

GEN-2020-002

Modification Request Impact Study

By SPP Generator Interconnection

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# Revision History

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# Executive Summary

Southwest Power Pool performed a Modification Request Impact Study (Study) for GEN-2020-002, an active Generation Interconnection Request (GIR) with a Point of Interconnection (POI) at the S6846 Substation 69 kV.

The GEN-2020-002 project interconnects in the Omaha Public Power District (OPPD) control area with a capacity of 81 MW as shown in Table ES‑1 below. This Study has been requested to evaluate the modification of the GEN-2020-002 Dynamic Model. The generating capacity for GEN-2020-002 (81MW) and the total capability (82.40MW) exceeds its Generator Interconnection Agreement (GIA) Interconnection Service amount, 81 MW, 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 transformer, generation interconnection line, main substation transformer, and reactive power devices. The existing and modified configurations for GEN-2020-002 are shown in Table ES‑2.

Table ES‑1: GEN-2020-002 Configuration

|  |  |  |  |
| --- | --- | --- | --- |
| Request | Point of Interconnection | Generator Configuration | GIA Capacity (MW) |
| GEN-2020-002 | S6846 Substation 69 kV (647846) | 26 x Sungrow SG3600UD 3.6 MVA Inverters | 81 |

Table ES‑2: GEN-2020-002 Modification Request

|  |  |  |
| --- | --- | --- |
| Facility | Existing Generating Facility Configuration | Modification Generating Facility Configuration |
| Point of Interconnection | S6846 Substation 69 kV (647846) | S6846 Substation 69 kV (647846) |
| Configuration/Capacity | 27 x 4.53 MW Solar Inverters | 26 x Sungrow SG3600UD 3.6 MVA Solar Inverters |
| Generation Interconnection Line | Length = 0.5 miles | Length = 0.5 miles |
| R = 0.129000 pu | R = 0.000000 pu |
| X = 0.065100 pu | X = 0.000100 pu |
| B = 0.004000 pu | B = 0.004000 pu |
| Main Substation Transformer1 | R = 0.002332 pu | R = 0.002998 pu |
| X = 0.069961 pu | X = 0.089950 pu |
| Winding MVA = 52 MVA | Winding MVA = 57 MVA |
| Rating MVA = 87 MVA | Rating MVA = 95 MVA |
| Equivalent Collector Line2 | R = 0.010000 pu | R = 0.007308 pu |
| X = 0.011700 pu | X = 0.010145 pu |
| B = 0.014400 pu | B = 0.013090 pu |
| GSU Transformer1 | Gen Equivalent Qty: 27 | Gen Equivalent Qty: 26 |
| R = 0.005472 pu | R = 0.008688 pu |
| X = 0.054727 pu | X = 0.060814 pu |
| Winding MVA = 90 MVA | Winding MVA = 90 MVA |
| Rating MVA = 90 MVA | Rating MVA = 90 MVA |
| Generator Dynamic Model3 & Power Factor | REGCAU13 Leading and Lagging: ±0.8988 | REGCA13 Leading and Lagging: ±0.8803 |
| Reactive Power Devices | N/A | N/A |
| 1) X/R based on Winding MVA, 2) All pu are on 100 MVA Base 3) DYR stability model name | | |

SPP determined that powerflow should not be performed because the technology type of the request was unchanged with the modification. However, SPP determined that the change in inverter parameters and controller model required short circuit and dynamic stability analyses.

The scope of this modification request study included short circuit analysis, and dynamic stability analysis.

SPP performed the analyses using the modification request data based on the DISIS-2017-002 study models:

1. 2025 Summer Peak (25SP),
2. 2025 Winter Peak (25WP)

All analyses were performed using the Siemens PTI PSS/E[[1]](#footnote-2) version 34 software and the results are summarized below.

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-2020-002 contribution to three-phase fault currents in the immediate transmission systems at or near the GEN-2020-002 POI was no greater than 0.6999 kA. There was one bus with a pre-existing maximum three-phase fault current over 40 kA. This bus is highlighted in [Appendix B](#_Appendix_B:_Gen-2020-002).

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. Seven Hundred and Fifty-Seven events were simulated, which included three-phase faults and single-line-to-ground stuck breaker faults.

The results of the dynamic stability analysis showed that there were several existing base case issues found in the original Annual Interim 2022 case and the case with the GEN-2020-002 modification. These issues were not attributed to the GEN-2020-002 modification request and are detailed in [Appendix E](#_Appendix_E:_GEN-2020-002).

There were no damping or voltage recovery violations attributed to the GEN-2020-002 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.

The requested modification has been determined by SPP to **not be 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, 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.

# Scope of Study

Southwest Power Pool (SPP) performed a Modification Request Impact Study (Study) for GEN-2020-002. 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.

## Powerflow Analysis

SPP determined that powerflow should not be performed because the technology type of the request was unchanged with the modification.

## Stability Analysis, Short Circuit Analysis

To determine whether stability and short circuit analyses are required, SPP evaluates the difference between 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.

## Study Limitations

The assessments and conclusions provided in this report are based on assumptions and information provided to SPP by others. While the assumptions and information provided may be appropriate for the purposes of this report, SPP does not guarantee that those conditions assumed will occur. In addition, SPP 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.

# Project and Modification Request

The GEN-2020-002 Interconnection Customer has requested a modification to its Interconnection Request (IR) with a Point of Interconnection (POI) at the S6846 Substation 69 kV. At the time of report posting, GEN-2020-002 is an active Interconnection Request with a queue status of “DISIS STAGE.” GEN-2020-002 is a solar plant with a maximum summer and winter queue capacity of 81 MW with Energy Resource Interconnection Service (ERIS).

The GEN-2020-002 project is currently in the DISIS-2020-001 cluster. Figure 1 shows the powerflow model single line diagram for the existing GEN-2020-002 configuration using the DISIS-2017-002 stability models. The GEN-2020-002 project interconnects in the Omaha Public Power District (OPPD) control area with a capacity of 81 MW as shown in Table 1‑1 below.

Table 1‑1: GEN-2020-002 Configuration

|  |  |  |  |
| --- | --- | --- | --- |
| Request | Point of Interconnection | Generator Configuration | GIA Capacity (MW) |
| GEN-2020-002 | S6846 Substation 69 kV (647846) | 26 x Sungrow SG3600UD 3.6 MVA Solar Inverters | 81 |

Figure 1: GEN-2020-002 Single Line Diagram (Existing Configuration\*)

A diagram of a number

Description automatically generated

\*based on the DISIS-2017-002 stability models

This Study has been requested by the Interconnection Customer to evaluate the modification of GEN-2020-002 dynamic model. The generating capacity for GEN-2020-002 (82.4 MW) and the total capability (82.4 MW) exceed its Generator Interconnection Agreement (GIA) Interconnection Service amount, 81 MW, 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 transformer, generation interconnection line, main substation transformer, and reactive power devices. Figure 2 shows the powerflow model single line diagram for the GEN-2020-002 modification. The existing and modified configurations for GEN-2020-002 are shown in Table 1‑2.

Figure 2: GEN-2020-002 Single Line Diagram (Modification Configuration)

A diagram of a graph

Description automatically generated with medium confidence

Table 1‑2: GEN-2020-002 Modification Request

|  |  |  |
| --- | --- | --- |
| Facility | Existing Generating Facility Configuration | Modification Generating Facility Configuration |
| Point of Interconnection | S6846 Substation 69 kV (647846) | S6846 Substation 69 kV (647846) |
| Configuration/Capacity | 27 x 4.53 MW Solar Inverters | 26 x Sungrow SG3600UD 3.6 MVA Solar Inverters |
| Generation Interconnection Line | Length = 0.5 miles | Length = 0.5 miles |
| R = 0.129000 pu | R = 0.000000 pu |
| X = 0.065100 pu | X = 0.000100 pu |
| B = 0.004000 pu | B = 0.004000 pu |
| Main Substation Transformer1 | R = 0.002332 pu | R = 0.002998 pu |
| X = 0.069961 pu | X = 0.089950 pu |
| Winding MVA = 52 MVA | Winding MVA = 57 MVA |
| Rating MVA = 87 MVA | Rating MVA = 95 MVA |
| Equivalent Collector Line2 | R = 0.010000 pu | R = 0.007308 pu |
| X = 0.011700 pu | X = 0.010145 pu |
| B = 0.014400 pu | B = 0.013090 pu |
| GSU Transformer1 | Gen Equivalent Qty: 26 | Gen Equivalent Qty: 26 |
| R = 0.005472 pu | R = 0.008688 pu |
| X = 0.054727 pu | X = 0.060814 pu |
| Winding MVA = 90 MVA | Winding MVA = 90 MVA |
| Rating MVA = 90 MVA | Rating MVA = 90 MVA |
| Generator Dynamic Model3 & Power Factor | REGCAU13 Leading and Lagging: ±0.8988 | REGCA13 Leading and Lagging: ±0.8803 |
| Reactive Power Devices | N/A | N/A |
| 1) X/R based on Winding MVA, 2) All pu are on 100 MVA Base 3) DYR stability model name | | |

# Existing Versus Modification Comparison

To determine which analyses are required for the Study, the differences between the existing configuration and the requested modification were evaluated. SPP performed this comparison and the resulting analyses using a set of modified study models developed based on the modification request data and the DISIS-2017-002 study models.

The methodology and results of the comparisons are described below. The analysis was completed using PSS/E version 34.8.0 software.

## Stability Model Parameters Comparison

SPP determined that short circuit and dynamic stability analyses were required because of the change in dynamic models. This is because the short circuit contribution and stability responses of the existing configuration and the requested modification’s configuration may differ. The generator dynamic model for the modification can be found in [Appendix A](#_Appendix_A:_GEN-2020-002).

As short circuit and dynamic stability analyses were required, a turbine parameters comparison was not needed for the determination of the scope of the study.

## Equivalent Impedance Comparison Calculation

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

# Short Circuit Analysis

A short circuit study was performed using the 25SP model for GEN-2020-002. The detailed results of the short circuit analysis are provided in [Appendix B](#_Appendix_B:_Gen-2020-002).

## Methodology

The short circuit analysis included applying a three-phase fault on buses up to 5 levels away from the 69 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-2020-002 online.

SPP created a short circuit model using the 25SP DISIS-2017-002 stability study model by adjusting the GEN-2020-002 short circuit parameters consistent with the modification data. The adjusted parameters are shown in Table 2‑1 below.

Table 2‑1: Short Circuit Model Parameters\*

|  |  |
| --- | --- |
| Parameter | Value by Generator Bus# |
| **906023** |
| Machine MVA Base | 93.60 |
| R (pu) | 0.0 |
| X’’ (pu) | 0.9426 |

\*pu values based on Machine MVA Base

## Results

The results of the short circuit analysis for the 25SP model are summarized in Table 2‑2 and Table 2‑3. The GEN-2020-002 POI bus (S6846 Substation 69 kV - 647846) fault current magnitudes are provided in Table 2‑2 showing a maximum fault current of 8.0408 kA with the GEN-2020-002 project online. Table 2‑3 shows the maximum fault current magnitudes and fault current increases with the GEN-2020-002 project online.

There was one bus with a pre-existing maximum three-phase fault current over 40 kA. This bus is highlighted in [Appendix B](#_Appendix_B:_Gen-2020-002). The maximum GEN-2020-002 contribution to three-phase fault current was about 9.534% and 0.6999 kA.

Table 2‑2: POI Short Circuit Results

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Case | GEN-OFF Current (kA) | GEN-ON Current (kA) | Max kA Change | Max %Change |
| 25SP | 7.3409 | 8.0408 | 0.6999 | 9.534% |

Table 2‑3: 25SP Short Circuit Results

|  |  |  |  |
| --- | --- | --- | --- |
| Voltage (kV) | Max. Current (kA) | Max kA Change | Max %Change |
| 69 | 26.8244 | 0.6999 | 9.534% |
| 115 | 26.7996 | 0.0146 | 0.057% |
| 161 | 45.1699 | 0.0931 | 0.666% |
| **Max** | **45.1699** | **0.6999** | **9.534%** |

# Dynamic Stability Analysis

SPP performed a dynamic stability analysis to identify the impact of the inverter configuration change and other modifications to GEN-2020-002. The analysis was performed according to SPP’s Disturbance Performance Requirements[[2]](#footnote-3). The modification details are described in the Project and Modification Request section and the dynamic modeling data is provided in [Appendix A](#_Appendix_A:_GEN-2020-002). The existing original case issues and simulation plots can be found in [Appendix E.](#_Appendix_E:_GEN-2020-002)

## Methodology and Criteria

The dynamic stability analysis was performed using models developed with the requested GEN-2020-002 configuration of 26 x Sungrow SG3600UD 3.6 MVA Inverters (REGCA1). This stability analysis was performed using PTI’s PSS/E version 34.8.0 software.

The modifications requested for the GEN-2020-002 project were used to create modified stability modelsfor this impact study based on the DISIS-2017-002 stability study models:

1. 2025 Summer Peak (25SP),
2. 2025 Winter Peak (25WP)

The modified dynamic model data for the GEN-2020-002 project is provided in [Appendix A](#_Appendix_A:_GEN-2020-002). The modified powerflow 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.

During the fault simulations, the monitored areas include all buses and radially connected facilities within five buses of the Request’s POI as well as three buses from each regional or tie-line facility. The active power (PELEC), reactive power (QELEC), and terminal voltage (ETERM) were monitored for GEN-2020-002 and other current and prior queued projects in their cluster group[[3]](#footnote-4) within the monitored area. The machine rotor angle for synchronous machines and speed for asynchronous machines within the studied area were monitored. In addition, the voltages of all 69 kV and above buses within the study area were monitored.

## Fault Definitions

SPP developed and simulated faults for GEN-2020-002 using the modified study models. 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 [Appendix C](#_Appendix_C:_Fault). These contingencies were applied to the modified 25SP and 25WP models.

## Results

[Appendix D](#_Appendix_D:_GEN-2020-002) includes the relevant results of the fault events simulated for each of the modified cases. Existing original case issues are documented separately in [Appendix E](#_Appendix_E:_GEN-2020-002). The associated stability plots are also provided in [Appendix E](#_Appendix_E:_GEN-2020-002).

The results of the dynamic stability analysis showed that there were several existing original case issues found in the original Annual Interim 2022 case and the case with the GEN-2020-002 modification. These issues were not attributed to the GEN-2020-002 modification request and detailed in [Appendix E](#_Appendix_E:_GEN-2020-002).

There were no damping or voltage recovery violations attributed to the GEN-2020-002 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.

# 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.

## Results

The modified generating capacity of GEN-2020-002 (81 MW) and the total capability (82.4 MW) exceed the GIA Interconnection Service amount, 81 MW, as listed in Appendix A of the GIA. The GEN-2020-002 inverters are rated at 3.17 MW and use a Power Plant Controller (PPC) to limit the total power injected into the POI.

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.

# 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.

## Results

SPP determined the requested modification is **not a Material Modification** based on the results of this Modification Request Impact Study performed by SPP. SPP evaluated the impact of the requested modification on the prior study results. SPP 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 enough to change the previously studied powerflow conclusions.

This determination implies that any network upgrades already required by GEN-2020-002 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.

# Appendix A: GEN-2020-002 Generator Dynamic Model

906023 'REGCA1' 1 0

0.20000E-01 10.000 0.90000 0.50000 1.0000

1.1000 0.10000E-01 0.0000 -1.0000 0.10000E-01

0.0000 99.000 -99.000 0.70000 /

906023 'REECA1' 1

0 0 1 0 0 0

0.85000 1.2000 0.10000E-01 -0.10000 0.10000

2.0000 1.0000 -1.0000 0.0000 0.0000

0.0000 0.0000 0.10000E-01 0.60000 -0.60000

1.1000 0.90000 0.30000 5.0000 0.50000

0.0000 0.0000 0.10000E-01 99.000 -99.000

1.0000 0.0000 1.0000 0.10000E-01 0.0000

1.0000 0.50000 1.0000 0.85000 1.0000

1.2000 1.0000 0.0000 1.0000 0.50000

1.0000 0.85000 1.0000 1.2000 1.0000 /

906023 'REPCA1' 1

906020 906020 647846 '1 ' 0 1 1

0.50000E-01 0.50000 10.000 0.0000 0.50000E-01

0.85000 0.0000 0.0000 0.30000E-01 0.50000E-01

-0.50000E-01 0.0000 0.0000 0.47500 -0.47500

0.50000 0.25000 0.25000 -0.60000E-03 0.60000E-03

999.00 -999.00 0.88000 0.0000 0.50000

20.000 20.000 /

90602301 'VTGTPAT' 906023 906023 '1 ' -1.0000 1.3000 0.50000E-01 0.0000 /

90602302 'VTGTPAT' 906023 906023 '1 ' -1.0000 1.2000 0.16000 0.0000 /

90602303 'VTGTPAT' 906023 906023 '1 ' -1.0000 1.1000 10.000 0.0000 /

90602304 'VTGTPAT' 906023 906023 '1 ' 0.50000 5.0000 2.0000 0.0000 /

90602305 'VTGTPAT' 906023 906023 '1 ' 0.70000 5.0000 10.000 0.0000 /

90602306 'VTGTPAT' 906023 906023 '1 ' 0.88000 5.0000 20.000 0.0000 /

90602307 'FRQTPAT' 906023 906023 '1 ' 57.000 100.00 0.50000 0.0000 /

90602308 'FRQTPAT' 906023 906023 '1 ' 58.300 100.00 600.00 0.0000 /

90602309 'FRQTPAT' 906023 906023 '1 ' -100.00 62.000 0.50000 0.0000 /

90602310 'FRQTPAT' 906023 906023 '1 ' -100.00 60.700 600.00 0.0000 /

# Appendix B: GEN-2020-002 Short Circuit Results

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Group** | **Bus Number** | **Bus Name** | **Bus Voltage (kV)** | **Request Not In Service 25SP Fault Current 3-Phase (kA)** | **Request In Service 25SP Fault Current 3-Phase (kA)** | **Change in Fault Current (kA)** |
| 02 NEBRASKA | 640155 | DAVEY 7 | 115 | 11.3682 | 11.3709 | 0.0027 |
| 02 NEBRASKA | 640320 | PLTSMTH8 | 69 | 5.4597 | 5.4622 | 0.0025 |
| 02 NEBRASKA | 646209 | S1209 5 | 161 | 45.1111 | 45.1699 | 0.0588 |
| 02 NEBRASKA | 646214 | S1214 5 | 161 | 12.3845 | 12.467 | 0.0825 |
| 02 NEBRASKA | 646254 | S1254 5 | 161 | 31.4386 | 31.4861 | 0.0475 |
| 02 NEBRASKA | 646281 | S1281 5 | 161 | 33.9653 | 34.0463 | 0.081 |
| 02 NEBRASKA | 646287 | S1287 5 | 161 | 21.3937 | 21.4621 | 0.0684 |
| 02 NEBRASKA | 646361 | S1361 5 | 161 | 39.0098 | 39.0805 | 0.0707 |
| 02 NEBRASKA | 646363 | S1363 5 | 161 | 30.7818 | 30.8274 | 0.0456 |
| 02 NEBRASKA | 647014 | S914A 8 | 69 | 11.2893 | 11.6431 | 0.3538 |
| 02 NEBRASKA | 647079 | 979TP 8 | 69 | 6.9927 | 7.005 | 0.0123 |
| 02 NEBRASKA | 647091 | 991TP 8 | 69 | 11.5394 | 11.577 | 0.0376 |
| 02 NEBRASKA | 647100 | ASH GRV8 | 69 | 6.908 | 6.9283 | 0.0203 |
| 02 NEBRASKA | 647104 | MUD LNG8 | 69 | 14.5792 | 14.5928 | 0.0136 |
| 02 NEBRASKA | 647427 | FREM G 8 | 69 | 14.0135 | 14.048 | 0.0345 |
| 02 NEBRASKA | 647846 | S6846 8 | 69 | 7.3409 | 8.0408 | 0.6999 |
| 02 NEBRASKA | 647900 | S900 8 | 69 | 8.0437 | 8.0713 | 0.0276 |
| 02 NEBRASKA | 647902 | S902 8 | 69 | 8.9396 | 9.1659 | 0.2263 |
| 02 NEBRASKA | 647904 | S904 8 | 69 | 8.7142 | 8.7199 | 0.0057 |
| 02 NEBRASKA | 647909 | S909 8 | 69 | 26.7659 | 26.8244 | 0.0585 |
| 02 NEBRASKA | 647914 | S914 8 | 69 | 7.7571 | 7.8747 | 0.1176 |
| 02 NEBRASKA | 647918 | S918 8 | 69 | 22.7286 | 22.7541 | 0.0255 |
| 02 NEBRASKA | 647921 | S921 8 | 69 | 26.1751 | 26.1963 | 0.0212 |
| 02 NEBRASKA | 647937 | S937 8 | 69 | 8.9982 | 9.114 | 0.1158 |
| 02 NEBRASKA | 647939 | S939 8 | 69 | 19.9675 | 19.9932 | 0.0257 |
| 02 NEBRASKA | 647960 | S960 8 | 69 | 7.4311 | 7.4407 | 0.0096 |
| 02 NEBRASKA | 647972 | S972 8 | 69 | 4.275 | 4.2801 | 0.0051 |
| 02 NEBRASKA | 647979 | S979 8 | 69 | 6.8447 | 6.8565 | 0.0118 |
| 02 NEBRASKA | 647982 | S982 8 | 69 | 3.8279 | 3.8303 | 0.0024 |
| 02 NEBRASKA | 647983 | S983 8 | 69 | 7.1468 | 7.6092 | 0.4624 |
| 02 NEBRASKA | 647984 | S984 8 | 69 | 7.8351 | 7.957 | 0.1219 |
| 02 NEBRASKA | 647985 | S985 8 | 69 | 8.1264 | 8.1327 | 0.0063 |
| 02 NEBRASKA | 647988 | S988 8 | 69 | 2.8817 | 2.9043 | 0.0226 |
| 02 NEBRASKA | 647991 | S991 8 | 69 | 9.7231 | 9.7497 | 0.0266 |
| 02 NEBRASKA | 650169 | 70&BLUFF 5 | 161 | 8.813 | 8.8293 | 0.0163 |
| 02 NEBRASKA | 650261 | 56&I80 7 | 115 | 22.823 | 22.8337 | 0.0107 |
| 02 NEBRASKA | 650269 | 70&BLUFF 7 | 115 | 25.4472 | 25.4618 | 0.0146 |
| 02 NEBRASKA | 650275 | 84&BLUFF 7 | 115 | 26.786 | 26.7996 | 0.0136 |
| 02 NEBRASKA | 650277 | TBGS\_A 7 | 115 | 25.499 | 25.5112 | 0.0122 |
| 02 NEBRASKA | 650278 | TBGS\_B 7 | 115 | 25.6786 | 25.691 | 0.0124 |
| 02 NEBRASKA | 906020 | GEN-2020-002 | 69 | 7.3409 | 8.0408 | 0.6999 |

# Appendix C: Fault Definitions

| **Fault ID** | **Planning Event** | **Fault Description** |
| --- | --- | --- |
| GROUP2\_FAULT\_1\_P1 | P1 | 3 Phase fault on 56&I80 7 115.00 (650261) 115 kV Bus  a. Apply fault at the 56&I80 7 115.00 (650261) 115 kV Bus  b. Clear fault after 7 cycles and trip the faulted elements:  b.1. 19&ALVO 7 (650215) 115.0 kV to 56&I80 7 (650261) 115.0 kV Transmission Circuit #1  b.2. 56&I80 7 (650261) 115.0 kV to 70&BLUFF 7 (650269) 115.0 kV Transmission Circuit #1  b.3. 56&I80 7 (650261) 115.0 kV to 56&I80 9 (650361) 12.5 kV to 611TERTIARY (650561) 7.2 kV Three Winding #1 |
| GROUP2\_FAULT\_2\_P1 | P1 | 3 Phase fault on 84FLETCHER7 115.00 (650284) 115 kV Bus  a. Apply fault at the 84FLETCHER7 115.00 (650284) 115 kV Bus  b. Clear fault after 7 cycles and trip the faulted elements:  b.1. 84LEIGHTON7 (650267) 115.0 kV to 84FLETCHER7 (650284) 115.0 kV Transmission Circuit #1  b.2. 84&BLUFF 7 (650275) 115.0 kV to 84FLETCHER7 (650284) 115.0 kV Transmission Circuit #1  b.3. 84FLETCHER7 (650284) 115.0 kV to 84&FL 9 (650384) 13.2 kV to 841TERTIARY (650584) 7.2 kV Three Winding #1 |
| GROUP2\_FAULT\_3\_P1 | P1 | 3 Phase fault on 70&BLUFF 7 115.00 (650269) 115 kV Bus  a. Apply fault at the 70&BLUFF 7 115.00 (650269) 115 kV Bus  b. Clear fault after 7 cycles and trip the faulted elements:  b.1. 70&BLUFF 7 (650269) 115.0 kV to 84&BLUFF 7 (650275) 115.0 kV Transmission Circuit #1  c. Wait 20 cycles, and then reclose the faulted elements in (b) back into the Fault  d. Leave Fault on for 7 cycles, then trip the faulted elements in (b) and clear the fault |
| GROUP2\_FAULT\_4\_P1 | P1 | 3 Phase fault on 84&BLUFF 7 115.00 (650275) 115 kV Bus  a. Apply fault at the 84&BLUFF 7 115.00 (650275) 115 kV Bus  b. Clear fault after 7 cycles and trip the faulted elements:  b.1. 84&BLUFF 7 (650275) 115.0 kV to WAVERLY 7 (650283) 115.0 kV Transmission Circuit #1  c. Wait 20 cycles, and then reclose the faulted elements in (b) back into the Fault  d. Leave Fault on for 7 cycles, then trip the faulted elements in (b) and clear the fault |
| GROUP2\_FAULT\_5\_P1 | P1 | 3 Phase fault on 70&BLUFF 5 161.00 (650169) 161 kV Bus  a. Apply fault at the 70&BLUFF 5 161.00 (650169) 161 kV Bus  b. Clear fault after 7 cycles and trip the faulted elements:  b.1. S1214 5 (646214) 161.0 kV to 70&BLUFF 5 (650169) 161.0 kV Transmission Circuit #1  b.2. 70&BLUFF 5 (650169) 161.0 kV to 70&BLUFF 7 (650269) 115.0 kV to 70&BLUFF 9 (650369) 13.8 kV Three Winding #1  b.4. 70&BLUFF 9 (650369) 13.8 kV to 70&BLUFF 7 (650269) 115.0 kV to 70&BLUFF 5 (650169) 161.0 kV Three Winding #1 |
| GROUP2\_FAULT\_6\_P1 | P1 | 3 Phase fault on S3454 3 345.00 (645454) 345 kV Bus  a. Apply fault at the S3454 3 345.00 (645454) 345 kV Bus  b. Clear fault after 6 cycles and trip the faulted elements:  b.1. S3454 3 (645454) 345.0 kV to WAGENER 3 (650185) 345.0 kV Transmission Circuit #1  c. Wait 20 cycles, and then reclose the faulted elements in (b) back into the Fault  d. Leave Fault on for 6 cycles, then trip the faulted elements in (b) and clear the fault |
| GROUP2\_FAULT\_7\_P1 | P1 | 3 Phase fault on 120&ALVO 7 115.00 (650279) 115 kV Bus  a. Apply fault at the 120&ALVO 7 115.00 (650279) 115 kV Bus  b. Clear fault after 7 cycles and trip the faulted elements:  b.1. 120&ALVO 7 (650279) 115.0 kV to WAVERLY 7 (650283) 115.0 kV Transmission Circuit #1  c. Wait 20 cycles, and then reclose the faulted elements in (b) back into the Fault  d. Leave Fault on for 7 cycles, then trip the faulted elements in (b) and clear the fault |
| GROUP2\_FAULT\_8\_P1 | P1 | 3 Phase fault on DAVEY 7 115.00 (640155) 115 kV Bus  a. Apply fault at the DAVEY 7 115.00 (640155) 115 kV Bus  b. Clear fault after 7 cycles and trip the faulted elements:  b.1. DAVEY 7 (640155) 115.0 kV to WAHOO 7 (640402) 115.0 kV Transmission Circuit #1  b.2. DAVEY 7 (640155) 115.0 kV to 70&BLUFF 7 (650269) 115.0 kV Transmission Circuit #1  c. Wait 20 cycles, and then reclose the faulted elements in (b) back into the Fault  d. Leave Fault on for 7 cycles, then trip the faulted elements in (b) and clear the fault |
| GROUP2\_FAULT\_9\_P1 | P1 | 3 Phase fault on S3451 3 345.00 (645451) 345 kV Bus  a. Apply fault at the S3451 3 345.00 (645451) 345 kV Bus  b. Clear fault after 6 cycles and trip the faulted elements:  b.1. S3451 3 (645451) 345.0 kV to S3454 3 (645454) 345.0 kV Transmission Circuit #1  c. Wait 20 cycles, and then reclose the faulted elements in (b) back into the Fault  d. Leave Fault on for 6 cycles, then trip the faulted elements in (b) and clear the fault |
| GROUP2\_FAULT\_10\_P1 | P1 | 3 Phase fault on S3454 3 345.00 (645454) 345 kV Bus  a. Apply fault at the S3454 3 345.00 (645454) 345 kV Bus  b. Clear fault after 6 cycles and trip the faulted elements:  b.1. S3454 3 (645454) 345.0 kV to S3455 3 (645455) 345.0 kV Transmission Circuit #1  c. Wait 20 cycles, and then reclose the faulted elements in (b) back into the Fault  d. Leave Fault on for 6 cycles, then trip the faulted elements in (b) and clear the fault |
| GROUP2\_FAULT\_11\_P1 | P1 | 3 Phase fault on S3455 3 345.00 (645455) 345 kV Bus  a. Apply fault at the S3455 3 345.00 (645455) 345 kV Bus  b. Clear fault after 6 cycles and trip the faulted elements:  b.1. S3455 3 (645455) 345.0 kV to S3456 3 (645456) 345.0 kV Transmission Circuit #1  c. Wait 20 cycles, and then reclose the faulted elements in (b) back into the Fault  d. Leave Fault on for 6 cycles, then trip the faulted elements in (b) and clear the fault |
| GROUP2\_FAULT\_12\_P1 | P1 | 3 Phase fault on S3455 3 345.00 (645455) 345 kV Bus  a. Apply fault at the S3455 3 345.00 (645455) 345 kV Bus  b. Clear fault after 6 cycles and trip the faulted elements:  b.1. S3455 3 (645455) 345.0 kV to S3740 3 (645740) 345.0 kV Transmission Circuit #1  c. Wait 20 cycles, and then reclose the faulted elements in (b) back into the Fault  d. Leave Fault on for 6 cycles, then trip the faulted elements in (b) and clear the fault |
| GROUP2\_FAULT\_13\_P1 | P1 | 3 Phase fault on S3455 3 345.00 (645455) 345 kV Bus  a. Apply fault at the S3455 3 345.00 (645455) 345 kV Bus  b. Clear fault after 6 cycles and trip the faulted elements:  b.1. S3455 3 (645455) 345.0 kV to S3761 3 (645761) 345.0 kV Transmission Circuit #1  c. Wait 20 cycles, and then reclose the faulted elements in (b) back into the Fault  d. Leave Fault on for 6 cycles, then trip the faulted elements in (b) and clear the fault |
| GROUP2\_FAULT\_14\_P1 | P1 | 3 Phase fault on S1214 5 161.00 (646214) 161 kV Bus  a. Apply fault at the S1214 5 161.00 (646214) 161 kV Bus  b. Clear fault after 7 cycles and trip the faulted elements:  b.1. S1214 5 (646214) 161.0 kV to S1287 5 (646287) 161.0 kV Transmission Circuit #1  c. Wait 20 cycles, and then reclose the faulted elements in (b) back into the Fault  d. Leave Fault on for 7 cycles, then trip the faulted elements in (b) and clear the fault |
| GROUP2\_FAULT\_15\_P1 | P1 | 3 Phase fault on S1221 5 161.00 (646221) 161 kV Bus  a. Apply fault at the S1221 5 161.00 (646221) 161 kV Bus  b. Clear fault after 7 cycles and trip the faulted elements:  b.1. S1221 5 (646221) 161.0 kV to S1255 5 (646255) 161.0 kV Transmission Circuit #1  c. Wait 20 cycles, and then reclose the faulted elements in (b) back into the Fault  d. Leave Fault on for 7 cycles, then trip the faulted elements in (b) and clear the fault |
| GROUP2\_FAULT\_16\_P1 | P1 | 3 Phase fault on S1233 5 161.00 (646233) 161 kV Bus  a. Apply fault at the S1233 5 161.00 (646233) 161 kV Bus  b. Clear fault after 7 cycles and trip the faulted elements:  b.1. S1233 5 (646233) 161.0 kV to S1255 5 (646255) 161.0 kV Transmission Circuit #1  c. Wait 20 cycles, and then reclose the faulted elements in (b) back into the Fault  d. Leave Fault on for 7 cycles, then trip the faulted elements in (b) and clear the fault |
| GROUP2\_FAULT\_17\_P1 | P1 | 3 Phase fault on S1249 5 161.00 (646249) 161 kV Bus  a. Apply fault at the S1249 5 161.00 (646249) 161 kV Bus  b. Clear fault after 7 cycles and trip the faulted elements:  b.1. S1249 5 (646249) 161.0 kV to S1256 5 (646256) 161.0 kV Transmission Circuit #1  c. Wait 20 cycles, and then reclose the faulted elements in (b) back into the Fault  d. Leave Fault on for 7 cycles, then trip the faulted elements in (b) and clear the fault |
| GROUP2\_FAULT\_18\_P1 | P1 | 3 Phase fault on S1254 5 161.00 (646254) 161 kV Bus  a. Apply fault at the S1254 5 161.00 (646254) 161 kV Bus  b. Clear fault after 7 cycles and trip the faulted elements:  b.1. S1254 5 (646254) 161.0 kV to S1281 5 (646281) 161.0 kV Transmission Circuit #1  c. Wait 20 cycles, and then reclose the faulted elements in (b) back into the Fault  d. Leave Fault on for 7 cycles, then trip the faulted elements in (b) and clear the fault |
| GROUP2\_FAULT\_19\_P1 | P1 | 3 Phase fault on S1255 5 161.00 (646255) 161 kV Bus  a. Apply fault at the S1255 5 161.00 (646255) 161 kV Bus  b. Clear fault after 7 cycles and trip the faulted elements:  b.1. S1255 5 (646255) 161.0 kV to S1259 5 (646259) 161.0 kV Transmission Circuit #1  c. Wait 20 cycles, and then reclose the faulted elements in (b) back into the Fault  d. Leave Fault on for 7 cycles, then trip the faulted elements in (b) and clear the fault |
| GROUP2\_FAULT\_20\_P1 | P1 | 3 Phase fault on S1255 5 161.00 (646255) 161 kV Bus  a. Apply fault at the S1255 5 161.00 (646255) 161 kV Bus  b. Clear fault after 7 cycles and trip the faulted elements:  b.1. S1255 5 (646255) 161.0 kV to S1361 5 (646361) 161.0 kV Transmission Circuit #1  c. Wait 20 cycles, and then reclose the faulted elements in (b) back into the Fault  d. Leave Fault on for 7 cycles, then trip the faulted elements in (b) and clear the fault |
| GROUP2\_FAULT\_21\_P1 | P1 | 3 Phase fault on S1259 5 161.00 (646259) 161 kV Bus  a. Apply fault at the S1259 5 161.00 (646259) 161 kV Bus  b. Clear fault after 7 cycles and trip the faulted elements:  b.1. S1259 5 (646259) 161.0 kV to S1278 5 (646278) 161.0 kV Transmission Circuit #1  c. Wait 20 cycles, and then reclose the faulted elements in (b) back into the Fault  d. Leave Fault on for 7 cycles, then trip the faulted elements in (b) and clear the fault |
| GROUP2\_FAULT\_22\_P1 | P1 | 3 Phase fault on S1260 5 161.00 (646260) 161 kV Bus  a. Apply fault at the S1260 5 161.00 (646260) 161 kV Bus  b. Clear fault after 7 cycles and trip the faulted elements:  b.1. S1260 5 (646260) 161.0 kV to S1361 5 (646361) 161.0 kV Transmission Circuit #1  c. Wait 20 cycles, and then reclose the faulted elements in (b) back into the Fault  d. Leave Fault on for 7 cycles, then trip the faulted elements in (b) and clear the fault |
| GROUP2\_FAULT\_23\_P1 | P1 | 3 Phase fault on S1281 5 161.00 (646281) 161 kV Bus  a. Apply fault at the S1281 5 161.00 (646281) 161 kV Bus  b. Clear fault after 7 cycles and trip the faulted elements:  b.1. S1254 5 (646254) 161.0 kV to S1281 5 (646281) 161.0 kV Transmission Circuit #1  b.2. S1281 5 (646281) 161.0 kV to S1287 5 (646287) 161.0 kV Transmission Circuit #1  b.3. S1281 5 (646281) 161.0 kV to S1361 5 (646361) 161.0 kV Transmission Circuit #1  b.4. S1281 5 (646281) 161.0 kV to S1363 5 (646363) 161.0 kV Transmission Circuit #1  c. Wait 20 cycles, and then reclose the faulted elements in (b) back into the Fault  d. Leave Fault on for 7 cycles, then trip the faulted elements in (b) and clear the fault |
| GROUP2\_FAULT\_24\_P1 | P1 | 3 Phase fault on S1259 5 161.00 (646259) 161 kV Bus  a. Apply fault at the S1259 5 161.00 (646259) 161 kV Bus  b. Clear fault after 7 cycles and trip the faulted elements:  b.1. S1259 5 (646259) 161.0 kV to S1260 5 (646260) 161.0 kV Transmission Circuit #1  c. Wait 20 cycles, and then reclose the faulted elements in (b) back into the Fault  d. Leave Fault on for 7 cycles, then trip the faulted elements in (b) and clear the fault |
| GROUP2\_FAULT\_25\_P1 | P1 | 3 Phase fault on PLTSMTH8 69.000 (640320) 69 kV Bus  a. Apply fault at the PLTSMTH8 69.000 (640320) 69 kV Bus  b. Clear fault after 7 cycles and trip the faulted elements:  b.1. PLTSMTH8 (640320) 69.0 kV to S985 8 (647985) 69.0 kV Transmission Circuit #1  c. Wait 20 cycles, and then reclose the faulted elements in (b) back into the Fault  d. Leave Fault on for 7 cycles, then trip the faulted elements in (b) and clear the fault |
| GROUP2\_FAULT\_26\_P1 | P1 | 3 Phase fault on S914A 8 69.000 (647014) 69 kV Bus  a. Apply fault at the S914A 8 69.000 (647014) 69 kV Bus  b. Clear fault after 7 cycles and trip the faulted elements:  b.1. S914A 8 (647014) 69.0 kV to S6846 8 (647846) 69.0 kV Transmission Circuit #1  c. Wait 20 cycles, and then reclose the faulted elements in (b) back into the Fault  d. Leave Fault on for 7 cycles, then trip the faulted elements in (b) and clear the fault |
| GROUP2\_FAULT\_27\_P1 | P1 | 3 Phase fault on S914A 8 69.000 (647014) 69 kV Bus  a. Apply fault at the S914A 8 69.000 (647014) 69 kV Bus  b. Clear fault after 7 cycles and trip the faulted elements:  b.1. S914A 8 (647014) 69.0 kV to S914 8 (647914) 69.0 kV Transmission Circuit #1  c. Wait 20 cycles, and then reclose the faulted elements in (b) back into the Fault  d. Leave Fault on for 7 cycles, then trip the faulted elements in (b) and clear the fault |
| GROUP2\_FAULT\_28\_P1 | P1 | 3 Phase fault on 991TP 8 69.000 (647091) 69 kV Bus  a. Apply fault at the 991TP 8 69.000 (647091) 69 kV Bus  b. Clear fault after 7 cycles and trip the faulted elements:  b.1. 991TP 8 (647091) 69.0 kV to FREM G 8 (647427) 69.0 kV Transmission Circuit #1  b.2. 991TP 8 (647091) 69.0 kV to S984 8 (647984) 69.0 kV Transmission Circuit #1  b.3. 991TP 8 (647091) 69.0 kV to S991 8 (647991) 69.0 kV Transmission Circuit #1  c. Wait 20 cycles, and then reclose the faulted elements in (b) back into the Fault  d. Leave Fault on for 7 cycles, then trip the faulted elements in (b) and clear the fault |
| GROUP2\_FAULT\_29\_P1 | P1 | 3 Phase fault on S6846 8 69.000 (647846) 69 kV Bus  a. Apply fault at the S6846 8 69.000 (647846) 69 kV Bus  b. Clear fault after 7 cycles and trip the faulted elements:  b.1. S6846 8 (647846) 69.0 kV to S983 8 (647983) 69.0 kV Transmission Circuit #1  c. Wait 20 cycles, and then reclose the faulted elements in (b) back into the Fault  d. Leave Fault on for 7 cycles, then trip the faulted elements in (b) and clear the fault |
| GROUP2\_FAULT\_30\_P1 | P1 | 3 Phase fault on S900 8 69.000 (647900) 69 kV Bus  a. Apply fault at the S900 8 69.000 (647900) 69 kV Bus  b. Clear fault after 7 cycles and trip the faulted elements:  b.1. S900 8 (647900) 69.0 kV to S914 8 (647914) 69.0 kV Transmission Circuit #1  c. Wait 20 cycles, and then reclose the faulted elements in (b) back into the Fault  d. Leave Fault on for 7 cycles, then trip the faulted elements in (b) and clear the fault |
| GROUP2\_FAULT\_31\_P1 | P1 | 3 Phase fault on S900 8 69.000 (647900) 69 kV Bus  a. Apply fault at the S900 8 69.000 (647900) 69 kV Bus  b. Clear fault after 7 cycles and trip the faulted elements:  b.1. S900 8 (647900) 69.0 kV to S972 8 (647972) 69.0 kV Transmission Circuit #1  c. Wait 20 cycles, and then reclose the faulted elements in (b) back into the Fault  d. Leave Fault on for 7 cycles, then trip the faulted elements in (b) and clear the fault |
| GROUP2\_FAULT\_32\_P1 | P1 | 3 Phase fault on S900 8 69.000 (647900) 69 kV Bus  a. Apply fault at the S900 8 69.000 (647900) 69 kV Bus  b. Clear fault after 7 cycles and trip the faulted elements:  b.1. S900 8 (647900) 69.0 kV to S985 8 (647985) 69.0 kV Transmission Circuit #1  c. Wait 20 cycles, and then reclose the faulted elements in (b) back into the Fault  d. Leave Fault on for 7 cycles, then trip the faulted elements in (b) and clear the fault |
| GROUP2\_FAULT\_33\_P1 | P1 | 3 Phase fault on S937 8 69.000 (647937) 69 kV Bus  a. Apply fault at the S937 8 69.000 (647937) 69 kV Bus  b. Clear fault after 7 cycles and trip the faulted elements:  b.1. S902 8 (647902) 69.0 kV to S937 8 (647937) 69.0 kV Transmission Circuit #1  b.2. S909 8 (647909) 69.0 kV to S937 8 (647937) 69.0 kV Transmission Circuit #1  b.3. S937 8 (647937) 69.0 kV Generator #1  c. Wait 20 cycles, and then reclose the faulted elements in (b) back into the Fault  d. Leave Fault on for 7 cycles, then trip the faulted elements in (b) and clear the fault |
| GROUP2\_FAULT\_34\_P1 | P1 | 3 Phase fault on S902 8 69.000 (647902) 69 kV Bus  a. Apply fault at the S902 8 69.000 (647902) 69 kV Bus  b. Clear fault after 7 cycles and trip the faulted elements:  b.1. S902 8 (647902) 69.0 kV to S983 8 (647983) 69.0 kV Transmission Circuit #1  c. Wait 20 cycles, and then reclose the faulted elements in (b) back into the Fault  d. Leave Fault on for 7 cycles, then trip the faulted elements in (b) and clear the fault |
| GROUP2\_FAULT\_35\_P1 | P1 | 3 Phase fault on S902 8 69.000 (647902) 69 kV Bus  a. Apply fault at the S902 8 69.000 (647902) 69 kV Bus  b. Clear fault after 7 cycles and trip the faulted elements:  b.1. S902 8 (647902) 69.0 kV to S984 8 (647984) 69.0 kV Transmission Circuit #1  c. Wait 20 cycles, and then reclose the faulted elements in (b) back into the Fault  d. Leave Fault on for 7 cycles, then trip the faulted elements in (b) and clear the fault |
| GROUP2\_FAULT\_36\_P1 | P1 | 3 Phase fault on S904 8 69.000 (647904) 69 kV Bus  a. Apply fault at the S904 8 69.000 (647904) 69 kV Bus  b. Clear fault after 7 cycles and trip the faulted elements:  b.1. S904 8 (647904) 69.0 kV to S906 S 8 (647906) 69.0 kV Transmission Circuit #1  c. Wait 20 cycles, and then reclose the faulted elements in (b) back into the Fault  d. Leave Fault on for 7 cycles, then trip the faulted elements in (b) and clear the fault |
| GROUP2\_FAULT\_37\_P1 | P1 | 3 Phase fault on S904 8 69.000 (647904) 69 kV Bus  a. Apply fault at the S904 8 69.000 (647904) 69 kV Bus  b. Clear fault after 7 cycles and trip the faulted elements:  b.1. S904 8 (647904) 69.0 kV to S985 8 (647985) 69.0 kV Transmission Circuit #1  c. Wait 20 cycles, and then reclose the faulted elements in (b) back into the Fault  d. Leave Fault on for 7 cycles, then trip the faulted elements in (b) and clear the fault |
| GROUP2\_FAULT\_38\_P1 | P1 | 3 Phase fault on S972 8 69.000 (647972) 69 kV Bus  a. Apply fault at the S972 8 69.000 (647972) 69 kV Bus  b. Clear fault after 7 cycles and trip the faulted elements:  b.1. S972 8 (647972) 69.0 kV to S982 8 (647982) 69.0 kV Transmission Circuit #1  c. Wait 20 cycles, and then reclose the faulted elements in (b) back into the Fault  d. Leave Fault on for 7 cycles, then trip the faulted elements in (b) and clear the fault |
| GROUP2\_FAULT\_39\_P1 | P1 | 3 Phase fault on FREM F 8 69.000 (647426) 69 kV Bus  a. Apply fault at the FREM F 8 69.000 (647426) 69 kV Bus  b. Clear fault after 7 cycles and trip the faulted elements:  b.1. FREM F 8 (647426) 69.0 kV to S992 8 (647992) 69.0 kV Transmission Circuit #1  c. Wait 20 cycles, and then reclose the faulted elements in (b) back into the Fault  d. Leave Fault on for 7 cycles, then trip the faulted elements in (b) and clear the fault |
| GROUP2\_FAULT\_40\_P1 | P1 | 3 Phase fault on FREM A 8 69.000 (647421) 69 kV Bus  a. Apply fault at the FREM A 8 69.000 (647421) 69 kV Bus  b. Clear fault after 7 cycles and trip the faulted elements:  b.1. FREM A 8 (647421) 69.0 kV to FREM G 8 (647427) 69.0 kV Transmission Circuit #1  c. Wait 20 cycles, and then reclose the faulted elements in (b) back into the Fault  d. Leave Fault on for 7 cycles, then trip the faulted elements in (b) and clear the fault |
| GROUP2\_FAULT\_41\_P1 | P1 | 3 Phase fault on FREM A 8 69.000 (647421) 69 kV Bus  a. Apply fault at the FREM A 8 69.000 (647421) 69 kV Bus  b. Clear fault after 7 cycles and trip the faulted elements:  b.1. FREM A 8 (647421) 69.0 kV to FREM B 8 (647422) 69.0 kV Transmission Circuit #1  c. Wait 20 cycles, and then reclose the faulted elements in (b) back into the Fault  d. Leave Fault on for 7 cycles, then trip the faulted elements in (b) and clear the fault |
| GROUP2\_FAULT\_42\_P1 | P1 | 3 Phase fault on FREM A 8 69.000 (647421) 69 kV Bus  a. Apply fault at the FREM A 8 69.000 (647421) 69 kV Bus  b. Clear fault after 7 cycles and trip the faulted elements:  b.1. FREM A 8 (647421) 69.0 kV to FREM F 8 (647426) 69.0 kV Transmission Circuit #1  c. Wait 20 cycles, and then reclose the faulted elements in (b) back into the Fault  d. Leave Fault on for 7 cycles, then trip the faulted elements in (b) and clear the fault |
| GROUP2\_FAULT\_43\_P1 | P1 | 3 Phase fault on FREM B 8 69.000 (647422) 69 kV Bus  a. Apply fault at the FREM B 8 69.000 (647422) 69 kV Bus  b. Clear fault after 7 cycles and trip the faulted elements:  b.1. FREM B 8 (647422) 69.0 kV to FREM C 8 (647423) 69.0 kV Transmission Circuit #1  c. Wait 20 cycles, and then reclose the faulted elements in (b) back into the Fault  d. Leave Fault on for 7 cycles, then trip the faulted elements in (b) and clear the fault |
| GROUP2\_FAULT\_44\_P1 | P1 | 3 Phase fault on FREM B 8 69.000 (647422) 69 kV Bus  a. Apply fault at the FREM B 8 69.000 (647422) 69 kV Bus  b. Clear fault after 7 cycles and trip the faulted elements:  b.1. FREM B 8 (647422) 69.0 kV to FREM D 8 (647424) 69.0 kV Transmission Circuit #1  c. Wait 20 cycles, and then reclose the faulted elements in (b) back into the Fault  d. Leave Fault on for 7 cycles, then trip the faulted elements in (b) and clear the fault |
| GROUP2\_FAULT\_45\_P1 | P1 | 3 Phase fault on FREM B 8 69.000 (647422) 69 kV Bus  a. Apply fault at the FREM B 8 69.000 (647422) 69 kV Bus  b. Clear fault after 7 cycles and trip the faulted elements:  b.1. FREM B 8 (647422) 69.0 kV to FREM G 8 (647427) 69.0 kV Transmission Circuit #1  c. Wait 20 cycles, and then reclose the faulted elements in (b) back into the Fault  d. Leave Fault on for 7 cycles, then trip the faulted elements in (b) and clear the fault |
| GROUP2\_FAULT\_46\_P1 | P1 | 3 Phase fault on FREM E 8 69.000 (647425) 69 kV Bus  a. Apply fault at the FREM E 8 69.000 (647425) 69 kV Bus  b. Clear fault after 7 cycles and trip the faulted elements:  b.1. FREM E 8 (647425) 69.0 kV to FREM F 8 (647426) 69.0 kV Transmission Circuit #1  c. Wait 20 cycles, and then reclose the faulted elements in (b) back into the Fault  d. Leave Fault on for 7 cycles, then trip the faulted elements in (b) and clear the fault |
| GROUP2\_FAULT\_47\_P1 | P1 | 3 Phase fault on S1291 5 161.00 (646291) 161 kV Bus  a. Apply fault at the S1291 5 161.00 (646291) 161 kV Bus  b. Clear fault after 7 cycles and trip the faulted elements:  b.1. S991 E 8 (647291) 69.0 kV to FREM B 8 (647422) 69.0 kV Transmission Circuit #1  b.2. S991 E 8 (647291) 69.0 kV to S1291 5 (646291) 161.0 kV to S1291T29 (648291) 13.8 kV Three Winding #1 |
| GROUP2\_FAULT\_48\_P1 | P1 | 3 Phase fault on ASH GRV8 69.000 (647100) 69 kV Bus  a. Apply fault at the ASH GRV8 69.000 (647100) 69 kV Bus  b. Clear fault after 7 cycles and trip the faulted elements:  b.1. ASH GRV8 (647100) 69.0 kV to S900 8 (647900) 69.0 kV Transmission Circuit #1  c. Wait 20 cycles, and then reclose the faulted elements in (b) back into the Fault  d. Leave Fault on for 7 cycles, then trip the faulted elements in (b) and clear the fault |
| GROUP2\_FAULT\_49\_P1 | P1 | 3 Phase fault on 979TP 8 69.000 (647079) 69 kV Bus  a. Apply fault at the 979TP 8 69.000 (647079) 69 kV Bus  b. Clear fault after 7 cycles and trip the faulted elements:  b.1. 979TP 8 (647079) 69.0 kV to S900 8 (647900) 69.0 kV Transmission Circuit #1  b.2. 979TP 8 (647079) 69.0 kV to S960 8 (647960) 69.0 kV Transmission Circuit #1  b.3. 979TP 8 (647079) 69.0 kV to S979 8 (647979) 69.0 kV Transmission Circuit #1  c. Wait 20 cycles, and then reclose the faulted elements in (b) back into the Fault  d. Leave Fault on for 7 cycles, then trip the faulted elements in (b) and clear the fault |
| GROUP2\_FAULT\_50\_P1 | P1 | 3 Phase fault on S914A 8 69.000 (647014) 69 kV Bus  a. Apply fault at the S914A 8 69.000 (647014) 69 kV Bus  b. Clear fault after 7 cycles and trip the faulted elements:  b.1. S914A 8 (647014) 69.0 kV to S988 8 (647988) 69.0 kV Transmission Circuit #1  c. Wait 20 cycles, and then reclose the faulted elements in (b) back into the Fault  d. Leave Fault on for 7 cycles, then trip the faulted elements in (b) and clear the fault |
| GROUP2\_FAULT\_51\_P1 | P1 | 3 Phase fault on S3454 3 345.00 (645454) 345 kV Bus  a. Apply fault at the S3454 3 345.00 (645454) 345 kV Bus  b. Clear fault after 6 cycles and trip the faulted elements:  b.1. S1249 5 (646249) 161.0 kV to S1254 5 (646254) 161.0 kV Transmission Circuit #1  b.2. S3454 3 (645454) 345.0 kV to S1254 5 (646254) 161.0 kV to S1254T19 (648254) 13.8 kV Three Winding #1 |
| GROUP2\_FAULT\_52\_P1 | P1 | 3 Phase fault on S3455 3 345.00 (645455) 345 kV Bus  a. Apply fault at the S3455 3 345.00 (645455) 345 kV Bus  b. Clear fault after 6 cycles and trip the faulted elements:  b.1. S3455 3 (645455) 345.0 kV to S1255 5 (646255) 161.0 kV to S3455T19 (648255) 13.8 kV Three Winding #1 |
| GROUP2\_FAULT\_53\_P1 | P1 | 3 Phase fault on S3455 3 345.00 (645455) 345 kV Bus  a. Apply fault at the S3455 3 345.00 (645455) 345 kV Bus  b. Clear fault after 6 cycles and trip the faulted elements:  b.1. S3455 3 (645455) 345.0 kV to S1255 5 (646255) 161.0 kV to S3455T39 (648355) 13.8 kV Three Winding #1 |
| GROUP2\_FAULT\_54\_P1 | P1 | 3 Phase fault on S3761 3 345.00 (645761) 345 kV Bus  a. Apply fault at the S3761 3 345.00 (645761) 345 kV Bus  b. Clear fault after 6 cycles and trip the faulted elements:  b.1. S3761 3 (645761) 345.0 kV to S1361 5 (646361) 161.0 kV to S3761T19 (648261) 13.8 kV Three Winding #1 |
| GROUP2\_FAULT\_55\_P1 | P1 | 3 Phase fault on S1214 5 161.00 (646214) 161 kV Bus  a. Apply fault at the S1214 5 161.00 (646214) 161 kV Bus  b. Clear fault after 7 cycles and trip the faulted elements:  b.1. S1214 5 (646214) 161.0 kV to S914A 8 (647014) 69.0 kV to S1214T19 (648214) 13.8 kV Three Winding #1 |
| GROUP2\_FAULT\_56\_P1 | P1 | 3 Phase fault on S1260 5 161.00 (646260) 161 kV Bus  a. Apply fault at the S1260 5 161.00 (646260) 161 kV Bus  b. Clear fault after 7 cycles and trip the faulted elements:  b.1. S1260 5 (646260) 161.0 kV to S960 8 (647960) 69.0 kV to S1260T29 (648260) 7.6 kV Three Winding #1 |
| GROUP2\_FAULT\_57\_P1 | P1 | 3 Phase fault on S900 8 69.000 (647900) 69 kV Bus  a. Apply fault at the S900 8 69.000 (647900) 69 kV Bus  b. Clear fault after 7 cycles and trip the faulted elements:  b.1. S900 8 (647900) 69.0 kV Fixed Shunt Device #1  c. Wait 20 cycles, and then reclose the faulted elements in (b) back into the Fault  d. Leave Fault on for 7 cycles, then trip the faulted elements in (b) and clear the fault |
| GROUP2\_FAULT\_58\_P1 | P1 | 3 Phase fault on S1260 5 161.00 (646260) 161 kV Bus  a. Apply fault at the S1260 5 161.00 (646260) 161 kV Bus  b. Clear fault after 7 cycles and trip the faulted elements:  b.1. S1260 5 (646260) 161.0 kV to S1362 5 (646362) 161.0 kV Transmission Circuit #1  c. Wait 20 cycles, and then reclose the faulted elements in (b) back into the Fault  d. Leave Fault on for 7 cycles, then trip the faulted elements in (b) and clear the fault |
| GROUP2\_FAULT\_59\_P1 | P1 | 3 Phase fault on S1362 5 161.00 (646362) 161 kV Bus  a. Apply fault at the S1362 5 161.00 (646362) 161 kV Bus  b. Clear fault after 7 cycles and trip the faulted elements:  b.1. S1362 5 (646362) 161.0 kV to S1363 5 (646363) 161.0 kV Transmission Circuit #1  c. Wait 20 cycles, and then reclose the faulted elements in (b) back into the Fault  d. Leave Fault on for 7 cycles, then trip the faulted elements in (b) and clear the fault |
| GROUP2\_FAULT\_60\_P1 | P1 | 3 Phase fault on S1362 5 161.00 (646362) 161 kV Bus  a. Apply fault at the S1362 5 161.00 (646362) 161 kV Bus  b. Clear fault after 7 cycles and trip the faulted elements:  b.1. S1362 5 (646362) 161.0 kV to S1363 5 (646363) 161.0 kV Transmission Circuit #2  c. Wait 20 cycles, and then reclose the faulted elements in (b) back into the Fault  d. Leave Fault on for 7 cycles, then trip the faulted elements in (b) and clear the fault |
| GROUP2\_FAULT\_1\_P4 | P4 | Single Phase Fault with Stuck Breaker on S1281 5 161.00 (646281) 161 kV Bus  a. Apply Fault at the S1281 5 161.00 (646281) 161 kV Bus  b. Clear Fault after 16 cycles and trip the following elements:  b.1. S1254 5 (646254) 161.0 kV to S1281 5 (646281) 161.0 kV Transmission Circuit #1  b.2. S1281 5 (646281) 161.0 kV to S1287 5 (646287) 161.0 kV Transmission Circuit #1  b.3. S1281 5 (646281) 161.0 kV to S1361 5 (646361) 161.0 kV Transmission Circuit #1  b.4. S1281 5 (646281) 161.0 kV to S1363 5 (646363) 161.0 kV Transmission Circuit #1 |
| GROUP2\_FAULT\_2\_P4 | P4 | Single Phase Fault with Stuck Breaker on S1214 5 161.00 (646214) 161 kV Bus  a. Apply Fault at the S1214 5 161.00 (646214) 161 kV Bus  b. Clear Fault after 16 cycles and trip the following elements:  b.1. S1214 5 (646214) 161.0 kV to 70&BLUFF 5 (650169) 161.0 kV Transmission Circuit #1 |
| GROUP2\_FAULT\_3\_P4 | P4 | Single Phase Fault with Stuck Breaker on S1214 5 161.00 (646214) 161 kV Bus  a. Apply Fault at the S1214 5 161.00 (646214) 161 kV Bus  b. Clear Fault after 16 cycles and trip the following elements:  b.1. S1214 5 (646214) 161.0 kV to S914A 8 (647014) 69.0 kV to S1214T19 (648214) 13.8 kV Three Winding #1 |
| GROUP2\_FAULT\_4\_P4 | P4 | Single Phase Fault with Stuck Breaker on S1214 5 161.00 (646214) 161 kV Bus  a. Apply Fault at the S1214 5 161.00 (646214) 161 kV Bus  b. Clear Fault after 16 cycles and trip the following elements:  b.1. S1214 5 (646214) 161.0 kV to S1287 5 (646287) 161.0 kV Transmission Circuit #1 |
| GROUP2\_FAULT\_5\_P4 | P4 | Single Phase Fault with Stuck Breaker on S1254 5 161.00 (646254) 161 kV Bus  a. Apply Fault at the S1254 5 161.00 (646254) 161 kV Bus  b. Clear Fault after 16 cycles and trip the following elements:  b.1. S1254 5 (646254) 161.0 kV to S1281 5 (646281) 161.0 kV Transmission Circuit #1 |
| GROUP2\_FAULT\_6\_P4 | P4 | Single Phase Fault with Stuck Breaker on S1254 5 161.00 (646254) 161 kV Bus  a. Apply Fault at the S1254 5 161.00 (646254) 161 kV Bus  b. Clear Fault after 16 cycles and trip the following elements:  b.1. S1254 5 (646254) 161.0 kV to S1281 5 (646281) 161.0 kV Transmission Circuit #1 |
| GROUP2\_FAULT\_7\_P4 | P4 | Single Phase Fault with Stuck Breaker on S1281 5 161.00 (646281) 161 kV Bus  a. Apply Fault at the S1281 5 161.00 (646281) 161 kV Bus  b. Clear Fault after 16 cycles and trip the following elements:  b.1. S1281 5 (646281) 161.0 kV to S1287 5 (646287) 161.0 kV Transmission Circuit #1 |
| GROUP2\_FAULT\_8\_P4 | P4 | Single Phase Fault with Stuck Breaker on S1254 5 161.00 (646254) 161 kV Bus  a. Apply Fault at the S1254 5 161.00 (646254) 161 kV Bus  b. Clear Fault after 16 cycles and trip the following elements:  b.1. S3454 3 (645454) 345.0 kV to S1254 5 (646254) 161.0 kV to S1254T19 (648254) 13.8 kV Three Winding #1  b.4. S1249 5 (646249) 161.0 kV to S1254 5 (646254) 161.0 kV Transmission Circuit #1  b.5. S1254 5 (646254) 161.0 kV to S1281 5 (646281) 161.0 kV Transmission Circuit #1  b.6. S3451 3 (645451) 345.0 kV to S3454 3 (645454) 345.0 kV Transmission Circuit #1 |
| GROUP2\_FAULT\_9\_P4 | P4 | Single Phase Fault with Stuck Breaker on S1254 5 161.00 (646254) 161 kV Bus  a. Apply Fault at the S1254 5 161.00 (646254) 161 kV Bus  b. Clear Fault after 16 cycles and trip the following elements:  b.1. S3454 3 (645454) 345.0 kV to S1254 5 (646254) 161.0 kV to S1254T19 (648254) 13.8 kV Three Winding #1  b.4. S1249 5 (646249) 161.0 kV to S1254 5 (646254) 161.0 kV Transmission Circuit #1  b.5. S1254 5 (646254) 161.0 kV to S1281 5 (646281) 161.0 kV Transmission Circuit #1  b.6. S3454 3 (645454) 345.0 kV to S3455 3 (645455) 345.0 kV Transmission Circuit #1 |
| GROUP2\_FAULT\_10\_P4 | P4 | Single Phase Fault with Stuck Breaker on S1214 5 161.00 (646214) 161 kV Bus  a. Apply Fault at the S1214 5 161.00 (646214) 161 kV Bus  b. Clear Fault after 16 cycles and trip the following elements:  b.1. S1214 5 (646214) 161.0 kV to S1287 5 (646287) 161.0 kV Transmission Circuit #1  b.2. S1214 5 (646214) 161.0 kV to 70&BLUFF 5 (650169) 161.0 kV Transmission Circuit #1  b.3. S1214 5 (646214) 161.0 kV to S914A 8 (647014) 69.0 kV to S1214T19 (648214) 13.8 kV Three Winding #1 |
| GROUP2\_FAULT\_11\_P4 | P4 | Single Phase Fault with Stuck Breaker on S3454 3 345.00 (645454) 345 kV Bus  a. Apply Fault at the S3454 3 345.00 (645454) 345 kV Bus  b. Clear Fault after 16 cycles and trip the following elements:  b.1. S1249 5 (646249) 161.0 kV to S1254 5 (646254) 161.0 kV Transmission Circuit #1  b.2. S1254 5 (646254) 161.0 kV to S1281 5 (646281) 161.0 kV Transmission Circuit #1  b.3. S1254 5 (646254) 161.0 kV to S3454 3 (645454) 345.0 kV to S1254T19 (648254) 13.8 kV Three Winding #1 |
| GROUP2\_FAULT\_12\_P4 | P4 | Single Phase Fault with Stuck Breaker on S1260 5 161.00 (646260) 161 kV Bus  a. Apply Fault at the S1260 5 161.00 (646260) 161 kV Bus  b. Clear Fault after 16 cycles and trip the following elements:  b.1. S1254 5 (646254) 161.0 kV to S1281 5 (646281) 161.0 kV Transmission Circuit #1  b.2. S1281 5 (646281) 161.0 kV to S1287 5 (646287) 161.0 kV Transmission Circuit #1  b.3. S1281 5 (646281) 161.0 kV to S1361 5 (646361) 161.0 kV Transmission Circuit #1  b.4. S1281 5 (646281) 161.0 kV to S1363 5 (646363) 161.0 kV Transmission Circuit #1  b.5. S1260 5 (646260) 161.0 kV to S960 8 (647960) 69.0 kV to S1260T29 (648260) 7.6 kV Three Winding #1 |
| GROUP2\_FAULT\_13\_P4 | P4 | Single Phase Fault with Stuck Breaker on S1281 5 161.00 (646281) 161 kV Bus  a. Apply Fault at the S1281 5 161.00 (646281) 161 kV Bus  b. Clear Fault after 16 cycles and trip the following elements:  b.1. S1254 5 (646254) 161.0 kV to S1281 5 (646281) 161.0 kV Transmission Circuit #1  b.2. S1281 5 (646281) 161.0 kV to S1287 5 (646287) 161.0 kV Transmission Circuit #1  b.3. S1281 5 (646281) 161.0 kV to S1361 5 (646361) 161.0 kV Transmission Circuit #1  b.4. S1281 5 (646281) 161.0 kV to S1363 5 (646363) 161.0 kV Transmission Circuit #1  b.5. S1255 5 (646255) 161.0 kV to S1361 5 (646361) 161.0 kV Transmission Circuit #1 |
| GROUP2\_FAULT\_14\_P4 | P4 | Single Phase Fault with Stuck Breaker on S1287 5 161.00 (646287) 161 kV Bus  a. Apply Fault at the S1287 5 161.00 (646287) 161 kV Bus  b. Clear Fault after 16 cycles and trip the following elements:  b.1. S1214 5 (646214) 161.0 kV to S1287 5 (646287) 161.0 kV Transmission Circuit #1  b.2. S1281 5 (646281) 161.0 kV to S1287 5 (646287) 161.0 kV Transmission Circuit #1 |
| GROUP2\_FAULT\_15\_P4 | P4 | Single Phase Fault with Stuck Breaker on S6846 8 69.000 (647846) 69 kV Bus  a. Apply Fault at the S6846 8 69.000 (647846) 69 kV Bus  b. Clear Fault after 16 cycles and trip the following elements:  b.1. S914A 8 (647014) 69.0 kV to S6846 8 (647846) 69.0 kV Transmission Circuit #1  b.2. S6846 8 (647846) 69.0 kV to S983 8 (647983) 69.0 kV Transmission Circuit #1  b.3. S6846 8 (647846) 69.0 kV to GEN-2020-002 (906020) 69.0 kV Transmission Circuit #1 |
| GROUP2\_FAULT\_16\_P4 | P4 | Single Phase Fault with Stuck Breaker on 56&I80 7 115.00 (650261) 115 kV Bus  a. Apply Fault at the 56&I80 7 115.00 (650261) 115 kV Bus  b. Clear Fault after 16 cycles and trip the following elements:  b.1. 56&I80 7 (650261) 115.0 kV to 70&BLUFF 7 (650269) 115.0 kV Transmission Circuit #1  b.2. 19&ALVO 7 (650215) 115.0 kV to 56&I80 7 (650261) 115.0 kV Transmission Circuit #1  b.3. DAVEY 7 (640155) 115.0 kV to 70&BLUFF 7 (650269) 115.0 kV Transmission Circuit #1  b.4. 70&BLUFF 7 (650269) 115.0 kV to 84&BLUFF 7 (650275) 115.0 kV Transmission Circuit #1  b.5. 70&BLUFF 7 (650269) 115.0 kV to 70&BLUFF 5 (650169) 161.0 kV to 70&BLUFF 9 (650369) 13.8 kV Three Winding #1  b.8. 56&I80 7 (650261) 115.0 kV to 56&I80 9 (650361) 12.5 kV to 611TERTIARY (650561) 7.2 kV Three Winding #1 |
| GROUP2\_FAULT\_17\_P4 | P4 | Single Phase Fault with Stuck Breaker on S1254 5 161.00 (646254) 161 kV Bus  a. Apply Fault at the S1254 5 161.00 (646254) 161 kV Bus  b. Clear Fault after 16 cycles and trip the following elements:  b.1. S3454 3 (645454) 345.0 kV to S1254 5 (646254) 161.0 kV to S1254T19 (648254) 13.8 kV Three Winding #1  b.4. S1249 5 (646249) 161.0 kV to S1254 5 (646254) 161.0 kV Transmission Circuit #1  b.5. S1254 5 (646254) 161.0 kV to S1281 5 (646281) 161.0 kV Transmission Circuit #1  b.6. S3451 3 (645451) 345.0 kV to S3454 3 (645454) 345.0 kV Transmission Circuit #1 |
| GROUP2\_FAULT\_18\_P4 | P4 | Single Phase Fault with Stuck Breaker on S1254 5 161.00 (646254) 161 kV Bus  a. Apply Fault at the S1254 5 161.00 (646254) 161 kV Bus  b. Clear Fault after 16 cycles and trip the following elements:  b.1. S3454 3 (645454) 345.0 kV to S1254 5 (646254) 161.0 kV to S1254T19 (648254) 13.8 kV Three Winding #1  b.4. S1249 5 (646249) 161.0 kV to S1254 5 (646254) 161.0 kV Transmission Circuit #1  b.5. S1254 5 (646254) 161.0 kV to S1281 5 (646281) 161.0 kV Transmission Circuit #1  b.6. S3451 3 (645451) 345.0 kV to S3454 3 (645454) 345.0 kV Transmission Circuit #1 |
| GROUP2\_FAULT\_19\_P4 | P4 | Single Phase Fault with Stuck Breaker on S1254 5 161.00 (646254) 161 kV Bus  a. Apply Fault at the S1254 5 161.00 (646254) 161 kV Bus  b. Clear Fault after 16 cycles and trip the following elements:  b.1. S3454 3 (645454) 345.0 kV to S1254 5 (646254) 161.0 kV to S1254T19 (648254) 13.8 kV Three Winding #1  b.4. S1249 5 (646249) 161.0 kV to S1254 5 (646254) 161.0 kV Transmission Circuit #1  b.5. S1254 5 (646254) 161.0 kV to S1281 5 (646281) 161.0 kV Transmission Circuit #1  b.6. S3451 3 (645451) 345.0 kV to S3454 3 (645454) 345.0 kV Transmission Circuit #1 |
| GROUP2\_FAULT\_20\_P4 | P4 | Single Phase Fault with Stuck Breaker on S1254 5 161.00 (646254) 161 kV Bus  a. Apply Fault at the S1254 5 161.00 (646254) 161 kV Bus  b. Clear Fault after 16 cycles and trip the following elements:  b.1. S3454 3 (645454) 345.0 kV to S1254 5 (646254) 161.0 kV to S1254T19 (648254) 13.8 kV Three Winding #1  b.4. S1249 5 (646249) 161.0 kV to S1254 5 (646254) 161.0 kV Transmission Circuit #1  b.5. S1254 5 (646254) 161.0 kV to S1281 5 (646281) 161.0 kV Transmission Circuit #1  b.6. S3454 3 (645454) 345.0 kV to S3455 3 (645455) 345.0 kV Transmission Circuit #1 |
| GROUP2\_FAULT\_21\_P4 | P4 | Single Phase Fault with Stuck Breaker on S1254 5 161.00 (646254) 161 kV Bus  a. Apply Fault at the S1254 5 161.00 (646254) 161 kV Bus  b. Clear Fault after 16 cycles and trip the following elements:  b.1. S3454 3 (645454) 345.0 kV to S1254 5 (646254) 161.0 kV to S1254T19 (648254) 13.8 kV Three Winding #1  b.4. S1249 5 (646249) 161.0 kV to S1254 5 (646254) 161.0 kV Transmission Circuit #1  b.5. S1254 5 (646254) 161.0 kV to S1281 5 (646281) 161.0 kV Transmission Circuit #1  b.6. S3454 3 (645454) 345.0 kV to S3455 3 (645455) 345.0 kV Transmission Circuit #1 |
| GROUP2\_FAULT\_22\_P4 | P4 | Single Phase Fault with Stuck Breaker on S1254 5 161.00 (646254) 161 kV Bus  a. Apply Fault at the S1254 5 161.00 (646254) 161 kV Bus  b. Clear Fault after 16 cycles and trip the following elements:  b.1. S3454 3 (645454) 345.0 kV to S1254 5 (646254) 161.0 kV to S1254T19 (648254) 13.8 kV Three Winding #1  b.4. S1249 5 (646249) 161.0 kV to S1254 5 (646254) 161.0 kV Transmission Circuit #1  b.5. S1254 5 (646254) 161.0 kV to S1281 5 (646281) 161.0 kV Transmission Circuit #1  b.6. S3454 3 (645454) 345.0 kV to S3455 3 (645455) 345.0 kV Transmission Circuit #1 |
| GROUP2\_FAULT\_23\_P4 | P4 | Single Phase Fault with Stuck Breaker on S1214 5 161.00 (646214) 161 kV Bus  a. Apply Fault at the S1214 5 161.00 (646214) 161 kV Bus  b. Clear Fault after 16 cycles and trip the following elements:  b.1. S1214 5 (646214) 161.0 kV to S1287 5 (646287) 161.0 kV Transmission Circuit #1  b.2. S1214 5 (646214) 161.0 kV to 70&BLUFF 5 (650169) 161.0 kV Transmission Circuit #1  b.3. S1214 5 (646214) 161.0 kV to S914A 8 (647014) 69.0 kV to S1214T19 (648214) 13.8 kV Three Winding #1 |
| GROUP2\_FAULT\_24\_P4 | P4 | Single Phase Fault with Stuck Breaker on S1214 5 161.00 (646214) 161 kV Bus  a. Apply Fault at the S1214 5 161.00 (646214) 161 kV Bus  b. Clear Fault after 16 cycles and trip the following elements:  b.1. S1214 5 (646214) 161.0 kV to S1287 5 (646287) 161.0 kV Transmission Circuit #1  b.2. S1214 5 (646214) 161.0 kV to 70&BLUFF 5 (650169) 161.0 kV Transmission Circuit #1  b.3. S1214 5 (646214) 161.0 kV to S914A 8 (647014) 69.0 kV to S1214T19 (648214) 13.8 kV Three Winding #1 |
| GROUP2\_FAULT\_25\_P4 | P4 | Single Phase Fault with Stuck Breaker on S1214 5 161.00 (646214) 161 kV Bus  a. Apply Fault at the S1214 5 161.00 (646214) 161 kV Bus  b. Clear Fault after 16 cycles and trip the following elements:  b.1. S1214 5 (646214) 161.0 kV to S1287 5 (646287) 161.0 kV Transmission Circuit #1  b.2. S1214 5 (646214) 161.0 kV to 70&BLUFF 5 (650169) 161.0 kV Transmission Circuit #1  b.3. S1214 5 (646214) 161.0 kV to S914A 8 (647014) 69.0 kV to S1214T19 (648214) 13.8 kV Three Winding #1 |
| GROUP2\_FAULT\_26\_P4 | P4 | Single Phase Fault with Stuck Breaker on S3454 3 345.00 (645454) 345 kV Bus  a. Apply Fault at the S3454 3 345.00 (645454) 345 kV Bus  b. Clear Fault after 16 cycles and trip the following elements:  b.1. S1249 5 (646249) 161.0 kV to S1254 5 (646254) 161.0 kV Transmission Circuit #1  b.2. S1254 5 (646254) 161.0 kV to S1281 5 (646281) 161.0 kV Transmission Circuit #1  b.3. S1254 5 (646254) 161.0 kV to S3454 3 (645454) 345.0 kV to S1254T19 (648254) 13.8 kV Three Winding #1 |
| GROUP2\_FAULT\_27\_P4 | P4 | Single Phase Fault with Stuck Breaker on S3454 3 345.00 (645454) 345 kV Bus  a. Apply Fault at the S3454 3 345.00 (645454) 345 kV Bus  b. Clear Fault after 16 cycles and trip the following elements:  b.1. S1249 5 (646249) 161.0 kV to S1254 5 (646254) 161.0 kV Transmission Circuit #1  b.2. S1254 5 (646254) 161.0 kV to S1281 5 (646281) 161.0 kV Transmission Circuit #1  b.3. S1254 5 (646254) 161.0 kV to S3454 3 (645454) 345.0 kV to S1254T19 (648254) 13.8 kV Three Winding #1 |
| GROUP2\_FAULT\_28\_P4 | P4 | Single Phase Fault with Stuck Breaker on S3454 3 345.00 (645454) 345 kV Bus  a. Apply Fault at the S3454 3 345.00 (645454) 345 kV Bus  b. Clear Fault after 16 cycles and trip the following elements:  b.1. S1249 5 (646249) 161.0 kV to S1254 5 (646254) 161.0 kV Transmission Circuit #1  b.2. S1254 5 (646254) 161.0 kV to S1281 5 (646281) 161.0 kV Transmission Circuit #1  b.3. S1254 5 (646254) 161.0 kV to S3454 3 (645454) 345.0 kV to S1254T19 (648254) 13.8 kV Three Winding #1 |
| GROUP2\_FAULT\_29\_P4 | P4 | Single Phase Fault with Stuck Breaker on S1287 5 161.00 (646287) 161 kV Bus  a. Apply Fault at the S1287 5 161.00 (646287) 161 kV Bus  b. Clear Fault after 16 cycles and trip the following elements:  b.1. S1214 5 (646214) 161.0 kV to S1287 5 (646287) 161.0 kV Transmission Circuit #1  b.2. S1281 5 (646281) 161.0 kV to S1287 5 (646287) 161.0 kV Transmission Circuit #1 |
| GROUP2\_FAULT\_30\_P4 | P4 | Single Phase Fault with Stuck Breaker on S1287 5 161.00 (646287) 161 kV Bus  a. Apply Fault at the S1287 5 161.00 (646287) 161 kV Bus  b. Clear Fault after 16 cycles and trip the following elements:  b.1. S1214 5 (646214) 161.0 kV to S1287 5 (646287) 161.0 kV Transmission Circuit #1  b.2. S1281 5 (646281) 161.0 kV to S1287 5 (646287) 161.0 kV Transmission Circuit #1 |
| GROUP2\_FAULT\_31\_P4 | P4 | Single Phase Fault with Stuck Breaker on S1281 5 161.00 (646281) 161 kV Bus  a. Apply Fault at the S1281 5 161.00 (646281) 161 kV Bus  b. Clear Fault after 16 cycles and trip the following elements:  b.1. S1260 5 (646260) 161.0 kV to S1361 5 (646361) 161.0 kV Transmission Circuit #1  b.2. S1254 5 (646254) 161.0 kV to S1281 5 (646281) 161.0 kV Transmission Circuit #1  b.3. S1281 5 (646281) 161.0 kV to S1287 5 (646287) 161.0 kV Transmission Circuit #1  b.4. S1281 5 (646281) 161.0 kV to S1361 5 (646361) 161.0 kV Transmission Circuit #1  b.5. S1281 5 (646281) 161.0 kV to S1363 5 (646363) 161.0 kV Transmission Circuit #1 |
| GROUP2\_FAULT\_32\_P4 | P4 | Single Phase Fault with Stuck Breaker on S1260 5 161.00 (646260) 161 kV Bus  a. Apply Fault at the S1260 5 161.00 (646260) 161 kV Bus  b. Clear Fault after 16 cycles and trip the following elements:  b.1. S1254 5 (646254) 161.0 kV to S1281 5 (646281) 161.0 kV Transmission Circuit #1  b.2. S1281 5 (646281) 161.0 kV to S1287 5 (646287) 161.0 kV Transmission Circuit #1  b.3. S1281 5 (646281) 161.0 kV to S1361 5 (646361) 161.0 kV Transmission Circuit #1  b.4. S1281 5 (646281) 161.0 kV to S1363 5 (646363) 161.0 kV Transmission Circuit #1  b.5. S1260 5 (646260) 161.0 kV to S960 8 (647960) 69.0 kV to S1260T29 (648260) 7.6 kV Three Winding #1 |
| GROUP2\_FAULT\_33\_P4 | P4 | Single Phase Fault with Stuck Breaker on S1281 5 161.00 (646281) 161 kV Bus  a. Apply Fault at the S1281 5 161.00 (646281) 161 kV Bus  b. Clear Fault after 16 cycles and trip the following elements:  b.1. S1260 5 (646260) 161.0 kV to S1361 5 (646361) 161.0 kV Transmission Circuit #1  b.2. S1254 5 (646254) 161.0 kV to S1281 5 (646281) 161.0 kV Transmission Circuit #1  b.3. S1281 5 (646281) 161.0 kV to S1287 5 (646287) 161.0 kV Transmission Circuit #1  b.4. S1281 5 (646281) 161.0 kV to S1361 5 (646361) 161.0 kV Transmission Circuit #1  b.5. S1281 5 (646281) 161.0 kV to S1363 5 (646363) 161.0 kV Transmission Circuit #1 |
| GROUP2\_FAULT\_34\_P4 | P4 | Single Phase Fault with Stuck Breaker on S1281 5 161.00 (646281) 161 kV Bus  a. Apply Fault at the S1281 5 161.00 (646281) 161 kV Bus  b. Clear Fault after 16 cycles and trip the following elements:  b.1. S1260 5 (646260) 161.0 kV to S1361 5 (646361) 161.0 kV Transmission Circuit #1  b.2. S1254 5 (646254) 161.0 kV to S1281 5 (646281) 161.0 kV Transmission Circuit #1  b.3. S1281 5 (646281) 161.0 kV to S1287 5 (646287) 161.0 kV Transmission Circuit #1  b.4. S1281 5 (646281) 161.0 kV to S1361 5 (646361) 161.0 kV Transmission Circuit #1  b.5. S1281 5 (646281) 161.0 kV to S1363 5 (646363) 161.0 kV Transmission Circuit #1 |
| GROUP2\_FAULT\_35\_P4 | P4 | Single Phase Fault with Stuck Breaker on S1281 5 161.00 (646281) 161 kV Bus  a. Apply Fault at the S1281 5 161.00 (646281) 161 kV Bus  b. Clear Fault after 16 cycles and trip the following elements:  b.1. S1254 5 (646254) 161.0 kV to S1281 5 (646281) 161.0 kV Transmission Circuit #1  b.2. S1281 5 (646281) 161.0 kV to S1287 5 (646287) 161.0 kV Transmission Circuit #1  b.3. S1281 5 (646281) 161.0 kV to S1361 5 (646361) 161.0 kV Transmission Circuit #1  b.4. S1281 5 (646281) 161.0 kV to S1363 5 (646363) 161.0 kV Transmission Circuit #1 |
| GROUP2\_FAULT\_36\_P4 | P4 | Single Phase Fault with Stuck Breaker on S1281 5 161.00 (646281) 161 kV Bus  a. Apply Fault at the S1281 5 161.00 (646281) 161 kV Bus  b. Clear Fault after 16 cycles and trip the following elements:  b.1. S1254 5 (646254) 161.0 kV to S1281 5 (646281) 161.0 kV Transmission Circuit #1  b.2. S1281 5 (646281) 161.0 kV to S1287 5 (646287) 161.0 kV Transmission Circuit #1  b.3. S1281 5 (646281) 161.0 kV to S1361 5 (646361) 161.0 kV Transmission Circuit #1  b.4. S1281 5 (646281) 161.0 kV to S1363 5 (646363) 161.0 kV Transmission Circuit #1 |
| GROUP2\_FAULT\_37\_P4 | P4 | Single Phase Fault with Stuck Breaker on S900 8 69.000 (647900) 69 kV Bus  a. Apply Fault at the S900 8 69.000 (647900) 69 kV Bus  b. Clear Fault after 16 cycles and trip the following elements:  b.1. 979TP 8 (647079) 69.0 kV to S900 8 (647900) 69.0 kV Transmission Circuit #1  b.2. ASH GRV8 (647100) 69.0 kV to S900 8 (647900) 69.0 kV Transmission Circuit #1  b.3. S900 8 (647900) 69.0 kV to S914 8 (647914) 69.0 kV Transmission Circuit #1  b.4. S900 8 (647900) 69.0 kV to S972 8 (647972) 69.0 kV Transmission Circuit #1  b.5. S900 8 (647900) 69.0 kV to S985 8 (647985) 69.0 kV Transmission Circuit #1 |
| GROUP2\_FAULT\_38\_P4 | P4 | Single Phase Fault with Stuck Breaker on S900 8 69.000 (647900) 69 kV Bus  a. Apply Fault at the S900 8 69.000 (647900) 69 kV Bus  b. Clear Fault after 16 cycles and trip the following elements:  b.1. 979TP 8 (647079) 69.0 kV to S900 8 (647900) 69.0 kV Transmission Circuit #1  b.2. ASH GRV8 (647100) 69.0 kV to S900 8 (647900) 69.0 kV Transmission Circuit #1  b.3. S900 8 (647900) 69.0 kV to S914 8 (647914) 69.0 kV Transmission Circuit #1  b.4. S900 8 (647900) 69.0 kV to S972 8 (647972) 69.0 kV Transmission Circuit #1  b.5. S900 8 (647900) 69.0 kV to S985 8 (647985) 69.0 kV Transmission Circuit #1  b.6. 979TP 8 (647079) 69.0 kV to S960 8 (647960) 69.0 kV Transmission Circuit #1  b.7. 979TP 8 (647079) 69.0 kV to S979 8 (647979) 69.0 kV Transmission Circuit #1 |
| GROUP2\_FAULT\_39\_P4 | P4 | Single Phase Fault with Stuck Breaker on S902 8 69.000 (647902) 69 kV Bus  a. Apply Fault at the S902 8 69.000 (647902) 69 kV Bus  b. Clear Fault after 16 cycles and trip the following elements:  b.1. S902 8 (647902) 69.0 kV to S937 8 (647937) 69.0 kV Transmission Circuit #1  b.2. S902 8 (647902) 69.0 kV to S983 8 (647983) 69.0 kV Transmission Circuit #1  b.3. S902 8 (647902) 69.0 kV to S984 8 (647984) 69.0 kV Transmission Circuit #1 |
| GROUP2\_FAULT\_40\_P4 | P4 | Single Phase Fault with Stuck Breaker on S902 8 69.000 (647902) 69 kV Bus  a. Apply Fault at the S902 8 69.000 (647902) 69 kV Bus  b. Clear Fault after 16 cycles and trip the following elements:  b.1. S902 8 (647902) 69.0 kV to S937 8 (647937) 69.0 kV Transmission Circuit #1  b.2. S902 8 (647902) 69.0 kV to S983 8 (647983) 69.0 kV Transmission Circuit #1  b.3. S902 8 (647902) 69.0 kV to S984 8 (647984) 69.0 kV Transmission Circuit #1  b.4. S909 8 (647909) 69.0 kV to S937 8 (647937) 69.0 kV Transmission Circuit #1  b.5. S937 8 (647937) 69.0 kV to Generator #1 |
| GROUP2\_FAULT\_41\_P4 | P4 | Single Phase Fault with Stuck Breaker on S985 8 69.000 (647985) 69 kV Bus  a. Apply Fault at the S985 8 69.000 (647985) 69 kV Bus  b. Clear Fault after 16 cycles and trip the following elements:  b.1. S904 8 (647904) 69.0 kV to S906 S 8 (647906) 69.0 kV Transmission Circuit #1  b.2. S904 8 (647904) 69.0 kV to S985 8 (647985) 69.0 kV Transmission Circuit #1  b.3. PLTSMTH8 (640320) 69.0 kV to S985 8 (647985) 69.0 kV Transmission Circuit #1  b.4. S900 8 (647900) 69.0 kV to S985 8 (647985) 69.0 kV Transmission Circuit #1 |
| GROUP2\_FAULT\_42\_P4 | P4 | Single Phase Fault with Stuck Breaker on S909 8 69.000 (647909) 69 kV Bus  a. Apply Fault at the S909 8 69.000 (647909) 69 kV Bus  b. Clear Fault after 16 cycles and trip the following elements:  b.1. S909 8 (647909) 69.0 kV to S918 8 (647918) 69.0 kV Transmission Circuit #1  b.2. S909 8 (647909) 69.0 kV to S921 8 (647921) 69.0 kV Transmission Circuit #1  b.3. S909 8 (647909) 69.0 kV to S937 8 (647937) 69.0 kV Transmission Circuit #1  b.4. S909 8 (647909) 69.0 kV to S939 8 (647939) 69.0 kV Transmission Circuit #1  b.5. S909 8 (647909) 69.0 kV to S1209 5 (646209) 161.0 kV to S1209T19 (648209) 13.8 kV Three Winding #1  b.6. S902 8 (647902) 69.0 kV to S937 8 (647937) 69.0 kV Transmission Circuit #1  b.7. S937 8 (647937) 69.0 kV to Generator #1 |
| GROUP2\_FAULT\_43\_P4 | P4 | Single Phase Fault with Stuck Breaker on S914 8 69.000 (647914) 69 kV Bus  a. Apply Fault at the S914 8 69.000 (647914) 69 kV Bus  b. Clear Fault after 16 cycles and trip the following elements:  b.1. S914A 8 (647014) 69.0 kV to S914 8 (647914) 69.0 kV Transmission Circuit #1  b.2. S900 8 (647900) 69.0 kV to S914 8 (647914) 69.0 kV Transmission Circuit #1 |
| GROUP2\_FAULT\_44\_P4 | P4 | Single Phase Fault with Stuck Breaker on S1214 5 161.00 (646214) 161 kV Bus  a. Apply Fault at the S1214 5 161.00 (646214) 161 kV Bus  b. Clear Fault after 16 cycles and trip the following elements:  b.1. S914A 8 (647014) 69.0 kV to S988 8 (647988) 69.0 kV Transmission Circuit #1  b.2. S1214 5 (646214) 161.0 kV to S914A 8 (647014) 69.0 kV to S1214T19 (648214) 13.8 kV Three Winding #1 |
| GROUP2\_FAULT\_45\_P4 | P4 | Single Phase Fault with Stuck Breaker on S1214 5 161.00 (646214) 161 kV Bus  a. Apply Fault at the S1214 5 161.00 (646214) 161 kV Bus  b. Clear Fault after 16 cycles and trip the following elements:  b.1. S914A 8 (647014) 69.0 kV to S6846 8 (647846) 69.0 kV Transmission Circuit #1  b.2. S1214 5 (646214) 161.0 kV to S914A 8 (647014) 69.0 kV to S1214T19 (648214) 13.8 kV Three Winding #1 |
| GROUP2\_FAULT\_46\_P4 | P4 | Single Phase Fault with Stuck Breaker on S914A 8 69.000 (647014) 69 kV Bus  a. Apply Fault at the S914A 8 69.000 (647014) 69 kV Bus  b. Clear Fault after 16 cycles and trip the following elements:  b.1. S914A 8 (647014) 69.0 kV to S914 8 (647914) 69.0 kV Transmission Circuit #1  b.2. S914A 8 (647014) 69.0 kV to S6846 8 (647846) 69.0 kV Transmission Circuit #1 |
| GROUP2\_FAULT\_47\_P4 | P4 | Single Phase Fault with Stuck Breaker on S914A 8 69.000 (647014) 69 kV Bus  a. Apply Fault at the S914A 8 69.000 (647014) 69 kV Bus  b. Clear Fault after 16 cycles and trip the following elements:  b.1. S914A 8 (647014) 69.0 kV to S914 8 (647914) 69.0 kV Transmission Circuit #1  b.2. S914A 8 (647014) 69.0 kV to S988 8 (647988) 69.0 kV Transmission Circuit #1 |
| GROUP2\_FAULT\_48\_P4 | P4 | Single Phase Fault with Stuck Breaker on S972 8 69.000 (647972) 69 kV Bus  a. Apply Fault at the S972 8 69.000 (647972) 69 kV Bus  b. Clear Fault after 16 cycles and trip the following elements:  b.1. S900 8 (647900) 69.0 kV to S972 8 (647972) 69.0 kV Transmission Circuit #1  b.2. S972 8 (647972) 69.0 kV to S982 8 (647982) 69.0 kV Transmission Circuit #1 |
| GROUP2\_FAULT\_49\_P4 | P4 | Single Phase Fault with Stuck Breaker on S972 8 69.000 (647972) 69 kV Bus  a. Apply Fault at the S972 8 69.000 (647972) 69 kV Bus  b. Clear Fault after 16 cycles and trip the following elements:  b.1. S900 8 (647900) 69.0 kV to S972 8 (647972) 69.0 kV Transmission Circuit #1  b.2. S972 8 (647972) 69.0 kV to S982 8 (647982) 69.0 kV Transmission Circuit #1  b.3. 990TP 8 (647090) 69.0 kV to S982 8 (647982) 69.0 kV Transmission Circuit #1 |
| GROUP2\_FAULT\_50\_P4 | P4 | Single Phase Fault with Stuck Breaker on S983 8 69.000 (647983) 69 kV Bus  a. Apply Fault at the S983 8 69.000 (647983) 69 kV Bus  b. Clear Fault after 16 cycles and trip the following elements:  b.1. S6846 8 (647846) 69.0 kV to S983 8 (647983) 69.0 kV Transmission Circuit #1  b.2. S902 8 (647902) 69.0 kV to S983 8 (647983) 69.0 kV Transmission Circuit #1 |
| GROUP2\_FAULT\_51\_P4 | P4 | Single Phase Fault with Stuck Breaker on 991TP 8 69.000 (647091) 69 kV Bus  a. Apply Fault at the 991TP 8 69.000 (647091) 69 kV Bus  b. Clear Fault after 16 cycles and trip the following elements:  b.1. 991TP 8 (647091) 69.0 kV to S984 8 (647984) 69.0 kV Transmission Circuit #1  b.2. S902 8 (647902) 69.0 kV to S984 8 (647984) 69.0 kV Transmission Circuit #1  b.3. 991TP 8 (647091) 69.0 kV to FREM G 8 (647427) 69.0 kV Transmission Circuit #1  b.4. 991TP 8 (647091) 69.0 kV to S991 8 (647991) 69.0 kV Transmission Circuit #1 |
| GROUP2\_FAULT\_52\_P4 | P4 | Single Phase Fault with Stuck Breaker on S985 8 69.000 (647985) 69 kV Bus  a. Apply Fault at the S985 8 69.000 (647985) 69 kV Bus  b. Clear Fault after 16 cycles and trip the following elements:  b.1. PLTSMTH8 (640320) 69.0 kV to S985 8 (647985) 69.0 kV Transmission Circuit #1  b.2. S900 8 (647900) 69.0 kV to S985 8 (647985) 69.0 kV Transmission Circuit #1  b.3. S904 8 (647904) 69.0 kV to S985 8 (647985) 69.0 kV Transmission Circuit #1 |
| GROUP2\_FAULT\_53\_P4 | P4 | Single Phase Fault with Stuck Breaker on S1281 5 161.00 (646281) 161 kV Bus  a. Apply Fault at the S1281 5 161.00 (646281) 161 kV Bus  b. Clear Fault after 16 cycles and trip the following elements:  b.1. S1281 5 (646281) 161.0 kV to S1363 5 (646363) 161.0 kV Transmission Circuit #1  b.2. S1281 5 (646281) 161.0 kV to S1361 5 (646361) 161.0 kV Transmission Circuit #1 |
| GROUP2\_FAULT\_54\_P4 | P4 | Single Phase Fault with Stuck Breaker on S914A 8 69.000 (647014) 69 kV Bus  a. Apply Fault at the S914A 8 69.000 (647014) 69 kV Bus  b. Clear Fault after 16 cycles and trip the following elements:  b.1. S914A 8 (647014) 69.0 kV to S914 8 (647914) 69.0 kV Transmission Circuit #1  b.2. S914A 8 (647014) 69.0 kV to S6846 8 (647846) 69.0 kV Transmission Circuit #1 |
| GROUP2\_FAULT\_55\_P4 | P4 | Single Phase Fault with Stuck Breaker on 979TP 8 69.000 (647079) 69 kV Bus  a. Apply Fault at the 979TP 8 69.000 (647079) 69 kV Bus  b. Clear Fault after 16 cycles and trip the following elements:  b.1. 979TP 8 (647079) 69.0 kV to S960 8 (647960) 69.0 kV Transmission Circuit #1  b.2. 979TP 8 (647079) 69.0 kV to S900 8 (647900) 69.0 kV Transmission Circuit #1 |
| GROUP2\_FAULT\_56\_P4 | P4 | Single Phase Fault with Stuck Breaker on 991TP 8 69.000 (647091) 69 kV Bus  a. Apply Fault at the 991TP 8 69.000 (647091) 69 kV Bus  b. Clear Fault after 16 cycles and trip the following elements:  b.1. 991TP 8 (647091) 69.0 kV to S984 8 (647984) 69.0 kV Transmission Circuit #1  b.2. 991TP 8 (647091) 69.0 kV to FREM G 8 (647427) 69.0 kV Transmission Circuit #1 |
| GROUP2\_FAULT\_57\_P4 | P4 | Single Phase Fault with Stuck Breaker on S6846 8 69.000 (647846) 69 kV Bus  a. Apply Fault at the S6846 8 69.000 (647846) 69 kV Bus  b. Clear Fault after 16 cycles and trip the following elements:  b.1. S6846 8 (647846) 69.0 kV to S914A 8 (647014) 69.0 kV Transmission Circuit #1  b.2. S6846 8 (647846) 69.0 kV to S983 8 (647983) 69.0 kV Transmission Circuit #1 |
| GROUP2\_FAULT\_58\_P4 | P4 | Single Phase Fault with Stuck Breaker on S900 8 69.000 (647900) 69 kV Bus  a. Apply Fault at the S900 8 69.000 (647900) 69 kV Bus  b. Clear Fault after 16 cycles and trip the following elements:  b.1. S900 8 (647900) 69.0 kV to 979TP 8 (647079) 69.0 kV Transmission Circuit #1  b.2. S900 8 (647900) 69.0 kV to S914 8 (647914) 69.0 kV Transmission Circuit #1 |
| GROUP2\_FAULT\_59\_P4 | P4 | Single Phase Fault with Stuck Breaker on S902 8 69.000 (647902) 69 kV Bus  a. Apply Fault at the S902 8 69.000 (647902) 69 kV Bus  b. Clear Fault after 16 cycles and trip the following elements:  b.1. S902 8 (647902) 69.0 kV to S983 8 (647983) 69.0 kV Transmission Circuit #1  b.2. S902 8 (647902) 69.0 kV to S937 8 (647937) 69.0 kV Transmission Circuit #1 |
| GROUP2\_FAULT\_60\_P4 | P4 | Single Phase Fault with Stuck Breaker on 70&BLUFF 7 115.00 (650269) 115 kV Bus  a. Apply Fault at the 70&BLUFF 7 115.00 (650269) 115 kV Bus  b. Clear Fault after 16 cycles and trip the following elements:  b.1. 70&BLUFF 7 (650269) 115.0 kV to 84&BLUFF 7 (650275) 115.0 kV Transmission Circuit #1  b.2. 70&BLUFF 7 (650269) 115.0 kV to 56&I80 7 (650261) 115.0 kV Transmission Circuit #1 |
| GROUP2\_FAULT\_61\_P4 | P4 | Single Phase Fault with Stuck Breaker on S3761 3 345.00 (645761) 345 kV Bus  a. Apply Fault at the S3761 3 345.00 (645761) 345 kV Bus  b. Clear Fault after 16 cycles and trip the following elements:  b.1. S1361 5 (646361) 161.0 kV to S3761 3 (645761) 345.0 kV to S3761T19 (648261) 13.8 kV Three Winding #1  b.2. S1361 5 (646361) 161.0 kV to S1255 5 (646255) 161.0 kV Transmission Circuit #1 |
| GROUP2\_FAULT\_62\_P4 | P4 | Single Phase Fault with Stuck Breaker on S1363 5 161.00 (646363) 161 kV Bus  a. Apply Fault at the S1363 5 161.00 (646363) 161 kV Bus  b. Clear Fault after 16 cycles and trip the following elements:  b.1. S1363 5 (646363) 161.0 kV to S1362 5 (646362) 161.0 kV Transmission Circuit #1  b.2. S1363 5 (646363) 161.0 kV to S1362 5 (646362) 161.0 kV Transmission Circuit #2 |
| GROUP2\_FAULT\_63\_P4 | P4 | Single Phase Fault with Stuck Breaker on S914 8 69.000 (647914) 69 kV Bus  a. Apply Fault at the S914 8 69.000 (647914) 69 kV Bus  b. Clear Fault after 16 cycles and trip the following elements:  b.1. S914 8 (647914) 69.0 kV to S914A 8 (647014) 69.0 kV Transmission Circuit #1  b.2. S914 8 (647914) 69.0 kV to S900 8 (647900) 69.0 kV Transmission Circuit #1 |
| GROUP2\_FAULT\_64\_P4 | P4 | Single Phase Fault with Stuck Breaker on S984 8 69.000 (647984) 69 kV Bus  a. Apply Fault at the S984 8 69.000 (647984) 69 kV Bus  b. Clear Fault after 16 cycles and trip the following elements:  b.1. S984 8 (647984) 69.0 kV to 991TP 8 (647091) 69.0 kV Transmission Circuit #1  b.2. S984 8 (647984) 69.0 kV to S902 8 (647902) 69.0 kV Transmission Circuit #1 |
| GROUP2\_FAULT\_65\_P4 | P4 | Single Phase Fault with Stuck Breaker on S983 8 69.000 (647983) 69 kV Bus  a. Apply Fault at the S983 8 69.000 (647983) 69 kV Bus  b. Clear Fault after 16 cycles and trip the following elements:  b.1. S983 8 (647983) 69.0 kV to S6846 8 (647846) 69.0 kV Transmission Circuit #1  b.2. S983 8 (647983) 69.0 kV to S902 8 (647902) 69.0 kV Transmission Circuit #1 |
| GROUP2\_FAULT\_66\_P4 | P4 | Single Phase Fault with Stuck Breaker on S972 8 69.000 (647972) 69 kV Bus  a. Apply Fault at the S972 8 69.000 (647972) 69 kV Bus  b. Clear Fault after 16 cycles and trip the following elements:  b.1. S972 8 (647972) 69.0 kV to S900 8 (647900) 69.0 kV Transmission Circuit #1  b.2. S972 8 (647972) 69.0 kV to S982 8 (647982) 69.0 kV Transmission Circuit #1 |
| GROUP2\_FAULT\_67\_P4 | P4 | Single Phase Fault with Stuck Breaker on S985 8 69.000 (647985) 69 kV Bus  a. Apply Fault at the S985 8 69.000 (647985) 69 kV Bus  b. Clear Fault after 16 cycles and trip the following elements:  b.1. S985 8 (647985) 69.0 kV to S904 8 (647904) 69.0 kV Transmission Circuit #1  b.2. S985 8 (647985) 69.0 kV to PLTSMTH8 (640320) 69.0 kV Transmission Circuit #1 |
| GROUP2\_FAULT\_68\_P4 | P4 | Single Phase Fault with Stuck Breaker on S937 8 69.000 (647937) 69 kV Bus  a. Apply Fault at the S937 8 69.000 (647937) 69 kV Bus  b. Clear Fault after 16 cycles and trip the following elements:  b.1. S937 8 (647937) 69.0 kV to S902 8 (647902) 69.0 kV Transmission Circuit #1  b.2. S937 8 (647937) 69.0 kV to S909 8 (647909) 69.0 kV Transmission Circuit #1  b.3. S937 8 (647937) 69.0 kV to Generator #1 |
| GROUP2\_FAULT\_69\_P4 | P4 | Single Phase Fault with Stuck Breaker on 70&BLUFF 5 161.00 (650169) 161 kV Bus  a. Apply Fault at the 70&BLUFF 5 161.00 (650169) 161 kV Bus  b. Clear Fault after 16 cycles and trip the following elements:  b.1. 70&BLUFF 5 (650169) 161.0 kV to S1214 5 (646214) 161.0 kV Transmission Circuit #1  b.2. 70&BLUFF 5 (650169) 161.0 kV to 70&BLUFF 7 (650269) 115.0 kV to 70&BLUFF 9 (650369) 13.8 kV Three Winding #1 |
| GROUP2\_FAULT\_70\_P4 | P4 | Single Phase Fault with Stuck Breaker on S3455 3 345.00 (645455) 345 kV Bus  a. Apply Fault at the S3455 3 345.00 (645455) 345 kV Bus  b. Clear Fault after 16 cycles and trip the following elements:  b.1. S3455 3 (645455) 345.0 kV to S3740 3 (645740) 345.0 kV Transmission Circuit #1  b.2. S3455 3 (645455) 345.0 kV to S1255 5 (646255) 161.0 kV to S3455T39 (648355) 13.8 kV Three Winding #1 |
| GROUP2\_FAULT\_71\_P4 | P4 | Single Phase Fault with Stuck Breaker on WAGENER 3 345.00 (650185) 345 kV Bus  a. Apply Fault at the WAGENER 3 345.00 (650185) 345 kV Bus  b. Clear Fault after 16 cycles and trip the following elements:  b.1. S3454 3 (645454) 345.0 kV to WAGENER 3 (650185) 345.0 kV Transmission Circuit #1  b.2. WAGENER 3 (650185) 345.0 kV to WAGENER 7 (650285) 115.0 kV to WAGENER2 9 (650485) 13.8 kV Three Winding #2 |
| GROUP2\_FAULT\_72\_P4 | P4 | Single Phase Fault with Stuck Breaker on WAGENER 3 345.00 (650185) 345 kV Bus  a. Apply Fault at the WAGENER 3 345.00 (650185) 345 kV Bus  b. Clear Fault after 16 cycles and trip the following elements:  b.1. S3454 3 (645454) 345.0 kV to WAGENER 3 (650185) 345.0 kV Transmission Circuit #1  b.2. NW68HOLDRG3 (650114) 345.0 kV to WAGENER 3 (650185) 345.0 kV Transmission Circuit #1 |
| GROUP2\_FAULT\_73\_P4 | P4 | Single Phase Fault with Stuck Breaker on 56&I80 7 115.00 (650261) 115 kV Bus  a. Apply Fault at the 56&I80 7 115.00 (650261) 115 kV Bus  b. Clear Fault after 16 cycles and trip the following elements:  b.1. 19&ALVO 7 (650215) 115.0 kV to 27FLETCHER7 (650228) 115.0 kV Transmission Circuit #1  b.2. 19&ALVO 7 (650215) 115.0 kV to 56&I80 7 (650261) 115.0 kV Transmission Circuit #1  b.3. 27FLETCHER7 (650228) 115.0 kV to 33SUPERIOR7 (650233) 115.0 kV Transmission Circuit #1  b.4. 56&I80 7 (650261) 115.0 kV to 70&BLUFF 7 (650269) 115.0 kV Transmission Circuit #1  b.5. 27FLETCHER7 (650228) 115.0 kV to 27&FL 9 (650328) 12.5 kV to 281TERTIARY (650528) 9.2 kV Three Winding #1  b.6. 56&I80 7 (650261) 115.0 kV to 56&I80 9 (650361) 12.5 kV to 611TERTIARY (650561) 7.2 kV Three Winding #1 |
| GROUP2\_FAULT\_74\_P4 | P4 | Single Phase Fault with Stuck Breaker on 84FLETCHER7 115.00 (650284) 115 kV Bus  a. Apply Fault at the 84FLETCHER7 115.00 (650284) 115 kV Bus  b. Clear Fault after 16 cycles and trip the following elements:  b.1. 57&GARLAND7 (650262) 115.0 kV to 84LEIGHTON7 (650267) 115.0 kV Transmission Circuit #1  b.2. 84LEIGHTON7 (650267) 115.0 kV to 84FLETCHER7 (650284) 115.0 kV Transmission Circuit #1  b.3. 84&BLUFF 7 (650275) 115.0 kV to 84FLETCHER7 (650284) 115.0 kV Transmission Circuit #1  b.4. 84FLETCHER7 (650284) 115.0 kV to 84&FL 9 (650384) 13.2 kV to 841TERTIARY (650584) 7.2 kV Three Winding #1 |
| GROUP2\_FAULT\_75\_P4 | P4 | Single Phase Fault with Stuck Breaker on 84FLETCHER7 115.00 (650284) 115 kV Bus  a. Apply Fault at the 84FLETCHER7 115.00 (650284) 115 kV Bus  b. Clear Fault after 16 cycles and trip the following elements:  b.1. 84LEIGHTON7 (650267) 115.0 kV to 84FLETCHER7 (650284) 115.0 kV Transmission Circuit #1  b.2. 84LEIGHTON7 (650267) 115.0 kV to WAGENER 7 (650285) 115.0 kV Transmission Circuit #1  b.3. 84&BLUFF 7 (650275) 115.0 kV to 84FLETCHER7 (650284) 115.0 kV Transmission Circuit #1  b.4. 84FLETCHER7 (650284) 115.0 kV to 84&FL 9 (650384) 13.2 kV to 841TERTIARY (650584) 7.2 kV Three Winding #1 |
| GROUP2\_FAULT\_76\_P4 | P4 | Single Phase Fault with Stuck Breaker on 84&BLUFF 7 115.00 (650275) 115 kV Bus  a. Apply Fault at the 84&BLUFF 7 115.00 (650275) 115 kV Bus  b. Clear Fault after 16 cycles and trip the following elements:  b.1. 70&BLUFF 7 (650269) 115.0 kV to 84&BLUFF 7 (650275) 115.0 kV Transmission Circuit #1  b.2. 84&BLUFF 7 (650275) 115.0 kV to WAVERLY 7 (650283) 115.0 kV Transmission Circuit #1 |
| GROUP2\_FAULT\_77\_P4 | P4 | Single Phase Fault with Stuck Breaker on 84FLETCHER7 115.00 (650284) 115 kV Bus  a. Apply Fault at the 84FLETCHER7 115.00 (650284) 115 kV Bus  b. Clear Fault after 16 cycles and trip the following elements:  b.1. 84LEIGHTON7 (650267) 115.0 kV to 84FLETCHER7 (650284) 115.0 kV Transmission Circuit #1  b.2. 70&BLUFF 7 (650269) 115.0 kV to 84&BLUFF 7 (650275) 115.0 kV Transmission Circuit #1  b.3. 84&BLUFF 7 (650275) 115.0 kV to 84FLETCHER7 (650284) 115.0 kV Transmission Circuit #1  b.4. 84FLETCHER7 (650284) 115.0 kV to 84&FL 9 (650384) 13.2 kV to 841TERTIARY (650584) 7.2 kV Three Winding #1 |
| GROUP2\_FAULT\_78\_P4 | P4 | Single Phase Fault with Stuck Breaker on TBGS\_A 7 115.00 (650277) 115 kV Bus  a. Apply Fault at the TBGS\_A 7 115.00 (650277) 115 kV Bus  b. Clear Fault after 16 cycles and trip the following elements:  b.1. TBGS 4G (650004) 13.8 kV to TBGS LFG G (650010) 4.2 kV Two Winding #1  b.2. 84&BLUFF 7 (650275) 115.0 kV to TBGS\_A 7 (650277) 115.0 kV Transmission Circuit #1  b.3. 84&BLUFF 7 (650275) 115.0 kV to WAVERLY 7 (650283) 115.0 kV Transmission Circuit #1  b.4. TBGS\_A 7 (650277) 115.0 kV to TBGS 4G (650004) 13.8 kV Two Winding #1 |
| GROUP2\_FAULT\_79\_P4 | P4 | Single Phase Fault with Stuck Breaker on TBGS\_B 7 115.00 (650278) 115 kV Bus  a. Apply Fault at the TBGS\_B 7 115.00 (650278) 115 kV Bus  b. Clear Fault after 16 cycles and trip the following elements:  b.1. TBGS 4G (650004) 13.8 kV to TBGS LFG G (650010) 4.2 kV Two Winding #1  b.2. 84&BLUFF 7 (650275) 115.0 kV to TBGS\_A 7 (650277) 115.0 kV Transmission Circuit #1  b.3. 84&BLUFF 7 (650275) 115.0 kV to TBGS\_B 7 (650278) 115.0 kV Transmission Circuit #1  b.4. TBGS\_A 7 (650277) 115.0 kV to TBGS 4G (650004) 13.8 kV Two Winding #1  b.5. TBGS\_B 7 (650278) 115.0 kV to TBGS 1G (650001) 13.8 kV Two Winding #1  b.6. TBGS\_B 7 (650278) 115.0 kV to TBGS 2G (650002) 13.8 kV Two Winding #1  b.7. TBGS\_B 7 (650278) 115.0 kV to TBGS 3G (650003) 13.8 kV Two Winding #1 |
| GROUP2\_FAULT\_80\_P4 | P4 | Single Phase Fault with Stuck Breaker on 84FLETCHER7 115.00 (650284) 115 kV Bus  a. Apply Fault at the 84FLETCHER7 115.00 (650284) 115 kV Bus  b. Clear Fault after 16 cycles and trip the following elements:  b.1. 84LEIGHTON7 (650267) 115.0 kV to 84FLETCHER7 (650284) 115.0 kV Transmission Circuit #1  b.2. 84&BLUFF 7 (650275) 115.0 kV to TBGS\_B 7 (650278) 115.0 kV Transmission Circuit #1  b.3. 84&BLUFF 7 (650275) 115.0 kV to 84FLETCHER7 (650284) 115.0 kV Transmission Circuit #1  b.4. TBGS\_B 7 (650278) 115.0 kV to TBGS 1G (650001) 13.8 kV Two Winding #1  b.5. TBGS\_B 7 (650278) 115.0 kV to TBGS 2G (650002) 13.8 kV Two Winding #1  b.6. TBGS\_B 7 (650278) 115.0 kV to TBGS 3G (650003) 13.8 kV Two Winding #1  b.7. 84FLETCHER7 (650284) 115.0 kV to 84&FL 9 (650384) 13.2 kV to 841TERTIARY (650584) 7.2 kV Three Winding #1 |
| GROUP2\_FAULT\_81\_P4 | P4 | Single Phase Fault with Stuck Breaker on WAVERLY 7 115.00 (650283) 115 kV Bus  a. Apply Fault at the WAVERLY 7 115.00 (650283) 115 kV Bus  b. Clear Fault after 16 cycles and trip the following elements:  b.1. 84&BLUFF 7 (650275) 115.0 kV to WAVERLY 7 (650283) 115.0 kV Transmission Circuit #1  b.2. 120&ALVO 7 (650279) 115.0 kV to WAVERLY 7 (650283) 115.0 kV Transmission Circuit #1  b.3. WAVERLY 7 (650283) 115.0 kV to WAVERLY A9 (650383) 13.2 kV to 831TERTIARY (650583) 7.2 kV Three Winding #1  b.4. WAVERLY 7 (650283) 115.0 kV to WAVERLY B9 (650483) 12.5 kV to 832TERTIARY (650683) 7.2 kV Three Winding #1 |
| GROUP2\_FAULT\_82\_P4 | P4 | Single Phase Fault with Stuck Breaker on 120&ALVO 7 115.00 (650279) 115 kV Bus  a. Apply Fault at the 120&ALVO 7 115.00 (650279) 115 kV Bus  b. Clear Fault after 16 cycles and trip the following elements:  b.1. 120&ALVO 7 (650279) 115.0 kV to WAVERLY 7 (650283) 115.0 kV Transmission Circuit #1  b.2. 120&ALVO 7 (650279) 115.0 kV to WAGENER 7 (650285) 115.0 kV Transmission Circuit #1  b.3. 120&ALVO 7 (650279) 115.0 kV to 120&ALVO 9 (650379) 12.5 kV to 791TERTIARY (650579) 7.2 kV Three Winding #1 |
| GROUP2\_FAULT\_83\_P4 | P4 | Single Phase Fault with Stuck Breaker on 56&I80 7 115.00 (650261) 115 kV Bus  a. Apply Fault at the 56&I80 7 115.00 (650261) 115 kV Bus  b. Clear Fault after 16 cycles and trip the following elements:  b.1. NW56&MORTN7 (650207) 115.0 kV to NW12&ARBOR7 (650226) 115.0 kV Transmission Circuit #1  b.2. 19&ALVO 7 (650215) 115.0 kV to NW12&ARBOR7 (650226) 115.0 kV Transmission Circuit #1  b.3. 19&ALVO 7 (650215) 115.0 kV to 56&I80 7 (650261) 115.0 kV Transmission Circuit #1  b.4. 56&I80 7 (650261) 115.0 kV to 70&BLUFF 7 (650269) 115.0 kV Transmission Circuit #1  b.5. NW12&ARBOR7 (650226) 115.0 kV to NW12&AR 9 (650326) 12.5 kV to 261TERTIARY (650526) 7.2 kV Three Winding #1  b.6. 56&I80 7 (650261) 115.0 kV to 56&I80 9 (650361) 12.5 kV to 611TERTIARY (650561) 7.2 kV Three Winding #1 |
| GROUP2\_FAULT\_84\_P4 | P4 | Single Phase Fault with Stuck Breaker on S3454 3 345.00 (645454) 345 kV Bus  a. Apply Fault at the S3454 3 345.00 (645454) 345 kV Bus  b. Clear Fault after 16 cycles and trip the following elements:  b.1. S3451 3 (645451) 345.0 kV to S3454 3 (645454) 345.0 kV Transmission Circuit #1  b.2. S3454 3 (645454) 345.0 kV to WAGENER 3 (650185) 345.0 kV Transmission Circuit #1 |
| GROUP2\_FAULT\_85\_P4 | P4 | Single Phase Fault with Stuck Breaker on S3454 3 345.00 (645454) 345 kV Bus  a. Apply Fault at the S3454 3 345.00 (645454) 345 kV Bus  b. Clear Fault after 16 cycles and trip the following elements:  b.1. S3454 3 (645454) 345.0 kV to S3455 3 (645455) 345.0 kV Transmission Circuit #1  b.2. S3454 3 (645454) 345.0 kV to WAGENER 3 (650185) 345.0 kV Transmission Circuit #1 |
| GROUP2\_FAULT\_86\_P4 | P4 | Single Phase Fault with Stuck Breaker on S3455 3 345.00 (645455) 345 kV Bus  a. Apply Fault at the S3455 3 345.00 (645455) 345 kV Bus  b. Clear Fault after 16 cycles and trip the following elements:  b.1. S3455 3 (645455) 345.0 kV to S3456 3 (645456) 345.0 kV Transmission Circuit #1  b.2. S3455 3 (645455) 345.0 kV to S1255 5 (646255) 161.0 kV to S3455T19 (648255) 13.8 kV Three Winding #1 |
| GROUP2\_FAULT\_87\_P4 | P4 | Single Phase Fault with Stuck Breaker on S3455 3 345.00 (645455) 345 kV Bus  a. Apply Fault at the S3455 3 345.00 (645455) 345 kV Bus  b. Clear Fault after 16 cycles and trip the following elements:  b.1. S3455 3 (645455) 345.0 kV to S3761 3 (645761) 345.0 kV Transmission Circuit #1  b.2. S3455 3 (645455) 345.0 kV to S1255 5 (646255) 161.0 kV to S3455T39 (648355) 13.8 kV Three Winding #1 |
| GROUP2\_FAULT\_88\_P4 | P4 | Single Phase Fault with Stuck Breaker on S3456 3 345.00 (645456) 345 kV Bus  a. Apply Fault at the S3456 3 345.00 (645456) 345 kV Bus  b. Clear Fault after 16 cycles and trip the following elements:  b.1. CBLUFFS3 (635000) 345.0 kV to S3456 3 (645456) 345.0 kV Transmission Circuit #1  b.2. S3455 3 (645455) 345.0 kV to S3456 3 (645456) 345.0 kV Transmission Circuit #1 |
| GROUP2\_FAULT\_89\_P4 | P4 | Single Phase Fault with Stuck Breaker on S3740 3 345.00 (645740) 345 kV Bus  a. Apply Fault at the S3740 3 345.00 (645740) 345 kV Bus  b. Clear Fault after 16 cycles and trip the following elements:  b.1. S3455 3 (645455) 345.0 kV to S3740 3 (645740) 345.0 kV Transmission Circuit #1  b.2. S3740 3 (645740) 345.0 kV to CASS 2G (645042) 15.0 kV Two Winding #1 |
| GROUP2\_FAULT\_90\_P4 | P4 | Single Phase Fault with Stuck Breaker on S3761 3 345.00 (645761) 345 kV Bus  a. Apply Fault at the S3761 3 345.00 (645761) 345 kV Bus  b. Clear Fault after 16 cycles and trip the following elements:  b.1. S3455 3 (645455) 345.0 kV to S3761 3 (645761) 345.0 kV Transmission Circuit #1  b.2. S3761 3 (645761) 345.0 kV to S1361 5 (646361) 161.0 kV to S3761T19 (648261) 13.8 kV Three Winding #1 |
| GROUP2\_FAULT\_91\_P4 | P4 | Single Phase Fault with Stuck Breaker on S1221 5 161.00 (646221) 161 kV Bus  a. Apply Fault at the S1221 5 161.00 (646221) 161 kV Bus  b. Clear Fault after 16 cycles and trip the following elements:  b.1. S1221 5 (646221) 161.0 kV to S1255 5 (646255) 161.0 kV Transmission Circuit #1  b.2. S1221 5 (646221) 161.0 kV to S921 8 (647921) 69.0 kV to S1221T99 (648221) 13.8 kV Three Winding #1 |
| GROUP2\_FAULT\_92\_P4 | P4 | Single Phase Fault with Stuck Breaker on S1233 5 161.00 (646233) 161 kV Bus  a. Apply Fault at the S1233 5 161.00 (646233) 161 kV Bus  b. Clear Fault after 16 cycles and trip the following elements:  b.1. S1233 5 (646233) 161.0 kV to S1234 5 (646234) 161.0 kV Transmission Circuit #1  b.2. S1233 5 (646233) 161.0 kV to S1255 5 (646255) 161.0 kV Transmission Circuit #1 |
| GROUP2\_FAULT\_93\_P4 | P4 | Single Phase Fault with Stuck Breaker on S1249 5 161.00 (646249) 161 kV Bus  a. Apply Fault at the S1249 5 161.00 (646249) 161 kV Bus  b. Clear Fault after 16 cycles and trip the following elements:  b.1. S1249 5 (646249) 161.0 kV to S1254 5 (646254) 161.0 kV Transmission Circuit #1  b.2. S1249 5 (646249) 161.0 kV to S1256 5 (646256) 161.0 kV Transmission Circuit #1 |
| GROUP2\_FAULT\_94\_P4 | P4 | Single Phase Fault with Stuck Breaker on S1253 5 161.00 (646253) 161 kV Bus  a. Apply Fault at the S1253 5 161.00 (646253) 161 kV Bus  b. Clear Fault after 16 cycles and trip the following elements:  b.1. S1235 5 (646235) 161.0 kV to S1253 5 (646253) 161.0 kV Transmission Circuit #1  b.2. S1249 5 (646249) 161.0 kV to S1256 5 (646256) 161.0 kV Transmission Circuit #1  b.3. S1253 5 (646253) 161.0 kV to S1256 5 (646256) 161.0 kV Transmission Circuit #1  b.4. S1253 5 (646253) 161.0 kV to S1367 5 (646367) 161.0 kV Transmission Circuit #1 |
| GROUP2\_FAULT\_95\_P4 | P4 | Single Phase Fault with Stuck Breaker on S3455 3 345.00 (645455) 345 kV Bus  a. Apply Fault at the S3455 3 345.00 (645455) 345 kV Bus  b. Clear Fault after 16 cycles and trip the following elements:  b.1. S1221 5 (646221) 161.0 kV to S1255 5 (646255) 161.0 kV Transmission Circuit #1  b.2. S3455 3 (645455) 345.0 kV to S1255 5 (646255) 161.0 kV to S3455T19 (648255) 13.8 kV Three Winding #1 |
| GROUP2\_FAULT\_96\_P4 | P4 | Single Phase Fault with Stuck Breaker on S3455 3 345.00 (645455) 345 kV Bus  a. Apply Fault at the S3455 3 345.00 (645455) 345 kV Bus  b. Clear Fault after 16 cycles and trip the following elements:  b.1. S1255 5 (646255) 161.0 kV to S1259 5 (646259) 161.0 kV Transmission Circuit #1  b.2. S3455 3 (645455) 345.0 kV to S1255 5 (646255) 161.0 kV to S3455T39 (648355) 13.8 kV Three Winding #1 |
| GROUP2\_FAULT\_97\_P4 | P4 | Single Phase Fault with Stuck Breaker on S1259 5 161.00 (646259) 161 kV Bus  a. Apply Fault at the S1259 5 161.00 (646259) 161 kV Bus  b. Clear Fault after 16 cycles and trip the following elements:  b.1. S1255 5 (646255) 161.0 kV to S1259 5 (646259) 161.0 kV Transmission Circuit #1  b.2. S1259 5 (646259) 161.0 kV to S1260 5 (646260) 161.0 kV Transmission Circuit #1 |
| GROUP2\_FAULT\_98\_P4 | P4 | Single Phase Fault with Stuck Breaker on S1278 5 161.00 (646278) 161 kV Bus  a. Apply Fault at the S1278 5 161.00 (646278) 161 kV Bus  b. Clear Fault after 16 cycles and trip the following elements:  b.1. S1255 5 (646255) 161.0 kV to S1259 5 (646259) 161.0 kV Transmission Circuit #1  b.2. S1259 5 (646259) 161.0 kV to S1278 5 (646278) 161.0 kV Transmission Circuit #1 |
| GROUP2\_FAULT\_99\_P4 | P4 | Single Phase Fault with Stuck Breaker on S1278 5 161.00 (646278) 161 kV Bus  a. Apply Fault at the S1278 5 161.00 (646278) 161 kV Bus  b. Clear Fault after 16 cycles and trip the following elements:  b.1. S1259 5 (646259) 161.0 kV to S1260 5 (646260) 161.0 kV Transmission Circuit #1  b.2. S1259 5 (646259) 161.0 kV to S1278 5 (646278) 161.0 kV Transmission Circuit #1 |
| GROUP2\_FAULT\_100\_P4 | P4 | Single Phase Fault with Stuck Breaker on S1278 5 161.00 (646278) 161 kV Bus  a. Apply Fault at the S1278 5 161.00 (646278) 161 kV Bus  b. Clear Fault after 16 cycles and trip the following elements:  b.1. S1232 5 (646232) 161.0 kV to S1278 5 (646278) 161.0 kV Transmission Circuit #1  b.2. S1259 5 (646259) 161.0 kV to S1278 5 (646278) 161.0 kV Transmission Circuit #1 |
| GROUP2\_FAULT\_101\_P4 | P4 | Single Phase Fault with Stuck Breaker on 990TP 8 69.000 (647090) 69 kV Bus  a. Apply Fault at the 990TP 8 69.000 (647090) 69 kV Bus  b. Clear Fault after 16 cycles and trip the following elements:  b.1. 990TP 8 (647090) 69.0 kV to S971 8 (647971) 69.0 kV Transmission Circuit #1  b.2. 990TP 8 (647090) 69.0 kV to S982 8 (647982) 69.0 kV Transmission Circuit #1  b.3. 990TP 8 (647090) 69.0 kV to S990 8 (647990) 69.0 kV Transmission Circuit #1  b.4. S972 8 (647972) 69.0 kV to S982 8 (647982) 69.0 kV Transmission Circuit #1 |
| GROUP2\_FAULT\_102\_P4 | P4 | Single Phase Fault with Stuck Breaker on FREM A 8 69.000 (647421) 69 kV Bus  a. Apply Fault at the FREM A 8 69.000 (647421) 69 kV Bus  b. Clear Fault after 16 cycles and trip the following elements:  b.1. FREM A 8 (647421) 69.0 kV to FREM 6G (647416) 13.8 kV Two Winding #1  b.2. FREM A 8 (647421) 69.0 kV to FREM 7G (647417) 13.8 kV Two Winding #1  b.3. FREM A 8 (647421) 69.0 kV to FREM 8G (647418) 13.8 kV Two Winding #1  b.4. FREM A 8 (647421) 69.0 kV to FREM B 8 (647422) 69.0 kV Transmission Circuit #1  b.5. FREM A 8 (647421) 69.0 kV to FREM F 8 (647426) 69.0 kV Transmission Circuit #1  b.6. FREM A 8 (647421) 69.0 kV to FREM G 8 (647427) 69.0 kV Transmission Circuit #1  b.7. FREM A 8 (647421) 69.0 kV to FR67FAN9 (647487) 4.2 kV to FR67FNT9 (647497) 2.4 kV Three Winding #1  b.8. FREM A 8 (647421) 69.0 kV to FR8 AUX9 (647488) 4.2 kV to FR8 AXT9 (647498) 2.4 kV Three Winding #1 |
| GROUP2\_FAULT\_103\_P4 | P4 | Single Phase Fault with Stuck Breaker on FREM B 8 69.000 (647422) 69 kV Bus  a. Apply Fault at the FREM B 8 69.000 (647422) 69 kV Bus  b. Clear Fault after 16 cycles and trip the following elements:  b.1. S991 E 8 (647291) 69.0 kV to FREM B 8 (647422) 69.0 kV Transmission Circuit #1  b.2. FREM A 8 (647421) 69.0 kV to FREM B 8 (647422) 69.0 kV Transmission Circuit #1  b.3. FREM B 8 (647422) 69.0 kV to FREM C 8 (647423) 69.0 kV Transmission Circuit #1  b.4. FREM B 8 (647422) 69.0 kV to FREM D 8 (647424) 69.0 kV Transmission Circuit #1  b.5. FREM B 8 (647422) 69.0 kV to FREM G 8 (647427) 69.0 kV Transmission Circuit #1 |
| GROUP2\_FAULT\_104\_P4 | P4 | Single Phase Fault with Stuck Breaker on FREM C 8 69.000 (647423) 69 kV Bus  a. Apply Fault at the FREM C 8 69.000 (647423) 69 kV Bus  b. Clear Fault after 16 cycles and trip the following elements:  b.1. FREM B 8 (647422) 69.0 kV to FREM C 8 (647423) 69.0 kV Transmission Circuit #1  b.2. FREM C 8 (647423) 69.0 kV to FREM D 8 (647424) 69.0 kV Transmission Circuit #1 |
| GROUP2\_FAULT\_105\_P4 | P4 | Single Phase Fault with Stuck Breaker on FREM D 8 69.000 (647424) 69 kV Bus  a. Apply Fault at the FREM D 8 69.000 (647424) 69 kV Bus  b. Clear Fault after 16 cycles and trip the following elements:  b.1. FREM B 8 (647422) 69.0 kV to FREM D 8 (647424) 69.0 kV Transmission Circuit #1  b.2. FREM C 8 (647423) 69.0 kV to FREM D 8 (647424) 69.0 kV Transmission Circuit #1  b.3. FREM D 8 (647424) 69.0 kV to FREM E 8 (647425) 69.0 kV Transmission Circuit #1  b.4. FREM D 8 (647424) 69.0 kV to S976 8 (647976) 69.0 kV Transmission Circuit #1 |
| GROUP2\_FAULT\_106\_P4 | P4 | Single Phase Fault with Stuck Breaker on FREM E 8 69.000 (647425) 69 kV Bus  a. Apply Fault at the FREM E 8 69.000 (647425) 69 kV Bus  b. Clear Fault after 16 cycles and trip the following elements:  b.1. FREM D 8 (647424) 69.0 kV to FREM E 8 (647425) 69.0 kV Transmission Circuit #1  b.2. FREM E 8 (647425) 69.0 kV to FREM F 8 (647426) 69.0 kV Transmission Circuit #1 |
| GROUP2\_FAULT\_107\_P4 | P4 | Single Phase Fault with Stuck Breaker on FREM F 8 69.000 (647426) 69 kV Bus  a. Apply Fault at the FREM F 8 69.000 (647426) 69 kV Bus  b. Clear Fault after 16 cycles and trip the following elements:  b.1. FREM A 8 (647421) 69.0 kV to FREM F 8 (647426) 69.0 kV Transmission Circuit #1  b.2. FREM E 8 (647425) 69.0 kV to FREM F 8 (647426) 69.0 kV Transmission Circuit #1  b.3. FREM F 8 (647426) 69.0 kV to S992 8 (647992) 69.0 kV Transmission Circuit #1 |
| GROUP2\_FAULT\_108\_P4 | P4 | Single Phase Fault with Stuck Breaker on FREM G 8 69.000 (647427) 69 kV Bus  a. Apply Fault at the FREM G 8 69.000 (647427) 69 kV Bus  b. Clear Fault after 16 cycles and trip the following elements:  b.1. 991TP 8 (647091) 69.0 kV to FREM G 8 (647427) 69.0 kV Transmission Circuit #1  b.2. FREM A 8 (647421) 69.0 kV to FREM G 8 (647427) 69.0 kV Transmission Circuit #1  b.3. FREM B 8 (647422) 69.0 kV to FREM G 8 (647427) 69.0 kV Transmission Circuit #1  b.4. FREM G 8 (647427) 69.0 kV to FREM 1G (647411) 13.8 kV Two Winding #1 |
| GROUP2\_FAULT\_109\_P4 | P4 | Single Phase Fault with Stuck Breaker on S906 S 8 69.000 (647906) 69 kV Bus  a. Apply Fault at the S906 S 8 69.000 (647906) 69 kV Bus  b. Clear Fault after 16 cycles and trip the following elements:  b.1. 6815TP38 (647016) 69.0 kV to S906 S 8 (647906) 69.0 kV Transmission Circuit #1  b.2. S904 8 (647904) 69.0 kV to S906 S 8 (647906) 69.0 kV Transmission Circuit #1  b.3. S906 S 8 (647906) 69.0 kV to SARPY 2G (645032) 13.8 kV Two Winding #1  b.4. S906 S 8 (647906) 69.0 kV to S924 8 (647924) 69.0 kV Transmission Circuit #1  b.5. S906 S 8 (647906) 69.0 kV to S938 8 (647938) 69.0 kV Transmission Circuit #1  b.6. S1206 5 (646206) 161.0 kV to S906 S 8 (647906) 69.0 kV to S1206T19 (648206) 13.8 kV Three Winding #1  b.9. S906 S 8 (647906) 69.0 kV to Switched Shunt Device #1 |
| GROUP2\_FAULT\_110\_P4 | P4 | Single Phase Fault with Stuck Breaker on WAHOO 7 115.00 (640402) 115 kV Bus  a. Apply Fault at the WAHOO 7 115.00 (640402) 115 kV Bus  b. Clear Fault after 16 cycles and trip the following elements:  b.1. DAVEY 7 (640155) 115.0 kV to WAHOO 7 (640402) 115.0 kV Transmission Circuit #1  b.2. DAVIDCY7 (640157) 115.0 kV to WAHOO 7 (640402) 115.0 kV Transmission Circuit #1  b.3. WAHOO 29 (648402) 13.8 kV to WAHOO 7 (640402) 115.0 kV Two Winding #1  b.4. WAHOO 7 (640402) 115.0 kV to WAHOO G (640403) 34.5 kV to WAHOO T1 9 (643163) 13.8 kV Three Winding #1 |
| REGIONAL\_FAULT\_1\_P1 | P1 | 3 Phase fault on FTRANDL4 230.00 (652509) 230 kV Bus  a. Apply fault at the FTRANDL4 230.00 (652509) 230 kV Bus  b. Clear fault after 7 cycles and trip the faulted elements:  b.1. FTRANDL4 (652509) 230.0 kV to FTRANDL7 (652510) 115.0 kV Two Winding #1  b.2. FTRANDL4 (652509) 230.0 kV to FTRANDL7 (652510) 115.0 kV Two Winding #2 |
| REGIONAL\_FAULT\_2\_P1 | P1 | 3 Phase fault on FTTHOMP4 230.00 (652507) 230 kV Bus  a. Apply fault at the FTTHOMP4 230.00 (652507) 230 kV Bus  b. Clear fault after 7 cycles and trip the faulted elements:  b.1. FTTHOMP4 (652507) 230.0 kV to FTRANDL4 (652509) 230.0 kV Transmission Circuit #1  c. Wait 20 cycles, and then reclose the faulted elements in (b) back into the Fault  d. Leave Fault on for 7 cycles, then trip the faulted elements in (b) and clear the fault |
| REGIONAL\_FAULT\_3\_P1 | P1 | 3 Phase fault on RAUN 3 345.00 (635200) 345 kV Bus  a. Apply fault at the RAUN 3 345.00 (635200) 345 kV Bus  b. Clear fault after 6 cycles and trip the faulted elements:  b.1. RAUN 3 (635200) 345.0 kV Fixed Shunt Device #1  c. Wait 20 cycles, and then reclose the faulted elements in (b) back into the Fault  d. Leave Fault on for 6 cycles, then trip the faulted elements in (b) and clear the fault |
| REGIONAL\_FAULT\_4\_P1 | P1 | 3 Phase fault on CBLUFFS3 345.00 (635000) 345 kV Bus  a. Apply fault at the CBLUFFS3 345.00 (635000) 345 kV Bus  b. Clear fault after 6 cycles and trip the faulted elements:  b.1. CBLUFFS3 (635000) 345.0 kV to PNYCRK 3 (635013) 345.0 kV Transmission Circuit #1  c. Wait 20 cycles, and then reclose the faulted elements in (b) back into the Fault  d. Leave Fault on for 6 cycles, then trip the faulted elements in (b) and clear the fault |
| REGIONAL\_FAULT\_5\_P1 | P1 | 3 Phase fault on CBLUFFS3 345.00 (635000) 345 kV Bus  a. Apply fault at the CBLUFFS3 345.00 (635000) 345 kV Bus  b. Clear fault after 6 cycles and trip the faulted elements:  b.1. CBLUFFS3 (635000) 345.0 kV to OVRLND 3 (635014) 345.0 kV Transmission Circuit #1  c. Wait 20 cycles, and then reclose the faulted elements in (b) back into the Fault  d. Leave Fault on for 6 cycles, then trip the faulted elements in (b) and clear the fault |
| REGIONAL\_FAULT\_6\_P1 | P1 | 3 Phase fault on CBLUFFS3 345.00 (635000) 345 kV Bus  a. Apply fault at the CBLUFFS3 345.00 (635000) 345 kV Bus  b. Clear fault after 6 cycles and trip the faulted elements:  b.1. CBLUFFS3 (635000) 345.0 kV to STHLND 3 (635016) 345.0 kV Transmission Circuit #1  c. Wait 20 cycles, and then reclose the faulted elements in (b) back into the Fault  d. Leave Fault on for 6 cycles, then trip the faulted elements in (b) and clear the fault |
| REGIONAL\_FAULT\_7\_P1 | P1 | 3 Phase fault on CBLUFFS3 345.00 (635000) 345 kV Bus  a. Apply fault at the CBLUFFS3 345.00 (635000) 345 kV Bus  b. Clear fault after 6 cycles and trip the faulted elements:  b.1. CBLUFFS3 (635000) 345.0 kV to S3456 3 (645456) 345.0 kV Transmission Circuit #1  c. Wait 20 cycles, and then reclose the faulted elements in (b) back into the Fault  d. Leave Fault on for 6 cycles, then trip the faulted elements in (b) and clear the fault |
| REGIONAL\_FAULT\_8\_P1 | P1 | 3 Phase fault on PNYCRK 3 345.00 (635013) 345 kV Bus  a. Apply fault at the PNYCRK 3 345.00 (635013) 345 kV Bus  b. Clear fault after 6 cycles and trip the faulted elements:  b.1. PNYCRK 3 (635013) 345.0 kV to STHLND 3 (635016) 345.0 kV Transmission Circuit #1  c. Wait 20 cycles, and then reclose the faulted elements in (b) back into the Fault  d. Leave Fault on for 6 cycles, then trip the faulted elements in (b) and clear the fault |
| REGIONAL\_FAULT\_9\_P1 | P1 | 3 Phase fault on PNYCRK 3 345.00 (635013) 345 kV Bus  a. Apply fault at the PNYCRK 3 345.00 (635013) 345 kV Bus  b. Clear fault after 6 cycles and trip the faulted elements:  b.1. PNYCRK 3 (635013) 345.0 kV to STHLND 3 (635016) 345.0 kV Transmission Circuit #2  c. Wait 20 cycles, and then reclose the faulted elements in (b) back into the Fault  d. Leave Fault on for 6 cycles, then trip the faulted elements in (b) and clear the fault |
| REGIONAL\_FAULT\_10\_P1 | P1 | 3 Phase fault on PNYCRK 3 345.00 (635013) 345 kV Bus  a. Apply fault at the PNYCRK 3 345.00 (635013) 345 kV Bus  b. Clear fault after 6 cycles and trip the faulted elements:  b.1. PNYCRK 3 (635013) 345.0 kV to RLHILLS3 (635100) 345.0 kV Transmission Circuit #1  c. Wait 20 cycles, and then reclose the faulted elements in (b) back into the Fault  d. Leave Fault on for 6 cycles, then trip the faulted elements in (b) and clear the fault |
| REGIONAL\_FAULT\_11\_P1 | P1 | 3 Phase fault on OVRLND 3 345.00 (635014) 345 kV Bus  a. Apply fault at the OVRLND 3 345.00 (635014) 345 kV Bus  b. Clear fault after 6 cycles and trip the faulted elements:  b.1. OVRLND 3 (635014) 345.0 kV to FALLOW 3 (635590) 345.0 kV Transmission Circuit #1  c. Wait 20 cycles, and then reclose the faulted elements in (b) back into the Fault  d. Leave Fault on for 6 cycles, then trip the faulted elements in (b) and clear the fault |
| REGIONAL\_FAULT\_12\_P1 | P1 | 3 Phase fault on ATCHSN 3 345.00 (635017) 345 kV Bus  a. Apply fault at the ATCHSN 3 345.00 (635017) 345 kV Bus  b. Clear fault after 6 cycles and trip the faulted elements:  b.1. ATCHSN 3 (635017) 345.0 kV to COOPER 3 (640139) 345.0 kV Transmission Circuit #1  c. Wait 20 cycles, and then reclose the faulted elements in (b) back into the Fault  d. Leave Fault on for 6 cycles, then trip the faulted elements in (b) and clear the fault |
| REGIONAL\_FAULT\_13\_P1 | P1 | 3 Phase fault on RAUN 3 345.00 (635200) 345 kV Bus  a. Apply fault at the RAUN 3 345.00 (635200) 345 kV Bus  b. Clear fault after 6 cycles and trip the faulted elements:  b.1. RAUN 3 (635200) 345.0 kV to HOSKINS3 (640226) 345.0 kV Transmission Circuit #1  c. Wait 20 cycles, and then reclose the faulted elements in (b) back into the Fault  d. Leave Fault on for 6 cycles, then trip the faulted elements in (b) and clear the fault |
| REGIONAL\_FAULT\_14\_P1 | P1 | 3 Phase fault on RAUN 3 345.00 (635200) 345 kV Bus  a. Apply fault at the RAUN 3 345.00 (635200) 345 kV Bus  b. Clear fault after 6 cycles and trip the faulted elements:  b.1. RAUN 3 (635200) 345.0 kV to S3451 3 (645451) 345.0 kV Transmission Circuit #1  c. Wait 20 cycles, and then reclose the faulted elements in (b) back into the Fault  d. Leave Fault on for 6 cycles, then trip the faulted elements in (b) and clear the fault |
| REGIONAL\_FAULT\_15\_P1 | P1 | 3 Phase fault on RAUN 3 345.00 (635200) 345 kV Bus  a. Apply fault at the RAUN 3 345.00 (635200) 345 kV Bus  b. Clear fault after 6 cycles and trip the faulted elements:  b.1. RAUN 3 (635200) 345.0 kV to SIOUXCY3 (652564) 345.0 kV Transmission Circuit #1  c. Wait 20 cycles, and then reclose the faulted elements in (b) back into the Fault  d. Leave Fault on for 6 cycles, then trip the faulted elements in (b) and clear the fault |
| REGIONAL\_FAULT\_16\_P1 | P1 | 3 Phase fault on OVRLND 3 345.00 (635014) 345 kV Bus  a. Apply fault at the OVRLND 3 345.00 (635014) 345 kV Bus  b. Clear fault after 6 cycles and trip the faulted elements:  b.1. OVRLND 3 (635014) 345.0 kV to OVRLND 5 (635015) 161.0 kV Two Winding #1 |
| REGIONAL\_FAULT\_17\_P1 | P1 | 3 Phase fault on RAUN 3 345.00 (635200) 345 kV Bus  a. Apply fault at the RAUN 3 345.00 (635200) 345 kV Bus  b. Clear fault after 6 cycles and trip the faulted elements:  b.1. RAUN 3 (635200) 345.0 kV to RAUN 5 (635201) 161.0 kV Two Winding #2 |
| REGIONAL\_FAULT\_18\_P1 | P1 | 3 Phase fault on CBLUFFS3 345.00 (635000) 345 kV Bus  a. Apply fault at the CBLUFFS3 345.00 (635000) 345 kV Bus  b. Clear fault after 6 cycles and trip the faulted elements:  b.1. CBLUFFS3 (635000) 345.0 kV to CBLUFFS5 (635001) 161.0 kV to CBLF1XT9 (635025) 13.8 kV Three Winding #1 |
| REGIONAL\_FAULT\_19\_P1 | P1 | 3 Phase fault on CBLUFFS3 345.00 (635000) 345 kV Bus  a. Apply fault at the CBLUFFS3 345.00 (635000) 345 kV Bus  b. Clear fault after 6 cycles and trip the faulted elements:  b.1. CBLUFFS3 (635000) 345.0 kV to CBLUFFS5 (635001) 161.0 kV to CBLF2XT9 (635026) 13.8 kV Three Winding #2 |
| REGIONAL\_FAULT\_20\_P1 | P1 | 3 Phase fault on RAUN 3 345.00 (635200) 345 kV Bus  a. Apply fault at the RAUN 3 345.00 (635200) 345 kV Bus  b. Clear fault after 6 cycles and trip the faulted elements:  b.1. RAUN 3 (635200) 345.0 kV to RAUN 5 (635201) 161.0 kV to RAUN1XT9 (635205) 13.8 kV Three Winding #1 |
| REGIONAL\_FAULT\_21\_P1 | P1 | 3 Phase fault on FTRANDL4 230.00 (652509) 230 kV Bus  a. Apply fault at the FTRANDL4 230.00 (652509) 230 kV Bus  b. Clear fault after 7 cycles and trip the faulted elements:  b.1. FTRANDL4 (652509) 230.0 kV to SIOUXCY4 (652565) 230.0 kV Transmission Circuit #1  c. Wait 20 cycles, and then reclose the faulted elements in (b) back into the Fault  d. Leave Fault on for 7 cycles, then trip the faulted elements in (b) and clear the fault |
| REGIONAL\_FAULT\_22\_P1 | P1 | 3 Phase fault on AXTELL 3 345.00 (640065) 345 kV Bus  a. Apply fault at the AXTELL 3 345.00 (640065) 345 kV Bus  b. Clear fault after 6 cycles and trip the faulted elements:  b.1. AXTELL 7 (640066) 115.0 kV to AXTELL 3 (640065) 345.0 kV to AXTELL 9 (640067) 13.8 kV Three Winding #1 |
| REGIONAL\_FAULT\_23\_P1 | P1 | 3 Phase fault on COOPER 3 345.00 (640139) 345 kV Bus  a. Apply fault at the COOPER 3 345.00 (640139) 345 kV Bus  b. Clear fault after 6 cycles and trip the faulted elements:  b.1. COOPER 5 (640140) 161.0 kV to COOPER 3 (640139) 345.0 kV to COOPER T2 9 (640142) 13.8 kV Three Winding #1 |
| REGIONAL\_FAULT\_24\_P1 | P1 | 3 Phase fault on COOPER 3 345.00 (640139) 345 kV Bus  a. Apply fault at the COOPER 3 345.00 (640139) 345 kV Bus  b. Clear fault after 6 cycles and trip the faulted elements:  b.1. COOPER 5 (640140) 161.0 kV to COOPER 3 (640139) 345.0 kV to COOPER T5 9 (643172) 13.8 kV Three Winding #1 |
| REGIONAL\_FAULT\_25\_P1 | P1 | 3 Phase fault on GENTLMN3 345.00 (640183) 345 kV Bus  a. Apply fault at the GENTLMN3 345.00 (640183) 345 kV Bus  b. Clear fault after 6 cycles and trip the faulted elements:  b.1. GENTLMN4 (640184) 230.0 kV to GENTLMN3 (640183) 345.0 kV to G.GENT19 (640185) 13.8 kV Three Winding #1 |
| REGIONAL\_FAULT\_26\_P1 | P1 | 3 Phase fault on GENTLMN3 345.00 (640183) 345 kV Bus  a. Apply fault at the GENTLMN3 345.00 (640183) 345 kV Bus  b. Clear fault after 6 cycles and trip the faulted elements:  b.1. GENTLMN4 (640184) 230.0 kV to GENTLMN3 (640183) 345.0 kV to GENTLEMANT29 (643066) 13.8 kV Three Winding #2 |
| REGIONAL\_FAULT\_27\_P1 | P1 | 3 Phase fault on REDWILO3 345.00 (640325) 345 kV Bus  a. Apply fault at the REDWILO3 345.00 (640325) 345 kV Bus  b. Clear fault after 6 cycles and trip the faulted elements:  b.1. REDWILO7 (640326) 115.0 kV to REDWILO3 (640325) 345.0 kV to REDWILO9 (640327) 13.8 kV Three Winding #1 |
| REGIONAL\_FAULT\_28\_P1 | P1 | 3 Phase fault on 7FAIRPT 345.00 (300039) 345 kV Bus  a. Apply fault at the 7FAIRPT 345.00 (300039) 345 kV Bus  b. Clear fault after 6 cycles and trip the faulted elements:  b.1. 7FAIRPT (300039) 345.0 kV to ST JOE 7 (541199) 345.0 kV Transmission Circuit #1  b.2. 7FAIRPT (300039) 345.0 kV to COOPER 3 (640139) 345.0 kV Transmission Circuit #1  b.3. 5FAIRPTB2 (300076) 161.0 kV to 5FAIRPTXF3 (301559) 161.0 kV Transmission Circuit #1  b.4. 5FAIRPTXF3 (301559) 161.0 kV to 7FAIRPT (300039) 345.0 kV Two Winding #3 |
| REGIONAL\_FAULT\_29\_P1 | P1 | 3 Phase fault on COOPER 3 345.00 (640139) 345 kV Bus  a. Apply fault at the COOPER 3 345.00 (640139) 345 kV Bus  b. Clear fault after 6 cycles and trip the faulted elements:  b.1. COOPER 3 (640139) 345.0 kV to S3458 3 (645458) 345.0 kV Transmission Circuit #1  c. Wait 20 cycles, and then reclose the faulted elements in (b) back into the Fault  d. Leave Fault on for 6 cycles, then trip the faulted elements in (b) and clear the fault |
| REGIONAL\_FAULT\_30\_P1 | P1 | 3 Phase fault on MEADOWGROVE4230.00 (640540) 230 kV Bus  a. Apply fault at the MEADOWGROVE4230.00 (640540) 230 kV Bus  b. Clear fault after 7 cycles and trip the faulted elements:  b.1. MEADOWGROVE4 (640540) 230.0 kV to FTRANDL4 (652509) 230.0 kV Transmission Circuit #1  c. Wait 20 cycles, and then reclose the faulted elements in (b) back into the Fault  d. Leave Fault on for 7 cycles, then trip the faulted elements in (b) and clear the fault |
| REGIONAL\_FAULT\_31\_P1 | P1 | 3 Phase fault on FTRANDL4 230.00 (652509) 230 kV Bus  a. Apply fault at the FTRANDL4 230.00 (652509) 230 kV Bus  b. Clear fault after 7 cycles and trip the faulted elements:  b.1. FTRANDL4 (652509) 230.0 kV to LAKPLAT-ER4 (655475) 230.0 kV Transmission Circuit #1  c. Wait 20 cycles, and then reclose the faulted elements in (b) back into the Fault  d. Leave Fault on for 7 cycles, then trip the faulted elements in (b) and clear the fault |
| REGIONAL\_FAULT\_32\_P1 | P1 | 3 Phase fault on FTRANDL4 230.00 (652509) 230 kV Bus  a. Apply fault at the FTRANDL4 230.00 (652509) 230 kV Bus  b. Clear fault after 7 cycles and trip the faulted elements:  b.1. FTRANDL4 (652509) 230.0 kV to UTICAJC4 (652526) 230.0 kV Transmission Circuit #1  c. Wait 20 cycles, and then reclose the faulted elements in (b) back into the Fault  d. Leave Fault on for 7 cycles, then trip the faulted elements in (b) and clear the fault |
| REGIONAL\_FAULT\_33\_P1 | P1 | 3 Phase fault on MINGO 7 345.00 (531451) 345 kV Bus  a. Apply fault at the MINGO 7 345.00 (531451) 345 kV Bus  b. Clear fault after 6 cycles and trip the faulted elements:  b.1. MINGO 7 (531451) 345.0 kV to REDWILO3 (640325) 345.0 kV Transmission Circuit #1  c. Wait 20 cycles, and then reclose the faulted elements in (b) back into the Fault  d. Leave Fault on for 6 cycles, then trip the faulted elements in (b) and clear the fault |
| REGIONAL\_FAULT\_34\_P1 | P1 | 3 Phase fault on J748POI 345.00 (87487) 345 kV Bus  a. Apply fault at the J748POI 345.00 (87487) 345 kV Bus  b. Clear fault after 6 cycles and trip the faulted elements:  b.1. J748POI (87487) 345.0 kV to RAUN 3 (635200) 345.0 kV Transmission Circuit #1  c. Wait 20 cycles, and then reclose the faulted elements in (b) back into the Fault  d. Leave Fault on for 6 cycles, then trip the faulted elements in (b) and clear the fault |
| REGIONAL\_FAULT\_35\_P1 | P1 | 3 Phase fault on ST JOE 7 345.00 (541199) 345 kV Bus  a. Apply fault at the ST JOE 7 345.00 (541199) 345 kV Bus  b. Clear fault after 6 cycles and trip the faulted elements:  b.1. ST JOE 7 (541199) 345.0 kV to EASTOWN7 (541400) 345.0 kV Transmission Circuit #1  c. Wait 20 cycles, and then reclose the faulted elements in (b) back into the Fault  d. Leave Fault on for 6 cycles, then trip the faulted elements in (b) and clear the fault |
| REGIONAL\_FAULT\_36\_P1 | P1 | 3 Phase fault on ST JOE 7 345.00 (541199) 345 kV Bus  a. Apply fault at the ST JOE 7 345.00 (541199) 345 kV Bus  b. Clear fault after 6 cycles and trip the faulted elements:  b.1. ST JOE 7 (541199) 345.0 kV to COOPER 3 (640139) 345.0 kV Transmission Circuit #1  c. Wait 20 cycles, and then reclose the faulted elements in (b) back into the Fault  d. Leave Fault on for 6 cycles, then trip the faulted elements in (b) and clear the fault |
| REGIONAL\_FAULT\_37\_P1 | P1 | 3 Phase fault on ST JOE 7 345.00 (541199) 345 kV Bus  a. Apply fault at the ST JOE 7 345.00 (541199) 345 kV Bus  b. Clear fault after 6 cycles and trip the faulted elements:  b.1. ST JOE 7 (541199) 345.0 kV to G17-183-TAP (761383) 345.0 kV Transmission Circuit #1  c. Wait 20 cycles, and then reclose the faulted elements in (b) back into the Fault  d. Leave Fault on for 6 cycles, then trip the faulted elements in (b) and clear the fault |
| REGIONAL\_FAULT\_38\_P1 | P1 | 3 Phase fault on G16-050-TAP 345.00 (560082) 345 kV Bus  a. Apply fault at the G16-050-TAP 345.00 (560082) 345 kV Bus  b. Clear fault after 6 cycles and trip the faulted elements:  b.1. G16-050-TAP (560082) 345.0 kV to AXTELL 3 (640065) 345.0 kV Transmission Circuit #1  c. Wait 20 cycles, and then reclose the faulted elements in (b) back into the Fault  d. Leave Fault on for 6 cycles, then trip the faulted elements in (b) and clear the fault |
| REGIONAL\_FAULT\_39\_P1 | P1 | 3 Phase fault on RAUN 3 345.00 (635200) 345 kV Bus  a. Apply fault at the RAUN 3 345.00 (635200) 345 kV Bus  b. Clear fault after 6 cycles and trip the faulted elements:  b.1. RAUN 3 (635200) 345.0 kV to J412 POI 3 (635252) 345.0 kV Transmission Circuit #1  c. Wait 20 cycles, and then reclose the faulted elements in (b) back into the Fault  d. Leave Fault on for 6 cycles, then trip the faulted elements in (b) and clear the fault |
| REGIONAL\_FAULT\_40\_P1 | P1 | 3 Phase fault on AXTELL 3 345.00 (640065) 345 kV Bus  a. Apply fault at the AXTELL 3 345.00 (640065) 345 kV Bus  b. Clear fault after 6 cycles and trip the faulted elements:  b.1. AXTELL 3 (640065) 345.0 kV to PAULINE3 (640312) 345.0 kV Transmission Circuit #1  c. Wait 20 cycles, and then reclose the faulted elements in (b) back into the Fault  d. Leave Fault on for 6 cycles, then trip the faulted elements in (b) and clear the fault |
| REGIONAL\_FAULT\_41\_P1 | P1 | 3 Phase fault on AXTELL 3 345.00 (640065) 345 kV Bus  a. Apply fault at the AXTELL 3 345.00 (640065) 345 kV Bus  b. Clear fault after 6 cycles and trip the faulted elements:  b.1. AXTELL 3 (640065) 345.0 kV to SWEET W3 (640374) 345.0 kV Transmission Circuit #1  c. Wait 20 cycles, and then reclose the faulted elements in (b) back into the Fault  d. Leave Fault on for 6 cycles, then trip the faulted elements in (b) and clear the fault |
| REGIONAL\_FAULT\_42\_P1 | P1 | 3 Phase fault on COOPER 3 345.00 (640139) 345 kV Bus  a. Apply fault at the COOPER 3 345.00 (640139) 345 kV Bus  b. Clear fault after 6 cycles and trip the faulted elements:  b.1. COOPER 3 (640139) 345.0 kV to MONOLITH 3 (640590) 345.0 kV Transmission Circuit #1  c. Wait 20 cycles, and then reclose the faulted elements in (b) back into the Fault  d. Leave Fault on for 6 cycles, then trip the faulted elements in (b) and clear the fault |
| REGIONAL\_FAULT\_43\_P1 | P1 | 3 Phase fault on GENTLMN3 345.00 (640183) 345 kV Bus  a. Apply fault at the GENTLMN3 345.00 (640183) 345 kV Bus  b. Clear fault after 6 cycles and trip the faulted elements:  b.1. GENTLMN3 (640183) 345.0 kV to KEYSTON3 (640252) 345.0 kV Transmission Circuit #1  c. Wait 20 cycles, and then reclose the faulted elements in (b) back into the Fault  d. Leave Fault on for 6 cycles, then trip the faulted elements in (b) and clear the fault |
| REGIONAL\_FAULT\_44\_P1 | P1 | 3 Phase fault on GENTLMN3 345.00 (640183) 345 kV Bus  a. Apply fault at the GENTLMN3 345.00 (640183) 345 kV Bus  b. Clear fault after 6 cycles and trip the faulted elements:  b.1. GENTLMN3 (640183) 345.0 kV to REDWILO3 (640325) 345.0 kV Transmission Circuit #1  c. Wait 20 cycles, and then reclose the faulted elements in (b) back into the Fault  d. Leave Fault on for 6 cycles, then trip the faulted elements in (b) and clear the fault |
| REGIONAL\_FAULT\_45\_P1 | P1 | 3 Phase fault on GENTLMN3 345.00 (640183) 345 kV Bus  a. Apply fault at the GENTLMN3 345.00 (640183) 345 kV Bus  b. Clear fault after 6 cycles and trip the faulted elements:  b.1. GENTLMN3 (640183) 345.0 kV to SWEET W3 (640374) 345.0 kV Transmission Circuit #1  c. Wait 20 cycles, and then reclose the faulted elements in (b) back into the Fault  d. Leave Fault on for 6 cycles, then trip the faulted elements in (b) and clear the fault |
| REGIONAL\_FAULT\_46\_P1 | P1 | 3 Phase fault on GENTLMN3 345.00 (640183) 345 kV Bus  a. Apply fault at the GENTLMN3 345.00 (640183) 345 kV Bus  b. Clear fault after 6 cycles and trip the faulted elements:  b.1. GENTLMN3 (640183) 345.0 kV to SWEET W3 (640374) 345.0 kV Transmission Circuit #2  c. Wait 20 cycles, and then reclose the faulted elements in (b) back into the Fault  d. Leave Fault on for 6 cycles, then trip the faulted elements in (b) and clear the fault |
| REGIONAL\_FAULT\_47\_P1 | P1 | 3 Phase fault on GENTLMN3 345.00 (640183) 345 kV Bus  a. Apply fault at the GENTLMN3 345.00 (640183) 345 kV Bus  b. Clear fault after 6 cycles and trip the faulted elements:  b.1. GENTLMN3 (640183) 345.0 kV to THEDFRD3 (640500) 345.0 kV Transmission Circuit #1  c. Wait 20 cycles, and then reclose the faulted elements in (b) back into the Fault  d. Leave Fault on for 6 cycles, then trip the faulted elements in (b) and clear the fault |
| REGIONAL\_FAULT\_48\_P1 | P1 | 3 Phase fault on ST JOE 7 345.00 (541199) 345 kV Bus  a. Apply fault at the ST JOE 7 345.00 (541199) 345 kV Bus  b. Clear fault after 6 cycles and trip the faulted elements:  b.1. ST JOE 7 (541199) 345.0 kV to ST JOE 5 (541253) 161.0 kV to STJOE 1T (541370) 13.8 kV Three Winding #22 |
| REGIONAL\_FAULT\_49\_P1 | P1 | 3 Phase fault on ST JOE 7 345.00 (541199) 345 kV Bus  a. Apply fault at the ST JOE 7 345.00 (541199) 345 kV Bus  b. Clear fault after 6 cycles and trip the faulted elements:  b.1. ST JOE 7 (541199) 345.0 kV to ST JOE 5 (541253) 161.0 kV to STJOE 2T (541371) 13.8 kV Three Winding #33 |
| REGIONAL\_FAULT\_1\_P4 | P4 | Single Phase Fault with Stuck Breaker on CBLUFFS3 345.00 (635000) 345 kV Bus  a. Apply Fault at the CBLUFFS3 345.00 (635000) 345 kV Bus  b. Clear Fault after 16 cycles and trip the following elements:  b.1. CBLUFFS3 (635000) 345.0 kV to WSEC 4G (635024) 26.0 kV Two Winding #1  b.2. CBLUFFS3 (635000) 345.0 kV to OVRLND 3 (635014) 345.0 kV Transmission Circuit #1 |
| REGIONAL\_FAULT\_2\_P4 | P4 | Single Phase Fault with Stuck Breaker on CBLUFFS3 345.00 (635000) 345 kV Bus  a. Apply Fault at the CBLUFFS3 345.00 (635000) 345 kV Bus  b. Clear Fault after 16 cycles and trip the following elements:  b.1. CBLUFFS3 (635000) 345.0 kV to WSEC 3G (635023) 24.0 kV Two Winding #1  b.2. CBLUFFS3 (635000) 345.0 kV to PNYCRK 3 (635013) 345.0 kV Transmission Circuit #1 |
| REGIONAL\_FAULT\_3\_P4 | P4 | Single Phase Fault with Stuck Breaker on CBLUFFS3 345.00 (635000) 345 kV Bus  a. Apply Fault at the CBLUFFS3 345.00 (635000) 345 kV Bus  b. Clear Fault after 16 cycles and trip the following elements:  b.1. CBLUFFS3 (635000) 345.0 kV to STHLND 3 (635016) 345.0 kV Transmission Circuit #1  b.2. CBLUFFS3 (635000) 345.0 kV to CBLUFFS5 (635001) 161.0 kV to CBLF1XT9 (635025) 13.8 kV Three Winding #1 |
| REGIONAL\_FAULT\_4\_P4 | P4 | Single Phase Fault with Stuck Breaker on RLHILLS3 345.00 (635100) 345 kV Bus  a. Apply Fault at the RLHILLS3 345.00 (635100) 345 kV Bus  b. Clear Fault after 16 cycles and trip the following elements:  b.1. PNYCRK 3 (635013) 345.0 kV to RLHILLS3 (635100) 345.0 kV Transmission Circuit #1  b.2. RLHILLS3 (635100) 345.0 kV to RLHILLS B1 9 (635101) 34.5 kV Two Winding #1 |
| REGIONAL\_FAULT\_5\_P4 | P4 | Single Phase Fault with Stuck Breaker on RLHILLS3 345.00 (635100) 345 kV Bus  a. Apply Fault at the RLHILLS3 345.00 (635100) 345 kV Bus  b. Clear Fault after 16 cycles and trip the following elements:  b.1. PNYCRK 3 (635013) 345.0 kV to RLHILLS3 (635100) 345.0 kV Transmission Circuit #1  b.2. RLHILLS3 (635100) 345.0 kV to RLHILLS B3 9 (635105) 34.5 kV Two Winding #1 |
| REGIONAL\_FAULT\_6\_P4 | P4 | Single Phase Fault with Stuck Breaker on ATCHSN 3 345.00 (635017) 345 kV Bus  a. Apply Fault at the ATCHSN 3 345.00 (635017) 345 kV Bus  b. Clear Fault after 16 cycles and trip the following elements:  b.1. ATCHSN 3 (635017) 345.0 kV to COOPER 3 (640139) 345.0 kV Transmission Circuit #1  b.2. ATCHSN 3 (635017) 345.0 kV to FRMRCTY B1 9 (635019) 34.5 kV Two Winding #1 |
| REGIONAL\_FAULT\_7\_P4 | P4 | Single Phase Fault with Stuck Breaker on OVRLND 3 345.00 (635014) 345 kV Bus  a. Apply Fault at the OVRLND 3 345.00 (635014) 345 kV Bus  b. Clear Fault after 16 cycles and trip the following elements:  b.1. OVRLND 3 (635014) 345.0 kV to FALLOW 3 (635590) 345.0 kV Transmission Circuit #1  b.2. OVRLND 3 (635014) 345.0 kV to OVRLND 5 (635015) 161.0 kV Two Winding #1 |
| REGIONAL\_FAULT\_8\_P4 | P4 | Single Phase Fault with Stuck Breaker on OVRLND 3 345.00 (635014) 345 kV Bus  a. Apply Fault at the OVRLND 3 345.00 (635014) 345 kV Bus  b. Clear Fault after 16 cycles and trip the following elements:  b.1. OVRLND 3 (635014) 345.0 kV to FALLOW 3 (635590) 345.0 kV Transmission Circuit #1  b.2. CBLUFFS3 (635000) 345.0 kV to OVRLND 3 (635014) 345.0 kV Transmission Circuit #1 |
| REGIONAL\_FAULT\_9\_P4 | P4 | Single Phase Fault with Stuck Breaker on OVRLND 3 345.00 (635014) 345 kV Bus  a. Apply Fault at the OVRLND 3 345.00 (635014) 345 kV Bus  b. Clear Fault after 16 cycles and trip the following elements:  b.1. CBLUFFS3 (635000) 345.0 kV to OVRLND 3 (635014) 345.0 kV Transmission Circuit #1  b.2. OVRLND 3 (635014) 345.0 kV to OVRLND 5 (635015) 161.0 kV Two Winding #1 |
| REGIONAL\_FAULT\_10\_P4 | P4 | Single Phase Fault with Stuck Breaker on CBLUFFS3 345.00 (635000) 345 kV Bus  a. Apply Fault at the CBLUFFS3 345.00 (635000) 345 kV Bus  b. Clear Fault after 16 cycles and trip the following elements:  b.1. CBLUFFS5 (635001) 161.0 kV to INDNCRK5 (635011) 161.0 kV Transmission Circuit #1  b.2. CBLUFFS3 (635000) 345.0 kV to CBLUFFS5 (635001) 161.0 kV to CBLF1XT9 (635025) 13.8 kV Three Winding #1 |
| REGIONAL\_FAULT\_11\_P4 | P4 | Single Phase Fault with Stuck Breaker on OVRLND 3 345.00 (635014) 345 kV Bus  a. Apply Fault at the OVRLND 3 345.00 (635014) 345 kV Bus  b. Clear Fault after 16 cycles and trip the following elements:  b.1. OVRLND 3 (635014) 345.0 kV to OVRLND 5 (635015) 161.0 kV Two Winding #1  b.2. QUICK 5 (635012) 161.0 kV to OVRLND 5 (635015) 161.0 kV Transmission Circuit #1 |
| REGIONAL\_FAULT\_12\_P4 | P4 | Single Phase Fault with Stuck Breaker on OVRLND 3 345.00 (635014) 345 kV Bus  a. Apply Fault at the OVRLND 3 345.00 (635014) 345 kV Bus  b. Clear Fault after 16 cycles and trip the following elements:  b.1. OVRLND 3 (635014) 345.0 kV to OVRLND 5 (635015) 161.0 kV Two Winding #1  b.2. CBLUFFS5 (635001) 161.0 kV to OVRLND 5 (635015) 161.0 kV Transmission Circuit #1 |
| REGIONAL\_FAULT\_13\_P4 | P4 | Single Phase Fault with Stuck Breaker on FALLOW 3 345.00 (635590) 345 kV Bus  a. Apply Fault at the FALLOW 3 345.00 (635590) 345 kV Bus  b. Clear Fault after 16 cycles and trip the following elements:  b.1. OVRLND 3 (635014) 345.0 kV to FALLOW 3 (635590) 345.0 kV Transmission Circuit #1  b.2. FALLOW 3 (635590) 345.0 kV to MRNLGHT B1 9 (635595) 34.5 kV Two Winding #1 |
| REGIONAL\_FAULT\_14\_P4 | P4 | Single Phase Fault with Stuck Breaker on RAUN 3 345.00 (635200) 345 kV Bus  a. Apply Fault at the RAUN 3 345.00 (635200) 345 kV Bus  b. Clear Fault after 16 cycles and trip the following elements:  b.1. RAUN 3 (635200) 345.0 kV to NEAL 3G (635213) 22.0 kV Two Winding #1  b.2. RAUN 3 (635200) 345.0 kV to RAUN 5 (635201) 161.0 kV Two Winding #2 |
| REGIONAL\_FAULT\_15\_P4 | P4 | Single Phase Fault with Stuck Breaker on RAUN 3 345.00 (635200) 345 kV Bus  a. Apply Fault at the RAUN 3 345.00 (635200) 345 kV Bus  b. Clear Fault after 16 cycles and trip the following elements:  b.1. RAUN 3 (635200) 345.0 kV to NEAL 4G (635214) 24.0 kV Two Winding #1  b.2. RAUN 3 (635200) 345.0 kV to RAUN 5 (635201) 161.0 kV to RAUN1XT9 (635205) 13.8 kV Three Winding #1 |
| REGIONAL\_FAULT\_16\_P4 | P4 | Single Phase Fault with Stuck Breaker on RAUN 3 345.00 (635200) 345 kV Bus  a. Apply Fault at the RAUN 3 345.00 (635200) 345 kV Bus  b. Clear Fault after 16 cycles and trip the following elements:  b.1. RAUN 3 (635200) 345.0 kV to S3451 3 (645451) 345.0 kV Transmission Circuit #1  b.2. RAUN 3 (635200) 345.0 kV to HOSKINS3 (640226) 345.0 kV Transmission Circuit #1 |
| REGIONAL\_FAULT\_17\_P4 | P4 | Single Phase Fault with Stuck Breaker on RAUN 3 345.00 (635200) 345 kV Bus  a. Apply Fault at the RAUN 3 345.00 (635200) 345 kV Bus  b. Clear Fault after 16 cycles and trip the following elements:  b.1. RAUN 5 (635201) 161.0 kV to INTCHG 5 (635220) 161.0 kV Transmission Circuit #1  b.2. RAUN 3 (635200) 345.0 kV to RAUN 5 (635201) 161.0 kV Two Winding #2 |
| REGIONAL\_FAULT\_18\_P4 | P4 | Single Phase Fault with Stuck Breaker on RAUN 3 345.00 (635200) 345 kV Bus  a. Apply Fault at the RAUN 3 345.00 (635200) 345 kV Bus  b. Clear Fault after 16 cycles and trip the following elements:  b.1. RAUN 5 (635201) 161.0 kV to NEAL S 5 (635202) 161.0 kV Transmission Circuit #1  b.2. RAUN 3 (635200) 345.0 kV to RAUN 5 (635201) 161.0 kV to RAUN1XT9 (635205) 13.8 kV Three Winding #1 |
| REGIONAL\_FAULT\_19\_P4 | P4 | Single Phase Fault with Stuck Breaker on SIOUXCY3 345.00 (652564) 345 kV Bus  a. Apply Fault at the SIOUXCY3 345.00 (652564) 345 kV Bus  b. Clear Fault after 16 cycles and trip the following elements:  b.1. RAUN 3 (635200) 345.0 kV to SIOUXCY3 (652564) 345.0 kV Transmission Circuit #1  b.2. SIOUXCY3 (652564) 345.0 kV to SIOUXCY-LNX3 (652864) 345.0 kV Transmission Circuit #z  b.3. SIOUXCY3 (652564) 345.0 kV to SIOUXCY2 (652552) 230.0 kV to SIOUXC19 (652304) 13.8 kV Three Winding #1  b.4. SIOUXCY3 (652564) 345.0 kV to SIOUXCY2 (652552) 230.0 kV to SIOUXC29 (652305) 13.8 kV Three Winding #1 |
| REGIONAL\_FAULT\_20\_P4 | P4 | Single Phase Fault with Stuck Breaker on SIOUXCY3 345.00 (652564) 345 kV Bus  a. Apply Fault at the SIOUXCY3 345.00 (652564) 345 kV Bus  b. Clear Fault after 16 cycles and trip the following elements:  b.1. RAUN 3 (635200) 345.0 kV to SIOUXCY3 (652564) 345.0 kV Transmission Circuit #1  b.2. SIOUXCY3 (652564) 345.0 kV to SIOUXCY-LNX3 (652864) 345.0 kV Transmission Circuit #z  b.3. SIOUXCY3 (652564) 345.0 kV to SIOUXCY2 (652552) 230.0 kV to SIOUXC19 (652304) 13.8 kV Three Winding #1  b.4. SIOUXCY3 (652564) 345.0 kV to SIOUXCY2 (652552) 230.0 kV to SIOUXC29 (652305) 13.8 kV Three Winding #1  b.5. SPLT RK3 (601006) 345.0 kV to SIOUXCY-LNX3 (652864) 345.0 kV Transmission Circuit #1 |
| REGIONAL\_FAULT\_21\_P4 | P4 | Single Phase Fault with Stuck Breaker on SIOUXCY4 230.00 (652565) 230 kV Bus  a. Apply Fault at the SIOUXCY4 230.00 (652565) 230 kV Bus  b. Clear Fault after 16 cycles and trip the following elements:  b.1. TWIN CH4 (640386) 230.0 kV to SIOUXCY4 (652565) 230.0 kV Transmission Circuit #1  b.2. FTRANDL4 (652509) 230.0 kV to SIOUXCY4 (652565) 230.0 kV Transmission Circuit #1  b.3. SIOUXCY2 (652552) 230.0 kV to SIOUXCY4 (652565) 230.0 kV Transmission Circuit #z1  b.4. SIOUXCY2 (652552) 230.0 kV to SIOUXCY4 (652565) 230.0 kV Transmission Circuit #z2  b.5. SIOUXCY4 (652565) 230.0 kV to DENISON4 (652567) 230.0 kV Transmission Circuit #1  b.6. SIOUXCY4 (652565) 230.0 kV to RASMUSN-ER4 (655484) 230.0 kV Transmission Circuit #1  b.7. SIOUXCY4 (652565) 230.0 kV to SIOUXCY5 (652566) 161.0 kV to SIOUXC39 (652308) 13.8 kV Three Winding #1  b.8. SIOUXCY4 (652565) 230.0 kV to SIOUXCY5 (652566) 161.0 kV to SIOUXC49 (652310) 13.8 kV Three Winding #1 |
| REGIONAL\_FAULT\_22\_P4 | P4 | Single Phase Fault with Stuck Breaker on EASTOWN7 345.00 (541400) 345 kV Bus  a. Apply Fault at the EASTOWN7 345.00 (541400) 345 kV Bus  b. Clear Fault after 16 cycles and trip the following elements:  b.1. ST JOE 7 (541199) 345.0 kV to EASTOWN7 (541400) 345.0 kV Transmission Circuit #1  b.2. EASTOWN7 (541400) 345.0 kV to IATAN 7 (542982) 345.0 kV Transmission Circuit #1 |
| REGIONAL\_FAULT\_23\_P4 | P4 | Single Phase Fault with Stuck Breaker on ST JOE 7 345.00 (541199) 345 kV Bus  a. Apply Fault at the ST JOE 7 345.00 (541199) 345 kV Bus  b. Clear Fault after 16 cycles and trip the following elements:  b.1. ST JOE 7 (541199) 345.0 kV to EASTOWN7 (541400) 345.0 kV Transmission Circuit #1  b.2. 7FAIRPT (300039) 345.0 kV to ST JOE 7 (541199) 345.0 kV Transmission Circuit #1 |
| REGIONAL\_FAULT\_24\_P4 | P4 | Single Phase Fault with Stuck Breaker on ST JOE 7 345.00 (541199) 345 kV Bus  a. Apply Fault at the ST JOE 7 345.00 (541199) 345 kV Bus  b. Clear Fault after 16 cycles and trip the following elements:  b.1. ST JOE 7 (541199) 345.0 kV to COOPER 3 (640139) 345.0 kV Transmission Circuit #1  b.2. ST JOE 7 (541199) 345.0 kV to G17-183-TAP (761383) 345.0 kV Transmission Circuit #1 |
| REGIONAL\_FAULT\_25\_P4 | P4 | Single Phase Fault with Stuck Breaker on EASTOWN7 345.00 (541400) 345 kV Bus  a. Apply Fault at the EASTOWN7 345.00 (541400) 345 kV Bus  b. Clear Fault after 16 cycles and trip the following elements:  b.1. ST JOE 7 (541199) 345.0 kV to EASTOWN7 (541400) 345.0 kV Transmission Circuit #1  b.2. EASTOWN7 (541400) 345.0 kV to EASTOWN5 (541401) 161.0 kV to EASTOWN1 (541402) 13.8 kV Three Winding #11 |
| REGIONAL\_FAULT\_26\_P4 | P4 | Single Phase Fault with Stuck Breaker on ST JOE 7 345.00 (541199) 345 kV Bus  a. Apply Fault at the ST JOE 7 345.00 (541199) 345 kV Bus  b. Clear Fault after 16 cycles and trip the following elements:  b.1. ST JOE 7 (541199) 345.0 kV to EASTOWN7 (541400) 345.0 kV Transmission Circuit #1  b.2. ST JOE 7 (541199) 345.0 kV to ST JOE 5 (541253) 161.0 kV to STJOE 1T (541370) 13.8 kV Three Winding #22 |
| REGIONAL\_FAULT\_27\_P4 | P4 | Single Phase Fault with Stuck Breaker on ST JOE 7 345.00 (541199) 345 kV Bus  a. Apply Fault at the ST JOE 7 345.00 (541199) 345 kV Bus  b. Clear Fault after 16 cycles and trip the following elements:  b.1. 7FAIRPT (300039) 345.0 kV to ST JOE 7 (541199) 345.0 kV Transmission Circuit #1  b.2. ST JOE 7 (541199) 345.0 kV to ST JOE 5 (541253) 161.0 kV to STJOE 2T (541371) 13.8 kV Three Winding #33 |
| REGIONAL\_FAULT\_28\_P4 | P4 | Single Phase Fault with Stuck Breaker on ST JOE 7 345.00 (541199) 345 kV Bus  a. Apply Fault at the ST JOE 7 345.00 (541199) 345 kV Bus  b. Clear Fault after 16 cycles and trip the following elements:  b.1. ST JOE 7 (541199) 345.0 kV to ST JOE 5 (541253) 161.0 kV to STJOE 2T (541371) 13.8 kV Three Winding #33  b.2. ST JOE 7 (541199) 345.0 kV to G17-183-TAP (761383) 345.0 kV Transmission Circuit #1 |
| REGIONAL\_FAULT\_29\_P4 | P4 | Single Phase Fault with Stuck Breaker on ST JOE 7 345.00 (541199) 345 kV Bus  a. Apply Fault at the ST JOE 7 345.00 (541199) 345 kV Bus  b. Clear Fault after 16 cycles and trip the following elements:  b.1. ST JOE 7 (541199) 345.0 kV to COOPER 3 (640139) 345.0 kV Transmission Circuit #1  b.2. ST JOE 7 (541199) 345.0 kV to ST JOE 5 (541253) 161.0 kV to STJOE 1T (541370) 13.8 kV Three Winding #22 |
| REGIONAL\_FAULT\_30\_P4 | P4 | Single Phase Fault with Stuck Breaker on MINGO 7 345.00 (531451) 345 kV Bus  a. Apply Fault at the MINGO 7 345.00 (531451) 345 kV Bus  b. Clear Fault after 16 cycles and trip the following elements:  b.1. MINGO 7 (531451) 345.0 kV to REDWILO3 (640325) 345.0 kV Transmission Circuit #1  b.2. MINGTER1 (531452) 13.8 kV to MINGO 3 (531429) 115.0 kV to MINGO 7 (531451) 345.0 kV Three Winding #1 |
| REGIONAL\_FAULT\_31\_P4 | P4 | Single Phase Fault with Stuck Breaker on ST JOE 7 345.00 (541199) 345 kV Bus  a. Apply Fault at the ST JOE 7 345.00 (541199) 345 kV Bus  b. Clear Fault after 16 cycles and trip the following elements:  b.1. ST JOE 7 (541199) 345.0 kV to EASTOWN7 (541400) 345.0 kV Transmission Circuit #1  b.2. 7FAIRPT (300039) 345.0 kV to ST JOE 7 (541199) 345.0 kV Transmission Circuit #1 |
| REGIONAL\_FAULT\_32\_P4 | P4 | Single Phase Fault with Stuck Breaker on ST JOE 7 345.00 (541199) 345 kV Bus  a. Apply Fault at the ST JOE 7 345.00 (541199) 345 kV Bus  b. Clear Fault after 16 cycles and trip the following elements:  b.1. 7FAIRPT (300039) 345.0 kV to ST JOE 7 (541199) 345.0 kV Transmission Circuit #1  b.2. ST JOE 7 (541199) 345.0 kV to ST JOE 5 (541253) 161.0 kV to STJOE 2T (541371) 13.8 kV Three Winding #33 |
| REGIONAL\_FAULT\_33\_P4 | P4 | Single Phase Fault with Stuck Breaker on ST JOE 7 345.00 (541199) 345 kV Bus  a. Apply Fault at the ST JOE 7 345.00 (541199) 345 kV Bus  b. Clear Fault after 16 cycles and trip the following elements:  b.1. ST JOE 7 (541199) 345.0 kV to ST JOE 5 (541253) 161.0 kV to STJOE 2T (541371) 13.8 kV Three Winding #33  b.2. ST JOE 7 (541199) 345.0 kV to G17-183-TAP (761383) 345.0 kV Transmission Circuit #1 |
| REGIONAL\_FAULT\_34\_P4 | P4 | Single Phase Fault with Stuck Breaker on ST JOE 7 345.00 (541199) 345 kV Bus  a. Apply Fault at the ST JOE 7 345.00 (541199) 345 kV Bus  b. Clear Fault after 16 cycles and trip the following elements:  b.1. ST JOE 7 (541199) 345.0 kV to COOPER 3 (640139) 345.0 kV Transmission Circuit #1  b.2. ST JOE 7 (541199) 345.0 kV to G17-183-TAP (761383) 345.0 kV Transmission Circuit #1 |
| REGIONAL\_FAULT\_35\_P4 | P4 | Single Phase Fault with Stuck Breaker on ST JOE 7 345.00 (541199) 345 kV Bus  a. Apply Fault at the ST JOE 7 345.00 (541199) 345 kV Bus  b. Clear Fault after 16 cycles and trip the following elements:  b.1. ST JOE 7 (541199) 345.0 kV to COOPER 3 (640139) 345.0 kV Transmission Circuit #1  b.2. ST JOE 7 (541199) 345.0 kV to ST JOE 5 (541253) 161.0 kV to STJOE 1T (541370) 13.8 kV Three Winding #22 |
| REGIONAL\_FAULT\_36\_P4 | P4 | Single Phase Fault with Stuck Breaker on ST JOE 7 345.00 (541199) 345 kV Bus  a. Apply Fault at the ST JOE 7 345.00 (541199) 345 kV Bus  b. Clear Fault after 16 cycles and trip the following elements:  b.1. ST JOE 7 (541199) 345.0 kV to EASTOWN7 (541400) 345.0 kV Transmission Circuit #1  b.2. ST JOE 7 (541199) 345.0 kV to ST JOE 5 (541253) 161.0 kV to STJOE 1T (541370) 13.8 kV Three Winding #22 |
| REGIONAL\_FAULT\_37\_P4 | P4 | Single Phase Fault with Stuck Breaker on EASTOWN7 345.00 (541400) 345 kV Bus  a. Apply Fault at the EASTOWN7 345.00 (541400) 345 kV Bus  b. Clear Fault after 16 cycles and trip the following elements:  b.1. ST JOE 7 (541199) 345.0 kV to EASTOWN7 (541400) 345.0 kV Transmission Circuit #1  b.2. EASTOWN7 (541400) 345.0 kV to EASTOWN5 (541401) 161.0 kV to EASTOWN1 (541402) 13.8 kV Three Winding #11 |
| REGIONAL\_FAULT\_38\_P4 | P4 | Single Phase Fault with Stuck Breaker on EASTOWN7 345.00 (541400) 345 kV Bus  a. Apply Fault at the EASTOWN7 345.00 (541400) 345 kV Bus  b. Clear Fault after 16 cycles and trip the following elements:  b.1. ST JOE 7 (541199) 345.0 kV to EASTOWN7 (541400) 345.0 kV Transmission Circuit #1  b.2. EASTOWN7 (541400) 345.0 kV to IATAN 7 (542982) 345.0 kV Transmission Circuit #1 |
| REGIONAL\_FAULT\_39\_P4 | P4 | Single Phase Fault with Stuck Breaker on ST JOE 7 345.00 (541199) 345 kV Bus  a. Apply Fault at the ST JOE 7 345.00 (541199) 345 kV Bus  b. Clear Fault after 16 cycles and trip the following elements:  b.1. 7FAIRPT (300039) 345.0 kV to ST JOE 7 (541199) 345.0 kV Transmission Circuit #1  b.2. ST JOE 7 (541199) 345.0 kV to ST JOE 5 (541253) 161.0 kV to STJOE 2T (541371) 13.8 kV Three Winding #33 |
| REGIONAL\_FAULT\_40\_P4 | P4 | Single Phase Fault with Stuck Breaker on ST JOE 7 345.00 (541199) 345 kV Bus  a. Apply Fault at the ST JOE 7 345.00 (541199) 345 kV Bus  b. Clear Fault after 16 cycles and trip the following elements:  b.1. ST JOE 7 (541199) 345.0 kV to ST JOE 5 (541253) 161.0 kV to STJOE 2T (541371) 13.8 kV Three Winding #33  b.2. ST JOE 7 (541199) 345.0 kV to G17-183-TAP (761383) 345.0 kV Transmission Circuit #1 |
| REGIONAL\_FAULT\_41\_P4 | P4 | Single Phase Fault with Stuck Breaker on ST JOE 7 345.00 (541199) 345 kV Bus  a. Apply Fault at the ST JOE 7 345.00 (541199) 345 kV Bus  b. Clear Fault after 16 cycles and trip the following elements:  b.1. ST JOE 7 (541199) 345.0 kV to COOPER 3 (640139) 345.0 kV Transmission Circuit #1  b.2. ST JOE 7 (541199) 345.0 kV to ST JOE 5 (541253) 161.0 kV to STJOE 1T (541370) 13.8 kV Three Winding #22 |
| REGIONAL\_FAULT\_42\_P4 | P4 | Single Phase Fault with Stuck Breaker on EASTOWN7 345.00 (541400) 345 kV Bus  a. Apply Fault at the EASTOWN7 345.00 (541400) 345 kV Bus  b. Clear Fault after 16 cycles and trip the following elements:  b.1. ST JOE 7 (541199) 345.0 kV to EASTOWN7 (541400) 345.0 kV Transmission Circuit #1  b.2. EASTOWN7 (541400) 345.0 kV to EASTOWN5 (541401) 161.0 kV to EASTOWN1 (541402) 13.8 kV Three Winding #11 |
| REGIONAL\_FAULT\_43\_P4 | P4 | Single Phase Fault with Stuck Breaker on ST JOE 7 345.00 (541199) 345 kV Bus  a. Apply Fault at the ST JOE 7 345.00 (541199) 345 kV Bus  b. Clear Fault after 16 cycles and trip the following elements:  b.1. ST JOE 7 (541199) 345.0 kV to EASTOWN7 (541400) 345.0 kV Transmission Circuit #1  b.2. ST JOE 7 (541199) 345.0 kV to ST JOE 5 (541253) 161.0 kV to STJOE 1T (541370) 13.8 kV Three Winding #22 |
| REGIONAL\_FAULT\_44\_P4 | P4 | Single Phase Fault with Stuck Breaker on ST JOE 7 345.00 (541199) 345 kV Bus  a. Apply Fault at the ST JOE 7 345.00 (541199) 345 kV Bus  b. Clear Fault after 16 cycles and trip the following elements:  b.1. ST JOE 7 (541199) 345.0 kV to EASTOWN7 (541400) 345.0 kV Transmission Circuit #1  b.2. 7FAIRPT (300039) 345.0 kV to ST JOE 7 (541199) 345.0 kV Transmission Circuit #1 |
| REGIONAL\_FAULT\_45\_P4 | P4 | Single Phase Fault with Stuck Breaker on ST JOE 7 345.00 (541199) 345 kV Bus  a. Apply Fault at the ST JOE 7 345.00 (541199) 345 kV Bus  b. Clear Fault after 16 cycles and trip the following elements:  b.1. ST JOE 7 (541199) 345.0 kV to COOPER 3 (640139) 345.0 kV Transmission Circuit #1  b.2. ST JOE 7 (541199) 345.0 kV to G17-183-TAP (761383) 345.0 kV Transmission Circuit #1 |
| REGIONAL\_FAULT\_46\_P4 | P4 | Single Phase Fault with Stuck Breaker on EASTOWN7 345.00 (541400) 345 kV Bus  a. Apply Fault at the EASTOWN7 345.00 (541400) 345 kV Bus  b. Clear Fault after 16 cycles and trip the following elements:  b.1. ST JOE 7 (541199) 345.0 kV to EASTOWN7 (541400) 345.0 kV Transmission Circuit #1  b.2. EASTOWN7 (541400) 345.0 kV to IATAN 7 (542982) 345.0 kV Transmission Circuit #1 |
| REGIONAL\_FAULT\_47\_P4 | P4 | Single Phase Fault with Stuck Breaker on RAUN 3 345.00 (635200) 345 kV Bus  a. Apply Fault at the RAUN 3 345.00 (635200) 345 kV Bus  b. Clear Fault after 16 cycles and trip the following elements:  b.1. RAUN 3 (635200) 345.0 kV to S3451 3 (645451) 345.0 kV Transmission Circuit #1 |
| REGIONAL\_FAULT\_48\_P4 | P4 | Single Phase Fault with Stuck Breaker on CBLUFFS3 345.00 (635000) 345 kV Bus  a. Apply Fault at the CBLUFFS3 345.00 (635000) 345 kV Bus  b. Clear Fault after 16 cycles and trip the following elements:  b.1. CBLUFFS3 (635000) 345.0 kV to S3456 3 (645456) 345.0 kV Transmission Circuit #1 |
| REGIONAL\_FAULT\_49\_P4 | P4 | Single Phase Fault with Stuck Breaker on COOPER 3 345.00 (640139) 345 kV Bus  a. Apply Fault at the COOPER 3 345.00 (640139) 345 kV Bus  b. Clear Fault after 16 cycles and trip the following elements:  b.1. COOPER 3 (640139) 345.0 kV to S3458 3 (645458) 345.0 kV Transmission Circuit #1 |
| REGIONAL\_FAULT\_50\_P4 | P4 | Single Phase Fault with Stuck Breaker on RAUN 3 345.00 (635200) 345 kV Bus  a. Apply Fault at the RAUN 3 345.00 (635200) 345 kV Bus  b. Clear Fault after 16 cycles and trip the following elements:  b.1. RAUN 3 (635200) 345.0 kV to S3451 3 (645451) 345.0 kV Transmission Circuit #1 |
| REGIONAL\_FAULT\_51\_P4 | P4 | Single Phase Fault with Stuck Breaker on S3451 3 345.00 (645451) 345 kV Bus  a. Apply Fault at the S3451 3 345.00 (645451) 345 kV Bus  b. Clear Fault after 16 cycles and trip the following elements:  b.1. RAUN 3 (635200) 345.0 kV to S3451 3 (645451) 345.0 kV Transmission Circuit #1  b.2. S3451 3 (645451) 345.0 kV to S1251 5 (646251) 161.0 kV to S3451T49 (648351) 13.8 kV Three Winding #1 |
| REGIONAL\_FAULT\_52\_P4 | P4 | Single Phase Fault with Stuck Breaker on S3456 3 345.00 (645456) 345 kV Bus  a. Apply Fault at the S3456 3 345.00 (645456) 345 kV Bus  b. Clear Fault after 16 cycles and trip the following elements:  b.1. CBLUFFS3 (635000) 345.0 kV to S3456 3 (645456) 345.0 kV Transmission Circuit #1  b.2. S3455 3 (645455) 345.0 kV to S3456 3 (645456) 345.0 kV Transmission Circuit #1 |
| REGIONAL\_FAULT\_53\_P4 | P4 | Single Phase Fault with Stuck Breaker on S3456 3 345.00 (645456) 345 kV Bus  a. Apply Fault at the S3456 3 345.00 (645456) 345 kV Bus  b. Clear Fault after 16 cycles and trip the following elements:  b.1. S3456 3 (645456) 345.0 kV to S3458 3 (645458) 345.0 kV Transmission Circuit #1  b.2. CBLUFFS3 (635000) 345.0 kV to S3456 3 (645456) 345.0 kV Transmission Circuit #1 |
| REGIONAL\_FAULT\_54\_P4 | P4 | Single Phase Fault with Stuck Breaker on COOPER 3 345.00 (640139) 345 kV Bus  a. Apply Fault at the COOPER 3 345.00 (640139) 345 kV Bus  b. Clear Fault after 16 cycles and trip the following elements:  b.1. COOPER 3 (640139) 345.0 kV to S3458 3 (645458) 345.0 kV Transmission Circuit #1 |
| REGIONAL\_FAULT\_55\_P4 | P4 | Single Phase Fault with Stuck Breaker on LAKPLAT-ER4 230.00 (655475) 230 kV Bus  a. Apply Fault at the LAKPLAT-ER4 230.00 (655475) 230 kV Bus  b. Clear Fault after 16 cycles and trip the following elements:  b.1. FTTHOMP4 (652507) 230.0 kV to LAKPLAT-ER4 (655475) 230.0 kV Transmission Circuit #1  b.2. FTRANDL4 (652509) 230.0 kV to LAKPLAT-ER4 (655475) 230.0 kV Transmission Circuit #1  b.3. LAKPLAT-ER4 (655475) 230.0 kV to LAKPLAT-ER8 (655476) 69.0 kV Two Winding #1 |
| REGIONAL\_FAULT\_56\_P4 | P4 | Single Phase Fault with Stuck Breaker on SIOUXCY4 230.00 (652565) 230 kV Bus  a. Apply Fault at the SIOUXCY4 230.00 (652565) 230 kV Bus  b. Clear Fault after 16 cycles and trip the following elements:  b.1. TWIN CH4 (640386) 230.0 kV to SIOUXCY4 (652565) 230.0 kV Transmission Circuit #1  b.2. FTRANDL4 (652509) 230.0 kV to SIOUXCY4 (652565) 230.0 kV Transmission Circuit #1  b.3. SIOUXCY4 (652565) 230.0 kV to DENISON4 (652567) 230.0 kV Transmission Circuit #1  b.4. SIOUXCY4 (652565) 230.0 kV to SIOUXCY5 (652566) 161.0 kV to SIOUXC49 (652310) 13.8 kV Three Winding #1 |
| REGIONAL\_FAULT\_57\_P4 | P4 | Single Phase Fault with Stuck Breaker on LAKPLAT-ER4 230.00 (655475) 230 kV Bus  a. Apply Fault at the LAKPLAT-ER4 230.00 (655475) 230 kV Bus  b. Clear Fault after 16 cycles and trip the following elements:  b.1. FTTHOMP4 (652507) 230.0 kV to LAKPLAT-ER4 (655475) 230.0 kV Transmission Circuit #1  b.2. FTRANDL4 (652509) 230.0 kV to LAKPLAT-ER4 (655475) 230.0 kV Transmission Circuit #1  b.3. LAKPLAT-ER4 (655475) 230.0 kV to LAKPLAT-ER8 (655476) 69.0 kV Two Winding #1 |
| REGIONAL\_FAULT\_58\_P4 | P4 | Single Phase Fault with Stuck Breaker on FTTHOMP4 230.00 (652507) 230 kV Bus  a. Apply Fault at the FTTHOMP4 230.00 (652507) 230 kV Bus  b. Clear Fault after 16 cycles and trip the following elements:  b.1. FTTHOMP4 (652507) 230.0 kV to BIGBND14 (652540) 230.0 kV Transmission Circuit #1  b.2. FTTHOMP4 (652507) 230.0 kV to FTRANDL4 (652509) 230.0 kV Transmission Circuit #1 |
| REGIONAL\_FAULT\_59\_P4 | P4 | Single Phase Fault with Stuck Breaker on UTICAJC4 230.00 (652526) 230 kV Bus  a. Apply Fault at the UTICAJC4 230.00 (652526) 230 kV Bus  b. Clear Fault after 16 cycles and trip the following elements:  b.1. FTRANDL4 (652509) 230.0 kV to UTICAJC4 (652526) 230.0 kV Transmission Circuit #1  b.2. UTICAJC4 (652526) 230.0 kV to UTICAJC7 (652626) 115.0 kV to UTICAJC9 (652627) 13.2 kV Three Winding #1 |
| REGIONAL\_FAULT\_60\_P4 | P4 | Single Phase Fault with Stuck Breaker on UTICAJC4 230.00 (652526) 230 kV Bus  a. Apply Fault at the UTICAJC4 230.00 (652526) 230 kV Bus  b. Clear Fault after 16 cycles and trip the following elements:  b.1. FTRANDL4 (652509) 230.0 kV to UTICAJC4 (652526) 230.0 kV Transmission Circuit #1  b.2. UTICAJC4 (652526) 230.0 kV to RASMUSN-ER4 (655484) 230.0 kV Transmission Circuit #1 |
| REGIONAL\_FAULT\_61\_P4 | P4 | Single Phase Fault with Stuck Breaker on SIOUXCY3 345.00 (652564) 345 kV Bus  a. Apply Fault at the SIOUXCY3 345.00 (652564) 345 kV Bus  b. Clear Fault after 16 cycles and trip the following elements:  b.1. RAUN 3 (635200) 345.0 kV to SIOUXCY3 (652564) 345.0 kV Transmission Circuit #1  b.2. SIOUXCY3 (652564) 345.0 kV to SIOUXCY-LNX3 (652864) 345.0 kV Transmission Circuit #z  b.3. SIOUXCY3 (652564) 345.0 kV to SIOUXCY2 (652552) 230.0 kV to SIOUXC19 (652304) 13.8 kV Three Winding #1  b.4. SIOUXCY3 (652564) 345.0 kV to SIOUXCY2 (652552) 230.0 kV to SIOUXC29 (652305) 13.8 kV Three Winding #1  b.7. SPLT RK3 (601006) 345.0 kV to SIOUXCY-LNX3 (652864) 345.0 kV Transmission Circuit #1 |
| REGIONAL\_FAULT\_62\_P4 | P4 | Single Phase Fault with Stuck Breaker on SIOUXCY4 230.00 (652565) 230 kV Bus  a. Apply Fault at the SIOUXCY4 230.00 (652565) 230 kV Bus  b. Clear Fault after 16 cycles and trip the following elements:  b.1. TWIN CH4 (640386) 230.0 kV to SIOUXCY4 (652565) 230.0 kV Transmission Circuit #1  b.2. FTRANDL4 (652509) 230.0 kV to SIOUXCY4 (652565) 230.0 kV Transmission Circuit #1  b.3. SIOUXCY2 (652552) 230.0 kV to SIOUXCY4 (652565) 230.0 kV Transmission Circuit #z1  b.4. SIOUXCY2 (652552) 230.0 kV to SIOUXCY4 (652565) 230.0 kV Transmission Circuit #z2  b.5. SIOUXCY4 (652565) 230.0 kV to DENISON4 (652567) 230.0 kV Transmission Circuit #1  b.6. SIOUXCY4 (652565) 230.0 kV to RASMUSN-ER4 (655484) 230.0 kV Transmission Circuit #1  b.7. SIOUXCY4 (652565) 230.0 kV to SIOUXCY5 (652566) 161.0 kV to SIOUXC39 (652308) 13.8 kV Three Winding #1  b.8. SIOUXCY4 (652565) 230.0 kV to SIOUXCY5 (652566) 161.0 kV to SIOUXC49 (652310) 13.8 kV Three Winding #1  b.9. SIOUXC19 (652304) 13.8 kV to SIOUXCY3 (652564) 345.0 kV to SIOUXCY2 (652552) 230.0 kV Three Winding #1  b.10. SIOUXC29 (652305) 13.8 kV to SIOUXCY3 (652564) 345.0 kV to SIOUXCY2 (652552) 230.0 kV Three Winding #1 |
| REGIONAL\_FAULT\_63\_P4 | P4 | Single Phase Fault with Stuck Breaker on SIOUXCY4 230.00 (652565) 230 kV Bus  a. Apply Fault at the SIOUXCY4 230.00 (652565) 230 kV Bus  b. Clear Fault after 16 cycles and trip the following elements:  b.1. TWIN CH4 (640386) 230.0 kV to SIOUXCY4 (652565) 230.0 kV Transmission Circuit #1  b.2. FTRANDL4 (652509) 230.0 kV to SIOUXCY4 (652565) 230.0 kV Transmission Circuit #1  b.3. SIOUXCY4 (652565) 230.0 kV to DENISON4 (652567) 230.0 kV Transmission Circuit #1  b.4. SIOUXCY4 (652565) 230.0 kV to SIOUXCY5 (652566) 161.0 kV to SIOUXC49 (652310) 13.8 kV Three Winding #1 |
| REGIONAL\_FAULT\_64\_P4 | P4 | Single Phase Fault with Stuck Breaker on FTTHOMP4 230.00 (652507) 230 kV Bus  a. Apply Fault at the FTTHOMP4 230.00 (652507) 230 kV Bus  b. Clear Fault after 16 cycles and trip the following elements:  b.1. FTTHOMP4 (652507) 230.0 kV to FTTHOMP8 (652276) 69.0 kV to FTTHOMP9 (652277) 13.8 kV Three Winding #1  b.4. FTTHOMP4 (652507) 230.0 kV to FTRANDL4 (652509) 230.0 kV Transmission Circuit #1 |
| REGIONAL\_FAULT\_65\_P4 | P4 | Single Phase Fault with Stuck Breaker on FTRANDL4 230.00 (652509) 230 kV Bus  a. Apply Fault at the FTRANDL4 230.00 (652509) 230 kV Bus  b. Clear Fault after 16 cycles and trip the following elements:  b.1. FTRANDL4 (652509) 230.0 kV to FTRANDL7 (652510) 115.0 kV Two Winding #1  b.2. BONESTL7 (652475) 115.0 kV to GREGORY7 (652478) 115.0 kV Transmission Circuit #1  b.3. BONESTL7 (652475) 115.0 kV to FTRANDL7 (652510) 115.0 kV Transmission Circuit #1  b.4. FTRANDL4 (652509) 230.0 kV to FTRANDL7 (652510) 115.0 kV Two Winding #2 |
| REGIONAL\_FAULT\_66\_P4 | P4 | Single Phase Fault with Stuck Breaker on FTRANDL4 230.00 (652509) 230 kV Bus  a. Apply Fault at the FTRANDL4 230.00 (652509) 230 kV Bus  b. Clear Fault after 16 cycles and trip the following elements:  b.1. FTRANDL4 (652509) 230.0 kV to FTRANDL7 (652510) 115.0 kV Two Winding #1  b.2. FTRANDL7 (652510) 115.0 kV to FTRDL12G (652546) 13.8 kV Two Winding #1  b.3. FTRANDL4 (652509) 230.0 kV to FTRANDL7 (652510) 115.0 kV Two Winding #2 |
| REGIONAL\_FAULT\_67\_P4 | P4 | Single Phase Fault with Stuck Breaker on FTRANDL4 230.00 (652509) 230 kV Bus  a. Apply Fault at the FTRANDL4 230.00 (652509) 230 kV Bus  b. Clear Fault after 16 cycles and trip the following elements:  b.1. FTRANDL4 (652509) 230.0 kV to FTRANDL7 (652510) 115.0 kV Two Winding #1  b.2. ARMOUR 7 (652501) 115.0 kV to FTRANDL7 (652510) 115.0 kV Transmission Circuit #1  b.3. ARMOUR 7 (652501) 115.0 kV to MTVERN 7 (652518) 115.0 kV Transmission Circuit #1  b.4. ARMOUR 9 (652246) 34.5 kV to ARMOUR 7 (652501) 115.0 kV Two Winding #1  b.5. ARMOUR 8 (652249) 69.0 kV to ARMOUR 7 (652501) 115.0 kV Two Winding #1  b.6. FTRANDL4 (652509) 230.0 kV to FTRANDL7 (652510) 115.0 kV Two Winding #2 |
| REGIONAL\_FAULT\_68\_P4 | P4 | Single Phase Fault with Stuck Breaker on FTRANDL4 230.00 (652509) 230 kV Bus  a. Apply Fault at the FTRANDL4 230.00 (652509) 230 kV Bus  b. Clear Fault after 16 cycles and trip the following elements:  b.1. FTRANDL4 (652509) 230.0 kV to FTRANDL7 (652510) 115.0 kV Two Winding #1  b.2. SPENCER7 (640349) 115.0 kV to FTRANDL7 (652510) 115.0 kV Transmission Circuit #1  b.3. FTRANDL4 (652509) 230.0 kV to FTRANDL7 (652510) 115.0 kV Two Winding #2 |
| REGIONAL\_FAULT\_69\_P4 | P4 | Single Phase Fault with Stuck Breaker on FTRANDL4 230.00 (652509) 230 kV Bus  a. Apply Fault at the FTRANDL4 230.00 (652509) 230 kV Bus  b. Clear Fault after 16 cycles and trip the following elements:  b.1. FTRANDL4 (652509) 230.0 kV to FTRANDL7 (652510) 115.0 kV Two Winding #1  b.2. FTRANDL7 (652510) 115.0 kV to WHTSWAN-ER7 (655490) 115.0 kV Transmission Circuit #1  b.3. TYNDALL7 (652525) 115.0 kV to WHTSWAN-ER7 (655490) 115.0 kV Transmission Circuit #1  b.4. FTRANDL4 (652509) 230.0 kV to FTRANDL7 (652510) 115.0 kV Two Winding #2 |
| REGIONAL\_FAULT\_70\_P4 | P4 | Single Phase Fault with Stuck Breaker on FTRANDL4 230.00 (652509) 230 kV Bus  a. Apply Fault at the FTRANDL4 230.00 (652509) 230 kV Bus  b. Clear Fault after 16 cycles and trip the following elements:  b.1. FTRANDL4 (652509) 230.0 kV to FTRANDL7 (652510) 115.0 kV Two Winding #1  b.2. BONESTL7 (652475) 115.0 kV to GREGORY7 (652478) 115.0 kV Transmission Circuit #1  b.3. BONESTL7 (652475) 115.0 kV to FTRANDL7 (652510) 115.0 kV Transmission Circuit #1  b.4. FTRANDL4 (652509) 230.0 kV to FTRANDL7 (652510) 115.0 kV Two Winding #2 |
| REGIONAL\_FAULT\_71\_P4 | P4 | Single Phase Fault with Stuck Breaker on FTRANDL4 230.00 (652509) 230 kV Bus  a. Apply Fault at the FTRANDL4 230.00 (652509) 230 kV Bus  b. Clear Fault after 16 cycles and trip the following elements:  b.1. FTRANDL4 (652509) 230.0 kV to FTRANDL7 (652510) 115.0 kV Two Winding #1  b.2. FTRANDL7 (652510) 115.0 kV to FTRDL12G (652546) 13.8 kV Two Winding #1  b.3. FTRANDL4 (652509) 230.0 kV to FTRANDL7 (652510) 115.0 kV Two Winding #2 |
| REGIONAL\_FAULT\_72\_P4 | P4 | Single Phase Fault with Stuck Breaker on FTRANDL4 230.00 (652509) 230 kV Bus  a. Apply Fault at the FTRANDL4 230.00 (652509) 230 kV Bus  b. Clear Fault after 16 cycles and trip the following elements:  b.1. FTRANDL4 (652509) 230.0 kV to FTRANDL7 (652510) 115.0 kV Two Winding #1  b.2. ARMOUR 7 (652501) 115.0 kV to FTRANDL7 (652510) 115.0 kV Transmission Circuit #1  b.3. ARMOUR 7 (652501) 115.0 kV to MTVERN 7 (652518) 115.0 kV Transmission Circuit #1  b.4. ARMOUR 9 (652246) 34.5 kV to ARMOUR 7 (652501) 115.0 kV Two Winding #1  b.5. ARMOUR 8 (652249) 69.0 kV to ARMOUR 7 (652501) 115.0 kV Two Winding #1  b.6. FTRANDL4 (652509) 230.0 kV to FTRANDL7 (652510) 115.0 kV Two Winding #2 |
| REGIONAL\_FAULT\_73\_P4 | P4 | Single Phase Fault with Stuck Breaker on FTRANDL4 230.00 (652509) 230 kV Bus  a. Apply Fault at the FTRANDL4 230.00 (652509) 230 kV Bus  b. Clear Fault after 16 cycles and trip the following elements:  b.1. FTRANDL4 (652509) 230.0 kV to FTRANDL7 (652510) 115.0 kV Two Winding #1  b.2. SPENCER7 (640349) 115.0 kV to FTRANDL7 (652510) 115.0 kV Transmission Circuit #1  b.3. FTRANDL4 (652509) 230.0 kV to FTRANDL7 (652510) 115.0 kV Two Winding #2 |
| REGIONAL\_FAULT\_74\_P4 | P4 | Single Phase Fault with Stuck Breaker on FTRANDL4 230.00 (652509) 230 kV Bus  a. Apply Fault at the FTRANDL4 230.00 (652509) 230 kV Bus  b. Clear Fault after 16 cycles and trip the following elements:  b.1. FTRANDL4 (652509) 230.0 kV to FTRANDL7 (652510) 115.0 kV Two Winding #1  b.2. FTRANDL7 (652510) 115.0 kV to WHTSWAN-ER7 (655490) 115.0 kV Transmission Circuit #1  b.3. TYNDALL7 (652525) 115.0 kV to WHTSWAN-ER7 (655490) 115.0 kV Transmission Circuit #1  b.4. FTRANDL4 (652509) 230.0 kV to FTRANDL7 (652510) 115.0 kV Two Winding #2 |
| REGIONAL\_FAULT\_75\_P4 | P4 | Single Phase Fault with Stuck Breaker on FTRANDL4 230.00 (652509) 230 kV Bus  a. Apply Fault at the FTRANDL4 230.00 (652509) 230 kV Bus  b. Clear Fault after 16 cycles and trip the following elements:  b.1. FTRANDL4 (652509) 230.0 kV to FTRANDL7 (652510) 115.0 kV Two Winding #1  b.2. FTRANDL4 (652509) 230.0 kV to SIOUXCY4 (652565) 230.0 kV Transmission Circuit #1  b.3. FTRANDL4 (652509) 230.0 kV to FTRANDL7 (652510) 115.0 kV Two Winding #2 |
| REGIONAL\_FAULT\_76\_P4 | P4 | Single Phase Fault with Stuck Breaker on FTRANDL4 230.00 (652509) 230 kV Bus  a. Apply Fault at the FTRANDL4 230.00 (652509) 230 kV Bus  b. Clear Fault after 16 cycles and trip the following elements:  b.1. FTRANDL4 (652509) 230.0 kV to FTRANDL7 (652510) 115.0 kV Two Winding #1  b.2. FTRANDL4 (652509) 230.0 kV to UTICAJC4 (652526) 230.0 kV Transmission Circuit #1  b.3. FTRANDL4 (652509) 230.0 kV to FTRANDL7 (652510) 115.0 kV Two Winding #2 |
| REGIONAL\_FAULT\_77\_P4 | P4 | Single Phase Fault with Stuck Breaker on FTRANDL4 230.00 (652509) 230 kV Bus  a. Apply Fault at the FTRANDL4 230.00 (652509) 230 kV Bus  b. Clear Fault after 16 cycles and trip the following elements:  b.1. FTRANDL4 (652509) 230.0 kV to FTRANDL7 (652510) 115.0 kV Two Winding #1  b.2. FTRANDL4 (652509) 230.0 kV to FTRDL78G (652549) 13.8 kV Two Winding #1  b.3. FTRANDL4 (652509) 230.0 kV to FTRANDL7 (652510) 115.0 kV Two Winding #2 |
| REGIONAL\_FAULT\_78\_P4 | P4 | Single Phase Fault with Stuck Breaker on FTRANDL4 230.00 (652509) 230 kV Bus  a. Apply Fault at the FTRANDL4 230.00 (652509) 230 kV Bus  b. Clear Fault after 16 cycles and trip the following elements:  b.1. FTRANDL4 (652509) 230.0 kV to FTRANDL7 (652510) 115.0 kV Two Winding #1  b.2. FTTHOMP4 (652507) 230.0 kV to FTRANDL4 (652509) 230.0 kV Transmission Circuit #1  b.3. FTRANDL4 (652509) 230.0 kV to FTRANDL7 (652510) 115.0 kV Two Winding #2 |
| REGIONAL\_FAULT\_79\_P4 | P4 | Single Phase Fault with Stuck Breaker on FTRANDL4 230.00 (652509) 230 kV Bus  a. Apply Fault at the FTRANDL4 230.00 (652509) 230 kV Bus  b. Clear Fault after 16 cycles and trip the following elements:  b.1. FTRANDL4 (652509) 230.0 kV to FTRANDL7 (652510) 115.0 kV Two Winding #1  b.2. MEADOWGROVE4 (640540) 230.0 kV to FTRANDL4 (652509) 230.0 kV Transmission Circuit #1  b.3. FTRANDL4 (652509) 230.0 kV to FTRANDL7 (652510) 115.0 kV Two Winding #2 |
| REGIONAL\_FAULT\_80\_P4 | P4 | Single Phase Fault with Stuck Breaker on FTRANDL4 230.00 (652509) 230 kV Bus  a. Apply Fault at the FTRANDL4 230.00 (652509) 230 kV Bus  b. Clear Fault after 16 cycles and trip the following elements:  b.1. FTRANDL4 (652509) 230.0 kV to FTRANDL7 (652510) 115.0 kV Two Winding #1  b.2. FTRANDL4 (652509) 230.0 kV to FTRDL56G (652548) 13.8 kV Two Winding #1  b.3. FTRANDL4 (652509) 230.0 kV to FTRANDL7 (652510) 115.0 kV Two Winding #2 |
| REGIONAL\_FAULT\_81\_P4 | P4 | Single Phase Fault with Stuck Breaker on FTRANDL4 230.00 (652509) 230 kV Bus  a. Apply Fault at the FTRANDL4 230.00 (652509) 230 kV Bus  b. Clear Fault after 16 cycles and trip the following elements:  b.1. FTRANDL4 (652509) 230.0 kV to FTRANDL7 (652510) 115.0 kV Two Winding #1  b.2. FTRANDL4 (652509) 230.0 kV to LAKPLAT-ER4 (655475) 230.0 kV Transmission Circuit #1  b.3. FTRANDL4 (652509) 230.0 kV to FTRANDL7 (652510) 115.0 kV Two Winding #2 |
| REGIONAL\_FAULT\_82\_P4 | P4 | Single Phase Fault with Stuck Breaker on FTRANDL4 230.00 (652509) 230 kV Bus  a. Apply Fault at the FTRANDL4 230.00 (652509) 230 kV Bus  b. Clear Fault after 16 cycles and trip the following elements:  b.1. FTRANDL4 (652509) 230.0 kV to FTRANDL7 (652510) 115.0 kV Two Winding #1  b.2. FTRANDL4 (652509) 230.0 kV to FTRDL34G (652547) 13.8 kV Two Winding #1  b.3. FTRANDL4 (652509) 230.0 kV to FTRANDL7 (652510) 115.0 kV Two Winding #2 |
| REGIONAL\_FAULT\_83\_P4 | P4 | Single Phase Fault with Stuck Breaker on FTRANDL4 230.00 (652509) 230 kV Bus  a. Apply Fault at the FTRANDL4 230.00 (652509) 230 kV Bus  b. Clear Fault after 16 cycles and trip the following elements:  b.1. FTRANDL4 (652509) 230.0 kV to FTRANDL7 (652510) 115.0 kV Two Winding #1  b.2. FTRANDL4 (652509) 230.0 kV to SIOUXCY4 (652565) 230.0 kV Transmission Circuit #1  b.3. FTRANDL4 (652509) 230.0 kV to FTRANDL7 (652510) 115.0 kV Two Winding #2 |
| REGIONAL\_FAULT\_84\_P4 | P4 | Single Phase Fault with Stuck Breaker on FTRANDL4 230.00 (652509) 230 kV Bus  a. Apply Fault at the FTRANDL4 230.00 (652509) 230 kV Bus  b. Clear Fault after 16 cycles and trip the following elements:  b.1. FTRANDL4 (652509) 230.0 kV to FTRANDL7 (652510) 115.0 kV Two Winding #1  b.2. FTRANDL4 (652509) 230.0 kV to UTICAJC4 (652526) 230.0 kV Transmission Circuit #1  b.3. FTRANDL4 (652509) 230.0 kV to FTRANDL7 (652510) 115.0 kV Two Winding #2 |
| REGIONAL\_FAULT\_85\_P4 | P4 | Single Phase Fault with Stuck Breaker on FTRANDL4 230.00 (652509) 230 kV Bus  a. Apply Fault at the FTRANDL4 230.00 (652509) 230 kV Bus  b. Clear Fault after 16 cycles and trip the following elements:  b.1. FTRANDL4 (652509) 230.0 kV to FTRANDL7 (652510) 115.0 kV Two Winding #1  b.2. FTRANDL4 (652509) 230.0 kV to FTRDL78G (652549) 13.8 kV Two Winding #1  b.3. FTRANDL4 (652509) 230.0 kV to FTRANDL7 (652510) 115.0 kV Two Winding #2 |
| REGIONAL\_FAULT\_86\_P4 | P4 | Single Phase Fault with Stuck Breaker on FTRANDL4 230.00 (652509) 230 kV Bus  a. Apply Fault at the FTRANDL4 230.00 (652509) 230 kV Bus  b. Clear Fault after 16 cycles and trip the following elements:  b.1. FTRANDL4 (652509) 230.0 kV to FTRANDL7 (652510) 115.0 kV Two Winding #1  b.2. FTTHOMP4 (652507) 230.0 kV to FTRANDL4 (652509) 230.0 kV Transmission Circuit #1  b.3. FTRANDL4 (652509) 230.0 kV to FTRANDL7 (652510) 115.0 kV Two Winding #2 |
| REGIONAL\_FAULT\_87\_P4 | P4 | Single Phase Fault with Stuck Breaker on FTRANDL4 230.00 (652509) 230 kV Bus  a. Apply Fault at the FTRANDL4 230.00 (652509) 230 kV Bus  b. Clear Fault after 16 cycles and trip the following elements:  b.1. FTRANDL4 (652509) 230.0 kV to FTRANDL7 (652510) 115.0 kV Two Winding #1  b.2. MEADOWGROVE4 (640540) 230.0 kV to FTRANDL4 (652509) 230.0 kV Transmission Circuit #1  b.3. FTRANDL4 (652509) 230.0 kV to FTRANDL7 (652510) 115.0 kV Two Winding #2 |
| REGIONAL\_FAULT\_88\_P4 | P4 | Single Phase Fault with Stuck Breaker on FTRANDL4 230.00 (652509) 230 kV Bus  a. Apply Fault at the FTRANDL4 230.00 (652509) 230 kV Bus  b. Clear Fault after 16 cycles and trip the following elements:  b.1. FTRANDL4 (652509) 230.0 kV to FTRANDL7 (652510) 115.0 kV Two Winding #1  b.2. FTRANDL4 (652509) 230.0 kV to FTRDL56G (652548) 13.8 kV Two Winding #1  b.3. FTRANDL4 (652509) 230.0 kV to FTRANDL7 (652510) 115.0 kV Two Winding #2 |
| REGIONAL\_FAULT\_89\_P4 | P4 | Single Phase Fault with Stuck Breaker on FTRANDL4 230.00 (652509) 230 kV Bus  a. Apply Fault at the FTRANDL4 230.00 (652509) 230 kV Bus  b. Clear Fault after 16 cycles and trip the following elements:  b.1. FTRANDL4 (652509) 230.0 kV to FTRANDL7 (652510) 115.0 kV Two Winding #1  b.2. FTRANDL4 (652509) 230.0 kV to LAKPLAT-ER4 (655475) 230.0 kV Transmission Circuit #1  b.3. FTRANDL4 (652509) 230.0 kV to FTRANDL7 (652510) 115.0 kV Two Winding #2 |
| REGIONAL\_FAULT\_90\_P4 | P4 | Single Phase Fault with Stuck Breaker on FTRANDL4 230.00 (652509) 230 kV Bus  a. Apply Fault at the FTRANDL4 230.00 (652509) 230 kV Bus  b. Clear Fault after 16 cycles and trip the following elements:  b.1. FTRANDL4 (652509) 230.0 kV to FTRANDL7 (652510) 115.0 kV Two Winding #1  b.2. FTRANDL4 (652509) 230.0 kV to FTRDL34G (652547) 13.8 kV Two Winding #1  b.3. FTRANDL4 (652509) 230.0 kV to FTRANDL7 (652510) 115.0 kV Two Winding #2 |
| REGIONAL\_FAULT\_91\_P4 | P4 | Single Phase Fault with Stuck Breaker on FTRANDL4 230.00 (652509) 230 kV Bus  a. Apply Fault at the FTRANDL4 230.00 (652509) 230 kV Bus  b. Clear Fault after 16 cycles and trip the following elements:  b.1. FTRANDL4 (652509) 230.0 kV to FTRANDL7 (652510) 115.0 kV Two Winding #1  b.2. FTRANDL4 (652509) 230.0 kV to FTRANDL7 (652510) 115.0 kV Two Winding #2 |
| REGIONAL\_FAULT\_92\_P4 | P4 | Single Phase Fault with Stuck Breaker on FTRANDL4 230.00 (652509) 230 kV Bus  a. Apply Fault at the FTRANDL4 230.00 (652509) 230 kV Bus  b. Clear Fault after 16 cycles and trip the following elements:  b.1. FTRANDL4 (652509) 230.0 kV to FTRANDL7 (652510) 115.0 kV Two Winding #1  b.2. FTRANDL4 (652509) 230.0 kV to FTRANDL7 (652510) 115.0 kV Two Winding #2 |
| REGIONAL\_FAULT\_93\_P4 | P4 | Single Phase Fault with Stuck Breaker on FTRANDL4 230.00 (652509) 230 kV Bus  a. Apply Fault at the FTRANDL4 230.00 (652509) 230 kV Bus  b. Clear Fault after 16 cycles and trip the following elements:  b.1. FTRANDL4 (652509) 230.0 kV to FTRANDL7 (652510) 115.0 kV Two Winding #1  b.2. FTRANDL4 (652509) 230.0 kV to FTRANDL7 (652510) 115.0 kV Two Winding #2 |
| REGIONAL\_FAULT\_94\_P4 | P4 | Single Phase Fault with Stuck Breaker on FTRANDL4 230.00 (652509) 230 kV Bus  a. Apply Fault at the FTRANDL4 230.00 (652509) 230 kV Bus  b. Clear Fault after 16 cycles and trip the following elements:  b.1. FTRANDL4 (652509) 230.0 kV to FTRANDL7 (652510) 115.0 kV Two Winding #1  b.2. FTRANDL4 (652509) 230.0 kV to FTRANDL7 (652510) 115.0 kV Two Winding #2 |
| REGIONAL\_FAULT\_95\_P4 | P4 | Single Phase Fault with Stuck Breaker on FTRANDL4 230.00 (652509) 230 kV Bus  a. Apply Fault at the FTRANDL4 230.00 (652509) 230 kV Bus  b. Clear Fault after 16 cycles and trip the following elements:  b.1. FTRANDL4 (652509) 230.0 kV to FTRANDL7 (652510) 115.0 kV Two Winding #1  b.2. FTRANDL4 (652509) 230.0 kV to FTRANDL7 (652510) 115.0 kV Two Winding #2 |
| REGIONAL\_FAULT\_96\_P4 | P4 | Single Phase Fault with Stuck Breaker on FTRANDL4 230.00 (652509) 230 kV Bus  a. Apply Fault at the FTRANDL4 230.00 (652509) 230 kV Bus  b. Clear Fault after 16 cycles and trip the following elements:  b.1. FTRANDL4 (652509) 230.0 kV to FTRANDL7 (652510) 115.0 kV Two Winding #1  b.2. FTRANDL4 (652509) 230.0 kV to FTRANDL7 (652510) 115.0 kV Two Winding #2 |
| REGIONAL\_FAULT\_97\_P4 | P4 | Single Phase Fault with Stuck Breaker on FTRANDL4 230.00 (652509) 230 kV Bus  a. Apply Fault at the FTRANDL4 230.00 (652509) 230 kV Bus  b. Clear Fault after 16 cycles and trip the following elements:  b.1. FTRANDL4 (652509) 230.0 kV to FTRANDL7 (652510) 115.0 kV Two Winding #1  b.2. FTRANDL4 (652509) 230.0 kV to FTRANDL7 (652510) 115.0 kV Two Winding #2 |
| REGIONAL\_FAULT\_98\_P4 | P4 | Single Phase Fault with Stuck Breaker on FTRANDL4 230.00 (652509) 230 kV Bus  a. Apply Fault at the FTRANDL4 230.00 (652509) 230 kV Bus  b. Clear Fault after 16 cycles and trip the following elements:  b.1. FTRANDL4 (652509) 230.0 kV to FTRANDL7 (652510) 115.0 kV Two Winding #1  b.2. FTRANDL4 (652509) 230.0 kV to FTRANDL7 (652510) 115.0 kV Two Winding #2 |
| REGIONAL\_FAULT\_99\_P4 | P4 | Single Phase Fault with Stuck Breaker on FTRANDL4 230.00 (652509) 230 kV Bus  a. Apply Fault at the FTRANDL4 230.00 (652509) 230 kV Bus  b. Clear Fault after 16 cycles and trip the following elements:  b.1. FTRANDL4 (652509) 230.0 kV to FTRANDL7 (652510) 115.0 kV Two Winding #1  b.2. FTRANDL4 (652509) 230.0 kV to FTRANDL7 (652510) 115.0 kV Two Winding #2 |
| REGIONAL\_FAULT\_100\_P4 | P4 | Single Phase Fault with Stuck Breaker on FTRANDL4 230.00 (652509) 230 kV Bus  a. Apply Fault at the FTRANDL4 230.00 (652509) 230 kV Bus  b. Clear Fault after 16 cycles and trip the following elements:  b.1. FTRANDL4 (652509) 230.0 kV to FTRANDL7 (652510) 115.0 kV Two Winding #1  b.2. FTRANDL4 (652509) 230.0 kV to FTRANDL7 (652510) 115.0 kV Two Winding #2 |
| REGIONAL\_FAULT\_101\_P4 | P4 | Single Phase Fault with Stuck Breaker on MINGO 7 345.00 (531451) 345 kV Bus  a. Apply Fault at the MINGO 7 345.00 (531451) 345 kV Bus  b. Clear Fault after 16 cycles and trip the following elements:  b.1. MINGTER (531453) 13.8 kV to MINGO 3 (531429) 115.0 kV to MINGO 7 (531451) 345.0 kV Three Winding #1  b.2. MINGO 7 (531451) 345.0 kV to REDWILO3 (640325) 345.0 kV Transmission Circuit #1 |
| REGIONAL\_FAULT\_102\_P4 | P4 | Single Phase Fault with Stuck Breaker on GENTLMN3 345.00 (640183) 345 kV Bus  a. Apply Fault at the GENTLMN3 345.00 (640183) 345 kV Bus  b. Clear Fault after 16 cycles and trip the following elements:  b.1. GENTLMN3 (640183) 345.0 kV to SWEET W3 (640374) 345.0 kV Transmission Circuit #1  b.2. GENTLMN3 (640183) 345.0 kV to THEDFRD3 (640500) 345.0 kV Transmission Circuit #1 |
| REGIONAL\_FAULT\_103\_P4 | P4 | Single Phase Fault with Stuck Breaker on SIOUXCY4 230.00 (652565) 230 kV Bus  a. Apply Fault at the SIOUXCY4 230.00 (652565) 230 kV Bus  b. Clear Fault after 16 cycles and trip the following elements:  b.1. SIOUXCY4 (652565) 230.0 kV to SIOUXCY5 (652566) 161.0 kV to SIOUXC49 (652310) 13.8 kV Three Winding #1  b.4. SIOUXCY3 (652564) 345.0 kV to SIOUXCY2 (652552) 230.0 kV to SIOUXC19 (652304) 13.8 kV Three Winding #1  b.7. SIOUXCY3 (652564) 345.0 kV to SIOUXCY2 (652552) 230.0 kV to SIOUXC29 (652305) 13.8 kV Three Winding #1  b.10. SIOUXCY4 (652565) 230.0 kV to SIOUXCY5 (652566) 161.0 kV to SIOUXC39 (652308) 13.8 kV Three Winding #1  b.13. TWIN CH4 (640386) 230.0 kV to SIOUXCY4 (652565) 230.0 kV Transmission Circuit #1  b.14. FTRANDL4 (652509) 230.0 kV to SIOUXCY4 (652565) 230.0 kV Transmission Circuit #1  b.15. SIOUXCY2 (652552) 230.0 kV to SIOUXCY4 (652565) 230.0 kV Transmission Circuit #z1  b.16. SIOUXCY2 (652552) 230.0 kV to SIOUXCY4 (652565) 230.0 kV Transmission Circuit #z2  b.17. SIOUXCY4 (652565) 230.0 kV to DENISON4 (652567) 230.0 kV Transmission Circuit #1  b.18. SIOUXCY4 (652565) 230.0 kV to RASMUSN-ER4 (655484) 230.0 kV Transmission Circuit #1 |
| REGIONAL\_FAULT\_104\_P4 | P4 | Single Phase Fault with Stuck Breaker on GENTLMN3 345.00 (640183) 345 kV Bus  a. Apply Fault at the GENTLMN3 345.00 (640183) 345 kV Bus  b. Clear Fault after 16 cycles and trip the following elements:  b.1. GENTLMN3 (640183) 345.0 kV to SWEET W3 (640374) 345.0 kV Transmission Circuit #2  b.2. GENTLMN3 (640183) 345.0 kV to REDWILO3 (640325) 345.0 kV Transmission Circuit #1 |
| REGIONAL\_FAULT\_105\_P4 | P4 | Single Phase Fault with Stuck Breaker on GENTLMN3 345.00 (640183) 345 kV Bus  a. Apply Fault at the GENTLMN3 345.00 (640183) 345 kV Bus  b. Clear Fault after 16 cycles and trip the following elements:  b.1. GENTLMN3 (640183) 345.0 kV to KEYSTON3 (640252) 345.0 kV Transmission Circuit #1  b.2. GENTLMN4 (640184) 230.0 kV to GENTLMN3 (640183) 345.0 kV to GENTLEMANT29 (643066) 13.8 kV Three Winding #2 |
| REGIONAL\_FAULT\_106\_P4 | P4 | Single Phase Fault with Stuck Breaker on GENTLMN3 345.00 (640183) 345 kV Bus  a. Apply Fault at the GENTLMN3 345.00 (640183) 345 kV Bus  b. Clear Fault after 16 cycles and trip the following elements:  b.1. GENTLMN3 (640183) 345.0 kV to GENTLM2G (640011) 24.0 kV Two Winding #1  b.2. GENTLMN4 (640184) 230.0 kV to GENTLMN3 (640183) 345.0 kV to G.GENT19 (640185) 13.8 kV Three Winding #1 |
| REGIONAL\_FAULT\_107\_P4 | P4 | Single Phase Fault with Stuck Breaker on GENTLMN3 345.00 (640183) 345 kV Bus  a. Apply Fault at the GENTLMN3 345.00 (640183) 345 kV Bus  b. Clear Fault after 16 cycles and trip the following elements:  b.1. GENTLMN4 (640184) 230.0 kV to OGALALA4 (640302) 230.0 kV Transmission Circuit #1  b.2. GENTLMN4 (640184) 230.0 kV to GENTLMN3 (640183) 345.0 kV to GENTLEMANT29 (643066) 13.8 kV Three Winding #2 |
| REGIONAL\_FAULT\_108\_P4 | P4 | Single Phase Fault with Stuck Breaker on SWEET W3 345.00 (640374) 345 kV Bus  a. Apply Fault at the SWEET W3 345.00 (640374) 345 kV Bus  b. Clear Fault after 16 cycles and trip the following elements:  b.1. SWEET W3 (640374) 345.0 kV to GR ISLD3 (653571) 345.0 kV Transmission Circuit #1  b.2. GENTLMN3 (640183) 345.0 kV to SWEET W3 (640374) 345.0 kV Transmission Circuit #1 |
| REGIONAL\_FAULT\_109\_P4 | P4 | Single Phase Fault with Stuck Breaker on KEYSTON3 345.00 (640252) 345 kV Bus  a. Apply Fault at the KEYSTON3 345.00 (640252) 345 kV Bus  b. Clear Fault after 16 cycles and trip the following elements:  b.1. GENTLMN3 (640183) 345.0 kV to KEYSTON3 (640252) 345.0 kV Transmission Circuit #1  b.2. KEYSTON3 (640252) 345.0 kV to SD.LS-KS-MB3 (659425) 345.0 kV Transmission Circuit #1  b.3. SIDNEY\_\_-MB3 (659133) 345.0 kV to SD.LS-KS-MB3 (659425) 345.0 kV Transmission Circuit #z  b.4. KEYSTON7 (640253) 115.0 kV to KEYSTON3 (640252) 345.0 kV to KEYSTON9 (640254) 13.8 kV Three Winding #1 |
| REGIONAL\_FAULT\_110\_P4 | P4 | Single Phase Fault with Stuck Breaker on SWEET W3 345.00 (640374) 345 kV Bus  a. Apply Fault at the SWEET W3 345.00 (640374) 345 kV Bus  b. Clear Fault after 16 cycles and trip the following elements:  b.1. AXTELL 3 (640065) 345.0 kV to SWEET W3 (640374) 345.0 kV Transmission Circuit #1  b.2. GENTLMN3 (640183) 345.0 kV to SWEET W3 (640374) 345.0 kV Transmission Circuit #2 |
| REGIONAL\_FAULT\_111\_P4 | P4 | Single Phase Fault with Stuck Breaker on SWEET W3 345.00 (640374) 345 kV Bus  a. Apply Fault at the SWEET W3 345.00 (640374) 345 kV Bus  b. Clear Fault after 16 cycles and trip the following elements:  b.1. SWEET W3 (640374) 345.0 kV to GR ISLD3 (653571) 345.0 kV Transmission Circuit #1  b.2. GENTLMN3 (640183) 345.0 kV to SWEET W3 (640374) 345.0 kV Transmission Circuit #2 |
| REGIONAL\_FAULT\_112\_P4 | P4 | Single Phase Fault with Stuck Breaker on SWEET W3 345.00 (640374) 345 kV Bus  a. Apply Fault at the SWEET W3 345.00 (640374) 345 kV Bus  b. Clear Fault after 16 cycles and trip the following elements:  b.1. AXTELL 3 (640065) 345.0 kV to SWEET W3 (640374) 345.0 kV Transmission Circuit #1  b.2. GENTLMN3 (640183) 345.0 kV to SWEET W3 (640374) 345.0 kV Transmission Circuit #1 |
| REGIONAL\_FAULT\_113\_P4 | P4 | Single Phase Fault with Stuck Breaker on REDWILO3 345.00 (640325) 345 kV Bus  a. Apply Fault at the REDWILO3 345.00 (640325) 345 kV Bus  b. Clear Fault after 16 cycles and trip the following elements:  b.1. GENTLMN3 (640183) 345.0 kV to REDWILO3 (640325) 345.0 kV Transmission Circuit #1  b.2. MINGO 7 (531451) 345.0 kV to REDWILO3 (640325) 345.0 kV Transmission Circuit #1  b.3. REDWILO7 (640326) 115.0 kV to REDWILO3 (640325) 345.0 kV to REDWILO9 (640327) 13.8 kV Three Winding #1 |
| REGIONAL\_FAULT\_114\_P4 | P4 | Single Phase Fault with Stuck Breaker on AXTELL 3 345.00 (640065) 345 kV Bus  a. Apply Fault at the AXTELL 3 345.00 (640065) 345 kV Bus  b. Clear Fault after 16 cycles and trip the following elements:  b.1. AXTELL 3 (640065) 345.0 kV to SWEET W3 (640374) 345.0 kV Transmission Circuit #1  b.2. AXTELL 7 (640066) 115.0 kV to AXTELL 3 (640065) 345.0 kV to AXTELL 9 (640067) 13.8 kV Three Winding #1 |
| REGIONAL\_FAULT\_115\_P4 | P4 | Single Phase Fault with Stuck Breaker on AXTELL 3 345.00 (640065) 345 kV Bus  a. Apply Fault at the AXTELL 3 345.00 (640065) 345 kV Bus  b. Clear Fault after 16 cycles and trip the following elements:  b.1. AXTELL 7 (640066) 115.0 kV to AXTELL 3 (640065) 345.0 kV to AXTELL 9 (640067) 13.8 kV Three Winding #1  b.2. G16-050-TAP (560082) 345.0 kV to AXTELL 3 (640065) 345.0 kV Transmission Circuit #1 |
| REGIONAL\_FAULT\_116\_P4 | P4 | Single Phase Fault with Stuck Breaker on AXTELL 3 345.00 (640065) 345 kV Bus  a. Apply Fault at the AXTELL 3 345.00 (640065) 345 kV Bus  b. Clear Fault after 16 cycles and trip the following elements:  b.1. AXTELL 3 (640065) 345.0 kV to PAULINE3 (640312) 345.0 kV Transmission Circuit #1  b.2. G16-050-TAP (560082) 345.0 kV to AXTELL 3 (640065) 345.0 kV Transmission Circuit #1 |
| REGIONAL\_FAULT\_117\_P4 | P4 | Single Phase Fault with Stuck Breaker on AXTELL 3 345.00 (640065) 345 kV Bus  a. Apply Fault at the AXTELL 3 345.00 (640065) 345 kV Bus  b. Clear Fault after 16 cycles and trip the following elements:  b.1. AXTELL 3 (640065) 345.0 kV to PAULINE3 (640312) 345.0 kV Transmission Circuit #1  b.2. AXTELL 3 (640065) 345.0 kV to SWEET W3 (640374) 345.0 kV Transmission Circuit #1 |
| REGIONAL\_FAULT\_118\_P4 | P4 | Single Phase Fault with Stuck Breaker on COOPER 3 345.00 (640139) 345 kV Bus  a. Apply Fault at the COOPER 3 345.00 (640139) 345 kV Bus  b. Clear Fault after 16 cycles and trip the following elements:  b.1. ST JOE 7 (541199) 345.0 kV to COOPER 3 (640139) 345.0 kV Transmission Circuit #1  b.2. ATCHSN 3 (635017) 345.0 kV to COOPER 3 (640139) 345.0 kV Transmission Circuit #1 |
| REGIONAL\_FAULT\_119\_P4 | P4 | Single Phase Fault with Stuck Breaker on COOPER 3 345.00 (640139) 345 kV Bus  a. Apply Fault at the COOPER 3 345.00 (640139) 345 kV Bus  b. Clear Fault after 16 cycles and trip the following elements:  b.1. COOPER 3 (640139) 345.0 kV to MONOLITH 3 (640590) 345.0 kV Transmission Circuit #1  b.2. COOPER 3 (640139) 345.0 kV to COOPER1G (640009) 22.0 kV Two Winding #1 |
| REGIONAL\_FAULT\_120\_P4 | P4 | Single Phase Fault with Stuck Breaker on COOPER 3 345.00 (640139) 345 kV Bus  a. Apply Fault at the COOPER 3 345.00 (640139) 345 kV Bus  b. Clear Fault after 16 cycles and trip the following elements:  b.1. COOPER 3 (640139) 345.0 kV to S3458 3 (645458) 345.0 kV Transmission Circuit #1  b.2. COOPER 5 (640140) 161.0 kV to COOPER 3 (640139) 345.0 kV to COOPER T2 9 (640142) 13.8 kV Three Winding #1 |
| REGIONAL\_FAULT\_121\_P4 | P4 | Single Phase Fault with Stuck Breaker on COOPER 3 345.00 (640139) 345 kV Bus  a. Apply Fault at the COOPER 3 345.00 (640139) 345 kV Bus  b. Clear Fault after 16 cycles and trip the following elements:  b.1. 7FAIRPT (300039) 345.0 kV to COOPER 3 (640139) 345.0 kV Transmission Circuit #1  b.2. COOPER 5 (640140) 161.0 kV to COOPER 3 (640139) 345.0 kV to COOPER T5 9 (643172) 13.8 kV Three Winding #1 |
| REGIONAL\_FAULT\_122\_P4 | P4 | Single Phase Fault with Stuck Breaker on COOPER 3 345.00 (640139) 345 kV Bus  a. Apply Fault at the COOPER 3 345.00 (640139) 345 kV Bus  b. Clear Fault after 16 cycles and trip the following elements:  b.1. COOPER 5 (640140) 161.0 kV to S1280 5 (646280) 161.0 kV Transmission Circuit #1  b.2. COOPER 5 (640140) 161.0 kV to COOPER 3 (640139) 345.0 kV to COOPER T2 9 (640142) 13.8 kV Three Winding #1 |
| REGIONAL\_FAULT\_123\_P4 | P4 | Single Phase Fault with Stuck Breaker on HOSKINS3 345.00 (640226) 345 kV Bus  a. Apply Fault at the HOSKINS3 345.00 (640226) 345 kV Bus  b. Clear Fault after 16 cycles and trip the following elements:  b.1. RAUN 3 (635200) 345.0 kV to HOSKINS3 (640226) 345.0 kV Transmission Circuit #1  b.2. HOSKINS4 (640227) 230.0 kV to HOSKINS3 (640226) 345.0 kV to HOSKINS T2 9 (643082) 13.8 kV Three Winding #1 |
| REGIONAL\_FAULT\_124\_P4 | P4 | Single Phase Fault with Stuck Breaker on HOSKINS3 345.00 (640226) 345 kV Bus  a. Apply Fault at the HOSKINS3 345.00 (640226) 345 kV Bus  b. Clear Fault after 16 cycles and trip the following elements:  b.1. RAUN 3 (635200) 345.0 kV to HOSKINS3 (640226) 345.0 kV Transmission Circuit #1  b.2. HOSKINS7 (640228) 115.0 kV to HOSKINS3 (640226) 345.0 kV to HOSKNS19 (640231) 13.8 kV Three Winding #1 |
| REGIONAL\_FAULT\_125\_P4 | P4 | Single Phase Fault with Stuck Breaker on MONOLITH 3 345.00 (640590) 345 kV Bus  a. Apply Fault at the MONOLITH 3 345.00 (640590) 345 kV Bus  b. Clear Fault after 16 cycles and trip the following elements:  b.1. COOPER 3 (640139) 345.0 kV to MONOLITH 3 (640590) 345.0 kV Transmission Circuit #1  b.2. MONOLITH 7 (640591) 115.0 kV to MONOLITH 3 (640590) 345.0 kV to MONOLITHT2 9 (640597) 13.8 kV Three Winding #1 |
| REGIONAL\_FAULT\_126\_P4 | P4 | Single Phase Fault with Stuck Breaker on PAULINE3 345.00 (640312) 345 kV Bus  a. Apply Fault at the PAULINE3 345.00 (640312) 345 kV Bus  b. Clear Fault after 16 cycles and trip the following elements:  b.1. AXTELL 3 (640065) 345.0 kV to PAULINE3 (640312) 345.0 kV Transmission Circuit #1  b.2. PAULINE3 (640312) 345.0 kV to TOBIAS 3 (640525) 345.0 kV Transmission Circuit #1  b.3. PAULINE7 (640313) 115.0 kV to PAULINE3 (640312) 345.0 kV to PAULINE9 (640315) 13.8 kV Three Winding #1 |
| REGIONAL\_FAULT\_127\_P4 | P4 | Single Phase Fault with Stuck Breaker on 7FAIRPT 345.00 (300039) 345 kV Bus  a. Apply Fault at the 7FAIRPT 345.00 (300039) 345 kV Bus  b. Clear Fault after 16 cycles and trip the following elements:  b.1. COOPER 5 (640140) 161.0 kV to COOPER 3 (640139) 345.0 kV to COOPER T5 9 (643172) 13.8 kV Three Winding #1  b.4. 7FAIRPT (300039) 345.0 kV to COOPER 3 (640139) 345.0 kV Transmission Circuit #1  b.5. 7FAIRPT (300039) 345.0 kV to ST JOE 7 (541199) 345.0 kV Transmission Circuit #1  b.6. 5FAIRPTXF3 (301559) 161.0 kV to 7FAIRPT (300039) 345.0 kV Two Winding #3  b.7. 5FAIRPTB2 (300076) 161.0 kV to 5FAIRPTXF3 (301559) 161.0 kV Transmission Circuit #1 |
| REGIONAL\_FAULT\_128\_P4 | P4 | Single Phase Fault with Stuck Breaker on S3451 3 345.00 (645451) 345 kV Bus  a. Apply Fault at the S3451 3 345.00 (645451) 345 kV Bus  b. Clear Fault after 16 cycles and trip the following elements:  b.1. RAUN 3 (635200) 345.0 kV to S3451 3 (645451) 345.0 kV Transmission Circuit #1  b.2. S3451 3 (645451) 345.0 kV to S1251 5 (646251) 161.0 kV to S3451T49 (648351) 13.8 kV Three Winding #1 |
| REGIONAL\_FAULT\_129\_P4 | P4 | Single Phase Fault with Stuck Breaker on S3451 3 345.00 (645451) 345 kV Bus  a. Apply Fault at the S3451 3 345.00 (645451) 345 kV Bus  b. Clear Fault after 16 cycles and trip the following elements:  b.1. RAUN 3 (635200) 345.0 kV to S3451 3 (645451) 345.0 kV Transmission Circuit #1  b.2. S3451 3 (645451) 345.0 kV to S1251 5 (646251) 161.0 kV to S3451T49 (648351) 13.8 kV Three Winding #1 |
| REGIONAL\_FAULT\_130\_P4 | P4 | Single Phase Fault with Stuck Breaker on S3451 3 345.00 (645451) 345 kV Bus  a. Apply Fault at the S3451 3 345.00 (645451) 345 kV Bus  b. Clear Fault after 16 cycles and trip the following elements:  b.1. RAUN 3 (635200) 345.0 kV to S3451 3 (645451) 345.0 kV Transmission Circuit #1  b.2. S3451 3 (645451) 345.0 kV to S1251 5 (646251) 161.0 kV to S3451T49 (648351) 13.8 kV Three Winding #1 |
| REGIONAL\_FAULT\_131\_P4 | P4 | Single Phase Fault with Stuck Breaker on S3451 3 345.00 (645451) 345 kV Bus  a. Apply Fault at the S3451 3 345.00 (645451) 345 kV Bus  b. Clear Fault after 16 cycles and trip the following elements:  b.1. RAUN 3 (635200) 345.0 kV to S3451 3 (645451) 345.0 kV Transmission Circuit #1  b.2. S3451 3 (645451) 345.0 kV to S1251 5 (646251) 161.0 kV to S3451T49 (648351) 13.8 kV Three Winding #1 |
| REGIONAL\_FAULT\_132\_P4 | P4 | Single Phase Fault with Stuck Breaker on S3456 3 345.00 (645456) 345 kV Bus  a. Apply Fault at the S3456 3 345.00 (645456) 345 kV Bus  b. Clear Fault after 16 cycles and trip the following elements:  b.1. CBLUFFS3 (635000) 345.0 kV to S3456 3 (645456) 345.0 kV Transmission Circuit #1  b.2. S3455 3 (645455) 345.0 kV to S3456 3 (645456) 345.0 kV Transmission Circuit #1 |
| REGIONAL\_FAULT\_133\_P4 | P4 | Single Phase Fault with Stuck Breaker on S3456 3 345.00 (645456) 345 kV Bus  a. Apply Fault at the S3456 3 345.00 (645456) 345 kV Bus  b. Clear Fault after 16 cycles and trip the following elements:  b.1. CBLUFFS3 (635000) 345.0 kV to S3456 3 (645456) 345.0 kV Transmission Circuit #1  b.2. S3455 3 (645455) 345.0 kV to S3456 3 (645456) 345.0 kV Transmission Circuit #1 |
| REGIONAL\_FAULT\_134\_P4 | P4 | Single Phase Fault with Stuck Breaker on S3456 3 345.00 (645456) 345 kV Bus  a. Apply Fault at the S3456 3 345.00 (645456) 345 kV Bus  b. Clear Fault after 16 cycles and trip the following elements:  b.1. S3456 3 (645456) 345.0 kV to S3458 3 (645458) 345.0 kV Transmission Circuit #1  b.2. CBLUFFS3 (635000) 345.0 kV to S3456 3 (645456) 345.0 kV Transmission Circuit #1 |
| REGIONAL\_FAULT\_135\_P4 | P4 | Single Phase Fault with Stuck Breaker on S3456 3 345.00 (645456) 345 kV Bus  a. Apply Fault at the S3456 3 345.00 (645456) 345 kV Bus  b. Clear Fault after 16 cycles and trip the following elements:  b.1. S3456 3 (645456) 345.0 kV to S3458 3 (645458) 345.0 kV Transmission Circuit #1  b.2. CBLUFFS3 (635000) 345.0 kV to S3456 3 (645456) 345.0 kV Transmission Circuit #1 |
| REGIONAL\_FAULT\_136\_P4 | P4 | Single Phase Fault with Stuck Breaker on COOPER 3 345.00 (640139) 345 kV Bus  a. Apply Fault at the COOPER 3 345.00 (640139) 345 kV Bus  b. Clear Fault after 16 cycles and trip the following elements:  b.1. COOPER 5 (640140) 161.0 kV to S1280 5 (646280) 161.0 kV Transmission Circuit #1  b.2. COOPER 5 (640140) 161.0 kV to COOPER 3 (640139) 345.0 kV to COOPER T2 9 (640142) 13.8 kV Three Winding #1 |
| REGIONAL\_FAULT\_137\_P4 | P4 | Single Phase Fault with Stuck Breaker on COOPER 3 345.00 (640139) 345 kV Bus  a. Apply Fault at the COOPER 3 345.00 (640139) 345 kV Bus  b. Clear Fault after 16 cycles and trip the following elements:  b.1. COOPER 5 (640140) 161.0 kV to S1280 5 (646280) 161.0 kV Transmission Circuit #1  b.2. COOPER 5 (640140) 161.0 kV to COOPER 3 (640139) 345.0 kV to COOPER T2 9 (640142) 13.8 kV Three Winding #1 |
| REGIONAL\_FAULT\_138\_P4 | P4 | Single Phase Fault with Stuck Breaker on COOPER 3 345.00 (640139) 345 kV Bus  a. Apply Fault at the COOPER 3 345.00 (640139) 345 kV Bus  b. Clear Fault after 16 cycles and trip the following elements:  b.1. COOPER 5 (640140) 161.0 kV to S1280 5 (646280) 161.0 kV Transmission Circuit #1  b.2. COOPER 5 (640140) 161.0 kV to COOPER 3 (640139) 345.0 kV to COOPER T2 9 (640142) 13.8 kV Three Winding #1 |
| REGIONAL\_FAULT\_139\_P4 | P4 | Single Phase Fault with Stuck Breaker on SIOUXCY4 230.00 (652565) 230 kV Bus  a. Apply Fault at the SIOUXCY4 230.00 (652565) 230 kV Bus  b. Clear Fault after 16 cycles and trip the following elements:  b.1. SIOUXCY4 (652565) 230.0 kV to SIOUXCY5 (652566) 161.0 kV to SIOUXC49 (652310) 13.8 kV Three Winding #1  b.4. SIOUXCY3 (652564) 345.0 kV to SIOUXCY2 (652552) 230.0 kV to SIOUXC19 (652304) 13.8 kV Three Winding #1  b.7. SIOUXCY3 (652564) 345.0 kV to SIOUXCY2 (652552) 230.0 kV to SIOUXC29 (652305) 13.8 kV Three Winding #1  b.10. SIOUXCY4 (652565) 230.0 kV to SIOUXCY5 (652566) 161.0 kV to SIOUXC39 (652308) 13.8 kV Three Winding #1  b.13. TWIN CH4 (640386) 230.0 kV to SIOUXCY4 (652565) 230.0 kV Transmission Circuit #1  b.14. FTRANDL4 (652509) 230.0 kV to SIOUXCY4 (652565) 230.0 kV Transmission Circuit #1  b.15. SIOUXCY2 (652552) 230.0 kV to SIOUXCY4 (652565) 230.0 kV Transmission Circuit #z1  b.16. SIOUXCY2 (652552) 230.0 kV to SIOUXCY4 (652565) 230.0 kV Transmission Circuit #z2  b.17. SIOUXCY4 (652565) 230.0 kV to DENISON4 (652567) 230.0 kV Transmission Circuit #1  b.18. SIOUXCY4 (652565) 230.0 kV to RASMUSN-ER4 (655484) 230.0 kV Transmission Circuit #1 |
| REGIONAL\_FAULT\_140\_P4 | P4 | Single Phase Fault with Stuck Breaker on SIOUXCY4 230.00 (652565) 230 kV Bus  a. Apply Fault at the SIOUXCY4 230.00 (652565) 230 kV Bus  b. Clear Fault after 16 cycles and trip the following elements:  b.1. TWIN CH4 (640386) 230.0 kV to SIOUXCY4 (652565) 230.0 kV Transmission Circuit #1  b.2. FTRANDL4 (652509) 230.0 kV to SIOUXCY4 (652565) 230.0 kV Transmission Circuit #1  b.3. SIOUXCY4 (652565) 230.0 kV to DENISON4 (652567) 230.0 kV Transmission Circuit #1  b.4. SIOUXCY4 (652565) 230.0 kV to SIOUXCY5 (652566) 161.0 kV to SIOUXC49 (652310) 13.8 kV Three Winding #1 |
| REGIONAL\_FAULT\_141\_P4 | P4 | Single Phase Fault with Stuck Breaker on SIOUXCY3 345.00 (652564) 345 kV Bus  a. Apply Fault at the SIOUXCY3 345.00 (652564) 345 kV Bus  b. Clear Fault after 16 cycles and trip the following elements:  b.1. RAUN 3 (635200) 345.0 kV to SIOUXCY3 (652564) 345.0 kV Transmission Circuit #1  b.2. SIOUXCY3 (652564) 345.0 kV to SIOUXCY-LNX3 (652864) 345.0 kV Transmission Circuit #z  b.3. SIOUXCY3 (652564) 345.0 kV to SIOUXCY2 (652552) 230.0 kV to SIOUXC19 (652304) 13.8 kV Three Winding #1  b.4. SIOUXCY3 (652564) 345.0 kV to SIOUXCY2 (652552) 230.0 kV to SIOUXC29 (652305) 13.8 kV Three Winding #1  b.7. SPLT RK3 (601006) 345.0 kV to SIOUXCY-LNX3 (652864) 345.0 kV Transmission Circuit #1 |
| REGIONAL\_FAULT\_142\_P4 | P4 | Single Phase Fault with Stuck Breaker on UTICAJC4 230.00 (652526) 230 kV Bus  a. Apply Fault at the UTICAJC4 230.00 (652526) 230 kV Bus  b. Clear Fault after 16 cycles and trip the following elements:  b.1. FTRANDL4 (652509) 230.0 kV to UTICAJC4 (652526) 230.0 kV Transmission Circuit #1  b.2. UTICAJC4 (652526) 230.0 kV to UTICAJC7 (652626) 115.0 kV to UTICAJC9 (652627) 13.2 kV Three Winding #1 |
| REGIONAL\_FAULT\_143\_P4 | P4 | Single Phase Fault with Stuck Breaker on UTICAJC4 230.00 (652526) 230 kV Bus  a. Apply Fault at the UTICAJC4 230.00 (652526) 230 kV Bus  b. Clear Fault after 16 cycles and trip the following elements:  b.1. FTRANDL4 (652509) 230.0 kV to UTICAJC4 (652526) 230.0 kV Transmission Circuit #1  b.2. UTICAJC4 (652526) 230.0 kV to RASMUSN-ER4 (655484) 230.0 kV Transmission Circuit #1 |
| REGIONAL\_FAULT\_144\_P4 | P4 | Single Phase Fault with Stuck Breaker on SIOUXCY4 230.00 (652565) 230 kV Bus  a. Apply Fault at the SIOUXCY4 230.00 (652565) 230 kV Bus  b. Clear Fault after 16 cycles and trip the following elements:  b.1. TWIN CH4 (640386) 230.0 kV to SIOUXCY4 (652565) 230.0 kV Transmission Circuit #1  b.2. FTRANDL4 (652509) 230.0 kV to SIOUXCY4 (652565) 230.0 kV Transmission Circuit #1  b.3. SIOUXCY4 (652565) 230.0 kV to DENISON4 (652567) 230.0 kV Transmission Circuit #1  b.4. SIOUXCY4 (652565) 230.0 kV to SIOUXCY5 (652566) 161.0 kV to SIOUXC49 (652310) 13.8 kV Three Winding #1 |
| REGIONAL\_FAULT\_145\_P4 | P4 | Single Phase Fault with Stuck Breaker on SIOUXCY3 345.00 (652564) 345 kV Bus  a. Apply Fault at the SIOUXCY3 345.00 (652564) 345 kV Bus  b. Clear Fault after 16 cycles and trip the following elements:  b.1. RAUN 3 (635200) 345.0 kV to SIOUXCY3 (652564) 345.0 kV Transmission Circuit #1  b.2. SIOUXCY3 (652564) 345.0 kV to SIOUXCY-LNX3 (652864) 345.0 kV Transmission Circuit #z  b.3. SIOUXCY3 (652564) 345.0 kV to SIOUXCY2 (652552) 230.0 kV to SIOUXC19 (652304) 13.8 kV Three Winding #1  b.4. SIOUXCY3 (652564) 345.0 kV to SIOUXCY2 (652552) 230.0 kV to SIOUXC29 (652305) 13.8 kV Three Winding #1  b.7. SPLT RK3 (601006) 345.0 kV to SIOUXCY-LNX3 (652864) 345.0 kV Transmission Circuit #1 |
| REGIONAL\_FAULT\_146\_P4 | P4 | Single Phase Fault with Stuck Breaker on UTICAJC4 230.00 (652526) 230 kV Bus  a. Apply Fault at the UTICAJC4 230.00 (652526) 230 kV Bus  b. Clear Fault after 16 cycles and trip the following elements:  b.1. FTRANDL4 (652509) 230.0 kV to UTICAJC4 (652526) 230.0 kV Transmission Circuit #1  b.2. UTICAJC4 (652526) 230.0 kV to UTICAJC7 (652626) 115.0 kV to UTICAJC9 (652627) 13.2 kV Three Winding #1 |
| REGIONAL\_FAULT\_147\_P4 | P4 | Single Phase Fault with Stuck Breaker on SIOUXCY4 230.00 (652565) 230 kV Bus  a. Apply Fault at the SIOUXCY4 230.00 (652565) 230 kV Bus  b. Clear Fault after 16 cycles and trip the following elements:  b.1. TWIN CH4 (640386) 230.0 kV to SIOUXCY4 (652565) 230.0 kV Transmission Circuit #1  b.2. FTRANDL4 (652509) 230.0 kV to SIOUXCY4 (652565) 230.0 kV Transmission Circuit #1  b.3. SIOUXCY4 (652565) 230.0 kV to DENISON4 (652567) 230.0 kV Transmission Circuit #1  b.4. SIOUXCY4 (652565) 230.0 kV to SIOUXCY5 (652566) 161.0 kV to SIOUXC49 (652310) 13.8 kV Three Winding #1 |
| REGIONAL\_FAULT\_148\_P4 | P4 | Single Phase Fault with Stuck Breaker on FTTHOMP4 230.00 (652507) 230 kV Bus  a. Apply Fault at the FTTHOMP4 230.00 (652507) 230 kV Bus  b. Clear Fault after 16 cycles and trip the following elements:  b.1. FTTHOMP4 (652507) 230.0 kV to FTTHOMP8 (652276) 69.0 kV to FTTHOMP9 (652277) 13.8 kV Three Winding #1  b.4. FTTHOMP4 (652507) 230.0 kV to FTRANDL4 (652509) 230.0 kV Transmission Circuit #1 |
| REGIONAL\_FAULT\_149\_P4 | P4 | Single Phase Fault with Stuck Breaker on FTTHOMP4 230.00 (652507) 230 kV Bus  a. Apply Fault at the FTTHOMP4 230.00 (652507) 230 kV Bus  b. Clear Fault after 16 cycles and trip the following elements:  b.1. FTTHOMP4 (652507) 230.0 kV to BIGBND14 (652540) 230.0 kV Transmission Circuit #1  b.2. FTTHOMP4 (652507) 230.0 kV to FTRANDL4 (652509) 230.0 kV Transmission Circuit #1 |
| REGIONAL\_FAULT\_150\_P4 | P4 | Single Phase Fault with Stuck Breaker on FTTHOMP4 230.00 (652507) 230 kV Bus  a. Apply Fault at the FTTHOMP4 230.00 (652507) 230 kV Bus  b. Clear Fault after 16 cycles and trip the following elements:  b.1. FTTHOMP4 (652507) 230.0 kV to BIGBND14 (652540) 230.0 kV Transmission Circuit #1  b.2. FTTHOMP4 (652507) 230.0 kV to FTRANDL4 (652509) 230.0 kV Transmission Circuit #1 |
| REGIONAL\_FAULT\_151\_P4 | P4 | Single Phase Fault with Stuck Breaker on FTRANDL4 230.00 (652509) 230 kV Bus  a. Apply Fault at the FTRANDL4 230.00 (652509) 230 kV Bus  b. Clear Fault after 16 cycles and trip the following elements:  b.1. FTRANDL4 (652509) 230.0 kV to FTRANDL7 (652510) 115.0 kV Two Winding #1  b.2. BONESTL7 (652475) 115.0 kV to GREGORY7 (652478) 115.0 kV Transmission Circuit #1  b.3. BONESTL7 (652475) 115.0 kV to FTRANDL7 (652510) 115.0 kV Transmission Circuit #1  b.4. FTRANDL4 (652509) 230.0 kV to FTRANDL7 (652510) 115.0 kV Two Winding #2 |
| REGIONAL\_FAULT\_152\_P4 | P4 | Single Phase Fault with Stuck Breaker on FTRANDL4 230.00 (652509) 230 kV Bus  a. Apply Fault at the FTRANDL4 230.00 (652509) 230 kV Bus  b. Clear Fault after 16 cycles and trip the following elements:  b.1. FTRANDL4 (652509) 230.0 kV to FTRANDL7 (652510) 115.0 kV Two Winding #1  b.2. ARMOUR 7 (652501) 115.0 kV to FTRANDL7 (652510) 115.0 kV Transmission Circuit #1  b.3. ARMOUR 7 (652501) 115.0 kV to MTVERN 7 (652518) 115.0 kV Transmission Circuit #1  b.4. ARMOUR 9 (652246) 34.5 kV to ARMOUR 7 (652501) 115.0 kV Two Winding #1  b.5. ARMOUR 8 (652249) 69.0 kV to ARMOUR 7 (652501) 115.0 kV Two Winding #1  b.6. FTRANDL4 (652509) 230.0 kV to FTRANDL7 (652510) 115.0 kV Two Winding #2 |
| REGIONAL\_FAULT\_153\_P4 | P4 | Single Phase Fault with Stuck Breaker on FTRANDL4 230.00 (652509) 230 kV Bus  a. Apply Fault at the FTRANDL4 230.00 (652509) 230 kV Bus  b. Clear Fault after 16 cycles and trip the following elements:  b.1. FTRANDL4 (652509) 230.0 kV to FTRANDL7 (652510) 115.0 kV Two Winding #1  b.2. SPENCER7 (640349) 115.0 kV to FTRANDL7 (652510) 115.0 kV Transmission Circuit #1  b.3. FTRANDL4 (652509) 230.0 kV to FTRANDL7 (652510) 115.0 kV Two Winding #2 |
| REGIONAL\_FAULT\_154\_P4 | P4 | Single Phase Fault with Stuck Breaker on FTRANDL4 230.00 (652509) 230 kV Bus  a. Apply Fault at the FTRANDL4 230.00 (652509) 230 kV Bus  b. Clear Fault after 16 cycles and trip the following elements:  b.1. FTRANDL4 (652509) 230.0 kV to FTRANDL7 (652510) 115.0 kV Two Winding #1  b.2. FTRANDL7 (652510) 115.0 kV to WHTSWAN-ER7 (655490) 115.0 kV Transmission Circuit #1  b.3. TYNDALL7 (652525) 115.0 kV to WHTSWAN-ER7 (655490) 115.0 kV Transmission Circuit #1  b.4. FTRANDL4 (652509) 230.0 kV to FTRANDL7 (652510) 115.0 kV Two Winding #2 |
| REGIONAL\_FAULT\_155\_P4 | P4 | Single Phase Fault with Stuck Breaker on FTRANDL4 230.00 (652509) 230 kV Bus  a. Apply Fault at the FTRANDL4 230.00 (652509) 230 kV Bus  b. Clear Fault after 16 cycles and trip the following elements:  b.1. FTRANDL4 (652509) 230.0 kV to FTRANDL7 (652510) 115.0 kV Two Winding #1  b.2. FTRANDL4 (652509) 230.0 kV to SIOUXCY4 (652565) 230.0 kV Transmission Circuit #1  b.3. FTRANDL4 (652509) 230.0 kV to FTRANDL7 (652510) 115.0 kV Two Winding #2 |
| REGIONAL\_FAULT\_156\_P4 | P4 | Single Phase Fault with Stuck Breaker on FTRANDL4 230.00 (652509) 230 kV Bus  a. Apply Fault at the FTRANDL4 230.00 (652509) 230 kV Bus  b. Clear Fault after 16 cycles and trip the following elements:  b.1. FTRANDL4 (652509) 230.0 kV to FTRANDL7 (652510) 115.0 kV Two Winding #1  b.2. FTRANDL4 (652509) 230.0 kV to UTICAJC4 (652526) 230.0 kV Transmission Circuit #1  b.3. FTRANDL4 (652509) 230.0 kV to FTRANDL7 (652510) 115.0 kV Two Winding #2 |
| REGIONAL\_FAULT\_157\_P4 | P4 | Single Phase Fault with Stuck Breaker on FTRANDL4 230.00 (652509) 230 kV Bus  a. Apply Fault at the FTRANDL4 230.00 (652509) 230 kV Bus  b. Clear Fault after 16 cycles and trip the following elements:  b.1. FTRANDL4 (652509) 230.0 kV to FTRANDL7 (652510) 115.0 kV Two Winding #1  b.2. FTTHOMP4 (652507) 230.0 kV to FTRANDL4 (652509) 230.0 kV Transmission Circuit #1  b.3. FTRANDL4 (652509) 230.0 kV to FTRANDL7 (652510) 115.0 kV Two Winding #2 |
| REGIONAL\_FAULT\_158\_P4 | P4 | Single Phase Fault with Stuck Breaker on FTRANDL4 230.00 (652509) 230 kV Bus  a. Apply Fault at the FTRANDL4 230.00 (652509) 230 kV Bus  b. Clear Fault after 16 cycles and trip the following elements:  b.1. FTRANDL4 (652509) 230.0 kV to FTRANDL7 (652510) 115.0 kV Two Winding #1  b.2. MEADOWGROVE4 (640540) 230.0 kV to FTRANDL4 (652509) 230.0 kV Transmission Circuit #1  b.3. FTRANDL4 (652509) 230.0 kV to FTRANDL7 (652510) 115.0 kV Two Winding #2 |
| REGIONAL\_FAULT\_159\_P4 | P4 | Single Phase Fault with Stuck Breaker on FTRANDL4 230.00 (652509) 230 kV Bus  a. Apply Fault at the FTRANDL4 230.00 (652509) 230 kV Bus  b. Clear Fault after 16 cycles and trip the following elements:  b.1. FTRANDL4 (652509) 230.0 kV to FTRANDL7 (652510) 115.0 kV Two Winding #1  b.2. FTRANDL4 (652509) 230.0 kV to LAKPLAT-ER4 (655475) 230.0 kV Transmission Circuit #1  b.3. FTRANDL4 (652509) 230.0 kV to FTRANDL7 (652510) 115.0 kV Two Winding #2 |
| REGIONAL\_FAULT\_160\_P4 | P4 | Single Phase Fault with Stuck Breaker on FTRANDL4 230.00 (652509) 230 kV Bus  a. Apply Fault at the FTRANDL4 230.00 (652509) 230 kV Bus  b. Clear Fault after 16 cycles and trip the following elements:  b.1. FTRANDL4 (652509) 230.0 kV to FTRANDL7 (652510) 115.0 kV Two Winding #1  b.2. BONESTL7 (652475) 115.0 kV to GREGORY7 (652478) 115.0 kV Transmission Circuit #1  b.3. BONESTL7 (652475) 115.0 kV to FTRANDL7 (652510) 115.0 kV Transmission Circuit #1  b.4. FTRANDL4 (652509) 230.0 kV to FTRANDL7 (652510) 115.0 kV Two Winding #2 |
| REGIONAL\_FAULT\_161\_P4 | P4 | Single Phase Fault with Stuck Breaker on FTRANDL4 230.00 (652509) 230 kV Bus  a. Apply Fault at the FTRANDL4 230.00 (652509) 230 kV Bus  b. Clear Fault after 16 cycles and trip the following elements:  b.1. FTRANDL4 (652509) 230.0 kV to FTRANDL7 (652510) 115.0 kV Two Winding #1  b.2. ARMOUR 7 (652501) 115.0 kV to FTRANDL7 (652510) 115.0 kV Transmission Circuit #1  b.3. ARMOUR 7 (652501) 115.0 kV to MTVERN 7 (652518) 115.0 kV Transmission Circuit #1  b.4. ARMOUR 9 (652246) 34.5 kV to ARMOUR 7 (652501) 115.0 kV Two Winding #1  b.5. ARMOUR 8 (652249) 69.0 kV to ARMOUR 7 (652501) 115.0 kV Two Winding #1  b.6. FTRANDL4 (652509) 230.0 kV to FTRANDL7 (652510) 115.0 kV Two Winding #2 |
| REGIONAL\_FAULT\_162\_P4 | P4 | Single Phase Fault with Stuck Breaker on FTRANDL4 230.00 (652509) 230 kV Bus  a. Apply Fault at the FTRANDL4 230.00 (652509) 230 kV Bus  b. Clear Fault after 16 cycles and trip the following elements:  b.1. FTRANDL4 (652509) 230.0 kV to FTRANDL7 (652510) 115.0 kV Two Winding #1  b.2. SPENCER7 (640349) 115.0 kV to FTRANDL7 (652510) 115.0 kV Transmission Circuit #1  b.3. FTRANDL4 (652509) 230.0 kV to FTRANDL7 (652510) 115.0 kV Two Winding #2 |
| REGIONAL\_FAULT\_163\_P4 | P4 | Single Phase Fault with Stuck Breaker on FTRANDL4 230.00 (652509) 230 kV Bus  a. Apply Fault at the FTRANDL4 230.00 (652509) 230 kV Bus  b. Clear Fault after 16 cycles and trip the following elements:  b.1. FTRANDL4 (652509) 230.0 kV to FTRANDL7 (652510) 115.0 kV Two Winding #1  b.2. FTRANDL7 (652510) 115.0 kV to WHTSWAN-ER7 (655490) 115.0 kV Transmission Circuit #1  b.3. TYNDALL7 (652525) 115.0 kV to WHTSWAN-ER7 (655490) 115.0 kV Transmission Circuit #1  b.4. FTRANDL4 (652509) 230.0 kV to FTRANDL7 (652510) 115.0 kV Two Winding #2 |
| REGIONAL\_FAULT\_164\_P4 | P4 | Single Phase Fault with Stuck Breaker on FTRANDL4 230.00 (652509) 230 kV Bus  a. Apply Fault at the FTRANDL4 230.00 (652509) 230 kV Bus  b. Clear Fault after 16 cycles and trip the following elements:  b.1. FTRANDL4 (652509) 230.0 kV to FTRANDL7 (652510) 115.0 kV Two Winding #1  b.2. FTRANDL4 (652509) 230.0 kV to SIOUXCY4 (652565) 230.0 kV Transmission Circuit #1  b.3. FTRANDL4 (652509) 230.0 kV to FTRANDL7 (652510) 115.0 kV Two Winding #2 |
| REGIONAL\_FAULT\_165\_P4 | P4 | Single Phase Fault with Stuck Breaker on FTRANDL4 230.00 (652509) 230 kV Bus  a. Apply Fault at the FTRANDL4 230.00 (652509) 230 kV Bus  b. Clear Fault after 16 cycles and trip the following elements:  b.1. FTRANDL4 (652509) 230.0 kV to FTRANDL7 (652510) 115.0 kV Two Winding #1  b.2. FTRANDL4 (652509) 230.0 kV to UTICAJC4 (652526) 230.0 kV Transmission Circuit #1  b.3. FTRANDL4 (652509) 230.0 kV to FTRANDL7 (652510) 115.0 kV Two Winding #2 |
| REGIONAL\_FAULT\_166\_P4 | P4 | Single Phase Fault with Stuck Breaker on FTRANDL4 230.00 (652509) 230 kV Bus  a. Apply Fault at the FTRANDL4 230.00 (652509) 230 kV Bus  b. Clear Fault after 16 cycles and trip the following elements:  b.1. FTRANDL4 (652509) 230.0 kV to FTRANDL7 (652510) 115.0 kV Two Winding #1  b.2. FTTHOMP4 (652507) 230.0 kV to FTRANDL4 (652509) 230.0 kV Transmission Circuit #1  b.3. FTRANDL4 (652509) 230.0 kV to FTRANDL7 (652510) 115.0 kV Two Winding #2 |
| REGIONAL\_FAULT\_167\_P4 | P4 | Single Phase Fault with Stuck Breaker on FTRANDL4 230.00 (652509) 230 kV Bus  a. Apply Fault at the FTRANDL4 230.00 (652509) 230 kV Bus  b. Clear Fault after 16 cycles and trip the following elements:  b.1. FTRANDL4 (652509) 230.0 kV to FTRANDL7 (652510) 115.0 kV Two Winding #1  b.2. MEADOWGROVE4 (640540) 230.0 kV to FTRANDL4 (652509) 230.0 kV Transmission Circuit #1  b.3. FTRANDL4 (652509) 230.0 kV to FTRANDL7 (652510) 115.0 kV Two Winding #2 |
| REGIONAL\_FAULT\_168\_P4 | P4 | Single Phase Fault with Stuck Breaker on FTRANDL4 230.00 (652509) 230 kV Bus  a. Apply Fault at the FTRANDL4 230.00 (652509) 230 kV Bus  b. Clear Fault after 16 cycles and trip the following elements:  b.1. FTRANDL4 (652509) 230.0 kV to FTRANDL7 (652510) 115.0 kV Two Winding #1  b.2. FTRANDL4 (652509) 230.0 kV to LAKPLAT-ER4 (655475) 230.0 kV Transmission Circuit #1  b.3. FTRANDL4 (652509) 230.0 kV to FTRANDL7 (652510) 115.0 kV Two Winding #2 |
| REGIONAL\_FAULT\_169\_P4 | P4 | Single Phase Fault with Stuck Breaker on FTRANDL4 230.00 (652509) 230 kV Bus  a. Apply Fault at the FTRANDL4 230.00 (652509) 230 kV Bus  b. Clear Fault after 16 cycles and trip the following elements:  b.1. FTRANDL4 (652509) 230.0 kV to FTRANDL7 (652510) 115.0 kV Two Winding #1  b.2. FTRANDL7 (652510) 115.0 kV to FTRDL12G (652546) 13.8 kV Two Winding #1  b.3. FTRANDL4 (652509) 230.0 kV to FTRANDL7 (652510) 115.0 kV Two Winding #2 |
| REGIONAL\_FAULT\_170\_P4 | P4 | Single Phase Fault with Stuck Breaker on FTRANDL4 230.00 (652509) 230 kV Bus  a. Apply Fault at the FTRANDL4 230.00 (652509) 230 kV Bus  b. Clear Fault after 16 cycles and trip the following elements:  b.1. FTRANDL4 (652509) 230.0 kV to FTRANDL7 (652510) 115.0 kV Two Winding #1  b.2. FTRANDL4 (652509) 230.0 kV to FTRDL34G (652547) 13.8 kV Two Winding #1  b.3. FTRANDL4 (652509) 230.0 kV to FTRANDL7 (652510) 115.0 kV Two Winding #2 |
| REGIONAL\_FAULT\_171\_P4 | P4 | Single Phase Fault with Stuck Breaker on FTRANDL4 230.00 (652509) 230 kV Bus  a. Apply Fault at the FTRANDL4 230.00 (652509) 230 kV Bus  b. Clear Fault after 16 cycles and trip the following elements:  b.1. FTRANDL4 (652509) 230.0 kV to FTRANDL7 (652510) 115.0 kV Two Winding #1  b.2. FTRANDL4 (652509) 230.0 kV to FTRDL56G (652548) 13.8 kV Two Winding #1  b.3. FTRANDL4 (652509) 230.0 kV to FTRANDL7 (652510) 115.0 kV Two Winding #2 |
| REGIONAL\_FAULT\_172\_P4 | P4 | Single Phase Fault with Stuck Breaker on FTRANDL4 230.00 (652509) 230 kV Bus  a. Apply Fault at the FTRANDL4 230.00 (652509) 230 kV Bus  b. Clear Fault after 16 cycles and trip the following elements:  b.1. FTRANDL4 (652509) 230.0 kV to FTRANDL7 (652510) 115.0 kV Two Winding #1  b.2. FTRANDL4 (652509) 230.0 kV to FTRDL78G (652549) 13.8 kV Two Winding #1  b.3. FTRANDL4 (652509) 230.0 kV to FTRANDL7 (652510) 115.0 kV Two Winding #2 |
| REGIONAL\_FAULT\_173\_P4 | P4 | Single Phase Fault with Stuck Breaker on FTRANDL4 230.00 (652509) 230 kV Bus  a. Apply Fault at the FTRANDL4 230.00 (652509) 230 kV Bus  b. Clear Fault after 16 cycles and trip the following elements:  b.1. FTRANDL4 (652509) 230.0 kV to FTRANDL7 (652510) 115.0 kV Two Winding #1  b.2. FTRANDL4 (652509) 230.0 kV to FTRANDL7 (652510) 115.0 kV Two Winding #2 |
| REGIONAL\_FAULT\_174\_P4 | P4 | Single Phase Fault with Stuck Breaker on FTRANDL4 230.00 (652509) 230 kV Bus  a. Apply Fault at the FTRANDL4 230.00 (652509) 230 kV Bus  b. Clear Fault after 16 cycles and trip the following elements:  b.1. FTRANDL4 (652509) 230.0 kV to FTRANDL7 (652510) 115.0 kV Two Winding #1  b.2. FTRANDL4 (652509) 230.0 kV to FTRANDL7 (652510) 115.0 kV Two Winding #2 |
| REGIONAL\_FAULT\_175\_P4 | P4 | Single Phase Fault with Stuck Breaker on FTRANDL4 230.00 (652509) 230 kV Bus  a. Apply Fault at the FTRANDL4 230.00 (652509) 230 kV Bus  b. Clear Fault after 16 cycles and trip the following elements:  b.1. FTRANDL4 (652509) 230.0 kV to FTRANDL7 (652510) 115.0 kV Two Winding #1  b.2. FTRANDL7 (652510) 115.0 kV to FTRDL12G (652546) 13.8 kV Two Winding #1  b.3. FTRANDL4 (652509) 230.0 kV to FTRANDL7 (652510) 115.0 kV Two Winding #2 |
| REGIONAL\_FAULT\_176\_P4 | P4 | Single Phase Fault with Stuck Breaker on FTRANDL4 230.00 (652509) 230 kV Bus  a. Apply Fault at the FTRANDL4 230.00 (652509) 230 kV Bus  b. Clear Fault after 16 cycles and trip the following elements:  b.1. FTRANDL4 (652509) 230.0 kV to FTRANDL7 (652510) 115.0 kV Two Winding #1  b.2. FTRANDL4 (652509) 230.0 kV to FTRDL34G (652547) 13.8 kV Two Winding #1  b.3. FTRANDL4 (652509) 230.0 kV to FTRANDL7 (652510) 115.0 kV Two Winding #2 |
| REGIONAL\_FAULT\_177\_P4 | P4 | Single Phase Fault with Stuck Breaker on FTRANDL4 230.00 (652509) 230 kV Bus  a. Apply Fault at the FTRANDL4 230.00 (652509) 230 kV Bus  b. Clear Fault after 16 cycles and trip the following elements:  b.1. FTRANDL4 (652509) 230.0 kV to FTRANDL7 (652510) 115.0 kV Two Winding #1  b.2. FTRANDL4 (652509) 230.0 kV to FTRDL56G (652548) 13.8 kV Two Winding #1  b.3. FTRANDL4 (652509) 230.0 kV to FTRANDL7 (652510) 115.0 kV Two Winding #2 |
| REGIONAL\_FAULT\_178\_P4 | P4 | Single Phase Fault with Stuck Breaker on FTRANDL4 230.00 (652509) 230 kV Bus  a. Apply Fault at the FTRANDL4 230.00 (652509) 230 kV Bus  b. Clear Fault after 16 cycles and trip the following elements:  b.1. FTRANDL4 (652509) 230.0 kV to FTRANDL7 (652510) 115.0 kV Two Winding #1  b.2. FTRANDL4 (652509) 230.0 kV to FTRDL78G (652549) 13.8 kV Two Winding #1  b.3. FTRANDL4 (652509) 230.0 kV to FTRANDL7 (652510) 115.0 kV Two Winding #2 |
| REGIONAL\_FAULT\_179\_P4 | P4 | Single Phase Fault with Stuck Breaker on FTRANDL4 230.00 (652509) 230 kV Bus  a. Apply Fault at the FTRANDL4 230.00 (652509) 230 kV Bus  b. Clear Fault after 16 cycles and trip the following elements:  b.1. FTRANDL4 (652509) 230.0 kV to FTRANDL7 (652510) 115.0 kV Two Winding #1  b.2. FTRANDL4 (652509) 230.0 kV to FTRANDL7 (652510) 115.0 kV Two Winding #2 |
| REGIONAL\_FAULT\_180\_P4 | P4 | Single Phase Fault with Stuck Breaker on FTRANDL4 230.00 (652509) 230 kV Bus  a. Apply Fault at the FTRANDL4 230.00 (652509) 230 kV Bus  b. Clear Fault after 16 cycles and trip the following elements:  b.1. FTRANDL4 (652509) 230.0 kV to FTRANDL7 (652510) 115.0 kV Two Winding #1  b.2. FTRANDL4 (652509) 230.0 kV to FTRANDL7 (652510) 115.0 kV Two Winding #2 |
| REGIONAL\_FAULT\_181\_P4 | P4 | Single Phase Fault with Stuck Breaker on FTRANDL4 230.00 (652509) 230 kV Bus  a. Apply Fault at the FTRANDL4 230.00 (652509) 230 kV Bus  b. Clear Fault after 16 cycles and trip the following elements:  b.1. FTRANDL4 (652509) 230.0 kV to FTRANDL7 (652510) 115.0 kV Two Winding #1  b.2. BONESTL7 (652475) 115.0 kV to GREGORY7 (652478) 115.0 kV Transmission Circuit #1  b.3. BONESTL7 (652475) 115.0 kV to FTRANDL7 (652510) 115.0 kV Transmission Circuit #1  b.4. FTRANDL4 (652509) 230.0 kV to FTRANDL7 (652510) 115.0 kV Two Winding #2 |
| REGIONAL\_FAULT\_182\_P4 | P4 | Single Phase Fault with Stuck Breaker on FTRANDL4 230.00 (652509) 230 kV Bus  a. Apply Fault at the FTRANDL4 230.00 (652509) 230 kV Bus  b. Clear Fault after 16 cycles and trip the following elements:  b.1. FTRANDL4 (652509) 230.0 kV to FTRANDL7 (652510) 115.0 kV Two Winding #1  b.2. FTRANDL7 (652510) 115.0 kV to FTRDL12G (652546) 13.8 kV Two Winding #1  b.3. FTRANDL4 (652509) 230.0 kV to FTRANDL7 (652510) 115.0 kV Two Winding #2 |
| REGIONAL\_FAULT\_183\_P4 | P4 | Single Phase Fault with Stuck Breaker on FTRANDL4 230.00 (652509) 230 kV Bus  a. Apply Fault at the FTRANDL4 230.00 (652509) 230 kV Bus  b. Clear Fault after 16 cycles and trip the following elements:  b.1. FTRANDL4 (652509) 230.0 kV to FTRANDL7 (652510) 115.0 kV Two Winding #1  b.2. ARMOUR 7 (652501) 115.0 kV to FTRANDL7 (652510) 115.0 kV Transmission Circuit #1  b.3. ARMOUR 7 (652501) 115.0 kV to MTVERN 7 (652518) 115.0 kV Transmission Circuit #1  b.4. ARMOUR 9 (652246) 34.5 kV to ARMOUR 7 (652501) 115.0 kV Two Winding #1  b.5. ARMOUR 8 (652249) 69.0 kV to ARMOUR 7 (652501) 115.0 kV Two Winding #1  b.6. FTRANDL4 (652509) 230.0 kV to FTRANDL7 (652510) 115.0 kV Two Winding #2 |
| REGIONAL\_FAULT\_184\_P4 | P4 | Single Phase Fault with Stuck Breaker on FTRANDL4 230.00 (652509) 230 kV Bus  a. Apply Fault at the FTRANDL4 230.00 (652509) 230 kV Bus  b. Clear Fault after 16 cycles and trip the following elements:  b.1. FTRANDL4 (652509) 230.0 kV to FTRANDL7 (652510) 115.0 kV Two Winding #1  b.2. SPENCER7 (640349) 115.0 kV to FTRANDL7 (652510) 115.0 kV Transmission Circuit #1  b.3. FTRANDL4 (652509) 230.0 kV to FTRANDL7 (652510) 115.0 kV Two Winding #2 |
| REGIONAL\_FAULT\_185\_P4 | P4 | Single Phase Fault with Stuck Breaker on FTRANDL4 230.00 (652509) 230 kV Bus  a. Apply Fault at the FTRANDL4 230.00 (652509) 230 kV Bus  b. Clear Fault after 16 cycles and trip the following elements:  b.1. FTRANDL4 (652509) 230.0 kV to FTRANDL7 (652510) 115.0 kV Two Winding #1  b.2. FTRANDL7 (652510) 115.0 kV to WHTSWAN-ER7 (655490) 115.0 kV Transmission Circuit #1  b.3. TYNDALL7 (652525) 115.0 kV to WHTSWAN-ER7 (655490) 115.0 kV Transmission Circuit #1  b.4. FTRANDL4 (652509) 230.0 kV to FTRANDL7 (652510) 115.0 kV Two Winding #2 |
| REGIONAL\_FAULT\_186\_P4 | P4 | Single Phase Fault with Stuck Breaker on FTRANDL4 230.00 (652509) 230 kV Bus  a. Apply Fault at the FTRANDL4 230.00 (652509) 230 kV Bus  b. Clear Fault after 16 cycles and trip the following elements:  b.1. FTRANDL4 (652509) 230.0 kV to FTRANDL7 (652510) 115.0 kV Two Winding #1  b.2. FTRANDL4 (652509) 230.0 kV to FTRANDL7 (652510) 115.0 kV Two Winding #2 |
| REGIONAL\_FAULT\_187\_P4 | P4 | Single Phase Fault with Stuck Breaker on FTRANDL4 230.00 (652509) 230 kV Bus  a. Apply Fault at the FTRANDL4 230.00 (652509) 230 kV Bus  b. Clear Fault after 16 cycles and trip the following elements:  b.1. FTRANDL4 (652509) 230.0 kV to FTRANDL7 (652510) 115.0 kV Two Winding #1  b.2. BONESTL7 (652475) 115.0 kV to GREGORY7 (652478) 115.0 kV Transmission Circuit #1  b.3. BONESTL7 (652475) 115.0 kV to FTRANDL7 (652510) 115.0 kV Transmission Circuit #1  b.4. FTRANDL4 (652509) 230.0 kV to FTRANDL7 (652510) 115.0 kV Two Winding #2 |
| REGIONAL\_FAULT\_188\_P4 | P4 | Single Phase Fault with Stuck Breaker on FTRANDL4 230.00 (652509) 230 kV Bus  a. Apply Fault at the FTRANDL4 230.00 (652509) 230 kV Bus  b. Clear Fault after 16 cycles and trip the following elements:  b.1. FTRANDL4 (652509) 230.0 kV to FTRANDL7 (652510) 115.0 kV Two Winding #1  b.2. FTRANDL7 (652510) 115.0 kV to FTRDL12G (652546) 13.8 kV Two Winding #1  b.3. FTRANDL4 (652509) 230.0 kV to FTRANDL7 (652510) 115.0 kV Two Winding #2 |
| REGIONAL\_FAULT\_189\_P4 | P4 | Single Phase Fault with Stuck Breaker on FTRANDL4 230.00 (652509) 230 kV Bus  a. Apply Fault at the FTRANDL4 230.00 (652509) 230 kV Bus  b. Clear Fault after 16 cycles and trip the following elements:  b.1. FTRANDL4 (652509) 230.0 kV to FTRANDL7 (652510) 115.0 kV Two Winding #1  b.2. ARMOUR 7 (652501) 115.0 kV to FTRANDL7 (652510) 115.0 kV Transmission Circuit #1  b.3. ARMOUR 7 (652501) 115.0 kV to MTVERN 7 (652518) 115.0 kV Transmission Circuit #1  b.4. ARMOUR 9 (652246) 34.5 kV to ARMOUR 7 (652501) 115.0 kV Two Winding #1  b.5. ARMOUR 8 (652249) 69.0 kV to ARMOUR 7 (652501) 115.0 kV Two Winding #1  b.6. FTRANDL4 (652509) 230.0 kV to FTRANDL7 (652510) 115.0 kV Two Winding #2 |
| REGIONAL\_FAULT\_190\_P4 | P4 | Single Phase Fault with Stuck Breaker on FTRANDL4 230.00 (652509) 230 kV Bus  a. Apply Fault at the FTRANDL4 230.00 (652509) 230 kV Bus  b. Clear Fault after 16 cycles and trip the following elements:  b.1. FTRANDL4 (652509) 230.0 kV to FTRANDL7 (652510) 115.0 kV Two Winding #1  b.2. SPENCER7 (640349) 115.0 kV to FTRANDL7 (652510) 115.0 kV Transmission Circuit #1  b.3. FTRANDL4 (652509) 230.0 kV to FTRANDL7 (652510) 115.0 kV Two Winding #2 |
| REGIONAL\_FAULT\_191\_P4 | P4 | Single Phase Fault with Stuck Breaker on FTRANDL4 230.00 (652509) 230 kV Bus  a. Apply Fault at the FTRANDL4 230.00 (652509) 230 kV Bus  b. Clear Fault after 16 cycles and trip the following elements:  b.1. FTRANDL4 (652509) 230.0 kV to FTRANDL7 (652510) 115.0 kV Two Winding #1  b.2. FTRANDL7 (652510) 115.0 kV to WHTSWAN-ER7 (655490) 115.0 kV Transmission Circuit #1  b.3. TYNDALL7 (652525) 115.0 kV to WHTSWAN-ER7 (655490) 115.0 kV Transmission Circuit #1  b.4. FTRANDL4 (652509) 230.0 kV to FTRANDL7 (652510) 115.0 kV Two Winding #2 |
| REGIONAL\_FAULT\_192\_P4 | P4 | Single Phase Fault with Stuck Breaker on FTRANDL4 230.00 (652509) 230 kV Bus  a. Apply Fault at the FTRANDL4 230.00 (652509) 230 kV Bus  b. Clear Fault after 16 cycles and trip the following elements:  b.1. FTRANDL4 (652509) 230.0 kV to FTRANDL7 (652510) 115.0 kV Two Winding #1  b.2. FTRANDL4 (652509) 230.0 kV to FTRANDL7 (652510) 115.0 kV Two Winding #2 |
| REGIONAL\_FAULT\_193\_P4 | P4 | Single Phase Fault with Stuck Breaker on FTRANDL4 230.00 (652509) 230 kV Bus  a. Apply Fault at the FTRANDL4 230.00 (652509) 230 kV Bus  b. Clear Fault after 16 cycles and trip the following elements:  b.1. FTRANDL4 (652509) 230.0 kV to FTRANDL7 (652510) 115.0 kV Two Winding #1  b.2. FTRANDL4 (652509) 230.0 kV to SIOUXCY4 (652565) 230.0 kV Transmission Circuit #1  b.3. FTRANDL4 (652509) 230.0 kV to FTRANDL7 (652510) 115.0 kV Two Winding #2 |
| REGIONAL\_FAULT\_194\_P4 | P4 | Single Phase Fault with Stuck Breaker on FTRANDL4 230.00 (652509) 230 kV Bus  a. Apply Fault at the FTRANDL4 230.00 (652509) 230 kV Bus  b. Clear Fault after 16 cycles and trip the following elements:  b.1. FTRANDL4 (652509) 230.0 kV to FTRANDL7 (652510) 115.0 kV Two Winding #1  b.2. FTRANDL4 (652509) 230.0 kV to UTICAJC4 (652526) 230.0 kV Transmission Circuit #1  b.3. FTRANDL4 (652509) 230.0 kV to FTRANDL7 (652510) 115.0 kV Two Winding #2 |
| REGIONAL\_FAULT\_195\_P4 | P4 | Single Phase Fault with Stuck Breaker on FTRANDL4 230.00 (652509) 230 kV Bus  a. Apply Fault at the FTRANDL4 230.00 (652509) 230 kV Bus  b. Clear Fault after 16 cycles and trip the following elements:  b.1. FTRANDL4 (652509) 230.0 kV to FTRANDL7 (652510) 115.0 kV Two Winding #1  b.2. FTRANDL4 (652509) 230.0 kV to FTRDL78G (652549) 13.8 kV Two Winding #1  b.3. FTRANDL4 (652509) 230.0 kV to FTRANDL7 (652510) 115.0 kV Two Winding #2 |
| REGIONAL\_FAULT\_196\_P4 | P4 | Single Phase Fault with Stuck Breaker on FTRANDL4 230.00 (652509) 230 kV Bus  a. Apply Fault at the FTRANDL4 230.00 (652509) 230 kV Bus  b. Clear Fault after 16 cycles and trip the following elements:  b.1. FTRANDL4 (652509) 230.0 kV to FTRANDL7 (652510) 115.0 kV Two Winding #1  b.2. FTTHOMP4 (652507) 230.0 kV to FTRANDL4 (652509) 230.0 kV Transmission Circuit #1  b.3. FTRANDL4 (652509) 230.0 kV to FTRANDL7 (652510) 115.0 kV Two Winding #2 |
| REGIONAL\_FAULT\_197\_P4 | P4 | Single Phase Fault with Stuck Breaker on FTRANDL4 230.00 (652509) 230 kV Bus  a. Apply Fault at the FTRANDL4 230.00 (652509) 230 kV Bus  b. Clear Fault after 16 cycles and trip the following elements:  b.1. FTRANDL4 (652509) 230.0 kV to FTRANDL7 (652510) 115.0 kV Two Winding #1  b.2. MEADOWGROVE4 (640540) 230.0 kV to FTRANDL4 (652509) 230.0 kV Transmission Circuit #1  b.3. FTRANDL4 (652509) 230.0 kV to FTRANDL7 (652510) 115.0 kV Two Winding #2 |
| REGIONAL\_FAULT\_198\_P4 | P4 | Single Phase Fault with Stuck Breaker on FTRANDL4 230.00 (652509) 230 kV Bus  a. Apply Fault at the FTRANDL4 230.00 (652509) 230 kV Bus  b. Clear Fault after 16 cycles and trip the following elements:  b.1. FTRANDL4 (652509) 230.0 kV to FTRANDL7 (652510) 115.0 kV Two Winding #1  b.2. FTRANDL4 (652509) 230.0 kV to FTRDL56G (652548) 13.8 kV Two Winding #1  b.3. FTRANDL4 (652509) 230.0 kV to FTRANDL7 (652510) 115.0 kV Two Winding #2 |
| REGIONAL\_FAULT\_199\_P4 | P4 | Single Phase Fault with Stuck Breaker on FTRANDL4 230.00 (652509) 230 kV Bus  a. Apply Fault at the FTRANDL4 230.00 (652509) 230 kV Bus  b. Clear Fault after 16 cycles and trip the following elements:  b.1. FTRANDL4 (652509) 230.0 kV to FTRANDL7 (652510) 115.0 kV Two Winding #1  b.2. FTRANDL4 (652509) 230.0 kV to LAKPLAT-ER4 (655475) 230.0 kV Transmission Circuit #1  b.3. FTRANDL4 (652509) 230.0 kV to FTRANDL7 (652510) 115.0 kV Two Winding #2 |
| REGIONAL\_FAULT\_200\_P4 | P4 | Single Phase Fault with Stuck Breaker on FTRANDL4 230.00 (652509) 230 kV Bus  a. Apply Fault at the FTRANDL4 230.00 (652509) 230 kV Bus  b. Clear Fault after 16 cycles and trip the following elements:  b.1. FTRANDL4 (652509) 230.0 kV to FTRANDL7 (652510) 115.0 kV Two Winding #1  b.2. FTRANDL4 (652509) 230.0 kV to FTRDL34G (652547) 13.8 kV Two Winding #1  b.3. FTRANDL4 (652509) 230.0 kV to FTRANDL7 (652510) 115.0 kV Two Winding #2 |
| REGIONAL\_FAULT\_201\_P4 | P4 | Single Phase Fault with Stuck Breaker on FTRANDL4 230.00 (652509) 230 kV Bus  a. Apply Fault at the FTRANDL4 230.00 (652509) 230 kV Bus  b. Clear Fault after 16 cycles and trip the following elements:  b.1. FTRANDL4 (652509) 230.0 kV to FTRANDL7 (652510) 115.0 kV Two Winding #1  b.2. FTRANDL4 (652509) 230.0 kV to FTRANDL7 (652510) 115.0 kV Two Winding #2 |
| REGIONAL\_FAULT\_202\_P4 | P4 | Single Phase Fault with Stuck Breaker on FTRANDL4 230.00 (652509) 230 kV Bus  a. Apply Fault at the FTRANDL4 230.00 (652509) 230 kV Bus  b. Clear Fault after 16 cycles and trip the following elements:  b.1. FTRANDL4 (652509) 230.0 kV to FTRANDL7 (652510) 115.0 kV Two Winding #1  b.2. FTRANDL4 (652509) 230.0 kV to SIOUXCY4 (652565) 230.0 kV Transmission Circuit #1  b.3. FTRANDL4 (652509) 230.0 kV to FTRANDL7 (652510) 115.0 kV Two Winding #2 |
| REGIONAL\_FAULT\_203\_P4 | P4 | Single Phase Fault with Stuck Breaker on FTRANDL4 230.00 (652509) 230 kV Bus  a. Apply Fault at the FTRANDL4 230.00 (652509) 230 kV Bus  b. Clear Fault after 16 cycles and trip the following elements:  b.1. FTRANDL4 (652509) 230.0 kV to FTRANDL7 (652510) 115.0 kV Two Winding #1  b.2. FTRANDL4 (652509) 230.0 kV to UTICAJC4 (652526) 230.0 kV Transmission Circuit #1  b.3. FTRANDL4 (652509) 230.0 kV to FTRANDL7 (652510) 115.0 kV Two Winding #2 |
| REGIONAL\_FAULT\_204\_P4 | P4 | Single Phase Fault with Stuck Breaker on FTRANDL4 230.00 (652509) 230 kV Bus  a. Apply Fault at the FTRANDL4 230.00 (652509) 230 kV Bus  b. Clear Fault after 16 cycles and trip the following elements:  b.1. FTRANDL4 (652509) 230.0 kV to FTRANDL7 (652510) 115.0 kV Two Winding #1  b.2. FTRANDL4 (652509) 230.0 kV to FTRDL78G (652549) 13.8 kV Two Winding #1  b.3. FTRANDL4 (652509) 230.0 kV to FTRANDL7 (652510) 115.0 kV Two Winding #2 |
| REGIONAL\_FAULT\_205\_P4 | P4 | Single Phase Fault with Stuck Breaker on FTRANDL4 230.00 (652509) 230 kV Bus  a. Apply Fault at the FTRANDL4 230.00 (652509) 230 kV Bus  b. Clear Fault after 16 cycles and trip the following elements:  b.1. FTRANDL4 (652509) 230.0 kV to FTRANDL7 (652510) 115.0 kV Two Winding #1  b.2. FTTHOMP4 (652507) 230.0 kV to FTRANDL4 (652509) 230.0 kV Transmission Circuit #1  b.3. FTRANDL4 (652509) 230.0 kV to FTRANDL7 (652510) 115.0 kV Two Winding #2 |
| REGIONAL\_FAULT\_206\_P4 | P4 | Single Phase Fault with Stuck Breaker on FTRANDL4 230.00 (652509) 230 kV Bus  a. Apply Fault at the FTRANDL4 230.00 (652509) 230 kV Bus  b. Clear Fault after 16 cycles and trip the following elements:  b.1. FTRANDL4 (652509) 230.0 kV to FTRANDL7 (652510) 115.0 kV Two Winding #1  b.2. MEADOWGROVE4 (640540) 230.0 kV to FTRANDL4 (652509) 230.0 kV Transmission Circuit #1  b.3. FTRANDL4 (652509) 230.0 kV to FTRANDL7 (652510) 115.0 kV Two Winding #2 |
| REGIONAL\_FAULT\_207\_P4 | P4 | Single Phase Fault with Stuck Breaker on FTRANDL4 230.00 (652509) 230 kV Bus  a. Apply Fault at the FTRANDL4 230.00 (652509) 230 kV Bus  b. Clear Fault after 16 cycles and trip the following elements:  b.1. FTRANDL4 (652509) 230.0 kV to FTRANDL7 (652510) 115.0 kV Two Winding #1  b.2. FTRANDL4 (652509) 230.0 kV to FTRDL56G (652548) 13.8 kV Two Winding #1  b.3. FTRANDL4 (652509) 230.0 kV to FTRANDL7 (652510) 115.0 kV Two Winding #2 |
| REGIONAL\_FAULT\_208\_P4 | P4 | Single Phase Fault with Stuck Breaker on FTRANDL4 230.00 (652509) 230 kV Bus  a. Apply Fault at the FTRANDL4 230.00 (652509) 230 kV Bus  b. Clear Fault after 16 cycles and trip the following elements:  b.1. FTRANDL4 (652509) 230.0 kV to FTRANDL7 (652510) 115.0 kV Two Winding #1  b.2. FTRANDL4 (652509) 230.0 kV to LAKPLAT-ER4 (655475) 230.0 kV Transmission Circuit #1  b.3. FTRANDL4 (652509) 230.0 kV to FTRANDL7 (652510) 115.0 kV Two Winding #2 |
| REGIONAL\_FAULT\_209\_P4 | P4 | Single Phase Fault with Stuck Breaker on FTRANDL4 230.00 (652509) 230 kV Bus  a. Apply Fault at the FTRANDL4 230.00 (652509) 230 kV Bus  b. Clear Fault after 16 cycles and trip the following elements:  b.1. FTRANDL4 (652509) 230.0 kV to FTRANDL7 (652510) 115.0 kV Two Winding #1  b.2. FTRANDL4 (652509) 230.0 kV to FTRDL34G (652547) 13.8 kV Two Winding #1  b.3. FTRANDL4 (652509) 230.0 kV to FTRANDL7 (652510) 115.0 kV Two Winding #2 |
| REGIONAL\_FAULT\_210\_P4 | P4 | Single Phase Fault with Stuck Breaker on FTRANDL4 230.00 (652509) 230 kV Bus  a. Apply Fault at the FTRANDL4 230.00 (652509) 230 kV Bus  b. Clear Fault after 16 cycles and trip the following elements:  b.1. FTRANDL4 (652509) 230.0 kV to FTRANDL7 (652510) 115.0 kV Two Winding #1  b.2. FTRANDL4 (652509) 230.0 kV to FTRANDL7 (652510) 115.0 kV Two Winding #2 |
| REGIONAL\_FAULT\_211\_P4 | P4 | Single Phase Fault with Stuck Breaker on J748POI 345.00 (87487) 345 kV Bus  a. Apply Fault at the J748POI 345.00 (87487) 345 kV Bus  b. Clear Fault after 16 cycles and trip the following elements:  b.1. J748POI (87487) 345.0 kV to CHEROKEE 3 (635399) 345.0 kV Transmission Circuit #1  b.2. J748POI (87487) 345.0 kV to RAUN 3 (635200) 345.0 kV Transmission Circuit #1 |
| REGIONAL\_FAULT\_212\_P4 | P4 | Single Phase Fault with Stuck Breaker on 7FAIRPT 345.00 (300039) 345 kV Bus  a. Apply Fault at the 7FAIRPT 345.00 (300039) 345 kV Bus  b. Clear Fault after 16 cycles and trip the following elements:  b.1. 7FAIRPT (300039) 345.0 kV to COOPER 3 (640139) 345.0 kV Transmission Circuit #1  b.2. 7FAIRPT (300039) 345.0 kV to 5FAIRPTXF3 (301559) 161.0 kV Two Winding #3 |
| REGIONAL\_FAULT\_213\_P4 | P4 | Single Phase Fault with Stuck Breaker on MINGO 7 345.00 (531451) 345 kV Bus  a. Apply Fault at the MINGO 7 345.00 (531451) 345 kV Bus  b. Clear Fault after 16 cycles and trip the following elements:  b.1. MINGO 7 (531451) 345.0 kV to REDWILO3 (640325) 345.0 kV Transmission Circuit #1  b.2. MINGO 7 (531451) 345.0 kV to SETAB 7 (531465) 345.0 kV Transmission Circuit #1 |
| REGIONAL\_FAULT\_214\_P4 | P4 | Single Phase Fault with Stuck Breaker on ST JOE 7 345.00 (541199) 345 kV Bus  a. Apply Fault at the ST JOE 7 345.00 (541199) 345 kV Bus  b. Clear Fault after 16 cycles and trip the following elements:  b.1. ST JOE 7 (541199) 345.0 kV to COOPER 3 (640139) 345.0 kV Transmission Circuit #1  b.2. ST JOE 7 (541199) 345.0 kV to G17-183-TAP (761383) 345.0 kV Transmission Circuit #1 |
| REGIONAL\_FAULT\_215\_P4 | P4 | Single Phase Fault with Stuck Breaker on G16-050-TAP 345.00 (560082) 345 kV Bus  a. Apply Fault at the G16-050-TAP 345.00 (560082) 345 kV Bus  b. Clear Fault after 16 cycles and trip the following elements:  b.1. G16-050-TAP (560082) 345.0 kV to POSTROCK7 (530583) 345.0 kV Transmission Circuit #1  b.2. G16-050-TAP (560082) 345.0 kV to AXTELL 3 (640065) 345.0 kV Transmission Circuit #1 |
| REGIONAL\_FAULT\_216\_P4 | P4 | Single Phase Fault with Stuck Breaker on CBLUFFS3 345.00 (635000) 345 kV Bus  a. Apply Fault at the CBLUFFS3 345.00 (635000) 345 kV Bus  b. Clear Fault after 16 cycles and trip the following elements:  b.1. CBLUFFS3 (635000) 345.0 kV to OVRLND 3 (635014) 345.0 kV Transmission Circuit #1  b.2. CBLUFFS3 (635000) 345.0 kV to S3456 3 (645456) 345.0 kV Transmission Circuit #1 |
| REGIONAL\_FAULT\_217\_P4 | P4 | Single Phase Fault with Stuck Breaker on PNYCRK 3 345.00 (635013) 345 kV Bus  a. Apply Fault at the PNYCRK 3 345.00 (635013) 345 kV Bus  b. Clear Fault after 16 cycles and trip the following elements:  b.1. PNYCRK 3 (635013) 345.0 kV to CBLUFFS3 (635000) 345.0 kV Transmission Circuit #1  b.2. PNYCRK 3 (635013) 345.0 kV to RLHILLS3 (635100) 345.0 kV Transmission Circuit #1 |
| REGIONAL\_FAULT\_218\_P4 | P4 | Single Phase Fault with Stuck Breaker on OVRLND 3 345.00 (635014) 345 kV Bus  a. Apply Fault at the OVRLND 3 345.00 (635014) 345 kV Bus  b. Clear Fault after 16 cycles and trip the following elements:  b.1. OVRLND 3 (635014) 345.0 kV to CBLUFFS3 (635000) 345.0 kV Transmission Circuit #1  b.2. OVRLND 3 (635014) 345.0 kV to FALLOW 3 (635590) 345.0 kV Transmission Circuit #1 |
| REGIONAL\_FAULT\_219\_P4 | P4 | Single Phase Fault with Stuck Breaker on ATCHSN 3 345.00 (635017) 345 kV Bus  a. Apply Fault at the ATCHSN 3 345.00 (635017) 345 kV Bus  b. Clear Fault after 16 cycles and trip the following elements:  b.1. ATCHSN 3 (635017) 345.0 kV to WESTBORO 3 (635018) 345.0 kV Transmission Circuit #1  b.2. ATCHSN 3 (635017) 345.0 kV to COOPER 3 (640139) 345.0 kV Transmission Circuit #1 |
| REGIONAL\_FAULT\_220\_P4 | P4 | Single Phase Fault with Stuck Breaker on RAUN 3 345.00 (635200) 345 kV Bus  a. Apply Fault at the RAUN 3 345.00 (635200) 345 kV Bus  b. Clear Fault after 16 cycles and trip the following elements:  b.1. RAUN 3 (635200) 345.0 kV to SIOUXCY3 (652564) 345.0 kV Transmission Circuit #1  b.2. RAUN 3 (635200) 345.0 kV to RAUN 5 (635201) 161.0 kV Two Winding #2 |
| REGIONAL\_FAULT\_221\_P4 | P4 | Single Phase Fault with Stuck Breaker on AXTELL 3 345.00 (640065) 345 kV Bus  a. Apply Fault at the AXTELL 3 345.00 (640065) 345 kV Bus  b. Clear Fault after 16 cycles and trip the following elements:  b.1. AXTELL 3 (640065) 345.0 kV to SWEET W3 (640374) 345.0 kV Transmission Circuit #1  b.2. AXTELL 3 (640065) 345.0 kV to G16-050-TAP (560082) 345.0 kV Transmission Circuit #1 |
| REGIONAL\_FAULT\_222\_P4 | P4 | Single Phase Fault with Stuck Breaker on COOPER 3 345.00 (640139) 345 kV Bus  a. Apply Fault at the COOPER 3 345.00 (640139) 345 kV Bus  b. Clear Fault after 16 cycles and trip the following elements:  b.1. COOPER 3 (640139) 345.0 kV to ST JOE 7 (541199) 345.0 kV Transmission Circuit #1  b.2. COOPER 3 (640139) 345.0 kV to 7FAIRPT (300039) 345.0 kV Transmission Circuit #1 |
| REGIONAL\_FAULT\_223\_P4 | P4 | Single Phase Fault with Stuck Breaker on GENTLMN3 345.00 (640183) 345 kV Bus  a. Apply Fault at the GENTLMN3 345.00 (640183) 345 kV Bus  b. Clear Fault after 16 cycles and trip the following elements:  b.1. GENTLMN3 (640183) 345.0 kV to REDWILO3 (640325) 345.0 kV Transmission Circuit #1  b.2. GENTLMN3 (640183) 345.0 kV to SWEET W3 (640374) 345.0 kV Transmission Circuit #1 |
| REGIONAL\_FAULT\_224\_P4 | P4 | Single Phase Fault with Stuck Breaker on MEADOWGROVE4230.00 (640540) 230 kV Bus  a. Apply Fault at the MEADOWGROVE4230.00 (640540) 230 kV Bus  b. Clear Fault after 16 cycles and trip the following elements:  b.1. MEADOWGROVE4 (640540) 230.0 kV to COLMBUS4 (640133) 230.0 kV Transmission Circuit #1  b.2. MEADOWGROVE4 (640540) 230.0 kV to FTRANDL4 (652509) 230.0 kV Transmission Circuit #1 |
| REGIONAL\_FAULT\_225\_P4 | P4 | Single Phase Fault with Stuck Breaker on FTTHOMP4 230.00 (652507) 230 kV Bus  a. Apply Fault at the FTTHOMP4 230.00 (652507) 230 kV Bus  b. Clear Fault after 16 cycles and trip the following elements:  b.1. FTTHOMP4 (652507) 230.0 kV to LETCHER4 (652606) 230.0 kV Transmission Circuit #1  b.2. FTTHOMP4 (652507) 230.0 kV to WESSINGTON 4 (652607) 230.0 kV Transmission Circuit #1 |
| REGIONAL\_FAULT\_226\_P4 | P4 | Single Phase Fault with Stuck Breaker on FTRANDL4 230.00 (652509) 230 kV Bus  a. Apply Fault at the FTRANDL4 230.00 (652509) 230 kV Bus  b. Clear Fault after 16 cycles and trip the following elements:  b.1. FTRANDL4 (652509) 230.0 kV to UTICAJC4 (652526) 230.0 kV Transmission Circuit #1  b.2. FTRANDL4 (652509) 230.0 kV to FTTHOMP4 (652507) 230.0 kV Transmission Circuit #1 |
| REGIONAL\_FAULT\_227\_P4 | P4 | Single Phase Fault with Stuck Breaker on AXTELL 3 345.00 (640065) 345 kV Bus  a. Apply Fault at the AXTELL 3 345.00 (640065) 345 kV Bus  b. Clear Fault after 16 cycles and trip the following elements:  b.1. AXTELL 7 (640066) 115.0 kV to AXTELL 3 (640065) 345.0 kV to AXTELL 9 (640067) 13.8 kV Three Winding #1  b.2. AXTELL 7 (640066) 115.0 kV to KEARNEY7 (640250) 115.0 kV Transmission Circuit #1 |
| REGIONAL\_FAULT\_228\_P4 | P4 | Single Phase Fault with Stuck Breaker on COOPER 3 345.00 (640139) 345 kV Bus  a. Apply Fault at the COOPER 3 345.00 (640139) 345 kV Bus  b. Clear Fault after 16 cycles and trip the following elements:  b.1. COOPER 5 (640140) 161.0 kV to S1280 5 (646280) 161.0 kV Transmission Circuit #1  b.2. COOPER 5 (640140) 161.0 kV to COOPER 3 (640139) 345.0 kV to COOPER T2 9 (640142) 13.8 kV Three Winding #1 |
| REGIONAL\_FAULT\_229\_P4 | P4 | Single Phase Fault with Stuck Breaker on GENTLMN4 230.00 (640184) 230 kV Bus  a. Apply Fault at the GENTLMN4 230.00 (640184) 230 kV Bus  b. Clear Fault after 16 cycles and trip the following elements:  b.1. GENTLMN4 (640184) 230.0 kV to N.PLATT4 (640286) 230.0 kV Transmission Circuit #1  b.2. GENTLMN4 (640184) 230.0 kV to N.PLATT4 (640286) 230.0 kV Transmission Circuit #2 |
| REGIONAL\_FAULT\_230\_P4 | P4 | Single Phase Fault with Stuck Breaker on REDWILO3 345.00 (640325) 345 kV Bus  a. Apply Fault at the REDWILO3 345.00 (640325) 345 kV Bus  b. Clear Fault after 16 cycles and trip the following elements:  b.1. REDWILO7 (640326) 115.0 kV to REDWILO3 (640325) 345.0 kV to REDWILO9 (640327) 13.8 kV Three Winding #1  b.2. REDWILO7 (640326) 115.0 kV to BEVERLY7 (640082) 115.0 kV Transmission Circuit #1 |
| REGIONAL\_FAULT\_231\_P4 | P4 | Single Phase Fault with Stuck Breaker on REDWILO3 345.00 (640325) 345 kV Bus  a. Apply Fault at the REDWILO3 345.00 (640325) 345 kV Bus  b. Clear Fault after 16 cycles and trip the following elements:  b.1. REDWILO3 (640325) 345.0 kV to GENTLMN3 (640183) 345.0 kV Transmission Circuit #1  b.2. REDWILO3 (640325) 345.0 kV to MINGO 7 (531451) 345.0 kV Transmission Circuit #1 |
| REGIONAL\_FAULT\_232\_P4 | P4 | Single Phase Fault with Stuck Breaker on EASTOWN7 345.00 (541400) 345 kV Bus  a. Apply Fault at the EASTOWN7 345.00 (541400) 345 kV Bus  b. Clear Fault after 16 cycles and trip the following elements:  b.1. EASTOWN7 (541400) 345.0 kV to IATAN 7 (542982) 345.0 kV Transmission Circuit #1  b.2. EASTOWN7 (541400) 345.0 kV to ST JOE 7 (541199) 345.0 kV Transmission Circuit #1 |
| REGIONAL\_FAULT\_233\_P4 | P4 | Single Phase Fault with Stuck Breaker on G17-183-TAP 345.00 (761383) 345 kV Bus  a. Apply Fault at the G17-183-TAP 345.00 (761383) 345 kV Bus  b. Clear Fault after 16 cycles and trip the following elements:  b.1. G17-183-TAP (761383) 345.0 kV to NASHUA 7 (542980) 345.0 kV Transmission Circuit #1  b.2. G17-183-TAP (761383) 345.0 kV to ST JOE 7 (541199) 345.0 kV Transmission Circuit #1 |
| REGIONAL\_FAULT\_234\_P4 | P4 | Single Phase Fault with Stuck Breaker on STHLND 3 345.00 (635016) 345 kV Bus  a. Apply Fault at the STHLND 3 345.00 (635016) 345 kV Bus  b. Clear Fault after 16 cycles and trip the following elements:  b.1. STHLND 3 (635016) 345.0 kV to CBLUFFS3 (635000) 345.0 kV Transmission Circuit #1  b.2. STHLND 3 (635016) 345.0 kV to PNYCRK 3 (635013) 345.0 kV Transmission Circuit #1 |
| REGIONAL\_FAULT\_235\_P4 | P4 | Single Phase Fault with Stuck Breaker on RLHILLS3 345.00 (635100) 345 kV Bus  a. Apply Fault at the RLHILLS3 345.00 (635100) 345 kV Bus  b. Clear Fault after 16 cycles and trip the following elements:  b.1. RLHILLS3 (635100) 345.0 kV to ORIENT 3 (635570) 345.0 kV Transmission Circuit #1  b.2. RLHILLS3 (635100) 345.0 kV to PNYCRK 3 (635013) 345.0 kV Transmission Circuit #1 |
| REGIONAL\_FAULT\_236\_P4 | P4 | Single Phase Fault with Stuck Breaker on FALLOW 3 345.00 (635590) 345 kV Bus  a. Apply Fault at the FALLOW 3 345.00 (635590) 345 kV Bus  b. Clear Fault after 16 cycles and trip the following elements:  b.1. FALLOW 3 (635590) 345.0 kV to ARBR HL 3 (635580) 345.0 kV Transmission Circuit #1  b.2. FALLOW 3 (635590) 345.0 kV to OVRLND 3 (635014) 345.0 kV Transmission Circuit #1 |
| REGIONAL\_FAULT\_237\_P4 | P4 | Single Phase Fault with Stuck Breaker on J412 POI 3 345.00 (635252) 345 kV Bus  a. Apply Fault at the J412 POI 3 345.00 (635252) 345 kV Bus  b. Clear Fault after 16 cycles and trip the following elements:  b.1. J412 POI 3 (635252) 345.0 kV to IDA CO 3 (635206) 345.0 kV Transmission Circuit #1  b.2. J412 POI 3 (635252) 345.0 kV to RAUN 3 (635200) 345.0 kV Transmission Circuit #1 |
| REGIONAL\_FAULT\_238\_P4 | P4 | Single Phase Fault with Stuck Breaker on HOSKINS3 345.00 (640226) 345 kV Bus  a. Apply Fault at the HOSKINS3 345.00 (640226) 345 kV Bus  b. Clear Fault after 16 cycles and trip the following elements:  b.1. HOSKINS3 (640226) 345.0 kV to HOSKINS7 (640228) 115.0 kV to HOSKNS19 (640231) 13.8 kV Three Winding #1  b.2. HOSKINS3 (640226) 345.0 kV to HOSKINS4 (640227) 230.0 kV to HOSKINS T2 9 (643082) 13.8 kV Three Winding #1 |
| REGIONAL\_FAULT\_239\_P4 | P4 | Single Phase Fault with Stuck Breaker on SIOUXCY3 345.00 (652564) 345 kV Bus  a. Apply Fault at the SIOUXCY3 345.00 (652564) 345 kV Bus  b. Clear Fault after 16 cycles and trip the following elements:  b.1. SIOUXCY3 (652564) 345.0 kV to RAUN 3 (635200) 345.0 kV Transmission Circuit #1  b.2. SIOUXCY3 (652564) 345.0 kV to SIOUXCY2 (652552) 230.0 kV to SIOUXC19 (652304) 13.8 kV Three Winding #1 |
| REGIONAL\_FAULT\_240\_P4 | P4 | Single Phase Fault with Stuck Breaker on PAULINE3 345.00 (640312) 345 kV Bus  a. Apply Fault at the PAULINE3 345.00 (640312) 345 kV Bus  b. Clear Fault after 16 cycles and trip the following elements:  b.1. PAULINE3 (640312) 345.0 kV to AXTELL 3 (640065) 345.0 kV Transmission Circuit #1  b.2. PAULINE3 (640312) 345.0 kV to TOBIAS 3 (640525) 345.0 kV Transmission Circuit #1 |
| REGIONAL\_FAULT\_241\_P4 | P4 | Single Phase Fault with Stuck Breaker on SWEET W3 345.00 (640374) 345 kV Bus  a. Apply Fault at the SWEET W3 345.00 (640374) 345 kV Bus  b. Clear Fault after 16 cycles and trip the following elements:  b.1. SWEET W3 (640374) 345.0 kV to AXTELL 3 (640065) 345.0 kV Transmission Circuit #1  b.2. SWEET W3 (640374) 345.0 kV to GENTLMN3 (640183) 345.0 kV Transmission Circuit #1 |
| REGIONAL\_FAULT\_242\_P4 | P4 | Single Phase Fault with Stuck Breaker on MONOLITH 3 345.00 (640590) 345 kV Bus  a. Apply Fault at the MONOLITH 3 345.00 (640590) 345 kV Bus  b. Clear Fault after 16 cycles and trip the following elements:  b.1. MONOLITH 3 (640590) 345.0 kV to MOORE 3 (640277) 345.0 kV Transmission Circuit #1  b.2. MONOLITH 3 (640590) 345.0 kV to MONOLITH 7 (640591) 115.0 kV to MONOLITHT2 9 (640597) 13.8 kV Three Winding #1 |
| REGIONAL\_FAULT\_243\_P4 | P4 | Single Phase Fault with Stuck Breaker on KEYSTON3 345.00 (640252) 345 kV Bus  a. Apply Fault at the KEYSTON3 345.00 (640252) 345 kV Bus  b. Clear Fault after 16 cycles and trip the following elements:  b.1. KEYSTON3 (640252) 345.0 kV to SD.LS-KS-MB3 (659425) 345.0 kV Transmission Circuit #1  b.2. KEYSTON3 (640252) 345.0 kV to GENTLMN3 (640183) 345.0 kV Transmission Circuit #1 |
| REGIONAL\_FAULT\_244\_P4 | P4 | Single Phase Fault with Stuck Breaker on THEDFRD3 345.00 (640500) 345 kV Bus  a. Apply Fault at the THEDFRD3 345.00 (640500) 345 kV Bus  b. Clear Fault after 16 cycles and trip the following elements:  b.1. THEDFRD3 (640500) 345.0 kV to GENTLMN3 (640183) 345.0 kV Transmission Circuit #1  b.2. THEDFRD3 (640500) 345.0 kV to THEDFRD7 (640381) 115.0 kV to THEDFORD9 (640570) 13.8 kV Three Winding #1 |
| REGIONAL\_FAULT\_245\_P4 | P4 | Single Phase Fault with Stuck Breaker on UTICAJC4 230.00 (652526) 230 kV Bus  a. Apply Fault at the UTICAJC4 230.00 (652526) 230 kV Bus  b. Clear Fault after 16 cycles and trip the following elements:  b.1. UTICAJC4 (652526) 230.0 kV to FTRANDL4 (652509) 230.0 kV Transmission Circuit #1  b.2. UTICAJC4 (652526) 230.0 kV to G17-175TAP (762237) 230.0 kV Transmission Circuit #1 |
| REGIONAL\_FAULT\_246\_P4 | P4 | Single Phase Fault with Stuck Breaker on SIOUXCY4 230.00 (652565) 230 kV Bus  a. Apply Fault at the SIOUXCY4 230.00 (652565) 230 kV Bus  b. Clear Fault after 16 cycles and trip the following elements:  b.1. SIOUXCY4 (652565) 230.0 kV to SIOUXCY2 (652552) 230.0 kV Transmission Circuit #z1  b.2. SIOUXCY4 (652565) 230.0 kV to SIOUXCY5 (652566) 161.0 kV to SIOUXC49 (652310) 13.8 kV Three Winding #1 |
| REGIONAL\_FAULT\_247\_P4 | P4 | Single Phase Fault with Stuck Breaker on LAKPLAT-ER4 230.00 (655475) 230 kV Bus  a. Apply Fault at the LAKPLAT-ER4 230.00 (655475) 230 kV Bus  b. Clear Fault after 16 cycles and trip the following elements:  b.1. LAKPLAT-ER4 (655475) 230.0 kV to FTTHOMP4 (652507) 230.0 kV Transmission Circuit #1  b.2. LAKPLAT-ER4 (655475) 230.0 kV to FTRANDL4 (652509) 230.0 kV Transmission Circuit #1 |
| REGIONAL\_FAULT\_248\_P4 | P4 | Single Phase Fault with Stuck Breaker on ST JOE 7 345.00 (541199) 345 kV Bus  a. Apply Fault at the ST JOE 7 345.00 (541199) 345 kV Bus  b. Clear Fault after 16 cycles and trip the following elements:  b.1. ST JOE 5 (541253) 161.0 kV to ST JOE 7 (541199) 345.0 kV to STJOE 2T (541371) 13.8 kV Three Winding #33  b.2. ST JOE 5 (541253) 161.0 kV to ST JOE 7 (541199) 345.0 kV to STJOE 1T (541370) 13.8 kV Three Winding #22 |
| REGIONAL\_FAULT\_249\_P4 | P4 | Single Phase Fault with Stuck Breaker on CBLUFFS3 345.00 (635000) 345 kV Bus  a. Apply Fault at the CBLUFFS3 345.00 (635000) 345 kV Bus  b. Clear Fault after 16 cycles and trip the following elements:  b.1. CBLUFFS5 (635001) 161.0 kV to CBLUFFS3 (635000) 345.0 kV to CBLF1XT9 (635025) 13.8 kV Three Winding #1  b.2. CBLUFFS5 (635001) 161.0 kV to CBLUFFS3 (635000) 345.0 kV to CBLF2XT9 (635026) 13.8 kV Three Winding #2 |
| REGIONAL\_FAULT\_250\_P4 | P4 | Single Phase Fault with Stuck Breaker on OVRLND 3 345.00 (635014) 345 kV Bus  a. Apply Fault at the OVRLND 3 345.00 (635014) 345 kV Bus  b. Clear Fault after 16 cycles and trip the following elements:  b.1. OVRLND 5 (635015) 161.0 kV to OVRLND 3 (635014) 345.0 kV Two Winding #1  b.2. OVRLND 5 (635015) 161.0 kV to QUICK 5 (635012) 161.0 kV Transmission Circuit #1 |
| REGIONAL\_FAULT\_251\_P4 | P4 | Single Phase Fault with Stuck Breaker on RAUN 3 345.00 (635200) 345 kV Bus  a. Apply Fault at the RAUN 3 345.00 (635200) 345 kV Bus  b. Clear Fault after 16 cycles and trip the following elements:  b.1. RAUN 5 (635201) 161.0 kV to RAUN 3 (635200) 345.0 kV Two Winding #2  b.2. RAUN 5 (635201) 161.0 kV to RAUN 3 (635200) 345.0 kV to RAUN1XT9 (635205) 13.8 kV Three Winding #1 |
| REGIONAL\_FAULT\_252\_P4 | P4 | Single Phase Fault with Stuck Breaker on FTRANDL7 115.00 (652510) 115 kV Bus  a. Apply Fault at the FTRANDL7 115.00 (652510) 115 kV Bus  b. Clear Fault after 16 cycles and trip the following elements:  b.1. FTRANDL7 (652510) 115.0 kV to SPENCER7 (640349) 115.0 kV Transmission Circuit #1  b.2. FTRANDL7 (652510) 115.0 kV to WHTSWAN-ER7 (655490) 115.0 kV Transmission Circuit #1 |

# Appendix D: GEN-2020-002 Dynamic Stability Results

| Fault ID | 25SP | | | 25WP | | |
| --- | --- | --- | --- | --- | --- | --- |
| Volt Violation | Volt Recovery | Stable | Volt Violation | Volt Recovery | Stable |
| GROUP2\_FAULT\_1\_P1 | Pass | Pass | Stable | Pass | Pass | Stable |
| GROUP2\_FAULT\_2\_P1 | Pass | Pass | Stable | Pass | Pass | Stable |
| GROUP2\_FAULT\_3\_P1 | Pass1 | Pass1 | Stable1 | Pass | Pass | Stable |
| GROUP2\_FAULT\_4\_P1 | Pass1 | Pass1 | Stable1 | Pass1 | Pass1 | Stable1 |
| GROUP2\_FAULT\_5\_P1 | Pass | Pass | Stable | Pass | Pass | Stable |
| GROUP2\_FAULT\_6\_P1 | Pass | Pass | Stable | Pass | Pass | Stable |
| GROUP2\_FAULT\_7\_P1 | Pass | Pass | Stable | Pass | Pass | Stable |
| GROUP2\_FAULT\_8\_P1 | Pass | Pass | Stable | Pass | Pass | Stable |
| GROUP2\_FAULT\_9\_P1 | Pass | Pass | Stable | Pass | Pass | Stable |
| GROUP2\_FAULT\_10\_P1 | Pass | Pass | Stable | Pass | Pass | Stable |
| GROUP2\_FAULT\_11\_P1 | Pass | Pass | Stable | Pass | Pass | Stable |
| GROUP2\_FAULT\_12\_P1 | Pass | Pass | Stable | Pass | Pass | Stable |
| GROUP2\_FAULT\_13\_P1 | Pass | Pass | Stable | Pass | Pass | Stable |
| GROUP2\_FAULT\_14\_P1 | Pass | Pass | Stable | Pass | Pass | Stable |
| GROUP2\_FAULT\_15\_P1 | Pass | Pass | Stable | Pass | Pass | Stable |
| GROUP2\_FAULT\_16\_P1 | Pass | Pass | Stable | Pass | Pass | Stable |
| GROUP2\_FAULT\_17\_P1 | Pass | Pass | Stable | Pass | Pass | Stable |
| GROUP2\_FAULT\_18\_P1 | Pass | Pass | Stable | Pass | Pass | Stable |
| GROUP2\_FAULT\_19\_P1 | Pass | Pass | Stable | Pass | Pass | Stable |
| GROUP2\_FAULT\_20\_P1 | Pass | Pass | Stable | Pass | Pass | Stable |
| GROUP2\_FAULT\_21\_P1 | Pass | Pass | Stable | Pass | Pass | Stable |
| GROUP2\_FAULT\_22\_P1 | Pass | Pass | Stable | Pass | Pass | Stable |
| GROUP2\_FAULT\_23\_P1 | Pass | Pass | Stable | Pass | Pass | Stable |
| GROUP2\_FAULT\_24\_P1 | Pass | Pass | Stable | Pass | Pass | Stable |
| GROUP2\_FAULT\_25\_P1 | Pass | Pass | Stable | Pass | Pass | Stable |
| GROUP2\_FAULT\_26\_P1 | Pass | Pass | Stable | Pass | Pass | Stable |
| GROUP2\_FAULT\_27\_P1 | Pass | Pass | Stable | Pass | Pass | Stable |
| GROUP2\_FAULT\_28\_P1 | Pass | Pass | Stable | Pass | Pass | Stable |
| GROUP2\_FAULT\_29\_P1 | Pass | Pass | Stable | Pass | Pass | Stable |
| GROUP2\_FAULT\_30\_P1 | Pass | Pass | Stable | Pass | Pass | Stable |
| GROUP2\_FAULT\_31\_P1 | Pass | Pass | Stable | Pass | Pass | Stable |
| GROUP2\_FAULT\_32\_P1 | Pass | Pass | Stable | Pass | Pass | Stable |
| GROUP2\_FAULT\_33\_P1 | Pass | Pass | Stable | Pass | Pass | Stable |
| GROUP2\_FAULT\_34\_P1 | Pass | Pass | Stable | Pass | Pass | Stable |
| GROUP2\_FAULT\_35\_P1 | Pass | Pass | Stable | Pass | Pass | Stable |
| GROUP2\_FAULT\_36\_P1 | Pass | Pass | Stable | Pass | Pass | Stable |
| GROUP2\_FAULT\_37\_P1 | Pass | Pass | Stable | Pass | Pass | Stable |
| GROUP2\_FAULT\_38\_P1 | Pass | Pass | Stable | Pass | Pass | Stable |
| GROUP2\_FAULT\_39\_P1 | Pass | Pass | Stable | Pass | Pass | Stable |
| GROUP2\_FAULT\_40\_P1 | Pass | Pass | Stable | Pass | Pass | Stable |
| GROUP2\_FAULT\_41\_P1 | Pass | Pass | Stable | Pass | Pass | Stable |
| GROUP2\_FAULT\_42\_P1 | Pass | Pass | Stable | Pass | Pass | Stable |
| GROUP2\_FAULT\_43\_P1 | Pass | Pass | Stable | Pass | Pass | Stable |
| GROUP2\_FAULT\_44\_P1 | Pass | Pass | Stable | Pass | Pass | Stable |
| GROUP2\_FAULT\_45\_P1 | Pass | Pass | Stable | Pass | Pass | Stable |
| GROUP2\_FAULT\_46\_P1 | Pass | Pass | Stable | Pass | Pass | Stable |
| GROUP2\_FAULT\_47\_P1 | Pass | Pass | Stable | Pass | Pass | Stable |
| GROUP2\_FAULT\_48\_P1 | Pass | Pass | Stable | Pass | Pass | Stable |
| GROUP2\_FAULT\_49\_P1 | Pass | Pass | Stable | Pass | Pass | Stable |
| GROUP2\_FAULT\_50\_P1 | Pass | Pass | Stable | Pass | Pass | Stable |
| GROUP2\_FAULT\_51\_P1 | Pass | Pass | Stable | Pass | Pass | Stable |
| GROUP2\_FAULT\_52\_P1 | Pass | Pass | Stable | Pass | Pass | Stable |
| GROUP2\_FAULT\_53\_P1 | Pass | Pass | Stable | Pass | Pass | Stable |
| GROUP2\_FAULT\_54\_P1 | Pass | Pass | Stable | Pass | Pass | Stable |
| GROUP2\_FAULT\_55\_P1 | Pass | Pass | Stable | Pass | Pass | Stable |
| GROUP2\_FAULT\_56\_P1 | Pass | Pass | Stable | Pass | Pass | Stable |
| GROUP2\_FAULT\_57\_P1 | Pass | Pass | Stable | Pass | Pass | Stable |
| GROUP2\_FAULT\_58\_P1 | Pass | Pass | Stable | Pass | Pass | Stable |
| GROUP2\_FAULT\_59\_P1 | Pass | Pass | Stable | Pass | Pass | Stable |
| GROUP2\_FAULT\_60\_P1 | Pass | Pass | Stable | Pass | Pass | Stable |
| GROUP2\_FAULT\_1\_P4 | Pass | Pass | Stable | Pass | Pass | Stable |
| GROUP2\_FAULT\_2\_P4 | Pass | Pass | Stable | Pass | Pass | Stable |
| GROUP2\_FAULT\_3\_P4 | Pass | Pass | Stable | Pass | Pass | Stable |
| GROUP2\_FAULT\_4\_P4 | Pass | Pass | Stable | Pass | Pass | Stable |
| GROUP2\_FAULT\_5\_P4 | Pass | Pass | Stable | Pass | Pass | Stable |
| GROUP2\_FAULT\_6\_P4 | Pass | Pass | Stable | Pass | Pass | Stable |
| GROUP2\_FAULT\_7\_P4 | Pass | Pass | Stable | Pass | Pass | Stable |
| GROUP2\_FAULT\_8\_P4 | Pass | Pass | Stable | Pass | Pass | Stable |
| GROUP2\_FAULT\_9\_P4 | Pass | Pass | Stable | Pass | Pass | Stable |
| GROUP2\_FAULT\_10\_P4 | Pass | Pass | Stable | Pass | Pass | Stable |
| GROUP2\_FAULT\_11\_P4 | Pass | Pass | Stable | Pass | Pass | Stable |
| GROUP2\_FAULT\_12\_P4 | Pass | Pass | Stable | Pass | Pass | Stable |
| GROUP2\_FAULT\_13\_P4 | Pass | Pass | Stable | Pass | Pass | Stable |
| GROUP2\_FAULT\_14\_P4 | Pass | Pass | Stable | Pass | Pass | Stable |
| GROUP2\_FAULT\_15\_P4 | Pass | Pass | Stable | Pass | Pass | Stable |
| GROUP2\_FAULT\_16\_P4 | Pass | Pass | Stable | Pass | Pass | Stable |
| GROUP2\_FAULT\_17\_P4 | Pass | Pass | Stable | Pass | Pass | Stable |
| GROUP2\_FAULT\_18\_P4 | Pass | Pass | Stable | Pass | Pass | Stable |
| GROUP2\_FAULT\_19\_P4 | Pass | Pass | Stable | Pass | Pass | Stable |
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| GROUP2\_FAULT\_22\_P4 | Pass | Pass | Stable | Pass | Pass | Stable |
| GROUP2\_FAULT\_23\_P4 | Pass | Pass | Stable | Pass | Pass | Stable |
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| GROUP2\_FAULT\_41\_P4 | Pass | Pass | Stable | Pass | Pass | Stable |
| GROUP2\_FAULT\_42\_P4 | Pass | Pass | Stable | Pass | Pass | Stable |
| GROUP2\_FAULT\_43\_P4 | Pass | Pass | Stable | Pass | Pass | Stable |
| GROUP2\_FAULT\_44\_P4 | Pass | Pass | Stable | Pass | Pass | Stable |
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| REGIONAL\_FAULT\_2\_P1 | Pass | Pass | Stable | Pass | Pass | Stable |
| REGIONAL\_FAULT\_3\_P1 | Pass | Pass | Stable | Pass | Pass | Stable |
| REGIONAL\_FAULT\_4\_P1 | Pass | Pass | Stable | Pass | Pass | Stable |
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| REGIONAL\_FAULT\_6\_P1 | Pass | Pass | Stable | Pass | Pass | Stable |
| REGIONAL\_FAULT\_7\_P1 | Pass | Pass | Stable | Pass | Pass | Stable |
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| REGIONAL\_FAULT\_19\_P1 | Pass | Pass | Stable | Pass | Pass | Stable |
| REGIONAL\_FAULT\_20\_P1 | Pass | Pass | Stable | Pass | Pass | Stable |
| REGIONAL\_FAULT\_21\_P1 | Pass | Pass | Stable | Pass | Pass | Stable |
| REGIONAL\_FAULT\_22\_P1 | Pass | Pass | Stable | Pass | Pass | Stable |
| REGIONAL\_FAULT\_23\_P1 | Pass | Pass | Stable | Pass | Pass | Stable |
| REGIONAL\_FAULT\_24\_P1 | Pass | Pass | Stable | Pass | Pass | Stable |
| REGIONAL\_FAULT\_25\_P1 | Pass | Pass | Stable | Pass | Pass | Stable |
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| REGIONAL\_FAULT\_27\_P1 | Pass | Pass | Stable | Pass | Pass | Stable |
| REGIONAL\_FAULT\_28\_P1 | Pass | Pass | Stable | Pass | Pass | Stable |
| REGIONAL\_FAULT\_29\_P1 | Pass | Pass | Stable | Pass | Pass | Stable |
| REGIONAL\_FAULT\_30\_P1 | Pass | Pass | Stable | Pass | Pass | Stable |
| REGIONAL\_FAULT\_31\_P1 | Pass | Pass | Stable | Pass | Pass | Stable |
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| REGIONAL\_FAULT\_35\_P1 | Pass | Pass | Stable | Pass | Pass | Stable |
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| REGIONAL\_FAULT\_49\_P1 | Pass | Pass | Stable | Pass | Pass | Stable |
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| REGIONAL\_FAULT\_2\_P4 | Pass | Pass | Stable | Pass | Pass | Stable |
| REGIONAL\_FAULT\_3\_P4 | Pass | Pass | Stable | Pass | Pass | Stable |
| REGIONAL\_FAULT\_4\_P4 | Pass | Pass | Stable | Pass | Pass | Stable |
| REGIONAL\_FAULT\_5\_P4 | Pass | Pass | Stable | Pass | Pass | Stable |
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| REGIONAL\_FAULT\_7\_P4 | Pass | Pass | Stable | Pass | Pass | Stable |
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| REGIONAL\_FAULT\_9\_P4 | Pass | Pass | Stable | Pass | Pass | Stable |
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| REGIONAL\_FAULT\_14\_P4 | Pass | Pass | Stable | Pass | Pass | Stable |
| REGIONAL\_FAULT\_15\_P4 | Pass | Pass | Stable | Pass | Pass | Stable |
| REGIONAL\_FAULT\_16\_P4 | Pass | Pass | Stable | Pass | Pass | Stable |
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| REGIONAL\_FAULT\_25\_P4 | Pass | Pass | Stable | Pass | Pass | Stable |
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| REGIONAL\_FAULT\_43\_P4 | Pass | Pass | Stable | Pass | Pass | Stable |
| REGIONAL\_FAULT\_44\_P4 | Pass | Pass | Stable | Pass | Pass | Stable |
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| REGIONAL\_FAULT\_46\_P4 | Pass | Pass | Stable | Pass | Pass | Stable |
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| REGIONAL\_FAULT\_122\_P4 | Pass | Pass | Stable | Pass | Pass | Stable |
| REGIONAL\_FAULT\_123\_P4 | Pass | Pass | Stable | Pass | Pass | Stable |
| REGIONAL\_FAULT\_124\_P4 | Pass | Pass | Stable | Pass | Pass | Stable |
| REGIONAL\_FAULT\_125\_P4 | Pass | Pass | Stable | Pass | Pass | Stable |
| REGIONAL\_FAULT\_126\_P4 | Pass | Pass | Stable | Pass | Pass | Stable |
| REGIONAL\_FAULT\_127\_P4 | Pass | Pass | Stable | Pass | Pass | Stable |
| REGIONAL\_FAULT\_128\_P4 | Pass | Pass | Stable | Pass | Pass | Stable |
| REGIONAL\_FAULT\_129\_P4 | Pass | Pass | Stable | Pass | Pass | Stable |
| REGIONAL\_FAULT\_130\_P4 | Pass | Pass | Stable | Pass | Pass | Stable |
| REGIONAL\_FAULT\_131\_P4 | Pass | Pass | Stable | Pass | Pass | Stable |
| REGIONAL\_FAULT\_132\_P4 | Pass | Pass | Stable | Pass | Pass | Stable |
| REGIONAL\_FAULT\_133\_P4 | Pass | Pass | Stable | Pass | Pass | Stable |
| REGIONAL\_FAULT\_134\_P4 | Pass | Pass | Stable | Pass | Pass | Stable |
| REGIONAL\_FAULT\_135\_P4 | Pass | Pass | Stable | Pass | Pass | Stable |
| REGIONAL\_FAULT\_136\_P4 | Pass | Pass | Stable | Pass | Pass | Stable |
| REGIONAL\_FAULT\_137\_P4 | Pass | Pass | Stable | Pass | Pass | Stable |
| REGIONAL\_FAULT\_138\_P4 | Pass | Pass | Stable | Pass | Pass | Stable |
| REGIONAL\_FAULT\_139\_P4 | Pass | Pass | Stable | Pass | Pass | Stable |
| REGIONAL\_FAULT\_140\_P4 | Pass | Pass | Stable | Pass | Pass | Stable |
| REGIONAL\_FAULT\_141\_P4 | Pass | Pass | Stable | Pass | Pass | Stable |
| REGIONAL\_FAULT\_142\_P4 | Pass | Pass | Stable | Pass | Pass | Stable |
| REGIONAL\_FAULT\_143\_P4 | Pass | Pass | Stable | Pass | Pass | Stable |
| REGIONAL\_FAULT\_144\_P4 | Pass | Pass | Stable | Pass | Pass | Stable |
| REGIONAL\_FAULT\_145\_P4 | Pass | Pass | Stable | Pass | Pass | Stable |
| REGIONAL\_FAULT\_146\_P4 | Pass | Pass | Stable | Pass | Pass | Stable |
| REGIONAL\_FAULT\_147\_P4 | Pass | Pass | Stable | Pass | Pass | Stable |
| REGIONAL\_FAULT\_148\_P4 | Pass | Pass | Stable | Pass | Pass | Stable |
| REGIONAL\_FAULT\_149\_P4 | Pass | Pass | Stable | Pass | Pass | Stable |
| REGIONAL\_FAULT\_150\_P4 | Pass | Pass | Stable | Pass | Pass | Stable |
| REGIONAL\_FAULT\_151\_P4 | Pass | Pass | Stable | Pass | Pass | Stable |
| REGIONAL\_FAULT\_152\_P4 | Pass | Pass | Stable | Pass | Pass | Stable |
| REGIONAL\_FAULT\_153\_P4 | Pass | Pass | Stable | Pass | Pass | Stable |
| REGIONAL\_FAULT\_154\_P4 | Pass | Pass | Stable | Pass | Pass | Stable |
| REGIONAL\_FAULT\_155\_P4 | Pass | Pass | Stable | Pass | Pass | Stable |
| REGIONAL\_FAULT\_156\_P4 | Pass | Pass | Stable | Pass | Pass | Stable |
| REGIONAL\_FAULT\_157\_P4 | Pass | Pass | Stable | Pass | Pass | Stable |
| REGIONAL\_FAULT\_158\_P4 | Pass | Pass | Stable | Pass | Pass | Stable |
| REGIONAL\_FAULT\_159\_P4 | Pass | Pass | Stable | Pass | Pass | Stable |
| REGIONAL\_FAULT\_160\_P4 | Pass | Pass | Stable | Pass | Pass | Stable |
| REGIONAL\_FAULT\_161\_P4 | Pass | Pass | Stable | Pass | Pass | Stable |
| REGIONAL\_FAULT\_162\_P4 | Pass | Pass | Stable | Pass | Pass | Stable |
| REGIONAL\_FAULT\_163\_P4 | Pass | Pass | Stable | Pass | Pass | Stable |
| REGIONAL\_FAULT\_164\_P4 | Pass | Pass | Stable | Pass | Pass | Stable |
| REGIONAL\_FAULT\_165\_P4 | Pass | Pass | Stable | Pass | Pass | Stable |
| REGIONAL\_FAULT\_166\_P4 | Pass | Pass | Stable | Pass | Pass | Stable |
| REGIONAL\_FAULT\_167\_P4 | Pass | Pass | Stable | Pass | Pass | Stable |
| REGIONAL\_FAULT\_168\_P4 | Pass | Pass | Stable | Pass | Pass | Stable |
| REGIONAL\_FAULT\_169\_P4 | Pass | Pass | Stable | Pass | Pass | Stable |
| REGIONAL\_FAULT\_170\_P4 | Pass | Pass | Stable | Pass | Pass | Stable |
| REGIONAL\_FAULT\_171\_P4 | Pass | Pass | Stable | Pass | Pass | Stable |
| REGIONAL\_FAULT\_172\_P4 | Pass | Pass | Stable | Pass | Pass | Stable |
| REGIONAL\_FAULT\_173\_P4 | Pass | Pass | Stable | Pass | Pass | Stable |
| REGIONAL\_FAULT\_174\_P4 | Pass | Pass | Stable | Pass | Pass | Stable |
| REGIONAL\_FAULT\_175\_P4 | Pass | Pass | Stable | Pass | Pass | Stable |
| REGIONAL\_FAULT\_176\_P4 | Pass | Pass | Stable | Pass | Pass | Stable |
| REGIONAL\_FAULT\_177\_P4 | Pass | Pass | Stable | Pass | Pass | Stable |
| REGIONAL\_FAULT\_178\_P4 | Pass | Pass | Stable | Pass | Pass | Stable |
| REGIONAL\_FAULT\_179\_P4 | Pass | Pass | Stable | Pass | Pass | Stable |
| REGIONAL\_FAULT\_180\_P4 | Pass | Pass | Stable | Pass | Pass | Stable |
| REGIONAL\_FAULT\_181\_P4 | Pass | Pass | Stable | Pass | Pass | Stable |
| REGIONAL\_FAULT\_182\_P4 | Pass | Pass | Stable | Pass | Pass | Stable |
| REGIONAL\_FAULT\_183\_P4 | Pass | Pass | Stable | Pass | Pass | Stable |
| REGIONAL\_FAULT\_184\_P4 | Pass | Pass | Stable | Pass | Pass | Stable |
| REGIONAL\_FAULT\_185\_P4 | Pass | Pass | Stable | Pass | Pass | Stable |
| REGIONAL\_FAULT\_186\_P4 | Pass | Pass | Stable | Pass | Pass | Stable |
| REGIONAL\_FAULT\_187\_P4 | Pass | Pass | Stable | Pass | Pass | Stable |
| REGIONAL\_FAULT\_188\_P4 | Pass | Pass | Stable | Pass | Pass | Stable |
| REGIONAL\_FAULT\_189\_P4 | Pass | Pass | Stable | Pass | Pass | Stable |
| REGIONAL\_FAULT\_190\_P4 | Pass | Pass | Stable | Pass | Pass | Stable |
| REGIONAL\_FAULT\_191\_P4 | Pass | Pass | Stable | Pass | Pass | Stable |
| REGIONAL\_FAULT\_192\_P4 | Pass | Pass | Stable | Pass | Pass | Stable |
| REGIONAL\_FAULT\_193\_P4 | Pass | Pass | Stable | Pass | Pass | Stable |
| REGIONAL\_FAULT\_194\_P4 | Pass | Pass | Stable | Pass | Pass | Stable |
| REGIONAL\_FAULT\_195\_P4 | Pass | Pass | Stable | Pass | Pass | Stable |
| REGIONAL\_FAULT\_196\_P4 | Pass | Pass | Stable | Pass | Pass | Stable |
| REGIONAL\_FAULT\_197\_P4 | Pass | Pass | Stable | Pass | Pass | Stable |
| REGIONAL\_FAULT\_198\_P4 | Pass | Pass | Stable | Pass | Pass | Stable |
| REGIONAL\_FAULT\_199\_P4 | Pass | Pass | Stable | Pass | Pass | Stable |
| REGIONAL\_FAULT\_200\_P4 | Pass | Pass | Stable | Pass | Pass | Stable |
| REGIONAL\_FAULT\_201\_P4 | Pass | Pass | Stable | Pass | Pass | Stable |
| REGIONAL\_FAULT\_202\_P4 | Pass | Pass | Stable | Pass | Pass | Stable |
| REGIONAL\_FAULT\_203\_P4 | Pass | Pass | Stable | Pass | Pass | Stable |
| REGIONAL\_FAULT\_204\_P4 | Pass | Pass | Stable | Pass | Pass | Stable |
| REGIONAL\_FAULT\_205\_P4 | Pass | Pass | Stable | Pass | Pass | Stable |
| REGIONAL\_FAULT\_206\_P4 | Pass | Pass | Stable | Pass | Pass | Stable |
| REGIONAL\_FAULT\_207\_P4 | Pass | Pass | Stable | Pass | Pass | Stable |
| REGIONAL\_FAULT\_208\_P4 | Pass | Pass | Stable | Pass | Pass | Stable |
| REGIONAL\_FAULT\_209\_P4 | Pass | Pass | Stable | Pass | Pass | Stable |
| REGIONAL\_FAULT\_210\_P4 | Pass | Pass | Stable | Pass | Pass | Stable |
| REGIONAL\_FAULT\_211\_P4 | Pass | Pass | Stable | Pass | Pass | Stable |
| REGIONAL\_FAULT\_212\_P4 | Pass | Pass | Stable | Pass | Pass | Stable |
| REGIONAL\_FAULT\_213\_P4 | Pass | Pass | Stable | Pass | Pass | Stable |
| REGIONAL\_FAULT\_214\_P4 | Pass | Pass | Stable | Pass | Pass | Stable |
| REGIONAL\_FAULT\_215\_P4 | Pass | Pass | Stable | Pass | Pass | Stable |
| REGIONAL\_FAULT\_216\_P4 | Pass | Pass | Stable | Pass | Pass | Stable |
| REGIONAL\_FAULT\_217\_P4 | Pass | Pass | Stable | Pass | Pass | Stable |
| REGIONAL\_FAULT\_218\_P4 | Pass | Pass | Stable | Pass | Pass | Stable |
| REGIONAL\_FAULT\_219\_P4 | Pass | Pass | Stable | Pass | Pass | Stable |
| REGIONAL\_FAULT\_220\_P4 | Pass | Pass | Stable | Pass | Pass | Stable |
| REGIONAL\_FAULT\_221\_P4 | Pass | Pass | Stable | Pass | Pass | Stable |
| REGIONAL\_FAULT\_222\_P4 | Pass | Pass | Stable | Pass | Pass | Stable |
| REGIONAL\_FAULT\_223\_P4 | Pass | Pass | Stable | Pass | Pass | Stable |
| REGIONAL\_FAULT\_224\_P4 | Pass | Pass | Stable | Pass | Pass | Stable |
| REGIONAL\_FAULT\_225\_P4 | Pass | Pass | Stable | Pass | Pass | Stable |
| REGIONAL\_FAULT\_226\_P4 | Pass | Pass | Stable | Pass | Pass | Stable |
| REGIONAL\_FAULT\_227\_P4 | Pass | Pass | Stable | Pass | Pass | Stable |
| REGIONAL\_FAULT\_228\_P4 | Pass | Pass | Stable | Pass | Pass | Stable |
| REGIONAL\_FAULT\_229\_P4 | Pass | Pass | Stable | Pass | Pass | Stable |
| REGIONAL\_FAULT\_230\_P4 | Pass | Pass | Stable | Pass | Pass | Stable |
| REGIONAL\_FAULT\_231\_P4 | Pass | Pass | Stable | Pass | Pass | Stable |
| REGIONAL\_FAULT\_232\_P4 | Pass | Pass | Stable | Pass | Pass | Stable |
| REGIONAL\_FAULT\_233\_P4 | Pass | Pass | Stable | Pass | Pass | Stable |
| REGIONAL\_FAULT\_234\_P4 | Pass | Pass | Stable | Pass | Pass | Stable |
| REGIONAL\_FAULT\_235\_P4 | Pass | Pass | Stable | Pass | Pass | Stable |
| REGIONAL\_FAULT\_236\_P4 | Pass | Pass | Stable | Pass | Pass | Stable |
| REGIONAL\_FAULT\_237\_P4 | Pass | Pass | Stable | Pass | Pass | Stable |
| REGIONAL\_FAULT\_238\_P4 | Pass | Pass | Stable | Pass | Pass | Stable |
| REGIONAL\_FAULT\_239\_P4 | Pass | Pass | Stable | Pass | Pass | Stable |
| REGIONAL\_FAULT\_240\_P4 | Pass | Pass | Stable | Pass | Pass | Stable |
| REGIONAL\_FAULT\_241\_P4 | Pass | Pass | Stable | Pass | Pass | Stable |
| REGIONAL\_FAULT\_242\_P4 | Pass | Pass | Stable | Pass | Pass | Stable |
| REGIONAL\_FAULT\_243\_P4 | Pass | Pass | Stable | Pass | Pass | Stable |
| REGIONAL\_FAULT\_244\_P4 | Pass | Pass | Stable | Pass | Pass | Stable |
| REGIONAL\_FAULT\_245\_P4 | Pass | Pass | Stable | Pass | Pass | Stable |
| REGIONAL\_FAULT\_246\_P4 | Pass | Pass | Stable | Pass | Pass | Stable |
| REGIONAL\_FAULT\_247\_P4 | Pass | Pass | Stable | Pass | Pass | Stable |
| REGIONAL\_FAULT\_248\_P4 | Pass | Pass | Stable | Pass | Pass | Stable |
| REGIONAL\_FAULT\_249\_P4 | Pass | Pass | Stable | Pass | Pass | Stable |
| REGIONAL\_FAULT\_250\_P4 | Pass | Pass | Stable | Pass | Pass | Stable |
| REGIONAL\_FAULT\_251\_P4 | Pass | Pass | Stable | Pass | Pass | Stable |
| REGIONAL\_FAULT\_252\_P4 | Pass | Pass | Stable | Pass | Pass | Stable |

1. Large swings observed in the active and reactive powers of Terry Bundy Generating Site units following the fault clearance in both the modified case and the original study case. The swings are not attributable to GEN-2020-002 as the swings are also observed in the base case models of both studies. **The issue is resolved with the removal of reclosing.**

# Appendix E: GEN-2020-002 Dynamic Stability Pre-existing ORIGiNAL case issues & SImulation plots

The results of the stability analysis showed that the Terry Bundy Generating site experiences rotor angle instability when a three-phase fault is applied at 84&BLUFF 7 115 kV bus or 70&BLUFF 7 115 kV bus. This issue was observed under two contingencies: GROUP\_FAULT\_3\_P1 and GROUP\_FAULT\_4\_P1 in the original case (Annual Interim 2022) and the GEN-2020-002 modification case. This issue was resolved by removing the reclosing of breaker for both the original and modification cases. This issue was determined to not be attributed to the GEN-2020-002 modification request. The following plots show in detail the rotor angle issue.

Figure 3: GROUP\_FAULT\_3\_P1 Real Power (25SP Original Case)

A graph of a graph showing a number of data

Description automatically generated with medium confidence

Figure 4: GROUP\_FAULT\_3\_P1 Real Power (25SP Original Case - Reclosing Removed)

A graph of a graph

Description automatically generated

Figure 5: GROUP\_FAULT\_3\_P1 Real Power (25SP Modification Case)

A graph of a graph showing a number of data

Description automatically generated with medium confidence

Figure 6: GROUP\_FAULT\_3\_P1 Real Power (25SP Modification Case - Reclosing Removed)

A graph of a graph

Description automatically generated with medium confidence

Figure 7: GROUP\_FAULT\_3\_P1 Reactive Power (25SP Original Case)

A graph of a graph

Description automatically generated

Figure 8: GROUP\_FAULT\_3\_P1 Reactive Power (25SP Original Case - Reclosing Removed)

A graph with text and numbers

Description automatically generated

Figure 9: GROUP\_FAULT\_3\_P1 Reactive Power (25SP Modification Case)

A graph of a graph

Description automatically generated

Figure 10: GROUP\_FAULT\_3\_P1 Reactive Power (25SP Modification Case – Reclosing Removed)

A graph with a line graph

Description automatically generated with medium confidence

Figure 11: GROUP\_FAULT\_3\_P1 Angle (25SP Original Case)

A graph with numbers and letters

Description automatically generated

Figure 12: GROUP\_FAULT\_3\_P1 Angle (25SP Original Case - Reclosing Removed)

A graph of a graph

Description automatically generated

Figure 13: GROUP\_FAULT\_3\_P1 Angle (25SP Modification Case)

A graph with numbers and letters

Description automatically generated

Figure 14: GROUP\_FAULT\_3\_P1 Angle (25SP Modification Case - Reclosing Removed)

A graph of a graph

Description automatically generated

Figure 15: GROUP\_FAULT\_4\_P1 Real Power (25SP Original Case)

A graph of a graph showing a number of data

Description automatically generated with medium confidence

Figure 16: GROUP\_FAULT\_4\_P1 Real Power (25SP Original Case - Reclosing Removed)

A graph of a graph

Description automatically generated

Figure 17: GROUP\_FAULT\_4\_P1 Real Power (25SP Modification Case)

A graph of a graph showing a number of data

Description automatically generated with medium confidence

Figure 18: GROUP\_FAULT\_4\_P1 Real Power (25SP Modification Case - Reclosing Removed)

A graph of a graph

Description automatically generated

Figure 19: GROUP\_FAULT\_4\_P1 Reactive Power (25SP Original Case)

A graph of a graph

Description automatically generated

Figure 20: GROUP\_FAULT\_4\_P1 Reactive Power (25SP Original Case - Reclosing Removed)

A graph with numbers and letters

Description automatically generated

Figure 21: GROUP\_FAULT\_4\_P1 Reactive Power (25SP Modification Case)

A graph of a graph

Description automatically generated

Figure 22: GROUP\_FAULT\_4\_P1 Reactive Power (25SP Modification Case – Reclosing Removed)

A graph of a graph

Description automatically generated

Figure 23: GROUP\_FAULT\_4\_P1 Angle (25SP Original Case)

A graph of a graph

Description automatically generated

Figure 24: GROUP\_FAULT\_4\_P1 Angle (25SP Original Case - Reclosing Removed)

A graph of a graph

Description automatically generated

Figure 25: GROUP\_FAULT\_4\_P1 Angle (25SP Modification Case)

A graph with different colored lines

Description automatically generated

Figure 26: GROUP\_FAULT\_4\_P1 Angle (25SP Modification Case - Reclosing Removed)

A graph of a graph

Description automatically generated

Figure 27: GROUP\_FAULT\_4\_P1 Real Power (25WP Original Case)

A graph with a line graph

Description automatically generated

Figure 28: GROUP\_FAULT\_4\_P1 Real Power (25WP Original Case - Reclosing Removed)

A graph of a graph

Description automatically generated

Figure 29: GROUP\_FAULT\_4\_P1 Real Power (25WP Modification Case)

A graph of a sound wave

Description automatically generated

Figure 30: GROUP\_FAULT\_4\_P1 Real Power (25WP Modification Case - Reclosing Removed)

A graph with a line graph

Description automatically generated

Figure 31: GROUP\_FAULT\_4\_P1 Reactive Power (25WP Original Case)

A graph with a line graph

Description automatically generated

Figure 32: GROUP\_FAULT\_4\_P1 Reactive Power (25WP Original Case - Reclosing Removed)

A graph with a line graph

Description automatically generated

Figure 33: GROUP\_FAULT\_4\_P1 Reactive Power (25WP Modification Case)

A graph of a graph

Description automatically generated

Figure 34: GROUP\_FAULT\_4\_P1 Reactive Power (25WP Modification Case - Reclosing Removed)

A graph with a line graph

Description automatically generated

Figure 35: GROUP\_FAULT\_4\_P1 Angle (25WP Original Case)

A graph with a blue line

Description automatically generated

Figure 36: GROUP\_FAULT\_4\_P1 Angle (25WP Original Case - Reclosing Removed)

A graph of a graph

Description automatically generated

Figure 37: GROUP\_FAULT\_4\_P1 Angle (25WP Modification Case)

A graph with a line graph

Description automatically generated

Figure 38: GROUP\_FAULT\_4\_P1 Angle (25WP Modification Case - Reclosing Removed)

A graph of a graph

Description automatically generated

1. Power System Simulator for Engineering [↑](#footnote-ref-2)
2. [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 [↑](#footnote-ref-3)
3. Based on the DISIS-2017-002 Cluster Groups [↑](#footnote-ref-4)