



SPP

*Southwest
Power Pool*

***System Impact Study
SPP-2013-022
For Transmission Service
Requested By:
KCPS***

From KCPL to TVA

***For a Reserved Amount Of
40 MW
For 1/1/2014 – 3/1/2014***

1. Executive Summary

KCPS has requested a system impact study for weekly and monthly firm transmission service from KCPL to TVA. The period of the transaction is from 1/1/2014 00:00 to 3/1/2014 00:00. The request is for reservations 79087503 and 79087512.

The 40 MW transaction from KCPL has an impact on the following flowgates with no AFC: CRAASHVALLYD, WDRCIMSPRNRW, VALLYDELDSAR, VALIANTLYDIA and TAHH59MUSFTS. 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

KCPS has requested a system impact study for transmission service from KCPL to TVA.

There are 5 constrained flowgates that require relief in order for this reservation to be accepted. The flowgates and the explanations are as follows:

- CRAASHVALLYD: Craig Junction – Ashdown West 138 kV line for the loss of Valliant – Lydia 345 kV line.
- WDRCIMSPRNRW: Woodring – Cimarron 345 kV line for the loss of Spring Creek – Northwest Station 345 kV line.
- VALLYDELDSAR: Valliant – Lydia 345 kV line for the loss of El Dorado – Sarepta 345 kV line.
- VALIANTLYDIA: Valliant – Lydia 345 kV.
- TAHH59MUSFTS: Tahlequah – Highway 59 161 kV line for the loss of Muskogee – Fort Smith 345 kV line.

3. Study Methodology

A. Description

Southwest Power Pool used Transmission Adequacy & Reliability Assessment (TARA) to obtain possible unit pairings that would relieve the constraint. TARA 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 2013 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 Transmission Adequacy & Reliability Assessment (TARA), 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 TARA is the amount of redispatch necessary to relieve the impact on the affected flowgate.

4. Study Results

After studying the impacts of the request, three flowgates require relief. The flowgates and associated amount of relief are as follows:

Table 1

Flowgate	Duration	Sensitivity (%)	Required Relief (MW)
5008 : CRAASHVALLYD	1/1/2014 - 3/1/2014	3.4%	1
5214 : WDRCIMSPRNRW	1/1/2014 - 3/1/2014	6.2%	1
5215 : VALLYDELDSAR	1/1/2014 - 3/1/2014	8.9%	2
5220 : VALIANTLYDIA	1/1/2014 - 3/1/2014	9.6%	2
5223 : TAHH59MUSFTS	1/1/2014 - 3/1/2014	3.1%	1

Table 2 displays a list of generator pairs that are possible relief options for each flowgates in question and the amount of redispatch capacity needed.

Table 2

5008 : CRAASHVALLYD			
Increment	Decrement	Sensitivity	MW
Turk - AEP	Hugo Power Plant - WFEC	25.0%	4
Fulton - AECC	Hugo Power Plant - WFEC	23.2%	4
Welsh - AEP	Hugo Power Plant - WFEC	22.4%	4
Lone Star - AEP	Hugo Power Plant - WFEC	22.3%	4
Wilkes - AEP	Hugo Power Plant - WFEC	22.2%	5
Turk - AEP	Comanche - AEP	19.1%	5
Turk - AEP	Seminole - OKGE	18.9%	5
Turk - AEP	Southwestern Power Station - AEP	18.9%	5
Turk - AEP	Anadarko - WFEC	18.9%	5
Fulton - AECC	Comanche - AEP	17.3%	6
Fulton - AECC	Seminole - OKGE	17.1%	6
Fulton - AECC	Southwestern Power Station - AEP	17.0%	6
Fulton - AECC	Anadarko - WFEC	17.0%	6
Welsh - AEP	Comanche - AEP	16.5%	6
Lone Star - AEP	Comanche - AEP	16.4%	6
Welsh - AEP	Seminole - OKGE	16.3%	6
Welsh - AEP	Southwestern Power Station - AEP	16.2%	6
Wilkes - AEP	Comanche - AEP	16.2%	6
Welsh - AEP	Anadarko - WFEC	16.2%	6
Lone Star - AEP	Seminole - OKGE	16.2%	6
Lone Star - AEP	Southwestern Power Station - AEP	16.2%	6
Lone Star - AEP	Anadarko - WFEC	16.2%	6

5214 : WDRCIMSPNRW			
Increment	Decrement	Sensitivity	MW
Mustang - OKGE	Spring Creek - WR	33.4%	3
Mustang - OKGE	Sooner - OKGE	33.4%	3
McClain - OKGE	Spring Creek - WR	33.3%	3
McClain - OKGE	Sooner - OKGE	33.3%	3
Anadarko - WFEC	Spring Creek - WR	32.8%	3
Anadarko - WFEC	Sooner - OKGE	32.8%	3
Southwestern Power Station - AEP	Spring Creek - WR	32.7%	3
Southwestern Power Station - AEP	Sooner - OKGE	32.7%	3
Comanche - AEP	Spring Creek - WR	32.4%	3
Comanche - AEP	Sooner - OKGE	32.4%	3
Mustang - OKGE	Gordon Evans EC - WR	25.8%	4
Mustang - OKGE	Murray Gill EC - WR	25.7%	4
McClain - OKGE	Gordon Evans EC - WR	25.6%	4
McClain - OKGE	Murray Gill EC - WR	25.6%	4
Anadarko - WFEC	Gordon Evans EC - WR	25.1%	4
Southwestern Power Station - AEP	Gordon Evans EC - WR	25.1%	4
Anadarko - WFEC	Murray Gill EC - WR	25.1%	4
Southwestern Power Station - AEP	Murray Gill EC - WR	25.0%	4

5215 : VALLYDELDSAR			
Increment	Decrement	Sensitivity	MW
Welsh - AEP	Hugo Power Plant - WFEC	66.5%	3
Lone Star - AEP	Hugo Power Plant - WFEC	63.3%	3
Wilkes - AEP	Hugo Power Plant - WFEC	63.1%	3
Pirkey - AEP	Hugo Power Plant - WFEC	62.5%	3
Welsh - AEP	Comanche - AEP	55.3%	4
Welsh - AEP	Seminole - OKGE	54.7%	4
Welsh - AEP	Southwestern Power Station - AEP	54.5%	4
Welsh - AEP	Anadarko - WFEC	54.5%	4
Lone Star - AEP	Comanche - AEP	52.1%	4
Wilkes - AEP	Comanche - AEP	51.9%	4
Lone Star - AEP	Seminole - OKGE	51.5%	4
Wilkes - AEP	Seminole - OKGE	51.3%	4
Lone Star - AEP	Southwestern Power Station - AEP	51.3%	4
Pirkey - AEP	Comanche - AEP	51.3%	4
Lone Star - AEP	Anadarko - WFEC	51.2%	4
Wilkes - AEP	Southwestern Power Station - AEP	51.1%	4
Wilkes - AEP	Anadarko - WFEC	51.1%	4
Pirkey - AEP	Seminole - OKGE	50.7%	4

5220 : VALIANTLYDIA			
Increment	Decrement	Sensitivity	MW
Welsh - AEP	Hugo Power Plant - WFEC	64.2%	3
Turk - AEP	Hugo Power Plant - WFEC	60.9%	3
Lone Star - AEP	Hugo Power Plant - WFEC	60.7%	3
Wilkes - AEP	Hugo Power Plant - WFEC	60.4%	3
Pirkey - AEP	Hugo Power Plant - WFEC	59.9%	3
Welsh - AEP	Comanche - AEP	51.6%	4
Welsh - AEP	Seminole - OKGE	51.0%	4
Welsh - AEP	Southwestern Power Station - AEP	50.7%	4
Welsh - AEP	Anadarko - WFEC	50.7%	4
Turk - AEP	Comanche - AEP	48.3%	4
Lone Star - AEP	Comanche - AEP	48.1%	4
Wilkes - AEP	Comanche - AEP	47.8%	4
Turk - AEP	Seminole - OKGE	47.6%	4
Lone Star - AEP	Seminole - OKGE	47.5%	4
Turk - AEP	Southwestern Power Station - AEP	47.4%	4
Turk - AEP	Anadarko - WFEC	47.4%	4

5223 : TAHH59MUSFTS			
Increment	Decrement	Sensitivity	MW
Fitzhugh - AECC	GRDA Unit 1 - GRDA	15.6%	6
Fitzhugh - AECC	GRDA Unit 2 - GRDA	14.9%	7
Fitzhugh - AECC	NE Power Station - AEP	14.4%	7
Fitzhugh - AECC	Muskogee - OKGE	14.2%	7
AES - OKGE	GRDA Unit 1 - GRDA	13.6%	7
AES - OKGE	GRDA Unit 2 - GRDA	12.9%	8
AES - OKGE	NE Power Station - AEP	12.4%	8
AES - OKGE	Muskogee - OKGE	12.2%	8
Arsenal Hill - AEP	GRDA Unit 1 - GRDA	6.1%	16
Lieberman - AEP	GRDA Unit 1 - GRDA	6.0%	17
Knox Lee - AEP	GRDA Unit 1 - GRDA	5.8%	17
Arsenal Hill - AEP	GRDA Unit 2 - GRDA	5.3%	19
Lieberman - AEP	GRDA Unit 2 - GRDA	5.3%	19
Knox Lee - AEP	GRDA Unit 2 - GRDA	5.1%	20
Arsenal Hill - AEP	NE Power Station - AEP	4.9%	21
Lieberman - AEP	NE Power Station - AEP	4.8%	21
Arsenal Hill - AEP	Muskogee - OKGE	4.7%	21
Lieberman - AEP	Muskogee - OKGE	4.7%	21
Knox Lee - AEP	NE Power Station - AEP	4.6%	22
Knox Lee - AEP	Muskogee - OKGE	4.5%	22

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.