



SPP *Southwest
Power Pool*

***System Impact Study
SPP-2011-004
For Transmission Service
Requested By:
AEPM***

From EES to CSWS

***For a Reserved Amount Of
250 MW
From 12/06/2011
To 10/05/2012***

1. Executive Summary

AEPM has requested a system impact study for monthly firm transmission service from EES to CSWS (Source: EES Sink: CSWS). The period of the transaction is from 12/6/2011 to 10/5/2012. The request is for reservation 76028511.

The 250 MW transaction from CSWS has an impact on the following flowgates with no AFC: LACNEOLANWIC, NESONENESTUL, WDRCIMSPRNRW, IASCLKNASJHA, FLCXFRFLCXFR, RUSDARANOFTS, and NESTULNESONE. To provide the AFC necessary for this transfer, the impact on these flowgates must be relieved.

2. Introduction

AEPM has requested a system impact study for transmission service from EES to CSWS.

There are seven constrained flowgates that require relief. The flowgates and the explanations are as follows:

- LACNEOLANWIC: Lacygne to Neosho 345 kV line for the loss of Lang to Wichita 345 kV line.

NESONENESTUL: Northeastern Station to Oneta 345 kV line for the loss of Northeastern Station to Tulsa North 345 kV line.
- WDRCIMSPRNRW: Woodring to Cimarron 345 kV line for the loss of Spring Creek to Northwest Station 345 kV line.
- FLCXFRFLCXFR: Flint Creek 345/161 kV transformer 1 for the loss of Flint Creek transformer 2.
- RUSDARANOFTS: Russellville to Dardanelle 161 kV for the loss of ANO to Fort Smith 500 kV line
- IASCLKNASJHA: Iatan to Stranger Creek 345 kV line for the loss of Lake Road to Nashua 161 kV line and St. Joe to Hawthorn 345 kV line.
- NESTULNESONE: Northeast Station to Tulsa North 345 kV line for the loss of Northeast Station to Oneta 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 2011 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

Flowgates	Duration	Required Relief (MW)
LACNEOLANWIC	12/6/11 – 10/5/12	9.1
NESONENESTUL	12/6/11 – 10/5/12	12.4
WDRCIMSPRNRW	12/6/11 – 10/5/12	9.4
FLCXFRFLXXFR	12/6/11 – 10/5/12	11.5
RUSDARANOFTS	12/6/11 – 10/5/12	23.9
IASCLKNASJHA	12/6/11 – 10/5/12	7.9
NESTULNESONE	12/6/11 – 10/5/12	13.8

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

Table 2

LACNEOLANWIC							
Increment Units	Decrement Units						
	Dolet Hills	Arsenal Hill	Lieberman	Fulton	Knox Lee	Pirkey	Wilkes
NE_Coal	0.087	0.085	0.085	0.085	0.084	0.084	0.083
NE_Gas	0.067	0.066	0.065	0.065	0.064	0.064	0.064
Flint Creek	0.058	0.056	0.056	0.056	0.055	0.055	0.054
Tulsa_PS	0.057	0.055	0.055	0.055	0.054	0.054	0.053
Mattison	0.056	0.055	0.054	0.054	0.053	0.053	0.053
NESONENESTUL							
Increment Units	Decrement Units						
	NE_Coal	Dolet Hills	Fulton	Arsenal Hill	Lieberman	Knox Lee	Pirkey
Riverside	0.724	0.103	0.101	0.101	0.100	0.098	0.098
Tulsa_PS	0.722	0.101	0.098	0.098	0.098	0.096	0.096
Weleetka	0.680	0.060	0.057	0.057	0.057	0.054	0.054
Elkins	0.660	0.040	0.037	0.037	0.036	0.034	0.034
Mattison	0.660	0.040	0.037	0.037	0.036	0.034	0.034
WDRCIMSPRNRW							
Increment Units	Decrement Units						
	NE_Gas	Flint Creek	NE_Coal	Mattison	Elkins	Fitzhugh	Tulsa_PS
Comanche	0.161	0.157	0.156	0.153	0.153	0.140	0.131
SW_Sta	0.150	0.146	0.145	0.142	0.142	0.130	0.121
Weleetka	0.072	0.068	0.067	0.064	0.064	0.052	0.042
Narrows	0.059	0.055	0.053	0.051	0.050	0.038	0.029
Welsh	0.053	0.049	0.048	0.045	0.045	0.033	0.024
IASCLKNASJHA							
Increment Units	Decrement Units						
	Dolet Hills	Arsenal Hill	Fulton	Lieberman	Knox Lee	Pirkey	Wilkes
NE_Coal	0.043	0.040	0.040	0.040	0.039	0.038	0.038
NE_Gas	0.040	0.038	0.038	0.038	0.036	0.036	0.036
Tulsa_PS	0.037	0.035	0.035	0.034	0.033	0.033	0.032
Riverside	0.036	0.034	0.034	0.034	0.033	0.032	0.032
SW_Sta	0.035	0.033	0.033	0.032	0.031	0.031	0.030

FLCXFRFLCXFR							
Increment Units	Decrement Units						
	NE_Gas	NE_Coal	Dolet Hills	Arsenal Hill	Fulton	Lieberman	Knox Lee
Flint Creek	0.420	0.411	0.401	0.400	0.400	0.400	0.400
Mattison	0.317	0.308	0.299	0.298	0.298	0.298	0.298
Elkins	0.316	0.307	0.297	0.297	0.297	0.297	0.296
RUSDARANOFTS							
Increment Units	Decrement Units						
	Dolet Hills	Fulton	Arsenal Hill	Lieberman	Knox Lee	Pirkey	Wilkes
Fitzhugh	0.320	0.320	0.316	0.315	0.310	0.310	0.309
Weleetka	0.106	0.106	0.102	0.101	0.096	0.096	0.095
Riverside	0.106	0.106	0.102	0.101	0.096	0.096	0.095
Tulsa_PS	0.105	0.105	0.101	0.100	0.096	0.096	0.095
Mattison	0.102	0.101	0.097	0.096	0.092	0.092	0.091
NESTULNESONE							
Increment Units	Decrement Units						
	NE_Coal	Dolet Hills	Arsenal Hill	Fulton	Lieberman	Knox Lee	Pirkey
Tulsa_PS	0.751	0.102	0.099	0.099	0.098	0.096	0.096
Riverside	0.746	0.097	0.094	0.094	0.093	0.091	0.091
NE_Gas	0.729	0.080	0.077	0.077	0.077	0.075	0.075
Weleetka	0.714	0.064	0.062	0.062	0.061	0.059	0.059
Elkins	0.698	0.048	0.045	0.045	0.045	0.043	0.043

Table 3 displays a list of generator pairs that are possible relief options for each flowgates in question and the redispatch amount needed.

Table 3

LACNEOLANWIC							
Increment Units	Decrement Units						
	Dolet Hills	Arsenal Hill	Lieberman	Fulton	Knox Lee	Pirkey	Wilkes
Flint Creek	105	107	107	108	109	109	109
Tulsa_PS	135	138	139	139	141	141	142
Mattison	158	162	163	164	167	167	168
Elkins	160	165	166	166	169	169	171
Riverside	162	167	168	168	171	171	173
NESONENESTUL							
Increment Units	Decrement Units						
	NE_Coal	Dolet Hills	Fulton	Arsenal Hill	Lieberman	Knox Lee	Pirkey
Riverside	17	120	123	123	124	127	127
Tulsa_PS	17	123	126	126	127	130	130
Weleetka	18	207	217	217	219	228	228
Elkins	19	312	336	336	341	362	362
Mattison	19	313	337	337	342	363	364
WDRCIMSPNRW							
Increment Units	Decrement Units						
	NE_Gas	Flint Creek	NE_Coal	Mattison	Elkins	Fitzhugh	Tulsa_PS
Comanche	58	60	60	62	62	67	72
SW_Sta	63	64	65	66	66	72	78
Weleetka	131	138	141	147	147	182	222
Narrows	161	172	176	186	186	246	326
Welsh	176	191	195	207	208	286	398
IASCLKNASJHA							
Increment Units	Decrement Units						
	Dolet Hills	Arsenal Hill	Fulton	Lieberman	Knox Lee	Pirkey	Wilkes
NE_Coal	186	195	196	197	205	205	208
NE_Gas	197	208	208	210	219	219	222
Tulsa_PS	214	227	227	230	240	241	245
Riverside	216	230	230	232	243	243	248
SW_Sta	227	241	241	244	256	256	261

FLCXFRFLCXFR							
Increment Units	Decrement Units						
	NE_Gas	NE_Coal	Dolet Hills	Arsenal Hill	Fulton	Lieberman	Knox Lee
Flint Creek	27	28	29	29	29	29	29
Mattison	36	37	39	39	39	39	39
Elkins	36	37	39	39	39	39	39
RUSDARANOFTS							
Increment Units	Decrement Units						
	Dolet Hills	Fulton	Arsenal Hill	Lieberman	Knox Lee	Pirkey	Wilkes
Fitzhugh	75	75	76	76	77	77	77
Weleetka	225	226	235	237	248	249	251
Riverside	225	226	235	237	248	249	251
Tulsa_PS	227	227	236	238	250	250	252
Mattison	235	236	246	248	260	261	263
NESTULNESONE							
Increment Units	Decrement Units						
	NE_Coal	Dolet Hills	Arsenal Hill	Fulton	Lieberman	Knox Lee	Pirkey
Tulsa_PS	18	136	140	140	140	143	143
Riverside	18	143	147	147	148	151	151
NE_Gas	19	173	179	180	180	185	185
Weleetka	19	214	223	224	225	233	233
Elkins	20	287	304	305	308	322	322

5. Conclusion

Generation redispatch options were studied in order to relieve the necessary constraints. However, this request fails the ASTFC validation process.