



SPP

*Southwest
Power Pool*

System Impact Study

SPP-2003-071

For Transmission Service

Requested By:

***Southwestern Public Service
Company***

From CSWS to SPS

For a Reserved Amount Of

50 MW

From 04/1/03

To 01/1/04

SPP Transmission Planning

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1. Executive Summary

Southwestern Public Service Company has requested a system impact study for Monthly Firm transmission service from CSWS to SPS. The period of the transaction is from 04/1/03 to 01/1/04. The request is for reservation 491862 for the amount of 50MW and is a redirect of original confirmed service 381168 from AMRN to SPS.

The 50MW transaction from CSWS to SPS has created greater impacts on the DOLXFRELDXFR, NWPATLYDVAL, PITSEMPITSUN, SWSFTCOKUTUC, and the TUCXFRTUCCAR flowgates. To provide the ATC 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 upgrades to the system that would relieve these flowgates.

After studying many scenarios using curtailment of reservations, there is a scenario that will relieve the flowgates in question.

2. Introduction

Southwestern Public Service Company has requested an impact study for transmission service from CSWS to SPS.

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

- DOLXFRELD CFR Flowgate: Dolet Hills 345/230 KV Transformer monitored for the loss Eldorado 345/500 KV Transformer.
- NWTPATLYDVAL Flowgate: N.W. Texarkana to Patterson, 138 KV, line monitored for the loss of the Lydia to Valliant, 345 KV, line.
- PITSEMPITSUN Flowgate: Pittsburg to Seminole, 345 KV, line monitored for the loss of the Pittsburg to Sunnyside, 345 KV, line.
- SWSFTCOKUTUC Flowgate: Southwestern Station to Ft Cobb Nat. Gas, 138 KV, line monitored for the loss of the Oklaunion to Tuco, 345 KV, line.
- TUCXFRTUCCAR Flowgate: Tuco 230/115 KV Transformer monitored for the loss of the Tuco to Carlisle, 230 KV, line.

There are no facility upgrades available to relieve this flowgate that can be completed in the time period available. This impact study reviews curtailment of existing reservations 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 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 comparing impacts of original request 381168 and redirect request 491862, five flowgates remain unrelieved. These flowgates with the amount that is needed to be relieved are as follows:

- DOLXFRELD CFR (7 MW)
- NWTPATLYDVAL (6 MW)
- PITSEMPITSUN (6 MW)
- SWSFTCOKUTUC (1 MW)
- TUCXFRTUCCAR (1 MW)

The DOLXFRELD CFR flowgate, a new constraint, is impacted by any reservation from CSWS to SPS, by 0.147 or 14.7 %. This equates to 7 MW ($50 * 0.147$) that needs to be relieved off this flowgate in order for the request to be approved. A CSWS to EES reservation (0.232 sensitivity factor) would need to be curtailed by 32 MW ($7 / 0.232$) or a CSWS to AMRN reservation (0.194 sensitivity factor) would need to be curtailed by 38 MW ($7 / 0.194$), in order to relieve the impact of the CSWS to SPS reservation on this flowgate.

The NWTPATLYDVAL flowgate, a new constraint, is impacted by any reservation from CSWS to SPS, by 0.128 or 12.8 %. This equates to 6 MW ($50 * 0.128$) that needs to be relieved off this flowgate in order for the request to be approved. A CSWS to EES reservation (0.077 sensitivity factor) would need to be curtailed by 83 MW ($6 / 0.077$) or a CSWS to AMRN reservation (0.101 sensitivity factor) would need to be curtailed by 63 MW ($6 / 0.101$), in order to relieve the impact of the CSWS to SPS reservation on this flowgate.

The PITSEMPITSUN flowgate had an impact from the original request of 0.157 (8 MW) and the impact of the redirect is 0.279 (14 MW). Once the original impact is taken away from the redirect impact, a 6 MW constraint is left to be relieved off the PITSEMPITSUN flowgate. Note: once the redirect is approved; the original will no longer be used. To relieve this constraint, a CSWS to AMRN schedule needs to be curtailed by 50 MW (0.122 impact factor), or a CSWS to EES schedule needs to be curtailed by 90 MW (0.068 impact factor).

The SWSFRCOKUTUC flowgate had an impact from the original request of 0.094 (4 MW) and the impact of the redirect is 0.102 (5 MW). Once the original impact is taken away from the redirect impact, a 1 MW constraint is left to be relieved off the SWSFRCOKUTUC flowgate. To relieve this constraint, a KCPL to SPS schedule needs to be curtailed by 4 MW (0.093 impact factor).

The TUCXFRTUCCAR flowgate had an impact from the original request of 0.08 (4 MW) and the impact of the redirect is 0.088 (5 MW). Once the original impact is taken away from the redirect impact, a 1 MW constraint is left to be relieved off the TUCXFRTUCCAR flowgate. To relieve this constraint, a CSWS to AMRN schedule needs to be curtailed by 5 MW (0.085 impact factor).

5. Conclusion

Curtailment options given by Southwestern Public Service Company were exhausted in this study to relieve the constraints necessary. The results of the study showed that the constraints on the flowgates in question could be relieved by the curtailment of two different scenarios:

- 1) KCPL to SPS and CSWS to EES
- 2) KCPL to SPS and CSWS to AMRN