SPP Southwest Power Pool

System Impact Study SPP-2001-354
For Transmission Service
Requested By
NRG Power Marketing, Inc.

From DEMC to MPS

For a Reserved Amount Of 100MW
From 1/1/02
To 2/1/02

SPP Transmission Planning

Table of Contents

1. Executive Summary

NRG Power Marketing has requested a system impact study for Monthly Firm transmission service from DEMC to MPS. The period of the transaction is from 1/1/02 to 2/1/02. The request is for reservations 314279 and 314283 for the amount of 100MW.

The 100MW transaction from DEMC to MPS has a positive response on the La Cygne to Stillwell, La Cygne to West Gardner flowgate, the Fort Smith to Arkansas Nuclear One Undervoltage flowgate, the Bartlesville SE to N. Bartlesville, N.E.S. to Delaware flowgate, and the Kildare to Creswell, Woodring to Wichita flowgate. The impact of this transfer on the La Cygne to Stillwell, 345kV line will cause an overload for the loss of the La Cygne to West Gardner, 345kV line during the time period of this request. The impact of this transfer will cause an undervoltage condition on the Fort Smith to Arkansas Nuclear One Undervoltage flowgate. The impact of this transfer will cause the Bartlesville to North Bartlesville, 138kV line to overload for the loss of the N.E.S to Delaware, 345kV line. The impact of this transfer will cause the Kildare to Creswell, 138kV line to overload for the loss of the Woodring to Wichita, 345kV line. To provide the ATC that is necessary for this transfer, the impact on these flowgates must be relieved.

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

Redispatch was looked at as an option to relieving the impact on the La Cygne to Stillwell, La Cygne to West Gardner, the Fort Smith to Arkansas Nuclear One Undervoltage, the Bartlesville SE to N. Bartlesville, N.E.S. to Delaware, and the Kildare to Creswell, Woodring to Wichita flowgates caused by the 100MW transfer.

Those companies owning units, which through increasing or decreasing generation will relieve the impact on the La Cygne to Stillwell, La Cygne to West Gardner, the Fort Smith to Arkansas Nuclear One Undervoltage, the Bartlesville SE to N. Bartlesville, N.E.S. to Delaware, and the Kildare to Creswell, Woodring to Wichita flowgates, were given the opportunity to participate in the redispatch of those units. Those companies declined to participate in redispatch. Therefore, there are no options available to relieve the impact on these flowgates caused by the 100MW DEMC to MPS transfer.

2. Introduction

NRG Power Marketing has requested an impact study for transmission service from DEMC to MPS.

The La Cygne to Stillwell, La Cygne to West Gardner flowgate has been identified as a limiting constraint for the DEMC to MPS transfer. For this flowgate, the La Cygne to Stillwell, 345kV line is monitored during the loss of the La Cygne to West Gardner, 345kV line. It has been determined that the 100MW transfer from DEMC to MPS will cause the La Cygne to Stillwell line to overload should the loss of the La Cygne to West Gardner line occur.

The 100MW transfer is also limited by the Fort Smith to Arkansas Nuclear One Undervoltage flowgate. For this flowgate, the Fort Smith to Arkansas Nuclear One, 500kV line is monitored for undervoltage. The DEMC to MPS transfer will cause the Fort Smith to Arkansas Nuclear One, 500kV line to experience a condition of undervoltage.

The 100MW transfer is also limited by the Bartlesville to North Bartlesville, N.E.S to Delaware flowgate. For this flowgate, the Bartlesville to North Bartlesville, 138kV line is monitored during the loss of the N.E.S to Delaware, 345kV line. The DEMC to MPS transfer will cause the Bartlesville to North Bartlesville line to overload during the loss of the N.E.S to Delaware line.

The 100MW transfer is also limited by the Kildare to Creswell, Woodring to Wichita flowgate. For this flowgate, the Kildare to Creswell, 138kV line is monitored during the loss of the Woodring to Wichita, 345kV line. The DEMC to MPS transfer will cause the Kildare to Creswell line to overload during the loss of the Woodring to Wichita line.

There are no facility upgrades available to relieve these flowgates that can be completed in the time period available. This impact study reviews redispatch as an option to relieving the transmission restraints.

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 La Cygne to Stillwell, La Cygne to West Gardner, the Fort Smith to Arkansas Nuclear One Undervoltage, the Bartlesville SE to N. Bartlesville, N.E.S. to Delaware, and the Kildare to Creswell, Woodring to Wichita flowgates are included in the flowgate list.

B. Model Updates

The 2001 Southwest Power Pool Winter Peak 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 constraint for the transfer is identified. The response factor of the transfer on that constraint is also determined.

4. Study Results

A. Study Analysis Results

NERC calculates shift factors on specified facilities for all generation units over 20MW in the Eastern Interconnection. NERC also provides a list of the Top 100 Relief pairs for a specified constraint. These generation shift factors were reviewed for impacts on the La Cygne to Stillwell, La Cygne to West Gardner, the Fort Smith to Arkansas Nuclear One Undervoltage, the Bartlesville SE to N. Bartlesville, N.E.S. to Delaware, and the Kildare to Creswell, Woodring to Wichita flowgates for the redispatch assessment. SPP generators with both negative and positive impacts were available. Those with negative impacts would reduce flows when unit output is increased. The generators with positive impacts would increase flows when unit output is increased and reduce flows when unit output is decreased. There are several redispatch options within SPP for pairing units with positive impacts to units with negative impacts.

The distribution factor on the La Cygne to Stillwell, La Cygne to West Gardner flowgate for the DEMC to MPS transfer is 19.6%. A redispatch would be required to relieve the 19.6MW impact on the constraint under emergency conditions.

The distribution factor on the Fort Smith to Arkansas Nuclear One Undervoltage flowgate for the DEMC to MPS transfer is 11.1%. A redispatch would be required to relieve the 11.1MW impact on the constraint under emergency conditions.

The distribution factor on the Bartlesville SE to N. Bartlesville, N.E.S. to Delaware flowgate for the DEMC to MPS transfer is 5.0%. A redispatch would be required to relieve the 5.0MW impact on the constraint under emergency conditions.

The distribution factor on the Kildare to Creswell, Woodring to Wichita flowgate for the DEMC to MPS transfer is 8.7%. A redispatch would be required to relieve the 8.7MW impact on the constraint under emergency conditions.

Table 1 documents the SPP generators top 40 relief pairs for the La Cygne to Stillwell, La Cygne to West Gardner flowgate.

Table 2 documents the SPP generators top 40 relief pairs for the Fort Smith to Arkansas Nuclear One Undervoltage flowgate.

Table 3 documents the SPP generators top 40 relief pairs for the Bartlesville SE to N. Bartlesville, N.E.S. to Delaware flowgate.

Table 4 documents the SPP generators top 40 relief pairs for the Kildare to Creswell, Woodring to Wichita flowgate.

Table 1: Top 40 Relief Pairs of SPP Generators for La Cygne to Stillwell, La Cygne to West Gardner Flowgate

Source	Sink	Factor		Source	Sink	Factor		Source	Sink	Factor
MPS_ARIESSTG18.0_1	KCPL_LAC G2 124.0_2	-72.9		MPS_ARIESCT118.0_1	KCPL_LAC G2 124.0_2	-72.9		MPS_ARIESCT218.0_1	KCPL_LAC G2 124.0_2	-72.9
MPS_ARIESSTG18.0_1	KCPL_LAC G1 122.0_1	-72.9		MPS_ARIESCT118.0_1	KCPL_LAC G1 122.0_1	-72.9		MPS_ARIESCT218.0_1	KCPL_LAC G1 122.0_1	-72.9
MPS_GRNWD#1 13.2_1	KCPL_LAC G2 124.0_2	-72.6		MPS_GRDWD#2 13.2_2	KCPL_LAC G2 124.0_2	-72.6		MPS_GRNWD#3 13.2_3	KCPL_LAC G2 124.0_2	-72.6
MPS_GRNWD#4 13.2_4	KCPL_LAC G2 124.0_2	-72.6		MPS_GRNWD#1 13.2_1	KCPL_LAC G1 122.0_1	-72.6		MPS_GRDWD#2 13.2_2	KCPL_LAC G1 122.0_1	-72.6
MPS_GRNWD#3 13.2_3	KCPL_LAC G1 122.0_1	-72.6		MPS_GRNWD#4 13.2_4	KCPL_LAC G1 122.0_1	-72.6		MPS_RGREEN#313.2_3	KCPL_LAC G2 124.0_2	-71.7
MPS_RGREEN#313.2_3	KCPL_LAC G1 122.0_1	-71.7		MPS_SIBLEY#322.0_3	KCPL_LAC G2 124.0_2	-69.9		MPS_SIBLEY#322.0_3	KCPL_LAC G1 122.0_1	-69.9
INDN_BLUVLY 269.0_4	KCPL_LAC G2 124.0_2	-69.8		INDN_BLUVLY 269.0_4	KCPL_LAC G1 122.0_1	-69.8		MPS_ARIESSTG18.0_1	WR_WCGS U1 25.0_1	-55.1
MPS_ARIESCT118.0_1	WR_WCGS U1 25.0_1	-55.1		MPS_ARIESCT218.0_1	WR_WCGS U1 25.0_1	-55.1		MPS_GRNWD#1 13.2_1	WR_WCGS U1 25.0_1	-54.8
MPS_GRDWD#2 13.2_2	WR_WCGS U1 25.0_1	-54.8		MPS_GRNWD#3 13.2_3	WR_WCGS U1 25.0_1	-54.8		MPS_GRNWD#4 13.2_4	WR_WCGS U1 25.0_1	-54.8
MPS_RGREEN#313.2_3	WR_WCGS U1 25.0_1	-53.9		MPS_SIBLEY#322.0_3	WR_WCGS U1 25.0_1	-52.1		INDN_BLUVLY 269.0_4	WR_WCGS U1 25.0_1	-52
MPS_ARIESSTG18.0_1	WR_NEC U3 12.0_1	-41.5		MPS_ARIESCT118.0_1	WR_NEC U3 12.0_1	-41.5		MPS_ARIESCT218.0_1	WR_NEC U3 12.0_1	-41.5
MPS_GRNWD#1 13.2_1	WR_NEC U3 12.0_1	-41.2		MPS_GRDWD#2 13.2_2	WR_NEC U3 12.0_1	-41.2		MPS_GRNWD#3 13.2_3	WR_NEC U3 12.0_1	-41.2
MPS_GRNWD#4 13.2_4	WR_NEC U3 12.0_1	-41.2		MPS_ARIESSTG18.0_1	WR_ERIE 269.0_3	-40.5		MPS_ARIESCT118.0_1	WR_ERIE 269.0_3	-40.5
MPS_ARIESCT218.0_1	WR_ERIE 269.0_3	-40.5								

Table 2: Top 40 Relief Pairs of SPP Generators for Fort Smith to Arkansas Nuclear One Undervoltage Flowgate

Source	Sink	Factor		Source	Sink	Factor		Source	Sink	Factor
EES_ANO U1 22.0_1	OKGE_AES 2G13.8_1	-62		EES_ANO U2 22.0_1	OKGE_AES 2G13.8_1	-62		EES_ANO U1 22.0_1	OKGE_AES 1G13.8_1	-62
EES_ANO U2 22.0_1	OKGE_AES 1G13.8_1	-62		EES_ANO U1 22.0_1	CSWS_L&D13 269.0_1	-59.3		EES_ANO U2 22.0_1	CSWS_L&D13 269.0_1	-59.3
EES_ANO U1 22.0_1	SPA_RSK3&4 113.8_4	-57.4		EES_ANO U2 22.0_1	SPA_RSK3&4 113.8_4	-57.4		EES_ANO U1 22.0_1	SPA_RSK3&4 113.8_3	-57.4
EES_ANO U2 22.0_1	SPA_RSK3&4 113.8_3	-57.4		EES_ANO U1 22.0_1	SPA_RSK1&2 113.8_2	-57.4		EES_ANO U2 22.0_1	SPA_RSK1&2 113.8_2	-57.4
EES_ANO U1 22.0_1	SPA_RSK1&2 113.8_1	-57.4		EES_ANO U2 22.0_1	SPA_RSK1&2 113.8_1	-57.4		EES_L&D #91 6.90_1	OKGE_AES 2G13.8_1	-55
EES_L&D #91 6.90_1	OKGE_AES 1G13.8_1	-55		EES_MURY U1 6.90_1	OKGE_AES 2G13.8_1	-54.3		EES_MURY U1 6.90_1	OKGE_AES 1G13.8_1	-54.3
EES_LYNC U2 13.8_1	OKGE_AES 2G13.8_1	-53.8		EES_LYNC U3 18.0_1	OKGE_AES 2G13.8_1	-53.8		EES_LYNC U2 13.8_1	OKGE_AES 1G13.8_1	-53.8
EES_LYNC U3 18.0_1	OKGE_AES 1G13.8_1	-53.8		EES_BLUF U1 22.0_1	OKGE_AES 2G13.8_1	-53.4		EES_BLUF U2 22.0_1	OKGE_AES 2G13.8_1	-53.4
EES_BLUF U1 22.0_1	OKGE_AES 1G13.8_1	-53.4		EES_BLUF U2 22.0_1	OKGE_AES 1G13.8_1	-53.4		EES_L&D #91 6.90_1	CSWS_L&D13 269.0_1	-52.3
EES_1CATH U122.0_1	OKGE_AES 2G13.8_1	-52		EES_1CATH U213.8_1	OKGE_AES 2G13.8_1	-52		EES_1CATH U122.0_1	OKGE_AES 1G13.8_1	-52
EES_1CATH U213.8_1	OKGE_AES 1G13.8_1	-52		EES_MURY U1 6.90_1	CSWS_L&D13 269.0_1	-51.6		EES_LYNC U2 13.8_1	CSWS_L&D13 269.0_1	-51.1
EES_LYNC U3 18.0_1	CSWS_L&D13 269.0_1	-51.1		EES_BLUF U1 22.0_1	CSWS_L&D13 269.0_1	-50.7		EES_BLUF U2 22.0_1	CSWS_L&D13 269.0_1	-50.7
EES_L&D #91 6.90_1	SPA_RSK3&4 113.8_4	-50.4		EES_L&D #91 6.90_1	SPA_RSK3&4 113.8_3	-50.4		EES_L&D #91 6.90_1	SPA_RSK1&2 113.8_2	-50.4
EES_L&D #91 6.90_1	SPA_RSK1&2 113.8_1	-50.4								

Table 3: Top 40 Relief Pairs of SPP Generators for Bartlesville SE to N. Bartlesville, N.E.S. to Delaware Flowgate

Source	Sink	Factor		Source	Sink	Factor		Source	Sink	Factor
CSWS_NES1-1 13.8_1	WR_SUB A 269.0_1	-42.8		CSWS_NES2-1 22.0_1	WR_SUB A 269.0_1	-42.8		CSWS_NES1-1A 18.0_1	WR_SUB A 269.0_1	-42.8
CSWS_NES1-1B 18.0_1	WR_SUB A 269.0_1	-42.8		SPA_KEY1&2 113.8_1	WR_SUB A 269.0_1	-37.5		SPA_KEY1&2 113.8_2	WR_SUB A 269.0_1	-37.5
GRDA_BOOMER 269.0_1	WR_SUB A 269.0_1	-37.5		CSWS_NES3-1 22.0_1	WR_SUB A 269.0_1	-37.2		CSWS_NES4-1 22.0_1	WR_SUB A 269.0_1	-37.2
CSWS_TPS4-1 13.8_1	WR_SUB A 269.0_1	-36.9		CSWS_NES1-1 13.8_1	WR_ERIE 269.0_3	-25.7		CSWS_NES2-1 22.0_1	WR_ERIE 269.0_3	-25.7
CSWS_NES1-1A 18.0_1	WR_ERIE 269.0_3	-25.7		CSWS_NES1-1B 18.0_1	WR_ERIE 269.0_3	-25.7		CSWS_NES1-1 13.8_1	WR_ERIE 269.0_2	-25.7
CSWS_NES2-1 22.0_1	WR_ERIE 269.0_2	-25.7		CSWS_NES1-1A 18.0_1	WR_ERIE 269.0_2	-25.7		CSWS_NES1-1B 18.0_1	WR_ERIE 269.0_2	-25.7
CSWS_NES1-1 13.8_1	WR_ERIE 269.0_1	-25.7		CSWS_NES2-1 22.0_1	WR_ERIE 269.0_1	-25.7		CSWS_NES1-1A 18.0_1	WR_ERIE 269.0_1	-25.7
CSWS_NES1-1B 18.0_1	WR_ERIE 269.0_1	-25.7		CSWS_NES1-1 13.8_1	WR_CHANUTE269.0_1	-25.7		CSWS_NES2-1 22.0_1	WR_CHANUTE269.0_1	-25.7
CSWS_NES1-1A 18.0_1	WR_CHANUTE269.0_1	-25.7		CSWS_NES1-1B 18.0_1	WR_CHANUTE269.0_1	-25.7		CSWS_NES1-1 13.8_1	WR_NEC U3 12.0_1	-24.6
CSWS_NES2-1 22.0_1	WR_NEC U3 12.0_1	-24.6		CSWS_NES1-1A 18.0_1	WR_NEC U3 12.0_1	-24.6		CSWS_NES1-1B 18.0_1	WR_NEC U3 12.0_1	-24.6
CSWS_NES1-1 13.8_1	WR_IOLA 269.0_1	-22.3		CSWS_NES2-1 22.0_1	WR_IOLA 269.0_1	-22.3		CSWS_NES1-1A 18.0_1	WR_IOLA 269.0_1	-22.3
CSWS_NES1-1B 18.0_1	WR_IOLA 269.0_1	-22.3		SPA_KEY1&2 113.8_1	WR_ERIE 269.0_3	-20.4		SPA_KEY1&2 113.8_2	WR_ERIE 269.0_3	-20.4
GRDA_BOOMER 269.0_1	WR_ERIE 269.0_3	-20.4		SPA_KEY1&2 113.8_1	WR_ERIE 269.0_2	-20.4		SPA_KEY1&2 113.8_2	WR_ERIE 269.0_2	-20.4
GRDA_BOOMER 269.0_1	WR_ERIE 269.0_2	-20.4								

Table 4: Top 40 Relief Pairs of SPP Generators for Kildare to Creswell, Woodring to Wichita Flowgate

Source	Sink	Factor		Source	Sink	Factor		Source	Sink	Factor
WR_WINFLD 269.0_1	OKGE_OMKAW 269.0_1	-55.6		WR_WINFLD 269.0_1	OKGE_OMPONCA269.0_1	-55.6		WR_WINFLD 269.0_1	OKGE_CONTEMPG13.2_1	-54.9
WR_WINFLD 269.0_1	OKGE_SOONER1G22.0_1	-49.6		WR_WELLING269.0_1	OKGE_OMKAW 269.0_1	-48.6		WR_WELLING269.0_1	OKGE_OMPONCA269.0_1	-48.6
WR_WINFLD 269.0_1	OKGE_SO4THG 13.2_4	-47.9		WR_WINFLD 269.0_1	OKGE_SO4THG 13.2_3	-47.9		WR_WINFLD 269.0_1	OKGE_SO4THG 13.2_2	-47.9
WR_WINFLD 269.0_1	OKGE_SO4THG 13.2_1	-47.9		WR_WELLING269.0_1	OKGE_CONTEMPG13.2_1	-47.9		WR_WINFLD 269.0_1	OKGE_SOONER2G20.0_1	-46.4
WR_WINFLD 269.0_1	WFEC_MORLND1 13.8_1	-43.2		WR_WELLING269.0_1	OKGE_SOONER1G22.0_1	-42.6		WR_WELLING269.0_1	OKGE_SO4THG 13.2_4	-40.9
WR_WELLING269.0_1	OKGE_SO4THG 13.2_3	-40.9		WR_WELLING269.0_1	OKGE_SO4THG 13.2_2	-40.9		WR_WELLING269.0_1	OKGE_SO4THG 13.2_1	-40.9
WR_WELLING269.0_1	OKGE_SOONER2G20.0_1	-39.4		WR_WELLING269.0_1	WFEC_MORLND1 13.8_1	-36.2		WR_GEC U1 12.5_1	OKGE_OMKAW 269.0_1	-31.5
WR_GEC U2 12.5_1	OKGE_OMKAW 269.0_1	-31.5		WR_GEC U1 12.5_1	OKGE_OMPONCA269.0_1	-31.5		WR_GEC U2 12.5_1	OKGE_OMPONCA269.0_1	-31.5
WR_AUGUSTA269.0_1	OKGE_OMKAW 269.0_1	-31.2		WR_AUGUSTA269.0_1	OKGE_OMPONCA269.0_1	-31.2		WR_GEC U3 14.4_1	OKGE_OMKAW 269.0_1	-31.1
WR_GEC U3 14.4_1	OKGE_OMPONCA269.0_1	-31.1		WR_GEC U4 14.4_1	OKGE_OMKAW 269.0_1	-31		WR_GEC U4 14.4_1	OKGE_OMPONCA269.0_1	-31
WR_GEC U1 12.5_1	OKGE_CONTEMPG13.2_1	-30.8		WR_GEC U2 12.5_1	OKGE_CONTEMPG13.2_1	-30.8		WR_WACO 4 138_1	OKGE_OMKAW 269.0_1	-30.8
WR_WACO 4 138_1	OKGE_OMPONCA269.0_1	-30.8		WR_AUGUSTA269.0_1	OKGE_CONTEMPG13.2_1	-30.5		WR_GEC U3 14.4_1	OKGE_CONTEMPG13.2_1	-30.4
WR_GEC U4 14.4_1	OKGE_CONTEMPG13.2_1	-30.3		WR_WACO 4 138_1	OKGE_CONTEMPG13.2_1	-30.1		WR_EEC GT2 13.8_1	OKGE_OMKAW 269.0_1	-29.7
WR_EEC GT3 18.0_1	OKGE_OMKAW 269.0_1	-29.7								

5. Conclusion

The SPP Regional Tariff participants were given the opportunity to include their units for redispatch in order to provide relief on the flowgates impacted by a certain transaction. The participants owning units that would relieve the flowgate impacted by the 100MW DEMC to MPS transfer declined to participate in the redispatch of those units. No other options are available to provide the capacity needed for the 100MW transfer. Therefore the request for monthly service from DEMC to MPS must be refused due to the impact on the La Cygne to Stillwell, La Cygne to West Gardner, the Fort Smith to Arkansas Nuclear One Undervoltage, the Bartlesville SE to N. Bartlesville, N.E.S. to Delaware, and the Kildare to Creswell, Woodring to Wichita flowgates.