



**SPP**

*Southwest  
Power Pool*

***System Impact Study  
SPP-2007-018  
For Transmission Service  
Requested By:  
American Electric Power***

***From AEPW to AEPW***

***For a Reserved Amount Of  
19 MW  
From 6/01/07  
To 7/01/07***

# ***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 6/01/2007 to 7/01/2007. The request is for reservation 1276790 for the amount of 19 MW.

The 19 MW transaction from AEPW to AEPW has an impact on the following flowgates with no AFC: ELDLONVALLYD, FLCXFRFLCXFR, HPPVALPITVAL, PITVALELDLON, 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 five constrained flowgates that require relief in order for this reservation to be accepted. The flowgates and the explanations are as follows:

- ELDLONVALLYD: El Dorado to Longwood 345 kV line for the loss of Valliant to Lydia 345 kV line
- FLCXFRFLCXFR: Flint Creek 161/345 KV transformer for the loss of the second Flint Creek 161/345 KV transformer
- HPPVALPITVAL: Hugo to Valiant 138kV line for the loss of Pittsburg to Valiant 345kV line
- PITVALELDLON: Pittsburg to Valiant 345 kV line for the loss of El Dorado to Longwood 345 kV line.
- REDARCREDARC: Redbud to Arcadia 345 kV line for the loss of the second 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 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 impacts of request 1276790, 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	15.3	June	3
FLCXFRFLCXFR	4.6	June	9
HPPVALPITVAL	4.9	June	9
PITVALELDLON	16.9	June	3
REDARCREARC	11.0	June	2

Tables 2 and 3 in conjunction display a list of generator pairs that are possible relief options for the flowgates in question.

**Table 2**

Source	Sink	ELDLONVALLYD Sensitivity (%)	FLCXFRFLCXFR Sensitivity (%)	HPPVALPITVAL Sensitivity (%)
Welsh (AEPW)	NES (AEPW)	36.0	-	14.0
Wilkes (AEPW)	NES (AEPW)	39.9	-	13.6
Wilkes (AEPW)	SWS (AEPW)	38.4	-	16.7
Welsh (AEPW)	SWS (AEPW)	37.6	-	17.0
Wilkes (AEPW)	RSS (AEPW)	39.7	-	14.1
TPS (AEPW)	Lieberman (AEPW)	-	-	-
TPS (AEPW)	Arsenal Hill (AEPW)	-	-	-
TPS (AEPW)	Pirkey (AEPW)	-	-	-
TPS (AEPW)	Welsh (AEPW)	-	-	-
TPS (AEPW)	Commanche (AEPW)	-	-	-
TPS (AEPW)	NES (AEPW)	-	-	-
RSS (AEPW)	Arsenal Hill (AEPW)	-	-	-
RSS (AEPW)	Pirkey (AEPW)	-	-	-
RSS (AEPW)	Knox Lee (AEPW)	-	-	-
RSS (AEPW)	Wilkes (AEPW)	-	-	-
RSS (AEPW)	NES (AEPW)	-	-	-
Weleetka (AEPW)	NES (AEPW)	-	-	-
Weleetka (AEPW)	RSS (AEPW)	-	-	-
Weleetka (AEPW)	SWS (AEPW)	-	-	-
Weleetka (AEPW)	TPS (AEPW)	-	-	-
Flint Creek (AEPW)	NES (AEPW)	-	42.5	-
Flint Creek (AEPW)	TPS (AEPW)	-	40.7	-
Flint Creek (AEPW)	RSS (AEPW)	-	40.3	-
Flint Creek (AEPW)	SWS (AEPW)	-	40.2	-
Flint Creek (AEPW)	Arsenal Hill (AEPW)	-	39.8	-

**Table 3**

Source	Sink	PITVALELDLON Sensitivity (%)	REDARCREDARC Sensitivity (%)
Welsh (AEPW)	NES (AEPW)	44.4	7.1
Wilkes (AEPW)	NES (AEPW)	42.5	6.9
Wilkes (AEPW)	SWS (AEPW)	45.4	-
Welsh (AEPW)	SWS (AEPW)	47.3	-
Wilkes (AEPW)	RSS (AEPW)	42.3	11.0
TPS (AEPW)	Lieberman (AEPW)	-	-
TPS (AEPW)	Arsenal Hill (AEPW)	-	-
TPS (AEPW)	Pirkey (AEPW)	-	-
TPS (AEPW)	Welsh (AEPW)	-	-
TPS (AEPW)	Commanche (AEPW)	-	-
TPS (AEPW)	NES (AEPW)	-	-
RSS (AEPW)	Arsenal Hill (AEPW)	-	-
RSS (AEPW)	Pirkey (AEPW)	-	-
RSS (AEPW)	Knox Lee (AEPW)	-	-
RSS (AEPW)	Wilkes (AEPW)	-	-
RSS (AEPW)	NES (AEPW)	-	-
Weleetka (AEPW)	NES (AEPW)	-	4.9
Weleetka (AEPW)	RSS (AEPW)	-	9.0
Weleetka (AEPW)	SWS (AEPW)	-	-
Weleetka (AEPW)	TPS (AEPW)	-	8.0
SWS (AEPW)	OECSTM (AEPW)	-	20.1
Welsh (AEPW)	COGEN (AEPW)	-	19.2
Commanche (AEPW)	RSS (AEPW)	-	18.7

Tables 4 and 5 in conjunction display the amount of redispatch capacity necessary for each generator pair.

**Table 4**

Source	Sink	ELDLONVALLYD Relief (MW)	FLCXFRFLCXFR Relief (MW)	HPPVALPITVAL Relief (MW)
Welsh (AEPW)	NES (AEPW)	8	-	64
Wilkes (AEPW)	NES (AEPW)	8	-	64
Wilkes (AEPW)	SWS (AEPW)	8	-	54
Welsh (AEPW)	SWS (AEPW)	8	-	53
Wilkes (AEPW)	RSS (AEPW)	8	-	64
TPS (AEPW)	Lieberman (AEPW)	-	-	-
TPS (AEPW)	Arsenal Hill (AEPW)	-	-	-
TPS (AEPW)	Pirkey (AEPW)	-	-	-
TPS (AEPW)	Welsh (AEPW)	-	-	-
TPS (AEPW)	Commanche (AEPW)	-	-	-
TPS (AEPW)	NES (AEPW)	-	-	-
RSS (AEPW)	Arsenal Hill (AEPW)	-	-	-
RSS (AEPW)	Pirkey (AEPW)	-	-	-
RSS (AEPW)	Knox Lee (AEPW)	-	-	-
RSS (AEPW)	Wilkes (AEPW)	-	-	-
RSS (AEPW)	NES (AEPW)	-	-	-
Weleetka (AEPW)	NES (AEPW)	-	-	-
Weleetka (AEPW)	RSS (AEPW)	-	-	-
Weleetka (AEPW)	SWS (AEPW)	-	-	-
Weleetka (AEPW)	TPS (AEPW)	-	-	-
Flint Creek (AEPW)	NES (AEPW)	-	21	-
Flint Creek (AEPW)	TPS (AEPW)	-	22	-
Flint Creek (AEPW)	RSS (AEPW)	-	22	-
Flint Creek (AEPW)	SWS (AEPW)	-	22	-
Flint Creek (AEPW)	Arsenal Hill (AEPW)	-	23	-

**Table 5**

Source	Sink	PITVALELDLON Relief (MW)	REDARCREARC Relief (MW)
Welsh (AEPW)	NES (AEPW)	7	28
Wilkes (AEPW)	NES (AEPW)	7	29
Wilkes (AEPW)	SWS (AEPW)	7	-
Welsh (AEPW)	SWS (AEPW)	6	-
Wilkes (AEPW)	RSS (AEPW)	7	18
TPS (AEPW)	Lieberman (AEPW)	-	-
TPS (AEPW)	Arsenal Hill (AEPW)	-	-
TPS (AEPW)	Pirkey (AEPW)	-	-
TPS (AEPW)	Welsh (AEPW)	-	-
TPS (AEPW)	Commanche (AEPW)	-	-
TPS (AEPW)	NES (AEPW)	-	-
RSS (AEPW)	Arsenal Hill (AEPW)	-	-
RSS (AEPW)	Pirkey (AEPW)	-	-
RSS (AEPW)	Knox Lee (AEPW)	-	-
RSS (AEPW)	Wilkes (AEPW)	-	-
RSS (AEPW)	NES (AEPW)	-	-
Weleetka (AEPW)	NES (AEPW)	-	41
Weleetka (AEPW)	RSS (AEPW)	-	42
Weleetka (AEPW)	SWS (AEPW)	-	-
Weleetka (AEPW)	TPS (AEPW)	-	25
SWS (AEPW)	OECSTM (AEPW)	-	10
Welsh (AEPW)	COGEN (AEPW)	-	10
Commanche (AEPW)	RSS (AEPW)	-	11

## **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.