



**SPP**

*Southwest  
Power Pool*

***System Impact Study  
SPP-2006-055  
For Transmission Service  
Requested By:  
American Electric Power***

***From AEPW to AEPW***

***For a Reserved Amount Of  
100 MW  
From 04/23/06  
To 04/25/06***

# ***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 04/23/06 to 04/25/06. The request is for reservation 1069831 for the amount of 100 MW.

The 100 MW transaction from AEPW to AEPW has an impact on the following flowgates with no AFC: ELDLONVALLYD, REDAR2MUSPIT, VALLYDELDLON, ONEBANNESTUL, and CRAASHVALLYD. 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 their explanations are as follows:

- ELDLONVALLYD: Eldorado to Longwood 345 kV line for the loss of Valliant to Lydia 345 kV line
- REDAR2MUSPIT: Redbud to Arcadia 345 kV line for the loss of Muskogee to Pittsburg 345 kV line
- VALLYDELDLON: Valliant to Lydia 345 kV line for the loss of Eldorado to Longwood 345 kV line
- ONEBANNESTUL: Oneta to Broken Arrow 138 kV line for the loss of Northeast Station to Tulsa 345 kV
- CRAASHVALLYD: Craig Junction to Ashdown West 138 kV line for the loss of Valliant to Lydia 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 2006 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 impact of request 1069831, 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>
ELDLONVALLYD	8.9	April 23, 24	9
REDAR2MUSPIT	7.9	April 23, 24	8
VALLYDELDLON	11.9	April 23, 24	12
ONEBANNESTUL	7.6	April 23, 24	8
CRAASHVALLYD	3.4	April 23, 24	4

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>ELDLONVALLYD Sensitivity (%)</b>	<b>REDAR2MUSPIT Sensitivity (%)</b>	<b>VALLYDELDLON Sensitivity (%)</b>
Wilkes (AEPW)	SWS (AEPW)	38.4	-	53.3
Welsh (AEPW)	SWS (AEPW)	37.6	-	56.3
Welsh (AEPW)	NES (AEPW)	36.0	6.6	50.8
Wilkes (AEPW)	NES (AEPW)	39.9	6.3	47.9
Wilkes (AEPW)	RSS (AEPW)	39.7	8.0	48.8

<b>Source</b>	<b>Sink</b>	<b>ONEBANNESTUL Sensitivity (%)</b>	<b>CRAASHVALLYD Sensitivity (%)</b>
Wilkes (AEPW)	SWS (AEPW)	-	17.0
Welsh (AEPW)	SWS (AEPW)	-	17.2
Welsh (AEPW)	NES (AEPW)	2.5	14.5
Wilkes (AEPW)	NES (AEPW)	2.5	14.3
Wilkes (AEPW)	RSS (AEPW)	5.6	14.9

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

**Table 3**

Source	Sink	ELDLONVALLYD Relief (MW)	REDAR2MUSPIT Relief (MW)	VALLYDELDLON Relief (MW)
Wilkes (AEPW)	SWS (AEPW)	24	-	23
Welsh (AEPW)	SWS (AEPW)	24	-	22
Welsh (AEPW)	NES (AEPW)	25	122	24
Wilkes (AEPW)	NES (AEPW)	23	122	25
Wilkes (AEPW)	RSS (AEPW)	23	100	25

Source	Sink	ONEBANNESTUL Relief (MW)	CRAASHVALLYD Relief (MW)
Wilkes (AEPW)	SWS (AEPW)	-	24
Welsh (AEPW)	SWS (AEPW)	-	24
Welsh (AEPW)	NES (AEPW)	320	28
Wilkes (AEPW)	NES (AEPW)	320	28
Wilkes (AEPW)	RSS (AEPW)	143	27

## **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.