



**SPP**

*Southwest  
Power Pool*

***System Impact Study  
SPP-2005-110  
For Transmission Service  
Requested By:  
American Electric Power***

***From AEPW to AEPW***

***For a Reserved Amount Of  
150 MW  
From 08/05/05  
To 08/06/05***

# ***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 08/05/05 to 08/06/05. The request is for reservation 939203 for the amount of 150 MW.

The 100 MW transaction from AEPW to AEPW has an impact on the following flowgates with no AFC: DANMAGANOFTS, HPPVALPITVAL, and REDARCREDARC. 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 three 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
- HPPVALPITVAL: Hugo Power Plant to Valliant 138 kV line for the loss of Pittsburg to Valliant 345 kV line
- REDARCREDARC: Redbud to Arcadia 345 kV line for the loss of Redbud to Arcadia 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 939203, three 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	4.4	August 3	7
HPPVALPITVAL	3.4	August 3	5
REDARCREDDARC	5.5	August 3	8

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>HPPVALPITVAL Sensitivity (%)</b>	<b>REDARCREDDARC Sensitivity (%)</b>
SWS (AEPW)	NES (AEPW)	-	-	19.4
NES (AEPW)	SWS (AEPW)	-	3	-
SWS (AEPW)	TPS (AEPW)	-	-	22
TPS (AEPW)	SWS (AEPW)	-	3	-
SWS (AEPW)	Wilkes (AEPW)	4.1	-	10.9
Wilkes (AEPW)	SWS (AEPW)	-	14.9	-
Welsh (AEPW)	RSS (AEPW)	-	13.3	12.1
RSS (AEPW)	Welsh (AEPW)	5	-	-
Welsh (AEPW)	NES (AEPW)	-	12.9	8.7
NES (AEPW)	Welsh (AEPW)	4.6	-	-
Wilkes (AEPW)	NES (AEPW)	-	11.8	8.4
NES (AEPW)	Wilkes (AEPW)	4.8	-	-
Wilkes (AEPW)	RSS (AEPW)	-	12.3	11.8
RSS (AEPW)	Wilkes (AEPW)	5.3	-	-

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

**Table 3**

Source	Sink	DANMAGANOFTS Sensitivity (MW)	HPPVALPITVAL Sensitivity (MW)	REDARCREDESC Sensitivity (MW)
SWS (AEPW)	NES (AEPW)	-	-	43
NES (AEPW)	SWS (AEPW)	-	170	-
SWS (AEPW)	TPS (AEPW)	-	-	38
TPS (AEPW)	SWS (AEPW)	-	170	-
SWS (AEPW)	Wilkes (AEPW)	161	-	76
Wilkes (AEPW)	SWS (AEPW)	-	35	-
Welsh (AEPW)	RSS (AEPW)	-	39	69
RSS (AEPW)	Welsh (AEPW)	132	-	-
Welsh (AEPW)	NES (AEPW)	-	40	95
NES (AEPW)	Welsh (AEPW)	144	-	-
Wilkes (AEPW)	NES (AEPW)	-	44	99
NES (AEPW)	Wilkes (AEPW)	138	-	-
Wilkes (AEPW)	RSS (AEPW)	-	42	70
RSS (AEPW)	Wilkes (AEPW)	125	-	-

## **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.