SPP Southwest Power Pool

System Impact Study
SPP-2005-164
For Transmission Service
Requested By:
American Electric Power

From AEPW to AEPW

For a Reserved Amount Of
65 MW
From 09/12/05
To 09/13/05

SPP Transmission Planning

1. Executive Summary

American Electric Power has requested a system impact study for monthly firm transmission service from AEPW to AEPW. The period of the transaction is from 09/12/05 to 09/13/05. The request is for reservations 962194 for the amount of 65 MW.

The 65 MW transaction from AEPW to AEPW has an impact on the following flowgate with no AFC: DANMAGANOFTS, MUSCLAMUSRSS, NWTPATLYDVAL, PITSEMPITSUM, and TUPTUPVALPIT. To provide the AFC necessary for this transfer, the impact on these flowgates must be relieved.

After studying many scenarios using curtailment of reservations and generation redispatch, there are several feasible scenarios that will relieve the flowgate(s) in question.

2. Introduction

American Electric Power has requested a system impact study for transmission service from AEPW to AEPW.

There are five constrained flowgates that requires relief in order for this reservation to be accepted. The flowgate and the explanation is as follows:

- DANMAGANOFTS: Danville to Magazine Rec 161 kV line for the loss of Arkansas Nuclear One to Fort Smith 500 KV line

- MUSCLAMUSRSS: Muskogee to Clarksville 345 kV line for the loss of Muskogee to Riverside Station 345 kV line

- NTWPATLYDVAL- Northwest Texarkana to Patterson 138 kV line for the loss of the Lydia to Valliant 345 kV line.

- PITSEMPITSUN- Pittsburg to Seminole 345 kV line for the loss of the Pittsburg to Sunnyside 345 kV line

- TUPTUPVALPIT- Tupelo to Tupelo Tap 138 kV line for the loss of the Valliant to Pittsburg 345 kV line

3. Study Methodology

A. Description

Southwest Power Pool used Managing and Utilizing System Transmission (MUST) to obtain possible unit pairings that would relieve the constraint. MUST calculates impacts on monitored facilities for all units within the Southwest Power Pool Footprint. The SPP ATC Calculator is used to determine response factors for the time period of the reservation.

B. Model Updates

The 2005 Southwest Power Pool 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 constraints for the transfer are identified. The response factor of the transfer on each constraint is also determined.

The product of the transfer amount and the response factor is the impact of a transfer on a limiting flowgate that must be relieved. With multiple flowgates affected by a transfer, relief of the largest impact may also provide relief of smaller impacts.

Using Managing and Utilizing System Transmission (MUST), specific generator pairs are chosen to reflect the units available for redispatch. The quotient of the amount of impact that must be relieved and the generation sensitivity factor calculated by MUST is the amount of redispatch necessary to relieve the impact on the affected flowgate.

4. Study Results

After studying the impacts of requests 962194, five flowgates require relief. The flowgates and associated amount of relief is as follows:

Table 1

Flowgates	Sensitivity (%)	Duration	Required Relief (MW)
DANMAGANOFTS	4.1	September 12	3
MUSCLAMUSRSS	17.8	September 12	12
NWTPATLYDVAL	14.9	September 12	10
PITSEMPITSUN	17.9	September 12	12
TUPTUPVALPIT	4.5	September 12	3

Table 2 displays a list of generator pairs that are possible relief options for the flowgates in question.

Table 2

Source	Sink	DANMAGANOFTS Sensitivity (%)	MUSCLAMUSRSS Sensitivity (%)	NWTPATLYDVAL Sensitivity (%)
SWS (AEPW)	Wilkes (AEPW)	4.3	7	15
RSS (AEPW)	Welsh (AEPW)	5.2	24	16.2
NES (AEPW)	Welsh (AEPW)	4.7	21.6	16
NES (AEPW)	Wilkes (AEPW)	4.9	21.4	13.6
RSS (AEPW)	Wilkes (AEPW)	5.5	24	13.9

Table 3 displays a list of generator pairs that are possible relief options for the flowgates in question.

Table 3

Source	Sink	PITSEMPITSUN Sensitivity (%)	TUPTUPVALPIT Sensitivity (%)
SWS (AEPW)	Wilkes (AEPW)	35	11.3
RSS (AEPW)	Welsh (AEPW)	19.7	4.7
NES (AEPW)	Welsh (AEPW)	19.5	4.86
NES (AEPW)	Wilkes (AEPW)	18.2	4.6
RSS (AEPW)	Wilkes (AEPW)	18.4	4.4

Table 4 displays the amount of redispatch capacity necessary for each generator pair.

Table 4

Source	Sink	DANMAGANOFTS Sensitivity (MW)	MUSCLAMUSRSS Sensitivity (MW)	NWTPATLYDVAL Sensitivity (MW)
SWS (AEPW)	Wilkes (AEPW)	63	166	65
RSS (AEPW)	Welsh (AEPW)	52	49	60
NES (AEPW)	Welsh (AEPW)	58	54	61
NES (AEPW)	Wilkes (AEPW)	55	54	72
RSS (AEPW)	Wilkes (AEPW)	49	49	70

Table 5 displays the amount of redispatch capacity necessary for each generator pair.

Table 5

Source	Sink	PITSEMPITSUN Sensitivity (MW)	TUPTUPVALPIT Sensitivity (MW)
SWS (AEPW)	Wilkes (AEPW)	34	25
RSS (AEPW)	Welsh (AEPW)	59	57
NES (AEPW)	Welsh (AEPW)	60	55
NES (AEPW)	Wilkes (AEPW)	65	58
RSS (AEPW)	Wilkes (AEPW)	63	61

5. Conclusion

Reservation curtailment and generation redispatch options were studied in order to relieve the necessary constraint. The results of this study shows that the constraints on the flowgates in question could be relieved by executing one or more of the options described in the Study Results section of this document. Before the Transmission Provider accepts the reservations, proof of the necessary relief options must be presented to Southwest Power Pool. Noncompliance with this guideline will result in the refusal of the reservation.