



**SPP**

*Southwest  
Power Pool*

***System Impact Study  
SPP-2005-244  
For Transmission Service  
Requested By:  
American Electric Power***

***From AEPW to AEPW***

***For a Reserved Amount Of  
205 MW  
From 12/12/05  
To 12/13/05***

# ***SPP Transmission Planning***

<b>1. EXECUTIVE SUMMARY .....</b>	<b>4</b>
<b>2. INTRODUCTION .....</b>	<b>5</b>
<b>3. STUDY METHODOLOGY.....</b>	<b>7</b>
A. DESCRIPTION .....	7
B. MODEL UPDATES .....	7
C. TRANSFER ANALYSIS .....	8
<b>4. STUDY RESULTS .....</b>	<b>9</b>
<b>5. CONCLUSION.....</b>	<b>15</b>

## **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 12/12/05 to 12/13/05. The request is for reservations 1008757 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, 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 five 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
- 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 1008757, five flowgates require relief. The flowgates and associated amount of relief is as follows:

**Table 1**

<b>Flowgates</b>	<b>Sensitivity (%)</b>	<b>Duration</b>	<b>Required Relief (MW)</b>
DANMAGANOFTS	4.2	December 12	9
FTSXFR500345	6.9	December 12	15
MUSCLAMUSRSS	17.3	December 12	36
PITSEMPITSUN	17.7	December 12	37
TUPTUPVALPIT	4.6	December 12	10

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 (%)
SWS (AEPW)	Wilkes (AEPW)	4.3	6.5	6.9
SWS (AEPW)	Welsh (AEPW)	3.9	6.0	7
NES (AEPW)	Welsh (AEPW)	4.7	7.2	21.6
NES (AEPW)	Wilkes (AEPW)	5	7.7	21.5
RSS (AEPW)	Wilkes (AEPW)	5.5	8.3	23.7
Wilkes (AEPW)	RSS (AEPW)	-	-	-
RSS (AEPW)	Welsh (AEPW)	5.2	7.8	23.8
Welsh (AEPW)	RSS (AEPW)	-	-	-

Source	Sink	PITSEMPITSUN Sensitivity (%)	TUPTUPVALPIT Sensitivity (%)
SWS (AEPW)	Wilkes (AEPW)	34.5	11.7
SWS (AEPW)	Welsh (AEPW)	35.8	12
NES (AEPW)	Welsh (AEPW)	19.3	4.6
NES (AEPW)	Wilkes (AEPW)	18	4.5
RSS (AEPW)	Wilkes (AEPW)	18.4	4
Wilkes (AEPW)	RSS (AEPW)	-	-
RSS (AEPW)	Welsh (AEPW)	19.6	4.3
Welsh (AEPW)	RSS (AEPW)	-	-

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

**Table 3**

Source	Sink	DANMAGANOFTS Sensitivity (MW)	FTSXFR500345 Sensitivity (MW)	MUSCLAMUSRSS Sensitivity (MW)
SWS (AEPW)	Wilkes (AEPW)	209	230	521
SWS (AEPW)	Welsh (AEPW)	230	250	514
NES (AEPW)	Welsh (AEPW)	191	208	166
NES (AEPW)	Wilkes (AEPW)	180	194	167
RSS (AEPW)	Wilkes (AEPW)	163	180	151
Wilkes (AEPW)	RSS (AEPW)	-	-	-
RSS (AEPW)	Welsh (AEPW)	173	192	151
Welsh (AEPW)	RSS (AEPW)	-	-	-

Source	Sink	PITSEMPITSUN Sensitivity (MW)	TUPTUPVALPIT Sensitivity (MW)
SWS (AEPW)	Wilkes (AEPW)	107	85
SWS (AEPW)	Welsh (AEPW)	103	83
NES (AEPW)	Welsh (AEPW)	191	217
NES (AEPW)	Wilkes (AEPW)	205	222
RSS (AEPW)	Wilkes (AEPW)	201	250
Wilkes (AEPW)	RSS (AEPW)	-	-
RSS (AEPW)	Welsh (AEPW)	188	232
Welsh (AEPW)	RSS (AEPW)	-	-

## **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.