



Report on

# GEN-2025-SR15 Surplus Interconnection Service Impact Study

**Revision R1      May 28, 2026**

Submitted to  
SPP



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## Revision History

DATE OR VERSION NUMBER	AUTHOR	CHANGE DESCRIPTION
5/28/2026	Aneiden Consulting	Initial Report Issued

## Executive Summary

Aneden Consulting (Aneden) was retained by SPP to perform a Surplus Interconnection Service Impact Study (Study) for GEN-2025-SR15 to utilize the Surplus Interconnection Service being made available by the McClain Units 1, 2 and 3 at its existing Point of Interconnection (POI), the McClain 138 kV Substation in the Oklahoma Gas & Electric control area.

GEN-2025-SR15, the proposed Surplus Generating Facility (SGF), will connect to the existing POI of the McClain Units 1, 2 and 3 via a separate generation interconnection line.

McClain Units 1, 2 and 3, the Existing Generating Facility (EGF), has a combined nameplate POI capacity of 648.6 MW and is making 125 MW of Surplus Interconnection Service available at its POI. The combined EGF units are modeled in the DISIS-2022-001-1 models with a maximum dispatch of 494 MW.

Per the SPP Open Access Transmission Tariff (SPP Tariff), the amount of Surplus Interconnection Service available to the SGF is limited by the amount of Interconnection Service granted to the EGF at the same POI. In addition, the Surplus Interconnection Service is only available up to the amount that can be accommodated without requiring Network Upgrades except those specified in the SPP Tariff<sup>1</sup>.

The proposed SGF configuration consists of 6 x INDAR/Ingteam synchronous gas-fired units operating at 21.7534 MW for a total assumed dispatch of 130.5204 MW. The generating capability of the SGF exceeds its requested Surplus Interconnection Service of 125 MW. The injection amount of the SGF must be limited to 125 MW at the POI and the combined generation from both the SGF and the EGF may not exceed 648.6 MW at the POI. The SGF and EGF information is shown in Table ES-1 below.

The detailed SGF configuration is captured in Table ES-2 below.

**Table ES-1: EGF & SGF Configuration**

Request	Interconnection Queue Capacity (MW)	Generator Fuel Type	Point of Interconnection
<b>GEN-2025-SR15 (SGF)</b>	125	Combustion Turbine	McClain 138 kV (514902)
<b>McClain Units 1, 2 and 3 (EGF)</b>	648.6	Combustion Turbine	McClain 138 kV (514902)

<sup>1</sup> Allowed Network Upgrades detailed in SPP Open Access Transmission Tariff Attachment V Section 3.3

**Table ES-2: SGF Interconnection Configuration**

Facility	SGF Configuration
Point of Interconnection	McClain 138 kV (514902)
Configuration/Capacity	6 x INDAR/Ingeteam 21.7534 MW (Thermal) = 130.5204 MW [dispatch] Units are rated at 25.358 MVA, GEN-2025-SR15 limited to 125 MW at the POI and total POI injection w/ McClain 138 kV Units limited to 648.6 MW
Generation Interconnection Line <sup>1</sup>	Length = 0.5 miles R = 0.0001629 pu X = 0.0020601 pu B = 0.014372 pu Rating MVA = 324 MVA
GSU Transformer <sup>2</sup>	X12 = 17.993% R12 = 0.514%, X23 = 35.985% R23 = 1.028%, X13 = 17.993% R13 = 0.514%, Winding MVA = 108 MVA, Winding 1 Rating MVA = 180 MVA Winding 2 Rating MVA = 90 MVA Winding 3 Rating MVA = 90 MVA
Station Service Load	Total of 5.12 MW + 2.48 MVAR modeled as two loads at each generator bus as:  2.95 MW + 1.43 MVAR  and  2.17 MW + 1.05 MVAR
Generator Dynamic Model <sup>3</sup> & Power Factor	6 x INDAR/Ingeteam 25.358 MVA (GENQECU) <sup>3</sup> Leading: 0.85785 Lagging: 0.85785

1) All pu are on 100 MVA Base, 2) X and R based on Winding MVA, 3) DYR stability model name

SPP determined that steady-state analysis was required because the combined dispatch of the EGF and SGF exceeded what has been modeled and studied in the previous Definitive Interconnection System Impact Studies (DISIS) study models. The addition of the SGF increased the maximum active power output above what is currently modeled for the EGF in the DISIS-2022-001-1 Low Variable Energy Resource (LVER) steady state models. The LVER models were used based on the fuel type of the SGF (thermal).

The scope of this study included reactive power analysis, short circuit analysis, steady-state analysis, and dynamic stability analysis.

Aneden performed the analyses using the study data provided for the SGF and the DISIS-2022-001-1 study models.

All analyses were performed using the Siemens PTI PSS/E<sup>2</sup> version 34 and PowerGEM TARA software and the results are summarized below.

The steady-state analysis was performed using powerflow models derived from the 24SP, 27SP, and 27WP SPP DISIS-2022-001-1 Transfer Case (TC) LVER model set. These models were updated to include the GEN-2025-SR15 surplus project.

<sup>2</sup> Power System Simulator for Engineering

The results of the steady-state analysis showed that there were no non-convergence, thermal, or voltage criteria impacts in the study system due to the addition of GEN-2025-SR15.

The short circuit analysis was performed using the 25SP stability model modified for short circuit analysis. The results from the short circuit analysis compared the 25SP model with the EGF online and SGF not connected to the SGF study model (EGF and SGF online). The maximum contribution to three-phase fault currents in the immediate transmission systems due to the addition of the SGF was not greater than 1.75 kA. The maximum three-phase fault current level within 5 buses of the POI with the EGF and SGF generators online was 46.5 kA for the 25SP model. There were several buses with a maximum three-phase fault current over 40 kA. These buses are highlighted in Appendix B.

The dynamic stability analysis was performed using Siemens PTI PSS/E version 34.8.1 software for the two modified study models: 25SP and 25WP, each with two dispatch scenarios. 82 fault events were simulated, which included three-phase faults and single-line-to-ground stuck breaker faults.

- Scenario 1: SGF at maximum assumed dispatch, 130.5204 MW, and EGF disconnected.
- Scenario 2: SGF at maximum assumed dispatch, 130.5204 MW, and EGF dispatched at its modeled 494 MW for a total combination of 624.5204 MW.

The results of the dynamic stability analysis showed several existing base case issues that were found in both the original DISIS-2022-001-1 model and in the model with GEN-2025-SR15 included. These issues were not attributed to the GEN-2025-SR15 surplus request and are detailed in Appendix C.

There were no damping or voltage recovery violations attributed to the GEN-2025-SR15 surplus request observed during the simulated faults.

The results of the study showed that the Surplus Interconnection Service Request by GEN-2025-SR15 did not negatively impact the reliability of the Transmission System. There were no additional Interconnection Facilities or Network Upgrades identified by the analyses.

SPP has determined that GEN-2025-SR15 may utilize the requested 125 MW of Surplus Interconnection Service being made available by the EGF. The combined generation from both the SGF and the EGF may not exceed 648.6 MW at the POI.

The customer must install monitoring and control equipment as needed to ensure that the SGF does not exceed the granted surplus amount and to ensure that combination of the SGF and EGF power injected at the POI does not exceed the EGF's Interconnection Service amount. The monitoring and control scheme may be reviewed by the TO and documented in Appendix C of the SGF Generation Interconnection Agreement (GIA).

It is likely that the customer may be required to reduce its generation output to 0 MW in real-time, also known as curtailment, under certain system conditions to allow system operators to maintain the reliability of the transmission network.

Nothing in this study should be construed as a guarantee of transmission service or delivery rights. If the customer wishes to obtain deliverability to final customers, a separate request for transmission service must be requested on SPP's OASIS by the customer.

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## 1.0 Scope of Study

Aneden Consulting (Aneden) was retained by SPP to perform a Surplus Service Impact Study (Study) for GEN-2025-SR15, the Surplus Generating Facility (SGF). A Surplus Service Impact Study is performed to identify the impact of the Surplus Interconnection Service on the transmission system reliability and any additional Interconnection Facilities necessary pursuant to the SPP Generator Interconnection Procedures (“GIP”) contained in Attachment V Section 3.3 of the SPP Open Access Transmission Tariff (SPP Tariff). The amount of Surplus Interconnection Service available to the SGF is limited by the amount of Interconnection Service granted to the existing interconnection customer for the Existing Generating Facility (EGF) at the same POI. The Surplus Interconnection Service is only available up to the amount that can be accommodated without requiring additional Network Upgrades except those specified in the SPP Tariff<sup>3</sup>. The required scope of the study is dependent upon the EGF and SGF specifications. The criteria sections below include the basis of the analyses included in the scope of study.

All analyses were performed using the Siemens PTI PSS/E version 34 and PowerGEM TARA software. The results of each analysis are presented in the following sections.

### 1.1 Reactive Power Analysis

SPP requires that a reactive power analysis be performed on the requested configuration if it is a non-synchronous resource. The reactive power analysis determines the added capacitive effect at the POI caused by the project’s collection system and transmission line’s capacitance. A shunt reactor size was determined for the SGF to offset the capacitive effect and maintain zero (0) MVAR injection at the POI while the plant’s generators and capacitors were offline, and the EGF project had a shunt compensating for its charging effects.

### 1.2 Short Circuit Analysis

SPP requires that a short circuit analysis be performed to determine the maximum available fault current requiring interruption by protective equipment with both the SGF and EGF online, along with the amount of increase in maximum fault current due to the addition of the SGF. The analysis was performed on two scenarios, with the EGF in service and SGF offline, and the modified model with both EGF and SGF in service.

### 1.3 Stability Analysis

SPP requires that a dynamic stability analysis be performed to determine whether the SGF, EGF, and the transmission system will remain stable and within applicable criteria. Dynamic stability analysis was performed on two dispatch scenarios, the first where the SGF was online at 100% of the assumed dispatch with the EGF offline and disconnected, and the second where the SGF was online at 100% of the assumed dispatch and the EGF was picking up the remaining EGF capacity up to its modeled capacity. The stability analyses will identify any additional Interconnection Facilities and Network Upgrades necessary.

### 1.4 Steady-State Analysis

The steady-state (thermal/voltage) analyses may be performed as necessary to ensure that all required reliability conditions are studied. If the EGF was not studied under off-peak conditions, off-peak steady state analyses shall be performed to the required level necessary to demonstrate reliable operation of the Surplus Interconnection Service. If the original system impact study is not available for the

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<sup>3</sup> Allowed Network Upgrades detailed in SPP Open Access Transmission Tariff Attachment V Section 3.3

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Interconnection Service, both off-peak and peak analysis may need to be performed for the EGF associated with the request.

An SGF that includes a fuel type (synchronous/non-synchronous) different from the EGF may require a steady-state analysis to study impacts resultant from changes in dispatch to all equal and lower queued requests. The steady-state analyses will identify any additional Interconnection Facilities and Network Upgrades necessary.

SPP determined that steady-state analysis was required because the combined dispatch of the EGF and SGF exceeded what has been modeled and studied in the previous Definitive Interconnection System Impact Studies (DISIS) study models. The addition of the SGF increased the maximum active power output above what is currently modeled for the EGF in the DISIS-2022-001-1 Low Variable Energy Resource (LVER) steady state models. The LVER models were used based on the fuel type of the SGF (thermal).

### **1.5 Necessary Interconnection Facilities & Network Upgrades**

The SPP Tariff<sup>4</sup> states that the reactive power, short circuit/fault duty, stability, and steady-state analyses (where applicable) for the Surplus Interconnection Service will identify any additional Interconnection Facilities necessary. In addition, the analyses will determine if any Network Upgrades are required for mitigation. The Surplus Interconnection Service is only available up to the amount that can be accommodated without requiring additional Network Upgrades unless (a) those additional Network Upgrades are either (1) located at the Point of Interconnection substation and at the same voltage level as the Generating Facility with an effective GIA, or (2) are System Protection Facilities; and (b) there are no material adverse impacts on the cost or timing of any Interconnection Requests pending at the time the Surplus Interconnection Service request is submitted.

### **1.6 Study Limitations**

The assessments and conclusions provided in this report are based on assumptions and information provided to Aneden by others. While the assumptions and information provided may be appropriate for the purposes of this report, Aneden does not guarantee that those conditions assumed will occur. In addition, Aneden did not independently verify the accuracy or completeness of the information provided. As such, the conclusions and results presented in this report may vary depending on the extent to which actual future conditions differ from the assumptions made or information used herein.

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<sup>4</sup> SPP Open Access Transmission Tariff Section 3.3.4.1

## 2.0 Surplus Interconnection Service Request

The GEN-2025-SR15 Interconnection Customer has requested a Surplus Interconnection Service Impact Study (Study) for GEN-2025-SR15 to utilize the Surplus Interconnection Service being made available by McClain Units 1, 2 and 3 at its existing Point of Interconnection (POI), the McClain 138 kV Substation, in the Oklahoma Gas & Electric (OG&E) control area.

GEN-2025-SR15, the proposed SGF, will connect to the existing POI of the McClain Units 1, 2 and 3 via a separate generation interconnection line.

McClain Units 1, 2 and 3, the EGF, has an effective combined nameplate POI capacity of 648.6 MW and is making 125 MW of Surplus Interconnection Service available at its POI. The combined EGF units are modeled in the DISIS-2022-001-1 models with a maximum dispatch of 494 MW.

Per the SPP Tariff the amount of Surplus Interconnection Service available to the SGF is limited by the amount of Interconnection Service granted to the EGF at the same POI. In addition, the Surplus Interconnection Service is only available up to the amount that can be accommodated without requiring additional Network Upgrades except those specified in the SPP Tariff.

At the time of the posting of this report, McClain Units 1, 2 and 3 (EGF) are active existing power plants at the same POI (McClain 138 kV) that are legacy units and as such do not have Generation Interconnection Agreements (GIAs). Figure 2-1 shows the power flow model single line diagram for the EGF configuration.

The proposed SGF configuration consists of 6 x INDAR/Ingeteam synchronous gas-fired units operating at 21.7534 MW for a total assumed dispatch of 130.5204 MW. The generating capability of the SGF exceeds its requested Surplus Interconnection Service of 125 MW. The injection amount of the SGF must be limited to 125 MW at the POI and the combined generation from both the SGF and the EGF may not exceed 648.6 MW at the POI. The SGF and EGF information is shown in Table 2-1 below.

**Table 2-1: EGF & SGF Configuration**

Request	Interconnection Queue Capacity (MW)	Generator Fuel Type	Point of Interconnection
<b>GEN-2025-SR15 (SGF)</b>	125	Combustion Turbine	McClain 138 kV (514902)
<b>McClain Units 1, 2 and 3 (EGF)</b>	648.6	Combustion Turbine	McClain 138 kV (514902)

The proposed detailed SGF configuration is captured in Figure 2-2 and Table 2-2 below.



**Table 2-2: SGF Interconnection Configuration**

Facility	SGF Configuration
Point of Interconnection	McClain 138 kV (514902)
Configuration/Capacity	6 x INDAR/Ingeteam 21.7534 MW (Thermal) = 130.5204 MW [dispatch] Units are rated at 25.358 MVA, GEN-2025-SR15 limited to 125 MW at the POI and total POI injection w/ McClain 138 kV Units limited to 648.6 MW
Generation Interconnection Line <sup>1</sup>	Length = 0.5 miles R = 0.0001629 pu X = 0.0020601 pu B = 0.014372 pu Rating MVA = 324 MVA
GSU Transformer <sup>2</sup>	X12 = 17.993% R12 = 0.514%, X23 = 35.985% R23 = 1.028%, X13 = 17.993% R13 = 0.514%, Winding MVA = 108 MVA, Winding 1 Rating MVA = 180 MVA Winding 2 Rating MVA = 90 MVA Winding 3 Rating MVA = 90 MVA
Station Service Load	Total of 5.12 MW + 2.48 MVAR modeled as two loads at each generator bus as:  2.95 MW + 1.43 MVAR  and  2.17 MW + 1.05 MVAR
Generator Dynamic Model <sup>3</sup> & Power Factor	6 x INDAR/Ingeteam 25.358 MVA (GENQECU) <sup>3</sup> Leading: 0.85785 Lagging: 0.85785

1) All pu are on 100 MVA Base, 2) X and R based on Winding MVA, 3) DYN stability model name

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## 3.0 Steady-State Analysis

Aneden performed a steady-state contingency analysis using PowerGEM TARA to evaluate the non-convergence, thermal, and voltage impacts of interconnecting GEN-2025-SR15 in the existing SPP transmission system. The methodology, criteria, and results of the steady-state contingency analysis are presented in the following sections.

### 3.1 Modeling

The steady-state analysis was performed using powerflow models derived from the SPP DISIS-2022-001-1 Transfer Case (TC) LVER model set. These models were updated to include the GEN-2025-SR15 surplus project.

The following study cases were evaluated:

- Year 2 Summer Peak (24SP)
- Year 5 Summer Peak (27SP)
- Year 5 Winter Peak (27WP)

The following 2023 Integrated Transmission Planning (ITP) project was added to the study models to ensure the latest local topology was up-to-date.

- 2023ITP Multi - Southgate - Westmoore Tap - Pennsylvania 138 kV Project

A set of Pre-Project and Post-Project models were created from these models as shown below:

- Pre-Project Models: DISIS-2022-001-1 TC LVER models with the EGF and any thermal Electrically Equivalent (EE) units dispatched to their modeled maximum
- Post-Project Models: Pre-Project models with the GEN-2025-SR15 unit added and modeled online at 100% of its assumed dispatch

Dispatch of the additional generation was performed in accordance with SPP DISIS load-ratio share methodologies. Must-run resources were excluded from sink adjustments. Where necessary, the sink definition was expanded consistent with SPP procedures to resolve system imbalances.

Steady-state analysis was performed for system intact and contingency conditions using SPP contingency definitions and methodology consistent with the DISIS-2022-001-1 ERIS steady-state analysis as laid out in the DISIS Manual<sup>5</sup>.

Constraint identification and impact assessment were based on the Post-Project model set, with comparison to the Pre-Project model set to determine incremental impacts associated with the Surplus Interconnection request.

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<sup>5</sup> GENERATOR INTERCONNECTION MANUAL (DISIS MANUAL) Version 4.4 - October 17, 2025

### 3.2 Methodology and Criteria

TARA was used to simulate system intact conditions and contingencies provided by SPP. The system facilities were monitored for non-convergence, thermal, and voltage impacts on all 69 kV lines and above.

Network constraints were found using a Transfer Distribution Factor (TDF) analysis.

For ERIS, thermal overloads are defined as being greater than 100% of Rate A for system intact conditions, and greater than 100% of Rate B for contingencies. These impacts were then analyzed to determine if they meet any of the following three criteria:

- At least 3% TDF impact where the constraint is identified under System-Intact conditions,
- At least 20% TDF impact where the constraint is identified under contingency conditions,
- or 3% PTDF on contingent elements that resulted in a non-converged solution.

TARA was also used to determine voltage constraints in accordance with the DISIS Manual and Transmission Owner planning criteria. The identified voltage constraints were analyzed to determine if they met the following ERIS criteria:

- At least 3% PTDF on contingent elements that resulted in a voltage constraint or on the line with the largest system intact MW flow into the bus experiencing the system intact voltage constraint
- and 2% change in pu voltage.

### 3.3 Results

The results of the steady-state analysis showed that there were no non-convergence, thermal, or voltage criteria impacts in the study system due to the addition of GEN-2025-SR15.

## 4.0 Short Circuit Analysis

A short circuit study was performed using the 25SP model to determine the maximum available fault current requiring interruption by protective equipment with both the SGF and EGF online for each bus in the relevant subsystem, and the amount of increase in maximum fault current due to the addition of the SGF. The detailed results of the short circuit analysis are provided in Appendix B.

### 4.1 Methodology

The short circuit analysis included applying a 3-phase fault on buses up to 5 levels away from the 138 kV POI bus. The PSS/E “Automatic Sequence Fault Calculation (ASCC)” fault analysis module was used to calculate the fault current levels in the transmission system with and without the SGF online. The first scenario was studied with both the SGF and EGF in service. In the second scenario the SGF was disconnected while the EGF was online to determine the impact of the SGF.

Aneden created a short circuit model using the 25SP DISIS-2022-001-1 stability study model by adjusting the SGF short circuit parameters consistent with the submitted data. The adjusted parameters used in the short circuit analysis are shown in Table 4-1 below. No other changes were made to the model.

**Table 4-1: Short Circuit Model Parameters\***

Parameter	Value by Generator Bus#	
	925151	925152
Machine MVA Base	76.08	76.08
R (pu)	0.003	0.003
X'' (pu)	0.233	0.233

\*pu values based on Machine MVA Base

### 4.2 Results

The results of the short circuit analysis compared the 25SP model with the EGF online and SGF not connected to the stability Scenario 2 dispatch model with both the EGF and SGF in service as described in Section 5.1. The GEN-2025-SR15 POI bus (McClain 138 kV) fault current magnitudes for the comparison cases are provided in Table 4-2 showing a fault current of 34.54 kA with the EGF and SGF online. The addition of the SGF configuration increased the POI bus fault current by 1.75 kA. Table 4-3 shows the maximum fault current magnitudes and fault current increases with the SGF project online.

The maximum fault current calculated within 5 buses of the POI was 46.5 kA for the 25SP model. There were several buses with a maximum three-phase fault current over 40 kA. These buses are highlighted in Appendix B. The maximum contribution to three-phase fault currents due to the addition of the SGF was about 5.3% and 1.75 kA.

**Table 4-2: POI Short Circuit Comparison Results**

Case	EGF Only Current (kA)	SGF & EGF Current (kA)	kA Change	%Change
25SP	32.79	34.54	1.75	5.3%

Table 4-3: 25SP Short Circuit Comparison Results

Voltage (kV)	Max. Current (EGF & SGF) (kA)	Max kA Change	Max %Change
69	17.6	0.02	0.1%
138	46.5	1.75	5.3%
345	36.4	0.16	0.6%
<b>Max</b>	<b>46.5</b>	<b>1.75</b>	<b>5.3%</b>

## 5.0 Dynamic Stability Analysis

Aneden performed a dynamic stability analysis to identify the impact of the SGF project. The analysis was performed according to SPP's Disturbance Performance Requirements<sup>6</sup>. The project details are described in Section 2.0 above and the dynamic modeling data is provided in Appendix A. The existing base case issues and simulation plots can be found in Appendix C.

### 5.1 Methodology and Criteria

The dynamic stability analysis was performed using models developed with the requested 6 x INDAR/Ingeteam units operating at 21.7534 MW (GENQECU) SGF generating facility configuration included in the models. This stability analysis was performed using Siemens PTI's PSS/E version 34.8.1 software.

Two stability model scenarios were developed using the models from DISIS-2022-001-1. The first scenario (Scenario 1) was comprised of the SGF online at 100% of the assumed dispatch (SGF = 130.5204 MW) while the EGF generator was offline and disconnected. The second scenario (Scenario 2) was comprised of the SGF at 100% of the assumed dispatch (SGF = 130.5204 MW) while the EGF generator picked up the remaining EGF capacity up to its modeled capability (EGF = 494 MW). The study scenarios are shown in Table 5-1.

**Table 5-1: Study Scenarios (Generator Dispatch MW)**

Scenario	MCLN 1G, MCLN 2G, and MCLN 1S EGF (MW)	GEN-2025-SR15 SGF (MW)	EGF + SGF (MW)
1	0 (Offline)	130.5204	130.5204
2	494	130.5204	624.5204

The GEN-2025-SR15 project details were used to create modified stability models for this impact study based on the DISIS-2022-001-1 stability study models:

- 2025 Summer Peak (25SP),
- 2025 Winter Peak (25WP)

The dynamic model data for the GEN-2025-SR15 project is provided in Appendix A. The power flow models and associated dynamic database were initialized (no-fault test) to confirm that there were no errors in the initial conditions of the system and the dynamic data.

The following system adjustments were made to address existing base case issues that are not attributed to the surplus request:

- The frequency protective relays at buses 587773, 587773, 587958, 762903, 760979, 760958, 760937, & 769704 were disabled after observing the generators tripping during initial three phase fault simulations. This frequency tripping issue is a known PSS/E limitation when calculating bus frequency as it relates to non-conventional type devices.

<sup>6</sup> SPP Disturbance Performance Requirements:

[https://www.spp.org/documents/28859/spp%20disturbance%20performance%20requirements%20\(twg%20approved\).pdf](https://www.spp.org/documents/28859/spp%20disturbance%20performance%20requirements%20(twg%20approved).pdf)

- The voltage protective relays at buses 587773, 587773, 587958, 762903, 760979, 760958, 760937, & 769704 were disabled to avoid generator tripping due to an instantaneous over voltage spike after fault clearing.
- The PSSE dynamic simulation iterations and acceleration factor were adjusted as needed to resolve PSSE dynamic simulation crashes.

During the fault simulations, the active power (PELEC), reactive power (QELEC), and terminal voltage (ETERM) were monitored for the EGF and SGF and other current and prior queued projects in Group 4. In addition, voltages of five (5) buses away from the POI of the SGF were monitored and plotted. The machine rotor angle for synchronous machines and speed for asynchronous machines within the study areas including 327 (EES-EAI), 330 (AECI), 351 (EES), 356 (AMMO), 502 (CLEC), 515 (SWPA), 520 (AEPW), 523 (GRDA), 524 (OKGE), 525 (WFEC), 526 (SPS), 527 (OMPA), 534 (SUNC), 536 (WERE), 544 (EMDE), and 546 (SPRM) were monitored. The voltages of all 100 kV and above buses within the study area were monitored as well.

**5.2 Fault Definitions**

Aneden developed fault events as required to study the SGF. The new set of faults was simulated using the modified study models. The fault events included three-phase faults and single-line-to-ground stuck breaker faults. Single-line-to-ground faults are approximated by applying a fault impedance to bring the faulted bus positive sequence voltage to 0.6 pu. The simulated faults are listed and described in Table 5-2 below. These contingencies were applied to the modified 25SP and 25WP models.

**Table 5-2: Fault Definitions**

Fault ID	Planning Event	Fault Descriptions
FLT1000-SB	P4	Stuck Breaker on MCCLAIN4 (514902) 138 kV Bus a. Apply single phase fault at the MCCLAIN4 (514902) 138 kV Bus b. Clear fault after 16 cycles and trip the following elements: b.1.Trip the MCCLAIN4 (514902) 138 kV to SARA 4 (514895) 138 kV line CKT 1. b.2.Trip the MCCLAIN4 (514902) 138 kV / MCLN 1S (514998) 18 kV XFMR CKT 1. b.3.Trip the MCCLAIN4 (514902) 138 kV / MCLN 1G (514999) 18 kV XFMR CKT 1. b.4. UNIT MCLN 1S (514998) 18 kV #1 b.5. UNIT MCLN 1G (514999) 18 kV #1
FLT1001-SB	P4	Stuck Breaker on MCCLAIN4 (514902) 138 kV Bus a. Apply single phase fault at the MCCLAIN4 (514902) 138 kV Bus b. Clear fault after 16 cycles and trip the following elements: b.1.Trip the MCCLAIN4 (514902) 138 kV to SARA 4 (514895) 138 kV line CKT 1. b.2.Trip the MCCLAIN4 (514902) 138 kV to NORMHLL4 (516097) 138 kV line CKT 1.
FLT1002-SB	P4	Stuck Breaker on MCCLAIN4 (514902) 138 kV Bus a. Apply single phase fault at the MCCLAIN4 (514902) 138 kV Bus b. Clear fault after 16 cycles and trip the following elements: b.1.Trip the MCCLAIN4 (514902) 138 kV to NORMHLL4 (516097) 138 kV line CKT 1. b.2.Trip the MCCLAIN4 (514902) 138 kV to G25-SR15-GSU1 (925153) 138 kV line CKT 1.
FLT1003_SP-SB	P4	Stuck Breaker on MCCLAIN4 (514902) 138 kV Bus a. Apply single phase fault at the MCCLAIN4 (514902) 138 kV Bus b. Clear fault after 16 cycles and trip the following elements: b.1.Trip the MCCLAIN4 (514902) 138 kV to SW134TP4 (514876) 138 kV line CKT 1. b.2.Trip the MCCLAIN4 (514902) 138 kV / MCLN 2G (515000) 18 kV XFMR CKT 1. b.3. UNIT MCLN 2G (515000) 18 kV #1
FLT1003_WP-SB	P4	Stuck Breaker on MCCLAIN4 (514902) 138 kV Bus a. Apply single phase fault at the MCCLAIN4 (514902) 138 kV Bus b. Clear fault after 16 cycles and trip the following elements: b.1.Trip the MCCLAIN4 (514902) 138 kV to WESTMOR4 (514887) 138 kV line CKT 1. b.2.Trip the MCCLAIN4 (514902) 138 kV / MCLN 2G (515000) 18 kV XFMR CKT 1. b.3. UNIT MCLN 2G (515000) 18 kV #1

Table 5-2 Continued

Fault ID	Planning Event	Fault Descriptions
FLT1004_SP-SB	P4	Stuck Breaker on MCCLAIN4 (514902) 138 kV Bus a. Apply single phase fault at the MCCLAIN4 (514902) 138 kV Bus b. Clear fault after 16 cycles and trip the following elements: b.1.Trip the MCCLAIN4 (514902) 138 kV to SW134TP4 (514876) 138 kV line CKT 1. b.2.Trip the MCCLAIN4 (514902) 138 kV / MCLN 1S (514998) 18 kV XFMR CKT 1. b.3.Trip the MCCLAIN4 (514902) 138 kV / MCLN 1G (514999) 18 kV XFMR CKT 1. b.4. UNIT MCLN 1S (514998) 18 kV #1 b.5. UNIT MCLN 1G (514999) 18 kV #1
FLT1004_WP-SB	P4	Stuck Breaker on MCCLAIN4 (514902) 138 kV Bus a. Apply single phase fault at the MCCLAIN4 (514902) 138 kV Bus b. Clear fault after 16 cycles and trip the following elements: b.1.Trip the MCCLAIN4 (514902) 138 kV to WESTMOR4 (514887) 138 kV line CKT 1. b.2.Trip the MCCLAIN4 (514902) 138 kV / MCLN 1S (514998) 18 kV XFMR CKT 1. b.3.Trip the MCCLAIN4 (514902) 138 kV / MCLN 1G (514999) 18 kV XFMR CKT 1. b.4. UNIT MCLN 1S (514998) 18 kV #1 b.5. UNIT MCLN 1G (514999) 18 kV #1
FLT1005-SB	P4	Stuck Breaker on MCCLAIN4 (514902) 138 kV Bus a. Apply single phase fault at the MCCLAIN4 (514902) 138 kV Bus b. Clear fault after 16 cycles and trip the following elements: b.1.Trip the MCCLAIN4 (514902) 138 kV to G25-SR15-GSU1 (925153) 138 kV line CKT 1. b.2.Trip the MCCLAIN4 (514902) 138 kV / MCLN 2G (515000) 18 kV XFMR CKT 1. b.3. UNIT MCLN 2G (515000) 18 kV #1
FLT1006-SB	P4	Stuck Breaker on SARA 4 (514895) 138 kV Bus a. Apply single phase fault at the SARA 4 (514895) 138 kV Bus b. Clear fault after 16 cycles and trip the following elements: b.1.Trip bus SARA 4 (514895) 138 kV.
FLT1007-SB	P4	Stuck Breaker on NORMHLL4 (516097) 138 kV Bus a. Apply single phase fault at the NORMHLL4 (516097) 138 kV Bus b. Clear fault after 16 cycles and trip the following elements: b.1.Trip the NORMHLL4 (516097) 138 kV to MCCLAIN4 (514902) 138 kV line CKT 1.
FLT1008-SB	P4	Stuck Breaker on NORMHLL4 (516097) 138 kV Bus a. Apply single phase fault at the NORMHLL4 (516097) 138 kV Bus b. Clear fault after 16 cycles and trip the following elements: b.1.Trip the NORMHLL4 (516097) 138 kV / NORMHLL7 (516096) 345 kV / NORMHLL11 (516098) 13.8 kV XFMR CKT 1.
FLT1009-SB	P4	Stuck Breaker on NORMHLL4 (516097) 138 kV Bus a. Apply single phase fault at the NORMHLL4 (516097) 138 kV Bus b. Clear fault after 16 cycles and trip the following elements: b.1.Trip the NORMHLL4 (516097) 138 kV to CHERYCK4 (514957) 138 kV line CKT 1.
FLT1010-SB	P4	Stuck Breaker on NORMHLL4 (516097) 138 kV Bus a. Apply single phase fault at the NORMHLL4 (516097) 138 kV Bus b. Clear fault after 16 cycles and trip the following elements: b.1.Trip the NORMHLL4 (516097) 138 kV to CHERYCK4 (514957) 138 kV line CKT 1. b.2.Trip the NORMHLL4 (516097) 138 kV / NORMHLL7 (516096) 345 kV / NORMHLL21 (516099) 13.8 kV XFMR CKT 2.
FLT1011-SB	P4	Stuck Breaker on NORMHLL4 (516097) 138 kV Bus a. Apply single phase fault at the NORMHLL4 (516097) 138 kV Bus b. Clear fault after 16 cycles and trip the following elements: b.2.Trip the NORMHLL4 (516097) 138 kV / NORMHLL7 (516096) 345 kV / NORMHLL21 (516099) 13.8 kV XFMR CKT 2.
FLT1012-SB	P4	Stuck Breaker on NORMHLL4 (516097) 138 kV Bus a. Apply single phase fault at the NORMHLL4 (516097) 138 kV Bus b. Clear fault after 16 cycles and trip the following elements: b.1.Trip the NORMHLL4 (516097) 138 kV to PLVALLY4 (514929) 138 kV line CKT 1.
FLT1013-SB	P4	Stuck Breaker on NORMHLL4 (516097) 138 kV Bus a. Apply single phase fault at the NORMHLL4 (516097) 138 kV Bus b. Clear fault after 16 cycles and trip the following elements: b.1.Trip the NORMHLL4 (516097) 138 kV to PLVALLY4 (514929) 138 kV line CKT 1. b.2.Trip the NORMHLL4 (516097) 138 kV to TURNER 4 (514992) 138 kV line CKT 1.
FLT1014-SB	P4	Stuck Breaker on NORMHLL4 (516097) 138 kV Bus a. Apply single phase fault at the NORMHLL4 (516097) 138 kV Bus b. Clear fault after 16 cycles and trip the following elements: b.1.Trip the NORMHLL4 (516097) 138 kV to TURNER 4 (514992) 138 kV line CKT 1.

Table 5-2 Continued

Fault ID	Planning Event	Fault Descriptions
FLT1015-SB	P4	Stuck Breaker on NORMHLL7 (516096) 345 kV Bus a. Apply single phase fault at the NORMHLL7 (516096) 345 kV Bus b. Clear fault after 16 cycles and trip the following elements: b.1.Trip the NORMHLL7 (516096) 345 kV to CIMARON7 (514901) 345 kV line CKT 1.
FLT1016-SB	P4	Stuck Breaker on NORMHLL7 (516096) 345 kV Bus a. Apply single phase fault at the NORMHLL7 (516096) 345 kV Bus b. Clear fault after 16 cycles and trip the following elements: b.1.Trip the NORMHLL7 (516096) 345 kV / NORMHLL4 (516097) 138 kV / NORMHLL11 (516098) 13.8 kV XFMR CKT 1.
FLT1017-SB	P4	Stuck Breaker on NORMHLL7 (516096) 345 kV Bus a. Apply single phase fault at the NORMHLL7 (516096) 345 kV Bus b. Clear fault after 16 cycles and trip the following elements: b.1.Trip the NORMHLL7 (516096) 345 kV / NORMHLL4 (516097) 138 kV / NORMHLL11 (516098) 13.8 kV XFMR CKT 1. b.2.Trip the NORMHLL7 (516096) 345 kV to DRAPER 7 (514934) 345 kV line CKT 2.
FLT1018-SB	P4	Stuck Breaker on NORMHLL7 (516096) 345 kV Bus a. Apply single phase fault at the NORMHLL7 (516096) 345 kV Bus b. Clear fault after 16 cycles and trip the following elements: b.1.Trip the NORMHLL7 (516096) 345 kV to DRAPER 7 (514934) 345 kV line CKT 2.
FLT1019-SB	P4	Stuck Breaker on NORMHLL7 (516096) 345 kV Bus a. Apply single phase fault at the NORMHLL7 (516096) 345 kV Bus b. Clear fault after 16 cycles and trip the following elements: b.1.Trip the NORMHLL7 (516096) 345 kV / NORMHLL4 (516097) 138 kV / NORMHLL21 (516099) 13.8 kV XFMR CKT 2.
FLT1020-SB	P4	Stuck Breaker on NORMHLL7 (516096) 345 kV Bus a. Apply single phase fault at the NORMHLL7 (516096) 345 kV Bus b. Clear fault after 16 cycles and trip the following elements: b.1.Trip the NORMHLL7 (516096) 345 kV / NORMHLL4 (516097) 138 kV / NORMHLL21 (516099) 13.8 kV XFMR CKT 2. b.2.Trip the NORMHLL7 (516096) 345 kV to DRAPER 7 (514934) 345 kV line CKT 1.
FLT1021-SB	P4	Stuck Breaker on NORMHLL7 (516096) 345 kV Bus a. Apply single phase fault at the NORMHLL7 (516096) 345 kV Bus b. Clear fault after 16 cycles and trip the following elements: b.1.Trip the NORMHLL7 (516096) 345 kV to DRAPER 7 (514934) 345 kV line CKT 1.
FLT1022-SB	P4	Stuck Breaker on NORMHLL7 (516096) 345 kV Bus a. Apply single phase fault at the NORMHLL7 (516096) 345 kV Bus b. Clear fault after 16 cycles and trip the following elements: b.1.Trip the NORMHLL7 (516096) 345 kV to MINCO 7 (514801) 345 kV line CKT 1.
FLT1023_SP-SB	P4	Stuck Breaker on SW134TP4 (514876) 138 kV Bus a. Apply single phase fault at the SW134TP4 (514876) 138 kV Bus b. Clear fault after 16 cycles and trip the following elements: b.1.Trip bus SW134TP4 (514876) 138 kV.
FLT1024_WP-SB	P4	Stuck Breaker on WESTMOR4 (514887) 138 kV Bus a. Apply single phase fault at the WESTMOR4 (514887) 138 kV Bus b. Clear fault after 16 cycles and trip the following elements: b.1.Trip bus WESTMOR4 (514887) 138 kV.
FLT9000-3PH	P1	3 Phase fault on MCCLAIN4 (514902) 138 kV to G25-SR15-GSU1 (925153) 138 kV line CKT 1, near MCCLAIN4 (514902) 138 kV. a. Apply fault at the MCCLAIN4 (514902) 138 kV Bus. b. Clear fault after 7 cycles by tripping the faulted line. Trip generator(s) on the Bus G25-SR15-GEN1 (925151) 13.8 kV Trip generator(s) on the Bus G25-SR15-GEN2 (925152) 13.8 kV c. Wait 20 cycles, and then re-close the line in (b) back into the fault. d. Leave Fault on for 7 cycles, then trip the line in (b) and remove fault.
FLT9001-3PH	P1	3 Phase fault on MCCLAIN4 (514902) 138 kV to SARA 4 (514895) 138 kV line CKT 1, near MCCLAIN4 (514902) 138 kV. a. Apply fault at the MCCLAIN4 (514902) 138 kV Bus. b. Clear fault after 7 cycles by tripping the faulted line. c. Wait 20 cycles, and then re-close the line in (b) back into the fault. d. Leave Fault on for 7 cycles, then trip the line in (b) and remove fault.

Table 5-2 Continued

Fault ID	Planning Event	Fault Descriptions
FLT9002-3PH	P1	3 Phase fault on SARA 4 (514895) 138 kV to MCCLAIN4 (514902) 138 kV line CKT 1, near SARA 4 (514895) 138 kV. a. Apply fault at the SARA 4 (514895) 138 kV Bus. b. Clear fault after 7 cycles by tripping the faulted line. c. Wait 20 cycles, and then re-close the line in (b) back into the fault. d. Leave Fault on for 7 cycles, then trip the line in (b) and remove fault.
FLT9003-3PH	P1	3 Phase fault on MCCLAIN4 (514902) 138 kV to NORMHLL4 (516097) 138 kV line CKT 1, near MCCLAIN4 (514902) 138 kV. a. Apply fault at the MCCLAIN4 (514902) 138 kV Bus. b. Clear fault after 7 cycles by tripping the faulted line. c. Wait 20 cycles, and then re-close the line in (b) back into the fault. d. Leave Fault on for 7 cycles, then trip the line in (b) and remove fault.
FLT9004-3PH	P1	3 Phase fault on NORMHLL4 (516097) 138 kV to MCCLAIN4 (514902) 138 kV line CKT 1, near NORMHLL4 (516097) 138 kV. a. Apply fault at the NORMHLL4 (516097) 138 kV Bus. b. Clear fault after 7 cycles by tripping the faulted line. c. Wait 20 cycles, and then re-close the line in (b) back into the fault. d. Leave Fault on for 7 cycles, then trip the line in (b) and remove fault.
FLT9005_SP-3PH	P1	3 Phase fault on MCCLAIN4 (514902) 138 kV to SW134TP4 (514876) 138 kV line CKT 1, near MCCLAIN4 (514902) 138 kV. a. Apply fault at the MCCLAIN4 (514902) 138 kV Bus. b. Clear fault after 7 cycles by tripping the faulted line. c. Wait 20 cycles, and then re-close the line in (b) back into the fault. d. Leave Fault on for 7 cycles, then trip the line in (b) and remove fault.
FLT9006_SP-3PH	P1	3 Phase fault on SW134TP4 (514876) 138 kV to MCCLAIN4 (514902) 138 kV line CKT 1, near SW134TP4 (514876) 138 kV. a. Apply fault at the SW134TP4 (514876) 138 kV Bus. b. Clear fault after 7 cycles by tripping the faulted line. c. Wait 20 cycles, and then re-close the line in (b) back into the fault. d. Leave Fault on for 7 cycles, then trip the line in (b) and remove fault.
FLT9007-3PH	P1	3 Phase fault on SARA 4 (514895) 138 kV to CIMARON4 (514898) 138 kV line CKT 1, near SARA 4 (514895) 138 kV. a. Apply fault at the SARA 4 (514895) 138 kV Bus. b. Clear fault after 7 cycles by tripping the faulted line. c. Wait 20 cycles, and then re-close the line in (b) back into the fault. d. Leave Fault on for 7 cycles, then trip the line in (b) and remove fault.
FLT9008-3PH	P1	3 Phase fault on CIMARON4 (514898) 138 kV to SARA 4 (514895) 138 kV line CKT 1, near CIMARON4 (514898) 138 kV. a. Apply fault at the CIMARON4 (514898) 138 kV Bus. b. Clear fault after 7 cycles by tripping the faulted line. c. Wait 20 cycles, and then re-close the line in (b) back into the fault. d. Leave Fault on for 7 cycles, then trip the line in (b) and remove fault.
FLT9009-3PH	P1	3 Phase fault on CIMARON4 (514898) 138 kV to HAYMAKR4 (514863) 138 kV line CKT 1, near CIMARON4 (514898) 138 kV. a. Apply fault at the CIMARON4 (514898) 138 kV Bus. b. Clear fault after 7 cycles by tripping the faulted line. c. Wait 20 cycles, and then re-close the line in (b) back into the fault. d. Leave Fault on for 7 cycles, then trip the line in (b) and remove fault.
FLT9010-3PH	P1	3 Phase fault on CIMARON4 (514898) 138 kV to TUTCONT4 (511425) 138 kV line CKT 1, near CIMARON4 (514898) 138 kV. a. Apply fault at the CIMARON4 (514898) 138 kV Bus. b. Clear fault after 7 cycles by tripping the faulted line. c. Wait 20 cycles, and then re-close the line in (b) back into the fault. d. Leave Fault on for 7 cycles, then trip the line in (b) and remove fault.
FLT9011-3PH	P1	3 Phase fault on CIMARON4 (514898) 138 kV to CZECHAL4 (514894) 138 kV line CKT 1, near CIMARON4 (514898) 138 kV. a. Apply fault at the CIMARON4 (514898) 138 kV Bus. b. Clear fault after 7 cycles by tripping the faulted line. c. Wait 20 cycles, and then re-close the line in (b) back into the fault. d. Leave Fault on for 7 cycles, then trip the line in (b) and remove fault.

Table 5-2 Continued

Fault ID	Planning Event	Fault Descriptions
FLT9012-3PH	P1	3 Phase fault on CIMARON4 (514898) 138 kV to EL-RENO4 (514819) 138 kV line CKT 1, near CIMARON4 (514898) 138 kV. a. Apply fault at the CIMARON4 (514898) 138 kV Bus. b. Clear fault after 7 cycles by tripping the faulted line. c. Wait 20 cycles, and then re-close the line in (b) back into the fault. d. Leave Fault on for 7 cycles, then trip the line in (b) and remove fault.
FLT9013-3PH	P1	3 Phase fault on CIMARON4 (514898) 138 kV to JENSENT4 (514820) 138 kV line CKT 1, near CIMARON4 (514898) 138 kV. a. Apply fault at the CIMARON4 (514898) 138 kV Bus. b. Clear fault after 7 cycles by tripping the faulted line. c. Wait 20 cycles, and then re-close the line in (b) back into the fault. d. Leave Fault on for 7 cycles, then trip the line in (b) and remove fault.
FLT9014-3PH	P1	3 Phase fault on CIMARON4 (514898) 138 kV / CIMARON7 (514901) 345 kV / CIMARO11 (515714) 13.8 kV XFMR CKT 1, near CIMARON4 (514898) 138 kV. a. Apply fault at the CIMARON4 (514898) 138 kV Bus. b. Clear fault after 7 cycles by tripping the faulted line.
FLT9015-3PH	P1	3 Phase fault on CIMARON7 (514901) 345 kV to NORTWST7 (514880) 345 kV line CKT 1, near CIMARON7 (514901) 345 kV. a. Apply fault at the CIMARON7 (514901) 345 kV Bus. b. Clear fault after 6 cycles by tripping the faulted line. c. Wait 20 cycles, and then re-close the line in (b) back into the fault. d. Leave Fault on for 6 cycles, then trip the line in (b) and remove fault.
FLT9016-3PH	P1	3 Phase fault on CIMARON7 (514901) 345 kV to MATHWSN7 (515497) 345 kV line CKT 1, near CIMARON7 (514901) 345 kV. a. Apply fault at the CIMARON7 (514901) 345 kV Bus. b. Clear fault after 6 cycles by tripping the faulted line. c. Wait 20 cycles, and then re-close the line in (b) back into the fault. d. Leave Fault on for 6 cycles, then trip the line in (b) and remove fault.
FLT9017-3PH	P1	3 Phase fault on CIMARON7 (514901) 345 kV to FSHRTAP7 (515610) 345 kV line CKT 1, near CIMARON7 (514901) 345 kV. a. Apply fault at the CIMARON7 (514901) 345 kV Bus. b. Clear fault after 6 cycles by tripping the faulted line. c. Wait 20 cycles, and then re-close the line in (b) back into the fault. d. Leave Fault on for 6 cycles, then trip the line in (b) and remove fault.
FLT9018-3PH	P1	3 Phase fault on CIMARON7 (514901) 345 kV to MINCO 7 (514801) 345 kV line CKT 1, near CIMARON7 (514901) 345 kV. a. Apply fault at the CIMARON7 (514901) 345 kV Bus. b. Clear fault after 6 cycles by tripping the faulted line. c. Wait 20 cycles, and then re-close the line in (b) back into the fault. d. Leave Fault on for 6 cycles, then trip the line in (b) and remove fault.
FLT9019-3PH	P1	3 Phase fault on CIMARON7 (514901) 345 kV to NORMHLL7 (516096) 345 kV line CKT 1, near CIMARON7 (514901) 345 kV. a. Apply fault at the CIMARON7 (514901) 345 kV Bus. b. Clear fault after 6 cycles by tripping the faulted line. c. Wait 20 cycles, and then re-close the line in (b) back into the fault. d. Leave Fault on for 6 cycles, then trip the line in (b) and remove fault.
FLT9020-3PH	P1	3 Phase fault on NORMHLL4 (516097) 138 kV / NORMHLL7 (516096) 345 kV / NORMHLL11 (516098) 13.8 kV XFMR CKT 1, near NORMHLL4 (516097) 138 kV. a. Apply fault at the NORMHLL4 (516097) 138 kV Bus. b. Clear fault after 7 cycles by tripping the faulted line.
FLT9021-3PH	P1	3 Phase fault on NORMHLL7 (516096) 345 kV to CIMARON7 (514901) 345 kV line CKT 1, near NORMHLL7 (516096) 345 kV. a. Apply fault at the NORMHLL7 (516096) 345 kV Bus. b. Clear fault after 6 cycles by tripping the faulted line. c. Wait 20 cycles, and then re-close the line in (b) back into the fault. d. Leave Fault on for 6 cycles, then trip the line in (b) and remove fault.
FLT9022-3PH	P1	3 Phase fault on NORMHLL7 (516096) 345 kV to MINCO 7 (514801) 345 kV line CKT 1, near NORMHLL7 (516096) 345 kV. a. Apply fault at the NORMHLL7 (516096) 345 kV Bus. b. Clear fault after 6 cycles by tripping the faulted line. c. Wait 20 cycles, and then re-close the line in (b) back into the fault. d. Leave Fault on for 6 cycles, then trip the line in (b) and remove fault.

Table 5-2 Continued

Fault ID	Planning Event	Fault Descriptions
FLT9023-3PH	P1	3 Phase fault on MINCO 7 (514801) 345 kV to NORMHLL7 (516096) 345 kV line CKT 1, near MINCO 7 (514801) 345 kV. a. Apply fault at the MINCO 7 (514801) 345 kV Bus. b. Clear fault after 6 cycles by tripping the faulted line. c. Wait 20 cycles, and then re-close the line in (b) back into the fault. d. Leave Fault on for 6 cycles, then trip the line in (b) and remove fault.
FLT9024-3PH	P1	3 Phase fault on MINCO 7 (514801) 345 kV to MCNOWND7 (515444) 345 kV line CKT 1, near MINCO 7 (514801) 345 kV. a. Apply fault at the MINCO 7 (514801) 345 kV Bus. b. Clear fault after 6 cycles by tripping the faulted line. c. Wait 20 cycles, and then re-close the line in (b) back into the fault. d. Leave Fault on for 6 cycles, then trip the line in (b) and remove fault.
FLT9025-3PH	P1	3 Phase fault on MINCO 7 (514801) 345 kV to MNCWWD37 (515549) 345 kV line CKT 1, near MINCO 7 (514801) 345 kV. a. Apply fault at the MINCO 7 (514801) 345 kV Bus. b. Clear fault after 6 cycles by tripping the faulted line. c. Wait 20 cycles, and then re-close the line in (b) back into the fault. d. Leave Fault on for 6 cycles, then trip the line in (b) and remove fault.
FLT9026-3PH	P1	3 Phase fault on MINCO 7 (514801) 345 kV to GRACMNT7 (515800) 345 kV line CKT 1, near MINCO 7 (514801) 345 kV. a. Apply fault at the MINCO 7 (514801) 345 kV Bus. b. Clear fault after 6 cycles by tripping the faulted line. c. Wait 20 cycles, and then re-close the line in (b) back into the fault. d. Leave Fault on for 6 cycles, then trip the line in (b) and remove fault.
FLT9027-3PH	P1	3 Phase fault on MINCO 7 (514801) 345 kV to GEN-2017-233 (761250) 345 kV line CKT 1, near MINCO 7 (514801) 345 kV. a. Apply fault at the MINCO 7 (514801) 345 kV Bus. b. Clear fault after 6 cycles by tripping the faulted line. b.2. UNIT G17-150GEN1 (761232) 0.7 kV #1 b.3. UNIT G17-233-GEN1 (761253) 0.7 kV #1 c. Wait 20 cycles, and then re-close the line in (b) back into the fault. d. Leave Fault on for 6 cycles, then trip the line in (b) and remove fault.
FLT9028-3PH	P1	3 Phase fault on MINCO 7 (514801) 345 kV to CIMARON7 (514901) 345 kV line CKT 1, near MINCO 7 (514801) 345 kV. a. Apply fault at the MINCO 7 (514801) 345 kV Bus. b. Clear fault after 6 cycles by tripping the faulted line. c. Wait 20 cycles, and then re-close the line in (b) back into the fault. d. Leave Fault on for 6 cycles, then trip the line in (b) and remove fault.
FLT9029-3PH	P1	3 Phase fault on NORMHLL7 (516096) 345 kV to DRAPER 7 (514934) 345 kV line CKT 1, near NORMHLL7 (516096) 345 kV. a. Apply fault at the NORMHLL7 (516096) 345 kV Bus. b. Clear fault after 6 cycles by tripping the faulted line. c. Wait 20 cycles, and then re-close the line in (b) back into the fault. d. Leave Fault on for 6 cycles, then trip the line in (b) and remove fault.
FLT9030-3PH	P1	3 Phase fault on DRAPER 7 (514934) 345 kV to NORMHLL7 (516096) 345 kV line CKT 1, near DRAPER 7 (514934) 345 kV. a. Apply fault at the DRAPER 7 (514934) 345 kV Bus. b. Clear fault after 6 cycles by tripping the faulted line. c. Wait 20 cycles, and then re-close the line in (b) back into the fault. d. Leave Fault on for 6 cycles, then trip the line in (b) and remove fault.
FLT9031-3PH	P1	3 Phase fault on DRAPER 7 (514934) 345 kV / DRAPER 4 (514933) 138 kV / DRAPER21 (515792) 13.8 kV XFMR CKT 2, near DRAPER 7 (514934) 345 kV. a. Apply fault at the DRAPER 7 (514934) 345 kV Bus. b. Clear fault after 6 cycles by tripping the faulted line.
FLT9032-3PH	P1	3 Phase fault on DRAPER 7 (514934) 345 kV to SEMINOL7 (515045) 345 kV line CKT 1, near DRAPER 7 (514934) 345 kV. a. Apply fault at the DRAPER 7 (514934) 345 kV Bus. b. Clear fault after 6 cycles by tripping the faulted line. c. Wait 20 cycles, and then re-close the line in (b) back into the fault. d. Leave Fault on for 6 cycles, then trip the line in (b) and remove fault.

Table 5-2 Continued

Fault ID	Planning Event	Fault Descriptions
FLT9033-3PH	P1	3 Phase fault on NORMHLL4 (516097) 138 kV to CHERYCK4 (514957) 138 kV line CKT 1, near NORMHLL4 (516097) 138 kV. a. Apply fault at the NORMHLL4 (516097) 138 kV Bus. b. Clear fault after 7 cycles by tripping the faulted line. c. Wait 20 cycles, and then re-close the line in (b) back into the fault. d. Leave Fault on for 7 cycles, then trip the line in (b) and remove fault.
FLT9034-3PH	P1	3 Phase fault on CHERYCK4 (514957) 138 kV to NORMHLL4 (516097) 138 kV line CKT 1, near CHERYCK4 (514957) 138 kV. a. Apply fault at the CHERYCK4 (514957) 138 kV Bus. b. Clear fault after 7 cycles by tripping the faulted line. c. Wait 20 cycles, and then re-close the line in (b) back into the fault. d. Leave Fault on for 7 cycles, then trip the line in (b) and remove fault.
FLT9035-3PH	P1	3 Phase fault on CHERYCK4 (514957) 138 kV to BOYD 4 (514958) 138 kV line CKT 1, near CHERYCK4 (514957) 138 kV. a. Apply fault at the CHERYCK4 (514957) 138 kV Bus. b. Clear fault after 7 cycles by tripping the faulted line. c. Wait 20 cycles, and then re-close the line in (b) back into the fault. d. Leave Fault on for 7 cycles, then trip the line in (b) and remove fault.
FLT9036-3PH	P1	3 Phase fault on NORMHLL4 (516097) 138 kV to PLVALLY4 (514929) 138 kV line CKT 1, near NORMHLL4 (516097) 138 kV. a. Apply fault at the NORMHLL4 (516097) 138 kV Bus. b. Clear fault after 7 cycles by tripping the faulted line. c. Wait 20 cycles, and then re-close the line in (b) back into the fault. d. Leave Fault on for 7 cycles, then trip the line in (b) and remove fault.
FLT9037-3PH	P1	3 Phase fault on PLVALLY4 (514929) 138 kV to NORMHLL4 (516097) 138 kV line CKT 1, near PLVALLY4 (514929) 138 kV. a. Apply fault at the PLVALLY4 (514929) 138 kV Bus. b. Clear fault after 7 cycles by tripping the faulted line. c. Wait 20 cycles, and then re-close the line in (b) back into the fault. d. Leave Fault on for 7 cycles, then trip the line in (b) and remove fault.
FLT9038-3PH	P1	3 Phase fault on PLVALLY4 (514929) 138 kV to HOLLYWD4 (514953) 138 kV line CKT 1, near PLVALLY4 (514929) 138 kV. a. Apply fault at the PLVALLY4 (514929) 138 kV Bus. b. Clear fault after 7 cycles by tripping the faulted line. c. Wait 20 cycles, and then re-close the line in (b) back into the fault. d. Leave Fault on for 7 cycles, then trip the line in (b) and remove fault.
FLT9039-3PH	P1	3 Phase fault on NORMHLL4 (516097) 138 kV to TURNER 4 (514992) 138 kV line CKT 1, near NORMHLL4 (516097) 138 kV. a. Apply fault at the NORMHLL4 (516097) 138 kV Bus. b. Clear fault after 7 cycles by tripping the faulted line. c. Wait 20 cycles, and then re-close the line in (b) back into the fault. d. Leave Fault on for 7 cycles, then trip the line in (b) and remove fault.
FLT9040-3PH	P1	3 Phase fault on TURNER 4 (514992) 138 kV to NORMHLL4 (516097) 138 kV line CKT 1, near TURNER 4 (514992) 138 kV. a. Apply fault at the TURNER 4 (514992) 138 kV Bus. b. Clear fault after 7 cycles by tripping the faulted line. c. Wait 20 cycles, and then re-close the line in (b) back into the fault. d. Leave Fault on for 7 cycles, then trip the line in (b) and remove fault.
FLT9041_SP-3PH	P1	3 Phase fault on SW134TP4 (514876) 138 kV to SOGATE 4 (514928) 138 kV line CKT 1, near SW134TP4 (514876) 138 kV. a. Apply fault at the SW134TP4 (514876) 138 kV Bus. b. Clear fault after 7 cycles by tripping the faulted line. c. Wait 20 cycles, and then re-close the line in (b) back into the fault. d. Leave Fault on for 7 cycles, then trip the line in (b) and remove fault.
FLT9042_SP-3PH	P1	3 Phase fault on SOGATE 4 (514928) 138 kV to SW134TP4 (514876) 138 kV line CKT 1, near SOGATE 4 (514928) 138 kV. a. Apply fault at the SOGATE 4 (514928) 138 kV Bus. b. Clear fault after 7 cycles by tripping the faulted line. c. Wait 20 cycles, and then re-close the line in (b) back into the fault. d. Leave Fault on for 7 cycles, then trip the line in (b) and remove fault.

Table 5-2 Continued

Fault ID	Planning Event	Fault Descriptions
FLT9043_SP-3PH	P1	3 Phase fault on SW134TP4 (514876) 138 kV to WESTMOR4 (514887) 138 kV line CKT 1, near SW134TP4 (514876) 138 kV. a. Apply fault at the SW134TP4 (514876) 138 kV Bus. b. Clear fault after 7 cycles by tripping the faulted line. c. Wait 20 cycles, and then re-close the line in (b) back into the fault. d. Leave Fault on for 7 cycles, then trip the line in (b) and remove fault.
FLT9044_SP-3PH	P1	3 Phase fault on WESTMOR4 (514887) 138 kV to SW134TP4 (514876) 138 kV line CKT 1, near WESTMOR4 (514887) 138 kV. a. Apply fault at the WESTMOR4 (514887) 138 kV Bus. b. Clear fault after 7 cycles by tripping the faulted line. c. Wait 20 cycles, and then re-close the line in (b) back into the fault. d. Leave Fault on for 7 cycles, then trip the line in (b) and remove fault.
FLT9045-3PH	P1	3 Phase fault on SOGATE 4 (514928) 138 kV to TURNER 4 (514992) 138 kV line CKT 1, near SOGATE 4 (514928) 138 kV. a. Apply fault at the SOGATE 4 (514928) 138 kV Bus. b. Clear fault after 7 cycles by tripping the faulted line. c. Wait 20 cycles, and then re-close the line in (b) back into the fault. d. Leave Fault on for 7 cycles, then trip the line in (b) and remove fault.
FLT9046-3PH	P1	3 Phase fault on TURNER 4 (514992) 138 kV to SOGATE 4 (514928) 138 kV line CKT 1, near TURNER 4 (514992) 138 kV. a. Apply fault at the TURNER 4 (514992) 138 kV Bus. b. Clear fault after 7 cycles by tripping the faulted line. c. Wait 20 cycles, and then re-close the line in (b) back into the fault. d. Leave Fault on for 7 cycles, then trip the line in (b) and remove fault.
FLT9047-3PH	P1	3 Phase fault on WESTMOR4 (514887) 138 kV to PENN 4 (514925) 138 kV line CKT 1, near WESTMOR4 (514887) 138 kV. a. Apply fault at the WESTMOR4 (514887) 138 kV Bus. b. Clear fault after 7 cycles by tripping the faulted line. c. Wait 20 cycles, and then re-close the line in (b) back into the fault. d. Leave Fault on for 7 cycles, then trip the line in (b) and remove fault.
FLT9048-3PH	P1	3 Phase fault on MCCLAIN4 (514902) 138 kV to MCLN 1S (514998) 18 kV XFMR CKT 1, near MCCLAIN4 (514902) 138 kV. a. Apply fault at the MCCLAIN4 (514902) 138 kV Bus. b. Clear fault after 7 cycles by tripping the faulted line. b.2. UNIT MCLN 1S (514998) 18 kV #1
FLT9049-3PH	P1	3 Phase fault on MCCLAIN4 (514902) 138 kV to MCLN 1G (514999) 18 kV XFMR CKT 1, near MCCLAIN4 (514902) 138 kV. a. Apply fault at the MCCLAIN4 (514902) 138 kV Bus. b. Clear fault after 7 cycles by tripping the faulted line. b.2. UNIT MCLN 1G (514999) 18 kV #1
FLT9050-3PH	P1	3 Phase fault on MCCLAIN4 (514902) 138 kV to MCLN 2G (515000) 18 kV XFMR CKT 1, near MCCLAIN4 (514902) 138 kV. a. Apply fault at the MCCLAIN4 (514902) 138 kV Bus. b. Clear fault after 7 cycles by tripping the faulted line. b.2. UNIT MCLN 2G (515000) 18 kV #1
FLT9051_WP-3PH	P1	3 Phase fault on MCCLAIN4 (514902) 138 kV to WESTMOR4 (514887) 138 kV line CKT 1, near MCCLAIN4 (514902) 138 kV. a. Apply fault at the MCCLAIN4 (514902) 138 kV Bus. b. Clear fault after 7 cycles by tripping the faulted line. c. Wait 20 cycles, and then re-close the line in (b) back into the fault. d. Leave Fault on for 7 cycles, then trip the line in (b) and remove fault.
FLT9052_WP-3PH	P1	3 Phase fault on WESTMOR4 (514887) 138 kV to MCCLAIN4 (514902) 138 kV line CKT 1, near WESTMOR4 (514887) 138 kV. a. Apply fault at the WESTMOR4 (514887) 138 kV Bus. b. Clear fault after 7 cycles by tripping the faulted line. c. Wait 20 cycles, and then re-close the line in (b) back into the fault. d. Leave Fault on for 7 cycles, then trip the line in (b) and remove fault.
FLT9053_WP-3PH	P1	3 Phase fault on WESTMOR4 (514887) 138 kV to SOGATE 4 (514928) 138 kV line CKT 1, near WESTMOR4 (514887) 138 kV. a. Apply fault at the WESTMOR4 (514887) 138 kV Bus. b. Clear fault after 7 cycles by tripping the faulted line. c. Wait 20 cycles, and then re-close the line in (b) back into the fault. d. Leave Fault on for 7 cycles, then trip the line in (b) and remove fault.

Table 5-2 Continued

Fault ID	Planning Event	Fault Descriptions
FLT9054_WP-3PH	P1	3 Phase fault on SOGATE 4 (514928) 138 kV to WESTMOR4 (514887) 138 kV line CKT 1, near SOGATE 4 (514928) 138 kV. a. Apply fault at the SOGATE 4 (514928) 138 kV Bus. b. Clear fault after 7 cycles by tripping the faulted line. c. Wait 20 cycles, and then re-close the line in (b) back into the fault. d. Leave Fault on for 7 cycles, then trip the line in (b) and remove fault.

**5.3 Scenario 1 Results**

Table 5-3 shows the relevant results of the fault events simulated for each of the modified models in Scenario 1. Existing DISIS base case issues are documented separately in Appendix C. The associated stability plots are also provided in Appendix C.

Table 5-3: Scenario 1 Dynamic Stability Results (EGF = 0 MW, SGF = 130.5204 MW)

Fault ID	25SP			25WP		
	Voltage Violation	Voltage Recovery	Stable	Voltage Violation	Voltage Recovery	Stable
FLT1000-SB	Pass	Pass	Stable	Pass	Pass	Stable
FLT1001-SB	Pass	Pass	Stable	Pass	Pass	Stable
FLT1002-SB	Pass	Pass	Stable	Pass	Pass	Stable
FLT1003_SP-SB	Pass	Pass	Stable	N/A	N/A	N/A
FLT1003_WP-SB	N/A	N/A	N/A	Pass	Pass	Stable
FLT1004_SP-SB	Pass	Pass	Stable	N/A	N/A	N/A
FLT1004_WP-SB	N/A	N/A	N/A	Pass	Pass	Stable
FLT1005-SB	Pass	Pass	Stable	Pass	Pass	Stable
FLT1006-SB	Pass	Pass	Stable	Pass	Pass	Stable
FLT1007-SB	Pass	Pass	Stable	Pass	Pass	Stable
FLT1008-SB	Pass	Pass	Stable	Pass	Pass	Stable
FLT1009-SB	Pass	Pass	Stable	Pass	Pass	Stable
FLT1010-SB	Pass	Pass	Stable	Pass	Pass	Stable
FLT1011-SB	Pass	Pass	Stable	Pass	Pass	Stable
FLT1012-SB	Pass	Pass	Stable	Pass	Pass	Stable
FLT1013-SB	Pass	Pass	Stable	Pass	Pass	Stable
FLT1014-SB	Pass	Pass	Stable	Pass	Pass	Stable
FLT1015-SB	Pass	Pass	Stable	Pass	Pass	Stable
FLT1016-SB	Pass	Pass	Stable	Pass	Pass	Stable
FLT1017-SB	Pass	Pass	Stable	Pass	Pass	Stable
FLT1018-SB	Pass	Pass	Stable	Pass	Pass	Stable
FLT1019-SB	Pass	Pass	Stable	Pass	Pass	Stable
FLT1020-SB	Pass	Pass	Stable	Pass	Pass	Stable
FLT1021-SB	Pass	Pass	Stable	Pass	Pass	Stable
FLT1022-SB	Pass	Pass	Stable	Pass	Pass	Stable
FLT1023_SP-SB	Pass	Pass	Stable	N/A	N/A	N/A
FLT1024_WP-SB	N/A	N/A	N/A	Pass	Pass	Stable

Table 5-3 continued

Fault ID	25SP			25WP		
	Voltage Violation	Voltage Recovery	Stable	Voltage Violation	Voltage Recovery	Stable
FLT9000-3PH	Pass	Pass	Stable	Pass	Pass	Stable
FLT9001-3PH	Pass	Pass	Stable	Pass	Pass	Stable
FLT9002-3PH	Pass	Pass	Stable	Pass	Pass	Stable
FLT9003-3PH	Pass	Pass	Stable	Pass	Pass	Stable
FLT9004-3PH	Pass	Pass	Stable	Pass	Pass	Stable
FLT9005_SP-3PH	Pass	Pass	Stable	N/A	N/A	N/A
FLT9006_SP-3PH	Pass	Pass	Stable	N/A	N/A	N/A
FLT9007-3PH	Pass	Pass	Stable	Pass	Pass	Stable
FLT9008-3PH	Pass	Pass	Stable	Pass	Pass	Stable
FLT9009-3PH	Pass	Pass	Stable	Pass	Pass	Stable
FLT9010-3PH	Pass	Pass	Stable	Pass	Pass	Stable
FLT9011-3PH	Pass	Pass	Stable	Pass	Pass	Stable
FLT9012-3PH	Pass	Pass	Stable	Pass	Pass	Stable
FLT9013-3PH	Pass	Pass	Stable	Pass	Pass	Stable
FLT9014-3PH	Pass	Pass	Stable	Pass	Pass	Stable
FLT9015-3PH	Pass	Pass	Stable	Pass	Pass	Stable
FLT9016-3PH	Pass	Pass	Stable	Pass	Pass	Stable
FLT9017-3PH	Pass	Pass	Stable	Pass	Pass	Stable
FLT9018-3PH	Pass	Pass	Stable	Pass	Pass	Stable
FLT9019-3PH	Pass	Pass	Stable	Pass	Pass	Stable
FLT9020-3PH	Pass	Pass	Stable	Pass	Pass	Stable
FLT9021-3PH	Pass	Pass	Stable	Pass	Pass	Stable
FLT9022-3PH	Pass	Pass	Stable	Pass	Pass	Stable
FLT9023-3PH	Pass	Pass	Stable	Pass	Pass	Stable
FLT9024-3PH	Pass	Pass	Stable	Pass	Pass	Stable
FLT9025-3PH	Pass	Pass	Stable	Pass	Pass	Stable
FLT9026-3PH	Pass	Pass	Stable	Pass	Pass	Stable
FLT9027-3PH	Pass	Pass	Stable	Pass	Pass	Stable
FLT9028-3PH	Pass	Pass	Stable	Pass	Pass	Stable
FLT9029-3PH	Pass	Pass	Stable	Pass	Pass	Stable
FLT9030-3PH	Pass	Pass	Stable	Pass	Pass	Stable
FLT9031-3PH	Pass	Pass	Stable	Pass	Pass	Stable
FLT9032-3PH	Pass	Pass	Stable	Pass	Pass	Stable
FLT9033-3PH	Pass	Pass	Stable	Pass	Pass	Stable
FLT9034-3PH	Pass	Pass	Stable	Pass	Pass	Stable
FLT9035-3PH	Pass	Pass	Stable	Pass	Pass	Stable
FLT9036-3PH	Pass	Pass	Stable	Pass	Pass	Stable

Table 5-3 continued

Fault ID	25SP			25WP		
	Voltage Violation	Voltage Recovery	Stable	Voltage Violation	Voltage Recovery	Stable
FLT9037-3PH	Pass	Pass	Stable	Pass	Pass	Stable
FLT9038-3PH	Pass	Pass	Stable	Pass	Pass	Stable
FLT9039-3PH	Pass	Pass	Stable	Pass	Pass	Stable
FLT9040-3PH	Pass	Pass	Stable	Pass	Pass	Stable
FLT9041_SP-3PH	Pass	Pass	Stable	N/A	N/A	N/A
FLT9042_SP-3PH	Pass	Pass	Stable	N/A	N/A	N/A
FLT9043_SP-3PH	Pass	Pass	Stable	N/A	N/A	N/A
FLT9044_SP-3PH	Pass	Pass	Stable	N/A	N/A	N/A
FLT9045-3PH	Pass	Pass	Stable	Pass	Pass	Stable
FLT9046-3PH	Pass	Pass	Stable	Pass	Pass	Stable
FLT9047-3PH	Pass	Pass	Stable	Pass	Pass	Stable
FLT9048-3PH	Pass	Pass	Stable	Pass	Pass	Stable
FLT9049-3PH	Pass	Pass	Stable	Pass	Pass	Stable
FLT9050-3PH	Pass	Pass	Stable	Pass	Pass	Stable
FLT9051_WP-3PH	N/A	N/A	N/A	Pass	Pass	Stable
FLT9052_WP-3PH	N/A	N/A	N/A	Pass	Pass	Stable
FLT9053_WP-3PH	N/A	N/A	N/A	Pass	Pass	Stable
FLT9054_WP-3PH	N/A	N/A	N/A	Pass	Pass	Stable

The results of the Scenario 1 dynamic stability showed several existing base case issues that were found in both the original DISIS-2022-001-1 model and the model with GEN-2025-SR15 included. These issues were not attributed to the GEN-2025-SR15 surplus request and detailed in Appendix C.

There were no damping or voltage recovery violations attributed to the GEN-2025-SR15 surplus request observed during the simulated faults.

**5.4 Scenario 2 Results**

Table 5-4 shows the relevant results of the fault events simulated for each of the modified models in Scenario 2. Existing DISIS base case issues are documented separately in Appendix C. The associated stability plots are also provided in Appendix C.

Table 5-4: Scenario 2 Dynamic Stability Results (EGF = 494 MW, SGF = 130.5204 MW)

Fault ID	25SP			25WP		
	Voltage Violation	Voltage Recovery	Stable	Voltage Violation	Voltage Recovery	Stable
FLT1000-SB	Pass	Pass	Stable	Pass	Pass	Stable
FLT1001-SB	Pass	Pass	Stable	Pass	Pass	Stable
FLT1002-SB	Pass	Pass	Stable	Pass	Pass	Stable
FLT1003_SP-SB	Pass	Pass	Stable	N/A	N/A	N/A
FLT1003_WP-SB	N/A	N/A	N/A	Pass	Pass	Stable
FLT1004_SP-SB	Pass	Pass	Stable	N/A	N/A	N/A

Table 5-4 continued

Fault ID	25SP			25WP		
	Voltage Violation	Voltage Recovery	Stable	Voltage Violation	Voltage Recovery	Stable
FLT1004_WP-SB	N/A	N/A	N/A	Pass	Pass	Stable
FLT1005-SB	Pass	Pass	Stable	Pass	Pass	Stable
FLT1006-SB	Pass	Pass	Stable	Pass	Pass	Stable
FLT1007-SB	Pass	Pass	Stable	Pass	Pass	Stable
FLT1008-SB	Pass	Pass	Stable	Pass	Pass	Stable
FLT1009-SB	Pass	Pass	Stable	Pass	Pass	Stable
FLT1010-SB	Pass	Pass	Stable	Pass	Pass	Stable
FLT1011-SB	Pass	Pass	Stable	Pass	Pass	Stable
FLT1012-SB	Pass	Pass	Stable	Pass	Pass	Stable
FLT1013-SB	Pass	Pass	Stable	Pass	Pass	Stable
FLT1014-SB	Pass	Pass	Stable	Pass	Pass	Stable
FLT1015-SB	Pass	Pass	Stable	Pass	Pass	Stable
FLT1016-SB	Pass	Pass	Stable	Pass	Pass	Stable
FLT1017-SB	Pass	Pass	Stable	Pass	Pass	Stable
FLT1018-SB	Pass	Pass	Stable	Pass	Pass	Stable
FLT1019-SB	Pass	Pass	Stable	Pass	Pass	Stable
FLT1020-SB	Pass	Pass	Stable	Pass	Pass	Stable
FLT1021-SB	Pass	Pass	Stable	Pass	Pass	Stable
FLT1022-SB	Pass	Pass	Stable	Pass	Pass	Stable
FLT1023_SP-SB	Pass	Pass	Stable	N/A	N/A	N/A
FLT1024_WP-SB	N/A	N/A	N/A	Pass	Pass	Stable
FLT9000-3PH	Pass	Pass	Stable	Pass	Pass	Stable
FLT9001-3PH	Pass	Pass	Stable	Pass	Pass	Stable
FLT9002-3PH	Pass	Pass	Stable	Pass	Pass	Stable
FLT9003-3PH	Pass	Pass	Stable	Pass	Pass	Stable
FLT9004-3PH	Pass	Pass	Stable	Pass	Pass	Stable
FLT9005_SP-3PH	Pass	Pass	Stable	N/A	N/A	N/A
FLT9006_SP-3PH	Pass	Pass	Stable	N/A	N/A	N/A
FLT9007-3PH	Pass	Pass	Stable	Pass	Pass	Stable
FLT9008-3PH	Pass	Pass	Stable	Pass	Pass	Stable
FLT9009-3PH	Pass	Pass	Stable	Pass	Pass	Stable
FLT9010-3PH	Pass	Pass	Stable	Pass	Pass	Stable
FLT9011-3PH	Pass	Pass	Stable	Pass	Pass	Stable
FLT9012-3PH	Pass	Pass	Stable	Pass	Pass	Stable
FLT9013-3PH	Pass	Pass	Stable	Pass	Pass	Stable
FLT9014-3PH	Pass	Pass	Stable	Pass	Pass	Stable
FLT9015-3PH	Pass	Pass	Stable	Pass	Pass	Stable

Table 5-4 continued

Fault ID	25SP			25WP		
	Voltage Violation	Voltage Recovery	Stable	Voltage Violation	Voltage Recovery	Stable
FLT9016-3PH	Pass	Pass	Stable	Pass	Pass	Stable
FLT9017-3PH	Pass	Pass	Stable	Pass	Pass	Stable
FLT9018-3PH	Pass	Pass	Stable	Pass	Pass	Stable
FLT9019-3PH	Pass	Pass	Stable	Pass	Pass	Stable
FLT9020-3PH	Pass	Pass	Stable	Pass	Pass	Stable
FLT9021-3PH	Pass	Pass	Stable	Pass	Pass	Stable
FLT9022-3PH	Pass	Pass	Stable	Pass	Pass	Stable
FLT9023-3PH	Pass	Pass	Stable	Pass	Pass	Stable
FLT9024-3PH	Pass	Pass	Stable	Pass	Pass	Stable
FLT9025-3PH	Pass	Pass	Stable	Pass	Pass	Stable
FLT9026-3PH	Pass	Pass	Stable	Pass	Pass	Stable
FLT9027-3PH	Pass	Pass	Stable	Pass	Pass	Stable
FLT9028-3PH	Pass	Pass	Stable	Pass	Pass	Stable
FLT9029-3PH	Pass	Pass	Stable	Pass	Pass	Stable
FLT9030-3PH	Pass	Pass	Stable	Pass	Pass	Stable
FLT9031-3PH	Pass	Pass	Stable	Pass	Pass	Stable
FLT9032-3PH	Pass	Pass	Stable	Pass	Pass	Stable
FLT9033-3PH	Pass	Pass	Stable	Pass	Pass	Stable
FLT9034-3PH	Pass	Pass	Stable	Pass	Pass	Stable
FLT9035-3PH	Pass	Pass	Stable	Pass	Pass	Stable
FLT9036-3PH	Pass	Pass	Stable	Pass	Pass	Stable
FLT9037-3PH	Pass	Pass	Stable	Pass	Pass	Stable
FLT9038-3PH	Pass	Pass	Stable	Pass	Pass	Stable
FLT9039-3PH	Pass	Pass	Stable	Pass	Pass	Stable
FLT9040-3PH	Pass	Pass	Stable	Pass	Pass	Stable
FLT9041_SP-3PH	Pass	Pass	Stable	N/A	N/A	N/A
FLT9042_SP-3PH	Pass	Pass	Stable	N/A	N/A	N/A
FLT9043_SP-3PH	Pass	Pass	Stable	N/A	N/A	N/A
FLT9044_SP-3PH	Pass	Pass	Stable	N/A	N/A	N/A
FLT9045-3PH	Pass	Pass	Stable	Pass	Pass	Stable
FLT9046-3PH	Pass	Pass	Stable	Pass	Pass	Stable
FLT9047-3PH	Pass	Pass	Stable	Pass	Pass	Stable
FLT9048-3PH	Pass	Pass	Stable	Pass	Pass	Stable
FLT9049-3PH	Pass	Pass	Stable	Pass	Pass	Stable
FLT9050-3PH	Pass	Pass	Stable	Pass	Pass	Stable
FLT9051_WP-3PH	N/A	N/A	N/A	Pass	Pass	Stable
FLT9052_WP-3PH	N/A	N/A	N/A	Pass	Pass	Stable

**Table 5-4 continued**

Fault ID	25SP			25WP		
	Voltage Violation	Voltage Recovery	Stable	Voltage Violation	Voltage Recovery	Stable
FLT9053_WP-3PH	N/A	N/A	N/A	Pass	Pass	Stable
FLT9054_WP-3PH	N/A	N/A	N/A	Pass	Pass	Stable

The results of the Scenario 2 dynamic stability showed several existing base case issues that were found in both the original DISIS-2022-001-1 model and the model with GEN-2025-SR15 included. These issues were not attributed to the GEN-2025-SR15 surplus request and detailed in Appendix C.

There were no damping or voltage recovery violations attributed to the GEN-2025-SR15 surplus request observed during the simulated faults.

## 6.0 Necessary Interconnection Facilities and Network Upgrades

This study identified the impact of the Surplus Interconnection Service on the transmission system reliability and any additional Interconnection Facilities or Network Upgrades necessary. The Surplus Interconnection Service is only available up to the amount that can be accommodated without requiring additional Network Upgrades unless (a) those additional Network Upgrades are either (1) located at the Point of Interconnection substation and at the same voltage level as the Generating Facility with an effective GIA, or (2) are System Protection Facilities; and (b) there are no material adverse impacts on the cost or timing of any Interconnection Requests pending at the time the Surplus Interconnection Service request is submitted.

### 6.1 Interconnection Facilities

This study did not identify any additional Interconnection Facilities required by the addition of the SGF.

### 6.2 Network Upgrades

This study did not identify any Network Upgrades required by the addition of the SGF. SPP will reach out to the TO and/or TOP to determine if there are any additional Network Upgrades that are either (1) located at the Point of Interconnection substation and at the same voltage level as the Generating Facility with an effective GIA, or (2) are System Protection Facilities.

## 7.0 Surplus Interconnection Service Determination and Requirements

In accordance with Attachment V of the SPP Tariff, SPP shall evaluate the request for Surplus Interconnection Service and inform the Interconnection Customer in writing of whether the Surplus Interconnection Service can be utilized without negatively impacting the reliability of the Transmission System and without any additional Network Upgrades necessary except those specified in the SPP Tariff.

### 7.1 Surplus Service Determination

SPP determined the request for Surplus Interconnection Service does not negatively impact the reliability of the Transmission System and no required Network Upgrades or Interconnection Facilities were identified by this Surplus Interconnection Service Impact Study performed by Aneden. Aneden evaluated the impact of the requested Surplus Interconnection Service on the prior study results and determined that the requested Surplus Interconnection Service resulted in similar dynamic stability and short circuit analyses and that the steady-state results did not show any additional impacts with the surplus online.

SPP has determined that GEN-2025-SR15 may utilize the requested 125 MW of Surplus Interconnection Service being made available by McClain Units 1, 2 and 3.

### 7.2 Surplus Service Requirements

The amount of Surplus Interconnection Service available to be used is limited by the amount of Interconnection Service granted to the existing interconnection customer at the same POI. The combined generation from both the SGF and the EGF may not exceed 648.6 MW at the POI, which is the total Interconnection Service amount currently granted to the EGF.

The customer must install monitoring and control equipment as needed to ensure that the SGF does not exceed the granted surplus amount and to ensure that combination of the SGF and EGF power injected at the POI does not exceed the Interconnection Service amount determined by the legacy EGF's nameplate POI capacity. The monitoring and control scheme may be reviewed by the TO and documented in Appendix C of the SGF GIA.

SPP will reach out to the TO and/or TOP to determine if there are any additional Network Upgrades that are either (1) located at the Point of Interconnection substation and at the same voltage level as the Generating Facility with an effective GIA, or (2) are System Protection Facilities.