



**SPP** *Southwest  
Power Pool*

***System Impact Study  
SPP-2009-002  
For Transmission Service  
Requested By:  
American Electric Power***

***From Lebrock to AEPW***

***For a Reserved Amount Of  
50 MW  
From 04/01/09  
To 5/01/09***

## **1. Executive Summary**

American Electric Power has requested a system impact study for monthly firm transmission service from Lebrock to AEPW. The period of the transaction is from 4/1/2009 to 5/1/2009. The request is for reservation 1586385.

The 50 MW transaction from Lebrock to AEPW has an impact on the following flowgates with no AFC: DANMAGANOFTS, DOLXFRELDXFR, FTSXFR500345, FLCXFRFLCXFR, MUSCLAMUSRSS, NESTULNESONE, RUSDARANOFTS. To provide the AFC necessary for this transfer, the impact on these flowgates must be relieved.

After studying many scenarios using 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 Lebrock 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:

DANMAGANOFTS: Danville to Magazine Rec 161 kV line for the loss of Arkansas Nuclear One to Fort Smith 500 kV line.

DOLXFRELDXFR: Dolet Hills 345/230 transformer for the loss of El Dorado 345/500 transformer

FTSXFR500345: Fort Smith 500/161 transformer for the loss of Fort Smith 500/345 transformer

FLCXFRFLCXFR: Flint Creek 345/161 transformer for the loss of the second Flint Creek 345/161 transformer

MUSCLAMUSRSS: Muskogee to Clarksville 345 kV line for the loss of Muskogee to Riverside Station 345 kV line

NESTULNESONE: Northeast Station to Tulsa North 345 kV line for the loss of Northeast Station to Oneta 345 kV line.

RUSDARANOFTS: Russellville to Dardanelle 161 kV line for the loss of Arkansas Nuclear One to Fort Smith 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 2009 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 the request, seven flowgates require relief. The flowgates and associated amount of relief are as follows:

**Table 1**

<b>Flowgates</b>	<b>Sensitivity (%)</b>	<b>Duration</b>	<b>Required Relief (MW)</b>
DANMAGANOFTS	3.0	April 2009	1.5
DOLXFRELDXFR	10.0	April 2009	5.0
FTSXFR500345	5.0	April 2009	2.5
FLCXFRFLCXFR	6.0	April 2009	3.0
MUSCLAMUSRSS	10.0	April 2009	5.0
NESTULNESONE	3.0	April 2009	1.5
RUSDARANOFTS	6.0	April 2009	3.0

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	FTSXFR500345 Sensitivity (%)	MUSCLAMUSRSS Sensitivity (%)	DANMAGANOFTS Sensitivity (%)	DOLXFRELDXFR Sensitivity (%)
RSS (AEPW)	FULTON (AEPW)	19	12	7	2
TPS (AEPW)	FULTON (AEPW)	19	13	7	3
Weleetka (AEPW)	Arsenal Hill (AEPW)	19	7	7	18
TPS (AEPW)	Arsenal Hill (AEPW)	18	13	6	19
RSS (AEPW)	Lieberman (AEPW)	18	12	6	20
Weleetka (AEPW)	Knoxlee (AEPW)	17	7	6	16
Flint Creek (AEPW)	Fulton (AEPW)	17	20	6	3
Flint Creek (AEPW)	NES (AEPW)	1	6	-	-
Flint Creek (AEPW)	TPS (AEPW)	2	7	-	-

**Table 3**

Source	Sink	FLCXFRFLCXFR Sensitivity (%)	RUSDARANOFTS Sensitivity (%)	NESTULNESONE Sensitivity (%)
RSS (AEPW)	FULTON (AEPW)	-	10	10
TPS (AEPW)	FULTON (AEPW)	-	10	10
Weleetka (AEPW)	Arsenal Hill (AEPW)	-	10	6
TPS (AEPW)	Arsenal Hill (AEPW)	-	10	10
RSS (AEPW)	Lieberman (AEPW)	-	10	10
Weleetka (AEPW)	Knoxlee (AEPW)	-	10	3
Flint Creek (AEPW)	Fulton (AEPW)	39	10	4
Flint Creek (AEPW)	NES (AEPW)	41	-	4
Flint Creek (AEPW)	TPS (AEPW)	39	-	6

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

**Table 4**

Source	Sink	FTSXFR500345 Relief (MW)	MUSCLAMUSRSS Relief (MW)	DANMAGANOFTS Relief (MW)	DOLXFRELDXFR Relief (MW)
RSS (AEPW)	FULTON (AEPW)	8	42	36	150
TPS (AEPW)	FULTON (AEPW)	8	38	36	100
Weleetka (AEPW)	Arsenal Hill (AEPW)	8	71	36	17
TPS (AEPW)	Arsenal Hill (AEPW)	8	38	42	16
RSS (AEPW)	Lieberman (AEPW)	8	42	42	15
Weleetka (AEPW)	Knoxlee (AEPW)	8	71	42	19
Flint Creek (AEPW)	Fulton (AEPW)	8	25	42	100
Flint Creek (AEPW)	NES (AEPW)	150	83	-	-
Flint Creek (AEPW)	TPS (AEPW)	75	71	-	-

**Table 5**

Source	Sink	FLCXFRFLCXFR Relief (MW)	RUSDARANOFTS Relief (MW)	NESTULNESONE Relief (MW)
RSS (AEPW)	FULTON (AEPW)	-	15	30
TPS (AEPW)	FULTON (AEPW)	-	15	30
Weleetka (AEPW)	Arsenal Hill (AEPW)	-	15	50
TPS (AEPW)	Arsenal Hill (AEPW)	-	15	30
RSS (AEPW)	Lieberman (AEPW)	-	15	30
Weleetka (AEPW)	Knoxlee (AEPW)	-	15	100
Flint Creek (AEPW)	Fulton (AEPW)	13	15	75
Flint Creek (AEPW)	NES (AEPW)	12	-	75
Flint Creek (AEPW)	TPS (AEPW)	13	-	50

## **5. Conclusion**

Generation redispatch options were studied in order to relieve the necessary constraints. 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.