CALGT1-218.0_1	OKGE_MUSKOG4G18.0_1	-68.1
CSWS_CALSTM 218.0_1	OKGE_MUSKOG4G18.0_1	-68.1	CSWS_CALGT2-118.0_1	OKGE_MUSKOG4G18.0_1	-68.1	CSWS_CALGT2-218.0_1	OKGE_MUSKOG4G18.0_1	-68.1
CSWS_COGEN 2 18.0_G	OKGE_MUSKOG6G24.0_1	-63.1	CSWS_COGEN 2 18.0_S	OKGE_MUSKOG6G24.0_1	-63.1	CSWS_COGEN 3 18.0_G	OKGE_MUSKOG6G24.0_1	-63.1
CSWS_COGEN 3 18.0_S	OKGE_MUSKOG6G24.0_1	-63.1	CSWS_COGEN 2 18.0_G	OKGE_MUSKOG5G18.0_1	-63.1	CSWS_COGEN 2 18.0_S	OKGE_MUSKOG5G18.0_1	-63.1
CSWS_COGEN 3 18.0_G	OKGE_MUSKOG5G18.0_1	-63.1	CSWS_COGEN 3 18.0_S	OKGE_MUSKOG5G18.0_1	-63.1	CSWS_COGEN 2 18.0_G	OKGE_MUSKOG4G18.0_1	-63.1
CSWS_COGEN 2 18.0_S	OKGE_MUSKOG4G18.0_1	-63.1	CSWS_COGEN 3 18.0_G	OKGE_MUSKOG4G18.0_1	-63.1	CSWS_COGEN 3 18.0_S	OKGE_MUSKOG4G18.0_1	-63.1
CSWS_CALSTM 118.0_1	OKGE_MUSKOG3G17.1_1	-40.4	CSWS_CALGT1-118.0_1	OKGE_MUSKOG3G17.1_1	-40.4	CSWS_CALGT1-218.0_1	OKGE_MUSKOG3G17.1_1	-40.4
CSWS_CALSTM 218.0_1	OKGE_MUSKOG3G17.1_1	-40.4	CSWS_CALGT2-118.0_1	OKGE_MUSKOG3G17.1_1	-40.4	CSWS_CALGT2-218.0_1	OKGE_MUSKOG3G17.1_1	-40.4
CSWS_CALSTM 118.0_1	OKGE_AES 2G13.8_1	-40.1	CSWS_CALGT1-118.0_1	OKGE_AES 2G13.8_1	-40.1	CSWS_CALGT1-218.0_1	OKGE_AES 2G13.8_1	-40.1
CSWS_CALSTM 218.0_1	OKGE_AES 2G13.8_1	-40.1						

5. Conclusion

The Transmission Owners were given the opportunity to include their units for redispatch in order to provide relief on the flowgates impacted by a certain transaction. The participants owning units that would relieve the flowgate impacted by the 50MW CLEC to AEPW transfer declined to participate in the redispatch of those units. No other options are available to provide the capacity needed for the 50MW transfer. Therefore the request for monthly service from CLEC to AEPW must be refused due to the impact on the Fort Smith 500/161kV Tr, Fort Smith 500/345kV Tr and Muskogee to Clarksville, Muskogee to Riverside Station flowgates.