SPP Southwest Power Pool

# System Impact Study
# SPP-2005-089
# For Transmission Service
# Requested By:
# American Electric Power

## From AEPW to AEPW

## For a Reserved Amount Of
## 300 MW
## From 07/21/05
## To 07/22/05

# *SPP Transmission Planning*

## 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 07/21/05 to 07/22/05. The request is for reservation 928028 for the amount of 300 MW.

The 300 MW transaction from AEPW to AEPW has an impact on the following flowgates with no AFC: CRAASHVALLYD, ELDLONVALLYD, HPPVALPITVAL, REDACREDARC, RSSEXGSSPPRA, RSSEXGRIVRED, and RSSTPSTSS116. 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 require relief in order for this reservation to be accepted. The flowgates and the explanations are as follows:

- HPPVALPITVAL: Hugo Power Plant to Valiant 138 kV line for the loss of Pittsburg to Valiant 345 KV line

- RSSEXGSSPPRA: Riverside Station to Explorer Glenpool 138 kV line for the loss of Sand Springs to Prattville 138 kV line

- RSSOKMRSSEXP: Riverside Station to Okmulgee City 138 kV line for the loss of Riverside Station to Explorer Okmulgee 138 kV line

- RSSTPSRSS116: Riverside Station to Tulsa Power Station 138 kV line for the loss of Riverside Station to 116$^{th}$ Street and Peoria 138 kV line

- CRAASHVALLYD: Craig Junction to Ashdown 138KV line for the loss of Valiant – Lydia 345KV line

- ELDLONVALLYD: Eldorado to Longwood 345KV line for the loss of Valiant to Lydia 345KV line

- REDARCREDARC: Redbud to Arcadia 345/138 xfmr for the loss of Redbud to Arcadia 345/138 xfmr.

## 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 928028, seven flowgates require relief. The flowgates and associated amount of relief is as follows:

**Table 1**

| Flowgates | Sensitivity (%) | Duration | Required Relief (MW) |
|---|---|---|---|
| HPPVALPITVAL | 3.4 | July 21 | 11 |
| RSSEXGSSPPRA | 5.1 | July 21 | 16 |
| RSSOKMRSSEXP | 3.5 | July 21 | 11 |
| RSSTPSRSS116 | 8.1 | July 21 | 25 |
| CRAASHVALLYD | 4.1 | July 21 | 13 |
| ELDLONVALLYD | 11.5 | July 21 | 35 |
| REDARCREDARC | 7.2 | July 21 | 22 |

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

**Table 2**

| Source | Sink | HPPVALPITVAL Sensitivity (%) | RSSEXGSSPPRA Sensitivity (%) | RSSOKMRSSEXP Sensitivity (%) | RSSTPSRSS116 Sensitivity (%) |
|---|---|---|---|---|---|
| SWS (AEPW) | NES (AEPW) | - | 4.8 | 4.2 | - |
| NES (AEPW) | SWS (AEPW) | 3 | - | - | 3 |
| SWS (AEPW) | TPS (AEPW) | - | 9 | 6.7 | - |
| TPS (AEPW) | SWS (AEPW) | 3 | - | - | 19.1 |
| SWS (AEPW) | Wilkes (AEPW) | - | - | - | - |
| Wilkes (AEPW) | SWS (AEPW) | 15 | - | - | - |
| Welsh (AEPW) | RSS (AEPW) | - | 8.6 | 6.9 | 8.5 |
| Welsh (AEPW) | SWS (AEPW) | 16.1 | - | - | - |
| Welsh (AEPW) | NES (AEPW) | - | - | - | - |
| NES (AEPW) | Welsh (AEPW) | 13 | 3.2 | 3.4 | - |
| Wilkes (AEPW) | NES (AEPW) | 11.8 | 3.2 | 3.3 | - |
| Wilkes (AEPW) | RSS (AEPW) | - | 8.6 | 6.8 | 8.5 |
| Anadarko (WFEC) | Hugo (WFEC) | | | | |

| Source | Sink | CRAASHVALLYD Sensitivity (%) | ELDLONVALLYD Sensitivity (%) | REDARCREDARC Sensitivity (%) |
|---|---|---|---|---|
| SWS (AEPW) | NES (AEPW) | - | - | 18.8 |
| NES (AEPW) | SWS (AEPW) | - | - | - |
| SWS (AEPW) | TPS (AEPW) | - | - | 21.2 |
| TPS (AEPW) | SWS (AEPW) | - | - | - |
| SWS (AEPW) | Wilkes (AEPW) | - | - | - |
| Wilkes (AEPW) | SWS (AEPW) | 16.3 | 40.6 | - |
| Welsh (AEPW) | RSS (AEPW) | 16.8 | 41.8 | 23.4 |
| Welsh (AEPW) | SWS (AEPW) | 16.6 | 40.4 | - |
| Welsh (AEPW) | NES (AEPW) | 16.8 | 42.1 | - |
| NES (AEPW) | Welsh (AEPW) | - | - | 13.1 |
| Wilkes (AEPW) | NES (AEPW) | 16.2 | 42.4 | 12.5 |
| Wilkes (AEPW) | RSS (AEPW) | 16.2 | 41.1 | 22.2 |
| Anadarko (WFEC) | Hugo (WFEC) | - | | |

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

**Table 3**

| Source | Sink | HPPVALPITVAL Sensitivity (MW) | RSSEXGSSPPRA Sensitivity (MW) | RSSOKMRSSEXP Sensitivity (MW) | RSSTPSRSS116 Sensitivity (MW) |
|---|---|---|---|---|---|
| SWS (AEPW) | NES (AEPW) | - | 319 | 250 | - |
| NES (AEPW) | SWS (AEPW) | 340 | - | - | 810 |
| SWS (AEPW) | TPS (AEPW) | - | 170 | 157 | - |
| TPS (AEPW) | SWS (AEPW) | 340 | - | - | 127 |
| SWS (AEPW) | Wilkes (AEPW) | - | - | - | - |
| Wilkes (AEPW) | SWS (AEPW) | 68 | - | - | - |
| Welsh (AEPW) | RSS (AEPW) | - | 178 | 152 | 286 |
| Welsh (AEPW) | SWS (AEPW) | 63 | - | - | - |
| Welsh (AEPW) | NES (AEPW) | - | - | - | - |
| NES (AEPW) | Welsh (AEPW) | 78 | 478 | 309 | - |
| Wilkes (AEPW) | NES (AEPW) | 86 | 478 | 318 | - |
| Wilkes (AEPW) | RSS (AEPW) | - | 178 | 154 | 286 |
| Anadarko (WFEC) | Hugo (WFEC) | - | - | - | - |

| Source | Sink | CRAASHVALLYD Sensitivity (MW) | ELDLONVALLYD Sensitivity (MW) | REDARCREDARC Sensitivity (MW) |
|---|---|---|---|---|
| SWS (AEPW) | NES (AEPW) | - | - | 115 |
| NES (AEPW) | SWS (AEPW) | - | - | - |
| SWS (AEPW) | TPS (AEPW) | - | - | 101 |
| TPS (AEPW) | SWS (AEPW) | - | - | - |
| SWS (AEPW) | Wilkes (AEPW) | - | - | - |
| Wilkes (AEPW) | SWS (AEPW) | 75 | 85 | - |
| Welsh (AEPW) | RSS (AEPW) | 73 | 82 | 91 |
| Welsh (AEPW) | SWS (AEPW) | 74 | 85 | - |
| Welsh (AEPW) | NES (AEPW) | 73 | 82 | - |
| NES (AEPW) | Welsh (AEPW) | - | - | 165 |
| Wilkes (AEPW) | NES (AEPW) | 76 | 81 | 173 |
| Wilkes (AEPW) | RSS (AEPW) | 76 | 84 | 98 |
| Anadarko (WFEC) | Hugo (WFEC) | - | | |

## 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.