



**SPP**

*Southwest  
Power Pool*

***System Impact Study  
SPP-2005-250  
For Transmission Service  
Requested By:  
American Electric Power***

***From AEPW to AEPW***

***For a Reserved Amount Of  
95 MW  
From 12/20/05  
To 12/21/05***

# ***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 12/20/05 to 12/21/05. The request is for reservations 1014912 for the amount of 95 MW.

The 95 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 1014912, 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 20	4
FTSXFR500345	6.6	December 20	6
MUSCLAMUSRSS	16.2	December 20	15
NWTPATLYDVAL	13.2	December 20	13
PECXFRMUSCLA	3.7	December 20	4
PITSEMPITSUN	17.6	December 20	17
TUPTUPVALPIT	4.6	December 20	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)	98	96	223	82
SWS (AEPW)	Welsh (AEPW)	108	105	220	73
NES (AEPW)	Welsh (AEPW)	90	88	73	79
NES (AEPW)	Wilkes (AEPW)	84	84	73	90
RSS (AEPW)	Wilkes (AEPW)	76	76	66	88
RSS (AEPW)	Welsh (AEPW)	81	80	66	78
NES (AEPW)	Knox Lee (AEPW)	84	82	74	92

Source	Sink	PECXFRMUSCLA Relief Amount (MW)	PITSEMPITUN Relief Amount (MW)	TUPTUPVALPIT Relief Amount (MW)
SWS (AEPW)	Wilkes (AEPW)	-	49	39
SWS (AEPW)	Welsh (AEPW)	-	47	38
NES (AEPW)	Welsh (AEPW)	88	86	95
NES (AEPW)	Wilkes (AEPW)	90	92	99
RSS (AEPW)	Wilkes (AEPW)	141	90	104
RSS (AEPW)	Welsh (AEPW)	141	85	99
NES (AEPW)	Knox Lee (AEPW)	93	95	105

## **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.