

## SPP DISIS 2020 AFS INTERIM STUDY REPORT

### INTRODUCTION

Associated Electric Cooperative Inc. (AECI), through coordination with the Southwest Power Pool (SPP), has been requested to study potential negative impacts to the AECI transmission system from five (5) SPP generator interconnection requests that have requested interim service with SPP (the “Study”). Each of the five (5) projects (the “Projects”) are active interconnection requests in the SPP DISIS-2020 cycle. The results of the analysis, as well as any limitations to interim service due to AECI facility constraints, are included in this report. The list of Projects evaluated in the Study is listed in Table 1.

**Table 1: Study Cycle Requests Evaluated**

Project #	CA	Capacity (MW)	Fuel Type	Fuel Type	POI	Cluster Group
GEN-2020-025	OPPD	255.00	ER/NR	Gas	Substation 1363 161kV	02 - Nebraska
GEN-2020-028	OPPD	255.00	ER/NR	Gas	Substation 1363 161kV	02 - Nebraska
GEN-2020-043	OPPD	56.52	ER/NR	Gas	Between Substation 1209 and 1252; 161kV	02 - Nebraska
GEN-2020-044	OPPD	56.52	ER/NR	Gas	Between Substation 1209 and 1252; 161kV	02 - Nebraska
GEN-2020-045	OPPD	56.52	ER/NR	Gas	Between Substation 1209 and 1252; 161kV	02 - Nebraska

The results of this study are intended to indicate the amount of injection each generator under study could be granted, without any upgrades to the AECI system, at the time this study is performed. The results of the analysis are subject to change due to modifications in the study assumptions or in-service dates of higher or equally queued requests. In the event of such a change or at any future time, AECI reserves the right to revise the Study and report to reflect the system conditions at that time which may lower the amount of interim service these generators are granted. Furthermore, AECI will evaluate these generators under its normal affected system study process when AECI studies SPP’s DISIS-2020 cluster. Results from this interim study do not preclude these generators from being allocated cost during the study of the DISIS-2020 cluster.

### INPUTS AND ASSUMPTIONS

Each of the SERC member transmission planners is responsible for submitting system modeling data to SERC for development of the power flow models. Power flow analysis utilized the latest Long-Term Working Group (LTWG) models as developed by SERC Reliability Corporation (SERC).

Modeling parameters provided by SPP for the Projects were utilized for the Study.

Full details of the inputs and assumptions are provided in Appendix A.

## METHODOLOGY

Steady state analysis was performed to confirm the reliability impacts on the AECI system under a variety of system conditions and outages. AECI's transmission system must be capable of operating within the applicable normal ratings, emergency ratings, and voltage limits of AECI planning criteria. AECI is a member of SERC, one of eight Electric Reliability Organizations under the North American Electric Reliability Corporation (NERC). As a member of SERC, AECI develops its planning criteria consistent with NERC Reliability Planning Standards and the SERC planning criteria. The NERC TPL-001-5 Planning Standard Table I requires that, for normal and contingency conditions, line and equipment loading shall be within applicable thermal limits, voltage levels shall be maintained within applicable limits, all customer demands shall be supplied (except as noted), and stability of the network shall be maintained.

In evaluating the impacts of the Projects, the following thermal and voltage limits were applied to the analysis for P0 or normal system conditions:

- Thermal Limits within Applicable Rating – Applicable Rating shall be defined as the Normal Rating. The thermal limit shall be 100% of Rating A.
- Voltage Limits within Applicable Rating – Applicable Rating shall have the meaning of Nominal Voltage. Voltage limits shall be set at plus or minus five percent (+/- 5%), 0.95 p.u. - 1.05 p.u. for systems operating at 60 kV or above on load serving buses.

The following thermal and voltage limits were applied to the analysis for contingency conditions under P1 and P2EHV planning events:

- Thermal Limits within Applicable Rating – Applicable Rating shall be defined as the Emergency Rating. The thermal limit shall be 100% of Rating B.
- Voltage Limits within Applicable Rating – Applicable Rating shall have the meaning of Nominal Voltage. Voltage limits shall be set at plus five percent to minus ten percent (+5%/-10%), 0.90 p.u. – 1.05 p.u. for systems operating at 60 kV or above on load serving buses.

In order for the Projects to have a negative impact (i.e. criteria violation) on the system, the Projects must cause a three percent (3%) or greater increase in flow on an overloaded facility based upon the rating of the facility. In order for the Projects to have a negative voltage impact on the system, the Projects must cause a voltage violation and have a two percent (2%) or greater change in the voltage.

System upgrades are required for constraints resulting from the addition of the Projects under P0, P1, P2.1, P2.2 (EHV only), and P2.3 (EHV only) system conditions. For the purpose of this study, P2.1 events are included as part of the P1 contingency file. As such, these events will be denoted as a P1 event in the results.

## **STEADY STATE ANALYSIS RESULTS**

Steady state analysis results showed no thermal or voltage impacts on the AECI transmission system for facilitating interim service of the Projects.

## **CONCLUSION**

Based on the information received from SPP and the conditions studied, there were no impacts identified on AECI transmission facilities for facilitating interim service for the Projects. As a result, there are no limitations to the interim service requested of the five Projects at this time.

These Study results do not guarantee operation for all periods of time. Although the Study analyzed many of the most probable contingencies, they are not an all-inclusive list and cannot account for every operational situation. It is possible that the Projects may be required to reduce their generation output, also known as curtailment, under certain system conditions to allow system operators to maintain the reliability of the transmission network.

## VERSION HISTORY

Version Number and Date	Author	Change Description
V0 – 06/07/2022	AECI	Initial release, no impacts reported therefore no limited output required to facilitate that interconnection of the five (5) interim requests