Report on

# GEN-2017-158
# Modification Request Impact Study

**Revision R1 June 14, 2024**

Submitted to
Southwest Power Pool

anedenconsulting.com

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# Revision History

| DATE OR VERSION NUMBER | AUTHOR | CHANGE DESCRIPTION |
|---|---|---|
| 6/14/2024 | Aneden Consulting | Initial Report Issued |
| | | |
| | | |

# Executive Summary

Aneden Consulting (Aneden) was retained by the Southwest Power Pool (SPP) to perform a Modification Request Impact Study (Study) for GEN-2017-158, an active Generation Interconnection Request (GIR) with a Point of Interconnection (POI) at the Tolk 230 kV Substation.

The GEN-2017-158 project interconnects in the Xcel Energy, formerly known as Southwestern Public Service (SPS), control area with a capacity of 265 MW. This Study has been requested to evaluate the modification of GEN-2017-158 to change the configuration to 78 x GE 3.4 MW wind turbines for a total dispatch of 265.2 MW. The total dispatch, 265.2 MW, exceeds its Generator Interconnection Agreement (GIA) Interconnection Service amount. The injection amount must be limited to 265 MW at the POI as listed in Appendix A of the GIA. As a result, the customer must ensure that the amount of power injected at the POI does not exceed the Interconnection Service amount listed in its GIA.

In addition, the modification request included changes to the collection system, generator step-up transformers, main substation transformers, and generation interconnection line. The existing and modified configurations for GEN-2017-158 are shown in Table ES-1 below.

**Table ES-1: GEN-2017-158 Modification Request**

| Facility | Existing Configuration | | Modification Configuration | |
|---|---|---|---|---|
| Point of Interconnection | Tolk 230 kV Substation (525531) | | Tolk 230 kV Substation (525531) | |
| Configuration/Capacity | 106 x GE 2.5 MW (wind) = 265 MW | | 78 x GE 3.4 MW (wind) = 265.2 MW [dispatch]<br>POI limited to 265 MW | |
| Generation Interconnection Line | Shared with GEN-2018-099:<br>Length = 8 miles<br>R = 0.001528 pu<br>X = 0.011839 pu<br>B = 0.011650 pu<br>Rating MVA = 1084 MVA | | Shared with GEN-2018-099:<br>Length = 20 miles<br>R = 0.002120 pu<br>X = 0.019010 pu<br>B = 0.084650 pu<br>Rating MVA = 683 MVA | |
| Main Substation Transformer[1] | X = 8.997%, R = 0.225%,<br>Winding MVA = 90 MVA,<br>Rating MVA = 150 MVA | X = 8.997%, R = 0.225%,<br>Winding MVA = 90 MVA,<br>Rating MVA = 150 MVA | X = 8.998%, R = 0.205%,<br>Winding MVA = 93 MVA,<br>Rating MVA = 155 MVA | X = 8.998%, R = 0.205%,<br>Winding MVA = 93 MVA,<br>Rating MVA = 155 MVA |
| Equivalent GSU Transformer[1] | Gen 1 Equivalent Qty: 53<br>X = 5.699%, R = 0.759%,<br>Winding MVA = 148.4 MVA,<br>Rating MVA = 148.4 MVA | Gen 2 Equivalent Qty: 53<br>X = 5.699%, R = 0.759%,<br>Winding MVA = 148.4 MVA,<br>Rating MVA = 148.4 MVA | Gen 1 Equivalent Qty: 39<br>X = 10.129%, R = 0.796%,<br>Winding MVA = 156 MVA,<br>Rating MVA = 156 MVA | Gen 2 Equivalent Qty: 39<br>X = 10.129%, R = 0.796%,<br>Winding MVA = 156 MVA,<br>Rating MVA = 156 MVA |
| Equivalent Collector Line[2] | R = 0.007998 pu<br>X = 0.010403 pu<br>B = 0.065780 pu | R = 0.007267 pu<br>X = 0.008926 pu<br>B = 0.073220 pu | R = 0.006807 pu<br>X = 0.012212 pu<br>B = 0.100032 pu | R = 0.005069 pu<br>X = 0.008751 pu<br>B = 0.075731 pu |
| Generator Dynamic Model[3] & Power Factor | 53 x GE 2.5 MW (REGCA1)[3]<br>Leading: 0.95<br>Lagging: 0.95 | 53 x GE 2.5 MW (REGCA1)[3]<br>Leading: 0.95<br>Lagging: 0.95 | 39 x GE 3.4 MW (REGCA1)[3]<br>Leading: 0.9<br>Lagging: 0.9 | 39 x GE 3.4 MW (REGCA1)[3]<br>Leading: 0.9<br>Lagging: 0.9 |

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

SPP determined that steady-state analysis was not required because the modifications to the project were not significant enough to change the previously studied steady-state conclusions. However, SPP determined that the change in equivalent impedance (21.07%) has the potential to alter the project impact and would require dynamic stability analysis and short circuit analysis to be performed.

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

Aneden performed the analyses using the modification request data and the DISIS-2018-002/2019-001 study models:

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

All analyses were performed using the Siemens PTI PSS/E[1] version 34 software and the results are summarized below.

The results of the reactive power analysis using the 25SP model showed that the GEN-2017-158 project needed a 26.1 MVAr shunt reactor on the 34.5 kV bus of the project substation with the modifications in place, an increase from the 15.06 MVAr found in the DISIS-2017-002-2 study[2].This is necessary to offset the capacitive effect on the transmission network caused by the project's transmission line and collector system during reduced generation conditions. The information gathered from the reactive power analysis is provided as information to the Interconnection Customer and Transmission Owner (TO) and/or Transmission Operator (TOP). The applicable reactive power requirements will be further reviewed by the TO and/or TOP.

The short circuit analysis was performed using the 25SP stability model modified for short circuit analysis. The results from the short circuit analysis with the updated topology showed that the maximum GEN-2017-158 contribution to three-phase fault currents in the immediate transmission systems at or near the GEN-2017-158 POI was 1.27 kA. The maximum three-phase fault current level within 5 buses of the POI was 33.4 kA for the 25SP model.

The dynamic stability analysis was performed using Siemens PTI PSS/E version 34.8.0 software for the two modified study models: 25SP and 25WP. 115 events were simulated, which included three-phase faults and single-line-to-ground stuck breaker faults.

The results of the dynamic stability analysis showed several existing base case issues that were found in both the original DISIS-2018-002/2019-001 model and in the model with the GEN-2017-158 modification included. These issues were not attributed to the GEN-2017-158 modification request and are detailed in Appendix C.

There were no damping or voltage recovery violations attributed to the GEN-2017-158 modification request observed during the simulated faults. Additionally, the project was found to stay connected during the contingencies that were studied and, therefore, will meet the Low Voltage Ride Through (LVRT) requirements of FERC Order #661A.

Based on the results of the study, SPP determined that the requested modification is **not a Material Modification**. The requested modification does not have a material adverse impact on the cost or timing of any other Interconnection Request with a later Queue priority date. As the requested modification places the generating capacity of the Interconnection Request at a higher amount than its Interconnection Service,

[1] Power System Simulator for Engineering

[2] DISIS-2017-002-2 Restudy of Power Flow, Stability, and Short-Circuit – March 22, 2024

the customer must install monitoring and control equipment as needed to ensure that the amount of power injected at the POI does not exceed the Interconnection Service amount listed in its GIA.

In accordance with FERC Order No. 827, the generating facility will be required to provide dynamic reactive power within the range of 0.95 leading to 0.95 lagging at the high-side of the generator substation.

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 Southwest Power Pool's OASIS by the customer.

# 1.0 Scope of Study

Aneden Consulting (Aneden) was retained by the Southwest Power Pool (SPP) to perform a Modification Request Impact Study (Study) for GEN-2017-158. A Modification Request Impact Study is a generation interconnection study performed to evaluate the impacts of modifying the DISIS study assumptions. The determination of the required scope of the study is dependent upon the specific modification requested and how it may impact the results of the DISIS study. Impacting the DISIS results could potentially affect the cost or timing of any Interconnection Request with a later Queue priority date, deeming the requested modification a Material Modification. The criteria sections below include reasoning as to why an analysis was either included or excluded from the scope of study.

All analyses were performed using the Siemens PTI PSS/E version 34 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 capacitive effect at the POI caused by the project's collection system and transmission line's capacitance. A shunt reactor size was determined to offset the capacitive effect and maintain zero (0) MVAr injection at the POI while the plant's generators and capacitors were offline.

## 1.2 Short Circuit Analysis & Stability Analysis

To determine whether stability and short circuit analyses are required, SPP evaluates the difference between the stability models, the stability model parameters and, if needed, the equivalent collector system impedance between the existing configuration and the requested modification. Dynamic stability analysis and short circuit analysis would be required if the differences listed above were determined to have a significant impact on the most recently performed DISIS stability analysis.

## 1.3 Steady-State Analysis

Steady-state analysis is performed if SPP deems it necessary based on the nature of the requested change. SPP determined that steady-state analysis was not required because the modifications to the project were not significant enough to change the previously studied steady-state conclusions.

## 1.4 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.

## 2.0 Project and Modification Request

The GEN-2017-158 Interconnection Customer requested a modification to its Generation Interconnection Request (GIR) with a Point of Interconnection (POI) at the Tolk 230 kV Substation in the Southwestern Public Service (SPS) control area.

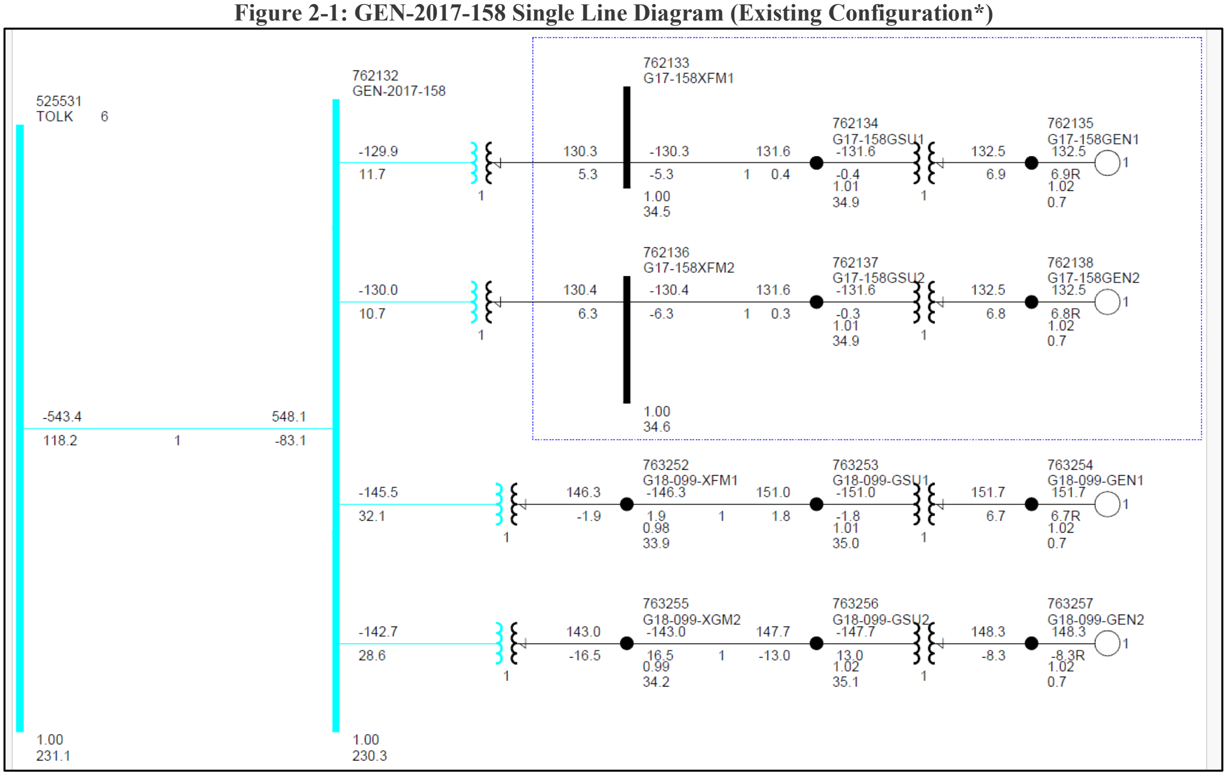
At the time of report posting, GEN-2017-158 is an active Interconnection Request with a queue status of "IA FULLY EXECUTED/ON SCHEDULE." GEN-2017-158 is a wind facility with a maximum summer and winter queue capacity of 265 MW with Energy Resource Interconnection Service (ERIS).

The GEN-2017-158 project is currently in the DISIS-2017-002 cluster. Figure 2-1 shows the power flow model single line diagram for the existing GEN-2017-158 configuration using the DISIS-2018-002/2019-001 25SP stability model.

This Study has been requested to evaluate the modification of GEN-2017-158 to change the configuration to 78 x GE 3.4 MW wind turbines for a total dispatch of 265.2 MW. The total dispatch, 265.2 MW, exceeds its Generator Interconnection Agreement (GIA) Interconnection Service amount. The injection amount must be limited to 265 MW at the POI as listed in Appendix A of the GIA. As a result, the customer must ensure that the amount of power injected at the POI does not exceed the Interconnection Service amount listed in its GIA.

In addition, the modification request included changes to the collection system, generator step-up transformers, main substation transformers, and generation interconnection line. Figure 2-2 shows the power flow model single line diagram for the GEN-2017-158 modification. The existing and modified configurations for GEN-2017-158 are shown in Table 2-1 below.

**Figure 2-1: GEN-2017-158 Single Line Diagram (Existing Configuration*)**




*based on the DISIS-2018-002/2019-001 25SP stability mode

Figure 2-2: GEN-2017-158 Single Line Diagram (Modification Configuration)

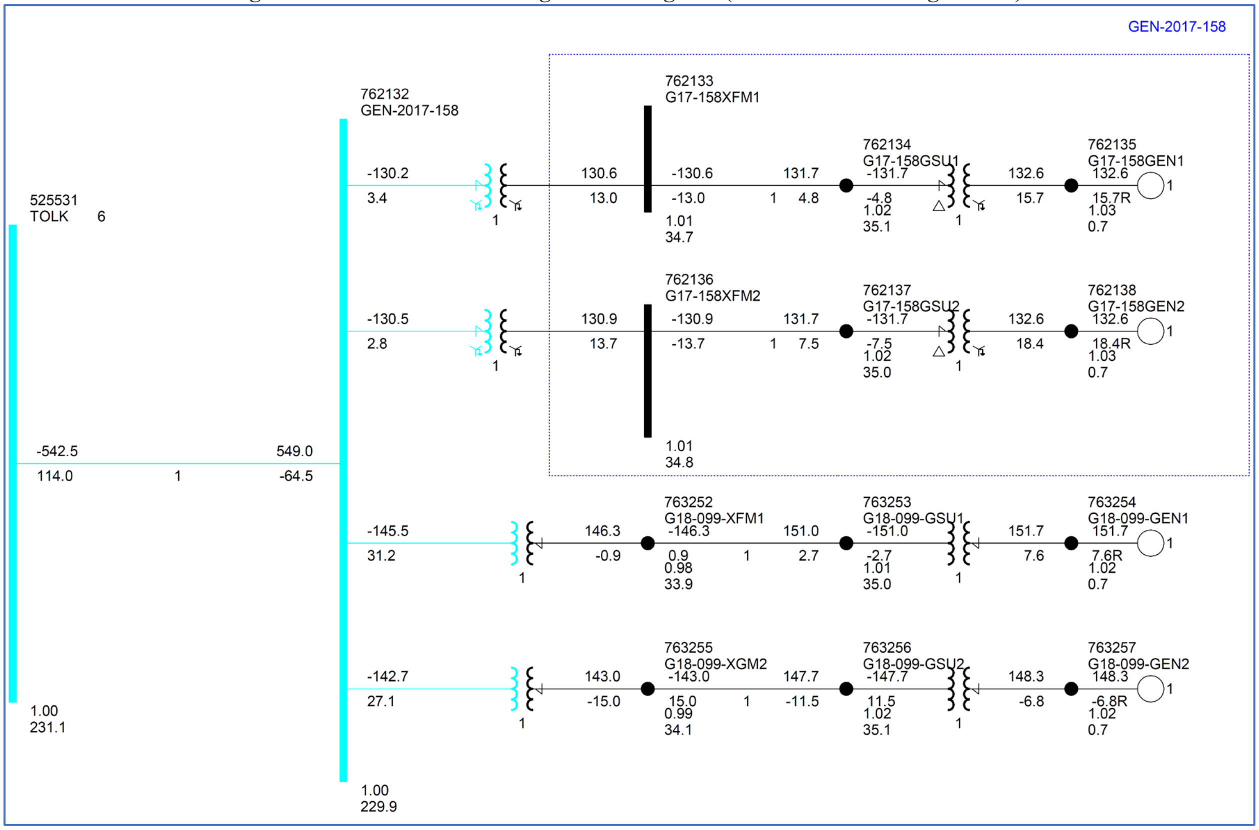



Table 2-1: GEN-2017-158 Modification Request

| Facility | Existing Configuration | | Modification Configuration | |
|---|---|---|---|---|
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| Configuration/Capacity | 106 x GE 2.5 MW (wind) = 265 MW | | 78 x GE 3.4 MW (wind) = 265.2 MW [dispatch]<br>POI limited to 265 MW | |
| Generation Interconnection Line | Shared with GEN-2018-099:<br>Length = 8 miles<br>R = 0.001528 pu<br>X = 0.011839 pu<br>B = 0.011650 pu<br>Rating MVA = 1084 MVA | | Shared with GEN-2018-099:<br>Length = 20 miles<br>R = 0.002120 pu<br>X = 0.019010 pu<br>B = 0.084650 pu<br>Rating MVA = 683 MVA | |
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| Generator Dynamic Model[3] & Power Factor | 53 x GE 2.5 MW (REGCA1)[3]<br>Leading: 0.95<br>Lagging: 0.95 | 53 x GE 2.5 MW (REGCA1)[3]<br>Leading: 0.95<br>Lagging: 0.95 | 39 x GE 3.4 MW (REGCA1)[3]<br>Leading: 0.9<br>Lagging: 0.9 | 39 x GE 3.4 MW (REGCA1)[3]<br>Leading: 0.9<br>Lagging: 0.9 |

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

# 3.0 Existing vs Modification Comparison

To determine which analyses are required for the Study, the differences between the existing configuration and the requested modification were evaluated. Aneden performed this comparison and the resulting analyses using a set of modified study models developed based on the modification request data and the DISIS-2018-002/2019-001 study models. The analysis was completed using PSS/E version 34 software.

The methodology and results of the comparisons are described below.

## 3.1 Equivalent Impedance Comparison Calculation

The impedances of the transmission lines, main power transformer(s), equivalent collector line impedances, and generator step-up transformers were added in series for GEN-2017-158 along with the project GEN-2018-099 (co-located on the same generation interconnection line) before and after the modification request. The percentage increase in the impedances before and after the modification request were then compared. If the absolute value percentage change was greater than 10%, additional dynamic stability analysis and short circuit analysis would be performed to further assess the impact of the requested modification. Table 3-1 shows the impedance differences before and after the modification request. Table 3-2 shows the change in the equivalent impedance from the previously studied configuration to the current modification request.

**Table 3-1: GEN-2017-158 & GEN-2018-099 Impedance Comparison**

| System Component | Existing Model Impedances (p.u.) | | | Modification Request Impedances (p.u.) | | |
|---|---|---|---|---|---|---|
| | *R* | *X* | | *R* | *X* | |
| Gen Tie Line from POI to GEN-2017-158 & GEN-2018-099 | 0.00153 | 0.01184 | | 0.00212 | 0.01901 | |
| GEN-2017-158 & GEN-2018-099 collector system equivalent | 0.00393 | 0.00509 | | 0.00375 | 0.00518 | |
| | | | | | | |
| | *R* | *X* | *MVA Base* | *R* | *X* | *MVA Base* |
| GEN-2017-158 & GEN-2018-099 Equivalent Main Transformer @ 100 MVA | 0.00062 | 0.02479 | 100 | 0.00060 | 0.02479 | 100 |
| | | | | | | |
| GEN-2017-158 & GEN-2018-099 Unit GSU @ 100 MVA Base | 0.00098 | 0.00734 | 100 | 0.00101 | 0.01057 | 100 |
| | | | | | | |
| | *R* | *X* | *Z* | *R* | *X* | *Z* |
| Total Impedance from POI to Collector System | 0.007058 | 0.049066 | 0.049571 | 0.007468 | 0.059549 | 0.060015 |

**Table 3-2: GEN-2017-158 & GEN-2018-099 Equivalent Impedance Comparison Results**

| Interconnection Request | Existing Impedance Z (p.u.) | MRIS Impedance Z (p.u.) | Impedance Z Difference % |
|---|---|---|---|
| GEN-2017-158 & GEN-2018-099 Impedance Increase | 0.04957 | 0.06002 | 21.07% |

SPP determined that the change in impedance (21.07%) has the potential to alter the project impact and would require dynamic stability analysis and short circuit analysis to be performed to determine the impact of the requested modification.

## 3.2 Stability Model Parameters Comparison

As the equivalent impedance change determined that short circuit and dynamic stability analyses were required, stability model parameter comparison was not needed for the determination of the scope of the study.

# 4.0 Reactive Power Analysis

The reactive power analysis was performed for GEN-2017-158 to determine the capacitive charging effects during reduced generation conditions (unsuitable wind speeds, unsuitable solar irradiance, insufficient state of charge, idle conditions, curtailment, etc.) at the generation site and to size shunt reactors that would reduce the project reactive power contribution to the POI to approximately zero.

## 4.1 Methodology and Criteria

For this analysis the GEN-2018-099 project that shares the gen-tie line was disconnected. The GEN-2017-158 generators were switched out of service while other system elements remained in-service. Shunt reactors were tested at the project's collection substation 34.5 kV buses to set the MVAr flow into the POI to approximately zero. The size of the shunt reactors was equivalent to the charging current value at unity voltage and the compensation provided is proportional to the voltage effects on the charging current (i.e., for voltages above unity, reactive compensation is greater than the size of the reactor).

Aneden performed the reactive power analysis using the modification request data based on the 25SP DISIS-2018-002/2019-001 stability study model.

## 4.2 Results

The results from the analysis showed that the GEN-2017-158 project needed approximately 26.1 MVAr of total compensation at its collector substations to reduce the POI MVAr to zero. This is an increase from the 15.06 MVAr found in the DISIS-2017-002-2 study[3]. The final shunt reactor requirements are shown in Table 4-1. Figure 4-1 illustrates the shunt reactor size needed to reduce the POI MVAr to approximately zero with the updated topology.

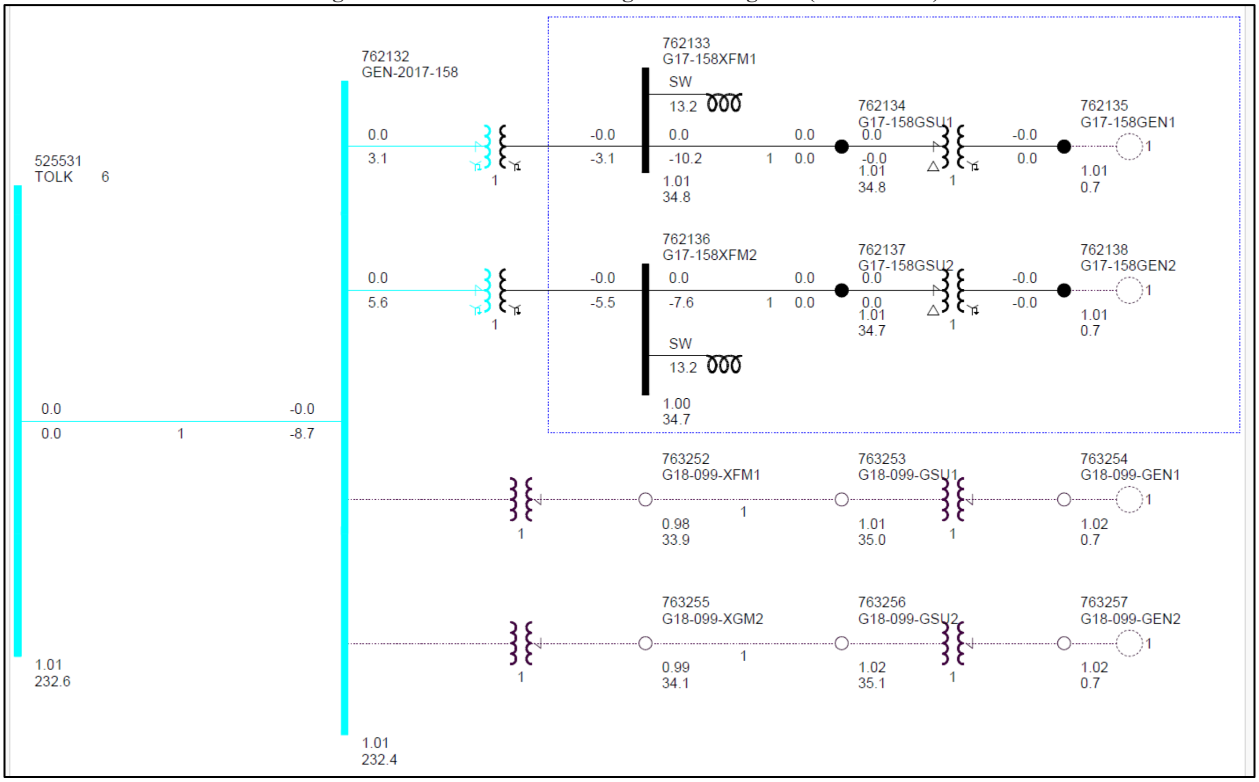
The information gathered from the reactive power analysis is provided as information to the Interconnection Customer and Transmission Owner (TO) and/or Transmission Operator (TOP). The applicable reactive power requirements will be further reviewed by the TO and/or TOP.

**Table 4-1: Shunt Reactor Size for Reactive Power Analysis**

| Machine | POI Bus Number | POI Bus Name | Reactor Size (MVAr) |
|---|---|---|---|
| | | | 25SP |
| GEN-2017-158 | 525531 | TOLK 6 | 26.1 |

[3] DISIS-2017-002-2 Restudy of Power Flow, Stability, and Short-Circuit – March 22, 2024

**Figure 4-1: GEN-2017-158 Single Line Diagram (Shunt Sizes)**



# 5.0 Short Circuit Analysis

Aneden performed a short circuit study using the 25SP model for GEN-2017-158 to determine the maximum fault current requiring interruption by protective equipment for each bus in the relevant subsystem. The detailed results of the short circuit analysis are provided in Appendix B.

## 5.1 Methodology

The short circuit analysis included applying a 3-phase fault on buses up to 5 levels away from the 230 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 GEN-2017-158 online.

Aneden created a short circuit model using the 25SP DISIS-2018-002/2019-001 stability study model by adjusting the GEN-2017-158 short circuit parameters consistent with the submitted data. The adjusted parameters used in the short circuit analysis are shown in Table 5-1 below. No other changes were made to the model.

**Table 5-1: Short Circuit Model Parameters***

| Parameter | Value by Generator Bus# | Value by Generator Bus# |
|---|---|---|
| | 762135 | 762138 |
| Machine MVA Base | 139.54 | 139.54 |
| R (pu) | 0.0 | 0.0 |
| X'' (pu) | 0.2 | 0.2 |

*pu values based on Machine MVA Base

## 5.2 Results

The results of the short circuit analysis for the 25SP model are summarized in Table 5-2 and Table 5-3. The GEN-2017-158 POI bus (Tolk 230 kV) fault current magnitudes for the comparison cases are provided in Table 5-2 showing a fault current of 33.4 kA with the GEN-2017-158 project online. Table 5-3 shows the maximum fault current magnitudes and fault current increases with the GEN-2017-158 project online.

The maximum fault current calculated within 5 buses of the POI was 33.4 kA for the 25SP model. The maximum GEN-2017-158 contribution to three-phase fault currents was about 4% and 1.27 kA[4].

**Table 5-2: POI Short Circuit Comparison Results**

| Case | GEN-OFF Current (kA) | GEN-ON Current (kA) | kA Change | %Change |
|---|---|---|---|---|
| 25SP | 32.13 | 33.40 | 1.27 | 4.0% |

[4] For buses not on the generation interconnection line

Table 5-3: 25SP Short Circuit Comparison Results[5]

| Voltage (kV) | Max. Current (kA) | Max kA Change | Max %Change |
|---|---|---|---|
| 69 | 8.8 | 0.01 | 0.2% |
| 115 | 33.0 | 0.11 | 0.6% |
| 230 | 33.4 | 1.27 | 4.0% |
| 345 | 19.4 | 0.30 | 1.8% |
| **Max** | **33.4** | **1.27** | **4.0%** |

[5] For buses not on the generation interconnection line

# 6.0 Dynamic Stability Analysis

Aneden performed a dynamic stability analysis to identify the impact of the modifications to GEN-2017-158. The analysis was performed according to SPP's Disturbance Performance Requirements[6]. The modification 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.

## 6.1 Methodology and Criteria

The dynamic stability analysis was performed using models developed with the requested GEN-2017-158 configuration of 78 x GE 3.4 MW turbines (REGCA1). This stability analysis was performed using Siemens PTI's PSS/E version 34.8.0 software.

The modifications requested for the GEN-2017-158 project were used to create modified stability models for this impact study based on the DISIS-2018-002/2019-001 stability study models:

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

The dynamic model data for the GEN-2017-158 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 modification request:

- The frequency protective relays at buses 763189, 763084, 763090, 525953, 525952, 525951, 523121, 523123, and 523122 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.
- The voltage protective relays at buses 763189, 523812, 763309, 763397, 763084, 763090, 523121, 523123, 523122, 560584, 560585, and 560586 were disabled to avoid generator tripping due to an instantaneous over voltage spike after fault clearing.
- The fault simulation file acceleration factor was reduced as needed to resolve stability simulation crashes.

During the fault simulations, the active power (PELEC), reactive power (QELEC), and terminal voltage (ETERM) were monitored for GEN-2017-158 and other current and prior queued projects in Group 5. In addition, voltages of five (5) buses away from the POI of the GEN-2017-158 were monitored and plotted. The machine rotor angle for synchronous machines and speed for asynchronous machines within the study areas including 520 (AEPW), 524 (OKGE), 526 (SPS), 534 (SUNC), and 652 (WAPA) were monitored. The voltages of all 100 kV and above buses within the study area were monitored as well.

[6] SPP Disturbance Performance Requirements: https://www.spp.org/documents/28859/spp%20disturbance%20performance%20requirements%20(twg%20approved).pdf

## 6.2 Fault Definitions

Aneden simulated the nearby faults previously studied in the DISIS-2018-002/2019-001 analysis and developed additional fault events as required. 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 6-1 below. These contingencies were applied to the modified 25SP and 25WP models.

**Table 6-1: Fault Definitions**

| Fault ID | Planning Event | Fault Descriptions |
|---|---|---|
| FLT0001-3PH | P1 | 3 Phase fault on NEWHART 6 (525461) 230 kV Bus to PLANT_X 6 (525481) 230 kV line CKT 1, near NEWHART 6 (525461) 230 kV.<br>a. Apply fault at the NEWHART 6 (525461) 230 kV Bus.<br>b. Clear fault after 7 cycles by tripping the faulted line.<br>c. Wait 20 cycles, and then re-close the line in (b) back into the fault.<br>d. Leave Fault on for 7 cycles, then trip the line in (b) and remove fault. |
| FLT0002-3PH | P1 | 3 Phase fault on PLANT_X 6 (525481) 230 kV Bus to TOLK 6 (525531) 230 kV line CKT 1, near PLANT_X 6 (525481) 230 kV.<br>a. Apply fault at the PLANT_X 6 (525481) 230 kV Bus.<br>b. Clear fault after 7 cycles by tripping the faulted line.<br>c. Wait 20 cycles, and then re-close the line in (b) back into the fault.<br>d. Leave Fault on for 7 cycles, then trip the line in (b) and remove fault. |
| FLT0003-3PH | P1 | 3 Phase fault on PLANT_X 6 (525481) 230 kV Bus to TOLK 6 (525531) 230 kV line CKT 2, near PLANT_X 6 (525481) 230 kV.<br>a. Apply fault at the PLANT_X 6 (525481) 230 kV Bus.<br>b. Clear fault after 7 cycles by tripping the faulted line.<br>c. Wait 20 cycles, and then re-close the line in (b) back into the fault.<br>d. Leave Fault on for 7 cycles, then trip the line in (b) and remove fault. |
| FLT0004-3PH | P1 | 3 Phase fault on PLANT_X 6 (525481) 230 kV Bus to SUNDOWN 6 (526435) 230 kV line CKT 1, near PLANT_X 6 (525481) 230 kV.<br>a. Apply fault at the PLANT_X 6 (525481) 230 kV Bus.<br>b. Clear fault after 7 cycles by tripping the faulted line.<br>c. Wait 20 cycles, and then re-close the line in (b) back into the fault.<br>d. Leave Fault on for 7 cycles, then trip the line in (b) and remove fault. |
| FLT0005-3PH | P1 | 3 Phase fault on PLANT_X 6 (525481) 230 kV Bus to G17-146-TAP (760498) 230 kV line CKT 1, near PLANT_X 6 (525481) 230 kV.<br>a. Apply fault at the PLANT_X 6 (525481) 230 kV Bus.<br>b. Clear fault after 7 cycles by tripping the faulted line.<br>c. Wait 20 cycles, and then re-close the line in (b) back into the fault.<br>d. Leave Fault on for 7 cycles, then trip the line in (b) and remove fault. |
| FLT0006-3PH | P1 | 3 Phase fault on PLANT_X 6 PLANT_X 3 (525480) 115 kV /(525481) 230 kV / PLANTX_TR1 1 (525479) 13.2 kV XFMR CKT 1, near PLANT_X 3 (525480) 115 kV.<br>a. Apply fault at the PLANT_X 3 (525480) 115 kV Bus.<br>b. Clear fault after 7 cycles by tripping the faulted transformer. |
| FLT0007-3PH | P1 | 3 Phase fault on PLANT_X 6 PLANT_X 3 (525480) 115 kV /(525481) 230 kV / PLANTX_TR1 1 (525478) 13.2 kV XFMR CKT 2, near PLANT_X 3 (525480) 115 kV.<br>a. Apply fault at the PLANT_X 3 (525480) 115 kV Bus.<br>b. Clear fault after 7 cycles by tripping the faulted transformer. |
| FLT0008-3PH | P1 | 3 Phase fault on NEWHART 6 (525461) 230 kV Bus to POTTER_CO 6 (523959) 230 kV line CKT 1, near NEWHART 6 (525461) 230 kV.<br>a. Apply fault at the NEWHART 6 (525461) 230 kV Bus.<br>b. Clear fault after 7 cycles by tripping the faulted line.<br>c. Wait 20 cycles, and then re-close the line in (b) back into the fault.<br>d. Leave Fault on for 7 cycles, then trip the line in (b) and remove fault. |

**Table 6-1 Continued**

| Fault ID | Planning Event | Fault Descriptions |
|---|---|---|
| FLT0009-3PH | P1 | 3 Phase fault on NEWHART 6 (525461) 230 kV Bus to SWISHER 6 (525213) 230 kV line CKT 1, near NEWHART 6 (525461) 230 kV.<br>a. Apply fault at the NEWHART 6 (525461) 230 kV Bus.<br>b. Clear fault after 7 cycles by tripping the faulted line.<br>c. Wait 20 cycles, and then re-close the line in (b) back into the fault.<br>d. Leave Fault on for 7 cycles, then trip the line in (b) and remove fault. |
| FLT0010-3PH | P1 | 3 Phase fault on NEWHART 6 (525461) 230 kV / NEWHART 3 (525460) 115 kV / NEWHART_TR11 (525459) 13.2 kV XFMR CKT 1, near NEWHART 6 (525461) 230 kV.<br>a. Apply fault at the NEWHART 6 (525461) 230 kV Bus.<br>b. Clear fault after 7 cycles by tripping the faulted transformer. |
| FLT0011-3PH | P1 | 3 Phase fault on NEWHART 6 (525461) 230 kV / NEWHART 3 (525460) 115 kV / NEWHART_TR21 (525458) 13.2 kV XFMR CKT 2, near NEWHART 6 (525461) 230 kV.<br>a. Apply fault at the NEWHART 6 (525461) 230 kV Bus.<br>b. Clear fault after 7 cycles by tripping the faulted transformer. |
| FLT0012-3PH | P1 | 3 Phase fault on TOLK 6 (525531) 230 kV Bus to ROOSEVELT 6 (524909) 230 kV line CKT 1, near TOLK 6 (525531) 230 kV.<br>a. Apply fault at the TOLK 6 (525531) 230 kV Bus.<br>b. Clear fault after 7 cycles by tripping the faulted line.<br>c. Wait 20 cycles, and then re-close the line in (b) back into the fault.<br>d. Leave Fault on for 7 cycles, then trip the line in (b) and remove fault. |
| FLT0013-3PH | P1 | 3 Phase fault on TOLK 6 (525531) 230 kV Bus to NEEDMORE 6 (525586) 230 kV line CKT 1, near TOLK 6 (525531) 230 kV.<br>a. Apply fault at the TOLK 6 (525531) 230 kV Bus.<br>b. Clear fault after 7 cycles by tripping the faulted line.<br>c. Wait 20 cycles, and then re-close the line in (b) back into the fault.<br>d. Leave Fault on for 7 cycles, then trip the line in (b) and remove fault. |
| FLT0014-3PH | P1 | 3 Phase fault on TOLK 6 (525531) 230 kV Bus to TUCO_INT 6 (525830) 230 kV line CKT 1, near TOLK 6 (525531) 230 kV.<br>a. Apply fault at the TOLK 6 (525531) 230 kV Bus.<br>b. Clear fault after 7 cycles by tripping the faulted line.<br>c. Wait 20 cycles, and then re-close the line in (b) back into the fault.<br>d. Leave Fault on for 7 cycles, then trip the line in (b) and remove fault. |
| FLT0015-3PH | P1 | 3 Phase fault on TOLK 6 (525531) 230 kV Bus to ROOSEVELT 6 (524909) 230 kV line CKT 2, near TOLK 6 (525531) 230 kV.<br>a. Apply fault at the TOLK 6 (525531) 230 kV Bus.<br>b. Clear fault after 7 cycles by tripping the faulted line.<br>c. Wait 20 cycles, and then re-close the line in (b) back into the fault.<br>d. Leave Fault on for 7 cycles, then trip the line in (b) and remove fault. |
| FLT0019-3PH | P1 | 3 Phase fault on G17-146-TAP (760498) 230 kV Bus to DEAFSMITH 6 (524623) 230 kV line CKT 1, near G17-146-TAP (760498) 230 kV.<br>a. Apply fault at the G17-146-TAP (760498) 230 kV Bus.<br>b. Clear fault after 7 cycles by tripping the faulted line.<br>c. Wait 20 cycles, and then re-close the line in (b) back into the fault.<br>d. Leave Fault on for 7 cycles, then trip the line in (b) and remove fault. |
| FLT0026-3PH | P1 | 3 Phase fault on SWISHER 6 (525213) 230 kV Bus to TUCO_INT 6 (525830) 230 kV line CKT 1, near SWISHER 6 (525213) 230 kV.<br>a. Apply fault at the SWISHER 6 (525213) 230 kV Bus.<br>b. Clear fault after 7 cycles by tripping the faulted line.<br>c. Wait 20 cycles, and then re-close the line in (b) back into the fault.<br>d. Leave Fault on for 7 cycles, then trip the line in (b) and remove fault. |
| FLT0035-3PH | P1 | 3 Phase fault on NEEDMORE 6 (525586) 230 kV Bus to YOAKUM 6 (526935) 230 kV line CKT 1, near NEEDMORE 6 (525586) 230 kV.<br>a. Apply fault at the NEEDMORE 6 (525586) 230 kV Bus.<br>b. Clear fault after 7 cycles by tripping the faulted line.<br>c. Wait 20 cycles, and then re-close the line in (b) back into the fault.<br>d. Leave Fault on for 7 cycles, then trip the line in (b) and remove fault. |

**Table 6-1 Continued**

| Fault ID | Planning Event | Fault Descriptions |
|---|---|---|
| FLT0036-3PH | P1 | 3 Phase fault on TUCO_INT 6 (525830) 230 kV Bus to CARLISLE 6 (526161) 230 kV line CKT 1, near TUCO_INT 6 (525830) 230 kV.<br>a. Apply fault at the TUCO_INT 6 (525830) 230 kV Bus.<br>b. Clear fault after 7 cycles by tripping the faulted line.<br>c. Wait 20 cycles, and then re-close the line in (b) back into the fault.<br>d. Leave Fault on for 7 cycles, then trip the line in (b) and remove fault. |
| FLT0037-3PH | P1 | 3 Phase fault on TUCO_INT 6 (525830) 230 kV Bus to JONES 6 (526337) 230 kV line CKT 1, near TUCO_INT 6 (525830) 230 kV.<br>a. Apply fault at the TUCO_INT 6 (525830) 230 kV Bus.<br>b. Clear fault after 7 cycles by tripping the faulted line.<br>c. Wait 20 cycles, and then re-close the line in (b) back into the fault.<br>d. Leave Fault on for 7 cycles, then trip the line in (b) and remove fault. |
| FLT0038-3PH | P1 | 3 Phase fault on TUCO_INT 6 (525830) 230 kV / TUCO_INT 3 (525828) 115 kV / TUCO_TR4 1 (525821) 13.2 kV XFMR CKT 1, near TUCO_INT 6 (525830) 230 kV.<br>a. Apply fault at the TUCO_INT 6 (525830) 230 kV Bus.<br>b. Clear fault after 7 cycles by tripping the faulted transformer. |
| FLT0039-3PH | P1 | 3 Phase fault on TUCO_INT 6 (525830) 230 kV / TUCO_INT 3 (525828) 115 kV / TUCO_TR3 1 (525819) 13.2 kV XFMR CKT 2, near TUCO_INT 6 (525830) 230 kV.<br>a. Apply fault at the TUCO_INT 6 (525830) 230 kV Bus.<br>b. Clear fault after 7 cycles by tripping the faulted transformer. |
| FLT0040-3PH | P1 | 3 Phase fault on WOLFFORTH 6 (526525) 230 kV Bus to CARLISLE 6 (526161) 230 kV line CKT 1, near WOLFFORTH 6 (526525) 230 kV.<br>a. Apply fault at the WOLFFORTH 6 (526525) 230 kV Bus.<br>b. Clear fault after 7 cycles by tripping the faulted line.<br>c. Wait 20 cycles, and then re-close the line in (b) back into the fault.<br>d. Leave Fault on for 7 cycles, then trip the line in (b) and remove fault. |
| FLT0069-3PH | P1 | 3 Phase fault on TUCO_INT 6 (525830) 230 kV Bus to TOLK 6 (525531) 230 kV line CKT 1, near TUCO_INT 6 (525830) 230 kV.<br>a. Apply fault at the TUCO_INT 6 (525830) 230 kV Bus.<br>b. Clear fault after 7 cycles by tripping the faulted line.<br>c. Wait 20 cycles, and then re-close the line in (b) back into the fault.<br>d. Leave Fault on for 7 cycles, then trip the line in (b) and remove fault. |
| FLT0070-3PH | P1 | 3 Phase fault on TUCO_INT 7 (525832) 345 kV / TUCO_INT 6 (525830) 230 kV / TUCO_TR1 1 (525824) 13.2 kV XFMR CKT 1, near TUCO_INT 7 (525832) 345 kV.<br>a. Apply fault at the TUCO_INT 7 (525832) 345 kV Bus.<br>b. Clear fault after 6 cycles by tripping the faulted transformer. |
| FLT0071-3PH | P1 | 3 Phase fault on TUCO_INT 7 (525832) 345 kV / TUCO_INT 6 (525830) 230 kV / TUCO_TR2 1 (525825) 13.2 kV XFMR CKT 2, near TUCO_INT 7 (525832) 345 kV.<br>a. Apply fault at the TUCO_INT 7 (525832) 345 kV Bus.<br>b. Clear fault after 6 cycles by tripping the faulted transformer. |
| FLT0094-3PH | P1 | 3 Phase fault on CARLISLE 6 (526161) 230 kV / CARLISLE 3 (526160) 115 kV / CRLSLE_TR1 1 (526157) 13.2 kV XFMR CKT 1, near CARLISLE 6 (526161) 230 kV.<br>a. Apply fault at the CARLISLE 6 (526161) 230 kV Bus.<br>b. Clear fault after 7 cycles by tripping the faulted transformer. |
| FLT0126-3PH | P1 | 3 Phase fault on EDDY_CNTY 7 (527802) 345 kV Bus to KIOWA 7 (527965) 345 kV line CKT 1, near EDDY_CNTY 7 (527802) 345 kV.<br>a. Apply fault at the EDDY_CNTY 7 (527802) 345 kV Bus.<br>b. Clear fault after 6 cycles by tripping the faulted line.<br>c. Wait 20 cycles, and then re-close the line in (b) back into the fault.<br>d. Leave Fault on for 6 cycles, then trip the line in (b) and remove fault. |
| FLT0127-3PH | P1 | 3 Phase fault on EDDY_CNTY 7 (527802) 345 kV / EDDY_NORTH 6 (527799) 230 kV / EDDY_TR 1 (527796) 13.2 kV XFMR CKT 1, near EDDY_CNTY 7 (527802) 345 kV.<br>a. Apply fault at the EDDY_CNTY 7 (527802) 345 kV Bus.<br>b. Clear fault after 6 cycles by tripping the faulted transformer. |

**Table 6-1 Continued**

| Fault ID | Planning Event | Fault Descriptions |
|---|---|---|
| FLT0192-3PH | P1 | 3 Phase fault on TUCO_INT 7 (525832) 345 kV Bus to YOAKUM_345 (526936) 345 kV line CKT 1, near TUCO_INT 7 (525832) 345 kV.<br>a. Apply fault at the TUCO_INT 7 (525832) 345 kV Bus.<br>b. Clear fault after 6 cycles by tripping the faulted line.<br>c. Wait 20 cycles, and then re-close the line in (b) back into the fault.<br>d. Leave Fault on for 6 cycles, then trip the line in (b) and remove fault. |
| FLT0193-3PH | P1 | 3 Phase fault on YOAKUM_345 (526936) 345 kV Bus to HOBBS_INT 7 (527896) 345 kV line CKT 1, near YOAKUM_345 (526936) 345 kV.<br>a. Apply fault at the YOAKUM_345 (526936) 345 kV Bus.<br>b. Clear fault after 6 cycles by tripping the faulted line.<br>c. Wait 20 cycles, and then re-close the line in (b) back into the fault.<br>d. Leave Fault on for 6 cycles, then trip the line in (b) and remove fault. |
| FLT0195-3PH | P1 | 3 Phase fault on YOAKUM_345 (526936) 345 kV / YOAKUM 6 (526935) 230 kV / YOAKUM_TR1 (526937) 13.2 kV XFMR CKT 1, near YOAKUM_345 (526936) 345 kV.<br>a. Apply fault at the YOAKUM_345 (526936) 345 kV Bus.<br>b. Clear fault after 6 cycles by tripping the faulted transformer. |
| FLT0196-3PH | P1 | 3 Phase fault on TUCO_INT 7 (525832) 345 kV Bus to CRAWFISH_DR (560022) 345 kV line CKT 1, near TUCO_INT 7 (525832) 345 kV.<br>a. Apply fault at the TUCO_INT 7 (525832) 345 kV Bus.<br>b. Clear fault after 6 cycles by tripping the faulted line.<br>c. Wait 20 cycles, and then re-close the line in (b) back into the fault.<br>d. Leave Fault on for 6 cycles, then trip the line in (b) and remove fault. |
| FLT0197-3PH | P1 | 3 Phase fault on CRAWFISH_DR (560022) 345 kV Bus to TUCO_INT 7 (525832) 345 kV line CKT 1, near CRAWFISH_DR (560022) 345 kV.<br>a. Apply fault at the CRAWFISH_DR (560022) 345 kV Bus.<br>b. Clear fault after 6 cycles by tripping the faulted line.<br>c. Wait 20 cycles, and then re-close the line in (b) back into the fault.<br>d. Leave Fault on for 6 cycles, then trip the line in (b) and remove fault. |
| FLT0198-3PH | P1 | 3 Phase fault on G17-151TAP (762216) 345 kV Bus to CRAWFISH_DR (560022) 345 kV line CKT 1, near G17-151TAP (762216) 345 kV.<br>a. Apply fault at the G17-151TAP (762216) 345 kV Bus.<br>b. Clear fault after 6 cycles by tripping the faulted line.<br>c. Wait 20 cycles, and then re-close the line in (b) back into the fault.<br>d. Leave Fault on for 6 cycles, then trip the line in (b) and remove fault. |
| FLT0199-3PH | P1 | 3 Phase fault on CROSSROADS 7 (527656) 345 kV Bus to EDDY_CNTY 7 (527802) 345 kV line CKT 1, near CROSSROADS 7 (527656) 345 kV.<br>a. Apply fault at the CROSSROADS 7 (527656) 345 kV Bus.<br>b. Clear fault after 6 cycles by tripping the faulted line.<br>c. Wait 20 cycles, and then re-close the line in (b) back into the fault.<br>d. Leave Fault on for 6 cycles, then trip the line in (b) and remove fault. |
| FLT0200-3PH | P1 | 3 Phase fault on HOBBS_INT 7 (527896) 345 kV / HOBBS_INT 6 (527894) 230 kV / HOBBS_TR3 1 (527895) 13.2 kV XFMR CKT 1, near HOBBS_INT 7 (527896) 345 kV.<br>a. Apply fault at the HOBBS_INT 7 (527896) 345 kV Bus.<br>b. Clear fault after 6 cycles by tripping the faulted transformer. |
| FLT0201-3PH | P1 | 3 Phase fault on YOAKUM 6 (526935) 230 kV / YOAKUM 3 (526934) 115 kV / YOAKUM_TR2 1 (526932) 13.2 kV XFMR CKT 2, near YOAKUM 6 (526935) 230 kV.<br>a. Apply fault at the YOAKUM 6 (526935) 230 kV Bus.<br>b. Clear fault after 7 cycles by tripping the faulted transformer. |
| FLT0202-3PH | P1 | 3 Phase fault on YOAKUM 6 (526935) 230 kV / YOAKUM 3 (526934) 115 kV / YOAKUM_TR1 1 (526931) 13.2 kV XFMR CKT 1, near YOAKUM 6 (526935) 230 kV.<br>a. Apply fault at the YOAKUM 6 (526935) 230 kV Bus.<br>b. Clear fault after 7 cycles by tripping the faulted transformer. |
| FLT0204-3PH | P1 | 3 Phase fault on YOAKUM 6 (526935) 230 kV Bus to INK_BASIN 6 (527028) 230 kV line CKT 1, near YOAKUM 6 (526935) 230 kV.<br>a. Apply fault at the YOAKUM 6 (526935) 230 kV Bus.<br>b. Clear fault after 7 cycles by tripping the faulted line.<br>c. Wait 20 cycles, and then re-close the line in (b) back into the fault.<br>d. Leave Fault on for 7 cycles, then trip the line in (b) and remove fault. |

**Table 6-1 Continued**

| Fault ID | Planning Event | Fault Descriptions |
|---|---|---|
| FLT0205-3PH | P1 | 3 Phase fault on YOAKUM 6 (526935) 230 kV Bus to BRU_SUB 6 (527009) 230 kV line CKT 1, near YOAKUM 6 (526935) 230 kV.<br>a. Apply fault at the YOAKUM 6 (526935) 230 kV Bus.<br>b. Clear fault after 7 cycles by tripping the faulted line.<br>c. Wait 20 cycles, and then re-close the line in (b) back into the fault.<br>d. Leave Fault on for 7 cycles, then trip the line in (b) and remove fault. |
| FLT0206-3PH | P1 | 3 Phase fault on YOAKUM 6 (526935) 230 kV Bus to MUSTANG 6 (527149) 230 kV line CKT 1, near YOAKUM 6 (526935) 230 kV.<br>a. Apply fault at the YOAKUM 6 (526935) 230 kV Bus.<br>b. Clear fault after 7 cycles by tripping the faulted line.<br>c. Wait 20 cycles, and then re-close the line in (b) back into the fault.<br>d. Leave Fault on for 7 cycles, then trip the line in (b) and remove fault. |
| FLT0207-3PH | P1 | 3 Phase fault on TOLK 7 (525549) 345 kV Bus to POTTER_CO 7 (523961) 345 kV line CKT 1, near TOLK 7 (525549) 345 kV.<br>a. Apply fault at the TOLK 7 (525549) 345 kV Bus.<br>b. Clear fault after 6 cycles by tripping the faulted line.<br>c. Wait 20 cycles, and then re-close the line in (b) back into the fault.<br>d. Leave Fault on for 6 cycles, then trip the line in (b) and remove fault. |
| FLT0209-3PH | P1 | 3 Phase fault on EDDY_CNTY 7 (527802) 345 kV Bus to CROSSROADS 7 (527656) 345 kV line CKT 1, near EDDY_CNTY 7 (527802) 345 kV.<br>a. Apply fault at the EDDY_CNTY 7 (527802) 345 kV Bus.<br>b. Clear fault after 6 cycles by tripping the faulted line.<br>c. Wait 20 cycles, and then re-close the line in (b) back into the fault.<br>d. Leave Fault on for 6 cycles, then trip the line in (b) and remove fault. |
| FLT0210-3PH | P1 | 3 Phase fault on KIOWA 7 (527965) 345 kV Bus to N_LOVING 7 (528185) 345 kV line CKT 1, near KIOWA 7 (527965) 345 kV.<br>a. Apply fault at the KIOWA 7 (527965) 345 kV Bus.<br>b. Clear fault after 6 cycles by tripping the faulted line.<br>c. Wait 20 cycles, and then re-close the line in (b) back into the fault.<br>d. Leave Fault on for 6 cycles, then trip the line in (b) and remove fault. |
| FLT0211-3PH | P1 | 3 Phase fault on KIOWA 7 (527965) 345 kV Bus to RDRUNNER 7 (528027) 345 kV line CKT 1, near KIOWA 7 (527965) 345 kV.<br>a. Apply fault at the KIOWA 7 (527965) 345 kV Bus.<br>b. Clear fault after 6 cycles by tripping the faulted line.<br>c. Wait 20 cycles, and then re-close the line in (b) back into the fault.<br>d. Leave Fault on for 6 cycles, then trip the line in (b) and remove fault. |
| FLT0212-3PH | P1 | 3 Phase fault on KIOWA 7 (527965) 345 kV / KIOWA 3 (527966) 115 kV / 527966 (527964) 13.2 kV XFMR CKT 1, near KIOWA 7 (527965) 345 kV.<br>a. Apply fault at the KIOWA 7 (527965) 345 kV Bus.<br>b. Clear fault after 6 cycles by tripping the faulted transformer. |
| FLT0233-3PH | P1 | 3 Phase fault on RDRUNNER 7 (528027) 345 kV / RDRUNNER 3 (528025) 115 kV / RDRNNER_TR11 (528023) 13.2 kV XFMR CKT 1, near RDRUNNER 7 (528027) 345 kV.<br>a. Apply fault at the RDRUNNER 7 (528027) 345 kV Bus.<br>b. Clear fault after 6 cycles by tripping the faulted transformer. |
| FLT0234-3PH | P1 | 3 Phase fault on RDRUNNER 7 (528027) 345 kV Bus to PHANTOM 7 (528015) 345 kV line CKT 1, near RDRUNNER 7 (528027) 345 kV.<br>a. Apply fault at the RDRUNNER 7 (528027) 345 kV Bus.<br>b. Clear fault after 6 cycles by tripping the faulted line.<br>c. Wait 20 cycles, and then re-close the line in (b) back into the fault.<br>d. Leave Fault on for 6 cycles, then trip the line in (b) and remove fault. |
| FLT0246-3PH | P1 | 3 Phase fault on HITCHLAND 7 (523097) 345 kV Bus to CARPENTER 7 (523823) 345 kV line CKT 1, near HITCHLAND 7 (523097) 345 kV.<br>a. Apply fault at the HITCHLAND 7 (523097) 345 kV Bus.<br>b. Clear fault after 6 cycles by tripping the faulted line.<br>c. Wait 20 cycles, and then re-close the line in (b) back into the fault.<br>d. Leave Fault on for 6 cycles, then trip the line in (b) and remove fault. |

**Table 6-1 Continued**

| Fault ID | Planning Event | Fault Descriptions |
|---|---|---|
| FLT0260-3PH | P1 | 3 Phase fault on TUCO_INT 6 (525830) 230 kV Bus to ANTELOPE_1 6 (525840) 230 kV line CKT 1, near TUCO_INT 6 (525830) 230 kV.<br>a. Apply fault at the TUCO_INT 6 (525830) 230 kV Bus.<br>b. Clear fault after 7 cycles by tripping the faulted line.<br>c. Wait 20 cycles, and then re-close the line in (b) back into the fault.<br>d. Leave Fault on for 7 cycles, then trip the line in (b) and remove fault. |
| FLT0262-3PH | P1 | 3 Phase fault on TUCO_INT 6 (525830) 230 kV Bus to SWISHER 6 (525213) 230 kV line CKT 1, near TUCO_INT 6 (525830) 230 kV.<br>a. Apply fault at the TUCO_INT 6 (525830) 230 kV Bus.<br>b. Clear fault after 7 cycles by tripping the faulted line.<br>c. Wait 20 cycles, and then re-close the line in (b) back into the fault.<br>d. Leave Fault on for 7 cycles, then trip the line in (b) and remove fault. |
| FLT0263-3PH | P1 | 3 Phase fault on HOBBS_INT 7 (527896) 345 kV Bus to KIOWA 7 (527965) 345 kV line CKT 1, near HOBBS_INT 7 (527896) 345 kV.<br>a. Apply fault at the HOBBS_INT 7 (527896) 345 kV Bus.<br>b. Clear fault after 6 cycles by tripping the faulted line.<br>c. Wait 20 cycles, and then re-close the line in (b) back into the fault.<br>d. Leave Fault on for 6 cycles, then trip the line in (b) and remove fault. |
| FLT0264-3PH | P1 | 3 Phase fault on CARLISLE 6 (526161) 230 kV Bus to WOLFFORTH 6 (526525) 230 kV line CKT 1, near CARLISLE 6 (526161) 230 kV.<br>a. Apply fault at the CARLISLE 6 (526161) 230 kV Bus.<br>b. Clear fault after 7 cycles by tripping the faulted line.<br>c. Wait 20 cycles, and then re-close the line in (b) back into the fault.<br>d. Leave Fault on for 7 cycles, then trip the line in (b) and remove fault. |
| FLT9001-3PH | P1 | 3 Phase fault on TOLK 6 (525531) 230 kV Bus to PLANT_X 6 (525481) 230 kV line CKT 1, near TOLK 6 (525531) 230 kV.<br>a. Apply fault at the TOLK 6 (525531) 230 kV Bus.<br>b. Clear fault after 7 cycles by tripping the faulted line.<br>c. Wait 20 cycles, and then re-close the line in (b) back into the fault.<br>d. Leave Fault on for 7 cycles, then trip the line in (b) and remove fault. |
| FLT9002-3PH | P1 | 3 Phase fault on TOLK 6 (525531) 230 kV / TOLK 7 (525549) 345 kV / TOLK_TR 1 (525537) 13.2 kV XFMR CKT 1, near TOLK 6 (525531) 230 kV.<br>a. Apply fault at the TOLK 6 (525531) 230 kV Bus.<br>b. Clear fault after 7 cycles by tripping the faulted transformer. |
| FLT9003-3PH | P1 | 3 Phase fault on TOLK 6 (525531) 230 kV Bus to LAMB_CNTY 6 (525637) 230 kV line CKT 1, near TOLK 6 (525531) 230 kV.<br>a. Apply fault at the TOLK 6 (525531) 230 kV Bus.<br>b. Clear fault after 7 cycles by tripping the faulted line.<br>c. Wait 20 cycles, and then re-close the line in (b) back into the fault.<br>d. Leave Fault on for 7 cycles, then trip the line in (b) and remove fault. |
| FLT9004-3PH | P1 | 3 Phase fault on TOLK 6 (525531) 230 kV / TOLK_1 1 (525561) 24 kV / XFMR CKT 1, near TOLK 6 (525531) 230 kV.<br>a. Apply fault at the TOLK 6 (525531) 230 kV Bus.<br>b. Clear fault after 7 cycles by tripping the faulted transformer.<br>Trip generator on the Bus TOLK_1 1 (525561) 24 kV |
| FLT9005-3PH | P1 | 3 Phase fault on PLANT_X 6 (525481) 230 kV Bus to GEN-2018-081 (763120) 230 kV line CKT 1, near PLANT_X 6 (525481) 230 kV.<br>a. Apply fault at the PLANT_X 6 (525481) 230 kV Bus.<br>b. Clear fault after 7 cycles by tripping the faulted line.<br>Trip generator on the Bus G18-081-GEN1 (763123) 0.7 kV<br>Trip generator on the Bus G19-074-GEN1 (764013) 0.7 kV<br>c. Wait 20 cycles, and then re-close the line in (b) back into the fault.<br>d. Leave Fault on for 7 cycles, then trip the line in (b) and remove fault. |
| FLT9006-3PH | P1 | 3 Phase fault on PLANT_X 6 (525481) 230 kV / PLANT_X 3 (525480) 115 kV / PLANTX_TR1 1 (525479) 13.2 kV XFMR CKT 1, near PLANT_X 6 (525481) 230 kV.<br>a. Apply fault at the PLANT_X 6 (525481) 230 kV Bus.<br>b. Clear fault after 7 cycles by tripping the faulted transformer. |

**Table 6-1 Continued**

| Fault ID | Planning Event | Fault Descriptions |
|---|---|---|
| FLT9007-3PH | P1 | 3 Phase fault on PLANT_X 6 (525481) 230 kV / PLANT_X4 1 (525494) 20 kV / XFMR CKT 1, near PLANT_X 6 (525481) 230 kV.<br>a. Apply fault at the PLANT_X 6 (525481) 230 kV Bus.<br>b. Clear fault after 7 cycles by tripping the faulted transformer.<br>Trip generator on the Bus PLANT_X4 1 (525494) 20 kV |
| FLT9008-3PH | P1 | 3 Phase fault on PLANT_X 6 (525481) 230 kV Bus to NEWHART 6 (525461) 230 kV line CKT 1, near PLANT_X 6 (525481) 230 kV.<br>a. Apply fault at the PLANT_X 6 (525481) 230 kV Bus.<br>b. Clear fault after 7 cycles by tripping the faulted line.<br>c. Wait 20 cycles, and then re-close the line in (b) back into the fault.<br>d. Leave Fault on for 7 cycles, then trip the line in (b) and remove fault. |
| FLT9009-3PH | P1 | 3 Phase fault on TUCO_INT 6 (525830) 230 kV Bus to HALE_WNDCL16 (525957) 230 kV line CKT 1, near TUCO_INT 6 (525830) 230 kV.<br>a. Apply fault at the TUCO_INT 6 (525830) 230 kV Bus.<br>b. Clear fault after 7 cycles by tripping the faulted line.<br>c. Wait 20 cycles, and then re-close the line in (b) back into the fault.<br>d. Leave Fault on for 7 cycles, then trip the line in (b) and remove fault. |
| FLT9010-3PH | P1 | 3 Phase fault on TUCO_INT 6 (525830) 230 kV / TUCO_SVC 1 (525820) 13 kV / XFMR CKT 1, near TUCO_INT 6 (525830) 230 kV.<br>a. Apply fault at the TUCO_INT 6 (525830) 230 kV Bus.<br>b. Clear fault after 7 cycles by tripping the faulted transformer.<br>Trip generator on the Bus TUCO_SVC 1 (525820) 13 kV |
| FLT9011-3PH | P1 | 3 Phase fault on TUCO_INT 6 (525830) 230 kV / TUCO_INT 7 (525832) 345 kV / TUCO_TR1 1 (525824) 13.2 kV XFMR CKT 1, near TUCO_INT 6 (525830) 230 kV.<br>a. Apply fault at the TUCO_INT 6 (525830) 230 kV Bus.<br>b. Clear fault after 7 cycles by tripping the faulted transformer. |
| FLT9012-3PH | P1 | 3 Phase fault on TUCO_INT 7 (525832) 345 kV Bus to ELK_CT1 (525850) 345 kV line CKT 1, near TUCO_INT 7 (525832) 345 kV.<br>a. Apply fault at the TUCO_INT 7 (525832) 345 kV Bus.<br>b. Clear fault after 6 cycles by tripping the faulted line.<br>Trip generator on the Bus ELK_1 1 (525844) 18 kV<br>c. Wait 20 cycles, and then re-close the line in (b) back into the fault.<br>d. Leave Fault on for 6 cycles, then trip the line in (b) and remove fault. |
| FLT9013-3PH | P1 | 3 Phase fault on TUCO_INT 7 (525832) 345 kV Bus to ELK_2 1 (525845) 18 kV line CKT 1, near TUCO_INT 7 (525832) 345 kV.<br>a. Apply fault at the TUCO_INT 7 (525832) 345 kV Bus.<br>b. Clear fault after 6 cycles by tripping the faulted line.<br>Trip generator on the Bus ELK_2 1 (525845) 18 kV<br>c. Wait 20 cycles, and then re-close the line in (b) back into the fault.<br>d. Leave Fault on for 6 cycles, then trip the line in (b) and remove fault. |
| FLT9014-3PH | P1 | 3 Phase fault on CRAWFISH_DR (560022) 345 kV Bus to BORDER 7 (515458) 13.2 kV line CKT 1, near CRAWFISH_DR (560022) 345 kV.<br>a. Apply fault at the CRAWFISH_DR (560022) 345 kV Bus.<br>b. Clear fault after 6 cycles by tripping the faulted line.<br>c. Wait 20 cycles, and then re-close the line in (b) back into the fault.<br>d. Leave Fault on for 6 cycles, then trip the line in (b) and remove fault. |
| FLT9015-3PH | P1 | 3 Phase fault on CRAWFISH_DR (560022) 345 kV Bus to G18-015-TAP (762467) 345 kV line CKT 1, near CRAWFISH_DR (560022) 345 kV.<br>a. Apply fault at the CRAWFISH_DR (560022) 345 kV Bus.<br>b. Clear fault after 6 cycles by tripping the faulted line.<br>c. Wait 20 cycles, and then re-close the line in (b) back into the fault.<br>d. Leave Fault on for 6 cycles, then trip the line in (b) and remove fault. |
| FLT9016-3PH | P1 | 3 Phase fault on CRAWFISH_DR (560022) 345 kV Bus to G18-092-TAP (763215) 345 kV line CKT 2, near CRAWFISH_DR (560022) 345 kV.<br>a. Apply fault at the CRAWFISH_DR (560022) 345 kV Bus.<br>b. Clear fault after 6 cycles by tripping the faulted line.<br>c. Wait 20 cycles, and then re-close the line in (b) back into the fault.<br>d. Leave Fault on for 6 cycles, then trip the line in (b) and remove fault. |

**Table 6-1 Continued**

| Fault ID | Planning Event | Fault Descriptions |
|---|---|---|
| FLT9017-3PH | P1 | 3 Phase fault on CRAWFISH_DR (560022) 345 kV Bus to GEN-2018-073 (763087) 345 kV line CKT 1, near CRAWFISH_DR (560022) 345 kV.<br>a. Apply fault at the CRAWFISH_DR (560022) 345 kV Bus.<br>b. Clear fault after 6 cycles by tripping the faulted line.<br>Trip generator on the Bus G18-073-GEN1 (763090) 0.7 kV<br>Trip generator on the Bus G18-073-GEN2 (763084) 0.7 kV<br>c. Wait 20 cycles, and then re-close the line in (b) back into the fault.<br>d. Leave Fault on for 6 cycles, then trip the line in (b) and remove fault. |
| FLT9018-3PH | P1 | 3 Phase fault on TOLK 7 (525549) 345 kV Bus to CROSSROADS 7 (527656) 345 kV line CKT 1, near TOLK 7 (525549) 345 kV.<br>a. Apply fault at the TOLK 7 (525549) 345 kV Bus.<br>b. Clear fault after 6 cycles by tripping the faulted line.<br>c. Wait 20 cycles, and then re-close the line in (b) back into the fault.<br>d. Leave Fault on for 6 cycles, then trip the line in (b) and remove fault. |
| FLT9019-3PH | P1 | 3 Phase fault on CROSSROADS 7 (527656) 345 kV Bus to RSVLT_CC_E 7 (527655) 345 kV line CKT 1, near CROSSROADS 7 (527656) 345 kV.<br>a. Apply fault at the CROSSROADS 7 (527656) 345 kV Bus.<br>b. Clear fault after 6 cycles by tripping the faulted line.<br>Trip generator on the Bus MILO_WIND 1 (527653) 0.7 kV<br>Trip generator on the Bus RSVLT_GEN2 1 (527652) 0.7 kV<br>Trip generator on the Bus RSVLT_GEN1 1 (527651) 0.7 kV<br>c. Wait 20 cycles, and then re-close the line in (b) back into the fault.<br>d. Leave Fault on for 6 cycles, then trip the line in (b) and remove fault. |
| FLT9020-3PH | P1 | 3 Phase fault on CROSSROADS 7 (527656) 345 kV Bus to SAGA_SCOL 7 (527610) 345 kV line CKT 1, near CROSSROADS 7 (527656) 345 kV.<br>a. Apply fault at the CROSSROADS 7 (527656) 345 kV Bus.<br>b. Clear fault after 6 cycles by tripping the faulted line.<br>Trip generator on the Bus SAGSFT3_2.21 (527605) 0.7 kV<br>Trip generator on the Bus SAGSFT4_2.21 (527607) 0.7 kV<br>Trip generator on the Bus SAGSFT2_2.21 (527617) 0.7 kV<br>Trip generator on the Bus SAGSFT2_2.01 (527618) 0.7 kV<br>Trip generator on the Bus SAGSFT1_2.21 (527614) 0.7 kV<br>Trip generator on the Bus SAGSFT1_2.01 (527615) 0.7 kV<br>c. Wait 20 cycles, and then re-close the line in (b) back into the fault.<br>d. Leave Fault on for 6 cycles, then trip the line in (b) and remove fault. |
| FLT9021-3PH | P1 | 3 Phase fault on RSVLT_CC_E 7 (527655) 345 kV Bus to RSVLT_CC_W 7 (527654) 345 kV line CKT 1, near RSVLT_CC_E 7 (527655) 345 kV.<br>a. Apply fault at the RSVLT_CC_E 7 (527655) 345 kV Bus.<br>b. Clear fault after 6 cycles by tripping the faulted line.<br>Trip generator on the Bus RSVLT_GEN2 1 (527652) 0.7 kV<br>Trip generator on the Bus RSVLT_GEN1 1 (527651) 0.7 kV<br>c. Wait 20 cycles, and then re-close the line in (b) back into the fault.<br>d. Leave Fault on for 6 cycles, then trip the line in (b) and remove fault. |
| FLT9022-3PH | P1 | 3 Phase fault on CROSSROADS 7 (527656) 345 kV Bus to HOBBS_INT 7 (527896) 345 kV line CKT LX, near CROSSROADS 7 (527656) 345 kV.<br>a. Apply fault at the CROSSROADS 7 (527656) 345 kV Bus.<br>b. Clear fault after 6 cycles by tripping the faulted line.<br>c. Wait 20 cycles, and then re-close the line in (b) back into the fault.<br>d. Leave Fault on for 6 cycles, then trip the line in (b) and remove fault. |
| FLT9023-3PH | P1 | 3 Phase fault on KIOWA 7 (527965) 345 kV Bus to HOBBS_INT 7 (527896) 345 kV line CKT 1, near KIOWA 7 (527965) 345 kV.<br>a. Apply fault at the KIOWA 7 (527965) 345 kV Bus.<br>b. Clear fault after 6 cycles by tripping the faulted line.<br>c. Wait 20 cycles, and then re-close the line in (b) back into the fault.<br>d. Leave Fault on for 6 cycles, then trip the line in (b) and remove fault. |

**Table 6-1 Continued**

| Fault ID | Planning Event | Fault Descriptions |
|---|---|---|
| FLT9024-3PH | P1 | 3 Phase fault on HOBBS_INT 7 (527896) 345 kV Bus to YOAKUM_345 (526936) 345 kV line CKT 1, near HOBBS_INT 7 (527896) 345 kV.<br>a. Apply fault at the HOBBS_INT 7 (527896) 345 kV Bus.<br>b. Clear fault after 6 cycles by tripping the faulted line.<br>c. Wait 20 cycles, and then re-close the line in (b) back into the fault.<br>d. Leave Fault on for 6 cycles, then trip the line in (b) and remove fault. |
| FLT9025-3PH | P1 | 3 Phase fault on YOAKUM_345 (526936) 345 kV Bus to GEN-2019-011 (763516) 345 kV line CKT 1, near YOAKUM_345 (526936) 345 kV.<br>a. Apply fault at the YOAKUM_345 (526936) 345 kV Bus.<br>b. Clear fault after 6 cycles by tripping the faulted line.<br>Trip generator on the Bus G19-011-GEN1 (763519) 0.5 kV<br>c. Wait 20 cycles, and then re-close the line in (b) back into the fault.<br>d. Leave Fault on for 6 cycles, then trip the line in (b) and remove fault. |
| FLT9026-3PH | P1 | 3 Phase fault on POTTER_CO 7 (523961) 345 kV Bus to CHISHOLM7 (511553) 345 kV line CKT 1, near POTTER_CO 7 (523961) 345 kV.<br>a. Apply fault at the POTTER_CO 7 (523961) 345 kV Bus.<br>b. Clear fault after 6 cycles by tripping the faulted line.<br>c. Wait 20 cycles, and then re-close the line in (b) back into the fault.<br>d. Leave Fault on for 6 cycles, then trip the line in (b) and remove fault. |
| FLT9027-3PH | P1 | 3 Phase fault on POTTER_CO 7 (523961) 345 kV / POTTER_CO 6 (523959) 230 kV / POTTER_TR 1 (523957) 13.2 kV XFMR CKT 1, near POTTER_CO 7 (523961) 345 kV.<br>a. Apply fault at the POTTER_CO 7 (523961) 345 kV Bus.<br>b. Clear fault after 6 cycles by tripping the faulted transformer. |
| FLT9028-3PH | P1 | 3 Phase fault on POTTER_CO 7 (523961) 345 kV Bus to HITCHLAND 7 (523097) 345 kV line CKT 1, near POTTER_CO 7 (523961) 345 kV.<br>a. Apply fault at the POTTER_CO 7 (523961) 345 kV Bus.<br>b. Clear fault after 6 cycles by tripping the faulted line.<br>c. Wait 20 cycles, and then re-close the line in (b) back into the fault.<br>d. Leave Fault on for 6 cycles, then trip the line in (b) and remove fault. |
| FLT9029-3PH | P1 | 3 Phase fault on POTTER_CO 7 (523961) 345 kV Bus to SPNSPUR_WND7 (524296) 345 kV line CKT 1, near POTTER_CO 7 (523961) 345 kV.<br>a. Apply fault at the POTTER_CO 7 (523961) 345 kV Bus.<br>b. Clear fault after 6 cycles by tripping the faulted line.<br>Trip generator on the Bus SPNSPUR_GEN1 (524295) 0.7 kV<br>c. Wait 20 cycles, and then re-close the line in (b) back into the fault.<br>d. Leave Fault on for 6 cycles, then trip the line in (b) and remove fault. |
| FLT9030-3PH | P1 | 3 Phase fault on CHISHOLM7 (511553) 345 kV / CHISHOLM6 (511557) 230 kV / CHISHOLM1 (511558) 13.2 kV XFMR CKT 1, near CHISHOLM7 (511553) 345 kV.<br>a. Apply fault at the CHISHOLM7 (511553) 345 kV Bus.<br>b. Clear fault after 6 cycles by tripping the faulted transformer. |
| FLT9031-3PH | P1 | 3 Phase fault on CHISHOLM7 (511553) 345 kV Bus to G16-037-TAP (560078) 345 kV line CKT 1, near CHISHOLM7 (511553) 345 kV.<br>a. Apply fault at the CHISHOLM7 (511553) 345 kV Bus.<br>b. Clear fault after 6 cycles by tripping the faulted line.<br>c. Wait 20 cycles, and then re-close the line in (b) back into the fault.<br>d. Leave Fault on for 6 cycles, then trip the line in (b) and remove fault. |
| FLT9032-3PH | P1 | 3 Phase fault on CHISHOLM7 (511553) 345 kV Bus to WWDBORDT (755000) 345 kV line CKT 1, near CHISHOLM7 (511553) 345 kV.<br>a. Apply fault at the CHISHOLM7 (511553) 345 kV Bus.<br>b. Clear fault after 6 cycles by tripping the faulted line.<br>c. Wait 20 cycles, and then re-close the line in (b) back into the fault.<br>d. Leave Fault on for 6 cycles, then trip the line in (b) and remove fault. |
| FLT9033-3PH | P1 | 3 Phase fault on HITCHLAND 7 (523097) 345 kV Bus to NOBLE_WND 7 (523101) 345 kV line CKT 1, near HITCHLAND 7 (523097) 345 kV.<br>a. Apply fault at the HITCHLAND 7 (523097) 345 kV Bus.<br>b. Clear fault after 6 cycles by tripping the faulted line.<br>c. Wait 20 cycles, and then re-close the line in (b) back into the fault.<br>d. Leave Fault on for 6 cycles, then trip the line in (b) and remove fault. |

**Table 6-1 Continued**

| Fault ID | Planning Event | Fault Descriptions |
|---|---|---|
| FLT9034-3PH | P1 | 3 Phase fault on HITCHLAND 7 (523097) 345 kV Bus to NOVUS1 7 (523112) 345 kV line CKT 1, near HITCHLAND 7 (523097) 345 kV.<br>a. Apply fault at the HITCHLAND 7 (523097) 345 kV Bus.<br>b. Clear fault after 6 cycles by tripping the faulted line.<br>c. Wait 20 cycles, and then re-close the line in (b) back into the fault.<br>d. Leave Fault on for 6 cycles, then trip the line in (b) and remove fault. |
| FLT9035-3PH | P1 | 3 Phase fault on HITCHLAND 7 (523097) 345 kV Bus to BVRCNTY7 (515554) 345 kV line CKT 1, near HITCHLAND 7 (523097) 345 kV.<br>a. Apply fault at the HITCHLAND 7 (523097) 345 kV Bus.<br>b. Clear fault after 6 cycles by tripping the faulted line.<br>c. Wait 20 cycles, and then re-close the line in (b) back into the fault.<br>d. Leave Fault on for 6 cycles, then trip the line in (b) and remove fault. |
| FLT9036-3PH | P1 | 3 Phase fault on HITCHLAND 7 (523097) 345 kV Bus to G10014G11022 (576397) 345 kV line CKT 1, near HITCHLAND 7 (523097) 345 kV.<br>a. Apply fault at the HITCHLAND 7 (523097) 345 kV Bus.<br>b. Clear fault after 6 cycles by tripping the faulted line.<br>Trip generator on the Bus G11-022-GEN1 (599148) 0.7 kV<br>Trip generator on the Bus G11-022-GEN2 (599150) 0.7 kV<br>Trip generator on the Bus G10-014-GEN2 (576400) 0.7 kV<br>Trip generator on the Bus G10-014-GEN1 (576410) 0.7 kV<br>c. Wait 20 cycles, and then re-close the line in (b) back into the fault.<br>d. Leave Fault on for 6 cycles, then trip the line in (b) and remove fault. |
| FLT9037-3PH | P1 | 3 Phase fault on HITCHLAND 7 (523097) 345 kV / HITCHLAND 6 (523095) 230 kV / HITCHLD_TR01 (523091) 13.2 kV XFMR CKT 1, near HITCHLAND 7 (523097) 345 kV.<br>a. Apply fault at the HITCHLAND 7 (523097) 345 kV Bus.<br>b. Clear fault after 6 cycles by tripping the faulted transformer. |
| FLT9038-3PH | P1 | 3 Phase fault on SUNDOWN 6 (526435) 230 kV / SUNDOWN 3 (526434) 115 kV / SUNDOWN_TR11 (526432) 13.8 kV XFMR CKT 1, near SUNDOWN 6 (526435) 230 kV.<br>a. Apply fault at the SUNDOWN 6 (526435) 230 kV Bus.<br>b. Clear fault after 7 cycles by tripping the faulted transformer. |
| FLT9039-3PH | P1 | 3 Phase fault on SUNDOWN 6 (526435) 230 kV Bus to WOLFFORTH 6 (526525) 230 kV line CKT 1, near SUNDOWN 6 (526435) 230 kV.<br>a. Apply fault at the SUNDOWN 6 (526435) 230 kV Bus.<br>b. Clear fault after 7 cycles by tripping the faulted line.<br>c. Wait 20 cycles, and then re-close the line in (b) back into the fault.<br>d. Leave Fault on for 7 cycles, then trip the line in (b) and remove fault. |
| FLT9040-3PH | P1 | 3 Phase fault on SUNDOWN 6 (526435) 230 kV Bus to AMOCO_SS 6 (526460) 230 kV line CKT 1, near SUNDOWN 6 (526435) 230 kV.<br>a. Apply fault at the SUNDOWN 6 (526435) 230 kV Bus.<br>b. Clear fault after 7 cycles by tripping the faulted line.<br>c. Wait 20 cycles, and then re-close the line in (b) back into the fault.<br>d. Leave Fault on for 7 cycles, then trip the line in (b) and remove fault. |
| FLT9041-3PH | P1 | 3 Phase fault on NEEDMORE 6 (525586) 230 kV Bus to BLUECLDPOI 6 (525585) 230 kV line CKT Z1, near NEEDMORE 6 (525586) 230 kV.<br>a. Apply fault at the NEEDMORE 6 (525586) 230 kV Bus.<br>b. Clear fault after 7 cycles by tripping the faulted line.<br>Trip generator on the Bus BLUECLDGEN 1 (525581) 0.7 kV<br>c. Wait 20 cycles, and then re-close the line in (b) back into the fault.<br>d. Leave Fault on for 7 cycles, then trip the line in (b) and remove fault. |
| FLT9042-3PH | P1 | 3 Phase fault on ROOSEVELT 6 (524909) 230 kV / ROOSEVELT 3 (524908) 115 kV / ROSEVLT_TR11 (524907) 13.2 kV XFMR CKT 1, near ROOSEVELT 6 (524909) 230 kV.<br>a. Apply fault at the ROOSEVELT 6 (524909) 230 kV Bus.<br>b. Clear fault after 7 cycles by tripping the faulted transformer. |

**Table 6-1 Continued**

| Fault ID | Planning Event | Fault Descriptions |
|---|---|---|
| FLT9043-3PH | P1 | 3 Phase fault on ROOSEVELT 6 (524909) 230 kV Bus to GEN-2019-003 (763483) 230 kV line CKT 1, near ROOSEVELT 6 (524909) 230 kV.<br>a. Apply fault at the ROOSEVELT 6 (524909) 230 kV Bus.<br>b. Clear fault after 7 cycles by tripping the faulted line.<br>Trip generator on the Bus G19-021-GEN1 (763607) 0.7 kV<br>Trip generator on the Bus G19-003-GEN1 (763486) 0.7 kV<br>c. Wait 20 cycles, and then re-close the line in (b) back into the fault.<br>d. Leave Fault on for 7 cycles, then trip the line in (b) and remove fault. |
| FLT9044-3PH | P1 | 3 Phase fault on ROOSEVELT 6 (524909) 230 kV Bus to OASIS 6 (524875) 230 kV line CKT 1, near ROOSEVELT 6 (524909) 230 kV.<br>a. Apply fault at the ROOSEVELT 6 (524909) 230 kV Bus.<br>b. Clear fault after 7 cycles by tripping the faulted line.<br>c. Wait 20 cycles, and then re-close the line in (b) back into the fault.<br>d. Leave Fault on for 7 cycles, then trip the line in (b) and remove fault. |
| FLT9045-3PH | P1 | 3 Phase fault on ROOSEVELT 6 (524909) 230 kV Bus to PLSNT_HILL 6 (524770) 230 kV line CKT 1, near ROOSEVELT 6 (524909) 230 kV.<br>a. Apply fault at the ROOSEVELT 6 (524909) 230 kV Bus.<br>b. Clear fault after 7 cycles by tripping the faulted line.<br>c. Wait 20 cycles, and then re-close the line in (b) back into the fault.<br>d. Leave Fault on for 7 cycles, then trip the line in (b) and remove fault. |
| FLT9046-3PH | P1 | 3 Phase fault on OASIS 6 (524875) 230 kV Bus to SN_JUAN_TAP6 (524885) 230 kV line CKT 1, near OASIS 6 (524875) 230 kV.<br>a. Apply fault at the OASIS 6 (524875) 230 kV Bus.<br>b. Clear fault after 7 cycles by tripping the faulted line.<br>c. Wait 20 cycles, and then re-close the line in (b) back into the fault.<br>d. Leave Fault on for 7 cycles, then trip the line in (b) and remove fault. |
| FLT9047-3PH | P1 | 3 Phase fault on OASIS 6 (524875) 230 kV / OASIS 3 (524874) 115 kV / OASIS_TR1 1 (524872) 13.2 kV XFMR CKT 1, near OASIS 6 (524875) 230 kV.<br>a. Apply fault at the OASIS 6 (524875) 230 kV Bus.<br>b. Clear fault after 7 cycles by tripping the faulted transformer. |
| FLT9048-3PH | P1 | 3 Phase fault on PLSNT_HILL 6 (524770) 230 kV Bus to OASIS 6 (524875) 230 kV line CKT 1, near PLSNT_HILL 6 (524770) 230 kV.<br>a. Apply fault at the PLSNT_HILL 6 (524770) 230 kV Bus.<br>b. Clear fault after 7 cycles by tripping the faulted line.<br>c. Wait 20 cycles, and then re-close the line in (b) back into the fault.<br>d. Leave Fault on for 7 cycles, then trip the line in (b) and remove fault. |
| FLT9049-3PH | P1 | 3 Phase fault on OASIS 6 (524875) 230 kV Bus to PLSNT_HILL 6 (524770) 230 kV line CKT 1, near OASIS 6 (524875) 230 kV.<br>a. Apply fault at the OASIS 6 (524875) 230 kV Bus.<br>b. Clear fault after 7 cycles by tripping the faulted line.<br>c. Wait 20 cycles, and then re-close the line in (b) back into the fault.<br>d. Leave Fault on for 7 cycles, then trip the line in (b) and remove fault. |
| FLT9050-3PH | P1 | 3 Phase fault on PLSNT_HILL 6 (524770) 230 kV / PLSNT_HILL 3 (524768) 115 kV / PLSNHIL_TR11 (524767) 13.2 kV XFMR CKT 1, near PLSNT_HILL 6 (524770) 230 kV.<br>a. Apply fault at the PLSNT_HILL 6 (524770) 230 kV Bus.<br>b. Clear fault after 7 cycles by tripping the faulted transformer. |
| FLT9051-3PH | P1 | 3 Phase fault on TOLK 6 (525531) 230 kV Bus to GEN-2018-097 (763241) 230 kV line CKT 1, near TOLK 6 (525531) 230 kV.<br>a. Apply fault at the TOLK 6 (525531) 230 kV Bus.<br>b. Clear fault after 7 cycles by tripping the faulted line.<br>Trip generator on the Bus G18-111-GEN1 (763298) 0.7 kV<br>Trip generator on the Bus G18-097-GEN1 (763244) 0.7 kV<br>Trip generator on the Bus G18-124-GEN1 (763397) 0.7 kV<br>Trip generator on the Bus G18-112-GEN1 (763309) 0.7 kV<br>c. Wait 20 cycles, and then re-close the line in (b) back into the fault.<br>d. Leave Fault on for 7 cycles, then trip the line in (b) and remove fault. |

**Table 6-1 Continued**

| Fault ID | Planning Event | Fault Descriptions |
|---|---|---|
| FLT9052-3PH | P1 | 3 Phase fault on TOLK 6 (525531) 230 kV / TOLK_2 1 (525562) 24 kV / XFMR CKT 1, near TOLK 6 (525531) 230 kV.<br>a. Apply fault at the TOLK 6 (525531) 230 kV Bus.<br>b. Clear fault after 7 cycles by tripping the faulted transformer.<br>Trip generator on the Bus TOLK_2 1 (525562) 24 kV |
| FLT1001-SB | P4 | Stuck Breaker on CROSSROADS 7 (527656) 345 kV Bus<br>a. Apply single phase fault at the CROSSROADS 7 (527656) 345 kV Bus<br>b. Clear fault after 16 cycles and trip the following elements:<br>b.1.Trip the CROSSROADS 7 (527656) 345 kV to SAGA_SCOL 7 (527610) 345 kV line CKT 1.<br>b.2.Trip the CROSSROADS 7 (527656) 345 kV to TOLK 7 (525549) 345 kV line CKT 1.<br>Trip generator on the Bus SAGSFT3_2.21 (527605) 0.7 kV<br>Trip generator on the Bus SAGSFT4_2.21 (527607) 0.7 kV<br>Trip generator on the Bus SAGSFT2_2.21 (527617) 0.7 kV<br>Trip generator on the Bus SAGSFT2_2.01 (527618) 0.7 kV<br>Trip generator on the Bus SAGSFT1_2.21 (527614) 0.7 kV<br>Trip generator on the Bus SAGSFT1_2.01 (527615) 0.7 kV |
| FLT1002-SB | P4 | Stuck Breaker on CROSSROADS 7 (527656) 345 kV Bus<br>a. Apply single phase fault at the CROSSROADS 7 (527656) 345 kV Bus<br>b. Clear fault after 16 cycles and trip the following elements:<br>b.1.Trip the CROSSROADS 7 (527656) 345 kV to EDDY_CNTY 7 (527802) 345 kV line CKT 1.<br>b.2.Trip the CROSSROADS 7 (527656) 345 kV to RSVLT_CC_E 7 (527655) 345 kV line CKT 1.<br>Trip generator on the Bus MILO_WIND 1 (527653) 0.7 kV<br>Trip generator on the Bus RSVLT_GEN2 1 (527652) 0.7 kV<br>Trip generator on the Bus RSVLT_GEN1 1 (527651) 0.7 kV |
| FLT1003-SB | P4 | Stuck Breaker on PLANT_X 6 (525481) 230 kV Bus<br>a. Apply single phase fault at the PLANT_X 6 (525481) 230 kV Bus<br>b. Clear fault after 16 cycles and trip the following elements:<br>b.3.Trip bus PLANT_X 6 (525481) 230 kV. |
| FLT1004-SB | P4 | Stuck Breaker on TUCO_INT 6 (525830) 230 kV Bus<br>a. Apply single phase fault at the TUCO_INT 6 (525830) 230 kV Bus<br>b. Clear fault after 16 cycles and trip the following elements:<br>b.1.Trip the TUCO_INT 6 (525830) 230 kV to JONES 6 (526337) 230 kV line CKT 1.<br>b.2.Trip the TUCO_INT 6 (525830) 230 kV to SWISHER 6 (525213) 230 kV line CKT 1. |
| FLT1005-SB | P4 | Stuck Breaker on TUCO_INT 6 (525830) 230 kV Bus<br>a. Apply single phase fault at the TUCO_INT 6 (525830) 230 kV Bus<br>b. Clear fault after 16 cycles and trip the following elements:<br>b.1.Trip the TUCO_INT 6 (525830) 230 kV to CARLISLE 6 (526161) 230 kV line CKT 1.<br>b.2.Trip the TUCO_INT 6 (525830) 230 kV to HALE_WNDCL16 (525957) 230 kV line CKT 1. |
| FLT1006-SB | P4 | Stuck Breaker on TUCO_INT 6 (525830) 230 kV Bus<br>a. Apply single phase fault at the TUCO_INT 6 (525830) 230 kV Bus<br>b. Clear fault after 16 cycles and trip the following elements:<br>b.1.Trip the TUCO_INT 6 (525830) 230 kV / TUCO_INT 7 (525832) 345 kV / TUCO_TR2 1 (525825) 13.2 kV XFMR CKT 2.<br>b.2.Trip the TUCO_INT 6 (525830) 230 kV / TUCO_INT 7 (525832) 345 kV / TUCO_TR1 1 (525824) 13.2 kV XFMR CKT 1. |

**Table 6-1 Continued**

| Fault ID | Planning Event | Fault Descriptions |
|---|---|---|
| FLT1007-SB | P4 | Stuck Breaker on TUCO_INT 6 (525830) 230 kV Bus<br>a. Apply single phase fault at the TUCO_INT 6 (525830) 230 kV Bus<br>b. Clear fault after 16 cycles and trip the following elements:<br>b.1.Trip the TUCO_INT 6 (525830) 230 kV / TUCO_INT 3 (525828) 115 kV / TUCO_TR4 1 (525821) 13.2 kV XFMR CKT 1.<br>b.2.Trip the TUCO_INT 6 (525830) 230 kV to TOLK 6 (525531) 230 kV line CKT 1. |
| FLT1008-SB | P4 | **Stuck Breaker at TOLK 7 (525549) 345 kV bus**<br>a. Apply single phase fault at TOLK 7 bus.<br>b. Clear fault after 16 cycles and trip the following elements<br>c. Trip the bus TOLK 7 (525549) |
| FLT1009-SB | P4 | **Stuck Breaker at POTTER_CO 7 (523961) 345 kV bus**<br>a. Apply single phase fault at POTTER_CO 7 bus.<br>b. Clear fault after 16 cycles and trip the following elements<br>c. Trip the bus POTTER_CO 7 (523961) |

## 6.3 Results

Table 6-2 shows the relevant results of the fault events simulated for each of the modified models. Existing DISIS base case issues are documented separately in Appendix C. The associated stability plots are also provided in Appendix C.

**Table 6-2: GEN-2017-158 Dynamic Stability Results**

| Fault ID | 25SP | | | 25WP | | |
|---|---|---|---|---|---|---|
| | Voltage Violation | Voltage Recovery | Stable | Voltage Violation | Voltage Recovery | Stable |
| FLT0001-3PH | Pass | Pass | Stable | Pass | Pass | Stable |
| FLT0002-3PH | Pass | Pass | Stable | Pass | Pass | Stable |
| FLT0003-3PH | Pass | Pass | Stable | Pass | Pass | Stable |
| FLT0004-3PH | Pass | Pass | Stable | Pass | Pass | Stable |
| FLT0005-3PH | Pass | Pass | Stable | Pass | Pass | Stable |
| FLT0006-3PH | Pass | Pass | Stable | Pass | Pass | Stable |
| FLT0007-3PH | Pass | Pass | Stable | Pass | Pass | Stable |
| FLT0008-3PH | Pass | Pass | Stable | Pass | Pass | Stable |
| FLT0009-3PH | Pass | Pass | Stable | Pass | Pass | Stable |
| FLT0010-3PH | Pass | Pass | Stable | Pass | Pass | Stable |
| FLT0011-3PH | Pass | Pass | Stable | Pass | Pass | Stable |
| FLT0012-3PH | Pass | Pass | Stable | Pass | Pass | Stable |
| FLT0013-3PH | Pass | Pass | Stable | Pass | Pass | Stable |
| FLT0014-3PH | Pass | Pass | Stable | Pass | Pass | Stable |
| FLT0015-3PH | Pass | Pass | Stable | Pass | Pass | Stable |
| FLT0019-3PH | Pass | Pass | Stable | Pass | Pass | Stable |
| FLT0026-3PH | Pass | Pass | Stable | Pass | Pass | Stable |
| FLT0035-3PH | Pass | Pass | Stable | Pass | Pass | Stable |
| FLT0036-3PH | Pass | Pass | Stable | Pass | Pass | Stable |

**Table 6-2 continued**

| Fault ID | 25SP | | | 25WP | | |
|---|---|---|---|---|---|---|
| | Voltage Violation | Voltage Recovery | Stable | Voltage Violation | Voltage Recovery | Stable |
| FLT0037-3PH | Pass | Pass | Stable | Pass | Pass | Stable |
| FLT0038-3PH | Pass | Pass | Stable | Pass | Pass | Stable |
| FLT0039-3PH | Pass | Pass | Stable | Pass | Pass | Stable |
| FLT0040-3PH | Pass | Pass | Stable | Pass | Pass | Stable |
| FLT0069-3PH | Pass | Pass | Stable | Pass | Pass | Stable |
| FLT0070-3PH | Pass | Pass | Stable | Pass | Pass | Stable |
| FLT0071-3PH | Pass | Pass | Stable | Pass | Pass | Stable |
| FLT0094-3PH | Pass | Pass | Stable | Pass | Pass | Stable |
| FLT0126-3PH | Pass | Pass | Stable | Pass | Pass | Stable |
| FLT0127-3PH | Pass | Pass | Stable | Pass | Pass | Stable |
| FLT0192-3PH | Pass | Pass | Stable | Pass | Pass | Stable |
| FLT0193-3PH | Pass | Pass | Stable | Pass | Pass | Stable |
| FLT0195-3PH | Pass | Pass | Stable | Pass | Pass | Stable |
| FLT0196-3PH | Pass | Pass | Stable | Pass | Pass | Stable |
| FLT0197-3PH | Pass | Pass | Stable | Pass | Pass | Stable |
| FLT0198-3PH | Pass | Pass | Stable | Pass | Pass | Stable |
| FLT0199-3PH | Pass | Pass | Stable | Pass | Pass | Stable |
| FLT0200-3PH | Pass | Pass | Stable | Pass | Pass | Stable |
| FLT0201-3PH | Pass | Pass | Stable | Pass | Pass | Stable |
| FLT0202-3PH | Pass | Pass | Stable | Pass | Pass | Stable |
| FLT0204-3PH | Pass | Pass | Stable | Pass | Pass | Stable |
| FLT0205-3PH | Pass | Pass | Stable | Pass | Pass | Stable |
| FLT0206-3PH | Pass | Pass | Stable | Pass | Pass | Stable |
| FLT0207-3PH | Pass | Pass | Stable | Pass | Pass | Stable |
| FLT0209-3PH | Pass | Pass | Stable | Pass | Pass | Stable |
| FLT0210-3PH | Pass | Pass | Stable | Pass | Pass | Stable |
| FLT0211-3PH | Pass | Pass | Stable | Pass | Pass | Stable |
| FLT0212-3PH | Pass | Pass | Stable | Pass | Pass | Stable |
| FLT0233-3PH | Pass | Pass | Stable | Pass | Pass | Stable |
| FLT0234-3PH | Pass | Pass | Stable | Pass | Pass | Stable |
| FLT0246-3PH | Pass | Pass | Stable | Pass | Pass | Stable |
| FLT0260-3PH | Pass | Pass | Stable | Pass | Pass | Stable |
| FLT0262-3PH | Pass | Pass | Stable | Pass | Pass | Stable |
| FLT0263-3PH | Pass | Pass | Stable | Pass | Pass | Stable |
| FLT0264-3PH | Pass | Pass | Stable | Pass | Pass | Stable |
| FLT9001-3PH | Pass | Pass | Stable | Pass | Pass | Stable |

**Table 6-2 continued**

| Fault ID | 25SP | | | 25WP | | |
|---|---|---|---|---|---|---|
| | Voltage Violation | Voltage Recovery | Stable | Voltage Violation | Voltage Recovery | 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 |
| FLT9005-3PH | Pass | Pass | Stable | Pass | Pass | Stable |
| FLT9006-3PH | Pass | Pass | Stable | Pass | Pass | Stable |
| 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 |
| FLT9037-3PH | Pass | Pass | Stable | Pass | Pass | Stable |
| FLT9038-3PH | Pass | Pass | Stable | Pass | Pass | Stable |

**Table 6-2 continued**

| Fault ID | 25SP | | | 25WP | | |
|---|---|---|---|---|---|---|
| | Voltage Violation | Voltage Recovery | Stable | Voltage Violation | Voltage Recovery | Stable |
| FLT9039-3PH | Pass | Pass | Stable | Pass | Pass | Stable |
| FLT9040-3PH | Pass | Pass | Stable | Pass | Pass | Stable |
| FLT9041-3PH | Pass | Pass | Stable | Pass | Pass | Stable |
| FLT9042-3PH | Pass | Pass | Stable | Pass | Pass | Stable |
| FLT9043-3PH | Pass | Pass | Stable | Pass | Pass | Stable |
| FLT9044-3PH | Pass | Pass | Stable | Pass | Pass | Stable |
| 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 |
| FLT9051-3PH | Pass | Pass | Stable | Pass | Pass | Stable |
| FLT9052-3PH | Pass | Pass | Stable | Pass | Pass | Stable |
| FLT1001-SB | Pass | Pass | Stable | Pass | Pass | Stable |
| FLT1002-SB | Pass | Pass | Stable | Pass | Pass | Stable |
| FLT1003-SB | Pass | Pass | Stable | Pass | Pass | Stable |
| FLT1004-SB | Pass | Pass | Stable | 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 |

The results of the dynamic stability showed several existing base case issues that were found in both the original DISIS-2018-002/2019-001 model and the model with the GEN-2017-158 modification included. These issues were not attributed to the GEN-2017-158 modification request and detailed in Appendix C.

There were no damping or voltage recovery violations attributed to the GEN-2017-158 modification request observed during the simulated faults. Additionally, the project was found to stay connected during the contingencies that were studied and, therefore, will meet the Low Voltage Ride Through (LVRT) requirements of FERC Order #661A.

## 7.0 Modified Capacity Exceeds GIA Capacity

Under FERC Order 845, Interconnection Customers are allowed to request Interconnection Service that is lower than the full generating capacity of their planned generating facilities. The Interconnection Customers must install acceptable control and protection devices that prevent the injection above their requested Interconnection Service amount measured at the POI.

As such, Interconnection Customers are allowed to increase the generating capacity of a generating facility without increasing its Interconnection Service amount stated in its GIA. This is allowable as long as they install the proper control and protection devices, and the requested modification is not determined to be a Material Modification.

The modified generating capacity of GEN-2017-158 (265.2 MW) exceeds the GIA Interconnection Service amount, 265 MW, as listed in Appendix A of the GIA.

The customer must install monitoring and control equipment as needed to ensure that the amount of power injected at the POI does not exceed the Interconnection Service amount listed in its GIA.

# 8.0 Material Modification Determination

In accordance with Attachment V of SPP's Open Access Transmission Tariff, for modifications other than those specifically permitted by Attachment V, SPP shall evaluate the proposed modifications prior to making them and inform the Interconnection Customer in writing of whether the modifications would constitute a Material Modification. Material Modification shall mean (1) modification to an Interconnection Request in the queue that has a material adverse impact on the cost or timing of any other Interconnection Request with a later Queue priority date; or (2) planned modification to an Existing Generating Facility that is undergoing evaluation for a Generating Facility Modification or Generating Facility Replacement, and has a material adverse impact on the Transmission System with respect to: i) steady-state thermal or voltage limits, ii) dynamic system stability and response, or iii) short-circuit capability limit; compared to the impacts of the Existing Generating Facility prior to the modification or replacement.

## 8.1 Results

SPP determined the requested modification is not a Material Modification based on the results of this Modification Request Impact Study performed by Aneden. Aneden evaluated the impact of the requested modification on the prior study results. Aneden determined that the requested modification did not negatively impact the prior study dynamic stability and short circuit results, and the modifications to the project were not significant enough to change the previously studied steady-state conclusions.

This determination implies that any network upgrades already required by GEN-2017-158 would not be negatively impacted and that no new upgrades are required due to the requested modification, thus not resulting in a material adverse impact on the cost or timing of any other Interconnection Request with a later Queue priority date.