System Impact Study
SPP-2024-056
For Transmission Service
Requested By:
OPPM

From OPPD to NPPD.OPPD.LDX

For a Reserved Amount Of
7 MW

From 10/18/2024
To 4/1/2025

1. Executive Summary

OPPM has requested a system impact study for monthly firm transmission service from OPPD to NPPD.OPPD.LDX. The period of the transaction is from 10/18/2024 00:00 to 4/1/2025 00:00. The request is for reservation 103959614.

The 7 MW transaction from OPPD has an impact on the following flowgate(s) with no AFC: BEAHARCRESHE, SHEBENSHEFOL, KELXFRTECXFR. To provide the AFC necessary for this transfer, the impact on these flowgate(s) must be relieved.

After studying many scenarios using generation redispatch, there are several feasible scenarios that will relieve the flowgate(s) in question.

2. Introduction

OPPM has requested a system impact study for transmission service from OPPD to NPPD.OPPD.LDX.

There are three constrained flowgates that require relief for this reservation to be accepted. The flowgates and the explanations are as follows:

- BEAHARCRESHE: Beatrice - Harbine 115kV for the loss of Crete - Sheldon 115kV.

- SHEBENSHEFOL: SW 7th & Bennet - Sheldon 115kV for the loss of Sheldon - Folsom & Pleasant Hill 115kV.

- KELXFRTECXFR: Kelly 161/115/13.8 kV XF 1 for the loss of Tecumseh Hill 161/115/12.47 kV XF 1.

3. Study Methodology

A. Description

Southwest Power Pool used Transmission Adequacy & Reliability Assessment (TARA) to obtain possible unit pairings that would relieve the constraint. TARA calculates impacts on monitored facilities for all units within the Southwest Power Pool Footprint. The SPP ATC Calculator is used to determine response factors for the time period of the reservation.

B. Model Updates

The 2024 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 Transmission Adequacy & Reliability Assessment (TARA), 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 TARA is the amount of redispatch necessary to relieve the impact on the affected flowgate.

4. Study Results

After studying the impacts of the request, three flowgates require relief. The flowgates and associated amount of relief are as follows:

Table 1

Flowgate	Duration	Sensitivity (%)	Required Relief (MW)
5646:BEAHARCRESHE	10/28/2024 00:00 - 12/1/2024 00:00	3.72%	0.26
5688:SHEBENSHEFOL	10/24/2024 00:00 - 4/1/2025 00:00	8.13%	0.57
5739:KELXFRTECXFR	11/1/2024 00:00 - 12/1/2024 00:00	4.89%	0.34

Table 2 displays a list of generator pairs that are possible relief options for each flowgate in question and the amount of redispatch capacity needed.

Table 2

5646:BEAHARCRESHE			
Increment	**Decrement**	**Sensitivity**	**MW**
ANTELOPE_A 1	TBGS 2G	3.03%	8.58
TUCO_INT 7_2	TBGS 2G	3.03%	8.58
JRPS GT2 1	TBGS 2G	2.68%	9.70
ANTELOPE_A 1	SARPY 3G	1.70%	15.31
TUCO_INT 7_2	SARPY 3G	1.70%	15.33
ANTELOPE_A 1	NEBCTY1G	1.61%	16.17
TUCO_INT 7_2	NEBCTY1G	1.61%	16.19
JRPS GT2 1	SARPY 3G	1.35%	19.32
JRPS GT2 1	NEBCTY1G	1.26%	20.70

5688:SHEBENSHEFOL			
Increment	**Decrement**	**Sensitivity**	**MW**
ANTELOPE_A 1	TBGS 2G	14.00%	4.07
TUCO_INT 7_2	TBGS 2G	14.00%	4.07
JRPS GT2 1	TBGS 2G	13.71%	4.16
ANTELOPE_A 1	SARPY 3G	1.81%	31.53
TUCO_INT 7_2	SARPY 3G	1.81%	31.58
JRPS GT2 1	SARPY 3G	1.51%	37.67
ANTELOPE_A 1	NEBCTY1G	1.25%	45.45
TUCO_INT 7_2	NEBCTY1G	1.25%	45.56
JRPS GT2 1	NEBCTY1G	0.96%	59.44

5739:KELXFRTECXFR			
Increment	**Decrement**	**Sensitivity**	**MW**
TUCO_INT 7_2	SARPY 3G	3.66%	9.30
ANTELOPE_A 1	SARPY 3G	3.66%	9.30
JRPS GT2 1	SARPY 3G	3.29%	10.34
TUCO_INT 7_2	TBGS 2G	3.21%	10.59
ANTELOPE_A 1	TBGS 2G	3.21%	10.60
TUCO_INT 7_2	NEBCTY1G	3.21%	10.61
ANTELOPE_A 1	NEBCTY1G	3.21%	10.61
JRPS GT2 1	TBGS 2G	2.84%	11.97
JRPS GT2 1	NEBCTY1G	2.84%	11.98

5. Conclusion

Generation redispatch options were studied to relieve the necessary constraints. The results of this study show that the constraints on the flowgates in question could be relieved by executing one or more of the options described in the Study Results section of this document.