



SPP *Southwest Power Pool*

***System Impact Study SPP-2001-164
For Transmission Service
Requested By
Western Resources Generation
Services***

From WR to KCPL

***For a Reserved Amount Of 7MW
From 6/1/01
To 9/1/01***

SPP Transmission Planning

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1. Executive Summary

Western Resources has requested a system impact study for Monthly Firm transmission service from WR to KCPL. The period of the transaction is from 6/1/01 to 9/1/01. The request is for reservation 244024 for the amount of 7MW.

The 7MW transaction from WR to KCPL has a positive response on the La Cygne to Stillwell, La Cygne to West Gardner flowgate and the Midland 161/115kV Tr, Hoyt to Stranger 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 the Midland 161/115kV transformer to overload for the loss of the Hoyt to Stranger, 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 and Midland 161/115kV Tr, Hoyt to Stranger flowgates caused by the 7MW 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 and the Midland 161/115kV Tr, Hoyt to Stranger 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 7MW WR to KCPL transfer.

2. Introduction

Western Resources has requested an impact study for transmission service from WR to KCPL

The La Cygne to Stillwell, La Cygne to West Gardner flowgate has been identified as a limiting constraint for the WR to KCPL 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 7MW transfer from WR to KCPL will cause the La Cygne to Stillwell line to overload should the loss of the La Cygne to West Gardner line occur.

The 7MW transfer is also limited by the Midland 161/115kV Tr, Hoyt to Stranger flowgate. For this flowgate, the Midland 161/115kV transformer is monitored during the loss of the Hoyt to Stranger, 345kV line. The WR to KCPL transfer will cause the transformer to overload during the Hoyt to Stranger outage.

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 which 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 and Midland 161/115kV Tr, Hoyt to Stranger flowgates are included in the flowgate list.

B. Model Updates

The 2001 Southwest Power Pool Summer 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 flowgate and the Midland 161/115kV Tr, Hoyt to Stranger flowgate for the redispatch assessment. SPP generators with both negative and positive impacts were available. Those with negative impacts would reduce transformer 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 WR to KCPL transfer is 8.1%. A redispatch would be required to relieve the 0.6MW impact on the constraint under emergency conditions.

The distribution factor on the Midland 161/115kV Tr, Hoyt to Stranger flowgate for the WR to KCPL transfer is 8.6%. A redispatch would be required to relieve the 0.6MW 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 Midland 161/115kV Tr, Hoyt to Stranger 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
KCPL_HAW G9 113.8_9	KCPL_LAC G1 122.0_1	-69	KCPL_HAW G9 113.8_9	KCPL_LAC G2 124.0_2	-69	KCPL_HAWCT8 113.8_8	KCPL_LAC G2 124.0_2	-69
KCPL_HAWCT8 113.8_8	KCPL_LAC G1 122.0_1	-69	KCPL_HAW G5 122.0_5	KCPL_LAC G1 122.0_1	-69	KCPL_HAWCT7 113.8_7	WR_WCGS U1 25.0_1	-50.6
KCPL_HAWCT6 116.0_6	WR_WCGS U1 25.0_1	-50.6	KCPL_HAWCT6 116.0_6	WR_NEC U3 12.0_1	-36.1	KCPL_HAWCT7 113.8_7	WR_NEC U3 12.0_1	-36.1
KCPL_HAW G5 122.0_5	WR_CHANUTE269.0_1	-34.4	KACY_QUIN 269.0_5	WR_CHANUTE269.0_1	-34.3	KACY_QUIN 269.0_5	WR_IOLA 269.0_1	-33.9
KACY_QUIN 269.0_4	WR_IOLA 269.0_1	-33.9	KACY_QUIN 269.0_4	WR_SUB A 269.0_1	-33.8	KACY_KAW 269.0_3	WR_SUB A 269.0_1	-33.8
KACY_KAW 269.0_3	WR_AUGUSTA269.0_1	-33.4	KACY_NEARMAN5 161_1	WR_AUGUSTA269.0_1	-33.4	KACY_NEARMAN5 161_1	WR_GETTY 269.0_1	-32.8
KCPL_NE CTS 113.8_8	WR_GETTY 269.0_1	-32.8	KCPL_NE CTS 113.8_8	WR_GEC U1 12.5_1	-32.5	KCPL_GA CT 113.8_9	WR_GEC U1 12.5_1	-32.5
KCPL_GA CT 113.8_9	WR_WELLING269.0_1	-32.1	KCPL_NE CTN 113.8_2	WR_WELLING269.0_1	-32.1	KCPL_NE CTN 113.8_2	WR_WINFLD 269.0_1	-32.1
KCPL_MONTG3 118.0_3	WR_WINFLD 269.0_1	-30.3	KCPL_MONTG3 118.0_3	CSWS_NES3 -1PB22.0_1	-28.7	KCPL_MONTG2 122.0_2	CSWS_NES3 -1PB22.0_1	-28.7
KCPL_MONTG2 122.0_2	OKGE_CONTEMPG13.2_1	-27.4	KCPL_IAT G1 124.0_1	OKGE_CONTEMPG13.2_1	-27	KCPL_IAT G1 124.0_1	OKGE_OMPONCA269.0_1	-27
WR_LEC U4 14.4_1	CSWS_NES2 -1PB22.0_1	-26.7	KCPL_CTY HIG269.0_1	SPA_KEY1&2 113.8_1	-25.9	WR_TEC GT 13.8_1	GRDA_BOOMER 269.0_1	-25.5
WR_JEC U1 26.0_1	OKGE_SOONER1G22.0_1	-24.6	WPEK_CLIFTON113.8_1	CSWS_CALSTM 118.0_1	-23.2	WR_AEC GT1 13.8_1	CSWS_CALGT1-118.0_1	-23
WR_MCPHGT3 13.8_1	CSWS_RSS1 -1PT24.0_1	-21.5	WR_COLBY 3 115_1	OKGE_SOONER2G20.0_1	-20.4	SPA_TRU123 113.8_2	GRDA_GRDA17-122.8_2	-19.5
WPEK_MULGREN113.8_3	EDE_A1G349 113.8_1	-18.8						

Table 2: Top 40 Relief Pairs of SPP Generators for Midland 161/115kV Transformer, Hoyt to Stranger Flowgate

Source	Sink	Factor	Source	Sink	Factor	Source	Sink	Factor
KACY_NEARMAN5 161_1	WR_LEC U3 14.4_1	-27	KACY_QUIN 269.0_1	WR_LEC U3 14.4_1	-27	KACY_QUIN 269.0_2	WR_LEC U3 14.4_1	-27
KACY_QUIN 269.0_4	WR_LEC U3 14.4_1	-27	KACY_QUIN 269.0_5	WR_LEC U3 14.4_1	-27	KACY_KAW 269.0_1	WR_LEC U3 14.4_1	-26.9
KACY_KAW 269.0_2	WR_LEC U3 14.4_1	-26.9	KACY_KAW 269.0_3	WR_LEC U3 14.4_1	-26.9	KACY_NEARMAN5 161_1	WR_LEC U4 14.4_1	-26
KACY_QUIN 269.0_1	WR_LEC U4 14.4_1	-26	KACY_QUIN 269.0_2	WR_LEC U4 14.4_1	-26	KACY_QUIN 269.0_4	WR_LEC U4 14.4_1	-26
KACY_QUIN 269.0_5	WR_LEC U4 14.4_1	-26	KACY_KAW 269.0_1	WR_LEC U4 14.4_1	-25.9	KACY_KAW 269.0_2	WR_LEC U4 14.4_1	-25.9
KACY_KAW 269.0_3	WR_LEC U4 14.4_1	-25.9	KCPL_GA CT 113.8_7	WR_LEC U3 14.4_1	-25.9	KCPL_GA CT 113.8_9	WR_LEC U3 14.4_1	-25.9
KCPL_GA CT 113.8_7	WR_LEC U4 14.4_1	-24.9	KCPL_GA CT 113.8_9	WR_LEC U4 14.4_1	-24.9	KACY_NEARMAN5 161_1	WR_LEC U5 24.0_1	-23.5
KACY_QUIN 269.0_1	WR_LEC U5 24.0_1	-23.5	KACY_QUIN 269.0_2	WR_LEC U5 24.0_1	-23.5	KACY_QUIN 269.0_4	WR_LEC U5 24.0_1	-23.5
KACY_QUIN 269.0_5	WR_LEC U5 24.0_1	-23.5	KACY_KAW 269.0_1	WR_LEC U5 24.0_1	-23.4	KACY_KAW 269.0_2	WR_LEC U5 24.0_1	-23.4
KACY_KAW 269.0_3	WR_LEC U5 24.0_1	-23.4	KCPL_GA CT 113.8_7	WR_LEC U5 24.0_1	-22.4	KCPL_GA CT 113.8_9	WR_LEC U5 24.0_1	-22.4
KACY_NEARMAN5 161_1	WR_TEC U8 16.0_1	-13.4	KACY_QUIN 269.0_1	WR_TEC U8 16.0_1	-13.4	KACY_QUIN 269.0_2	WR_TEC U8 16.0_1	-13.4
KACY_QUIN 269.0_4	WR_TEC U8 16.0_1	-13.4	KACY_QUIN 269.0_5	WR_TEC U8 16.0_1	-13.4	KACY_NEARMAN5 161_1	WR_TEC U7 14.4_1	-13.4
KACY_QUIN 269.0_1	WR_TEC U7 14.4_1	-13.4	KACY_QUIN 269.0_2	WR_TEC U7 14.4_1	-13.4	KACY_QUIN 269.0_4	WR_TEC U7 14.4_1	-13.4
KACY_QUIN 269.0_5	WR_TEC U7 14.4_1	-13.4						

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 7MW WR to KCPL transfer declined to participate in the redispatch of those units. No other options are available to provide the capacity needed for the 7MW transfer. Therefore the request for monthly service from WR to KCPL must be refused due to the impact on the La Cygne to Stillwell, La Cygne to West Gardner and Midland 161/115kV Tr, Hoyt to Stranger flowgates.