# System Impact Study
# SPP-2023-007
# For Transmission Service
# Requested By:
# TNSK

## From SPRM_SPRM to SPA

## For a Reserved Amount Of
## 50 MW

## From 02/06/2023
## To 03/01/2023

## 1. Executive Summary

TNSK has requested a system impact study for weekly firm transmission service from SPRM_SPRM to SPA. The period of the transaction is from 02/06/2023 00:00 to 03/01/2023 00:00. The request is for reservation 98820130.

The 50 MW transaction from SPRM_SPRM has an impact on the following flowgate(s) with no AFC: TAHH59MUSFTS, LARMONLARCAR, PECAGEPEC5TR. To provide the AFC necessary for this transfer, the impact on these flowgates 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

TNSK has requested a system impact study for transmission service from SPRM_SPRM to SPA.

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

- TAHH59MUSFTS: Talequah – Highway 59 161 kV for the loss of Muskogee – Ft. Smith 345 kV.

- LARMONLARCAR: LaRussell – Monett 161kV for the loss of LaRussell – Carthage 161kV.

- PECAGEPEC5TR: Pecan Creek – Agency 161kV for the loss of Pecan Creek – Five Tribes 161 kV.

## 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 2022 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 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 requires relief. The flowgates and associated amount of relief are as follows:

**Table 1**

| Flowgate | Duration | Sensitivity (%) | Required Relief (MW) |
|---|---|---|---|
| 5223:TAHH59MUSFTS | 2/13/2023 00:00 - 3/1/2023 00:00 | 3.61% | 1.80 |
| 5684:LARMONLARCAR | 2/13/2023 00:00 - 3/1/2023 00:00 | 5.00% | 2.50 |
| 5746:PECAGEPEC5TR | 2/6/2023 00:00 - 3/1/2023 00:00 | 4.99% | 2.49 |

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**

| 5223:TAHH59MUSFTS | | | |
|---|---|---|---|
| **Increment** | **Decrement** | **Sensitivity** | **MW** |
| TENGAS 1 | MUSKOG5G | 4.47% | 40.31 |

| 5684:LARMONLARCAR | | | |
|---|---|---|---|
| **Increment** | **Decrement** | **Sensitivity** | **MW** |
| FLINTCR1 | JRPS | 5.43% | 46.02 |

| 5746:PECAGEPEC5TR | | | |
|---|---|---|---|
| **Increment** | **Decrement** | **Sensitivity** | **MW** |
| FLINTCR1 | MUSKOG5G | 4.04% | 61.59 |
| TENGAS 1 | MUSKOG5G | 3.49% | 71.41 |

## 5. Conclusion

Generation redispatch options were studied in order to relieve the necessary constraint(s). The results of this study shows that the constraints on the flowgate(s) in question could be relieved by executing one or more of the options described in the Study Results section of this document.