



**SPP**

*Southwest  
Power Pool*

***System Impact Study  
SPP-2005-083  
For Transmission Service  
Requested By:  
American Electric Power***

***From AEPW to AEPW***

***For a Reserved Amount Of  
79 MW  
From 07/13/05  
To 07/14/05***

# ***SPP Transmission Planning***

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## **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 07/13/05 to 07/14/05. The request is for reservation 922609 for the amount of 79 MW.

The 79 MW transaction from AEPW to AEPW has an impact on the following flowgates with no AFC: DANMAGANOFTS, MUSCLAMUYSRSS, NWTPATLYDVAL, 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 require relief in order for this reservation to be accepted. The flowgates and the explanations are 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
- NWTPATLYDVAL: Northwest Texarkana to Patterson 138 kV line for the loss of Lydia to Valiant 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 Valiant 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 request 922609, 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	3.4	July 13	3
MUSCLAMUSRSS	13.2	July 13	11
NWTPATLYDVAL	12.0	July 13	10
PITSEMPITSUN	14.7	July 13	12
TUPTUPVALPIT	3.7	July 13	3

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

**Table 2**

<b>Source</b>	<b>Sink</b>	<b>DANMAGANOFTS Sensitivity (%)</b>	<b>MUSCLAMUSRSS Sensitivity (%)</b>	<b>NWTPATLYDVAL Sensitivity (%)</b>
SWS (AEPW)	NES (AEPW)	-	-	-
NES (AEPW)	SWS (AEPW)	-	14.1	-
SWS (AEPW)	TPS (AEPW)	-	-	-
TPS (AEPW)	SWS (AEPW)	-	16.4	-
SWS (AEPW)	Wilkes (AEPW)	4.1	6.8	15.2
Wilkes (AEPW)	SWS (AEPW)	-	-	-
SWS (AEPW)	Welsh (AEPW)	4	7	17.1
Welsh (AEPW)	SWS (AEPW)	-	-	-
Welsh (AEPW)	NES (AEPW)	4.5	-	-
NES (AEPW)	Welsh (AEPW)	-	21.1	15.7
Wilkes (AEPW)	NES (AEPW)	-	-	-
NES (AEPW)	Wilkes (AEPW)	-	14.1	13.8
Anadarko (WFEC)	Hugo Power Plant (WFEC)	-	-	-

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

**Table 3**

Source	Sink	DANMAGANOFTS Sensitivity (MW)	MUSCLAMUSRSS Sensitivity (MW)	NWTPATLYDVAL Sensitivity (MW)
SWS (AEPW)	NES (AEPW)	-	-	-
NES (AEPW)	SWS (AEPW)	-	74	-
SWS (AEPW)	TPS (AEPW)	-	-	-
TPS (AEPW)	SWS (AEPW)	-	64	-
SWS (AEPW)	Wilkes (AEPW)	66	154	63
Wilkes (AEPW)	SWS (AEPW)	-	-	-
SWS (AEPW)	Welsh (AEPW)	68	149	56
Welsh (AEPW)	SWS (AEPW)	-	-	-
Welsh (AEPW)	NES (AEPW)	64	-	-
NES (AEPW)	Welsh (AEPW)	-	50	61
Wilkes (AEPW)	NES (AEPW)	-	-	-
NES (AEPW)	Wilkes (AEPW)	-	74	69
Anadarko (WFEC)	Hugo Power Plant (WFEC)	-	-	-

Table 4 displays a list of generator pairs that are possible relief options for the flowgates in question.

**Table 4**

Source	Sink	PITSEMPITSUN Sensitivity (%)	TUPTUPVALPIT Sensitivity (%)
SWS (AEPW)	NES (AEPW)	16.1	7
NES (AEPW)	SWS (AEPW)	-	-
SWS (AEPW)	TPS (AEPW)	15.8	7
TPS (AEPW)	SWS (AEPW)	-	-
SWS (AEPW)	Wilkes (AEPW)	34.1	11.2
Wilkes (AEPW)	SWS (AEPW)	-	-
SWS (AEPW)	Welsh (AEPW)	35.4	11.5
Welsh (AEPW)	SWS (AEPW)	-	-
Welsh (AEPW)	NES (AEPW)	-	-
NES (AEPW)	Welsh (AEPW)	19.4	4.5
Wilkes (AEPW)	NES (AEPW)	-	-
NES (AEPW)	Wilkes (AEPW)	18.1	4.3
Anadarko (WFEC)	Hugo Power Plant (WFEC)	30	17

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)	NES (AEPW)	72	42
NES (AEPW)	SWS (AEPW)	-	-
SWS (AEPW)	TPS (AEPW)	74	42
TPS (AEPW)	SWS (AEPW)	-	-
SWS (AEPW)	Wilkes (AEPW)	28	26
Wilkes (AEPW)	SWS (AEPW)	-	-
SWS (AEPW)	Welsh (AEPW)	27	26
Welsh (AEPW)	SWS (AEPW)		
Welsh (AEPW)	NES (AEPW)		
NES (AEPW)	Welsh (AEPW)	60	65
Wilkes (AEPW)	NES (AEPW)		
NES (AEPW)	Wilkes (AEPW)	65	68
Anadarko (WFEC)	Hugo Power Plant (WFEC)	39	18



## **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 one of these relief options must be presented to Southwest Power Pool. Noncompliance with this guideline will result in the refusal of the reservation.