



SPP

*Southwest
Power Pool*

***System Impact Study
SPP-2005-253
For Transmission Service
Requested By:
American Electric Power***

From AEPW to AEPW

***For a Reserved Amount Of
205 MW
From 12/21/05
To 12/22/05***

SPP Transmission Planning

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1. Executive Summary

American Electric Power has requested a system impact study for daily firm transmission service from AEPW to AEPW. The period of the transaction is from 12/21/05 to 12/22/05. The request is for reservations 1015581 for the amount of 205 MW.

The 205 MW transaction from AEPW to AEPW has an impact on the following flowgate with no AFC: DANMAGANOFTS, FTSXFR500345, MUSCLAMUSRSS, NWTPATLYDVAL, PECXFRMUSCLA, PITSEMPITSUN, 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 seven constrained flowgates that requires relief in order for this reservation to be accepted. The flowgates and the explanations are as follows:

- DANMAGANOFTS: Dansville to Magazine Rec161 kV line for the loss of Arkansas Nuclear One to Fort Smith 500 kV line
- FTSXFR500345: Fort Smith 500/161 kV XFR for the loss of Fort Smith 500/345 kV XFR
- MUSCLAMUSRSS: Muskogee to Clarksville 345 kV line for the loss of Muskogee to Riverside Station 345 kV line
- NWTPATLYDVAL: North West Texarkana to Patterson 138 kV line for the loss of Lydia to Valliant 345 kV line
- PECXFRMUSCLA: Pecan 345/161 kV XFR for the loss of Muskogee to Clarksville 345 kV line
- PITSEMPITSUN: Pittsburg to Seminole 345 kV line for the loss of Pittsburg to Sunnyside 345 kV line
- TUPTUPVALPIT: Tupelo to Tupelo Tap 138 kV line for the loss of 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 1015581, seven flowgates require relief. The flowgates and associated amount of relief is as follows:

Table 1

Flowgates	Sensitivity (%)	Duration	Required Relief (MW)
DANMAGANOFTS	4.4	December 21	4
FTSXFR500345	6.6	December 21	6
MUSCLAMUSRSS	16.2	December 21	15
NWTPATLYDVAL	13.2	December 21	13
PECXFRMUSCLA	3.7	December 21	4
PITSEMPITSUN	17.6	December 21	17
TUPTUPVALPIT	4.6	December 21	4

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

Table 2

Source	Sink	DANMAGANOFTS Sensitivity (%)	FTSXFR500345 Sensitivity (%)	MUSCLAMUSRSS Sensitivity (%)	NWTPATLYDVAL Sensitivity (%)
SWS (AEPW)	Wilkes (AEPW)	4.3	6.5	6.9	15.3
SWS (AEPW)	Welsh (AEPW)	3.9	6	7	17.2
NES (AEPW)	Welsh (AEPW)	4.7	7.1	21	15.8
NES (AEPW)	Wilkes (AEPW)	5	7.5	21	13.9
RSS (AEPW)	Wilkes (AEPW)	5.5	8.2	23.3	14.2
RSS (AEPW)	Welsh (AEPW)	5.2	7.8	23.4	16.1
NES (AEPW)	Knox Lee (AEPW)	5	7.7	20.9	13.7

Source	Sink	PECXFRMUSCLA Sensitivity (%)	PITSEMPITSUN Sensitivity (%)	TUPTUPVALPIT Sensitivity (%)
SWS (AEPW)	Wilkes (AEPW)	-	34.3	11.3
SWS (AEPW)	Welsh (AEPW)	-	35.5	11.5
NES (AEPW)	Welsh (AEPW)	4.0	19.4	4.6
NES (AEPW)	Wilkes (AEPW)	3.9	18.2	4.4
RSS (AEPW)	Wilkes (AEPW)	2.5	18.5	4.2
RSS (AEPW)	Welsh (AEPW)	2.5	19.7	4.4
NES (AEPW)	Knox Lee(AEPW)	3.8	17.7	4.2

Table 3 displays the amount of redispatch capacity necessary for each generator pair.

Table 3

Source	Sink	DANMAGANOF TS Relief Amount (MW)	FTSXFR500345 Relief Amount (MW)	MUSCLAMUSRSS Relief Amount (MW)	NWTPATLYDVAL Relief Amount (MW)
SWS (AEPW)	Wilkes (AEPW)	210	208	481	177
SWS (AEPW)	Welsh (AEPW)	231	226	474	157
NES (AEPW)	Welsh (AEPW)	192	191	158	171
NES (AEPW)	Wilkes (AEPW)	180	180	158	195
RSS (AEPW)	Wilkes (AEPW)	164	165	143	191
RSS (AEPW)	Welsh (AEPW)	173	173	142	168
NES (AEPW)	Knox Lee (AEPW)	180	176	159	198

Source	Sink	PECXFRMUSCLA Relief Amount (MW)	PITSEMPITUN Relief Amount (MW)	TUPTUPVALPIT Relief Amount (MW)
SWS (AEPW)	Wilkes (AEPW)	-	105	83
SWS (AEPW)	Welsh (AEPW)	-	102	82
NES (AEPW)	Welsh (AEPW)	190	186	205
NES (AEPW)	Wilkes (AEPW)	194	198	214
RSS (AEPW)	Wilkes (AEPW)	303	195	225
RSS (AEPW)	Welsh (AEPW)	303	183	214
NES (AEPW)	Knox Lee (AEPW)	200	204	225

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.