SPP Southwest Power Pool

System Impact Study
SPP-2003-189
For Transmission Service
Requested By:
Western Resources

From OKGE to WR

For a Reserved Amount Of
600 MW
From 07/03/03
To 07/04/03

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1. Executive Summary

Western Resources has requested a system impact study for Daily Firm transmission service from a specific source in OKGE to WR. The period of the transaction is from 07/03/03 to 07/04/03. The request is for reservation 549645 for the amount of 600 MW.

The 600 MW transaction from a specific source in OKGE to WR has impacts on three flowgates (FTSMTHANOVLT, REDARCREDARC, and TEMPORARY6) which are constrained for the period of the request. To provide the ATC necessary for this transfer, the impact of this request on these flowgates must be relieved.

It has been determined that there is not sufficient time available to complete upgrades to the system that would relieve these flowgates.

Various re-dispatch options are presented. While these options are not exhaustive, they do represent the best alternatives for relief of constraints which are imposed by reservation 549645.

2. Introduction

Western Resources has requested an impact study for transmission service from a specific source in OKGE to WR.

There are three constrained flowgates that need relief in order for this reservation to be accepted. The flowgates and their explanations are as follows:

- FTSMTHANOVLT: Fort Smith to Arkansas Nuclear 345 KV line.
- REDARCREDARC: Redbud to Arcadia 345 KV Circuit 1 for the loss of Redbud to Arcadia 345 KV Circuit 2.
- TEMPORARY6: Redbud to Arcadia 345 KV line Circuit 1 and Redbud to Arcadia 345 KV line Circuit 2.

There are no facility upgrades available to relieve these flowgates that can be completed in the time period available.

3. Study Methodology

A. Description

Southwest Power Pool used the NERC Generator Sensitivity Factor (GSF) Viewer to obtain possible unit pairings that would relieve the constraint. The GSF viewer calculates impacts on monitored facilities for all units above 20MW in the Eastern Interconnection. The SPP ATC Calculator is used to determine response factors for the time period of the reservation.

B. Model Updates

The 2003 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 the NERC Generator Sensitivity Factor (GSF) Viewer, 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 the Viewer is the amount of redispatch necessary to relieve the impact on the affected flowgate.

4. Study Results

After studying the impacts of request 549645, it was determined that three flow gates are constrained. Table 1 indicates the constrained flow gates, the percent impact reservation 549645 has on each flowgate, and the amount of relief that must be provided in order for reservation 549645 to be accepted.

Table 1

Flowgates	Sensitivity Numbers (%)	MW of relief required
FTSMTHANOVLT	7.3	43.8
REDARCREDARC	72.2	155
TEMPORARY 6	72.2	433

Table 2 represents the available capacity as limited by the constrained flowgates for a transaction of a specific source in OKGE to WR:

Table 2

Flowgates	ATC Available
FTSMTHANOVLT	0
REDARCREDARC	385
TEMPORARY 6	0

Since no ATC is available due to limitations on FTSMTHANOVLT and TEMPORARY6 , a counter offer will not be offered.

Table 3 provides a list of top three generator pairs that will relieve the FTSMTHANOVLT flowgate.

Table 3

Source	Sink	Sensitivity Factor (%) For FTSMTHANOVLT	Sensitivity Factor (%) For REDARCREDARC	Sensitivity Factor (%) For TEMPORARY6
OKGE_OMKAW 269.0_1	OKGE_AES 1G13.8_1	23.1	15.6	15.9
OKGE_OMKAW 269.0_1	OKGE_MUSKOG4G18.0_1	9.6	20.0	20.3
OKGE_CONTEMPG13.2_2	OKGE_MUSKOG4G18.0_1	9.5	20.1	20.5

Table 4 provides a list of the top three Generator Pairs that will relieve the REDARCREDARC flowgate.

Table 4

Source	Sink	Sensitivity Factor (%) For FTSMTHANOVLT	Sensitivity Factor (%) For REDARCREDARC	Sensitivity Factor (%) For TEMPORARY6
OKGE_ONEOK1&213.8_2	OKGE_MUSKOG4G18.0_1	8.6	28.6	29.1
OKGE_MUSTNG3G20.9_1	OKGE_MUSKOG4G18.0_1	8.4	26.8	27.1
OKGE_SMITH 1G13.8_2	OKGE_MUSKOG4G18.0_1	8.4	26.7	27.1

Table 5 provides a list of the top three Generator Pairs that will relieve the TEMPORARY6 flowgate.

Table 5

Source	Sink	Sensitivity Factor (%) For FTSMTHANOVLT	Sensitivity Factor (%) For REDARCREDARC	Sensitivity Factor (%) For TEMPORARY6
OKGE_MUSTNG4G18.0_1	OKGE_MUSKOG4G18.0_1	8.4	26.8	27.1
OKGE_HSL 6G17.1 _1	OKGE_MUSKOG4G18.0_1	8.1	26.2	26.7
OKGE_TINKER5G13.8_1	OKGE_MUSKOG4G18.0_1	8.3	25.6	26.1

See **APPENDIX**, for additional relief pairs.

5. Conclusion

Several re-dispatch options were studied in effort to relieve the flow gates in question. The options presented are not exhaustive but provide the top relieving generation pairs within OKGE. Other options may exist.

In order for this request to be accepted, Western Resources must provide proof to SPP that feasible re-dispatch options have been obtained.

6. APPENDIX

Table 6 provides a list of additional generator pairs that will relieve the FTSMTHANOVLT flowgate.

Table 6

Control Area	Unit	Control Area	Unit	FTSMTHANOVLT	RedArcRedArc	Temporary 6
Control Area	Unit	Control Area	Unit	FTSMTHANOVLT	RedArcRedArc	Temp 6
EES	IDUKHSS218.0 1	OKGE	AES 1G13.8 1	50.1	-	-
EES	IDUKHSS218.0 1	CSWS	L&D13 269.0 1	47.1	-	-
EES	IDUKHSS218.0 1	SPA	RSK1&2 113.8 1	46.1	-	-
EES	1G10PAND18.0 1	SPA	RSK1&2 113.8 1	44.2	-	-
EES	1G10PAND18.0 1	SPA	EUF #1 113.8 1	38.8	-	-
EES	1G10PAND18.0 1	SPA	TEN1&2 113.8 2	36.7	-	-
EES	1PBENRU118.0 1	CSWS	FITZHUG5 161 1	34.9	-	-
EES	1PBENRU118.0 1	CSWS	COGEN 1 18.0 G	31.7	15.5	15.7
EES	1PBENRU118.0 1	CSWS	RSS1-1 24.0 1	30.6	8.3	8.5

Table 7 provides a list additional generator pairs that will relieve the REDARCREDARC flowgate.

Table 7

Control Area	Unit	Control Area	Unit	RedArcRedArc	Temporary 6	FTSMTHANOVLT
OKGE	ONEOK1&213.8 1	CSWS	COGEN 3 18.0 S	36.9	37.4	-
OKGE	ONEOK1&213.8 1	CSWS	OECGT1-118.0 1	31.5	32	-
OKGE	ONEOK1&213.8 1	CSWS	RSS1-1 24.0 1	29.7	30.2	-
OKGE	HSL 10G13.8 1	CSWS	TPS2-1 13.8 1	26.8	27.3	-
OKGE	HSL 10G13.8 1	CSWS	NES3-1 22.0 1	25.96	24.8	-
OKGE	HSL 10G13.8 1	SPA	KEY1&2 113.8 1	25.2	25.8	-
OKGE	HSL 10G13.8 1	CSWS	MIDCON-4 138 1	24.6	25.1	-
MCLN	MCLN1 18.0 1	CSWS	COGEN 3 18.0 S	34.1	34.6	-
MCLN	MCLN1 18.0 1	CSWS	OECGT1-118.0 1	28.7	29.2	-
MCLN	MCLN1 18.0 1	CSWS	RSS1-1 24.0 1	26.9	27.4	-

Table 8 provides a list of additional generator pairs that will relieve the TEMPORARY 6 flowgate.

Table 8

Control Area	Unit	Control Area	Unit	Temporary 6	RedArcRedArc	FTSMTHANOVLT
WFEC	MORLND1 13.8 1	CSWS	TPS2-1 13.8 1	25.1	24.7	-
WFEC	MORLND1 13.8 1	OKGE	MUSKOG6G24.0 1	24.5	24	9.4
WFEC	MORLND1 13.8 1	SPA	KEY1&2 113.8 1	23.6	23.1	-
WFEC	ANADRK3 13.8 1	CSWS	MIDCON-4 138 1	22.4	21.9	-
WFEC	ANADRK3 13.8 1	CSWS	NES1-1 14.4 1	22.1	21.7	-
WFEC	ANADRK3 13.8 1	GRDA	GRDA17-122.8 2	22.1	21.6	-
CSWS	SWS1-1 13.8 1	CSWS	COGEN 3 18.0 S	32.2	31.8	5.3
CSWS	SWS1-1 13.8 1	CSWS	OECGT1-118.0 1	26.8	26.4	-
CSWS	SWS1-1 13.8 1	CSWS	RSS2-1 22.0 1	25	24.6	-
CSWS	SWS1-1 13.8 1	CSWS	TPS2-1 13.8 1	24.4	24.1	-