SPP Southwest Power Pool

System Impact Study SPP-2002-170
For Transmission Service
Requested By
Westar Energy

From WR to KACY

For a Reserved Amount Of 61MW
From 8/5/02
To 9/2/02

SPP Transmission Planning

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1. Executive Summary

Westar Energy has requested a system impact study for multi-week Weekly Firm transmission service from WR to KACY. The period of the transaction is from 8/5/02 to 9/2/02. The request is for reservation 401017 for the amount of 61MW and is a redirect of original confirmed service 280576 from WR to NSP.

The 61MW transaction from WR to KACY has a positive response on the La Cygne to Stilwell, La Cygne to West Gardner flowgate and the La Cygne to Stilwell North PTDF 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 La Cygne to Stilwell North PTDF flowgate to overload. 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 the La Cygne to Stilwell North PTDF flowgates caused by the 61MW transfer.

A company 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 La Cygne to Stilwell North PTDF flowgates was willing to participate in the redispatch of those units. Service can be granted if the provided redispatch options are adhered to.

2. Introduction

Westar Energy has requested an impact study for transmission service from WR to KACY.

The La Cygne to Stillwell, La Cygne to West Gardner flowgate has been identified as a limiting constraint for the WR to KACY 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 61MW transfer from WR to KACY will cause the La Cygne to Stillwell line to overload should the loss of the La Cygne to West Gardner line occur.

The 61MW transfer is also limited by the La Cygne to Stilwell North PTDF flowgate. For this flowgate, flow north on the La Cygne to Stilwell, 345kV line is monitored. The WR to KACY transfer will cause the La Cygne to Stilwell line to overload.

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 constraints.

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 flowgate is included in the flowgate list. The generation factors for La Cygne to Stillwell, La Cygne to West Gardner flowgate are used for the La Cygne to Stilwell North PTDF flowgate.

B. Model Updates

The 2002 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 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 will 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

NERC calculates shift factors on specified facilities for all generation units over 20MW in the Eastern Interconnection. These generation shift factors were reviewed for impacts on the La Cygne to Stillwell, La Cygne to West Gardner and the La Cygne to Stilwell North PTDF 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. The SPP Regional Tariff participant agreed to decrease generation at either La Cygne Unit 1 or 2 (KCPL_LAC G1 122.0_1, KCPL_LAC G2 124.0_1) and increase generation at any of the following units: Abilene Energy Center Gas Turbine 1 (WR_AEC GT1 13.8_1), Hutchinson Energy Center Gas Turbine 1, 2, 3, or 4 (WR_HEC GT1 13.8_1, etc.), or BPU-City of McPherson Gas Turbine 1, 2, 3, or 4 (WR_MCPHGT1 13.8_2, etc.).

The response factor on the La Cygne to Stillwell, La Cygne to West Gardner flowgate for the WR to KACY transfer is 14.8% for the requested transaction period. The requested transfer is a redirect of existing firm transmission service from WR to NSP. The impact of this existing service on this flowgate is taken into account when determining the amount of redispatch required. The response factor on the La Cygne to Stillwell, La Cygne to West Gardner flowgate for the WR to NSP transfer is 7.5% for the requested transaction period. A redispatch would be required to relieve the 5MW difference in impacts on the constraint under emergency conditions. To relieve this impact, 8MW of redispatch must occur. The combined generation of the La Cygne units must be decreased by 8MW and the combined generation of any of the unit families of above-mentioned units must be increased by 8MW. Because this redispatch is less than that required for the La Cygne to Stilwell North PTDF flowgate, the greater redispatch will be the requirement for acceptance of this request.

The response factor on the La Cygne to Stilwell North PTDF flowgate for the WR to KACY transfer is 18.4% for the requested transaction period. The requested transfer is a redirect of existing firm transmission service from WR to NSP. The impact of this existing service on this flowgate is taken into account when determining the amount of redispatch required. The response factor on the La Cygne to Stilwell North PTDF flowgate for the WR to NSP transfer is 6.4% for the requested transaction period. A redispatch would be required to relieve the 8MW difference in impacts on the constraint under emergency conditions. To relieve this impact, varying amounts of redispatch must occur depending upon the generation pair chosen. The combined generation of the La Cygne units must be decreased by 12MW and the combined generation of either unit family of the Abilene or McPherson units must be increased by 12MW. The combined generation of the La Cygne units must be decreased by 13MW and the combined generation of the Hutchinson units must be increased by 13MW.

The generation sensitivity factors for these generation pairs are displayed in the following tables. Only one unit from each unit family is displayed.

Table 1: Generation Shift Factor for La Cygne units (decrease) and McPherson units (increase) for La Cygne to Stillwell, La Cygne to West Gardner Flowgate

Report Criteria		
Report Type:	**Transaction Pair**	
Limiting Flowgate:	**OTDF_LacStiLacWgr (From->To) : 5023**	
Options:	**Source: KCPL_LAC G1 122.0_1** **Sink: WR_MCPHGT1 13.8_1**	
Source	**Sink**	**Factor**
KCPL_LAC G1 122.0_1	WR_MCPHGT1 13.8_1	61.1

Table 2 Generation Shift Factor for La Cygne units (decrease) and Hutchinson units (increase) for La Cygne to Stillwell, La Cygne to West Gardner Flowgate

Report Criteria		
Report Type:	**Transaction Pair**	
Limiting Flowgate:	**OTDF_LacStiLacWgr (From->To) : 5023**	
Options:	**Source: KCPL_LAC G1 122.0_1** **Sink: WR_HEC GT1 13.8_1**	
Source	**Sink**	**Factor**
KCPL_LAC G1 122.0_1	WR_HEC GT1 13.8_1	60.3

Table 3 Generation Shift Factor for La Cygne units (decrease) and Abilene unit (increase) for La Cygne to Stillwell, La Cygne to West Gardner Flowgate

Report Criteria		
Report Type:	**Transaction Pair**	
Limiting Flowgate:	**OTDF_LacStiLacWgr (From->To) : 5023**	
Options:	**Source: KCPL_LAC G1 122.0_1** **Sink: WR_AEC GT1 13.8_1**	
Source	**Sink**	**Factor**
KCPL_LAC G1 122.0_1	WR_AEC GT1 13.8_1	62.6

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. A participant owning units that would relieve the flowgate impacted by the 50MW WR to KACY transfer agreed to participate in the redispatch of those units. Therefore the request for monthly service from WR to KACY will be accepted per the aforementioned redispatch terms. The Customer's confirmation of service will signify acceptance of the redispatch requirement.