GEN-2018-055

Modification Request Impact Study

By SPP Generator Interconnection

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REVISION HISTORY

DATE OR VERSION NUMBER	AUTHOR	CHANGE DESCRIPTION	COMMENTS
05/29/2026	EPE Consulting	Initial Report	

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EXECUTIVE SUMMARY

Southwest Power Pool (SPP) requested that Electric Power Engineers, LLC (EPE) perform a Modification Request Impact Study (MRIS) for GEN-2018-055, an active Generation Interconnection Request (GIR) with a Point of Interconnection (POI) at the Terry Road 345 kV substation (bus# 511568).

The GEN-2018-055 project currently interconnects in the Southwestern Public Service (SPS) control area with a capacity of 252 MW as shown in Table ES-1 below. This Study has been requested to evaluate the modification of GEN-2018-055 to change the inverter configuration from seventy TMEIC Ninja SPCS 3.6 MW/4.05 MVA inverters to fifty-five PE FS4105 solar inverters for a total capacity of 225.78 MVA gross and 203.72 MW at the POI. In addition, this request also includes changes to the collection system, generator step-up transformer, generation interconnection line, main substation transformer, and reactive power devices. The transformer is modified from one 280 MVA main power transformer to two MPTs (170 MVA/ 85 MVA).

The generating capacity for GEN-2018-055 (203.72 MW) is lower than the Generator Interconnection Agreement (GIA) Interconnection Service amount, 252 MW, as listed in Appendix A of the GIA. However, subsequent surplus capacity at the POI is planned which will increase the available capacity beyond the GIA service amount. 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. The existing and modified configurations for GEN-2018-055 are shown in Table ES-1.

SPP determined that power flow should not be performed as the request was dispatched to its full capacity in all of its DISIS group-specific power flow models. However, SPP determined that the change of inverters and connection scheme required short circuit and dynamic stability analyses.

The existing and modified configurations for GEN-2018-055 are shown in

Table ES-2.

Table ES-1: GEN-2018-055 Modified Configuration

REQUEST	POINT OF INTERCONNECTION	EXISTING GENERATOR CONFIGURATION	GIA CAPACITY (MW)
GEN-2018-055	Terry Road Substation 345 kV (511568)	55 x PE FS4105 inverters	203.72

Table ES-2: GEN-2018-055 Modification Request

FACILITY	EXISTING GENERATING FACILITY CONFIGURATION	MODIFICATION GENERATING FACILITY CONFIGURATION	
Point of Interconnection	Terry Road Substation 345 kV (511568)	Terry Road Substation 345 kV (511568)	
Configuration/Capacity	70 x TMEIC Ninja SPCS 3.6 MW/4.05 MV inverters	55 PE FS4105 4.105 MVA Solar Inverters	
Generation Interconnection Line	Length = 26 miles	Length = 26 miles	
	R = 0.0013 pu	R = 0.0013 pu	
	X = 0.0121 pu	X = 0.0121 pu	
	B = 0.2397 pu	B = 0.2397 pu	
Main Substation Transformer[1]	R = 0.0021 pu	R = 0.0019 pu	R = 0.0017 pu
	X = 0.0850 pu	X = 0.0845 pu	X = 0.0833 pu
	Winding MVA = 168 MVA	Winding MVA = 102 MVA	Winding MVA = 51 MVA
	Rating MVA = 280 MVA	Rating MVA = 170 MVA	Rating MVA = 85 MVA
Equivalent Collector Line[2]	R = 0.0017 pu	R = 0.0045 pu	R = 0.0080 pu
	X = 0.001727 pu	X = 0.0060 pu	X = 0.0084 pu
	B = 0.0189 pu	B = 0.0221 pu	B = 0.0092 pu
GSU Transformer[1]	Gen Equivalent Qty: 70	Gen Equivalent Qty: 37	Gen Equivalent Qty: 18
	R = 0.0094 pu	R = 0.0084 pu	R = 0.0084 pu
	X = 0.0593 pu	X = 0.0885 pu	X = 0.0885 pu
	Winding MVA = 280 MVA	Winding MVA = 155.66 MVA	Winding MVA = 75.73 MVA
	Rating MVA = 280 MVA	Rating MVA = 155.7 MVA	Rating MVA = 75.7 MVA
Generator Dynamic Model[3] & Power Factor	REGCA1 Leading and Lagging: ±0.9	REGCA1[3] Leading and Lagging: ±0.8803	
Reactive Power Devices	N/A	N/A	Binit = 20 Mvar
1) X/R based on Winding MVA, 2) All pu are on 100 MVA Base 3) DYR stability model name			

SPP determined that power flow 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 charging current compensation analysis, short circuit analysis, and dynamic stability analysis.

SPP performed the analyses using the modification request data based on the DISIS-2022-001-1 study models:

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

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

The results of the charging current compensation analysis using the 25SP models showed that the GEN-2018-055 project needed approximately 2.13 MVAr of compensation at its project 34.5 kV substation, while the wind unit sharing the same POI required an additional 24.1 MVAr at its 34.5 kV substation. In total, approximately 26.23 MVAr of reactive compensation was necessary to reduce the POI MVAr to zero with the modifications in place. This is necessary to offset the capacitive effect on the transmission network caused by the project's transmission line and collector system during reduced generation conditions. The information gathered from the charging current compensation analysis is provided as information to the Interconnection Customer and Transmission Owner (TO) and/or Transmission Operator. The applicable reactive power requirements will be further reviewed by the Transmission Owner and/or Transmission Operator.

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-2018-055 contribution to three-phase fault currents in the immediate transmission systems at or near the GEN-2018-055 POI showed that there were multiple buses with a maximum three-phase fault current over 40 kA. These buses are highlighted in Appendix B.

The dynamic stability analysis was performed using Siemens PTI PSS/E version 34.9.3 software for the two modified study models: 25SP and 25WP.

The results of the dynamic stability analysis showed no voltage violations or voltage recovery issues. Several generators experienced protective tripping, which introduced oscillatory behavior. These events were further evaluated by temporarily disabling the associated protection schemes to isolate their impact on system response. Additional oscillations were observed and subsequently mitigated by removing the mechanical model to assess its contribution to the system.

There were no damping or voltage recovery violations attributed to the GEN-2018-055 modification request observed during the simulated faults. Additionally, the project was found to

[1] Power System Simulator for Engineering

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) requested that Electric Power Engineers, LLC (EPE) performed a Modification Request Impact Study (Study) for GEN-2018-055. 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.

Power Flow Analysis

SPP determined that power flow 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.

REACTIVE POWER ANALYSIS

SPP requires that a charging current compensation analysis be performed on the requested modification configuration as it is a non-synchronous resource. The charging current compensation analysis determines the capacitive effect at the POI caused by the project's collector system and transmission line's capacitance. A shunt reactor size is determined in order to offset the capacitive effect and maintain zero (0) MVAr flow at the POI while the project's generators and capacitors are offline.

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

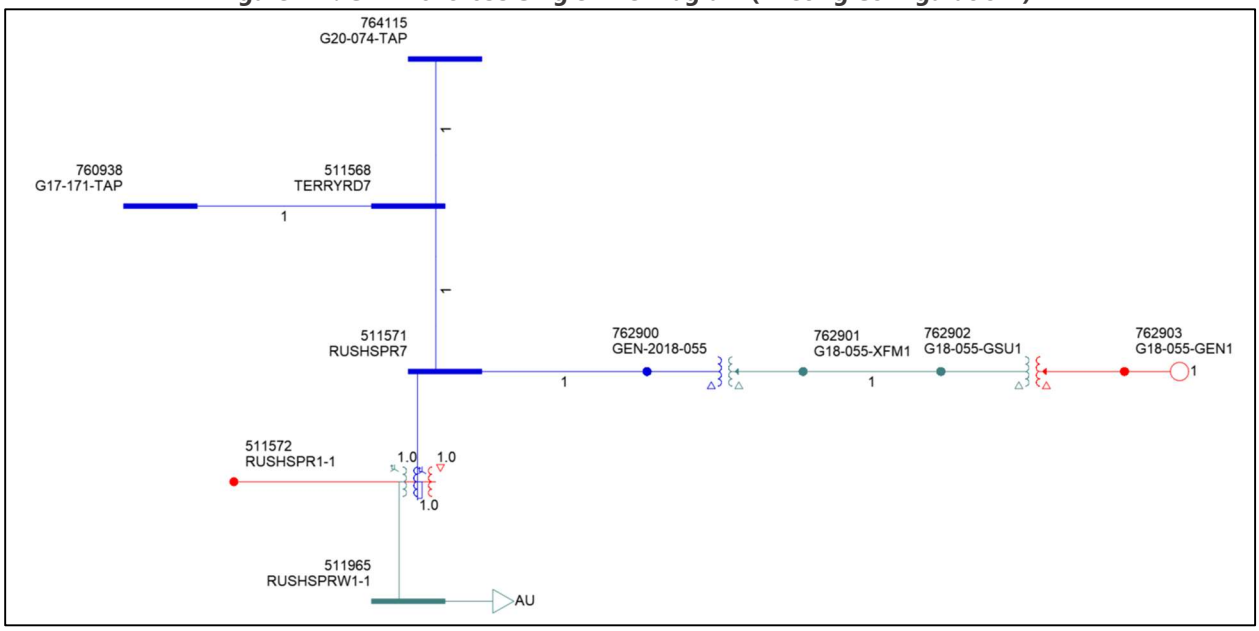
The GEN-2018-055 Interconnection Customer has requested a modification to its Interconnection Request (IR) with a Point of Interconnection (POI) at the Terry Road 345 kV substation (bus# 511568). At the time of report posting, GEN-2018-055 is an active Interconnection Request with a queue status of "DISIS STAGE." GEN-2018-055 is a solar plant with a maximum summer and winter queue capacity of 252 MW with Energy Resource Interconnection Service (ERIS) and Network Resource Interconnection Service (NRIS).

Figure 1-1 shows the power flow model single line diagram for the existing GEN-2018-055 configuration using the DISIS-2022-001 stability models. The GEN-2018-055 project interconnects in the Southwestern Public Service Company (SPS) control area with a capacity of 252 MW as shown in Table 1-1 below.

Table 1-1: GEN-2018-055 Existing Configuration

REQUEST	POINT OF INTERCONNECTION	EXISTING GENERATOR CONFIGURATION	GIA CAPACITY (MW)
GEN-2018-055	Terry Road Substation 345 kV (511568)	Terry Road Substation 345 kV (511568)	252

Figure 1-1: GEN-2018-055 Single Line Diagram (Existing Configuration*)



*based on the DISIS-2022-001 stability models

This Study has been requested by the Interconnection Customer to evaluate the modification of GEN-2018-055 dynamic model. The generating capacity for GEN-2018-055 (203.2 MW) does not exceed its Generator Interconnection Agreement (GIA) Interconnection Service amount of 252 MW, as listed in Appendix A of the GIA. Subsequent surplus generation planned at the site will cause the generating capacity at the site to exceed the GIA service amount. 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 1-2 shows the power flow model single line diagram for the GEN-2018-055 modification. The existing and modified configurations for GEN-2018-055 are shown in

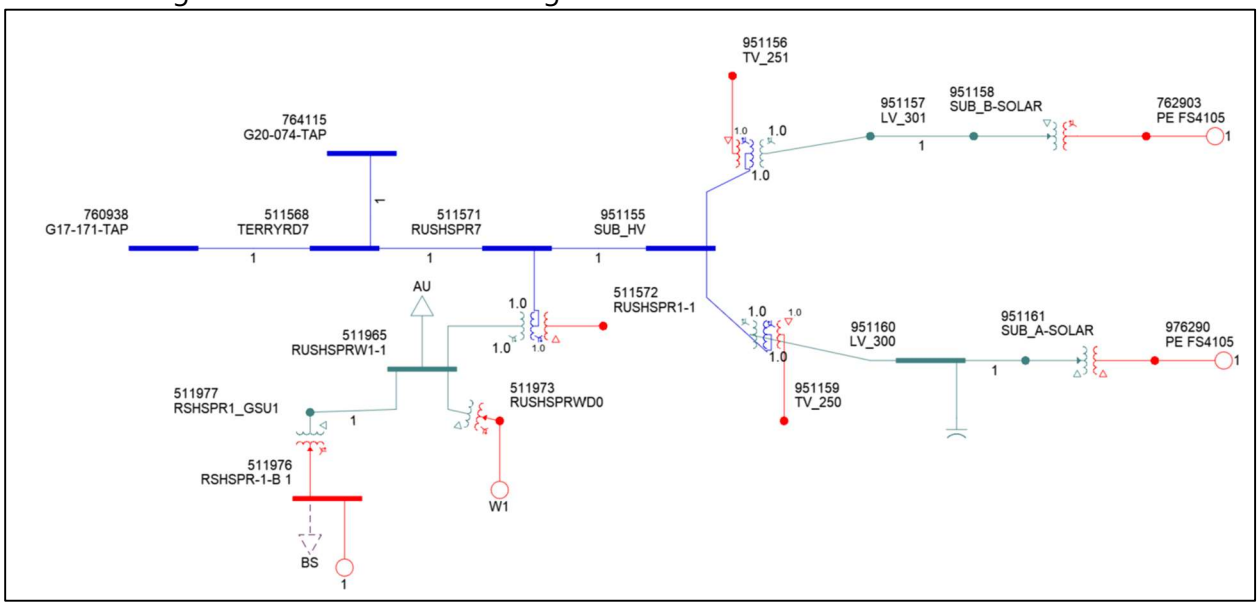


Table 1-2.

Figure 1-2: GEN-2018-055 Single Line Diagram (Modification Configuration)

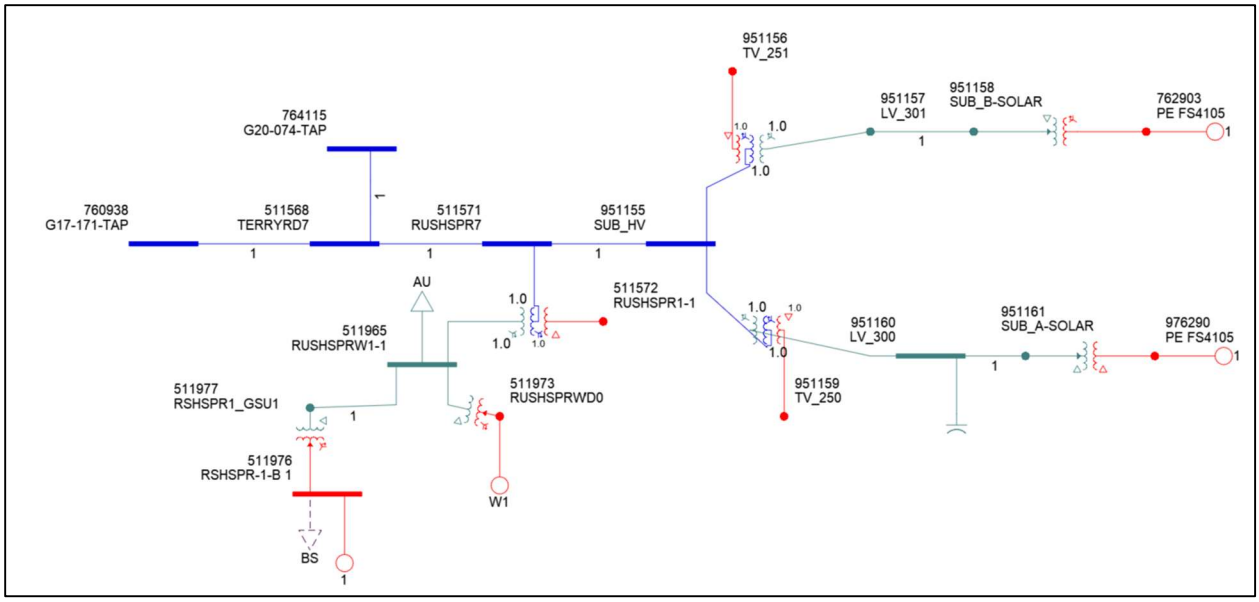


Table 1-2: GEN-2018-055 Modification Request

FACILITY	EXISTING GENERATING FACILITY CONFIGURATION	MODIFICATION GENERATING FACILITY CONFIGURATION	
Point of Interconnection	Terry Road Substation 345 kV (511568)	Terry Road Substation 345 kV (511568)	
Configuration/Capacity	70 x TMEIC Ninja SPCS 3.6 MW/4.05 MV inverters	55 PE FS4105 4.105 MVA Solar Inverters	
Generation Interconnection Line	Length = 26 miles	Length = 26 miles	
	R = 0.0013 pu	R = 0.0013 pu	
	X = 0.0121 pu	X = 0.0121 pu	
	B = 0.2397 pu	B = 0.2397 pu	
Main Substation Transformer[1]	R = 0.0021 pu	R = 0.0019 pu	R = 0.0017 pu
	X = 0.0850 pu	X = 0.0845 pu	X = 0.0833 pu

	Winding MVA = 168 MVA	Winding MVA = 102 MVA	Winding MVA = 51 MVA
	Rating MVA = 280 MVA	Rating MVA = 170 MVA	Rating MVA = 85 MVA
Equivalent Collector Line[2]	R = 0.0017 pu	R = 0.0045 pu	R = 0.0080 pu
	X = 0.001727 pu	X = 0.0060 pu	X = 0.0084 pu
	B = 0.0189 pu	B = 0.0221 pu	B = 0.0092 pu
GSU Transformer[1]	Gen Equivalent Qty: 70	Gen Equivalent Qty: 37	Gen Equivalent Qty: 18
	R = 0.0094 pu	R = 0.0084 pu	R = 0.0084 pu
	X = 0.0593 pu	X = 0.0885 pu	X = 0.0885 pu
	Winding MVA = 280 MVA	Winding MVA = 155.66 MVA	Winding MVA = 75.73 MVA
	Rating MVA = 280 MVA	Rating MVA = 155.7 MVA	Rating MVA = 75.7 MVA
Generator Dynamic Model[3] & Power Factor	REGCA1 Leading and Lagging: ±0.9	REGCA1[3] Leading and Lagging: ±0.8803	
Reactive Power Devices	N/A	N/A	Binit = 20 Mvar
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-2022-001 study models.

The methodology and results of the comparisons are described below. The analysis was completed using PSS/E version 34.9.3 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.

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.

REACTIVE COMPENSATION ANALYSIS

Reactive compensation analysis was performed for GEN-2018-055 to determine the capacitive charging effects during reduced generation conditions (unsuitable wind speeds, unsuitable solar irradiance, insufficient state of charge, idle conditions, curtailment, etc.) at the generation site and to size shunt reactors that would reduce the project reactive power contribution to the POI to approximately zero.

METHODOLOGY AND CRITERIA

The GEN-2018-055 generators and capacitors were switched out of service while other system elements remained in-service. A shunt reactor was tested at the project's collection substation 34.5 kV bus and the wind unit's collector substation 34.5 kV bus to set the MVAr flow into the POI to approximately zero. The size of the shunt reactor is equivalent to the charging current value at unity voltage and the compensation provided is proportional to the voltage effects on the charging current (i.e., for voltages above unity, reactive compensation is greater than the size of the reactor).

SPP performed the charging current compensation analysis using the modification request data based on the 2025 Summer Peak (25SP) DISIS-2022-001 stability study models.

RESULTS

The results from the analysis showed that the GEN-2018-055 project needed approximately 2.13 MVAr of compensation at its project substation, while the wind unit sharing the same POI required an additional 24.1 MVAr. In total, approximately 26.23 MVAr of reactive compensation was necessary to reduce the POI MVAr to zero.

Figure 3-1 illustrates the shunt reactor size needed to reduce the POI MVAr to approximately zero with the updated topology. The final shunt reactor requirements for GEN-2018-055 are shown in Table 3-1.

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

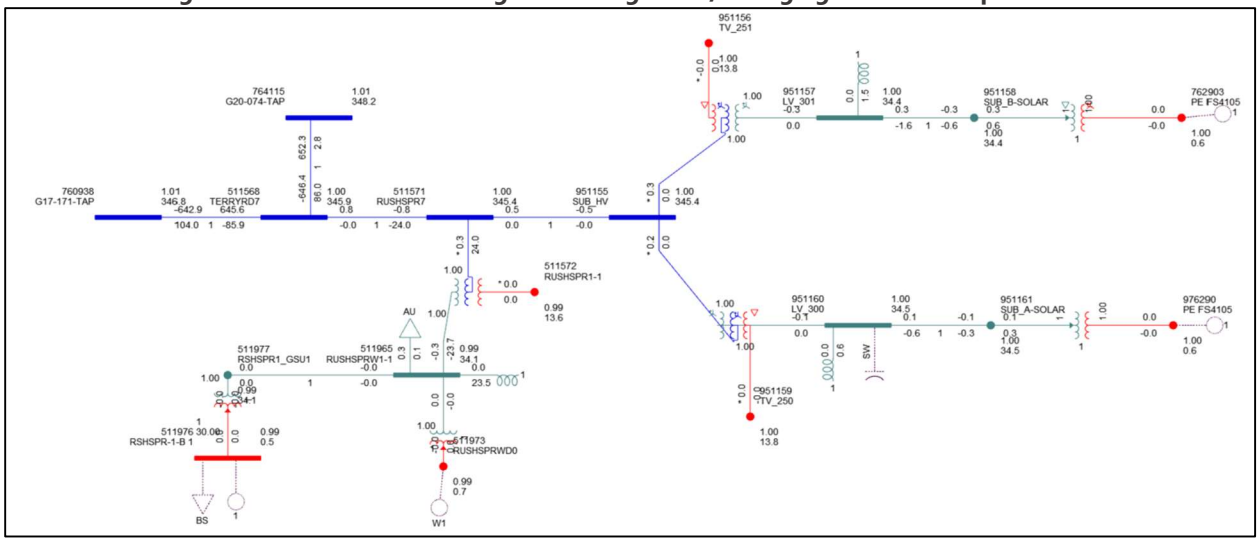
Table 3-1: Reactor Size for Modification Request*

MACHINE	POI BUS NUMBER	POI BUS NAME	REACTOR SIZE (MVAR)

			25SP
GEN-2018-055	Terry Road 345 kV (511568)	Terry Road Substation 345 kV (511568)	GEN-2018-055: 2.13 Total: 26.23

*The remaining gen-tie reactive compensation is supplied by the wind unit connected to the same POI.

Figure 3-1: GEN-2018-055 Single Line Diagram w/ Charging Current Compensation



SHORT CIRCUIT ANALYSIS

A short circuit study was performed using the 25SP model for GEN-2018-055. The detailed results of the short circuit analysis are provided in Appendix B.

Methodology

The short circuit analysis included applying a three-phase fault on buses up to 10 levels away from the 345 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-2018-055 online.

SPP created a short circuit model using the 25SP DISIS-2022-001 stability study model by adjusting the GEN-2018-055 short circuit parameters consistent with the modification data. The adjusted parameters are shown in Table 4-1 below.

Table 4-1: Short Circuit Model Parameters*

PARAMETER	VALUE BY GENERATOR BUS#	
	762903	976290
Machine MVA Base	151.88	73.89

R (pu)	0.0	0.0
X'' (pu)	1.0	1.0

*pu values based on Machine MVA Base

Results

The results of the short circuit analysis for the 25SP model are summarized in Table 4-2 and Table 4-3. The GEN-2018-055 POI bus (Terry Road Substation 345 kV - 511568) fault current magnitudes are provided in ase fault current was about 2.8320% and 0.3052 kA.

showing a maximum fault current of 11.8022 kA with the GEN-2018-055 project online.

Table 4-3 shows the maximum fault current magnitudes and fault current increases with the GEN-2018-055 project online.

There were 10 buses with a pre-existing maximum three-phase fault current over 40 kA. These buses are highlighted in Appendix B. The maximum GEN-2018-055 contribution to three-phase fault current was about 2.8320% and 0.3052 kA.

Table 4-2: Short Circuit Model Parameters*

CASE	GEN-OFF CURRENT (KA)	GEN-ON CURRENT (KA)	KA CHANGE	%CHANGE
25SP	10.777	11.8022	0.3052	2.832%

Table 4-3: 25SP Short Circuit Results

VOLTAGE (KV)	MAX. CURRENT (KA)	MAX KA CHANGE	MAX %CHANGE
69	16.4992	0.0144	0.090%
115	19.009	0.0005	0.003%
138	51.3554	0.092	0.369%
161	22.8258	0.002	0.0019%
230	27.2665	0.0019	0.0139%
345	36.2376	0.3052	2.8320%
500	8.3511	0.0	0.0%
Max	**51.3554**	**0.3052**	**2.8320%**

DYNAMIC STABILITY ANALYSIS

SPP performed a dynamic stability analysis to identify the impact of the inverter configuration change and other modifications to GEN-2018-055. The analysis was performed according to SPP's Disturbance Performance Requirements[2] shown in Appendix C. The modification details are described in the Project And section and the dynamic modeling data is provided in Appendix A. The existing original case issues and simulation plots can be found in Appendix F.

Methodology and Criteria

The dynamic stability analysis was performed using models developed with the requested GEN-2018-055 configuration of 55 PE FS4105 solar inverters (REGCA1). This stability analysis was performed using PTI's PSS/E version 34.9.3 software.

The modifications requested for the GEN-2018-055 project were used to create modified stability models for this impact study based on the DISIS-2022-001 stability study models:

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

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

The modified dynamic model data for the GEN-2018-055 project is provided in Appendix A. The modified power flow models and associated dynamic database were initialized (no-fault test) to confirm that there were no errors in the initial conditions of the system and the dynamic data.

During the fault simulations, the monitored areas included all buses and radially connected facilities within five buses of the Request's POI. The active power (PELEC), reactive power (QELEC), and terminal voltage (ETERM) were monitored for GEN-2018-055 and other requests within the monitored area. The machine rotor angle for synchronous machines within the studied area were monitored. In addition, the voltage and frequency of all 69 kV and above buses within the study area were monitored.

Fault Definitions

EPE developed and simulated faults for GEN-2018-055 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 D. These contingencies were applied to the modified 25SP and 25WP models.

Results

Appendix E includes the relevant results of the fault events simulated for each of the modified cases.

The results of the dynamic stability analysis showed no voltage violations or voltage recovery issues. Several generators experienced protective tripping during multiple events. However, these issues are already present in the base case and are not attributed to the unit. As a precaution to understand the potential impact if the requested simulation does not occur, the events were re-run with protection disabled, and no stability concerns were identified.

Additional oscillations were observed and subsequently mitigated by removing the mechanical model to assess its contribution to the system. These issues were also observed in the original DISIS-2022-001-1 cases and were not attributed to the modification request.

There were no damping or voltage recovery violations attributed to the GEN-2018-055 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.

It must be noted that the requested modification capacity (200 MW) is lower than the GIA granted capacity for GEN-2018-055 (252 MW) which is intended to be compensated by subsequent surplus capacity at the POI.

Results

The modified generating capacity of GEN-2018-055 (203.72 MW) does not exceed the GIA Interconnection Service amount, 252 MW, as listed in Appendix A of the GIA. The GEN-2018-055 inverters are rated at 3.7 MW and use a Power Plant Controller (PPC) to limit the total power injected into the POI. Subsequent surplus capacity planned at the POI will exceed the GIA service amount.

Subsequent surplus generation planned at the site will cause the available capacity of GEN-2018-055 to exceed the GIA service amount. 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 power flow conclusions.

This determination implies that any network upgrades already required by GEN-2018-055 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-2018-055 GENERATOR DYNAMIC MODEL

976290 'USRMDL' 1 'REGCAU1' 101 1 1 14 3 4

@!/ Lvplsw

1

@!/ Tg Rrpwr Brkpt Zerox Lvpl1

0.0060 10.000 0.0100 0.0000 1.0000

@!/ Volim Lvpnt1 Lvpnt0 Iolim Tfltr

2.0000 0.0100 0.0000 -1.0000 0.006

@!/ Khv Iqrmax Iqrmin Accel

0.0000 30.000 -30.000 1.0000/

976290 'USRMDL' 1 'REECAU1' 102 0 6 45 6 9

@!/ Bus# PFflag Vflag Qflag Pflag PQflag

0 0 0 0 0 1

@!/ Vdip Vup Trv dbd1 dbd2

0.8500 2.0000 0.0060 -0.0010 0.0010

@!/ Kqv Iqh1 Iql1 Vref0 Iqfrz

2.0000 2.0000 -2.0000 1.0000 0.0000

@!/ Thld Thld2 Tp QMax QMin

0.0000 0.0000 0.0060 0.4310 -0.4310

@!/ Vmax Vmin Kqp Kqi Kvp

1.2000 -1.2000 1.0000 5.0000 1.0000

@!/ Kvi Vbias Tiq dPmax dPmin

5.0000 0.0000 0.0060 30.000 -30.000

@!/ Pmax Pmin Imax Tpord Vq1

0.9024 0.0000 1.0000 0.0250 0.1000

@!/ Iq1 Vq2 Iq2 Vq3 Iq3

1.0000 1.1000 1.0000 0.0000 0.0000

@!/ Vq4 Iq4 Vp1 Ip1 Vp2

0.0000 0.0000 0.1000 1.0000 1.1000

@!/ Ip2 Vp3 Ip3 Vp4 Ip4

1.0000 0.0000 0.0000 0.0000 0.0000/

976290 'USRMDL' 1 'REPCAU1' 107 0 7 27 7 9

@!/ Bus# LDC_FromBus LDC_ToBus LDC_ID VCFlag Refflag Fflag

951155 951155 511571 '1' 0 1 1

@!/ Tfltr Kp Ki Tft Tfv

0.0200 1.0000 50.000 0.0000 0.0250

@!/ Vfrz Rc Xc Kc emax

0.8000 0.0000 0.0000 0.03310 1.0000

@!/ emin dbd1 dbd2 QMax QMin

-1.0000 0.0000 0.0000 0.4310 -0.4310

@!/ Kpg Kig Tp fdbd1 fdbd2

0.0100 2.0000 0.0200 -0.0006 0.0006

@!/ femax femin Pmax Pmin Tg

10000.0 -10000.0 0.90240 0.0000 0.1000

@!/ Ddn Dup

55.1431 55.1431/

```
97629001  'VTGDCAT'    976290    976290 '1 '  0.90000   10.000   120.00   0.0800 /
97629002  'VTGDCAT'    976290    976290 '1 '  0.80000   10.000   60.000   0.0800 /
97629003  'VTGDCAT'    976290    976290 '1 '  0.70000   10.000   21.000   0.0800 /
97629004  'VTGDCAT'    976290    976290 '1 '  0.50000   10.000   10.000   0.0800 /
97629005  'VTGDCAT'    976290    976290 '1 '   0.0000   1.1000   120.00   0.0800 /
97629006  'VTGDCAT'    976290    976290 '1 '   0.0000   1.1500   60.000   0.0800 /
97629007  'VTGDCAT'    976290    976290 '1 '   0.0000   1.2000   2.0000   0.0800 /
97629008  'FRQDCAT'    976290    976290 '1 '   56.500   63.500   6.0000   0.0800 /
```

```
762903 'USRMDL' 1  'REGCAU1'  101   1    1   14   3   4
                        @!/ Lvplsw
                             1
                        @!/ Tg          Rrpwr       Brkpt       Zerox     Lvpl1
                             0.0060      10.000      0.0100      0.0000    1.0000
                        @!/ Volim       Lvpnt1      Lvpnt0      Iolim     Tfltr
                             2.0000      0.0100      0.0000     -1.0000    0.006
                        @!/ Khv         Iqrmax      Iqrmin      Accel
                             0.0000      30.000     -30.000      1.0000/
762903  'USRMDL' 1  'REECAU1'  102    0    6    45   6   9
                        @!/ Bus#          PFflag        Vflag         Qflag         Pflag         PQflag
                             0             0             0             0             0                1
                        @!/ Vdip          Vup           Trv           dbd1          dbd2
```

0.8500 2.0000 0.0060 -0.0010 0.0010

@!/ Kqv Iqh1 Iql1 Vref0 Iqfrz

2.0000 2.0000 -2.0000 1.0000 0.0000

@!/ Thld Thld2 Tp QMax QMin

0.0000 0.0000 0.0060 0.4310 -0.4310

@!/ Vmax Vmin Kqp Kqi Kvp

1.2000 -1.2000 1.0000 5.0000 1.0000

@!/ Kvi Vbias Tiq dPmax dPmin

5.0000 0.0000 0.0060 30.000 -30.000

@!/ Pmax Pmin Imax Tpord Vq1

0.9024 0.0000 1.0000 0.0250 0.1000

@!/ Iq1 Vq2 Iq2 Vq3 Iq3

1.0000 1.1000 1.0000 0.0000 0.0000

@!/ Vq4 Iq4 Vp1 Ip1 Vp2

0.0000 0.0000 0.1000 1.0000 1.1000

@!/ Ip2 Vp3 Ip3 Vp4 Ip4

1.0000 0.0000 0.0000 0.0000 0.0000/

762903 'USRMDL' 1 'REPCAU1' 107 0 7 27 7 9

@!/ Bus# LDC_FromBus LDC_ToBus LDC_ID VCFlag Refflag Fflag

951155 951155 511571 '1' 0 1 1

@!/ Tfltr Kp Ki Tft Tfv

0.0200 1.0000 50.000 0.0000 0.0250

```
@!/ Vfrz        Rc          Xc          Kc          emax
      0.8000      0.0000      0.0000      0.06805     1.0000
@!/ emin        dbd1        dbd2        QMax        QMin
     -1.0000     0.0000      0.0000      0.4310     -0.4310
@!/ Kpg         Kig         Tp          fdbd1       fdbd2
      0.0100      2.0000      0.0200     -0.0006      0.0006
@!/ femax       femin       Pmax        Pmin        Tg
      10000.0    -10000.0     0.90240     0.0000      0.1000
@!/ Ddn         Dup
      26.8273     26.8273/

76290301  'VTGDCAT'   762903   762903 '1 '  0.90000  10.000  120.00  0.0800 /
76290302  'VTGDCAT'   762903   762903 '1 '  0.80000  10.000  60.000  0.0800 /
76290303  'VTGDCAT'   762903   762903 '1 '  0.70000  10.000  21.000  0.0800 /
76290304  'VTGDCAT'   762903   762903 '1 '  0.50000  10.000  10.000  0.0800 /
76290305  'VTGDCAT'   762903   762903 '1 '   0.0000   1.1000  120.00  0.0800 /
76290306  'VTGDCAT'   762903   762903 '1 '   0.0000   1.1500  60.000  0.0800 /
76290307  'VTGDCAT'   762903   762903 '1 '   0.0000   1.2000  2.0000  0.0800 /
76290308  'FRQDCAT'   762903   762903 '1 '   56.500   63.500  6.0000  0.0800 /
```

APPENDIX B: GEN-2018-055 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)
04 SOUTHEAST	509875	RSS T2 4	138	51.3551	51.3554	0.0003
04 SOUTHEAST	509773	RSS T1 4	138	50.447	50.4473	0.0003
04 SOUTHEAST	514898	CIMARON4	138	45.1221	45.1283	0.0062
04 SOUTHEAST	514879	NORTWST4	138	45.0514	45.0554	0.004
04 SOUTHEAST	516097	NORMHLL4	138	42.287	42.2941	0.0071
04 SOUTHEAST	508562	PIRKEY 4	138	42.2288	42.229	0.0002
04 SOUTHEAST	514941	HSL 4	138	41.8217	41.824	0.0023
04 SOUTHEAST	514933	DRAPER 4	138	41.5753	41.583	0.0077
04 SOUTHEAST	514907	ARCADIA4	138	41.3431	41.3451	0.002
04 SOUTHEAST	515044	SEMINOL4	138	40.0649	40.0737	0.0088
04 SOUTHEAST	514929	PLVALLY4	138	39.6016	39.6078	0.0062
04 SOUTHEAST	515461	RNDBARN4	138	39.3321	39.3339	0.0018
04 SOUTHEAST	515977	LKKONWA4	138	39.1672	39.1757	0.0085
04 SOUTHEAST	514853	DVISION4	138	36.7518	36.7546	0.0028
04 SOUTHEAST	514901	CIMARON7	345	36.2253	36.2376	0.0123
04 SOUTHEAST	520814	ANADARK4	138	35.8485	35.8638	0.0153
04 SOUTHEAST	514953	HOLLYWD4	138	35.1055	35.1104	0.0049
04 SOUTHEAST	511477	S.W.S.-4	138	33.9727	33.9901	0.0174
04 SOUTHEAST	515497	MATHWSN7	345	33.9786	33.9858	0.0072
04 SOUTHEAST	514946	MIDWEST4	138	33.8893	33.8944	0.0051
04 SOUTHEAST	514880	NORTWST7	345	33.7772	33.7832	0.006
04 SOUTHEAST	515802	GRACMNT4	138	32.738	32.7575	0.0195
04 SOUTHEAST	509782	R.S.S.-7	345	32.0712	32.0716	0.0004
04 SOUTHEAST	588039	G16133G161	345	32.0712	32.0716	0.0004
04 SOUTHEAST	514902	MCCLAIN4	138	32.0216	32.0241	0.0025
04 SOUTHEAST	514854	BRADEN 4	138	31.9999	32.0019	0.002
04 SOUTHEAST	507759	SW SHV 4	138	31.4926	31.4927	1E-04
04 SOUTHEAST	514992	TURNER 4	138	30.5687	30.572	0.0033
04 SOUTHEAST	514893	XEROX 4	138	30.4278	30.4297	0.0019
04 SOUTHEAST	514876	SW134TP4	138	30.2661	30.2687	0.0026
04 SOUTHEAST	508840	WILKES 4	138	30.2116	30.2118	0.0002
04 SOUTHEAST	521089	WASHITA4	138	30.0627	30.0765	0.0138
04 SOUTHEAST	509834	COGENT 7	345	29.7233	29.7236	0.0003

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)
04 SOUTHEAST	520917	FRNKLNS4	138	29.4929	29.4969	0.004
04 SOUTHEAST	509807	ONETA--7	345	29.0215	29.0217	0.0002
04 SOUTHEAST	514894	CZECHAL4	138	29.0114	29.0133	0.0019
04 SOUTHEAST	508831	DIANA 4	138	28.8773	28.8776	0.0003
04 SOUTHEAST	514928	SOGATE 4	138	28.4756	28.4781	0.0025
04 SOUTHEAST	515045	SEMINOL7	345	28.4388	28.4479	0.0091
04 SOUTHEAST	515224	MUSKOGE7	345	27.5545	27.5557	0.0012
04 SOUTHEAST	514873	LNEOAK 4	138	27.4201	27.4215	0.0014
04 SOUTHEAST	525531	TOLK	230	27.2662	27.2665	0.0003
04 SOUTHEAST	514828	KETCHTP4	138	27.0578	27.0589	0.0011
04 SOUTHEAST	514908	ARCADIA7	345	26.9492	26.9512	0.002
04 SOUTHEAST	523979	HARRNG_EST	230	26.8787	26.8791	0.0004
04 SOUTHEAST	516096	NORMHLL7	345	26.8352	26.8451	0.0099
04 SOUTHEAST	514863	HAYMAKR4	138	26.821	26.8227	0.0017
04 SOUTHEAST	514909	REDBUD 7	345	26.0248	26.0265	0.0017
04 SOUTHEAST	515376	WWRDEHV4	138	25.9601	25.9607	0.0006
04 SOUTHEAST	524044	NICHOLS	230	25.9539	25.9542	0.0003
04 SOUTHEAST	508071	NWTXARK4	138	25.8722	25.8738	0.0016
04 SOUTHEAST	514934	DRAPER 7	345	25.782	25.7903	0.0083
04 SOUTHEAST	520422	SEQUOYAHJ4	138	25.5454	25.5532	0.0078
04 SOUTHEAST	511467	L.E.S.-4	138	24.9584	25.0504	0.092
04 SOUTHEAST	508808	LONGWD 4	138	25.0086	25.0087	0.0001
04 SOUTHEAST	508070	NWT-BNT4	138	24.841	24.8425	0.0015
04 SOUTHEAST	507454	TURK 4	138	24.4275	24.4282	0.0007
04 SOUTHEAST	514948	CEDARLN4	138	23.801	23.8038	0.0028
04 SOUTHEAST	514881	SPRNGCK7	345	23.6066	23.6089	0.0023
04 SOUTHEAST	514801	MINCO 7	345	23.035	23.0549	0.0199
04 SOUTHEAST	515444	MCNOWND7	345	22.9394	22.9591	0.0197
04 SOUTHEAST	523959	POTTER_CO	230	22.8521	22.8525	0.0004
04 SOUTHEAST	515301	FTSMTHW5	161	22.8258	22.8258	0
04 SOUTHEAST	514949	SOONRTP4	138	22.8142	22.8168	0.0026
04 SOUTHEAST	509870	SAPLPRD7	345	22.8058	22.806	0.0002
04 SOUTHEAST	514864	PIEDMNT4	138	22.6825	22.6836	0.0011
04 SOUTHEAST	514510	BURGETT4	138	22.5292	22.5299	0.0007
04 SOUTHEAST	520948	HUGO PP4	138	22.4758	22.4823	0.0065

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)
04 SOUTHEAST	761250	GEN-2017-233	345	22.2809	22.2995	0.0186
04 SOUTHEAST	761229	GEN-2017-150	345	22.2377	22.2562	0.0185
04 SOUTHEAST	515235	PECANCK7	345	22.2379	22.2384	0.0005
04 SOUTHEAST	520560	HUGOITC4	138	22.1755	22.1821	0.0066
04 SOUTHEAST	514957	CHERYCK4	138	22.1175	22.1196	0.0021
04 SOUTHEAST	525481	PLANT_X	230	21.7424	21.7426	0.0002
04 SOUTHEAST	515375	WWRDEHV7	345	21.5023	21.5036	0.0013
04 SOUTHEAST	514930	OAKTRET4	138	21.4112	21.4134	0.0022
04 SOUTHEAST	515234	PECANCK5	161	21.2932	21.2934	0.0002
04 SOUTHEAST	525830	TUCO_INT	230	21.2294	21.2313	0.0019
04 SOUTHEAST	767301	GEN-2022-016	345	21.1954	21.1966	0.0012
04 SOUTHEAST	767221	GEN-2022-012	345	21.1753	21.1766	0.0013
04 SOUTHEAST	515465	LGARBER4	138	21.1553	21.1559	0.0006
04 SOUTHEAST	525840	ANTELOPE_1	230	21.0559	21.0578	0.0019
04 SOUTHEAST	5917	SPPMAINBUS	345	21.047	21.048	0.001
04 SOUTHEAST	5919	WELSHDC1	345	21.047	21.048	0.001
04 SOUTHEAST	5921	SPP-CAP1	345	21.047	21.048	0.001
04 SOUTHEAST	5922	SPP-CAP2	345	21.047	21.048	0.001
04 SOUTHEAST	5923	SPP-CAP3	345	21.047	21.048	0.001
04 SOUTHEAST	5924	SPP-REAC1	345	21.047	21.048	0.001
04 SOUTHEAST	508359	WELSH 7	345	21.047	21.048	0.001
04 SOUTHEAST	508054	BANN 4	138	20.9532	20.9541	0.0009
04 SOUTHEAST	514842	CHTWOOD4	138	20.8911	20.8917	0.0006
04 SOUTHEAST	767321	GEN-2022-017	345	20.8808	20.882	0.0012
04 SOUTHEAST	514906	JNSKAMO4	138	20.6783	20.6788	0.0005
04 SOUTHEAST	514958	BOYD 4	138	20.5459	20.5478	0.0019
04 SOUTHEAST	300136	4MEMORALT	138	20.5241	20.5246	0.0005
04 SOUTHEAST	515135	SUNNYSD4	138	20.4045	20.4721	0.0676
04 SOUTHEAST	524010	ROLLHILLS	230	20.2998	20.3001	0.0003
04 SOUTHEAST	515457	AIRDEPT4	138	20.2765	20.2778	0.0013
04 SOUTHEAST	509745	CLARKSV7	345	20.2015	20.2018	0.0003
04 SOUTHEAST	520547	SEQOYAH4	138	20.0742	20.079	0.0048
04 SOUTHEAST	515055	MAUD 4	138	20.0552	20.057	0.0018
04 SOUTHEAST	508049	NASH 4	138	19.9873	19.9881	0.0008
04 SOUTHEAST	514961	GM 4	138	19.8798	19.8812	0.0014

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)
04 SOUTHEAST	765660	GEN-2021-038	345	19.6024	19.6033	0.0009
04 SOUTHEAST	508832	DIANA 7	345	19.3059	19.3063	0.0004
04 SOUTHEAST	514895	SARA 4	138	19.3043	19.3054	0.0011
04 SOUTHEAST	515425	WWDPST 4	138	19.2086	19.2089	0.0003
04 SOUTHEAST	515800	GRACMNT7	345	19.0957	19.1429	0.0472
04 SOUTHEAST	507456	TURK 3	115	19.0087	19.009	0.0003
04 SOUTHEAST	525828	TUCO_INT	115	18.8859	18.8864	0.0005
04 SOUTHEAST	514827	CTNWOOD4	138	18.772	18.7723	0.0003
04 SOUTHEAST	763527	GEN-2019-012	345	18.7215	18.7225	0.001
04 SOUTHEAST	514715	WOODRNG7	345	18.6764	18.6769	0.0005
04 SOUTHEAST	588670	GEN-2017-023	138	18.543	18.5474	0.0044
04 SOUTHEAST	514820	JENSENT4	138	18.4744	18.4755	0.0011
04 SOUTHEAST	520923	GEORGIA4	138	18.3606	18.3648	0.0042
04 SOUTHEAST	588838	G17-092-SW	345	18.3421	18.3438	0.0017
04 SOUTHEAST	588839	FIREWHL-TA	345	18.3421	18.3438	0.0017
04 SOUTHEAST	527894	HOBBS_INT	230	18.3283	18.3283	0
04 SOUTHEAST	771721	GEN-2022-238	138	18.2526	18.2541	0.0015
04 SOUTHEAST	526935	YOAKUM	230	18.1918	18.192	0.0002
04 SOUTHEAST	515610	FSHRTAP7	345	18.0146	18.0171	0.0025
04 SOUTHEAST	515875	REDNGTN7	345	17.9658	17.9668	0.001
04 SOUTHEAST	515877	REDDIRT7	345	17.9616	17.9626	0.001
04 SOUTHEAST	588810	GEN-2017-040	345	17.9278	17.9294	0.0016
04 SOUTHEAST	508563	PIRKEY 7	345	17.9254	17.9255	1E-04
04 SOUTHEAST	526934	YOAKUM	115	17.863	17.863	0
04 SOUTHEAST	762592	GEN-2018-024	345	17.7846	17.7862	0.0016
04 SOUTHEAST	515407	TATONGA7	345	17.6394	17.6406	0.0012
04 SOUTHEAST	514785	WOODWRD4	138	17.6328	17.633	0.0002
04 SOUTHEAST	508091	ALUMAX 4	138	17.6059	17.6066	0.0007
04 SOUTHEAST	526268	LUBBCK_STH	115	17.5485	17.5487	0.0002
04 SOUTHEAST	508297	LSSOUTH4	138	17.4628	17.4629	0.0001
04 SOUTHEAST	769761	GEN-2022-139	345	17.1334	17.1335	1E-04
04 SOUTHEAST	526337	JONES	230	17.0403	17.0406	0.0003
04 SOUTHEAST	514819	EL-RENO4	138	16.9671	16.9679	0.0008
04 SOUTHEAST	508572	LEBROCK7	345	16.6246	16.6247	0.0001
04 SOUTHEAST	524414	AMA_SOUTH	115	16.5401	16.5402	0.0001

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)
04 SOUTHEAST	508079	SUGARHL2	69	16.4989	16.4992	0.0003
04 SOUTHEAST	516091	OKTAHA 7	345	16.4483	16.4494	0.0011
04 SOUTHEAST	515178	PARKLN 4	138	16.3344	16.3379	0.0035
04 SOUTHEAST	762823	GEN-2018-048	345	16.3041	16.3044	0.0003
04 SOUTHEAST	515003	BARNES 4	138	16.2376	16.2384	0.0008
04 SOUTHEAST	514808	JOHNCO 4	138	16.1394	16.1604	0.021
04 SOUTHEAST	515117	ARBUCKL4	138	16.0939	16.1038	0.0099
04 SOUTHEAST	511466	L.E.S.-2	69	16.0658	16.0802	0.0144
04 SOUTHEAST	511409	TREASILD7	345	15.9871	16.0486	0.0615
04 SOUTHEAST	514821	JENSEN 4	138	15.8138	15.8146	0.0008
04 SOUTHEAST	507760	SW SHV 7	345	15.8056	15.8057	1E-04
04 SOUTHEAST	508809	LONGWD 7	345	15.747	15.7471	1E-04
04 SOUTHEAST	511449	CORNVIL4	138	15.4464	15.4491	0.0027
04 SOUTHEAST	514993	SE15TH 4	138	15.4282	15.4289	0.0007
04 SOUTHEAST	762845	GEN-2018-050	345	15.4109	15.411	1E-04
04 SOUTHEAST	527149	MUSTANG	230	15.4043	15.4044	1E-04
04 SOUTHEAST	515853	DGRASSE4	138	15.2699	15.27	1E-04
04 SOUTHEAST	587804	G16-119-TA	345	15.254	15.2544	0.0004
04 SOUTHEAST	526269	LUBBCK_STH	230	15.2247	15.2249	0.0002
04 SOUTHEAST	508841	WILKES 7	345	15.1922	15.1924	0.0002
04 SOUTHEAST	511437	COMANC-4	138	15.0878	15.1131	0.0253
04 SOUTHEAST	560071	G16-003-TA	345	14.9144	14.9149	0.0005
04 SOUTHEAST	765440	GEN-2021-015	345	14.9138	14.9143	0.0005
04 SOUTHEAST	589300	GEN-2017-092	345	14.9041	14.9052	0.0011
04 SOUTHEAST	769201	GEN-2022-111	345	14.8508	14.8509	1E-04
04 SOUTHEAST	511468	L.E.S.-7	345	14.672	14.8158	0.1438
04 SOUTHEAST	539801	THISTLE7	345	14.7903	14.7904	0.0001
04 SOUTHEAST	510918	VALIANT4	138	14.7045	14.7072	0.0027
04 SOUTHEAST	510907	PITTSB-7	345	14.6935	14.7046	0.0111
04 SOUTHEAST	764550	G20-087-TA	345	14.5798	14.6849	0.1051
04 SOUTHEAST	764555	GEN-2020-087	345	14.5695	14.6745	0.105
04 SOUTHEAST	515559	SULPHR 4	138	14.592	14.6004	0.0084
04 SOUTHEAST	524365	RANDALL	230	14.5607	14.5608	1E-04
04 SOUTHEAST	763318	GEN-2018-115	345	14.3827	14.5206	0.1379
04 SOUTHEAST	510925	KIOWA 7	345	14.4154	14.4261	0.0107

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)
04 SOUTHEAST	520810	ANADARK2	69	14.3973	14.3985	0.0012
04 SOUTHEAST	515373	LBRTYLK4	138	14.3611	14.3613	0.0002
04 SOUTHEAST	515549	MNCWND37	345	14.3078	14.3149	0.0071
04 SOUTHEAST	525480	PLANT_X	115	14.313	14.3131	1E-04
04 SOUTHEAST	515144	LONEGRV4	138	14.2449	14.2764	0.0315
04 SOUTHEAST	526298	LUBBCK_EST	115	14.2629	14.263	1E-04
04 SOUTHEAST	515852	DGRASSE7	345	14.2006	14.2009	0.0003
04 SOUTHEAST	515177	PARKLN 2	69	14.135	14.1362	0.0012
04 SOUTHEAST	527009	BRU_SUB	230	14.1127	14.1128	1E-04
04 SOUTHEAST	514994	TINKER54	138	14.0945	14.0951	0.0006
04 SOUTHEAST	515075	FRSTHIL4	138	13.879	13.8796	0.0006
04 SOUTHEAST	508072	NWTXARK7	345	13.8726	13.874	0.0014
04 SOUTHEAST	515286	STRLGTP4	138	13.8344	13.8349	0.0005
04 SOUTHEAST	510946	C-RIVER4	138	13.8315	13.833	0.0015
04 SOUTHEAST	515585	MAMTHPW7	345	13.8052	13.8059	0.0007
04 SOUTHEAST	507429	PATTERS2	69	13.7779	13.7781	0.0002
04 SOUTHEAST	520440	HARPER2	69	13.6451	13.6462	0.0011
04 SOUTHEAST	510911	VALIANT7	345	13.6249	13.6316	0.0067
04 SOUTHEAST	508835	JEFFRSN4	138	13.6097	13.6097	0
04 SOUTHEAST	524415	AMA_SOUTH	230	13.5907	13.5909	0.0002
04 SOUTHEAST	520867	CORN TP4	138	13.5821	13.5842	0.0021
04 SOUTHEAST	515137	UNIROY 4	138	13.5197	13.5432	0.0235
04 SOUTHEAST	525460	NEWHART	115	13.5467	13.5468	1E-04
04 SOUTHEAST	525549	TOLK	345	13.4214	13.4215	1E-04
04 SOUTHEAST	508837	NGPLTAP4	138	13.374	13.3741	1E-04
04 SOUTHEAST	515531	VANOSTP4	138	13.3559	13.359	0.0031
04 SOUTHEAST	508298	LYDIA 7	345	13.3354	13.3372	0.0018
04 SOUTHEAST	515372	ARDWEST4	138	13.2882	13.3103	0.0221
04 SOUTHEAST	507431	PATTERS4	138	13.2439	13.2442	0.0003
04 SOUTHEAST	588180	GEN-2016-126	138	13.2351	13.2417	0.0066
04 SOUTHEAST	515174	VANOSS 4	138	13.2284	13.2313	0.0029
04 SOUTHEAST	515170	CHIKSAW2	69	13.1985	13.207	0.0085
04 SOUTHEAST	515138	CARTER 4	138	13.159	13.1769	0.0179
04 SOUTHEAST	515961	GUTHRIE7	345	13.173	13.1735	0.0005
04 SOUTHEAST	515605	CANADN7	345	13.0932	13.0944	0.0012

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)
04 SOUTHEAST	511488	112GORE4	138	12.9982	13.0175	0.0193
04 SOUTHEAST	515123	OAKLAW-4	138	12.9786	12.9847	0.0061
04 SOUTHEAST	521019	OAKLAWN4	138	12.9786	12.9847	0.0061
04 SOUTHEAST	515171	CHIKSAW4	138	12.9269	12.9433	0.0164
04 SOUTHEAST	516059	BECKHAM7	345	12.9327	12.9363	0.0036
04 SOUTHEAST	511553	CHISHOLM7	345	12.868	12.8717	0.0037
04 SOUTHEAST	515415	CHEEKTP4	138	12.7909	12.8159	0.025
04 SOUTHEAST	523961	POTTER_CO	345	12.8143	12.8146	0.0003
04 SOUTHEAST	525832	TUCO_INT	345	12.8041	12.8064	0.0023
04 SOUTHEAST	525850	ELK_CT1	345	12.6977	12.6999	0.0022
04 SOUTHEAST	769921	GEN-2022-147	345	12.6697	12.6719	0.0022
04 SOUTHEAST	520508	CLVLDSW4	138	12.6647	12.6661	0.0014
04 SOUTHEAST	514829	PINE ST4	138	12.6562	12.6564	0.0002
04 SOUTHEAST	511510	LAIRGST4	138	12.585	12.6029	0.0179
04 SOUTHEAST	511474	SHERID4	138	12.5254	12.5458	0.0204
04 SOUTHEAST	515136	SUNNYSD7	345	12.4232	12.5239	0.1007
04 SOUTHEAST	771600	G22-231-TA	138	12.539	12.5391	0.0001
04 SOUTHEAST	526525	WOLFFORTH	230	12.4583	12.4586	0.0003
04 SOUTHEAST	520828	BLANCHD4	138	12.3608	12.3618	0.001
04 SOUTHEAST	768400	G22-071-TA	138	12.3461	12.3472	0.0011
04 SOUTHEAST	515162	FNDTION4	138	12.3018	12.3167	0.0149
04 SOUTHEAST	526160	CARLISLE	115	12.3145	12.3146	1E-04
04 SOUTHEAST	762431	G18-003-TA	138	12.3108	12.311	0.0002
04 SOUTHEAST	515164	ROCKYPT4	138	12.2584	12.2755	0.0171
04 SOUTHEAST	511557	CHISHOLM6	230	12.264	12.2657	0.0017
04 SOUTHEAST	511512	RPPAPER4	138	12.2261	12.2437	0.0176
04 SOUTHEAST	515172	SPRNDAL4	138	12.2207	12.2356	0.0149
04 SOUTHEAST	511428	LG-YEAR4	138	12.1833	12.2003	0.017
04 SOUTHEAST	508080	SUGARHL4	138	12.1931	12.1934	0.0003
04 SOUTHEAST	515448	CRSRDSW7	345	12.1785	12.1791	0.0006
04 SOUTHEAST	765451	G21-016-TA	345	12.047	12.1373	0.0903
04 SOUTHEAST	500250	DOLHILL7	345	12.1201	12.1201	0
04 SOUTHEAST	523095	HITCHLAND	230	12.1008	12.1009	1E-04
04 SOUTHEAST	760938	G17-171-TA	345	11.8403	12.0465	0.2062
04 SOUTHEAST	588560	GEN-2017-011	345	12.0485	12.0488	0.0003

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)
04 SOUTHEAST	760939	GEN-2017-171	345	11.7697	11.9733	0.2036
04 SOUTHEAST	515600	KNGFSHR7	345	12.0084	12.0094	0.001
04 SOUTHEAST	509639	DIANASW4	138	11.9847	11.9847	0
04 SOUTHEAST	764115	G20-074-TA	345	11.8391	11.9612	0.1221
04 SOUTHEAST	764105	GEN-2020-074	345	11.8331	11.955	0.1219
04 SOUTHEAST	764075	GEN-2020-054	345	11.9545	11.956	0.0015
04 SOUTHEAST	511537	ARTVLTP4	138	11.9232	11.941	0.0178
04 SOUTHEAST	511509	53CACHE4	138	11.9067	11.9244	0.0177
04 SOUTHEAST	511471	LWS-NTP4	138	11.8781	11.8954	0.0173
04 SOUTHEAST	515554	BVRCNTY7	345	11.8535	11.8537	0.0002
04 SOUTHEAST	762132	GEN-2017-158	230	11.8332	11.8332	0
04 SOUTHEAST	511439	LWSTAP 4	138	11.7749	11.7917	0.0168
04 SOUTHEAST	515120	RUSSET-4	138	11.7662	11.7766	0.0104
04 SOUTHEAST	511429	L AIRGS4	138	11.7485	11.7641	0.0156
04 SOUTHEAST	765450	GEN-2021-016	345	11.6469	11.7314	0.0845
04 SOUTHEAST	521044	RUSSETT4	138	11.693	11.7032	0.0102
04 SOUTHEAST	515165	TOTAL 4	138	11.5807	11.5933	0.0126
04 SOUTHEAST	515677	BADGER 7	345	11.5794	11.5796	0.0002
04 SOUTHEAST	768401	GEN-2022-071	138	11.5636	11.5646	0.001
04 SOUTHEAST	515122	SXMLCKT4	138	11.5542	11.563	0.0088
04 SOUTHEAST	515951	PERSIMN7	345	11.5133	11.5137	0.0004
04 SOUTHEAST	511458	ELKCTY-4	138	11.4551	11.4558	0.0007
04 SOUTHEAST	525957	HALE_WNDCL	230	11.4515	11.4519	0.0004
04 SOUTHEAST	521122	HOWE 4	138	11.4395	11.4481	0.0086
04 SOUTHEAST	525192	KRESS_INT	115	11.4172	11.4173	1E-04
04 SOUTHEAST	515121	MILLCKT4	138	11.4022	11.4106	0.0084
04 SOUTHEAST	515318	SOTHADA4	138	11.3696	11.3713	0.0017
04 SOUTHEAST	511431	LWS S4	138	11.2831	11.2986	0.0155
04 SOUTHEAST	515873	DRPSPRG4	138	11.2767	11.2891	0.0124
04 SOUTHEAST	521157	HUGO 7	345	11.2815	11.2888	0.0073
04 SOUTHEAST	515422	C-RIVER7	345	11.282	11.2849	0.0029
04 SOUTHEAST	587770	GEN-2016-095	345	11.2456	11.2755	0.0299
04 SOUTHEAST	515074	FRSTHIL2	69	11.2741	11.2743	0.0002
04 SOUTHEAST	520838	CADDO 2	69	11.2647	11.2654	0.0007
04 SOUTHEAST	526299	LUBBCK_EST	230	11.2309	11.2311	0.0002

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)
04 SOUTHEAST	514809	JOHNCO 7	345	11.1554	11.1906	0.0352
04 SOUTHEAST	587794	G16-097-TA	138	11.1836	11.1878	0.0042
04 SOUTHEAST	523097	HITCHLAND	345	11.1842	11.1844	0.0002
04 SOUTHEAST	523101	NOBLE_WND	345	11.1484	11.1485	0.0001
04 SOUTHEAST	511568	TERRYRD7	345	10.777	11.0822	0.3052
04 SOUTHEAST	527896	HOBBS_INT	345	11.1292	11.1293	1E-04
04 SOUTHEAST	521017	ONEY 4	138	11.0773	11.079	0.0017
04 SOUTHEAST	764875	GEN-2020-060	230	11.0494	11.0495	1E-04
04 SOUTHEAST	511483	NORGE--4	138	11.0439	11.0454	0.0015
04 SOUTHEAST	526162	LP-DOUD_TP	115	11.0122	11.0123	1E-04
04 SOUTHEAST	523112	NOVUS1	345	10.9998	10.9999	0.0001
04 SOUTHEAST	587740	GEN-2016-091	345	10.9408	10.9687	0.0279
04 SOUTHEAST	520473	CKSHATP4	138	10.8699	10.8713	0.0014
04 SOUTHEAST	525212	SWISHER	115	10.8644	10.8645	1E-04
04 SOUTHEAST	526524	WOLFFORTH	115	10.8407	10.8408	1E-04
04 SOUTHEAST	765641	G21-036-TA	138	10.8252	10.8255	0.0003
04 SOUTHEAST	527028	INK_BASIN	230	10.7815	10.7815	0
04 SOUTHEAST	526435	SUNDOWN	230	10.7706	10.7707	0.0001
04 SOUTHEAST	526109	SP-ERSKINE	115	10.683	10.6831	1E-04
04 SOUTHEAST	515458	BORDER	345	10.6554	10.658	0.0026
04 SOUTHEAST	508351	PERDUE 4	138	10.6453	10.6454	0.0001
04 SOUTHEAST	520918	FROGVIL4	138	10.6188	10.6204	0.0016
04 SOUTHEAST	511430	LWS N4	138	10.5664	10.5801	0.0137
04 SOUTHEAST	515054	MAUD 2	69	10.5525	10.5527	0.0002
04 SOUTHEAST	515133	BLUERIV4	138	10.546	10.5486	0.0026
04 SOUTHEAST	515100	PAOLI- 4	138	10.4988	10.5009	0.0021
04 SOUTHEAST	520411	SAWYER4	138	10.4844	10.4858	0.0014
04 SOUTHEAST	516092	OKTAHA 5	161	10.4452	10.4454	0.0002
04 SOUTHEAST	525461	NEWHART	230	10.3218	10.3219	1E-04
04 SOUTHEAST	505600	TUPELO 4	138	10.3065	10.308	0.0015
04 SOUTHEAST	516093	OKTAHA 2	69	10.2763	10.2764	1E-04
04 SOUTHEAST	516146	25MILE 7	345	10.2626	10.2628	0.0002
04 SOUTHEAST	515475	PURCELL4	138	10.2259	10.2269	0.001
04 SOUTHEAST	526161	CARLISLE	230	10.2259	10.2261	0.0002
04 SOUTHEAST	515932	STIRLNG4	138	10.1888	10.1986	0.0098

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)
04 SOUTHEAST	515939	MNCWND47	345	10.1942	10.1976	0.0034
04 SOUTHEAST	511502	N29CHIK4	138	10.1785	10.1798	0.0013
04 SOUTHEAST	506945	CHAMSPR7	345	10.1798	10.1799	0.0001
04 SOUTHEAST	525585	BLUECLDPOI	230	10.1798	10.1798	0
04 SOUTHEAST	525586	NEEDMORE	230	10.1798	10.1798	0
04 SOUTHEAST	507402	ASHDWNR4	138	10.178	10.1782	0.0002
04 SOUTHEAST	526192	MURPHY	115	10.1495	10.1496	1E-04
04 SOUTHEAST	526936	YOAKUM_345	345	10.1338	10.134	0.0002
04 SOUTHEAST	515143	WOLFCRK4	138	10.1144	10.1292	0.0148
04 SOUTHEAST	525213	SWISHER	230	10.125	10.1252	0.0002
04 SOUTHEAST	521071	STNWLSW4	138	10.0956	10.097	0.0014
04 SOUTHEAST	505665	CENTRATAP4	138	10.095	10.0964	0.0014
04 SOUTHEAST	511486	ELGINJT4	138	10.0849	10.0923	0.0074
04 SOUTHEAST	511425	TUTCONT4	138	10.0833	10.0838	0.0005
04 SOUTHEAST	766120	GEN-2021-090	345	10.0771	10.0773	0.0002
04 SOUTHEAST	764520	G20-020-TA	345	10.0663	10.0676	0.0013
04 SOUTHEAST	764510	GEN-2020-020	345	10.0527	10.054	0.0013
04 SOUTHEAST	560078	G16-037-TA	345	10.0272	10.0328	0.0056
04 SOUTHEAST	763186	GEN-2018-089	230	10.0278	10.0279	1E-04
04 SOUTHEAST	511563	ELSWORTH	138	10.0097	10.0168	0.0071
04 SOUTHEAST	515302	FTSMITH7	345	10.0006	10.0007	1E-04
04 SOUTHEAST	510881	ALLENGT4	138	9.9916	9.993	0.0014
04 SOUTHEAST	507428	OKAY 4	138	9.9604	9.9605	1E-04
04 SOUTHEAST	504124	ASHDWN_W	138	9.947	9.9472	0.0002
04 SOUTHEAST	510908	MCALEST4	138	9.9448	9.9454	0.0006
04 SOUTHEAST	515166	ARDMORE2	69	9.9117	9.9166	0.0049
04 SOUTHEAST	525454	HALE_CNTY	115	9.9161	9.9162	1E-04
04 SOUTHEAST	511501	TUTTLE4	138	9.9034	9.9039	0.0005
04 SOUTHEAST	510951	TALAWANDA	138	9.8961	9.8967	0.0006
04 SOUTHEAST	524908	ROOSEVELT	115	9.8209	9.821	1E-04
04 SOUTHEAST	511421	VERDEN 4	138	9.7909	9.7922	0.0013
04 SOUTHEAST	515398	OUSPRT 4	138	9.7116	9.7117	1E-04
04 SOUTHEAST	337376	7SAREPTA%	345	9.6993	9.6993	0
04 SOUTHEAST	511575	LEONARD4	138	9.6958	9.6963	0.0005
04 SOUTHEAST	524267	BUSHLAND	230	9.6877	9.6877	0

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)
04 SOUTHEAST	587820	GEN-2016-102	138	9.6535	9.6557	0.0022
04 SOUTHEAST	526460	AMOCO_SS	230	9.5816	9.5817	0.0001
04 SOUTHEAST	511436	COMANC-2	69	9.5778	9.5808	0.003
04 SOUTHEAST	515097	WLNUTCK4	138	9.569	9.57	0.001
04 SOUTHEAST	587230	GEN-2016-037	345	9.5568	9.5619	0.0051
04 SOUTHEAST	515825	GRTWSRN7	345	9.5431	9.5434	0.0003
04 SOUTHEAST	515561	CARTRCO4	138	9.5169	9.524	0.0071
04 SOUTHEAST	510866	V-WEYCO4	138	9.5118	9.513	0.0012
04 SOUTHEAST	763131	GEN-2018-082	345	9.4677	9.4722	0.0045
04 SOUTHEAST	588710	GEN-2017-027	138	9.4608	9.4679	0.0071
04 SOUTHEAST	520406	TUPELO 4	138	9.4663	9.4675	0.0012
04 SOUTHEAST	763516	GEN-2019-011	345	9.4614	9.4615	1E-04
04 SOUTHEAST	515150	CANEYCK4	138	9.4251	9.4312	0.0061
04 SOUTHEAST	527656	CROSSROADS	345	9.4226	9.4227	1E-04
04 SOUTHEAST	508105	MANDEVILTP	138	9.3698	9.3699	1E-04
04 SOUTHEAST	769841	GEN-2022-143	138	9.3616	9.3676	0.006
04 SOUTHEAST	521067	TEXOMAJ4	138	9.3463	9.3524	0.0061
04 SOUTHEAST	515196	MILLCRK4	138	9.3087	9.3143	0.0056
04 SOUTHEAST	515168	HARRIS 2	69	9.2894	9.2937	0.0043
04 SOUTHEAST	515130	POOLVIL4	138	9.2673	9.2741	0.0068
04 SOUTHEAST	507455	TURK 7	345	9.2064	9.2068	0.0004
04 SOUTHEAST	515419	COMMRCT2	69	9.1984	9.2026	0.0042
04 SOUTHEAST	515420	SCMMRCT2	69	9.1876	9.1919	0.0043
04 SOUTHEAST	520552	REDCNTP4	138	9.1587	9.1591	0.0004
04 SOUTHEAST	526146	INDIANA	115	9.1465	9.1466	0.0001
04 SOUTHEAST	520859	COGAR 4	138	9.1311	9.1315	0.0004
04 SOUTHEAST	505602	S BROWN4	138	9.1205	9.1243	0.0038
04 SOUTHEAST	515157	BROWN 4	138	9.102	9.1058	0.0038
04 SOUTHEAST	521088	WASHITA2	69	9.0735	9.074	0.0005
04 SOUTHEAST	515118	JOLLYVL4	138	9.0546	9.059	0.0044
04 SOUTHEAST	515944	STRRDTP4	138	9.0251	9.0288	0.0037
04 SOUTHEAST	587790	GEN-2016-097	138	9.023	9.0257	0.0027
04 SOUTHEAST	523323	MCDWL_CREE	230	9.0197	9.0198	1E-04
04 SOUTHEAST	765300	GEN-2021-001	138	8.968	8.9716	0.0036
04 SOUTHEAST	528027	RDRUNNER	345	8.8671	8.8672	1E-04

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)
04 SOUTHEAST	515167	TOWERHT2	69	8.8578	8.8617	0.0039
04 SOUTHEAST	515394	KEENAN 4	138	8.8583	8.8584	1E-04
04 SOUTHEAST	511524	L-DISTP2	69	8.8433	8.8458	0.0025
04 SOUTHEAST	521125	CHEEK_4	138	8.7901	8.802	0.0119
04 SOUTHEAST	515152	BROWNTP4	138	8.7975	8.801	0.0035
04 SOUTHEAST	526076	STANTON_W	115	8.783	8.7831	0.0001
04 SOUTHEAST	515933	MLCLMRD4	138	8.7806	8.781	0.0004
04 SOUTHEAST	511541	SWEETWT6	230	8.7589	8.7595	0.0006
04 SOUTHEAST	511423	FLE TAP4	138	8.7449	8.7496	0.0047
04 SOUTHEAST	514814	PRICESF4	138	8.7432	8.7477	0.0045
04 SOUTHEAST	515643	HONEYCK4	138	8.7261	8.7312	0.0051
04 SOUTHEAST	504029	SFOREMAN	138	8.7291	8.7292	1E-04
04 SOUTHEAST	515575	ARBWIND4	138	8.7196	8.7246	0.005
04 SOUTHEAST	510890	CRAIGJT4	138	8.7048	8.7052	0.0004
04 SOUTHEAST	515099	PALIOGE2	69	8.6872	8.6879	0.0007
04 SOUTHEAST	765880	GEN-2021-063	138	8.6414	8.6417	0.0003
04 SOUTHEAST	521031	POCASET4	138	8.6347	8.6353	0.0006
04 SOUTHEAST	762216	G17-151TAP	345	8.615	8.6178	0.0028
04 SOUTHEAST	524909	ROOSEVELT	230	8.6007	8.6007	0
04 SOUTHEAST	599955	PNM-DC6	230	8.6007	8.6007	0
04 SOUTHEAST	515147	GLASSES4	138	8.5907	8.596	0.0053
04 SOUTHEAST	515149	MADINDT4	138	8.5883	8.5936	0.0053
04 SOUTHEAST	520510	NAPLSTP4	138	8.5754	8.5762	0.0008
04 SOUTHEAST	521079	VALLANT4	138	8.574	8.5748	0.0008
04 SOUTHEAST	511487	ELGINJT2	69	8.569	8.5715	0.0025
04 SOUTHEAST	521074	BOGGY4	138	8.5701	8.5711	0.001
04 SOUTHEAST	511538	ARTVILL4	138	8.5601	8.5692	0.0091
04 SOUTHEAST	511500	CACHE4	138	8.5319	8.5384	0.0065
04 SOUTHEAST	515169	AIRPRKT4	138	8.5287	8.5344	0.0057
04 SOUTHEAST	520911	FLETCHR2	69	8.5085	8.509	0.0005
04 SOUTHEAST	515173	BERWYN 4	138	8.4455	8.4509	0.0054
04 SOUTHEAST	515582	SLNGWND7	345	8.4359	8.4361	0.0002
04 SOUTHEAST	527965	KIOWA	345	8.4334	8.4334	0
04 SOUTHEAST	510948	EARLSBORO	138	8.384	8.3842	0.0002
04 SOUTHEAST	520472	CHCKSHA4	138	8.3619	8.3627	0.0008

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)
04 SOUTHEAST	769060	G22-104-TA	138	8.3578	8.3609	0.0031
04 SOUTHEAST	521004	MTRIVER4	138	8.3508	8.3512	0.0004
04 SOUTHEAST	515305	FTSMITH8	500	8.3511	8.3511	0
04 SOUTHEAST	769061	GEN-2022-104	138	8.3454	8.3485	0.0031
04 SOUTHEAST	508571	SPRHILL4	138	8.3053	8.3053	0
04 SOUTHEAST	515114	CHIGLEY4	138	8.2791	8.2811	0.002
04 SOUTHEAST	515073	ERLSBOR2	69	8.2668	8.2669	1E-04
04 SOUTHEAST	526297	LUBBCK_EST	69	8.2579	8.258	1E-04
04 SOUTHEAST	520530	AMBERTP4	138	8.2306	8.2311	0.0005
04 SOUTHEAST	768080	G22-055-TA	138	8.1747	8.1751	0.0004
04 SOUTHEAST	527020	SIDEWINDER	345	8.1138	8.1138	0
04 SOUTHEAST	525636	LAMB_CNTY	115	8.0516	8.0516	0
04 SOUTHEAST	515142	DILLARD4	138	8.0359	8.0444	0.0085
04 SOUTHEAST	520863	COMANCH2	69	7.9929	7.9936	0.0007
04 SOUTHEAST	521072	TUTLETP4	138	7.9915	7.9919	0.0004
04 SOUTHEAST	511422	FLETCHR4	138	7.9869	7.9909	0.004
04 SOUTHEAST	514733	MARSHL 4	138	7.9912	7.9913	1E-04
04 SOUTHEAST	515158	MADLIND4	138	7.9808	7.9853	0.0045
04 SOUTHEAST	510877	FIXCT4	138	7.9633	7.9635	0.0002
04 SOUTHEAST	515163	ROCKYPT2	69	7.9482	7.9515	0.0033
04 SOUTHEAST	511469	LGORE-N2	69	7.9299	7.9332	0.0033
04 SOUTHEAST	516006	DMNDSPG7	345	7.8847	7.9005	0.0158
04 SOUTHEAST	576397	G10014G110	345	7.8867	7.8867	0
04 SOUTHEAST	520827	BINGERJ4	138	7.8827	7.8835	0.0008
04 SOUTHEAST	520467	ENOSJCT4	138	7.8444	7.8486	0.0042
04 SOUTHEAST	511445	CARNEG-4	138	7.8339	7.8348	0.0009
04 SOUTHEAST	765890	GEN-2021-064	138	7.7791	7.7799	0.0008
04 SOUTHEAST	763483	GEN-2019-003	230	7.7321	7.7321	0
04 SOUTHEAST	515151	LTLCITY4	138	7.7062	7.7093	0.0031
04 SOUTHEAST	525826	TUCO_INT	69	7.6995	7.6996	0.0001
04 SOUTHEAST	523779	STLN-DEMAR	230	7.6339	7.6344	0.0005
04 SOUTHEAST	514796	IODINE-4	138	7.6007	7.6008	0.0001
04 SOUTHEAST	515160	MRIETA 2	138	7.5879	7.5927	0.0048
04 SOUTHEAST	521049	SCLMNJC4	138	7.5361	7.5385	0.0024
04 SOUTHEAST	508355	WELSHRE4	138	7.5113	7.5114	1E-04

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)
04 SOUTHEAST	520988	MARIETA4	138	7.5039	7.5083	0.0044
04 SOUTHEAST	508090	WATLANT4	138	7.4971	7.4972	1E-04
04 SOUTHEAST	515980	MNCWND57	345	7.4739	7.4756	0.0017
04 SOUTHEAST	511490	ELKCITY6	230	7.466	7.4666	0.0006
04 SOUTHEAST	521103	SLKHILLS 4	138	7.4516	7.452	0.0004
04 SOUTHEAST	511526	L-RLITP2	69	7.4326	7.4343	0.0017
04 SOUTHEAST	520514	BCVI_HVB	138	7.4318	7.4322	0.0004
04 SOUTHEAST	514818	ELRENO 2	69	7.4166	7.4167	1E-04
04 SOUTHEAST	510910	VALIANT2	69	7.3751	7.3754	0.0003
04 SOUTHEAST	525414	LAMTON	115	7.3619	7.3619	0
04 SOUTHEAST	515131	FOX 4	138	7.351	7.3558	0.0048
04 SOUTHEAST	515161	AIRPARK4	138	7.3433	7.3475	0.0042
04 SOUTHEAST	560088	G17-075-TA	345	7.3116	7.3287	0.0171
04 SOUTHEAST	520531	AMBER 4	138	7.327	7.3274	0.0004
04 SOUTHEAST	589130	GEN-2017-075	345	7.3021	7.3192	0.0171
04 SOUTHEAST	508064	MUNZCTY4	138	7.321	7.321	0
04 SOUTHEAST	505614	BRKN BW4	138	7.3197	7.32	0.0003
04 SOUTHEAST	511435	SNYDER-4	138	7.282	7.2839	0.0019
04 SOUTHEAST	588779	G17-036_TA	138	7.2234	7.2253	0.0019
04 SOUTHEAST	760498	G17-146-TA	230	7.1992	7.1992	0
04 SOUTHEAST	510888	B.BOWTP4	138	7.1864	7.1868	0.0004
04 SOUTHEAST	520912	FLETCH-4	138	7.1497	7.1504	0.0007
04 SOUTHEAST	511475	SNYDER-2	69	7.1397	7.1405	0.0008
04 SOUTHEAST	524875	OASIS	230	7.1065	7.1065	0
04 SOUTHEAST	520972	LEBANTP4	138	7.0631	7.0667	0.0036
04 SOUTHEAST	515113	CHIGLEY2	69	7.0603	7.0609	0.0006
04 SOUTHEAST	515129	RATLIFF4	138	7.0166	7.0199	0.0033
04 SOUTHEAST	526676	GRASSLAND	115	6.9856	6.9856	0
04 SOUTHEAST	520455	MRIETA 4	138	6.963	6.9668	0.0038
04 SOUTHEAST	588780	GEN-2017-036	138	6.9631	6.9649	0.0018
04 SOUTHEAST	515141	HLTNTAP4	138	6.952	6.9576	0.0056
04 SOUTHEAST	511470	LGORE-S2	69	6.9041	6.9068	0.0027
04 SOUTHEAST	764945	G20-067-TA	345	6.8917	6.892	0.0003
04 SOUTHEAST	764950	GEN-2020-068	345	6.8597	6.8599	0.0002
04 SOUTHEAST	511463	HOB-JCT4	138	6.843	6.8435	0.0005

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)
04 SOUTHEAST	521036	RATTAN 4	138	6.8151	6.8157	0.0006
04 SOUTHEAST	510886	IDABEL-4	138	6.806	6.8064	0.0004
04 SOUTHEAST	515159	COLBRTP4	138	6.8033	6.8053	0.002
04 SOUTHEAST	900001	TRAVERSE3	345	6.7982	6.7984	0.0002
04 SOUTHEAST	521052	SNYDER 4	138	6.7892	6.7907	0.0015
04 SOUTHEAST	768941	GEN-2022-098	345	6.7721	6.7868	0.0147
04 SOUTHEAST	511498	COM-TAP2	69	6.7786	6.7791	0.0005
04 SOUTHEAST	515155	BODLE 4	138	6.7279	6.7299	0.002
04 SOUTHEAST	511576	CEMRD_TP4	138	6.7122	6.7124	0.0002
04 SOUTHEAST	515132	DUNDEE 4	138	6.6334	6.6381	0.0047
04 SOUTHEAST	520511	ENVILLE4	138	6.5877	6.591	0.0033
04 SOUTHEAST	521098	WSBNKTP4	138	6.5785	6.5793	0.0008
04 SOUTHEAST	511492	SANTAFE4	138	6.5412	6.5417	0.0005
04 SOUTHEAST	511446	CL-AFTP4	138	6.4748	6.4751	0.0003
04 SOUTHEAST	515153	COLEMNT4	138	6.4636	6.4655	0.0019
04 SOUTHEAST	511508	BLANCHD4	138	6.4539	6.4543	0.0004
04 SOUTHEAST	511450	CORNVIL2	69	6.4416	6.442	0.0004
04 SOUTHEAST	525453	HALE_CNTY	69	6.4224	6.4225	0.0001
04 SOUTHEAST	510870	WCITYTP2	69	6.4114	6.4117	0.0003
04 SOUTHEAST	587200	GEN-2016-030	138	6.4039	6.4058	0.0019
04 SOUTHEAST	521050	SICKLES4	138	6.3947	6.3952	0.0005
04 SOUTHEAST	520870	CYRIL 2	69	6.3811	6.3814	0.0003
04 SOUTHEAST	515176	BUTRFLD4	138	6.3641	6.3659	0.0018
04 SOUTHEAST	520512	BC SW 4	138	6.3382	6.3385	0.0003
04 SOUTHEAST	521129	CHERRYRD 4	138	6.3367	6.3372	0.0005
04 SOUTHEAST	511542	BUFFCK6	230	6.3197	6.32	0.0003
04 SOUTHEAST	520946	HOLYCRK4	138	6.297	6.2973	0.0003
04 SOUTHEAST	515124	MAYSVIL4	138	6.2948	6.296	0.0012
04 SOUTHEAST	525326	COX	115	6.2461	6.2462	1E-04
04 SOUTHEAST	511491	RUSHSPT4	138	6.2103	6.2108	0.0005
04 SOUTHEAST	515563	ORIGINW4	138	6.1902	6.1917	0.0015
04 SOUTHEAST	515116	ARBUCKL2	69	6.1835	6.1842	0.0007
04 SOUTHEAST	510864	B.BOW 4	138	6.1737	6.174	0.0003
04 SOUTHEAST	520488	LEBANON4	138	6.1407	6.1435	0.0028
04 SOUTHEAST	900004	TRW2-TRW3	345	6.0695	6.0696	0.0001

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)
04 SOUTHEAST	526677	GRASSLAND	230	6.0509	6.0509	0
04 SOUTHEAST	520953	IDABEL 4	138	6.0478	6.048	0.0002
04 SOUTHEAST	765230	G20-012-TA	138	6.018	6.0191	0.0011
04 SOUTHEAST	511464	HOB-JCT2	69	6.0152	6.0155	0.0003
04 SOUTHEAST	523823	CARPENTER	345	6.0042	6.0043	1E-04
04 SOUTHEAST	521024	PARADSE4	138	5.9808	5.9813	0.0005
04 SOUTHEAST	762217	GEN-2017-151	345	5.9733	5.9747	0.0014
04 SOUTHEAST	520419	GARVIN4	138	5.9623	5.9626	0.0003
04 SOUTHEAST	525780	FLOYD_CNTY	115	5.9608	5.9608	0
04 SOUTHEAST	515962	OMEGA 4	138	5.9549	5.955	0.0001
04 SOUTHEAST	515570	MAYSVLT4	138	5.9364	5.9376	0.0012
04 SOUTHEAST	511457	DUNTOS TP2	69	5.9362	5.9366	0.0004
04 SOUTHEAST	511516	ALEX BR4	138	5.9199	5.9203	0.0004
04 SOUTHEAST	524770	PLSNT_HILL	230	5.906	5.906	0
04 SOUTHEAST	511461	FT.SILL2	69	5.9021	5.9038	0.0017
04 SOUTHEAST	504123	LOCKSBRG	138	5.9031	5.9032	1E-04
04 SOUTHEAST	520963	KIERSEY4	138	5.8796	5.8812	0.0016
04 SOUTHEAST	515101	PAULSVL2	69	5.8744	5.8748	0.0004
04 SOUTHEAST	521066	TEXOMA 4	138	5.8662	5.8686	0.0024
04 SOUTHEAST	520445	MAYSVLL4	138	5.8647	5.8658	0.0011
04 SOUTHEAST	511527	L-RLIFT2	69	5.8503	5.8513	0.001
04 SOUTHEAST	520513	BCV SW 4	138	5.8299	5.8304	0.0005
04 SOUTHEAST	511473	PO.HILL2	69	5.8148	5.8161	0.0013
04 SOUTHEAST	529311	OMWALTR2	69	5.7118	5.7125	0.0007
04 SOUTHEAST	511434	WALTRS-2	69	5.7089	5.7096	0.0007
04 SOUTHEAST	510909	MCALESTIND	138	5.6947	5.6949	0.0002
04 SOUTHEAST	515134	PRARPNT4	138	5.6653	5.667	0.0017
04 SOUTHEAST	511562	ROUNDCK4	138	5.664	5.6643	0.0003
04 SOUTHEAST	764948	G20-068-SS	345	5.6611	5.6612	1E-04
04 SOUTHEAST	764949	G20-068-SS	345	5.6611	5.6612	1E-04
04 SOUTHEAST	764935	GEN-2020-067	345	5.6526	5.6528	0.0002
04 SOUTHEAST	520404	MDCPRK4	138	5.6138	5.6143	0.0005
04 SOUTHEAST	768081	GEN-2022-055	138	5.6013	5.6014	1E-04
04 SOUTHEAST	511454	DUNREL 2	69	5.5865	5.5868	0.0003
04 SOUTHEAST	511452	DUNCAN-2	69	5.51	5.5102	0.0002

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)
04 SOUTHEAST	525637	LAMB_CNTY	230	5.5093	5.5093	0
04 SOUTHEAST	525763	CALLAHAN	115	5.4185	5.4185	0
04 SOUTHEAST	505598	ALLEN 4	138	5.389	5.3892	0.0002
04 SOUTHEAST	520981	LOCO 4	138	5.3763	5.3771	0.0008
04 SOUTHEAST	520798	MAYVL2 4	138	5.3576	5.3586	0.001
04 SOUTHEAST	520905	ESQNDLJ2	69	5.3509	5.3515	0.0006
04 SOUTHEAST	521010	NIJECT 4	138	5.3361	5.3365	0.0004
04 SOUTHEAST	511515	TEXAS 4	138	5.3209	5.3212	0.0003
04 SOUTHEAST	511554	RKY_RDG4	138	5.3069	5.3072	0.0003
04 SOUTHEAST	511569	DRFTSND4	138	5.2828	5.2832	0.0004
04 SOUTHEAST	520860	COLBERT4	138	5.2693	5.2706	0.0013
04 SOUTHEAST	511465	HOBART-2	69	5.2635	5.2637	0.0002
04 SOUTHEAST	515128	RATLIFF2	69	5.2257	5.2267	0.001
04 SOUTHEAST	511539	DUNTOS 2	69	5.2252	5.2254	0.0002
04 SOUTHEAST	515140	HLTNTAP2	69	5.1875	5.1889	0.0014
04 SOUTHEAST	515145	SINCPLT2	69	5.182	5.1834	0.0014
04 SOUTHEAST	524296	SPNSPUR_WN	345	5.1353	5.1354	1E-04
04 SOUTHEAST	524299	SPNSPUR_CO	345	5.1353	5.1354	1E-04
04 SOUTHEAST	515127	WLDHRST2	69	5.1305	5.1315	0.001
04 SOUTHEAST	520497	WSTBANK4	138	5.1119	5.1123	0.0004
04 SOUTHEAST	511544	DEMPSEY6	230	5.1074	5.1076	0.0002
04 SOUTHEAST	510893	HUGO---2	69	5.0676	5.0677	1E-04
04 SOUTHEAST	511547	ROARK6	230	5.0002	5.0004	0.0002
04 SOUTHEAST	511525	LDISPOS2	69	4.9982	4.9991	0.0009
04 SOUTHEAST	520968	LANE 4	138	4.9812	4.9815	0.0003
04 SOUTHEAST	521077	UNGER 4	138	4.9626	4.9631	0.0005
04 SOUTHEAST	525779	FLOYD_CNTY	69	4.952	4.952	0
04 SOUTHEAST	515805	COUTYTP2	69	4.9498	4.9507	0.0009
04 SOUTHEAST	520901	ENOS 4	138	4.9467	4.9484	0.0017
04 SOUTHEAST	515126	CONTYLN2	69	4.9378	4.9387	0.0009
04 SOUTHEAST	515111	DAVS 2	69	4.9147	4.9151	0.0004
04 SOUTHEAST	511535	CLIN-AF4	138	4.878	4.8782	0.0002
04 SOUTHEAST	510876	KIPUMPT2	69	4.8763	4.8764	1E-04
04 SOUTHEAST	521061	SWILSON4	138	4.856	4.8574	0.0014
04 SOUTHEAST	521027	PINERTP2	69	4.8312	4.8313	0.0001

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)
04 SOUTHEAST	511456	O.K.U.-7	345	4.7865	4.7967	0.0102
04 SOUTHEAST	511565	OKLAUN HVD	345	4.7715	4.7816	0.0101
04 SOUTHEAST	520874	DARWIN 4	138	4.7583	4.7586	0.0003
04 SOUTHEAST	520900	EMPIRE 4	138	4.7366	4.7371	0.0005
04 SOUTHEAST	760032	GEN-2017-133	345	4.7265	4.7265	0
04 SOUTHEAST	526679	CIRRUS_WND	230	4.725	4.725	0
04 SOUTHEAST	520826	BENNGTN4	138	4.6857	4.6863	0.0006
04 SOUTHEAST	511451	CYRIL--2	69	4.6825	4.683	0.0005
04 SOUTHEAST	515503	LTRIVRT2	69	4.6825	4.6825	0
04 SOUTHEAST	529302	OMALTUS4	138	4.6046	4.6051	0.0005
04 SOUTHEAST	515004	ROSEDAL2	69	4.5966	4.5967	1E-04
04 SOUTHEAST	525803	BLANCO	115	4.5824	4.5825	1E-04
04 SOUTHEAST	521086	WALTERS2	69	4.554	4.5544	0.0004
04 SOUTHEAST	511503	LAW WC2	69	4.5236	4.5248	0.0012
04 SOUTHEAST	511566	PERNELL4	138	4.5167	4.5177	0.001
04 SOUTHEAST	520939	HLDTNTP4	138	4.4881	4.4889	0.0008
04 SOUTHEAST	762467	G18-015-TA	345	4.4692	4.4736	0.0044
04 SOUTHEAST	762460	GEN-2018-015	345	4.4606	4.4649	0.0043
04 SOUTHEAST	529307	OMMARLO4	138	4.4595	4.4597	0.0002
04 SOUTHEAST	525816	TUCO_INT2	69	4.4485	4.4485	0
04 SOUTHEAST	525926	CROSBY	115	4.4478	4.4478	0
04 SOUTHEAST	521038	RINGLNG4	138	4.4456	4.4465	0.0009
04 SOUTHEAST	511564	MARTHA 4	138	4.4141	4.4145	0.0004
04 SOUTHEAST	515139	HEALDTN2	69	4.398	4.3989	0.0009
04 SOUTHEAST	515496	KNAWATP2	69	4.3983	4.3984	1E-04
04 SOUTHEAST	515053	PEARSNT2	69	4.279	4.279	0
04 SOUTHEAST	523869	CHAN+TASCO	230	4.2679	4.2679	0
04 SOUTHEAST	520465	REAGAN 4	138	4.2565	4.2579	0.0014
04 SOUTHEAST	507419	DEQUEEN4	138	4.2486	4.2487	1E-04
04 SOUTHEAST	511476	S.W.S.-2	69	4.2038	4.2039	1E-04
04 SOUTHEAST	520987	MARIETA2	69	4.1943	4.1949	0.0006
04 SOUTHEAST	520466	HAWORTH4	138	4.1267	4.1269	0.0002
04 SOUTHEAST	511573	REDBDPLN4	138	4.0475	4.0476	1E-04
04 SOUTHEAST	510920	SAWYER 2	69	3.8743	3.8744	1E-04
04 SOUTHEAST	510869	W CITY 2	69	3.8684	3.8685	1E-04

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)
04 SOUTHEAST	510917	FTOWSON2	69	3.7831	3.7831	0
04 SOUTHEAST	760830	GEN-2017-149	345	3.7642	3.7677	0.0035
04 SOUTHEAST	507434	SNASHVL4	138	3.7353	3.7353	0
04 SOUTHEAST	520487	HEALDTN4	138	3.6863	3.6869	0.0006
04 SOUTHEAST	520559	MRTA34_2	69	3.6616	3.6621	0.0005
04 SOUTHEAST	515125	WILDHRS2	69	3.5882	3.5887	0.0005
04 SOUTHEAST	529344	OMDUNE-4	138	3.5691	3.5692	0.0001
04 SOUTHEAST	529312	OMCOMNC2	69	3.5515	3.5516	0.0001
04 SOUTHEAST	511455	D.E.S.-4	138	3.5068	3.507	0.0002
04 SOUTHEAST	510901	HUGO---4	138	3.4897	3.4899	0.0002
04 SOUTHEAST	588760	GEN-2017-033	345	3.4765	3.4819	0.0054
04 SOUTHEAST	521003	MTNVWTP2	69	3.4545	3.4546	0.0001
04 SOUTHEAST	510875	KI PMPN2	69	3.4445	3.4446	1E-04
04 SOUTHEAST	511552	DUNCHERTP4	138	3.3531	3.3532	1E-04
04 SOUTHEAST	525885	SP-NEWDEAL	69	3.3377	3.3377	0
04 SOUTHEAST	511453	DUNCAN-4	138	3.2921	3.2922	1E-04
04 SOUTHEAST	515148	MOBILOL2	69	3.2839	3.2843	0.0004
04 SOUTHEAST	505604	DENISON4	138	3.2071	3.2075	0.0004
04 SOUTHEAST	510867	KI PMPS2	69	3.0893	3.0894	1E-04
04 SOUTHEAST	525731	SP-ABERNTH	69	2.9858	2.9858	0
04 SOUTHEAST	529304	OMDUNCN4	138	2.9507	2.9508	0.0001
04 SOUTHEAST	520543	PINERDG2	69	2.7931	2.7932	1E-04
04 SOUTHEAST	510894	VALYTIM2	69	2.712	2.712	0
04 SOUTHEAST	511443	BING-TP2	69	2.6568	2.6569	0.0001
04 SOUTHEAST	507461	GORDON TAP	138	2.6519	2.6519	0
04 SOUTHEAST	526159	CARLISLE	69	2.628	2.628	0
04 SOUTHEAST	525853	LH-WIL&ELN	69	2.6153	2.6153	0
04 SOUTHEAST	510915	ANTLTAP2	69	2.5086	2.5086	0
04 SOUTHEAST	510868	GA PAC 2	69	2.5083	2.5083	0
04 SOUTHEAST	525738	HALECENTER	69	2.4763	2.4763	0
04 SOUTHEAST	521068	THAKRVL2	69	2.1676	2.1677	0.0001
04 SOUTHEAST	511494	COMMTAP4	138	2.0031	2.0032	0.0001
04 SOUTHEAST	520423	CHICKASAW2	69	1.9136	1.9137	1E-04
04 SOUTHEAST	520960	JIMTOWN2	69	1.8365	1.8366	1E-04
04 SOUTHEAST	760389	GEN-2017-140	345	1.8096	1.8096	0

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)
04 SOUTHEAST	511442	BINGER-2	69	1.7438	1.7438	0

APPENDIX C: SPP DISTURBANCE PERFORMANCE REQUIREMENTS

Revision History

Version Number	Author	Change Description	Comments
1.0 (1/13/2013)	Transient Stability Task Force	First draft	TWG approval of Rotor Angle Damping
1.1 (7/31/2013)	Transmission Working Group	Approval of entire document	Approval of both Rotor Angle Damping and Transient Voltage requirements and addressed items regarding SPPR figure.
2.0 (12/15/2015)	Transmission Working Group	Revision to Transient Voltage Requirements	Addition of 2.5 seconds delay of looking at voltage being above 0.7 p.u.
3.0 (7/21/2016)	Dynamic Load Task Force	Revision to Rotor Angle Damping Requirements	Edited verbiage to clarify rotor angle requirements.

Overview

These Disturbance Performance Requirements ("Requirements") shall be applicable to the Bulk Electric System within the Southwest Power Pool Planning Area. Utilization of these Requirements applies to all registered entities within the Southwest Power Pool Planning Area. These Requirements shall not be applicable to facilities that are not part of Bulk Electric System. More stringent Requirements are at the sole discretion of each Transmission Planner.

Transient and dynamic stability assessments are generally performed to assure adequate avoidance of loss of generator synchronism and prevention of system voltage collapse within the first 20 seconds after a system disturbance. These Requirements provide a basis for evaluating the system response during the initial transient period following a disturbance on the Bulk Electric System by establishing minimum requirements for machine rotor angle damping and transient voltage recovery.

Rotor Angle Damping Requirement

Machine Rotor Angles shall exhibit well damped angular oscillations following a disturbance on the Bulk Electric System for all NERC TPL-001-4 P1 through P7 events.

Machines with rotor angle deviations greater than or equal to 16 degrees (measured as absolute maximum peak to absolute minimum peak) shall be evaluated against SPPR1 or SPPR5 requirements below. Machines with rotor angle deviations less than 16 degrees which do not exhibit convergence shall be evaluated on an individual basis. Rotor angle deviations will be calculated relative to the system swing machine.

Well damped angular oscillations shall meet one of the following two requirements when calculated directly from the rotor angle:

1. Successive Positive Peak Ratio One (SPPR1) must be less than or equal to 0.95 where SPPR1 is calculated as follows:

$$SPPR1 = \frac{\text{Peak Rotor Angle of 2nd Positive Peak minus Minimum Value}}{\text{Peak Rotor Angle of 1st Positive Peak minus Minimum Value}} \leq 0.95$$

-or- $\text{Damping Factor \%} = (1 - SPPR1) \times 100\% \geq 5\%$

The machine rotor angle damping ratio may be determined by appropriate modal analysis (i.e. Prony Analysis) where the following equivalent requirement must be met:

$$\text{Damping Ratio} \geq 0.0081633$$

2. Successive Positive Peak Ratio Five (SPPR5) must be less than or equal to 0.774 where SPPR5 is calculated as follows:

$$SPPR5 = \frac{\text{Peak Rotor Angle of 6th Positive Peak minus Minimum Value}}{\text{Peak Rotor Angle of 1st Positive Peak minus Minimum Value}} \leq 0.774$$

-or- Damping Factor % = (1 – SPPR5) x 100% ≥ 22.6%

The machine rotor angle damping ratio may be determined by appropriate modal analysis (i.e. Prony Analysis) where the following equivalent requirement must be met:

Damping Ratio ≥ 0.0081633

Qualitatively, these Requirements are shown in Figure 1 & 2 below.

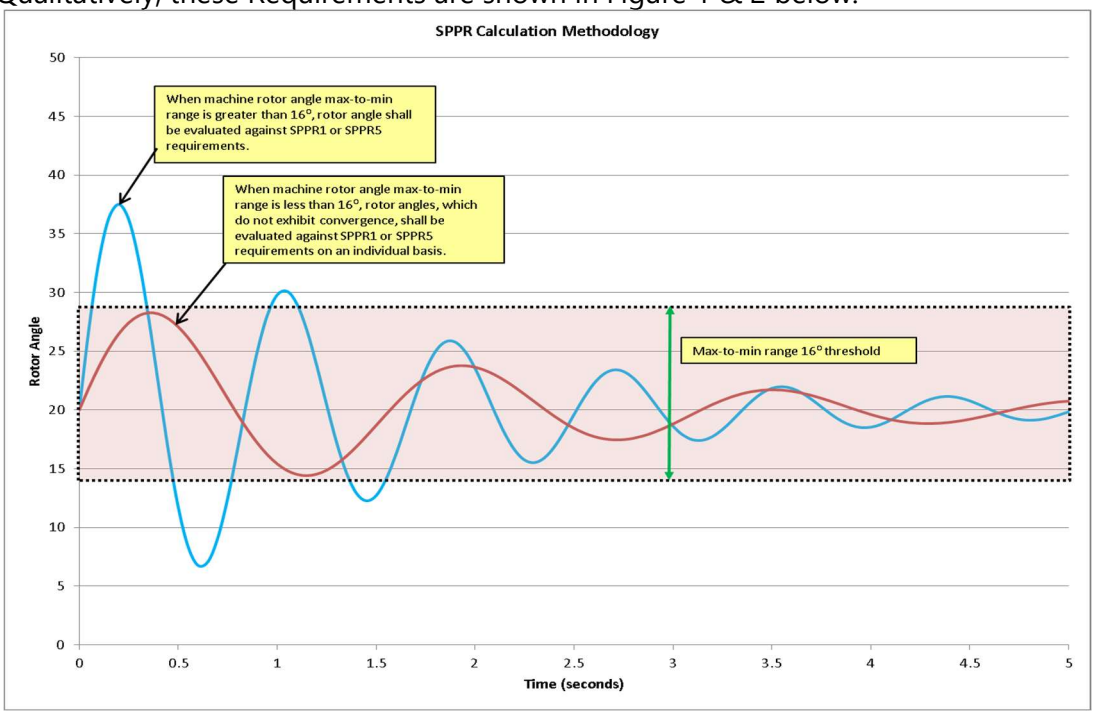


Figure 1. Applicability of 16 Degree Threshold

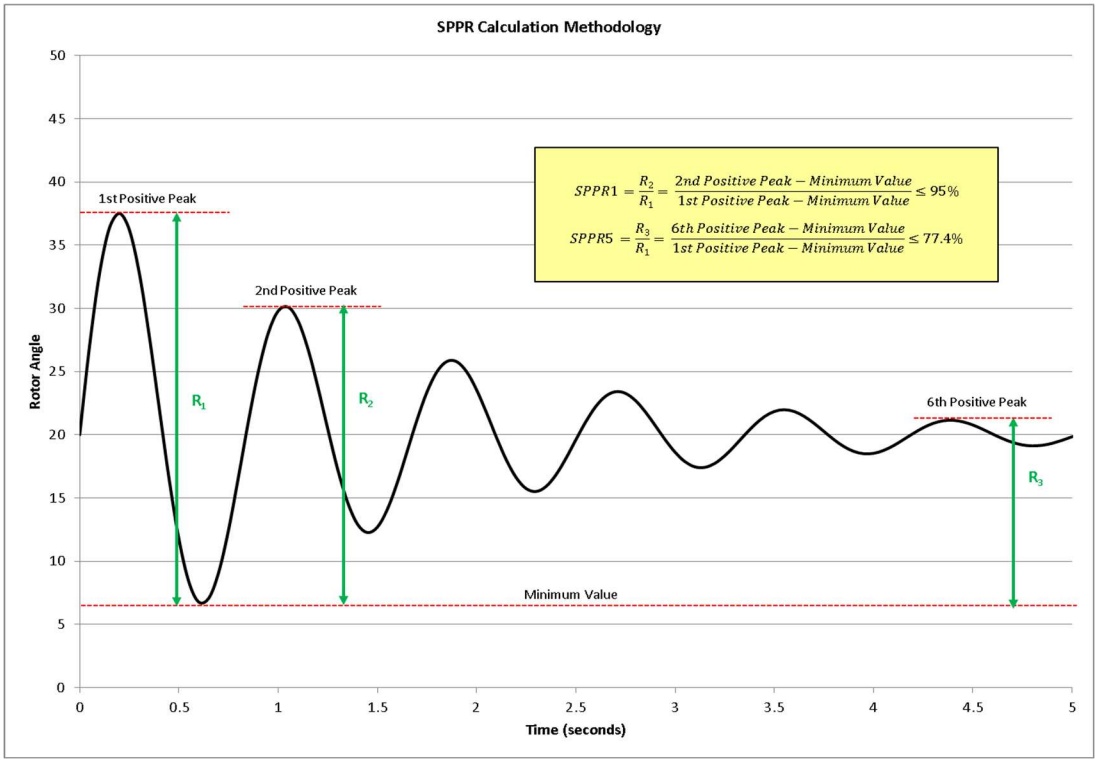


Figure 2. SPPR1 and SPPR5 Calculations

Transient Voltage Recovery Requirement

Bus voltages on the Bulk Electric System shall recover above 0.70 per unit, 2.5 seconds after the fault is cleared. Bus voltages shall not swing above 1.20 per unit after the fault is cleared, unless affected transmission system elements are designed to handle the rise above 1.2 per unit.

Qualitatively, this Requirement is shown in Figure 3 below.

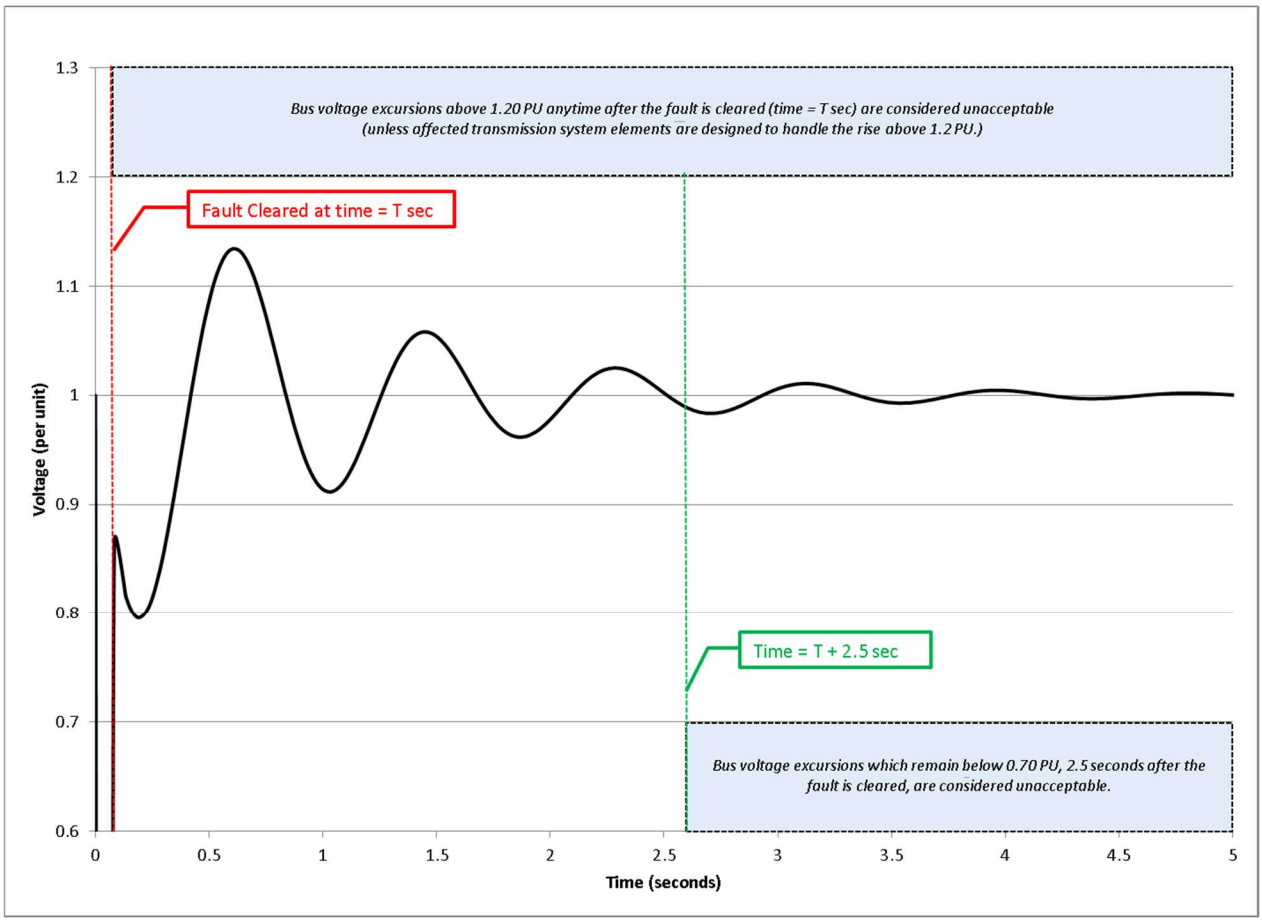


Figure 3. Transient Voltage Recovery Requirement

APPENDIX D: FAULT DEFINITIONS

Fault ID	Planning Event	Fault Description
GROUP4_P1_LOCAL_FAULT_001	P1	3 Phase fault on GRACMNT4 138.00 (515802) 138 kV Bus a. Apply fault at the GRACMNT4 138.00 (515802) 138 kV Bus b. Clear fault after 7 cycles and trip the faulted elements: b.1. GRACMNT4 (515802) 138.0 kV to ANADARK4 (520814) 138.0 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
GROUP4_P1_LOCAL_FAULT_002	P1	3 Phase fault on GRACMNT4 138.00 (515802) 138 kV Bus a. Apply fault at the GRACMNT4 138.00 (515802) 138 kV Bus b. Clear fault after 7 cycles and trip the faulted elements: b.1. GRACMNT4 (515802) 138.0 kV to ANADARK4 (520814) 138.0 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
GROUP4_P1_LOCAL_FAULT_003	P1	3 Phase fault on GOLDENSW4 138.00 (521194) 138 kV Bus a. Apply fault at the GOLDENSW4 138.00 (521194) 138 kV Bus b. Clear fault after 7 cycles and trip the faulted elements: b.1. BROKNBW4 (520834) 138.0 kV to GOLDENSW4 (521194) 138.0 kV Transmission Circuit #1 b.2. GOLDENSW4 (521194) 138.0 kV to DOMINJCT4 (521195) 138.0 kV Transmission Circuit #1 b.3. HUGO PP4 (520948) 138.0 kV to VALLANT4 (521079) 138.0 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
GROUP4_P1_LOCAL_FAULT_004	P1	3 Phase fault on SAWYER4 138.00 (520411) 138 kV Bus a. Apply fault at the SAWYER4 138.00 (520411) 138 kV Bus b. Clear fault after 7 cycles and trip the faulted elements: b.1. SAWYER4 (520411) 138.0 kV to HUGO PP4 (520948) 138.0 kV Transmission Circuit #1 b.2. ATOKA--4 (510887) 138.0 kV to LANE 4 (520968) 138.0 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

Fault ID	Planning Event	Fault Description
GROUP4_P1_LOCAL_FAULT_005	P1	3 Phase fault on FROGVIL4 138.00 (520918) 138 kV Bus a. Apply fault at the FROGVIL4 138.00 (520918) 138 kV Bus b. Clear fault after 7 cycles and trip the faulted elements: b.1. FROGVIL4 (520918) 138.0 kV to HUGO PP4 (520948) 138.0 kV Transmission Circuit #1 b.2. S BROWN4 (505602) 138.0 kV to G22-104-TAP (769060) 138.0 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
GROUP4_P1_LOCAL_FAULT_006	P1	3 Phase fault on VALIANT4 138.00 (510918) 138 kV Bus a. Apply fault at the VALIANT4 138.00 (510918) 138 kV Bus b. Clear fault after 7 cycles and trip the faulted elements: b.1. VALIANT4 (510918) 138.0 kV to HUGO PP4 (520948) 138.0 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
GROUP4_P1_LOCAL_FAULT_007	P1	3 Phase fault on GRACMNT4 138.00 (515802) 138 kV Bus a. Apply fault at the GRACMNT4 138.00 (515802) 138 kV Bus b. Clear fault after 7 cycles and trip the faulted elements: b.1. GRACMNT4 (515802) 138.0 kV to WASHITA4 (521089) 138.0 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
GROUP4_P1_LOCAL_FAULT_008	P1	3 Phase fault on GRACMNT4 138.00 (515802) 138 kV Bus a. Apply fault at the GRACMNT4 138.00 (515802) 138 kV Bus b. Clear fault after 7 cycles and trip the faulted elements: b.1. GRACMNT4 (515802) 138.0 kV to WASHITA4 (521089) 138.0 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
GROUP4_P1_LOCAL_FAULT_009	P1	3 Phase fault on COMANC-4 138.00 (511437) 138 kV Bus a. Apply fault at the COMANC-4 138.00 (511437) 138 kV Bus b. Clear fault after 7 cycles and trip the faulted elements: b.1. COMANC-4 (511437) 138.0 kV to 112GORE4 (511488) 138.0 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

Fault ID	Planning Event	Fault Description
GROUP4_P1_LOCAL_FAULT_010	P1	3 Phase fault on COMANC-4 138.00 (511437) 138 kV Bus a. Apply fault at the COMANC-4 138.00 (511437) 138 kV Bus b. Clear fault after 7 cycles and trip the faulted elements: b.1. COMANC-4 (511437) 138.0 kV to L.E.S.-4 (511467) 138.0 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
GROUP4_P1_LOCAL_FAULT_011	P1	3 Phase fault on COMMTAP4 138.00 (511494) 138 kV Bus a. Apply fault at the COMMTAP4 138.00 (511494) 138 kV Bus b. Clear fault after 7 cycles and trip the faulted elements: b.1. L.E.S.-4 (511467) 138.0 kV to COMMTAP4 (511494) 138.0 kV Transmission Circuit #1 b.2. DUNCAN-4 (511453) 138.0 kV to OMDUNCN4 (529304) 138.0 kV Transmission Circuit #1 b.3. COMMTAP4 (511494) 138.0 kV to OMDUNCN4 (529304) 138.0 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
GROUP4_P1_LOCAL_FAULT_012	P1	3 Phase fault on L.E.S.-4 138.00 (511467) 138 kV Bus a. Apply fault at the L.E.S.-4 138.00 (511467) 138 kV Bus b. Clear fault after 7 cycles and trip the faulted elements: b.1. L.E.S.-4 (511467) 138.0 kV to SHERID4 (511474) 138.0 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
GROUP4_P1_LOCAL_FAULT_013	P1	3 Phase fault on PITTSB-7 345.00 (510907) 345 kV Bus a. Apply fault at the PITTSB-7 345.00 (510907) 345 kV Bus b. Clear fault after 6 cycles and trip the faulted elements: b.1. PITTSB-7 (510907) 345.0 kV to C-RIVER7 (515422) 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
GROUP4_P1_LOCAL_FAULT_014	P1	3 Phase fault on PITTSB-7 345.00 (510907) 345 kV Bus a. Apply fault at the PITTSB-7 345.00 (510907) 345 kV Bus b. Clear fault after 6 cycles and trip the faulted elements: b.1. PITTSB-7 (510907) 345.0 kV to JOHNCO 7 (514809) 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

Fault ID	Planning Event	Fault Description
GROUP4_P1_LOCAL_FAULT_015	P1	3 Phase fault on PITTSB-7 345.00 (510907) 345 kV Bus a. Apply fault at the PITTSB-7 345.00 (510907) 345 kV Bus b. Clear fault after 6 cycles and trip the faulted elements: b.1. PITTSB-7 (510907) 345.0 kV to SEMINOL7 (515045) 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
GROUP4_P1_LOCAL_FAULT_016	P1	3 Phase fault on VALIANT7 345.00 (510911) 345 kV Bus a. Apply fault at the VALIANT7 345.00 (510911) 345 kV Bus b. Clear fault after 6 cycles and trip the faulted elements: b.1. VALIANT7 (510911) 345.0 kV to HUGO 7 (521157) 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
GROUP4_P1_LOCAL_FAULT_017	P1	3 Phase fault on LYDIA 7 345.00 (508298) 345 kV Bus a. Apply fault at the LYDIA 7 345.00 (508298) 345 kV Bus b. Clear fault after 6 cycles and trip the faulted elements: b.1. LYDIA 7 (508298) 345.0 kV to VALIANT7 (510911) 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
GROUP4_P1_LOCAL_FAULT_018	P1	3 Phase fault on O.K.U.-7 345.00 (511456) 345 kV Bus a. Apply fault at the O.K.U.-7 345.00 (511456) 345 kV Bus b. Clear fault after 6 cycles and trip the faulted elements: b.1. O.K.U.-7 (511456) 345.0 kV to L.E.S.-7 (511468) 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
GROUP4_P1_LOCAL_FAULT_019	P1	3 Phase fault on PITTSB-7 345.00 (510907) 345 kV Bus a. Apply fault at the PITTSB-7 345.00 (510907) 345 kV Bus b. Clear fault after 6 cycles and trip the faulted elements: b.1. PITTSB-7 (510907) 345.0 kV to KIOWA 7 (510925) 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
GROUP4_P1_LOCAL_FAULT_020	P1	3 Phase fault on PITTSB-7 345.00 (510907) 345 kV Bus a. Apply fault at the PITTSB-7 345.00 (510907) 345 kV Bus b. Clear fault after 6 cycles and trip the faulted elements: b.1. PITTSB-7 (510907) 345.0 kV to VALIANT7 (510911) 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

Fault ID	Planning Event	Fault Description
GROUP4_P1_LOCAL_FAULT_021	P1	3 Phase fault on COMANC-2 69.000 (511436) 69 kV Bus a. Apply fault at the COMANC-2 69.000 (511436) 69 kV Bus b. Clear fault after 7 cycles and trip the faulted elements: b.1. COMANC-2 (511436) 69.0 kV to L.E.S.-2 (511466) 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
GROUP4_P1_LOCAL_FAULT_022	P1	3 Phase fault on LGORE-S2 69.000 (511470) 69 kV Bus a. Apply fault at the LGORE-S2 69.000 (511470) 69 kV Bus b. Clear fault after 7 cycles and trip the faulted elements: b.1. L.E.S.-2 (511466) 69.0 kV to LGORE-S2 (511470) 69.0 kV Transmission Circuit #1 b.2. LGORE-S2 (511470) 69.0 kV to LAW WC2 (511503) 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
GROUP4_P1_LOCAL_FAULT_023	P1	3 Phase fault on L.E.S.-7 345.00 (511468) 345 kV Bus a. Apply fault at the L.E.S.-7 345.00 (511468) 345 kV Bus b. Clear fault after 6 cycles and trip the faulted elements: b.1. L.E.S.-4 (511467) 138.0 kV to L.E.S.-7 (511468) 345.0 kV to LES#4-1 (511414) 13.8 kV Three Winding #1
GROUP4_P1_LOCAL_FAULT_024	P1	3 Phase fault on L.E.S.-7 345.00 (511468) 345 kV Bus a. Apply fault at the L.E.S.-7 345.00 (511468) 345 kV Bus b. Clear fault after 6 cycles and trip the faulted elements: b.1. L.E.S.-4 (511467) 138.0 kV to L.E.S.-7 (511468) 345.0 kV to LES#5-1 (511411) 13.8 kV Three Winding #2
GROUP4_P1_LOCAL_FAULT_025	P1	3 Phase fault on VALIANT7 345.00 (510911) 345 kV Bus a. Apply fault at the VALIANT7 345.00 (510911) 345 kV Bus b. Clear fault after 6 cycles and trip the faulted elements: b.1. VALIANT4 (510918) 138.0 kV to VALIANT7 (510911) 345.0 kV to VALN3-1 (510939) 13.8 kV Three Winding #1
GROUP4_P1_LOCAL_FAULT_026	P1	3 Phase fault on VALIANT7 345.00 (510911) 345 kV Bus a. Apply fault at the VALIANT7 345.00 (510911) 345 kV Bus b. Clear fault after 6 cycles and trip the faulted elements: b.1. VALIANT4 (510918) 138.0 kV to VALIANT7 (510911) 345.0 kV to VALN2-1 (510938) 13.8 kV Three Winding #2
GROUP4_P1_LOCAL_FAULT_027	P1	3 Phase fault on ELGINJT4 138.00 (511486) 138 kV Bus a. Apply fault at the ELGINJT4 138.00 (511486) 138 kV Bus b. Clear fault after 7 cycles and trip the faulted elements: b.1. ELGINJT2 (511487) 69.0 kV to ELGINJT4 (511486) 138.0 kV to ELGJT1-1 (511412) 13.8 kV Three Winding #1
GROUP4_P1_LOCAL_FAULT_028	P1	3 Phase fault on L.E.S.-4 138.00 (511467) 138 kV Bus a. Apply fault at the L.E.S.-4 138.00 (511467) 138 kV Bus b. Clear fault after 7 cycles and trip the faulted elements: b.1. L.E.S.-2 (511466) 69.0 kV to L.E.S.-4 (511467) 138.0 kV to LES#1-1 (511416) 13.8 kV Three Winding #1

Fault ID	Planning Event	Fault Description
GROUP4_P1_LOCAL_FAULT_029	P1	3 Phase fault on L.E.S.-4 138.00 (511467) 138 kV Bus a. Apply fault at the L.E.S.-4 138.00 (511467) 138 kV Bus b. Clear fault after 7 cycles and trip the faulted elements: b.1. L.E.S.-2 (511466) 69.0 kV to L.E.S.-4 (511467) 138.0 kV to LES#2-1 (511415) 13.8 kV Three Winding #2
GROUP4_P1_LOCAL_FAULT_030	P1	3 Phase fault on TREASILD7 345.00 (511409) 345 kV Bus a. Apply fault at the TREASILD7 345.00 (511409) 345 kV Bus b. Clear fault after 6 cycles and trip the faulted elements: b.1. TREASILD7 (511409) 345.0 kV to GRACMNT7 (515800) 345.0 kV Transmission Circuit #1 b.2. TREASILD7 (511409) 345.0 kV to G20-087-TAP (764550) 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
GROUP4_P1_LOCAL_FAULT_031	P1	3 Phase fault on PITTSB-7 345.00 (510907) 345 kV Bus a. Apply fault at the PITTSB-7 345.00 (510907) 345 kV Bus b. Clear fault after 6 cycles and trip the faulted elements: b.1. PITTSB-7 (510907) 345.0 kV to SEMINOL7 (515045) 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
GROUP4_P1_LOCAL_FAULT_032	P1	3 Phase fault on JOHNCO 7 345.00 (514809) 345 kV Bus a. Apply fault at the JOHNCO 7 345.00 (514809) 345 kV Bus b. Clear fault after 6 cycles and trip the faulted elements: b.1. JOHNCO 7 (514809) 345.0 kV to DMNDSPG7 (516006) 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
GROUP4_P1_LOCAL_FAULT_033	P1	3 Phase fault on MINCO 7 345.00 (514801) 345 kV Bus a. Apply fault at the MINCO 7 345.00 (514801) 345 kV Bus b. Clear fault after 6 cycles and trip the faulted elements: b.1. MINCO 7 (514801) 345.0 kV to CIMARON7 (514901) 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
GROUP4_P1_LOCAL_FAULT_034	P1	3 Phase fault on MINCO 7 345.00 (514801) 345 kV Bus a. Apply fault at the MINCO 7 345.00 (514801) 345 kV Bus b. Clear fault after 6 cycles and trip the faulted elements: b.1. MINCO 7 (514801) 345.0 kV to NORMHLL7 (516096) 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

Fault ID	Planning Event	Fault Description
GROUP4_P1_LOCAL_FAULT_035	P1	3 Phase fault on MILLCKT4 138.00 (515121) 138 kV Bus a. Apply fault at the MILLCKT4 138.00 (515121) 138 kV Bus b. Clear fault after 7 cycles and trip the faulted elements: b.1. ARBUCKL4 (515117) 138.0 kV to MILLCKT4 (515121) 138.0 kV Transmission Circuit #1 b.2. JOHNCO 4 (514808) 138.0 kV to SXMLCKT4 (515122) 138.0 kV Transmission Circuit #1 b.3. MILLCKT4 (515121) 138.0 kV to MILLCRK4 (515196) 138.0 kV Transmission Circuit #1 b.4. MILLCKT4 (515121) 138.0 kV to SXMLCKT4 (515122) 138.0 kV Transmission Circuit #1 b.5. SXMLCKT4 (515122) 138.0 kV to HOWE 4 (521122) 138.0 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
GROUP4_P1_LOCAL_FAULT_036	P1	3 Phase fault on SPRNDAL4 138.00 (515172) 138 kV Bus a. Apply fault at the SPRNDAL4 138.00 (515172) 138 kV Bus b. Clear fault after 7 cycles and trip the faulted elements: b.1. RUSSET-4 (515120) 138.0 kV to STIRLNG4 (515932) 138.0 kV Transmission Circuit #1 b.2. DRPSPRG4 (515873) 138.0 kV to STIRLNG4 (515932) 138.0 kV Transmission Circuit #1 b.3. SPRNDAL4 (515172) 138.0 kV to DRPSPRG4 (515873) 138.0 kV Transmission Circuit #1 b.4. FNDTION4 (515162) 138.0 kV to SPRNDAL4 (515172) 138.0 kV Transmission Circuit #1 b.5. ROCKYPT4 (515164) 138.0 kV to SPRNDAL4 (515172) 138.0 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
GROUP4_P1_LOCAL_FAULT_037	P1	3 Phase fault on POOLVIL4 138.00 (515130) 138 kV Bus a. Apply fault at the POOLVIL4 138.00 (515130) 138 kV Bus b. Clear fault after 7 cycles and trip the faulted elements: b.1. POOLVIL4 (515130) 138.0 kV to CARTRCO4 (515561) 138.0 kV Transmission Circuit #1 b.2. DUNDEE 4 (515132) 138.0 kV to HLTNTAP4 (515141) 138.0 kV Transmission Circuit #1 b.3. POOLVIL4 (515130) 138.0 kV to FOX 4 (515131) 138.0 kV Transmission Circuit #1 b.4. FOX 4 (515131) 138.0 kV to DUNDEE 4 (515132) 138.0 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

Fault ID	Planning Event	Fault Description
GROUP4_P1_LOCAL_FAULT_038	P1	3 Phase fault on POOLVIL4 138.00 (515130) 138 kV Bus a. Apply fault at the POOLVIL4 138.00 (515130) 138 kV Bus b. Clear fault after 7 cycles and trip the faulted elements: b.1. POOLVIL4 (515130) 138.0 kV to CARTRCO4 (515561) 138.0 kV Transmission Circuit #1 b.2. POOLVIL4 (515130) 138.0 kV to FOX 4 (515131) 138.0 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
GROUP4_P1_LOCAL_FAULT_039	P1	3 Phase fault on SUNNYSD4 138.00 (515135) 138 kV Bus a. Apply fault at the SUNNYSD4 138.00 (515135) 138 kV Bus b. Clear fault after 7 cycles and trip the faulted elements: b.1. SUNNYSD4 (515135) 138.0 kV to UNIROY 4 (515137) 138.0 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
GROUP4_P1_LOCAL_FAULT_040	P1	3 Phase fault on CHEEKTP4 138.00 (515415) 138 kV Bus a. Apply fault at the CHEEKTP4 138.00 (515415) 138 kV Bus b. Clear fault after 7 cycles and trip the faulted elements: b.1. HLTNTAP4 (515141) 138.0 kV to DILLARD4 (515142) 138.0 kV Transmission Circuit #1 b.2. DILLARD4 (515142) 138.0 kV to WOLFCRK4 (515143) 138.0 kV Transmission Circuit #1 b.3. WOLFCRK4 (515143) 138.0 kV to CHEEKTP4 (515415) 138.0 kV Transmission Circuit #1 b.4. CHEEKTP4 (515415) 138.0 kV to CHEEK_4 (521125) 138.0 kV Transmission Circuit #1 b.5. LONEGRV4 (515144) 138.0 kV to CHEEKTP4 (515415) 138.0 kV Transmission Circuit #1 b.6. SUNNYSD4 (515135) 138.0 kV to LONEGRV4 (515144) 138.0 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

Fault ID	Planning Event	Fault Description
GROUP4_P1_LOCAL_FAULT_041	P1	3 Phase fault on CHEEKTP4 138.00 (515415) 138 kV Bus a. Apply fault at the CHEEKTP4 138.00 (515415) 138 kV Bus b. Clear fault after 7 cycles and trip the faulted elements: b.1. SUNNYSD4 (515135) 138.0 kV to LONEGRV4 (515144) 138.0 kV Transmission Circuit #1 b.2. WOLFCRK4 (515143) 138.0 kV to CHEEKTP4 (515415) 138.0 kV Transmission Circuit #1 b.3. LONEGRV4 (515144) 138.0 kV to CHEEKTP4 (515415) 138.0 kV Transmission Circuit #1 b.4. DILLARD4 (515142) 138.0 kV to WOLFCRK4 (515143) 138.0 kV Transmission Circuit #1 b.5. CHEEKTP4 (515415) 138.0 kV to CHEEK_4 (521125) 138.0 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
GROUP4_P1_LOCAL_FAULT_042	P1	3 Phase fault on SUNNYSD4 138.00 (515135) 138 kV Bus a. Apply fault at the SUNNYSD4 138.00 (515135) 138 kV Bus b. Clear fault after 7 cycles and trip the faulted elements: b.1. SUNNYSD4 (515135) 138.0 kV to ROCKYPT4 (515164) 138.0 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
GROUP4_P1_LOCAL_FAULT_043	P1	3 Phase fault on CARTER 4 138.00 (515138) 138 kV Bus a. Apply fault at the CARTER 4 138.00 (515138) 138 kV Bus b. Clear fault after 7 cycles and trip the faulted elements: b.1. CARTER 4 (515138) 138.0 kV to ARDWEST4 (515372) 138.0 kV Transmission Circuit #1 b.2. CARTER 4 (515138) 138.0 kV to CHIKSAW4 (515171) 138.0 kV Transmission Circuit #1 b.3. UNIROY 4 (515137) 138.0 kV to ARDWEST4 (515372) 138.0 kV Transmission Circuit #1 b.4. CARTER 4 (515138) 138.0 kV to HONEYCK4 (515643) 138.0 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
GROUP4_P1_LOCAL_FAULT_044	P1	3 Phase fault on MINCO 7 345.00 (514801) 345 kV Bus a. Apply fault at the MINCO 7 345.00 (514801) 345 kV Bus b. Clear fault after 6 cycles and trip the faulted elements: b.1. MINCO 7 (514801) 345.0 kV to MCNOWND7 (515444) 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

Fault ID	Planning Event	Fault Description
GROUP4_P1_LOCAL_FAULT_045	P1	3 Phase fault on PITTSB-7 345.00 (510907) 345 kV Bus a. Apply fault at the PITTSB-7 345.00 (510907) 345 kV Bus b. Clear fault after 6 cycles and trip the faulted elements: b.1. PITTSB-7 (510907) 345.0 kV to JOHNCO 7 (514809) 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
GROUP4_P1_LOCAL_FAULT_046	P1	3 Phase fault on JOHNCO 4 138.00 (514808) 138 kV Bus a. Apply fault at the JOHNCO 4 138.00 (514808) 138 kV Bus b. Clear fault after 7 cycles and trip the faulted elements: b.1. JOHNCO 4 (514808) 138.0 kV to RUSSET-4 (515120) 138.0 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
GROUP4_P1_LOCAL_FAULT_047	P1	3 Phase fault on JOHNCO 4 138.00 (514808) 138 kV Bus a. Apply fault at the JOHNCO 4 138.00 (514808) 138 kV Bus b. Clear fault after 7 cycles and trip the faulted elements: b.1. JOHNCO 4 (514808) 138.0 kV to CANEYCK4 (515150) 138.0 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
GROUP4_P1_LOCAL_FAULT_048	P1	3 Phase fault on TREASILD7 345.00 (511409) 345 kV Bus a. Apply fault at the TREASILD7 345.00 (511409) 345 kV Bus b. Clear fault after 6 cycles and trip the faulted elements: b.1. TREASILD7 (511409) 345.0 kV to GRACMNT7 (515800) 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
GROUP4_P1_LOCAL_FAULT_049	P1	3 Phase fault on MINCO 7 345.00 (514801) 345 kV Bus a. Apply fault at the MINCO 7 345.00 (514801) 345 kV Bus b. Clear fault after 6 cycles and trip the faulted elements: b.1. MINCO 7 (514801) 345.0 kV to GRACMNT7 (515800) 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
GROUP4_P1_LOCAL_FAULT_050	P1	3 Phase fault on GRACMNT4 138.00 (515802) 138 kV Bus a. Apply fault at the GRACMNT4 138.00 (515802) 138 kV Bus b. Clear fault after 7 cycles and trip the faulted elements: b.1. GRACMNT4 (515802) 138.0 kV to ANADARK4 (520814) 138.0 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

Fault ID	Planning Event	Fault Description
GROUP4_P1_LOCAL_FAULT_051	P1	3 Phase fault on GRACMNT4 138.00 (515802) 138 kV Bus a. Apply fault at the GRACMNT4 138.00 (515802) 138 kV Bus b. Clear fault after 7 cycles and trip the faulted elements: b.1. GRACMNT4 (515802) 138.0 kV to ANADARK4 (520814) 138.0 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
GROUP4_P1_LOCAL_FAULT_052	P1	3 Phase fault on GRACMNT4 138.00 (515802) 138 kV Bus a. Apply fault at the GRACMNT4 138.00 (515802) 138 kV Bus b. Clear fault after 7 cycles and trip the faulted elements: b.1. GRACMNT4 (515802) 138.0 kV to WASHITA4 (521089) 138.0 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
GROUP4_P1_LOCAL_FAULT_053	P1	3 Phase fault on GRACMNT4 138.00 (515802) 138 kV Bus a. Apply fault at the GRACMNT4 138.00 (515802) 138 kV Bus b. Clear fault after 7 cycles and trip the faulted elements: b.1. GRACMNT4 (515802) 138.0 kV to WASHITA4 (521089) 138.0 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
GROUP4_P1_LOCAL_FAULT_054	P1	3 Phase fault on MINCO 7 345.00 (514801) 345 kV Bus a. Apply fault at the MINCO 7 345.00 (514801) 345 kV Bus b. Clear fault after 6 cycles and trip the faulted elements: b.1. MINCO 7 (514801) 345.0 kV to MNCWND37 (515549) 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
GROUP4_P1_LOCAL_FAULT_055	P1	3 Phase fault on PITTSB-7 345.00 (510907) 345 kV Bus a. Apply fault at the PITTSB-7 345.00 (510907) 345 kV Bus b. Clear fault after 6 cycles and trip the faulted elements: b.1. PITTSB-7 (510907) 345.0 kV to C-RIVER7 (515422) 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
GROUP4_P1_LOCAL_FAULT_056	P1	3 Phase fault on BORDER 7345.00 (515458) 345 kV Bus a. Apply fault at the BORDER 7345.00 (515458) 345 kV Bus b. Clear fault after 6 cycles and trip the faulted elements: b.1. BORDER 7 (515458) 345.0 kV to BECKHAM7 (516059) 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

Fault ID	Planning Event	Fault Description
GROUP4_P1_LOCAL_FAULT_057	P1	3 Phase fault on CHISHOLM7 345.00 (511553) 345 kV Bus a. Apply fault at the CHISHOLM7 345.00 (511553) 345 kV Bus b. Clear fault after 6 cycles and trip the faulted elements: b.1. CHISHOLM7 (511553) 345.0 kV to BECKHAM7 (516059) 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
GROUP4_P1_LOCAL_FAULT_058	P1	3 Phase fault on BORDER 7345.00 (515458) 345 kV Bus a. Apply fault at the BORDER 7345.00 (515458) 345 kV Bus b. Clear fault after 6 cycles and trip the faulted elements: b.1. BORDER 7 (515458) 345.0 kV to TUCO_INT 7 (525832) 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
GROUP4_P1_LOCAL_FAULT_059	P1	3 Phase fault on CARTRCO4 138.00 (515561) 138 kV Bus a. Apply fault at the CARTRCO4 138.00 (515561) 138 kV Bus b. Clear fault after 7 cycles and trip the faulted elements: b.1. CARTRCO4 (515561) 138.0 kV to ORIGINW4 (515563) 138.0 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
GROUP4_P1_LOCAL_FAULT_060	P1	3 Phase fault on RATLIFF4 138.00 (515129) 138 kV Bus a. Apply fault at the RATLIFF4 138.00 (515129) 138 kV Bus b. Clear fault after 7 cycles and trip the faulted elements: b.1. RATLIFF4 (515129) 138.0 kV to CARTRCO4 (515561) 138.0 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
GROUP4_P1_LOCAL_FAULT_061	P1	3 Phase fault on SUNNYSD4 138.00 (515135) 138 kV Bus a. Apply fault at the SUNNYSD4 138.00 (515135) 138 kV Bus b. Clear fault after 7 cycles and trip the faulted elements: b.1. SUNNYSD4 (515135) 138.0 kV to CARTRCO4 (515561) 138.0 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
GROUP4_P1_LOCAL_FAULT_062	P1	3 Phase fault on ROCKYPT4 138.00 (515164) 138 kV Bus a. Apply fault at the ROCKYPT4 138.00 (515164) 138 kV Bus b. Clear fault after 7 cycles and trip the faulted elements: b.1. ROCKYPT2 (515163) 69.0 kV to ROCKYPT4 (515164) 138.0 kV to ROCKYPT1 (515754) 13.2 kV Three Winding #1

Fault ID	Planning Event	Fault Description
GROUP4_P1_LOCAL_FAULT_063	P1	3 Phase fault on SUNNYSD4 138.00 (515135) 138 kV Bus a. Apply fault at the SUNNYSD4 138.00 (515135) 138 kV Bus b. Clear fault after 7 cycles and trip the faulted elements: b.1. SUNNYSD4 (515135) 138.0 kV Switched Shunt Device # 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
GROUP4_P1_LOCAL_FAULT_064	P1	3 Phase fault on LYDIA 7 345.00 (508298) 345 kV Bus a. Apply fault at the LYDIA 7 345.00 (508298) 345 kV Bus b. Clear fault after 6 cycles and trip the faulted elements: b.1. LYDIA 7 (508298) 345.0 kV to VALIANT7 (510911) 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
GROUP4_P1_LOCAL_FAULT_065	P1	3 Phase fault on PITTSB-7 345.00 (510907) 345 kV Bus a. Apply fault at the PITTSB-7 345.00 (510907) 345 kV Bus b. Clear fault after 6 cycles and trip the faulted elements: b.1. PITTSB-7 (510907) 345.0 kV to VALIANT7 (510911) 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
GROUP4_P1_LOCAL_FAULT_066	P1	3 Phase fault on PITTSB-7 345.00 (510907) 345 kV Bus a. Apply fault at the PITTSB-7 345.00 (510907) 345 kV Bus b. Clear fault after 6 cycles and trip the faulted elements: b.1. PITTSB-7 (510907) 345.0 kV to KIOWA 7 (510925) 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
GROUP4_P1_LOCAL_FAULT_067	P1	3 Phase fault on PITTSB-7 345.00 (510907) 345 kV Bus a. Apply fault at the PITTSB-7 345.00 (510907) 345 kV Bus b. Clear fault after 6 cycles and trip the faulted elements: b.1. PITTSB-7 (510907) 345.0 kV to JOHNCO 7 (514809) 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
GROUP4_P1_LOCAL_FAULT_068	P1	3 Phase fault on PITTSB-7 345.00 (510907) 345 kV Bus a. Apply fault at the PITTSB-7 345.00 (510907) 345 kV Bus b. Clear fault after 6 cycles and trip the faulted elements: b.1. PITTSB-7 (510907) 345.0 kV to SEMINOL7 (515045) 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

Fault ID	Planning Event	Fault Description
GROUP4_P1_LOCAL_FAULT_069	P1	3 Phase fault on PITTSB-7 345.00 (510907) 345 kV Bus a. Apply fault at the PITTSB-7 345.00 (510907) 345 kV Bus b. Clear fault after 6 cycles and trip the faulted elements: b.1. PITTSB-7 (510907) 345.0 kV to C-RIVER7 (515422) 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
GROUP4_P1_LOCAL_FAULT_070	P1	3 Phase fault on VALIANT7 345.00 (510911) 345 kV Bus a. Apply fault at the VALIANT7 345.00 (510911) 345 kV Bus b. Clear fault after 6 cycles and trip the faulted elements: b.1. VALIANT7 (510911) 345.0 kV to HUGO 7 (521157) 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
GROUP4_P1_LOCAL_FAULT_071	P1	3 Phase fault on VALIANT7 345.00 (510911) 345 kV Bus a. Apply fault at the VALIANT7 345.00 (510911) 345 kV Bus b. Clear fault after 6 cycles and trip the faulted elements: b.1. VALIANT7 (510911) 345.0 kV to G20-020-TAP (764520) 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
GROUP4_P1_LOCAL_FAULT_072	P1	3 Phase fault on VALIANT4 138.00 (510918) 138 kV Bus a. Apply fault at the VALIANT4 138.00 (510918) 138 kV Bus b. Clear fault after 7 cycles and trip the faulted elements: b.1. VALIANT4 (510918) 138.0 kV to HUGO PP4 (520948) 138.0 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
GROUP4_P1_LOCAL_FAULT_073	P1	3 Phase fault on TREASILD7 345.00 (511409) 345 kV Bus a. Apply fault at the TREASILD7 345.00 (511409) 345 kV Bus b. Clear fault after 6 cycles and trip the faulted elements: b.1. TREASILD7 (511409) 345.0 kV to GRACMNT7 (515800) 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
GROUP4_P1_LOCAL_FAULT_074	P1	3 Phase fault on TREASILD7 345.00 (511409) 345 kV Bus a. Apply fault at the TREASILD7 345.00 (511409) 345 kV Bus b. Clear fault after 6 cycles and trip the faulted elements: b.1. TREASILD7 (511409) 345.0 kV to GEN-2016-095 (587770) 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

Fault ID	Planning Event	Fault Description
GROUP4_P1_LOCAL_FAULT_075	P1	3 Phase fault on TREASILD7 345.00 (511409) 345 kV Bus a. Apply fault at the TREASILD7 345.00 (511409) 345 kV Bus b. Clear fault after 6 cycles and trip the faulted elements: b.1. TREASILD7 (511409) 345.0 kV to G20-087-TAP (764550) 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
GROUP4_P1_LOCAL_FAULT_076	P1	3 Phase fault on FLETCHR4 138.00 (511422) 138 kV Bus a. Apply fault at the FLETCHR4 138.00 (511422) 138 kV Bus b. Clear fault after 7 cycles and trip the faulted elements: b.1. FLETCHR4 (511422) 138.0 kV to FLE TAP4 (511423) 138.0 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
GROUP4_P1_LOCAL_FAULT_077	P1	3 Phase fault on FLE TAP4 138.00 (511423) 138 kV Bus a. Apply fault at the FLE TAP4 138.00 (511423) 138 kV Bus b. Clear fault after 7 cycles and trip the faulted elements: b.1. FLE TAP4 (511423) 138.0 kV to L.E.S.-4 (511467) 138.0 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
GROUP4_P1_LOCAL_FAULT_078	P1	3 Phase fault on FLE TAP4 138.00 (511423) 138 kV Bus a. Apply fault at the FLE TAP4 138.00 (511423) 138 kV Bus b. Clear fault after 7 cycles and trip the faulted elements: b.1. FLE TAP4 (511423) 138.0 kV to G16-097-TAP (587794) 138.0 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
GROUP4_P1_LOCAL_FAULT_079	P1	3 Phase fault on LWS S4 138.00 (511431) 138 kV Bus a. Apply fault at the LWS S4 138.00 (511431) 138 kV Bus b. Clear fault after 7 cycles and trip the faulted elements: b.1. LWS S4 (511431) 138.0 kV to LWSTAP 4 (511439) 138.0 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
GROUP4_P1_LOCAL_FAULT_080	P1	3 Phase fault on COMANC-2 69.000 (511436) 69 kV Bus a. Apply fault at the COMANC-2 69.000 (511436) 69 kV Bus b. Clear fault after 7 cycles and trip the faulted elements: b.1. COMANC-2 (511436) 69.0 kV to L.E.S.-2 (511466) 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

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GROUP4_P1_LOCAL_FAULT_081	P1	3 Phase fault on COMANC-4 138.00 (511437) 138 kV Bus a. Apply fault at the COMANC-4 138.00 (511437) 138 kV Bus b. Clear fault after 7 cycles and trip the faulted elements: b.1. COMANC-4 (511437) 138.0 kV to L.E.S.-4 (511467) 138.0 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
GROUP4_P1_LOCAL_FAULT_082	P1	3 Phase fault on COMANC-4 138.00 (511437) 138 kV Bus a. Apply fault at the COMANC-4 138.00 (511437) 138 kV Bus b. Clear fault after 7 cycles and trip the faulted elements: b.1. COMANC-4 (511437) 138.0 kV to 112GORE4 (511488) 138.0 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
GROUP4_P1_LOCAL_FAULT_083	P1	3 Phase fault on LWSTAP 4 138.00 (511439) 138 kV Bus a. Apply fault at the LWSTAP 4 138.00 (511439) 138 kV Bus b. Clear fault after 7 cycles and trip the faulted elements: b.1. LWSTAP 4 (511439) 138.0 kV to L.E.S.-4 (511467) 138.0 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
GROUP4_P1_LOCAL_FAULT_084	P1	3 Phase fault on LWSTAP 4 138.00 (511439) 138 kV Bus a. Apply fault at the LWSTAP 4 138.00 (511439) 138 kV Bus b. Clear fault after 7 cycles and trip the faulted elements: b.1. LWSTAP 4 (511439) 138.0 kV to RPPAPER4 (511512) 138.0 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
GROUP4_P1_LOCAL_FAULT_085	P1	3 Phase fault on DUNCAN-4 138.00 (511453) 138 kV Bus a. Apply fault at the DUNCAN-4 138.00 (511453) 138 kV Bus b. Clear fault after 7 cycles and trip the faulted elements: b.1. DUNCAN-4 (511453) 138.0 kV to OMDUNCN4 (529304) 138.0 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
GROUP4_P1_LOCAL_FAULT_086	P1	3 Phase fault on O.K.U.-7 345.00 (511456) 345 kV Bus a. Apply fault at the O.K.U.-7 345.00 (511456) 345 kV Bus b. Clear fault after 6 cycles and trip the faulted elements: b.1. O.K.U.-7 (511456) 345.0 kV to L.E.S.-7 (511468) 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

Fault ID	Planning Event	Fault Description
GROUP4_P1_LOCAL_FAULT_087	P1	3 Phase fault on O.K.U.-7 345.00 (511456) 345 kV Bus a. Apply fault at the O.K.U.-7 345.00 (511456) 345 kV Bus b. Clear fault after 6 cycles and trip the faulted elements: b.1. O.K.U.-7 (511456) 345.0 kV to OKLAUN HVDC7 (511565) 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
GROUP4_P1_LOCAL_FAULT_088	P1	3 Phase fault on O.K.U.-7 345.00 (511456) 345 kV Bus a. Apply fault at the O.K.U.-7 345.00 (511456) 345 kV Bus b. Clear fault after 6 cycles and trip the faulted elements: b.1. O.K.U.-7 (511456) 345.0 kV to GEN-2017-033 (588760) 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
GROUP4_P1_LOCAL_FAULT_089	P1	3 Phase fault on O.K.U.-7 345.00 (511456) 345 kV Bus a. Apply fault at the O.K.U.-7 345.00 (511456) 345 kV Bus b. Clear fault after 6 cycles and trip the faulted elements: b.1. O.K.U.-7 (511456) 345.0 kV to G18-015-TAP (762467) 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
GROUP4_P1_LOCAL_FAULT_090	P1	3 Phase fault on L.E.S.-2 69.000 (511466) 69 kV Bus a. Apply fault at the L.E.S.-2 69.000 (511466) 69 kV Bus b. Clear fault after 7 cycles and trip the faulted elements: b.1. L.E.S.-2 (511466) 69.0 kV to LGORE-N2 (511469) 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
GROUP4_P1_LOCAL_FAULT_091	P1	3 Phase fault on L.E.S.-2 69.000 (511466) 69 kV Bus a. Apply fault at the L.E.S.-2 69.000 (511466) 69 kV Bus b. Clear fault after 7 cycles and trip the faulted elements: b.1. L.E.S.-2 (511466) 69.0 kV to LGORE-S2 (511470) 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
GROUP4_P1_LOCAL_FAULT_092	P1	3 Phase fault on L.E.S.-4 138.00 (511467) 138 kV Bus a. Apply fault at the L.E.S.-4 138.00 (511467) 138 kV Bus b. Clear fault after 7 cycles and trip the faulted elements: b.1. L.E.S.-4 (511467) 138.0 kV to SHERID4 (511474) 138.0 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

Fault ID	Planning Event	Fault Description
GROUP4_P1_LOCAL_FAULT_093	P1	3 Phase fault on L.E.S.-4 138.00 (511467) 138 kV Bus a. Apply fault at the L.E.S.-4 138.00 (511467) 138 kV Bus b. Clear fault after 7 cycles and trip the faulted elements: b.1. L.E.S.-4 (511467) 138.0 kV to ELGINJT4 (511486) 138.0 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
GROUP4_P1_LOCAL_FAULT_094	P1	3 Phase fault on L.E.S.-7 345.00 (511468) 345 kV Bus a. Apply fault at the L.E.S.-7 345.00 (511468) 345 kV Bus b. Clear fault after 6 cycles and trip the faulted elements: b.1. L.E.S.-7 (511468) 345.0 kV to G17-171-TAP (760938) 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
GROUP4_P1_LOCAL_FAULT_095	P1	3 Phase fault on L.E.S.-7 345.00 (511468) 345 kV Bus a. Apply fault at the L.E.S.-7 345.00 (511468) 345 kV Bus b. Clear fault after 6 cycles and trip the faulted elements: b.1. L.E.S.-7 (511468) 345.0 kV to G20-087-TAP (764550) 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
GROUP4_P1_LOCAL_FAULT_096	P1	3 Phase fault on SHERID4 138.00 (511474) 138 kV Bus a. Apply fault at the SHERID4 138.00 (511474) 138 kV Bus b. Clear fault after 7 cycles and trip the faulted elements: b.1. SHERID4 (511474) 138.0 kV to ARTVLTP4 (511537) 138.0 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
GROUP4_P1_LOCAL_FAULT_097	P1	3 Phase fault on ELGINJT4 138.00 (511486) 138 kV Bus a. Apply fault at the ELGINJT4 138.00 (511486) 138 kV Bus b. Clear fault after 7 cycles and trip the faulted elements: b.1. ELGINJT4 (511486) 138.0 kV to ELSWORTH 4 (511563) 138.0 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
GROUP4_P1_LOCAL_FAULT_098	P1	3 Phase fault on COMMTAP4 138.00 (511494) 138 kV Bus a. Apply fault at the COMMTAP4 138.00 (511494) 138 kV Bus b. Clear fault after 7 cycles and trip the faulted elements: b.1. COMMTAP4 (511494) 138.0 kV to OMDUNCN4 (529304) 138.0 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

Fault ID	Planning Event	Fault Description
GROUP4_P1_LOCAL_FAULT_099	P1	3 Phase fault on CHISHOLM7 345.00 (511553) 345 kV Bus a. Apply fault at the CHISHOLM7 345.00 (511553) 345 kV Bus b. Clear fault after 6 cycles and trip the faulted elements: b.1. CHISHOLM7 (511553) 345.0 kV to BECKHAM7 (516059) 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
GROUP4_P1_LOCAL_FAULT_100	P1	3 Phase fault on CHISHOLM7 345.00 (511553) 345 kV Bus a. Apply fault at the CHISHOLM7 345.00 (511553) 345 kV Bus b. Clear fault after 6 cycles and trip the faulted elements: b.1. CHISHOLM7 (511553) 345.0 kV to G16-037-TAP (560078) 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
GROUP4_P1_LOCAL_FAULT_101	P1	3 Phase fault on TERRYRD7 345.00 (511568) 345 kV Bus a. Apply fault at the TERRYRD7 345.00 (511568) 345 kV Bus b. Clear fault after 6 cycles and trip the faulted elements: b.1. TERRYRD7 (511568) 345.0 kV to G17-171-TAP (760938) 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
GROUP4_P1_LOCAL_FAULT_102	P1	3 Phase fault on TERRYRD7 345.00 (511568) 345 kV Bus a. Apply fault at the TERRYRD7 345.00 (511568) 345 kV Bus b. Clear fault after 6 cycles and trip the faulted elements: b.1. TERRYRD7 (511568) 345.0 kV to G20-074-TAP (764115) 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
GROUP4_P1_LOCAL_FAULT_103	P1	3 Phase fault on MINCO 7 345.00 (514801) 345 kV Bus a. Apply fault at the MINCO 7 345.00 (514801) 345 kV Bus b. Clear fault after 6 cycles and trip the faulted elements: b.1. MINCO 7 (514801) 345.0 kV to CIMARON7 (514901) 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
GROUP4_P1_LOCAL_FAULT_104	P1	3 Phase fault on MINCO 7 345.00 (514801) 345 kV Bus a. Apply fault at the MINCO 7 345.00 (514801) 345 kV Bus b. Clear fault after 6 cycles and trip the faulted elements: b.1. MINCO 7 (514801) 345.0 kV to NORMHLL7 (516096) 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

Fault ID	Planning Event	Fault Description
GROUP4_P1_LOCAL_FAULT_105	P1	3 Phase fault on MINCO 7 345.00 (514801) 345 kV Bus a. Apply fault at the MINCO 7 345.00 (514801) 345 kV Bus b. Clear fault after 6 cycles and trip the faulted elements: b.1. MINCO 7 (514801) 345.0 kV to GEN-2017-233 (761250) 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
GROUP4_P1_LOCAL_FAULT_106	P1	3 Phase fault on JOHNCO 4 138.00 (514808) 138 kV Bus a. Apply fault at the JOHNCO 4 138.00 (514808) 138 kV Bus b. Clear fault after 7 cycles and trip the faulted elements: b.1. JOHNCO 4 (514808) 138.0 kV to RUSSET-4 (515120) 138.0 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
GROUP4_P1_LOCAL_FAULT_107	P1	3 Phase fault on JOHNCO 4 138.00 (514808) 138 kV Bus a. Apply fault at the JOHNCO 4 138.00 (514808) 138 kV Bus b. Clear fault after 7 cycles and trip the faulted elements: b.1. JOHNCO 4 (514808) 138.0 kV to SXMLCKT4 (515122) 138.0 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
GROUP4_P1_LOCAL_FAULT_108	P1	3 Phase fault on JOHNCO 4 138.00 (514808) 138 kV Bus a. Apply fault at the JOHNCO 4 138.00 (514808) 138 kV Bus b. Clear fault after 7 cycles and trip the faulted elements: b.1. JOHNCO 4 (514808) 138.0 kV to CANEYCK4 (515150) 138.0 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
GROUP4_P1_LOCAL_FAULT_109	P1	3 Phase fault on JOHNCO 7 345.00 (514809) 345 kV Bus a. Apply fault at the JOHNCO 7 345.00 (514809) 345 kV Bus b. Clear fault after 6 cycles and trip the faulted elements: b.1. JOHNCO 7 (514809) 345.0 kV to G21-016-TAP (765451) 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
GROUP4_P1_LOCAL_FAULT_110	P1	3 Phase fault on RATLIFF4 138.00 (515129) 138 kV Bus a. Apply fault at the RATLIFF4 138.00 (515129) 138 kV Bus b. Clear fault after 7 cycles and trip the faulted elements: b.1. RATLIFF4 (515129) 138.0 kV to CARTRCO4 (515561) 138.0 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

Fault ID	Planning Event	Fault Description
GROUP4_P1_LOCAL_FAULT_111	P1	3 Phase fault on POOLVIL4 138.00 (515130) 138 kV Bus a. Apply fault at the POOLVIL4 138.00 (515130) 138 kV Bus b. Clear fault after 7 cycles and trip the faulted elements: b.1. POOLVIL4 (515130) 138.0 kV to CARTRCO4 (515561) 138.0 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
GROUP4_P1_LOCAL_FAULT_112	P1	3 Phase fault on SUNNYSD4 138.00 (515135) 138 kV Bus a. Apply fault at the SUNNYSD4 138.00 (515135) 138 kV Bus b. Clear fault after 7 cycles and trip the faulted elements: b.1. SUNNYSD4 (515135) 138.0 kV to UNIROY 4 (515137) 138.0 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
GROUP4_P1_LOCAL_FAULT_113	P1	3 Phase fault on SUNNYSD4 138.00 (515135) 138 kV Bus a. Apply fault at the SUNNYSD4 138.00 (515135) 138 kV Bus b. Clear fault after 7 cycles and trip the faulted elements: b.1. SUNNYSD4 (515135) 138.0 kV to LONEGRV4 (515144) 138.0 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
GROUP4_P1_LOCAL_FAULT_114	P1	3 Phase fault on SUNNYSD4 138.00 (515135) 138 kV Bus a. Apply fault at the SUNNYSD4 138.00 (515135) 138 kV Bus b. Clear fault after 7 cycles and trip the faulted elements: b.1. SUNNYSD4 (515135) 138.0 kV to ROCKYPT4 (515164) 138.0 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
GROUP4_P1_LOCAL_FAULT_115	P1	3 Phase fault on SUNNYSD4 138.00 (515135) 138 kV Bus a. Apply fault at the SUNNYSD4 138.00 (515135) 138 kV Bus b. Clear fault after 7 cycles and trip the faulted elements: b.1. SUNNYSD4 (515135) 138.0 kV to CARTRCO4 (515561) 138.0 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
GROUP4_P1_LOCAL_FAULT_116	P1	3 Phase fault on SUNNYSD7 345.00 (515136) 345 kV Bus a. Apply fault at the SUNNYSD7 345.00 (515136) 345 kV Bus b. Clear fault after 6 cycles and trip the faulted elements: b.1. SUNNYSD7 (515136) 345.0 kV to G17-075-TAP (560088) 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

Fault ID	Planning Event	Fault Description
GROUP4_P1_LOCAL_FAULT_117	P1	3 Phase fault on SUNNYSD7 345.00 (515136) 345 kV Bus a. Apply fault at the SUNNYSD7 345.00 (515136) 345 kV Bus b. Clear fault after 6 cycles and trip the faulted elements: b.1. SUNNYSD7 (515136) 345.0 kV to G20-074-TAP (764115) 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
GROUP4_P1_LOCAL_FAULT_118	P1	3 Phase fault on SUNNYSD7 345.00 (515136) 345 kV Bus a. Apply fault at the SUNNYSD7 345.00 (515136) 345 kV Bus b. Clear fault after 6 cycles and trip the faulted elements: b.1. SUNNYSD7 (515136) 345.0 kV to G20-074-TAP (764115) 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
GROUP4_P1_LOCAL_FAULT_119	P1	3 Phase fault on SUNNYSD7 345.00 (515136) 345 kV Bus a. Apply fault at the SUNNYSD7 345.00 (515136) 345 kV Bus b. Clear fault after 6 cycles and trip the faulted elements: b.1. SUNNYSD7 (515136) 345.0 kV to G21-016-TAP (765451) 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
GROUP4_P1_LOCAL_FAULT_120	P1	3 Phase fault on UNIROY 4 138.00 (515137) 138 kV Bus a. Apply fault at the UNIROY 4 138.00 (515137) 138 kV Bus b. Clear fault after 7 cycles and trip the faulted elements: b.1. UNIROY 4 (515137) 138.0 kV to ARDWEST4 (515372) 138.0 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
GROUP4_P1_LOCAL_FAULT_121	P1	3 Phase fault on DILLARD4 138.00 (515142) 138 kV Bus a. Apply fault at the DILLARD4 138.00 (515142) 138 kV Bus b. Clear fault after 7 cycles and trip the faulted elements: b.1. DILLARD4 (515142) 138.0 kV to WOLFCRK4 (515143) 138.0 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
GROUP4_P1_LOCAL_FAULT_122	P1	3 Phase fault on WOLFCRK4 138.00 (515143) 138 kV Bus a. Apply fault at the WOLFCRK4 138.00 (515143) 138 kV Bus b. Clear fault after 7 cycles and trip the faulted elements: b.1. WOLFCRK4 (515143) 138.0 kV to CHEEKTP4 (515415) 138.0 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

Fault ID	Planning Event	Fault Description
GROUP4_P1_LOCAL_FAULT_123	P1	3 Phase fault on LONEGRV4 138.00 (515144) 138 kV Bus a. Apply fault at the LONEGRV4 138.00 (515144) 138 kV Bus b. Clear fault after 7 cycles and trip the faulted elements: b.1. LONEGRV4 (515144) 138.0 kV to CHEEKTP4 (515415) 138.0 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
GROUP4_P1_LOCAL_FAULT_124	P1	3 Phase fault on MRIETA 2 138.00 (515160) 138 kV Bus a. Apply fault at the MRIETA 2 138.00 (515160) 138 kV Bus b. Clear fault after 7 cycles and trip the faulted elements: b.1. MRIETA 2 (515160) 138.0 kV to ROCKYPT4 (515164) 138.0 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
GROUP4_P1_LOCAL_FAULT_125	P1	3 Phase fault on ROCKYPT4 138.00 (515164) 138 kV Bus a. Apply fault at the ROCKYPT4 138.00 (515164) 138 kV Bus b. Clear fault after 7 cycles and trip the faulted elements: b.1. ROCKYPT4 (515164) 138.0 kV to SPRNDAL4 (515172) 138.0 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
GROUP4_P1_LOCAL_FAULT_126	P1	3 Phase fault on CHEEKTP4 138.00 (515415) 138 kV Bus a. Apply fault at the CHEEKTP4 138.00 (515415) 138 kV Bus b. Clear fault after 7 cycles and trip the faulted elements: b.1. CHEEKTP4 (515415) 138.0 kV to CHEEK_4 (521125) 138.0 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
GROUP4_P1_LOCAL_FAULT_127	P1	3 Phase fault on BORDER 7345.00 (515458) 345 kV Bus a. Apply fault at the BORDER 7345.00 (515458) 345 kV Bus b. Clear fault after 6 cycles and trip the faulted elements: b.1. BORDER 7 (515458) 345.0 kV to BECKHAM7 (516059) 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
GROUP4_P1_LOCAL_FAULT_128	P1	3 Phase fault on BORDER 7345.00 (515458) 345 kV Bus a. Apply fault at the BORDER 7345.00 (515458) 345 kV Bus b. Clear fault after 6 cycles and trip the faulted elements: b.1. BORDER 7 (515458) 345.0 kV to BECKHAM7 (516059) 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

Fault ID	Planning Event	Fault Description
GROUP4_P1_LOCAL_FAULT_129	P1	3 Phase fault on BORDER 7345.00 (515458) 345 kV Bus a. Apply fault at the BORDER 7345.00 (515458) 345 kV Bus b. Clear fault after 6 cycles and trip the faulted elements: b.1. BORDER 7 (515458) 345.0 kV to TUCO_INT 7 (525832) 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
GROUP4_P1_LOCAL_FAULT_130	P1	3 Phase fault on BORDER 7345.00 (515458) 345 kV Bus a. Apply fault at the BORDER 7345.00 (515458) 345 kV Bus b. Clear fault after 6 cycles and trip the faulted elements: b.1. BORDER 7 (515458) 345.0 kV to G17-151TAP (762216) 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
GROUP4_P1_LOCAL_FAULT_131	P1	3 Phase fault on CARTRCO4 138.00 (515561) 138 kV Bus a. Apply fault at the CARTRCO4 138.00 (515561) 138 kV Bus b. Clear fault after 7 cycles and trip the faulted elements: b.1. CARTRCO4 (515561) 138.0 kV to ORIGINW4 (515563) 138.0 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
GROUP4_P1_LOCAL_FAULT_132	P1	3 Phase fault on CARTRCO4 138.00 (515561) 138 kV Bus a. Apply fault at the CARTRCO4 138.00 (515561) 138 kV Bus b. Clear fault after 7 cycles and trip the faulted elements: b.1. CARTRCO4 (515561) 138.0 kV to GEN-2017-027 (588710) 138.0 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
GROUP4_P1_LOCAL_FAULT_133	P1	3 Phase fault on GRACMNT7 345.00 (515800) 345 kV Bus a. Apply fault at the GRACMNT7 345.00 (515800) 345 kV Bus b. Clear fault after 6 cycles and trip the faulted elements: b.1. GRACMNT7 (515800) 345.0 kV to G16-037-TAP (560078) 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
GROUP4_P1_LOCAL_FAULT_134	P1	3 Phase fault on GRACMNT4 138.00 (515802) 138 kV Bus a. Apply fault at the GRACMNT4 138.00 (515802) 138 kV Bus b. Clear fault after 7 cycles and trip the faulted elements: b.1. GRACMNT4 (515802) 138.0 kV to ANADARK4 (520814) 138.0 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

Fault ID	Planning Event	Fault Description
GROUP4_P1_LOCAL_FAULT_135	P1	3 Phase fault on GRACMNT4 138.00 (515802) 138 kV Bus a. Apply fault at the GRACMNT4 138.00 (515802) 138 kV Bus b. Clear fault after 7 cycles and trip the faulted elements: b.1. GRACMNT4 (515802) 138.0 kV to ANADARK4 (520814) 138.0 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
GROUP4_P1_LOCAL_FAULT_136	P1	3 Phase fault on GRACMNT4 138.00 (515802) 138 kV Bus a. Apply fault at the GRACMNT4 138.00 (515802) 138 kV Bus b. Clear fault after 7 cycles and trip the faulted elements: b.1. GRACMNT4 (515802) 138.0 kV to ANADARK4 (520814) 138.0 kV Transmission Circuit #3 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
GROUP4_P1_LOCAL_FAULT_137	P1	3 Phase fault on GRACMNT4 138.00 (515802) 138 kV Bus a. Apply fault at the GRACMNT4 138.00 (515802) 138 kV Bus b. Clear fault after 7 cycles and trip the faulted elements: b.1. GRACMNT4 (515802) 138.0 kV to WASHITA4 (521089) 138.0 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
GROUP4_P1_LOCAL_FAULT_138	P1	3 Phase fault on GRACMNT4 138.00 (515802) 138 kV Bus a. Apply fault at the GRACMNT4 138.00 (515802) 138 kV Bus b. Clear fault after 7 cycles and trip the faulted elements: b.1. GRACMNT4 (515802) 138.0 kV to WASHITA4 (521089) 138.0 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
GROUP4_P1_LOCAL_FAULT_139	P1	3 Phase fault on SAWYER4 138.00 (520411) 138 kV Bus a. Apply fault at the SAWYER4 138.00 (520411) 138 kV Bus b. Clear fault after 7 cycles and trip the faulted elements: b.1. SAWYER4 (520411) 138.0 kV to HUGO PP4 (520948) 138.0 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
GROUP4_P1_LOCAL_FAULT_140	P1	3 Phase fault on HUGOITC4 138.00 (520560) 138 kV Bus a. Apply fault at the HUGOITC4 138.00 (520560) 138 kV Bus b. Clear fault after 7 cycles and trip the faulted elements: b.1. HUGOITC4 (520560) 138.0 kV to HUGO PP4 (520948) 138.0 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

Fault ID	Planning Event	Fault Description
GROUP4_P1_LOCAL_FAULT_141	P1	3 Phase fault on FROGVIL4 138.00 (520918) 138 kV Bus a. Apply fault at the FROGVIL4 138.00 (520918) 138 kV Bus b. Clear fault after 7 cycles and trip the faulted elements: b.1. FROGVIL4 (520918) 138.0 kV to HUGO PP4 (520948) 138.0 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
GROUP4_P1_LOCAL_FAULT_142	P1	3 Phase fault on HUGO PP4 138.00 (520948) 138 kV Bus a. Apply fault at the HUGO PP4 138.00 (520948) 138 kV Bus b. Clear fault after 7 cycles and trip the faulted elements: b.1. HUGO PP4 (520948) 138.0 kV to VALLANT4 (521079) 138.0 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
GROUP4_P1_LOCAL_FAULT_143	P1	3 Phase fault on HUGO PP4 138.00 (520948) 138 kV Bus a. Apply fault at the HUGO PP4 138.00 (520948) 138 kV Bus b. Clear fault after 7 cycles and trip the faulted elements: b.1. HUGO PP4 (520948) 138.0 kV to GEN-2017-023 (588670) 138.0 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
GROUP4_P1_LOCAL_FAULT_144	P1	3 Phase fault on HUGO 7 345.00 (521157) 345 kV Bus a. Apply fault at the HUGO 7 345.00 (521157) 345 kV Bus b. Clear fault after 6 cycles and trip the faulted elements: b.1. HUGO 7 (521157) 345.0 kV to G17-075-TAP (560088) 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
GROUP4_P1_LOCAL_FAULT_145	P1	3 Phase fault on TUCO_INT 7345.00 (525832) 345 kV Bus a. Apply fault at the TUCO_INT 7345.00 (525832) 345 kV Bus b. Clear fault after 6 cycles and trip the faulted elements: b.1. TUCO_INT 7 (525832) 345.0 kV to ELK_CT1 (525850) 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
GROUP4_P1_LOCAL_FAULT_146	P1	3 Phase fault on TUCO_INT 7345.00 (525832) 345 kV Bus a. Apply fault at the TUCO_INT 7345.00 (525832) 345 kV Bus b. Clear fault after 6 cycles and trip the faulted elements: b.1. TUCO_INT 7 (525832) 345.0 kV to G17-151TAP (762216) 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

Fault ID	Planning Event	Fault Description
GROUP4_P1_LOCAL_FAULT_147	P1	3 Phase fault on TUCO_INT 7345.00 (525832) 345 kV Bus a. Apply fault at the TUCO_INT 7345.00 (525832) 345 kV Bus b. Clear fault after 6 cycles and trip the faulted elements: b.1. TUCO_INT 7 (525832) 345.0 kV to G20-067-TAP (764945) 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
GROUP4_P1_LOCAL_FAULT_148	P1	3 Phase fault on TUCO_INT 7345.00 (525832) 345 kV Bus a. Apply fault at the TUCO_INT 7345.00 (525832) 345 kV Bus b. Clear fault after 6 cycles and trip the faulted elements: b.1. TUCO_INT 7 (525832) 345.0 kV to GEN-2022-147 (769921) 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
GROUP4_P1_LOCAL_FAULT_149	P1	3 Phase fault on G17-075-TAP 345.00 (560088) 345 kV Bus a. Apply fault at the G17-075-TAP 345.00 (560088) 345 kV Bus b. Clear fault after 6 cycles and trip the faulted elements: b.1. G17-075-TAP (560088) 345.0 kV to GEN-2017-075 (589130) 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
GROUP4_P1_LOCAL_FAULT_150	P1	3 Phase fault on G17-075-TAP 345.00 (560088) 345 kV Bus a. Apply fault at the G17-075-TAP 345.00 (560088) 345 kV Bus b. Clear fault after 6 cycles and trip the faulted elements: b.1. G17-075-TAP (560088) 345.0 kV to GEN-2022-098 (768941) 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
GROUP4_P1_LOCAL_FAULT_151	P1	3 Phase fault on G17-151TAP 345.00 (762216) 345 kV Bus a. Apply fault at the G17-151TAP 345.00 (762216) 345 kV Bus b. Clear fault after 6 cycles and trip the faulted elements: b.1. G17-151TAP (762216) 345.0 kV to GEN-2017-151 (762217) 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
GROUP4_P1_LOCAL_FAULT_152	P1	3 Phase fault on G17-151TAP 345.00 (762216) 345 kV Bus a. Apply fault at the G17-151TAP 345.00 (762216) 345 kV Bus b. Clear fault after 6 cycles and trip the faulted elements: b.1. G17-151TAP (762216) 345.0 kV to G18-015-TAP (762467) 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

Fault ID	Planning Event	Fault Description
GROUP4_P1_LOCAL_FAULT_153	P1	3 Phase fault on GEN-2018-015345.00 (762460) 345 kV Bus a. Apply fault at the GEN-2018-015345.00 (762460) 345 kV Bus b. Clear fault after 6 cycles and trip the faulted elements: b.1. GEN-2018-015 (762460) 345.0 kV to G18-015-TAP (762467) 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
GROUP4_P1_LOCAL_FAULT_154	P1	3 Phase fault on GEN-2021-016345.00 (765450) 345 kV Bus a. Apply fault at the GEN-2021-016345.00 (765450) 345 kV Bus b. Clear fault after 6 cycles and trip the faulted elements: b.1. GEN-2021-016 (765450) 345.0 kV to G21-016-TAP (765451) 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
GROUP4_P1_LOCAL_FAULT_155	P1	3 Phase fault on VALIANT7 345.00 (510911) 345 kV Bus a. Apply fault at the VALIANT7 345.00 (510911) 345 kV Bus b. Clear fault after 6 cycles and trip the faulted elements: b.1. VALIANT4 (510918) 138.0 kV to VALIANT7 (510911) 345.0 kV to VALN2-1 (510938) 13.8 kV Three Winding #2
GROUP4_P1_LOCAL_FAULT_156	P1	3 Phase fault on VALIANT7 345.00 (510911) 345 kV Bus a. Apply fault at the VALIANT7 345.00 (510911) 345 kV Bus b. Clear fault after 6 cycles and trip the faulted elements: b.1. VALIANT4 (510918) 138.0 kV to VALIANT7 (510911) 345.0 kV to VALN3-1 (510939) 13.8 kV Three Winding #1
GROUP4_P1_LOCAL_FAULT_157	P1	3 Phase fault on L.E.S.-4 138.00 (511467) 138 kV Bus a. Apply fault at the L.E.S.-4 138.00 (511467) 138 kV Bus b. Clear fault after 7 cycles and trip the faulted elements: b.1. L.E.S.-2 (511466) 69.0 kV to L.E.S.-4 (511467) 138.0 kV to LES#1-1 (511416) 13.8 kV Three Winding #1
GROUP4_P1_LOCAL_FAULT_158	P1	3 Phase fault on L.E.S.-4 138.00 (511467) 138 kV Bus a. Apply fault at the L.E.S.-4 138.00 (511467) 138 kV Bus b. Clear fault after 7 cycles and trip the faulted elements: b.1. L.E.S.-2 (511466) 69.0 kV to L.E.S.-4 (511467) 138.0 kV to LES#2-1 (511415) 13.8 kV Three Winding #2
GROUP4_P1_LOCAL_FAULT_159	P1	3 Phase fault on L.E.S.-7 345.00 (511468) 345 kV Bus a. Apply fault at the L.E.S.-7 345.00 (511468) 345 kV Bus b. Clear fault after 6 cycles and trip the faulted elements: b.1. L.E.S.-4 (511467) 138.0 kV to L.E.S.-7 (511468) 345.0 kV to LES#4-1 (511414) 13.8 kV Three Winding #1
GROUP4_P1_LOCAL_FAULT_160	P1	3 Phase fault on L.E.S.-7 345.00 (511468) 345 kV Bus a. Apply fault at the L.E.S.-7 345.00 (511468) 345 kV Bus b. Clear fault after 6 cycles and trip the faulted elements: b.1. L.E.S.-4 (511467) 138.0 kV to L.E.S.-7 (511468) 345.0 kV to LES#5-1 (511411) 13.8 kV Three Winding #2
GROUP4_P1_LOCAL_FAULT_161	P1	3 Phase fault on ELGINJT4 138.00 (511486) 138 kV Bus a. Apply fault at the ELGINJT4 138.00 (511486) 138 kV Bus b. Clear fault after 7 cycles and trip the faulted elements: b.1. ELGINJT2 (511487) 69.0 kV to ELGINJT4 (511486) 138.0 kV to ELGJT1-1 (511412) 13.8 kV Three Winding #1

Fault ID	Planning Event	Fault Description
GROUP4_P1_LOCAL_FAULT_162	P1	3 Phase fault on CHISHOLM7 345.00 (511553) 345 kV Bus a. Apply fault at the CHISHOLM7 345.00 (511553) 345 kV Bus b. Clear fault after 6 cycles and trip the faulted elements: b.1. CHISHOLM6 (511557) 230.0 kV to CHISHOLM7 (511553) 345.0 kV to CHISHOLM1 (511558) 13.2 kV Three Winding #1
GROUP4_P1_LOCAL_FAULT_163	P1	3 Phase fault on SUNNYSD7 345.00 (515136) 345 kV Bus a. Apply fault at the SUNNYSD7 345.00 (515136) 345 kV Bus b. Clear fault after 6 cycles and trip the faulted elements: b.1. SUNNYSD4 (515135) 138.0 kV to SUNNYSD7 (515136) 345.0 kV to SUNNYSD1 (515762) 13.8 kV Three Winding #1
GROUP4_P1_LOCAL_FAULT_164	P1	3 Phase fault on SUNNYSD7 345.00 (515136) 345 kV Bus a. Apply fault at the SUNNYSD7 345.00 (515136) 345 kV Bus b. Clear fault after 6 cycles and trip the faulted elements: b.1. SUNNYSD7 (515136) 345.0 kV to SUNNYSD4 (515135) 138.0 kV to SUNYSD 1 (515405) 13.8 kV Three Winding #1
GROUP4_P1_LOCAL_FAULT_165	P1	3 Phase fault on ROCKYPT4 138.00 (515164) 138 kV Bus a. Apply fault at the ROCKYPT4 138.00 (515164) 138 kV Bus b. Clear fault after 7 cycles and trip the faulted elements: b.1. ROCKYPT2 (515163) 69.0 kV to ROCKYPT4 (515164) 138.0 kV to ROCKYPT1 (515754) 13.2 kV Three Winding #1
GROUP4_P1_LOCAL_FAULT_166	P1	3 Phase fault on GRACMNT7 345.00 (515800) 345 kV Bus a. Apply fault at the GRACMNT7 345.00 (515800) 345 kV Bus b. Clear fault after 6 cycles and trip the faulted elements: b.1. GRACMNT4 (515802) 138.0 kV to GRACMNT7 (515800) 345.0 kV to GRCMNT11 (515801) 13.8 kV Three Winding #1
GROUP4_P1_LOCAL_FAULT_167	P1	3 Phase fault on HUGO 7 345.00 (521157) 345 kV Bus a. Apply fault at the HUGO 7 345.00 (521157) 345 kV Bus b. Clear fault after 6 cycles and trip the faulted elements: b.1. HUGO 7 (521157) 345.0 kV to HUGOITC4 (520560) 138.0 kV to HUGO TERTA (521189) 13.8 kV Three Winding #1
GROUP4_P1_LOCAL_FAULT_168	P1	3 Phase fault on TUCO_INT 7345.00 (525832) 345 kV Bus a. Apply fault at the TUCO_INT 7345.00 (525832) 345 kV Bus b. Clear fault after 6 cycles and trip the faulted elements: b.1. TUCO_INT 7 (525832) 345.0 kV to TUCO_INT 6 (525830) 230.0 kV to TUCO_TR2 1 (525825) 13.2 kV Three Winding #2
GROUP4_P1_LOCAL_FAULT_169	P1	3 Phase fault on TUCO_INT 7345.00 (525832) 345 kV Bus a. Apply fault at the TUCO_INT 7345.00 (525832) 345 kV Bus b. Clear fault after 6 cycles and trip the faulted elements: b.1. TUCO_INT 7 (525832) 345.0 kV to TUCO_INT 6 (525830) 230.0 kV to TUCO_TR1 1 (525824) 13.2 kV Three Winding #1
GROUP4_P1_LOCAL_FAULT_170	P1	3 Phase fault on O.K.U.-7 345.00 (511456) 345 kV Bus a. Apply fault at the O.K.U.-7 345.00 (511456) 345 kV Bus b. Clear fault after 6 cycles and trip the faulted elements: b.1. O.K.U.-7 (511456) 345.0 kV Switched Shunt Device # 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

Fault ID	Planning Event	Fault Description
GROUP4_P1_LOCAL_FAULT_171	P1	3 Phase fault on OKLAUN HVDC7345.00 (511565) 345 kV Bus a. Apply fault at the OKLAUN HVDC7345.00 (511565) 345 kV Bus b. Clear fault after 6 cycles and trip the faulted elements: b.1. OKLAUN HVDC7 (511565) 345.0 kV Switched Shunt Device # 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
GROUP4_P1_LOCAL_FAULT_172	P1	3 Phase fault on SUNNYSD4 138.00 (515135) 138 kV Bus a. Apply fault at the SUNNYSD4 138.00 (515135) 138 kV Bus b. Clear fault after 7 cycles and trip the faulted elements: b.1. SUNNYSD4 (515135) 138.0 kV Switched Shunt Device # 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
GROUP4_P1_LOCAL_FAULT_173	P1	3 Phase fault on WOLFCRK4 138.00 (515143) 138 kV Bus a. Apply fault at the WOLFCRK4 138.00 (515143) 138 kV Bus b. Clear fault after 7 cycles and trip the faulted elements: b.1. WOLFCRK4 (515143) 138.0 kV Switched Shunt Device # 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
GROUP4_P1_LOCAL_FAULT_174	P1	3 Phase fault on LONEGRV4 138.00 (515144) 138 kV Bus a. Apply fault at the LONEGRV4 138.00 (515144) 138 kV Bus b. Clear fault after 7 cycles and trip the faulted elements: b.1. LONEGRV4 (515144) 138.0 kV Switched Shunt Device # 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
GROUP4_P1_LOCAL_FAULT_175	P1	3 Phase fault on BORDER 7345.00 (515458) 345 kV Bus a. Apply fault at the BORDER 7345.00 (515458) 345 kV Bus b. Clear fault after 6 cycles and trip the faulted elements: b.1. BORDER 7 (515458) 345.0 kV Switched Shunt Device # 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
GROUP4_P4_LOCAL_FAULT_001	P4	Single Phase Fault with Stuck Breaker on LYDIA 7 345.00 (508298) 345 kV Bus a. Apply Fault at the LYDIA 7 345.00 (508298) 345 kV Bus b. Clear Fault after 16 cycles and trip the following elements: b.1. LYDIA 7 (508298) 345.0 kV to WELSH 7 (508359) 345.0 kV Transmission Circuit #1 b.2. LYDIA 7 (508298) 345.0 kV to VALIANT7 (510911) 345.0 kV Transmission Circuit #1 b.3. NWTXARK7 (508072) 345.0 kV to LYDIA 7 (508298) 345.0 kV Transmission Circuit #1

Fault ID	Planning Event	Fault Description
GROUP4_P4_LOCAL_FAULT_002	P4	Single Phase Fault with Stuck Breaker on WELSH3-1 18.000 (509406) 18 kV Bus a. Apply Fault at the WELSH3-1 18.000 (509406) 18 kV Bus b. Clear Fault after 16 cycles and trip the following elements: b.1. LYDIA 7 (508298) 345.0 kV to WELSH 7 (508359) 345.0 kV Transmission Circuit #1 b.2. LYDIA 7 (508298) 345.0 kV to VALIANT7 (510911) 345.0 kV Transmission Circuit #1 b.3. NWTXARK7 (508072) 345.0 kV to LYDIA 7 (508298) 345.0 kV Transmission Circuit #1 b.4. WELSH3-1 (509406) 18.0 kV to Generator #
GROUP4_P4_LOCAL_FAULT_003	P4	Single Phase Fault with Stuck Breaker on NWTXARK7 345.00 (508072) 345 kV Bus a. Apply Fault at the NWTXARK7 345.00 (508072) 345 kV Bus b. Clear Fault after 16 cycles and trip the following elements: b.1. LYDIA 7 (508298) 345.0 kV to WELSH 7 (508359) 345.0 kV Transmission Circuit #1 b.2. LYDIA 7 (508298) 345.0 kV to VALIANT7 (510911) 345.0 kV Transmission Circuit #1 b.3. NWTXARK7 (508072) 345.0 kV to LYDIA 7 (508298) 345.0 kV Transmission Circuit #1 b.4. NWTXARK4 (508071) 138.0 kV to NWTXARK7 (508072) 345.0 kV to NWTEX2-1 (508101) 13.8 kV Three Winding #2
GROUP4_P4_LOCAL_FAULT_004	P4	Single Phase Fault with Stuck Breaker on NWTXARK7 345.00 (508072) 345 kV Bus a. Apply Fault at the NWTXARK7 345.00 (508072) 345 kV Bus b. Clear Fault after 16 cycles and trip the following elements: b.1. LYDIA 7 (508298) 345.0 kV to WELSH 7 (508359) 345.0 kV Transmission Circuit #1 b.2. LYDIA 7 (508298) 345.0 kV to VALIANT7 (510911) 345.0 kV Transmission Circuit #1 b.3. NWTXARK7 (508072) 345.0 kV to LYDIA 7 (508298) 345.0 kV Transmission Circuit #1 b.4. NWTXARK4 (508071) 138.0 kV to NWTXARK7 (508072) 345.0 kV to NWTEX1-1 (508100) 13.8 kV Three Winding #1
GROUP4_P4_LOCAL_FAULT_005	P4	Single Phase Fault with Stuck Breaker on VALIANT7 345.00 (510911) 345 kV Bus a. Apply Fault at the VALIANT7 345.00 (510911) 345 kV Bus b. Clear Fault after 16 cycles and trip the following elements: b.1. VALIANT4 (510918) 138.0 kV to VALIANT7 (510911) 345.0 kV to VALN3-1 (510939) 13.8 kV Three Winding #1 b.4. VALIANT4 (510918) 138.0 kV to VALIANT7 (510911) 345.0 kV to VALN2-1 (510938) 13.8 kV Three Winding #2
GROUP4_P4_LOCAL_FAULT_006	P4	Single Phase Fault with Stuck Breaker on VALIANT7 345.00 (510911) 345 kV Bus a. Apply Fault at the VALIANT7 345.00 (510911) 345 kV Bus b. Clear Fault after 16 cycles and trip the following elements: b.1. VALIANT4 (510918) 138.0 kV to VALIANT7 (510911) 345.0 kV to VALN3-1 (510939) 13.8 kV Three Winding #1 b.2. G20-020-TAP (764520) 345.0 kV to VALIANT7 (510911) 345.0 kV Transmission Circuit #

Fault ID	Planning Event	Fault Description
GROUP4_P4_LOCAL_FAULT_007	P4	Single Phase Fault with Stuck Breaker on VALIANT7 345.00 (510911) 345 kV Bus a. Apply Fault at the VALIANT7 345.00 (510911) 345 kV Bus b. Clear Fault after 16 cycles and trip the following elements: b.1. PITTSB-7 (510907) 345.0 kV to VALIANT7 (510911) 345.0 kV Transmission Circuit #1 b.2. VALIANT4 (510918) 138.0 kV to VALIANT7 (510911) 345.0 kV to VALN2-1 (510938) 13.8 kV Three Winding #2
GROUP4_P4_LOCAL_FAULT_008	P4	Single Phase Fault with Stuck Breaker on VALIANT7 345.00 (510911) 345 kV Bus a. Apply Fault at the VALIANT7 345.00 (510911) 345 kV Bus b. Clear Fault after 16 cycles and trip the following elements: b.1. VALIANT7 (510911) 345.0 kV to HUGO 7 (521157) 345.0 kV Transmission Circuit #1 b.2. G20-020-TAP (764520) 345.0 kV to VALIANT7 (510911) 345.0 kV Transmission Circuit #
GROUP4_P4_LOCAL_FAULT_009	P4	Single Phase Fault with Stuck Breaker on LYDIA 7 345.00 (508298) 345 kV Bus a. Apply Fault at the LYDIA 7 345.00 (508298) 345 kV Bus b. Clear Fault after 16 cycles and trip the following elements: b.1. LYDIA 7 (508298) 345.0 kV to WELSH 7 (508359) 345.0 kV Transmission Circuit #1 b.2. LYDIA 7 (508298) 345.0 kV to VALIANT7 (510911) 345.0 kV Transmission Circuit #1 b.3. NWTXARK7 (508072) 345.0 kV to LYDIA 7 (508298) 345.0 kV Transmission Circuit #1 b.4. VALIANT7 (510911) 345.0 kV to HUGO 7 (521157) 345.0 kV Transmission Circuit #1
GROUP4_P4_LOCAL_FAULT_010	P4	Single Phase Fault with Stuck Breaker on LYDIA 7 345.00 (508298) 345 kV Bus a. Apply Fault at the LYDIA 7 345.00 (508298) 345 kV Bus b. Clear Fault after 16 cycles and trip the following elements: b.1. PITTSB-7 (510907) 345.0 kV to VALIANT7 (510911) 345.0 kV Transmission Circuit #1 b.2. LYDIA 7 (508298) 345.0 kV to WELSH 7 (508359) 345.0 kV Transmission Circuit #1 b.3. LYDIA 7 (508298) 345.0 kV to VALIANT7 (510911) 345.0 kV Transmission Circuit #1 b.4. NWTXARK7 (508072) 345.0 kV to LYDIA 7 (508298) 345.0 kV Transmission Circuit #1
GROUP4_P4_LOCAL_FAULT_011	P4	Single Phase Fault with Stuck Breaker on O.K.U.-7 345.00 (511456) 345 kV Bus a. Apply Fault at the O.K.U.-7 345.00 (511456) 345 kV Bus b. Clear Fault after 16 cycles and trip the following elements: b.1. O.K.U.-7 (511456) 345.0 kV to L.E.S.-7 (511468) 345.0 kV Transmission Circuit #1 b.2. O.K.U.-7 (511456) 345.0 kV to G18-015-TAP (762467) 345.0 kV Transmission Circuit #

Fault ID	Planning Event	Fault Description
GROUP4_P4_LOCAL_FAULT_012	P4	Single Phase Fault with Stuck Breaker on L.E.S.-7 345.00 (511468) 345 kV Bus a. Apply Fault at the L.E.S.-7 345.00 (511468) 345 kV Bus b. Clear Fault after 16 cycles and trip the following elements: b.1. L.E.S.-4 (511467) 138.0 kV to L.E.S.-7 (511468) 345.0 kV to LES#4-1 (511414) 13.8 kV Three Winding #1 b.2. L.E.S.-7 (511468) 345.0 kV to G17-171-TAP (760938) 345.0 kV Transmission Circuit #1
GROUP4_P4_LOCAL_FAULT_013	P4	Single Phase Fault with Stuck Breaker on L.E.S.-7 345.00 (511468) 345 kV Bus a. Apply Fault at the L.E.S.-7 345.00 (511468) 345 kV Bus b. Clear Fault after 16 cycles and trip the following elements: b.1. O.K.U.-7 (511456) 345.0 kV to L.E.S.-7 (511468) 345.0 kV Transmission Circuit #1 b.2. L.E.S.-7 (511468) 345.0 kV to G17-171-TAP (760938) 345.0 kV Transmission Circuit #1
GROUP4_P4_LOCAL_FAULT_014	P4	Single Phase Fault with Stuck Breaker on L.E.S.-7 345.00 (511468) 345 kV Bus a. Apply Fault at the L.E.S.-7 345.00 (511468) 345 kV Bus b. Clear Fault after 16 cycles and trip the following elements: b.1. O.K.U.-7 (511456) 345.0 kV to L.E.S.-7 (511468) 345.0 kV Transmission Circuit #1 b.2. L.E.S.-4 (511467) 138.0 kV to L.E.S.-7 (511468) 345.0 kV to LES#5-1 (511411) 13.8 kV Three Winding #2
GROUP4_P4_LOCAL_FAULT_015	P4	Single Phase Fault with Stuck Breaker on PITTSB-7 345.00 (510907) 345 kV Bus a. Apply Fault at the PITTSB-7 345.00 (510907) 345 kV Bus b. Clear Fault after 16 cycles and trip the following elements: b.1. PITTSB-7 (510907) 345.0 kV to VALIANT7 (510911) 345.0 kV Transmission Circuit #1 b.2. PITTSB-7 (510907) 345.0 kV to C-RIVER7 (515422) 345.0 kV Transmission Circuit #1
GROUP4_P4_LOCAL_FAULT_016	P4	Single Phase Fault with Stuck Breaker on PITTSB-7 345.00 (510907) 345 kV Bus a. Apply Fault at the PITTSB-7 345.00 (510907) 345 kV Bus b. Clear Fault after 16 cycles and trip the following elements: b.1. PITTSB-7 (510907) 345.0 kV to VALIANT7 (510911) 345.0 kV Transmission Circuit #1 b.2. PITTSB-7 (510907) 345.0 kV to JOHNCO 7 (514809) 345.0 kV Transmission Circuit #1
GROUP4_P4_LOCAL_FAULT_017	P4	Single Phase Fault with Stuck Breaker on PITTSB-7 345.00 (510907) 345 kV Bus a. Apply Fault at the PITTSB-7 345.00 (510907) 345 kV Bus b. Clear Fault after 16 cycles and trip the following elements: b.1. PITTSB-7 (510907) 345.0 kV to JOHNCO 7 (514809) 345.0 kV Transmission Circuit #1 b.2. PITTSB-7 (510907) 345.0 kV to KIOWA 7 (510925) 345.0 kV Transmission Circuit #1

Fault ID	Planning Event	Fault Description
GROUP4_P4_LOCAL_FAULT_018	P4	Single Phase Fault with Stuck Breaker on PITTSB-7 345.00 (510907) 345 kV Bus a. Apply Fault at the PITTSB-7 345.00 (510907) 345 kV Bus b. Clear Fault after 16 cycles and trip the following elements: b.1. PITTSB-7 (510907) 345.0 kV to SEMINOL7 (515045) 345.0 kV Transmission Circuit #1 b.2. PITTSB-7 (510907) 345.0 kV to C-RIVER7 (515422) 345.0 kV Transmission Circuit #1
GROUP4_P4_LOCAL_FAULT_019	P4	Single Phase Fault with Stuck Breaker on PITTSB-7 345.00 (510907) 345 kV Bus a. Apply Fault at the PITTSB-7 345.00 (510907) 345 kV Bus b. Clear Fault after 16 cycles and trip the following elements: b.1. PITTSB-7 (510907) 345.0 kV to SEMINOL7 (515045) 345.0 kV Transmission Circuit #1 b.2. PITTSB-7 (510907) 345.0 kV to KIOWA 7 (510925) 345.0 kV Transmission Circuit #1
GROUP4_P4_LOCAL_FAULT_020	P4	Single Phase Fault with Stuck Breaker on TUCO_INT 7345.00 (525832) 345 kV Bus a. Apply Fault at the TUCO_INT 7345.00 (525832) 345 kV Bus b. Clear Fault after 16 cycles and trip the following elements: b.1. TUCO_INT 7 (525832) 345.0 kV to ELK_CT1 (525850) 345.0 kV Transmission Circuit #1 b.2. ELK_CT1 (525850) 345.0 kV to ELK_1 1 (525844) 18.0 kV Two Winding #1 b.3. ELK_CT1 (525850) 345.0 kV to ELK_2 1 (525845) 18.0 kV Two Winding #1 b.4. TUCO_INT 7 (525832) 345.0 kV to G20-067-TAP (764945) 345.0 kV Transmission Circuit #1
GROUP4_P4_LOCAL_FAULT_021	P4	Single Phase Fault with Stuck Breaker on TUCO_INT 7345.00 (525832) 345 kV Bus a. Apply Fault at the TUCO_INT 7345.00 (525832) 345 kV Bus b. Clear Fault after 16 cycles and trip the following elements: b.1. TUCO_TR1 1 (525824) 13.2 kV to TUCO_INT 7 (525832) 345.0 kV to TUCO_INT 6 (525830) 230.0 kV Three Winding #1 b.2. BORDER 7 (515458) 345.0 kV to TUCO_INT 7 (525832) 345.0 kV Transmission Circuit #1
GROUP4_P4_LOCAL_FAULT_022	P4	Single Phase Fault with Stuck Breaker on BORDER 7345.00 (515458) 345 kV Bus a. Apply Fault at the BORDER 7345.00 (515458) 345 kV Bus b. Clear Fault after 16 cycles and trip the following elements: b.1. BORDER 7 (515458) 345.0 kV to TUCO_INT 7 (525832) 345.0 kV Transmission Circuit #1 b.2. WWRDEHV7 (515375) 345.0 kV to BECKHAM7 (516059) 345.0 kV Transmission Circuit #1
GROUP4_P4_LOCAL_FAULT_023	P4	Single Phase Fault with Stuck Breaker on C-RIVER7 345.00 (515422) 345 kV Bus a. Apply Fault at the C-RIVER7 345.00 (515422) 345 kV Bus b. Clear Fault after 16 cycles and trip the following elements: b.1. C-RIVER7 (515422) 345.0 kV to C-RIVER4 (510946) 138.0 kV to C-RIVER1 (510947) 13.8 kV Three Winding #1 b.4. PITTSB-7 (510907) 345.0 kV to C-RIVER7 (515422) 345.0 kV Transmission Circuit #1

Fault ID	Planning Event	Fault Description
GROUP4_P4_LOCAL_FAULT_024	P4	Single Phase Fault with Stuck Breaker on C-RIVER7 345.00 (515422) 345 kV Bus a. Apply Fault at the C-RIVER7 345.00 (515422) 345 kV Bus b. Clear Fault after 16 cycles and trip the following elements: b.1. PITTSB-7 (510907) 345.0 kV to C-RIVER7 (515422) 345.0 kV Transmission Circuit #1 b.2. FIREWHL-TAP (588839) 345.0 kV to C-RIVER7 (515422) 345.0 kV Transmission Circuit #1
GROUP4_P4_LOCAL_FAULT_025	P4	Single Phase Fault with Stuck Breaker on CANEYCK4 138.00 (515150) 138 kV Bus a. Apply Fault at the CANEYCK4 138.00 (515150) 138 kV Bus b. Clear Fault after 16 cycles and trip the following elements: b.1. CANEYCK4 (515150) 138.0 kV to TEXOMAJ4 (521067) 138.0 kV Transmission Circuit #1 b.2. JOHNCO 4 (514808) 138.0 kV to CANEYCK4 (515150) 138.0 kV Transmission Circuit #1 b.3. CANEYCK4 (515150) 138.0 kV to Switched Shunt Device #
GROUP4_P4_LOCAL_FAULT_026	P4	Single Phase Fault with Stuck Breaker on CANEYCK4 138.00 (515150) 138 kV Bus a. Apply Fault at the CANEYCK4 138.00 (515150) 138 kV Bus b. Clear Fault after 16 cycles and trip the following elements: b.1. JOHNCO 4 (514808) 138.0 kV to CANEYCK4 (515150) 138.0 kV Transmission Circuit #1 b.2. MADINDT4 (515149) 138.0 kV to CANEYCK4 (515150) 138.0 kV Transmission Circuit #1 b.3. CANEYCK4 (515150) 138.0 kV to Switched Shunt Device #
GROUP4_P4_LOCAL_FAULT_027	P4	Single Phase Fault with Stuck Breaker on CARTRCO4 138.00 (515561) 138 kV Bus a. Apply Fault at the CARTRCO4 138.00 (515561) 138 kV Bus b. Clear Fault after 16 cycles and trip the following elements: b.1. POOLVIL4 (515130) 138.0 kV to CARTRCO4 (515561) 138.0 kV Transmission Circuit #1 b.2. RATLIFF4 (515129) 138.0 kV to CARTRCO4 (515561) 138.0 kV Transmission Circuit #1
GROUP4_P4_LOCAL_FAULT_028	P4	Single Phase Fault with Stuck Breaker on CARTRCO4 138.00 (515561) 138 kV Bus a. Apply Fault at the CARTRCO4 138.00 (515561) 138 kV Bus b. Clear Fault after 16 cycles and trip the following elements: b.1. RATLIFF4 (515129) 138.0 kV to CARTRCO4 (515561) 138.0 kV Transmission Circuit #1 b.2. CARTRCO4 (515561) 138.0 kV to ORIGINW4 (515563) 138.0 kV Transmission Circuit #1
GROUP4_P4_LOCAL_FAULT_029	P4	Single Phase Fault with Stuck Breaker on CARTRCO4 138.00 (515561) 138 kV Bus a. Apply Fault at the CARTRCO4 138.00 (515561) 138 kV Bus b. Clear Fault after 16 cycles and trip the following elements: b.1. CARTRCO4 (515561) 138.0 kV to ORIGINW4 (515563) 138.0 kV Transmission Circuit #1 b.2. SUNNYSD4 (515135) 138.0 kV to CARTRCO4 (515561) 138.0 kV Transmission Circuit #1

Fault ID	Planning Event	Fault Description
GROUP4_P4_LOCAL_FAULT_030	P4	Single Phase Fault with Stuck Breaker on CARTRCO4 138.00 (515561) 138 kV Bus a. Apply Fault at the CARTRCO4 138.00 (515561) 138 kV Bus b. Clear Fault after 16 cycles and trip the following elements: b.1. SUNNYSD4 (515135) 138.0 kV to CARTRCO4 (515561) 138.0 kV Transmission Circuit #1 b.2. POOLVIL4 (515130) 138.0 kV to CARTRCO4 (515561) 138.0 kV Transmission Circuit #1
GROUP4_P4_LOCAL_FAULT_031	P4	Single Phase Fault with Stuck Breaker on CIMARON7 345.00 (514901) 345 kV Bus a. Apply Fault at the CIMARON7 345.00 (514901) 345 kV Bus b. Clear Fault after 16 cycles and trip the following elements: b.1. MINCO 7 (514801) 345.0 kV to CIMARON7 (514901) 345.0 kV Transmission Circuit #1 b.2. CIMARON7 (514901) 345.0 kV to FSHRTAP7 (515610) 345.0 kV Transmission Circuit #1
GROUP4_P4_LOCAL_FAULT_032	P4	Single Phase Fault with Stuck Breaker on GRACMNT4 138.00 (515802) 138 kV Bus a. Apply Fault at the GRACMNT4 138.00 (515802) 138 kV Bus b. Clear Fault after 16 cycles and trip the following elements: b.1. GRACMNT4 (515802) 138.0 kV to WASHITA4 (521089) 138.0 kV Transmission Circuit #2 b.2. GRACMNT4 (515802) 138.0 kV to ANADARK4 (520814) 138.0 kV Transmission Circuit #1
GROUP4_P4_LOCAL_FAULT_033	P4	Single Phase Fault with Stuck Breaker on GRACMNT4 138.00 (515802) 138 kV Bus a. Apply Fault at the GRACMNT4 138.00 (515802) 138 kV Bus b. Clear Fault after 16 cycles and trip the following elements: b.1. GRACMNT4 (515802) 138.0 kV to ANADARK4 (520814) 138.0 kV Transmission Circuit #1
GROUP4_P4_LOCAL_FAULT_034	P4	Single Phase Fault with Stuck Breaker on GRACMNT4 138.00 (515802) 138 kV Bus a. Apply Fault at the GRACMNT4 138.00 (515802) 138 kV Bus b. Clear Fault after 16 cycles and trip the following elements: b.1. GRACMNT4 (515802) 138.0 kV to WASHITA4 (521089) 138.0 kV Transmission Circuit #1 b.2. GRACMNT4 (515802) 138.0 kV to WASHITA4 (521089) 138.0 kV Transmission Circuit #2
GROUP4_P4_LOCAL_FAULT_035	P4	Single Phase Fault with Stuck Breaker on GRACMNT4 138.00 (515802) 138 kV Bus a. Apply Fault at the GRACMNT4 138.00 (515802) 138 kV Bus b. Clear Fault after 16 cycles and trip the following elements: b.1. GRACMNT4 (515802) 138.0 kV to WASHITA4 (521089) 138.0 kV Transmission Circuit #1
GROUP4_P4_LOCAL_FAULT_036	P4	Single Phase Fault with Stuck Breaker on GRACMNT7 345.00 (515800) 345 kV Bus a. Apply Fault at the GRACMNT7 345.00 (515800) 345 kV Bus b. Clear Fault after 16 cycles and trip the following elements: b.1. MINCO 7 (514801) 345.0 kV to GRACMNT7 (515800) 345.0 kV Transmission Circuit #1 b.2. G16-037-TAP (560078) 345.0 kV to GRACMNT7 (515800) 345.0 kV Transmission Circuit #1

Fault ID	Planning Event	Fault Description
GROUP4_P4_LOCAL_FAULT_037	P4	Single Phase Fault with Stuck Breaker on GRACMNT7 345.00 (515800) 345 kV Bus a. Apply Fault at the GRACMNT7 345.00 (515800) 345 kV Bus b. Clear Fault after 16 cycles and trip the following elements: b.1. TREASILD7 (511409) 345.0 kV to GRACMNT7 (515800) 345.0 kV Transmission Circuit #1 b.2. MINCO 7 (514801) 345.0 kV to GRACMNT7 (515800) 345.0 kV Transmission Circuit #1
GROUP4_P4_LOCAL_FAULT_038	P4	Single Phase Fault with Stuck Breaker on TREASILD7 345.00 (511409) 345 kV Bus a. Apply Fault at the TREASILD7 345.00 (511409) 345 kV Bus b. Clear Fault after 16 cycles and trip the following elements: b.1. TREASILD7 (511409) 345.0 kV to GRACMNT7 (515800) 345.0 kV Transmission Circuit #1
GROUP4_P4_LOCAL_FAULT_039	P4	Single Phase Fault with Stuck Breaker on JOHNCO 4 138.00 (514808) 138 kV Bus a. Apply Fault at the JOHNCO 4 138.00 (514808) 138 kV Bus b. Clear Fault after 16 cycles and trip the following elements: b.1. JOHNCO 4 (514808) 138.0 kV to SXMLCKT4 (515122) 138.0 kV Transmission Circuit #1
GROUP4_P4_LOCAL_FAULT_040	P4	Single Phase Fault with Stuck Breaker on JOHNCO 4 138.00 (514808) 138 kV Bus a. Apply Fault at the JOHNCO 4 138.00 (514808) 138 kV Bus b. Clear Fault after 16 cycles and trip the following elements: b.1. JOHNCO 4 (514808) 138.0 kV to RUSSET-4 (515120) 138.0 kV Transmission Circuit #1 b.2. JOHNCO 4 (514808) 138.0 kV to CANEYCK4 (515150) 138.0 kV Transmission Circuit #1
GROUP4_P4_LOCAL_FAULT_041	P4	Single Phase Fault with Stuck Breaker on JOHNCO 4 138.00 (514808) 138 kV Bus a. Apply Fault at the JOHNCO 4 138.00 (514808) 138 kV Bus b. Clear Fault after 16 cycles and trip the following elements: b.1. JOHNCO 4 (514808) 138.0 kV to RUSSET-4 (515120) 138.0 kV Transmission Circuit #1
GROUP4_P4_LOCAL_FAULT_042	P4	Single Phase Fault with Stuck Breaker on JOHNCO 4 138.00 (514808) 138 kV Bus a. Apply Fault at the JOHNCO 4 138.00 (514808) 138 kV Bus b. Clear Fault after 16 cycles and trip the following elements: b.1. JOHNCO 4 (514808) 138.0 kV to CANEYCK4 (515150) 138.0 kV Transmission Circuit #1 b.2. JOHNCO 4 (514808) 138.0 kV to SXMLCKT4 (515122) 138.0 kV Transmission Circuit #1
GROUP4_P4_LOCAL_FAULT_043	P4	Single Phase Fault with Stuck Breaker on JOHNCO 7 345.00 (514809) 345 kV Bus a. Apply Fault at the JOHNCO 7 345.00 (514809) 345 kV Bus b. Clear Fault after 16 cycles and trip the following elements: b.1. JOHNCO 7 (514809) 345.0 kV to DMNDSPG7 (516006) 345.0 kV Transmission Circuit #1 b.2. PITTSB-7 (510907) 345.0 kV to JOHNCO 7 (514809) 345.0 kV Transmission Circuit #1

Fault ID	Planning Event	Fault Description
GROUP4_P4_LOCAL_FAULT_044	P4	Single Phase Fault with Stuck Breaker on PITTSB-7 345.00 (510907) 345 kV Bus a. Apply Fault at the PITTSB-7 345.00 (510907) 345 kV Bus b. Clear Fault after 16 cycles and trip the following elements: b.1. PITTSB-7 (510907) 345.0 kV to JOHNCO 7 (514809) 345.0 kV Transmission Circuit #1
GROUP4_P4_LOCAL_FAULT_045	P4	Single Phase Fault with Stuck Breaker on JOHNCO 7 345.00 (514809) 345 kV Bus a. Apply Fault at the JOHNCO 7 345.00 (514809) 345 kV Bus b. Clear Fault after 16 cycles and trip the following elements: b.1. JOHNCO 7 (514809) 345.0 kV to DMNDSPG7 (516006) 345.0 kV Transmission Circuit #1 b.2. JOHNCO 7 (514809) 345.0 kV to G21-016-TAP (765451) 345.0 kV Transmission Circuit #1
GROUP4_P4_LOCAL_FAULT_046	P4	Single Phase Fault with Stuck Breaker on MINCO 7 345.00 (514801) 345 kV Bus a. Apply Fault at the MINCO 7 345.00 (514801) 345 kV Bus b. Clear Fault after 16 cycles and trip the following elements: b.1. MINCO 7 (514801) 345.0 kV to MCNOWND7 (515444) 345.0 kV Transmission Circuit #1 b.2. MINCO 7 (514801) 345.0 kV to CIMARON7 (514901) 345.0 kV Transmission Circuit #1
GROUP4_P4_LOCAL_FAULT_047	P4	Single Phase Fault with Stuck Breaker on MINCO 7 345.00 (514801) 345 kV Bus a. Apply Fault at the MINCO 7 345.00 (514801) 345 kV Bus b. Clear Fault after 16 cycles and trip the following elements: b.1. MINCO 7 (514801) 345.0 kV to GRACMNT7 (515800) 345.0 kV Transmission Circuit #1 b.2. MINCO 7 (514801) 345.0 kV to MNCWND37 (515549) 345.0 kV Transmission Circuit #1
GROUP4_P4_LOCAL_FAULT_048	P4	Single Phase Fault with Stuck Breaker on MINCO 7 345.00 (514801) 345 kV Bus a. Apply Fault at the MINCO 7 345.00 (514801) 345 kV Bus b. Clear Fault after 16 cycles and trip the following elements: b.1. MINCO 7 (514801) 345.0 kV to MCNOWND7 (515444) 345.0 kV Transmission Circuit #1 b.2. MINCO 7 (514801) 345.0 kV to GRACMNT7 (515800) 345.0 kV Transmission Circuit #1
GROUP4_P4_LOCAL_FAULT_049	P4	Single Phase Fault with Stuck Breaker on MINCO 7 345.00 (514801) 345 kV Bus a. Apply Fault at the MINCO 7 345.00 (514801) 345 kV Bus b. Clear Fault after 16 cycles and trip the following elements: b.1. MINCO 7 (514801) 345.0 kV to MNCWND37 (515549) 345.0 kV Transmission Circuit #1 b.2. MINCO 7 (514801) 345.0 kV to CIMARON7 (514901) 345.0 kV Transmission Circuit #1

Fault ID	Planning Event	Fault Description
GROUP4_P4_LOCAL_FAULT_050	P4	Single Phase Fault with Stuck Breaker on RATLIFF4 138.00 (515129) 138 kV Bus a. Apply Fault at the RATLIFF4 138.00 (515129) 138 kV Bus b. Clear Fault after 16 cycles and trip the following elements: b.1. WLDHRST2 (515127) 69.0 kV to RATLIFF2 (515128) 69.0 kV Transmission Circuit #1 b.2. RATLIFF2 (515128) 69.0 kV to RATLIFF4 (515129) 138.0 kV to RATLIFF1 (515752) 13.2 kV Three Winding #1 b.3. RATLIFF4 (515129) 138.0 kV to PRARPNT4 (515134) 138.0 kV Transmission Circuit #1 b.4. RATLIFF4 (515129) 138.0 kV to CARTRCO4 (515561) 138.0 kV Transmission Circuit #1
GROUP4_P4_LOCAL_FAULT_051	P4	Single Phase Fault with Stuck Breaker on ROCKYPT4 138.00 (515164) 138 kV Bus a. Apply Fault at the ROCKYPT4 138.00 (515164) 138 kV Bus b. Clear Fault after 16 cycles and trip the following elements: b.1. ROCKYPT2 (515163) 69.0 kV to SCMMRCT2 (515420) 69.0 kV Transmission Circuit #1 b.2. ROCKYPT2 (515163) 69.0 kV to ROCKYPT4 (515164) 138.0 kV to ROCKYPT1 (515754) 13.2 kV Three Winding #1 b.3. SUNNYSD4 (515135) 138.0 kV to ROCKYPT4 (515164) 138.0 kV Transmission Circuit #1 b.4. MRIETA 2 (515160) 138.0 kV to ROCKYPT4 (515164) 138.0 kV Transmission Circuit #1 b.5. ROCKYPT4 (515164) 138.0 kV to SPRNDAL4 (515172) 138.0 kV Transmission Circuit #1
GROUP4_P4_LOCAL_FAULT_052	P4	Single Phase Fault with Stuck Breaker on RUSSET-4 138.00 (515120) 138 kV Bus a. Apply Fault at the RUSSET-4 138.00 (515120) 138 kV Bus b. Clear Fault after 16 cycles and trip the following elements: b.1. JOHNCO 4 (514808) 138.0 kV to RUSSET-4 (515120) 138.0 kV Transmission Circuit #1 b.2. RUSSET-4 (515120) 138.0 kV to GLASSES4 (515147) 138.0 kV Transmission Circuit #1 b.3. RUSSET-4 (515120) 138.0 kV to STIRLNG4 (515932) 138.0 kV Transmission Circuit #1 b.4. RUSSET-4 (515120) 138.0 kV to RUSSETT4 (521044) 138.0 kV Transmission Circuit #1
GROUP4_P4_LOCAL_FAULT_053	P4	Single Phase Fault with Stuck Breaker on SEMINOL7 345.00 (515045) 345 kV Bus a. Apply Fault at the SEMINOL7 345.00 (515045) 345 kV Bus b. Clear Fault after 16 cycles and trip the following elements: b.1. SEMINOL4 (515044) 138.0 kV to SEMINOL7 (515045) 345.0 kV to SEMINO21 (515757) 14.4 kV Three Winding #2 b.4. PITTSB-7 (510907) 345.0 kV to SEMINOL7 (515045) 345.0 kV Transmission Circuit #1
GROUP4_P4_LOCAL_FAULT_054	P4	Single Phase Fault with Stuck Breaker on SUNNYSD4 138.00 (515135) 138 kV Bus a. Apply Fault at the SUNNYSD4 138.00 (515135) 138 kV Bus b. Clear Fault after 16 cycles and trip the following elements: b.1. SUNNYSD4 (515135) 138.0 kV to UNIROY 4 (515137) 138.0 kV Transmission Circuit #1 b.2. SUNNYSD4 (515135) 138.0 kV to Switched Shunt Device #

Fault ID	Planning Event	Fault Description
GROUP4_P4_LOCAL_FAULT_055	P4	Single Phase Fault with Stuck Breaker on SUNNYSD4 138.00 (515135) 138 kV Bus a. Apply Fault at the SUNNYSD4 138.00 (515135) 138 kV Bus b. Clear Fault after 16 cycles and trip the following elements: b.1. SUNNYSD4 (515135) 138.0 kV to ROCKYPT4 (515164) 138.0 kV Transmission Circuit #1 b.2. SUNNYSD4 (515135) 138.0 kV to Switched Shunt Device #
GROUP4_P4_LOCAL_FAULT_056	P4	Single Phase Fault with Stuck Breaker on SUNNYSD4 138.00 (515135) 138 kV Bus a. Apply Fault at the SUNNYSD4 138.00 (515135) 138 kV Bus b. Clear Fault after 16 cycles and trip the following elements: b.1. SUNNYSD4 (515135) 138.0 kV to CARTRCO4 (515561) 138.0 kV Transmission Circuit #1 b.2. SUNNYSD4 (515135) 138.0 kV to LONEGRV4 (515144) 138.0 kV Transmission Circuit #1 b.3. SUNNYSD4 (515135) 138.0 kV to Switched Shunt Device #
GROUP4_P4_LOCAL_FAULT_057	P4	Single Phase Fault with Stuck Breaker on UNIROY 4 138.00 (515137) 138 kV Bus a. Apply Fault at the UNIROY 4 138.00 (515137) 138 kV Bus b. Clear Fault after 16 cycles and trip the following elements: b.1. SUNNYSD4 (515135) 138.0 kV to UNIROY 4 (515137) 138.0 kV Transmission Circuit #1 b.2. UNIROY 4 (515137) 138.0 kV to ARDWEST4 (515372) 138.0 kV Transmission Circuit #1
GROUP4_P4_LOCAL_FAULT_058	P4	Single Phase Fault with Stuck Breaker on ANADARK4 138.00 (520814) 138 kV Bus a. Apply Fault at the ANADARK4 138.00 (520814) 138 kV Bus b. Clear Fault after 16 cycles and trip the following elements: b.1. ANADARK4 (520814) 138.0 kV to GENCO1 (521101) 13.8 kV Two Winding #1 b.2. ANADARK4 (520814) 138.0 kV to GENCO2 (521102) 13.8 kV Two Winding #1 b.3. GRACMNT4 (515802) 138.0 kV to ANADARK4 (520814) 138.0 kV Transmission Circuit #1 b.4. ANADARK4 (520814) 138.0 kV to POCASET4 (521031) 138.0 kV Transmission Circuit #1 b.5. ANADARK4 (520814) 138.0 kV to ANADRK5 (520812) 13.8 kV Two Winding #1
GROUP4_P4_LOCAL_FAULT_059	P4	Single Phase Fault with Stuck Breaker on ANADARK4 138.00 (520814) 138 kV Bus a. Apply Fault at the ANADARK4 138.00 (520814) 138 kV Bus b. Clear Fault after 16 cycles and trip the following elements: b.1. GRACMNT4 (515802) 138.0 kV to ANADARK4 (520814) 138.0 kV Transmission Circuit #1 b.2. ANADARK4 (520814) 138.0 kV to POCASET4 (521031) 138.0 kV Transmission Circuit #1 b.3. ANADARK4 (520814) 138.0 kV to ANADRK5 (520812) 13.8 kV Two Winding #1

Fault ID	Planning Event	Fault Description
GROUP4_P4_LOCAL_FAULT_060	P4	Single Phase Fault with Stuck Breaker on ANADARK4 138.00 (520814) 138 kV Bus a. Apply Fault at the ANADARK4 138.00 (520814) 138 kV Bus b. Clear Fault after 16 cycles and trip the following elements: b.1. ANADARK4 (520814) 138.0 kV to ANADRK5 (520812) 13.8 kV Two Winding #1 b.2. ANADARK4 (520814) 138.0 kV to ANADRK6 (520813) 13.8 kV Two Winding #1 b.3. GRACMNT4 (515802) 138.0 kV to ANADARK4 (520814) 138.0 kV Transmission Circuit #1 b.4. ANADARK4 (520814) 138.0 kV to POCASET4 (521031) 138.0 kV Transmission Circuit #1
GROUP4_P4_LOCAL_FAULT_061	P4	Single Phase Fault with Stuck Breaker on ANADARK4 138.00 (520814) 138 kV Bus a. Apply Fault at the ANADARK4 138.00 (520814) 138 kV Bus b. Clear Fault after 16 cycles and trip the following elements: b.1. ANADARK4 (520814) 138.0 kV to POCASET4 (521031) 138.0 kV Transmission Circuit #1 b.2. BRIDGCR4 (520501) 138.0 kV to SUNSHIN4 (521059) 138.0 kV Transmission Circuit #1 b.3. GRACMNT4 (515802) 138.0 kV to ANADARK4 (520814) 138.0 kV Transmission Circuit #1 b.4. ANADARK4 (520814) 138.0 kV to ANADRK5 (520812) 13.8 kV Two Winding #1
GROUP4_P4_LOCAL_FAULT_062	P4	Single Phase Fault with Stuck Breaker on ANADARK4 138.00 (520814) 138 kV Bus a. Apply Fault at the ANADARK4 138.00 (520814) 138 kV Bus b. Clear Fault after 16 cycles and trip the following elements: b.1. GRACMNT4 (515802) 138.0 kV to ANADARK4 (520814) 138.0 kV Transmission Circuit #1 b.2. ANADARK4 (520814) 138.0 kV to POCASET4 (521031) 138.0 kV Transmission Circuit #1 b.3. ANADARK4 (520814) 138.0 kV to ANADRK5 (520812) 13.8 kV Two Winding #1

Fault ID	Planning Event	Fault Description
GROUP4_P4_LOCAL_FAULT_063	P4	Single Phase Fault with Stuck Breaker on S BROWN4 138.00 (505602) 138 kV Bus a. Apply Fault at the S BROWN4 138.00 (505602) 138 kV Bus b. Clear Fault after 16 cycles and trip the following elements: b.1. FROGVIL4 (520918) 138.0 kV to HUGO PP4 (520948) 138.0 kV Transmission Circuit #1 b.2. S BROWN4 (505602) 138.0 kV to KIERSEY4 (520963) 138.0 kV Transmission Circuit #1 b.3. COLBRT-4 (515193) 138.0 kV to COLBERT4 (520860) 138.0 kV Transmission Circuit #1 b.4. S BROWN4 (505602) 138.0 kV to RUSSETT4 (521044) 138.0 kV Transmission Circuit #1 b.5. RUSSET-4 (515120) 138.0 kV to RUSSETT4 (521044) 138.0 kV Transmission Circuit #1 b.6. TUPELO 4 (505600) 138.0 kV to S BROWN4 (505602) 138.0 kV Transmission Circuit #1 b.7. S BROWN4 (505602) 138.0 kV to DENISON4 (505604) 138.0 kV Transmission Circuit #1 b.8. S BROWN4 (505602) 138.0 kV to BROWN 4 (515157) 138.0 kV Transmission Circuit #1 b.9. S BROWN4 (505602) 138.0 kV to BROWN 4 (515157) 138.0 kV Transmission Circuit #2 b.10. S BROWN4 (505602) 138.0 kV to G22-104-TAP (769060) 138.0 kV Transmission Circuit #1
GROUP4_P4_LOCAL_FAULT_064	P4	Single Phase Fault with Stuck Breaker on GOLDENSW4 138.00 (521194) 138 kV Bus a. Apply Fault at the GOLDENSW4 138.00 (521194) 138 kV Bus b. Clear Fault after 16 cycles and trip the following elements: b.1. BROKNBW4 (520834) 138.0 kV to GOLDENSW4 (521194) 138.0 kV Transmission Circuit #1 b.2. GOLDENSW4 (521194) 138.0 kV to DOMINJCT4 (521195) 138.0 kV Transmission Circuit #1 b.3. HUGO PP4 (520948) 138.0 kV to VALLANT4 (521079) 138.0 kV Transmission Circuit #1 b.4. BRKN BW4 (505614) 138.0 kV to HOCHTWN4 (520943) 138.0 kV Transmission Circuit #1 b.5. CRAIGJT4 (510890) 138.0 kV to MTRIVER4 (521004) 138.0 kV Transmission Circuit #1
GROUP4_P4_LOCAL_FAULT_065	P4	Single Phase Fault with Stuck Breaker on WASHITA4 138.00 (521089) 138 kV Bus a. Apply Fault at the WASHITA4 138.00 (521089) 138 kV Bus b. Clear Fault after 16 cycles and trip the following elements: b.1. GRACMNT4 (515802) 138.0 kV to WASHITA4 (521089) 138.0 kV Transmission Circuit #1 b.2. ONEY 4 (521017) 138.0 kV to WASHITA4 (521089) 138.0 kV Transmission Circuit #1 b.3. CLINTJC4 (511485) 138.0 kV to CLINTON4 (520856) 138.0 kV Transmission Circuit #1

Fault ID	Planning Event	Fault Description
GROUP4_P4_LOCAL_FAULT_066	P4	Single Phase Fault with Stuck Breaker on WASHITA4 138.00 (521089) 138 kV Bus a. Apply Fault at the WASHITA4 138.00 (521089) 138 kV Bus b. Clear Fault after 16 cycles and trip the following elements: b.1. GRACMNT4 (515802) 138.0 kV to WASHITA4 (521089) 138.0 kV Transmission Circuit #2 b.2. S.W.S.-4 (511477) 138.0 kV to WASHITA4 (521089) 138.0 kV Transmission Circuit #1
GROUP4_P4_LOCAL_FAULT_067	P4	Single Phase Fault with Stuck Breaker on GRACMNT4 138.00 (515802) 138 kV Bus a. Apply Fault at the GRACMNT4 138.00 (515802) 138 kV Bus b. Clear Fault after 16 cycles and trip the following elements: b.1. GRACMNT4 (515802) 138.0 kV to WASHITA4 (521089) 138.0 kV Transmission Circuit #1 b.2. GRACMNT4 (515802) 138.0 kV to WASHITA4 (521089) 138.0 kV Transmission Circuit #2
GROUP4_P4_LOCAL_FAULT_068	P4	Single Phase Fault with Stuck Breaker on HUGO PP4 138.00 (520948) 138 kV Bus a. Apply Fault at the HUGO PP4 138.00 (520948) 138 kV Bus b. Clear Fault after 16 cycles and trip the following elements: b.1. SAWYER4 (520411) 138.0 kV to HUGO PP4 (520948) 138.0 kV Transmission Circuit #1 b.2. ATOKA--4 (510887) 138.0 kV to LANE 4 (520968) 138.0 kV Transmission Circuit #1 b.3. FROGVIL4 (520918) 138.0 kV to HUGO PP4 (520948) 138.0 kV Transmission Circuit #1 b.4. S BROWN4 (505602) 138.0 kV to G22-104-TAP (769060) 138.0 kV Transmission Circuit #1
GROUP4_P4_LOCAL_FAULT_069	P4	Single Phase Fault with Stuck Breaker on HUGO PP4 138.00 (520948) 138 kV Bus a. Apply Fault at the HUGO PP4 138.00 (520948) 138 kV Bus b. Clear Fault after 16 cycles and trip the following elements: b.1. BROKNBW4 (520834) 138.0 kV to GOLDENSW4 (521194) 138.0 kV Transmission Circuit #1 b.2. GOLDENSW4 (521194) 138.0 kV to DOMINJCT4 (521195) 138.0 kV Transmission Circuit #1 b.3. HUGO PP4 (520948) 138.0 kV to VALLANT4 (521079) 138.0 kV Transmission Circuit #1 b.4. HUGO PP4 (520948) 138.0 kV to HUGO1 (520947) 23.4 kV Two Winding #1

Fault ID	Planning Event	Fault Description
GROUP4_P4_LOCAL_FAULT_070	P4	Single Phase Fault with Stuck Breaker on 112GORE4 138.00 (511488) 138 kV Bus a. Apply Fault at the 112GORE4 138.00 (511488) 138 kV Bus b. Clear Fault after 16 cycles and trip the following elements: b.1. 112GORE4 (511488) 138.0 kV to LAIRGST4 (511510) 138.0 kV Transmission Circuit #1 b.2. CACHE4 (511500) 138.0 kV to LAIRGST4 (511510) 138.0 kV Transmission Circuit #1 b.3. COMANC-4 (511437) 138.0 kV to 112GORE4 (511488) 138.0 kV Transmission Circuit #1 b.4. 112GORE4 (511488) 138.0 kV to RPPAPER4 (511512) 138.0 kV Transmission Circuit #1 b.5. LWS-NTP4 (511471) 138.0 kV to 112GORE4 (511488) 138.0 kV Transmission Circuit #1 b.6. LWS-NTP4 (511471) 138.0 kV to 53CACHE4 (511509) 138.0 kV Transmission Circuit #1
GROUP4_P4_LOCAL_FAULT_071	P4	Single Phase Fault with Stuck Breaker on ELGINJT4 138.00 (511486) 138 kV Bus a. Apply Fault at the ELGINJT4 138.00 (511486) 138 kV Bus b. Clear Fault after 16 cycles and trip the following elements: b.1. L.E.S.-4 (511467) 138.0 kV to ELGINJT4 (511486) 138.0 kV Transmission Circuit #1 b.2. ELGINJT4 (511486) 138.0 kV to ELSWORTH 4 (511563) 138.0 kV Transmission Circuit #1 b.3. ELGINJT2 (511487) 69.0 kV to ELGINJT4 (511486) 138.0 kV to ELGJT1-1 (511412) 13.8 kV Three Winding #1
GROUP4_P4_LOCAL_FAULT_072	P4	Single Phase Fault with Stuck Breaker on LYDIA 7 345.00 (508298) 345 kV Bus a. Apply Fault at the LYDIA 7 345.00 (508298) 345 kV Bus b. Clear Fault after 16 cycles and trip the following elements: b.1. LYDIA 7 (508298) 345.0 kV to WELSH 7 (508359) 345.0 kV Transmission Circuit #1 b.2. LYDIA 7 (508298) 345.0 kV to VALIANT7 (510911) 345.0 kV Transmission Circuit #1 b.3. NWTXARK7 (508072) 345.0 kV to LYDIA 7 (508298) 345.0 kV Transmission Circuit #1
GROUP4_P4_LOCAL_FAULT_073	P4	Single Phase Fault with Stuck Breaker on WELSH3-1 18.000 (509406) 18 kV Bus a. Apply Fault at the WELSH3-1 18.000 (509406) 18 kV Bus b. Clear Fault after 16 cycles and trip the following elements: b.1. LYDIA 7 (508298) 345.0 kV to WELSH 7 (508359) 345.0 kV Transmission Circuit #1 b.2. LYDIA 7 (508298) 345.0 kV to VALIANT7 (510911) 345.0 kV Transmission Circuit #1 b.3. NWTXARK7 (508072) 345.0 kV to LYDIA 7 (508298) 345.0 kV Transmission Circuit #1 b.4. WELSH3-1 (509406) 18.0 kV to Generator #

Fault ID	Planning Event	Fault Description
GROUP4_P4_LOCAL_FAULT_074	P4	Single Phase Fault with Stuck Breaker on NWTXARK7 345.00 (508072) 345 kV Bus a. Apply Fault at the NWTXARK7 345.00 (508072) 345 kV Bus b. Clear Fault after 16 cycles and trip the following elements: b.1. LYDIA 7 (508298) 345.0 kV to WELSH 7 (508359) 345.0 kV Transmission Circuit #1 b.2. LYDIA 7 (508298) 345.0 kV to VALIANT7 (510911) 345.0 kV Transmission Circuit #1 b.3. NWTXARK7 (508072) 345.0 kV to LYDIA 7 (508298) 345.0 kV Transmission Circuit #1 b.4. NWTXARK4 (508071) 138.0 kV to NWTXARK7 (508072) 345.0 kV to NWTEX2-1 (508101) 13.8 kV Three Winding #2
GROUP4_P4_LOCAL_FAULT_075	P4	Single Phase Fault with Stuck Breaker on NWTXARK7 345.00 (508072) 345 kV Bus a. Apply Fault at the NWTXARK7 345.00 (508072) 345 kV Bus b. Clear Fault after 16 cycles and trip the following elements: b.1. LYDIA 7 (508298) 345.0 kV to WELSH 7 (508359) 345.0 kV Transmission Circuit #1 b.2. LYDIA 7 (508298) 345.0 kV to VALIANT7 (510911) 345.0 kV Transmission Circuit #1 b.3. NWTXARK7 (508072) 345.0 kV to LYDIA 7 (508298) 345.0 kV Transmission Circuit #1 b.4. NWTXARK4 (508071) 138.0 kV to NWTXARK7 (508072) 345.0 kV to NWTEX1-1 (508100) 13.8 kV Three Winding #1
GROUP4_P4_LOCAL_FAULT_076	P4	Single Phase Fault with Stuck Breaker on VALIANT7 345.00 (510911) 345 kV Bus a. Apply Fault at the VALIANT7 345.00 (510911) 345 kV Bus b. Clear Fault after 16 cycles and trip the following elements: b.1. VALIANT4 (510918) 138.0 kV to VALIANT7 (510911) 345.0 kV to VALN3-1 (510939) 13.8 kV Three Winding #1 b.4. VALIANT4 (510918) 138.0 kV to VALIANT7 (510911) 345.0 kV to VALN2-1 (510938) 13.8 kV Three Winding #2
GROUP4_P4_LOCAL_FAULT_077	P4	Single Phase Fault with Stuck Breaker on VALIANT7 345.00 (510911) 345 kV Bus a. Apply Fault at the VALIANT7 345.00 (510911) 345 kV Bus b. Clear Fault after 16 cycles and trip the following elements: b.1. VALIANT4 (510918) 138.0 kV to VALIANT7 (510911) 345.0 kV to VALN3-1 (510939) 13.8 kV Three Winding #1 b.2. G20-020-TAP (764520) 345.0 kV to VALIANT7 (510911) 345.0 kV Transmission Circuit #
GROUP4_P4_LOCAL_FAULT_078	P4	Single Phase Fault with Stuck Breaker on VALIANT7 345.00 (510911) 345 kV Bus a. Apply Fault at the VALIANT7 345.00 (510911) 345 kV Bus b. Clear Fault after 16 cycles and trip the following elements: b.1. PITTSB-7 (510907) 345.0 kV to VALIANT7 (510911) 345.0 kV Transmission Circuit #1 b.2. VALIANT4 (510918) 138.0 kV to VALIANT7 (510911) 345.0 kV to VALN2-1 (510938) 13.8 kV Three Winding #2

Fault ID	Planning Event	Fault Description
GROUP4_P4_LOCAL_FAULT_079	P4	Single Phase Fault with Stuck Breaker on VALIANT7 345.00 (510911) 345 kV Bus a. Apply Fault at the VALIANT7 345.00 (510911) 345 kV Bus b. Clear Fault after 16 cycles and trip the following elements: b.1. VALIANT7 (510911) 345.0 kV to HUGO 7 (521157) 345.0 kV Transmission Circuit #1 b.2. G20-020-TAP (764520) 345.0 kV to VALIANT7 (510911) 345.0 kV Transmission Circuit #
GROUP4_P4_LOCAL_FAULT_080	P4	Single Phase Fault with Stuck Breaker on LYDIA 7 345.00 (508298) 345 kV Bus a. Apply Fault at the LYDIA 7 345.00 (508298) 345 kV Bus b. Clear Fault after 16 cycles and trip the following elements: b.1. LYDIA 7 (508298) 345.0 kV to WELSH 7 (508359) 345.0 kV Transmission Circuit #1 b.2. LYDIA 7 (508298) 345.0 kV to VALIANT7 (510911) 345.0 kV Transmission Circuit #1 b.3. NWTXARK7 (508072) 345.0 kV to LYDIA 7 (508298) 345.0 kV Transmission Circuit #1 b.4. VALIANT7 (510911) 345.0 kV to HUGO 7 (521157) 345.0 kV Transmission Circuit #1
GROUP4_P4_LOCAL_FAULT_081	P4	Single Phase Fault with Stuck Breaker on LYDIA 7 345.00 (508298) 345 kV Bus a. Apply Fault at the LYDIA 7 345.00 (508298) 345 kV Bus b. Clear Fault after 16 cycles and trip the following elements: b.1. PITTSB-7 (510907) 345.0 kV to VALIANT7 (510911) 345.0 kV Transmission Circuit #1 b.2. LYDIA 7 (508298) 345.0 kV to WELSH 7 (508359) 345.0 kV Transmission Circuit #1 b.3. LYDIA 7 (508298) 345.0 kV to VALIANT7 (510911) 345.0 kV Transmission Circuit #1 b.4. NWTXARK7 (508072) 345.0 kV to LYDIA 7 (508298) 345.0 kV Transmission Circuit #1
GROUP4_P4_LOCAL_FAULT_082	P4	Single Phase Fault with Stuck Breaker on O.K.U.-7 345.00 (511456) 345 kV Bus a. Apply Fault at the O.K.U.-7 345.00 (511456) 345 kV Bus b. Clear Fault after 16 cycles and trip the following elements: b.1. O.K.U.-7 (511456) 345.0 kV to L.E.S.-7 (511468) 345.0 kV Transmission Circuit #1 b.2. O.K.U.-7 (511456) 345.0 kV to G18-015-TAP (762467) 345.0 kV Transmission Circuit #
GROUP4_P4_LOCAL_FAULT_083	P4	Single Phase Fault with Stuck Breaker on L.E.S.-7 345.00 (511468) 345 kV Bus a. Apply Fault at the L.E.S.-7 345.00 (511468) 345 kV Bus b. Clear Fault after 16 cycles and trip the following elements: b.1. L.E.S.-4 (511467) 138.0 kV to L.E.S.-7 (511468) 345.0 kV to LES#4-1 (511414) 13.8 kV Three Winding #1 b.2. G20-087-TAP (764550) 345.0 kV to L.E.S.-7 (511468) 345.0 kV Transmission Circuit #

Fault ID	Planning Event	Fault Description
GROUP4_P4_LOCAL_FAULT_084	P4	Single Phase Fault with Stuck Breaker on L.E.S.-7 345.00 (511468) 345 kV Bus a. Apply Fault at the L.E.S.-7 345.00 (511468) 345 kV Bus b. Clear Fault after 16 cycles and trip the following elements: b.1. L.E.S.-4 (511467) 138.0 kV to L.E.S.-7 (511468) 345.0 kV to LES#4-1 (511414) 13.8 kV Three Winding #1 b.2. L.E.S.-7 (511468) 345.0 kV to G17-171-TAP (760938) 345.0 kV Transmission Circuit #1
GROUP4_P4_LOCAL_FAULT_085	P4	Single Phase Fault with Stuck Breaker on L.E.S.-7 345.00 (511468) 345 kV Bus a. Apply Fault at the L.E.S.-7 345.00 (511468) 345 kV Bus b. Clear Fault after 16 cycles and trip the following elements: b.1. O.K.U.-7 (511456) 345.0 kV to L.E.S.-7 (511468) 345.0 kV Transmission Circuit #1 b.2. L.E.S.-7 (511468) 345.0 kV to G17-171-TAP (760938) 345.0 kV Transmission Circuit #1
GROUP4_P4_LOCAL_FAULT_086	P4	Single Phase Fault with Stuck Breaker on L.E.S.-7 345.00 (511468) 345 kV Bus a. Apply Fault at the L.E.S.-7 345.00 (511468) 345 kV Bus b. Clear Fault after 16 cycles and trip the following elements: b.1. L.E.S.-4 (511467) 138.0 kV to L.E.S.-7 (511468) 345.0 kV to LES#5-1 (511411) 13.8 kV Three Winding #2 b.2. G20-087-TAP (764550) 345.0 kV to L.E.S.-7 (511468) 345.0 kV Transmission Circuit #
GROUP4_P4_LOCAL_FAULT_087	P4	Single Phase Fault with Stuck Breaker on L.E.S.-7 345.00 (511468) 345 kV Bus a. Apply Fault at the L.E.S.-7 345.00 (511468) 345 kV Bus b. Clear Fault after 16 cycles and trip the following elements: b.1. O.K.U.-7 (511456) 345.0 kV to L.E.S.-7 (511468) 345.0 kV Transmission Circuit #1 b.2. L.E.S.-4 (511467) 138.0 kV to L.E.S.-7 (511468) 345.0 kV to LES#5-1 (511411) 13.8 kV Three Winding #2
GROUP4_P4_LOCAL_FAULT_088	P4	Single Phase Fault with Stuck Breaker on PITTSB-7 345.00 (510907) 345 kV Bus a. Apply Fault at the PITTSB-7 345.00 (510907) 345 kV Bus b. Clear Fault after 16 cycles and trip the following elements: b.1. PITTSB-7 (510907) 345.0 kV to VALIANT7 (510911) 345.0 kV Transmission Circuit #1 b.2. PITTSB-7 (510907) 345.0 kV to C-RIVER7 (515422) 345.0 kV Transmission Circuit #1
GROUP4_P4_LOCAL_FAULT_089	P4	Single Phase Fault with Stuck Breaker on PITTSB-7 345.00 (510907) 345 kV Bus a. Apply Fault at the PITTSB-7 345.00 (510907) 345 kV Bus b. Clear Fault after 16 cycles and trip the following elements: b.1. PITTSB-7 (510907) 345.0 kV to VALIANT7 (510911) 345.0 kV Transmission Circuit #1 b.2. PITTSB-7 (510907) 345.0 kV to JOHNCO 7 (514809) 345.0 kV Transmission Circuit #1

Fault ID	Planning Event	Fault Description
GROUP4_P4_LOCAL_FAULT_090	P4	Single Phase Fault with Stuck Breaker on PITTSB-7 345.00 (510907) 345 kV Bus a. Apply Fault at the PITTSB-7 345.00 (510907) 345 kV Bus b. Clear Fault after 16 cycles and trip the following elements: b.1. PITTSB-7 (510907) 345.0 kV to JOHNCO 7 (514809) 345.0 kV Transmission Circuit #1 b.2. PITTSB-7 (510907) 345.0 kV to KIOWA 7 (510925) 345.0 kV Transmission Circuit #1
GROUP4_P4_LOCAL_FAULT_091	P4	Single Phase Fault with Stuck Breaker on PITTSB-7 345.00 (510907) 345 kV Bus a. Apply Fault at the PITTSB-7 345.00 (510907) 345 kV Bus b. Clear Fault after 16 cycles and trip the following elements: b.1. PITTSB-7 (510907) 345.0 kV to SEMINOL7 (515045) 345.0 kV Transmission Circuit #1 b.2. PITTSB-7 (510907) 345.0 kV to C-RIVER7 (515422) 345.0 kV Transmission Circuit #1
GROUP4_P4_LOCAL_FAULT_092	P4	Single Phase Fault with Stuck Breaker on PITTSB-7 345.00 (510907) 345 kV Bus a. Apply Fault at the PITTSB-7 345.00 (510907) 345 kV Bus b. Clear Fault after 16 cycles and trip the following elements: b.1. PITTSB-7 (510907) 345.0 kV to SEMINOL7 (515045) 345.0 kV Transmission Circuit #1 b.2. PITTSB-7 (510907) 345.0 kV to KIOWA 7 (510925) 345.0 kV Transmission Circuit #1
GROUP4_P4_LOCAL_FAULT_093	P4	Single Phase Fault with Stuck Breaker on VALIANT7 345.00 (510911) 345 kV Bus a. Apply Fault at the VALIANT7 345.00 (510911) 345 kV Bus b. Clear Fault after 16 cycles and trip the following elements: b.1. V-WEYCO4 (510866) 138.0 kV to VALIANT4 (510918) 138.0 kV Transmission Circuit #1 b.2. VALIANT4 (510918) 138.0 kV to VALIANT7 (510911) 345.0 kV to VALN3-1 (510939) 13.8 kV Three Winding #1
GROUP4_P4_LOCAL_FAULT_094	P4	Single Phase Fault with Stuck Breaker on VALIANT7 345.00 (510911) 345 kV Bus a. Apply Fault at the VALIANT7 345.00 (510911) 345 kV Bus b. Clear Fault after 16 cycles and trip the following elements: b.1. VALIANT4 (510918) 138.0 kV to HUGO PP4 (520948) 138.0 kV Transmission Circuit #1 b.2. VALIANT4 (510918) 138.0 kV to VALIANT7 (510911) 345.0 kV to VALN3-1 (510939) 13.8 kV Three Winding #1
GROUP4_P4_LOCAL_FAULT_095	P4	Single Phase Fault with Stuck Breaker on ELSWORTH 4138.00 (511563) 138 kV Bus a. Apply Fault at the ELSWORTH 4138.00 (511563) 138 kV Bus b. Clear Fault after 16 cycles and trip the following elements: b.1. SWS2-1 (511847) 14.4 kV to S.W.S.-4 (511477) 138.0 kV Two Winding #1 b.2. S.W.S.-4 (511477) 138.0 kV to ELSWORTH 4 (511563) 138.0 kV Transmission Circuit #1 b.3. ELGINJT4 (511486) 138.0 kV to ELSWORTH 4 (511563) 138.0 kV Transmission Circuit #1 b.4. L.E.S.-4 (511467) 138.0 kV to ELGINJT4 (511486) 138.0 kV Transmission Circuit #1

Fault ID	Planning Event	Fault Description
GROUP4_P4_LOCAL_FAULT_096	P4	Single Phase Fault with Stuck Breaker on ELGINJT4 138.00 (511486) 138 kV Bus a. Apply Fault at the ELGINJT4 138.00 (511486) 138 kV Bus b. Clear Fault after 16 cycles and trip the following elements: b.1. L.E.S.-4 (511467) 138.0 kV to ELGINJT4 (511486) 138.0 kV Transmission Circuit #1 b.2. ELGINJT4 (511486) 138.0 kV to ELSWORTH 4 (511563) 138.0 kV Transmission Circuit #1 b.3. ELGINJT2 (511487) 69.0 kV to ELGINJT4 (511486) 138.0 kV to ELGJT1-1 (511412) 13.8 kV Three Winding #1
GROUP4_P4_LOCAL_FAULT_097	P4	Single Phase Fault with Stuck Breaker on DUNCAN-4 138.00 (511453) 138 kV Bus a. Apply Fault at the DUNCAN-4 138.00 (511453) 138 kV Bus b. Clear Fault after 16 cycles and trip the following elements: b.1. DUNCAN-4 (511453) 138.0 kV to OMDUNCN4 (529304) 138.0 kV Transmission Circuit #1
GROUP4_P4_LOCAL_FAULT_098	P4	Single Phase Fault with Stuck Breaker on L.E.S.-4 138.00 (511467) 138 kV Bus a. Apply Fault at the L.E.S.-4 138.00 (511467) 138 kV Bus b. Clear Fault after 16 cycles and trip the following elements: b.1. L.E.S.-4 (511467) 138.0 kV to ELGINJT4 (511486) 138.0 kV Transmission Circuit #1
GROUP4_P4_LOCAL_FAULT_099	P4	Single Phase Fault with Stuck Breaker on L.E.S.-7 345.00 (511468) 345 kV Bus a. Apply Fault at the L.E.S.-7 345.00 (511468) 345 kV Bus b. Clear Fault after 16 cycles and trip the following elements: b.1. L.E.S.-4 (511467) 138.0 kV to ELGINJT4 (511486) 138.0 kV Transmission Circuit #1 b.2. L.E.S.-4 (511467) 138.0 kV to L.E.S.-7 (511468) 345.0 kV to LES#4-1 (511414) 13.8 kV Three Winding #1
GROUP4_P4_LOCAL_FAULT_100	P4	Single Phase Fault with Stuck Breaker on L.E.S.-7 345.00 (511468) 345 kV Bus a. Apply Fault at the L.E.S.-7 345.00 (511468) 345 kV Bus b. Clear Fault after 16 cycles and trip the following elements: b.1. L.E.S.-4 (511467) 138.0 kV to L.E.S.-7 (511468) 345.0 kV to LES#4-1 (511414) 13.8 kV Three Winding #1
GROUP4_P4_LOCAL_FAULT_101	P4	Single Phase Fault with Stuck Breaker on FLE TAP4 138.00 (511423) 138 kV Bus a. Apply Fault at the FLE TAP4 138.00 (511423) 138 kV Bus b. Clear Fault after 16 cycles and trip the following elements: b.1. FLE TAP4 (511423) 138.0 kV to L.E.S.-4 (511467) 138.0 kV Transmission Circuit #1
GROUP4_P4_LOCAL_FAULT_102	P4	Single Phase Fault with Stuck Breaker on L.E.S.-4 138.00 (511467) 138 kV Bus a. Apply Fault at the L.E.S.-4 138.00 (511467) 138 kV Bus b. Clear Fault after 16 cycles and trip the following elements: b.1. FLE TAP4 (511423) 138.0 kV to L.E.S.-4 (511467) 138.0 kV Transmission Circuit #1 b.2. L.E.S.-2 (511466) 69.0 kV to L.E.S.-4 (511467) 138.0 kV to LES#1-1 (511416) 13.8 kV Three Winding #1

Fault ID	Planning Event	Fault Description
GROUP4_P4_LOCAL_FAULT_103	P4	Single Phase Fault with Stuck Breaker on L.E.S.-4 138.00 (511467) 138 kV Bus a. Apply Fault at the L.E.S.-4 138.00 (511467) 138 kV Bus b. Clear Fault after 16 cycles and trip the following elements: b.1. L.E.S.-2 (511466) 69.0 kV to L.E.S.-4 (511467) 138.0 kV to LES#1-1 (511416) 13.8 kV Three Winding #1
GROUP4_P4_LOCAL_FAULT_104	P4	Single Phase Fault with Stuck Breaker on L.E.S.-4 138.00 (511467) 138 kV Bus a. Apply Fault at the L.E.S.-4 138.00 (511467) 138 kV Bus b. Clear Fault after 16 cycles and trip the following elements: b.1. L.E.S.-4 (511467) 138.0 kV to COMMTAP4 (511494) 138.0 kV Transmission Circuit #1
GROUP4_P4_LOCAL_FAULT_105	P4	Single Phase Fault with Stuck Breaker on LWSTAP 4 138.00 (511439) 138 kV Bus a. Apply Fault at the LWSTAP 4 138.00 (511439) 138 kV Bus b. Clear Fault after 16 cycles and trip the following elements: b.1. LWSTAP 4 (511439) 138.0 kV to L.E.S.-4 (511467) 138.0 kV Transmission Circuit #1
GROUP4_P4_LOCAL_FAULT_106	P4	Single Phase Fault with Stuck Breaker on L.E.S.-4 138.00 (511467) 138 kV Bus a. Apply Fault at the L.E.S.-4 138.00 (511467) 138 kV Bus b. Clear Fault after 16 cycles and trip the following elements: b.1. L.E.S.-4 (511467) 138.0 kV to SHERID4 (511474) 138.0 kV Transmission Circuit #1
GROUP4_P4_LOCAL_FAULT_107	P4	Single Phase Fault with Stuck Breaker on SHERID4 138.00 (511474) 138 kV Bus a. Apply Fault at the SHERID4 138.00 (511474) 138 kV Bus b. Clear Fault after 16 cycles and trip the following elements: b.1. SHERID4 (511474) 138.0 kV to ARTVLTP4 (511537) 138.0 kV Transmission Circuit #1
GROUP4_P4_LOCAL_FAULT_108	P4	Single Phase Fault with Stuck Breaker on COMANC-4 138.00 (511437) 138 kV Bus a. Apply Fault at the COMANC-4 138.00 (511437) 138 kV Bus b. Clear Fault after 16 cycles and trip the following elements: b.1. COMANC-4 (511437) 138.0 kV to L.E.S.-4 (511467) 138.0 kV Transmission Circuit #1
GROUP4_P4_LOCAL_FAULT_109	P4	Single Phase Fault with Stuck Breaker on COMANC-4 138.00 (511437) 138 kV Bus a. Apply Fault at the COMANC-4 138.00 (511437) 138 kV Bus b. Clear Fault after 16 cycles and trip the following elements: b.1. COMANC-4 (511437) 138.0 kV to 112GORE4 (511488) 138.0 kV Transmission Circuit #1
GROUP4_P4_LOCAL_FAULT_110	P4	Single Phase Fault with Stuck Breaker on COMANC-4 138.00 (511437) 138 kV Bus a. Apply Fault at the COMANC-4 138.00 (511437) 138 kV Bus b. Clear Fault after 16 cycles and trip the following elements: b.1. COM1-1 (511851) 13.8 kV to COMANC-4 (511437) 138.0 kV Two Winding #1 b.2. COMANC-4 (511437) 138.0 kV to 112GORE4 (511488) 138.0 kV Transmission Circuit #1

Fault ID	Planning Event	Fault Description
GROUP4_P4_LOCAL_FAULT_111	P4	Single Phase Fault with Stuck Breaker on COMANC-4 138.00 (511437) 138 kV Bus a. Apply Fault at the COMANC-4 138.00 (511437) 138 kV Bus b. Clear Fault after 16 cycles and trip the following elements: b.1. COM1-1 (511851) 13.8 kV to COMANC-4 (511437) 138.0 kV Two Winding #1 b.2. COMANC-4 (511437) 138.0 kV to COMMTAP4 (511494) 138.0 kV Transmission Circuit #1
GROUP4_P4_LOCAL_FAULT_112	P4	Single Phase Fault with Stuck Breaker on COMANC-4 138.00 (511437) 138 kV Bus a. Apply Fault at the COMANC-4 138.00 (511437) 138 kV Bus b. Clear Fault after 16 cycles and trip the following elements: b.1. COMANC-4 (511437) 138.0 kV to COMMTAP4 (511494) 138.0 kV Transmission Circuit #1 b.2. COM2-1 (511852) 13.8 kV to COMANC-4 (511437) 138.0 kV Two Winding #1
GROUP4_P4_LOCAL_FAULT_113	P4	Single Phase Fault with Stuck Breaker on COMANC-4 138.00 (511437) 138 kV Bus a. Apply Fault at the COMANC-4 138.00 (511437) 138 kV Bus b. Clear Fault after 16 cycles and trip the following elements: b.1. COM2-1 (511852) 13.8 kV to COMANC-4 (511437) 138.0 kV Two Winding #1 b.2. COMANC-4 (511437) 138.0 kV to L.E.S.-4 (511467) 138.0 kV Transmission Circuit #1
GROUP4_P4_LOCAL_FAULT_114	P4	Single Phase Fault with Stuck Breaker on 112GORE4 138.00 (511488) 138 kV Bus a. Apply Fault at the 112GORE4 138.00 (511488) 138 kV Bus b. Clear Fault after 16 cycles and trip the following elements: b.1. COMANC-4 (511437) 138.0 kV to 112GORE4 (511488) 138.0 kV Transmission Circuit #1 b.2. LG-YEAR4 (511428) 138.0 kV to 112GORE4 (511488) 138.0 kV Transmission Circuit #1
GROUP4_P4_LOCAL_FAULT_115	P4	Single Phase Fault with Stuck Breaker on RATLIFF4 138.00 (515129) 138 kV Bus a. Apply Fault at the RATLIFF4 138.00 (515129) 138 kV Bus b. Clear Fault after 16 cycles and trip the following elements: b.1. RATLIFF4 (515129) 138.0 kV to PRARPNT4 (515134) 138.0 kV Transmission Circuit #1 b.2. RATLIFF4 (515129) 138.0 kV to CARTRCO4 (515561) 138.0 kV Transmission Circuit #1 b.3. RATLIFF4 (515129) 138.0 kV to RATLIFF2 (515128) 69.0 kV to RATLIFF1 (515752) 13.2 kV Three Winding #1
GROUP4_P4_LOCAL_FAULT_116	P4	Single Phase Fault with Stuck Breaker on ROCKYPT4 138.00 (515164) 138 kV Bus a. Apply Fault at the ROCKYPT4 138.00 (515164) 138 kV Bus b. Clear Fault after 16 cycles and trip the following elements: b.1. SUNNYSD4 (515135) 138.0 kV to ROCKYPT4 (515164) 138.0 kV Transmission Circuit #1 b.2. MRIETA 2 (515160) 138.0 kV to ROCKYPT4 (515164) 138.0 kV Transmission Circuit #1 b.3. ROCKYPT4 (515164) 138.0 kV to SPRNDAL4 (515172) 138.0 kV Transmission Circuit #1 b.4. ROCKYPT4 (515164) 138.0 kV to ROCKYPT2 (515163) 69.0 kV to ROCKYPT1 (515754) 13.2 kV Three Winding #1

Fault ID	Planning Event	Fault Description
GROUP4_P4_LOCAL_FAULT_117	P4	Single Phase Fault with Stuck Breaker on UNIROY 4 138.00 (515137) 138 kV Bus a. Apply Fault at the UNIROY 4 138.00 (515137) 138 kV Bus b. Clear Fault after 16 cycles and trip the following elements: b.1. SUNNYSD4 (515135) 138.0 kV to UNIROY 4 (515137) 138.0 kV Transmission Circuit #1 b.2. UNIROY 4 (515137) 138.0 kV to ARDWEST4 (515372) 138.0 kV Transmission Circuit #1
GROUP4_P4_LOCAL_FAULT_118	P4	Single Phase Fault with Stuck Breaker on ROCKYPT2 69.000 (515163) 69 kV Bus a. Apply Fault at the ROCKYPT2 69.000 (515163) 69 kV Bus b. Clear Fault after 16 cycles and trip the following elements: b.1. ROCKYPT2 (515163) 69.0 kV to ROCKYPT4 (515164) 138.0 kV to ROCKYPT1 (515754) 13.2 kV Three Winding #1 b.4. ROCKYPT2 (515163) 69.0 kV to SCMMRCT2 (515420) 69.0 kV Transmission Circuit #1 b.5. ROCKYPT2 (515163) 69.0 kV to Switched Shunt Device #
GROUP4_P4_LOCAL_FAULT_119	P4	Single Phase Fault with Stuck Breaker on LYDIA 7 345.00 (508298) 345 kV Bus a. Apply Fault at the LYDIA 7 345.00 (508298) 345 kV Bus b. Clear Fault after 16 cycles and trip the following elements: b.1. LYDIA 7 (508298) 345.0 kV to VALIANT7 (510911) 345.0 kV Transmission Circuit #1
GROUP4_P4_LOCAL_FAULT_120	P4	Single Phase Fault with Stuck Breaker on VALIANT7 345.00 (510911) 345 kV Bus a. Apply Fault at the VALIANT7 345.00 (510911) 345 kV Bus b. Clear Fault after 16 cycles and trip the following elements: b.1. VALIANT7 (510911) 345.0 kV to HUGO 7 (521157) 345.0 kV Transmission Circuit #1
GROUP4_P4_LOCAL_FAULT_121	P4	Single Phase Fault with Stuck Breaker on VALIANT7 345.00 (510911) 345 kV Bus a. Apply Fault at the VALIANT7 345.00 (510911) 345 kV Bus b. Clear Fault after 16 cycles and trip the following elements: b.1. VALIANT7 (510911) 345.0 kV to G20-020-TAP (764520) 345.0 kV Transmission Circuit #1
GROUP4_P4_LOCAL_FAULT_122	P4	Single Phase Fault with Stuck Breaker on VALIANT4 138.00 (510918) 138 kV Bus a. Apply Fault at the VALIANT4 138.00 (510918) 138 kV Bus b. Clear Fault after 16 cycles and trip the following elements: b.1. VALIANT4 (510918) 138.0 kV to HUGO PP4 (520948) 138.0 kV Transmission Circuit #1
GROUP4_P4_LOCAL_FAULT_123	P4	Single Phase Fault with Stuck Breaker on COMANC-2 69.000 (511436) 69 kV Bus a. Apply Fault at the COMANC-2 69.000 (511436) 69 kV Bus b. Clear Fault after 16 cycles and trip the following elements: b.1. COMANC-2 (511436) 69.0 kV to L.E.S.-2 (511466) 69.0 kV Transmission Circuit #1
GROUP4_P4_LOCAL_FAULT_124	P4	Single Phase Fault with Stuck Breaker on DUNCAN-4 138.00 (511453) 138 kV Bus a. Apply Fault at the DUNCAN-4 138.00 (511453) 138 kV Bus b. Clear Fault after 16 cycles and trip the following elements: b.1. DUNCAN-4 (511453) 138.0 kV to OMDUNCN4 (529304) 138.0 kV Transmission Circuit #1

Fault ID	Planning Event	Fault Description
GROUP4_P4_LOCAL_FAULT_125	P4	Single Phase Fault with Stuck Breaker on L.E.S.-2 69.000 (511466) 69 kV Bus a. Apply Fault at the L.E.S.-2 69.000 (511466) 69 kV Bus b. Clear Fault after 16 cycles and trip the following elements: b.1. L.E.S.-2 (511466) 69.0 kV to LGORE-N2 (511469) 69.0 kV Transmission Circuit #1
GROUP4_P4_LOCAL_FAULT_126	P4	Single Phase Fault with Stuck Breaker on L.E.S.-2 69.000 (511466) 69 kV Bus a. Apply Fault at the L.E.S.-2 69.000 (511466) 69 kV Bus b. Clear Fault after 16 cycles and trip the following elements: b.1. L.E.S.-2 (511466) 69.0 kV to LGORE-S2 (511470) 69.0 kV Transmission Circuit #1
GROUP4_P4_LOCAL_FAULT_127	P4	Single Phase Fault with Stuck Breaker on COMMTAP4 138.00 (511494) 138 kV Bus a. Apply Fault at the COMMTAP4 138.00 (511494) 138 kV Bus b. Clear Fault after 16 cycles and trip the following elements: b.1. COMMTAP4 (511494) 138.0 kV to OMDUNCN4 (529304) 138.0 kV Transmission Circuit #1
GROUP4_P4_LOCAL_FAULT_128	P4	Single Phase Fault with Stuck Breaker on TERRYRD7 345.00 (511568) 345 kV Bus a. Apply Fault at the TERRYRD7 345.00 (511568) 345 kV Bus b. Clear Fault after 16 cycles and trip the following elements: b.1. TERRYRD7 (511568) 345.0 kV to G20-074-TAP (764115) 345.0 kV Transmission Circuit #1
GROUP4_P4_LOCAL_FAULT_129	P4	Single Phase Fault with Stuck Breaker on JOHNCO 4 138.00 (514808) 138 kV Bus a. Apply Fault at the JOHNCO 4 138.00 (514808) 138 kV Bus b. Clear Fault after 16 cycles and trip the following elements: b.1. JOHNCO 4 (514808) 138.0 kV to RUSSET-4 (515120) 138.0 kV Transmission Circuit #1
GROUP4_P4_LOCAL_FAULT_130	P4	Single Phase Fault with Stuck Breaker on JOHNCO 4 138.00 (514808) 138 kV Bus a. Apply Fault at the JOHNCO 4 138.00 (514808) 138 kV Bus b. Clear Fault after 16 cycles and trip the following elements: b.1. JOHNCO 4 (514808) 138.0 kV to SXMLCKT4 (515122) 138.0 kV Transmission Circuit #1
GROUP4_P4_LOCAL_FAULT_131	P4	Single Phase Fault with Stuck Breaker on JOHNCO 4 138.00 (514808) 138 kV Bus a. Apply Fault at the JOHNCO 4 138.00 (514808) 138 kV Bus b. Clear Fault after 16 cycles and trip the following elements: b.1. JOHNCO 4 (514808) 138.0 kV to CANEYCK4 (515150) 138.0 kV Transmission Circuit #1
GROUP4_P4_LOCAL_FAULT_132	P4	Single Phase Fault with Stuck Breaker on JOHNCO 7 345.00 (514809) 345 kV Bus a. Apply Fault at the JOHNCO 7 345.00 (514809) 345 kV Bus b. Clear Fault after 16 cycles and trip the following elements: b.1. JOHNCO 7 (514809) 345.0 kV to GEN-2017-149 (760830) 345.0 kV Transmission Circuit #1
GROUP4_P4_LOCAL_FAULT_133	P4	Single Phase Fault with Stuck Breaker on RATLIFF4 138.00 (515129) 138 kV Bus a. Apply Fault at the RATLIFF4 138.00 (515129) 138 kV Bus b. Clear Fault after 16 cycles and trip the following elements: b.1. RATLIFF4 (515129) 138.0 kV to CARTRCO4 (515561) 138.0 kV Transmission Circuit #1

Fault ID	Planning Event	Fault Description
GROUP4_P4_LOCAL_FAULT_134	P4	Single Phase Fault with Stuck Breaker on POOLVIL4 138.00 (515130) 138 kV Bus a. Apply Fault at the POOLVIL4 138.00 (515130) 138 kV Bus b. Clear Fault after 16 cycles and trip the following elements: b.1. POOLVIL4 (515130) 138.0 kV to CARTRCO4 (515561) 138.0 kV Transmission Circuit #1
GROUP4_P4_LOCAL_FAULT_135	P4	Single Phase Fault with Stuck Breaker on SUNNYSD4 138.00 (515135) 138 kV Bus a. Apply Fault at the SUNNYSD4 138.00 (515135) 138 kV Bus b. Clear Fault after 16 cycles and trip the following elements: b.1. SUNNYSD4 (515135) 138.0 kV to UNIROY 4 (515137) 138.0 kV Transmission Circuit #1
GROUP4_P4_LOCAL_FAULT_136	P4	Single Phase Fault with Stuck Breaker on SUNNYSD4 138.00 (515135) 138 kV Bus a. Apply Fault at the SUNNYSD4 138.00 (515135) 138 kV Bus b. Clear Fault after 16 cycles and trip the following elements: b.1. SUNNYSD4 (515135) 138.0 kV to LONEGRV4 (515144) 138.0 kV Transmission Circuit #1
GROUP4_P4_LOCAL_FAULT_137	P4	Single Phase Fault with Stuck Breaker on SUNNYSD4 138.00 (515135) 138 kV Bus a. Apply Fault at the SUNNYSD4 138.00 (515135) 138 kV Bus b. Clear Fault after 16 cycles and trip the following elements: b.1. SUNNYSD4 (515135) 138.0 kV to ROCKYPT4 (515164) 138.0 kV Transmission Circuit #1
GROUP4_P4_LOCAL_FAULT_138	P4	Single Phase Fault with Stuck Breaker on SUNNYSD4 138.00 (515135) 138 kV Bus a. Apply Fault at the SUNNYSD4 138.00 (515135) 138 kV Bus b. Clear Fault after 16 cycles and trip the following elements: b.1. SUNNYSD4 (515135) 138.0 kV to CARTRCO4 (515561) 138.0 kV Transmission Circuit #1
GROUP4_P4_LOCAL_FAULT_139	P4	Single Phase Fault with Stuck Breaker on UNIROY 4 138.00 (515137) 138 kV Bus a. Apply Fault at the UNIROY 4 138.00 (515137) 138 kV Bus b. Clear Fault after 16 cycles and trip the following elements: b.1. UNIROY 4 (515137) 138.0 kV to ARDWEST4 (515372) 138.0 kV Transmission Circuit #1
GROUP4_P4_LOCAL_FAULT_140	P4	Single Phase Fault with Stuck Breaker on DILLARD4 138.00 (515142) 138 kV Bus a. Apply Fault at the DILLARD4 138.00 (515142) 138 kV Bus b. Clear Fault after 16 cycles and trip the following elements: b.1. DILLARD4 (515142) 138.0 kV to WOLFCRK4 (515143) 138.0 kV Transmission Circuit #1
GROUP4_P4_LOCAL_FAULT_141	P4	Single Phase Fault with Stuck Breaker on WOLFCRK4 138.00 (515143) 138 kV Bus a. Apply Fault at the WOLFCRK4 138.00 (515143) 138 kV Bus b. Clear Fault after 16 cycles and trip the following elements: b.1. WOLFCRK4 (515143) 138.0 kV to CHEEKTP4 (515415) 138.0 kV Transmission Circuit #1
GROUP4_P4_LOCAL_FAULT_142	P4	Single Phase Fault with Stuck Breaker on LONEGRV4 138.00 (515144) 138 kV Bus a. Apply Fault at the LONEGRV4 138.00 (515144) 138 kV Bus b. Clear Fault after 16 cycles and trip the following elements: b.1. LONEGRV4 (515144) 138.0 kV to CHEEKTP4 (515415) 138.0 kV Transmission Circuit #1

Fault ID	Planning Event	Fault Description
GROUP4_P4_LOCAL_FAULT_143	P4	Single Phase Fault with Stuck Breaker on MRIETA 2 138.00 (515160) 138 kV Bus a. Apply Fault at the MRIETA 2 138.00 (515160) 138 kV Bus b. Clear Fault after 16 cycles and trip the following elements: b.1. MRIETA 2 (515160) 138.0 kV to ROCKYPT4 (515164) 138.0 kV Transmission Circuit #1
GROUP4_P4_LOCAL_FAULT_144	P4	Single Phase Fault with Stuck Breaker on ROCKYPT4 138.00 (515164) 138 kV Bus a. Apply Fault at the ROCKYPT4 138.00 (515164) 138 kV Bus b. Clear Fault after 16 cycles and trip the following elements: b.1. ROCKYPT4 (515164) 138.0 kV to SPRNDAL4 (515172) 138.0 kV Transmission Circuit #1
GROUP4_P4_LOCAL_FAULT_145	P4	Single Phase Fault with Stuck Breaker on CHEEKTP4 138.00 (515415) 138 kV Bus a. Apply Fault at the CHEEKTP4 138.00 (515415) 138 kV Bus b. Clear Fault after 16 cycles and trip the following elements: b.1. CHEEKTP4 (515415) 138.0 kV to CHEEK_4 (521125) 138.0 kV Transmission Circuit #1
GROUP4_P4_LOCAL_FAULT_146	P4	Single Phase Fault with Stuck Breaker on CARTRCO4 138.00 (515561) 138 kV Bus a. Apply Fault at the CARTRCO4 138.00 (515561) 138 kV Bus b. Clear Fault after 16 cycles and trip the following elements: b.1. CARTRCO4 (515561) 138.0 kV to GEN-2017-027 (588710) 138.0 kV Transmission Circuit #1
GROUP4_P4_LOCAL_FAULT_147	P4	Single Phase Fault with Stuck Breaker on SAWYER4 138.00 (520411) 138 kV Bus a. Apply Fault at the SAWYER4 138.00 (520411) 138 kV Bus b. Clear Fault after 16 cycles and trip the following elements: b.1. SAWYER4 (520411) 138.0 kV to HUGO PP4 (520948) 138.0 kV Transmission Circuit #1
GROUP4_P4_LOCAL_FAULT_148	P4	Single Phase Fault with Stuck Breaker on HUGOITC4 138.00 (520560) 138 kV Bus a. Apply Fault at the HUGOITC4 138.00 (520560) 138 kV Bus b. Clear Fault after 16 cycles and trip the following elements: b.1. HUGOITC4 (520560) 138.0 kV to HUGO PP4 (520948) 138.0 kV Transmission Circuit #1
GROUP4_P4_LOCAL_FAULT_149	P4	Single Phase Fault with Stuck Breaker on FROGVIL4 138.00 (520918) 138 kV Bus a. Apply Fault at the FROGVIL4 138.00 (520918) 138 kV Bus b. Clear Fault after 16 cycles and trip the following elements: b.1. FROGVIL4 (520918) 138.0 kV to HUGO PP4 (520948) 138.0 kV Transmission Circuit #1
GROUP4_P4_LOCAL_FAULT_150	P4	Single Phase Fault with Stuck Breaker on HUGO PP4 138.00 (520948) 138 kV Bus a. Apply Fault at the HUGO PP4 138.00 (520948) 138 kV Bus b. Clear Fault after 16 cycles and trip the following elements: b.1. HUGO PP4 (520948) 138.0 kV to VALLANT4 (521079) 138.0 kV Transmission Circuit #1
GROUP4_P4_LOCAL_FAULT_151	P4	Single Phase Fault with Stuck Breaker on HUGO 7 345.00 (521157) 345 kV Bus a. Apply Fault at the HUGO 7 345.00 (521157) 345 kV Bus b. Clear Fault after 16 cycles and trip the following elements: b.1. HUGO 7 (521157) 345.0 kV to G17-075-TAP (560088) 345.0 kV Transmission Circuit #1

Fault ID	Planning Event	Fault Description
GROUP4_P4_LOCAL_FAULT_152	P4	Single Phase Fault with Stuck Breaker on TUCO_INT 7345.00 (525832) 345 kV Bus a. Apply Fault at the TUCO_INT 7345.00 (525832) 345 kV Bus b. Clear Fault after 16 cycles and trip the following elements: b.1. TUCO_INT 7 (525832) 345.0 kV to ELK_CT1 (525850) 345.0 kV Transmission Circuit #1
GROUP4_P4_LOCAL_FAULT_153	P4	Single Phase Fault with Stuck Breaker on TUCO_INT 7345.00 (525832) 345 kV Bus a. Apply Fault at the TUCO_INT 7345.00 (525832) 345 kV Bus b. Clear Fault after 16 cycles and trip the following elements: b.1. TUCO_INT 7 (525832) 345.0 kV to G17-151TAP (762216) 345.0 kV Transmission Circuit #1
GROUP4_P4_LOCAL_FAULT_154	P4	Single Phase Fault with Stuck Breaker on TUCO_INT 7345.00 (525832) 345 kV Bus a. Apply Fault at the TUCO_INT 7345.00 (525832) 345 kV Bus b. Clear Fault after 16 cycles and trip the following elements: b.1. TUCO_INT 7 (525832) 345.0 kV to G20-067-TAP (764945) 345.0 kV Transmission Circuit #1
GROUP4_P4_LOCAL_FAULT_155	P4	Single Phase Fault with Stuck Breaker on TUCO_INT 7345.00 (525832) 345 kV Bus a. Apply Fault at the TUCO_INT 7345.00 (525832) 345 kV Bus b. Clear Fault after 16 cycles and trip the following elements: b.1. TUCO_INT 7 (525832) 345.0 kV to GEN-2022-147 (769921) 345.0 kV Transmission Circuit #1
GROUP4_P4_LOCAL_FAULT_156	P4	Single Phase Fault with Stuck Breaker on G17-151TAP 345.00 (762216) 345 kV Bus a. Apply Fault at the G17-151TAP 345.00 (762216) 345 kV Bus b. Clear Fault after 16 cycles and trip the following elements: b.1. G17-151TAP (762216) 345.0 kV to GEN-2017-151 (762217) 345.0 kV Transmission Circuit #1
GROUP4_P4_LOCAL_FAULT_157	P4	Single Phase Fault with Stuck Breaker on GEN-2018-015345.00 (762460) 345 kV Bus a. Apply Fault at the GEN-2018-015345.00 (762460) 345 kV Bus b. Clear Fault after 16 cycles and trip the following elements: b.1. GEN-2018-015 (762460) 345.0 kV to G18-015-TAP (762467) 345.0 kV Transmission Circuit #1
GROUP4_P4_LOCAL_FAULT_158	P4	Single Phase Fault with Stuck Breaker on VALIANT7 345.00 (510911) 345 kV Bus a. Apply Fault at the VALIANT7 345.00 (510911) 345 kV Bus b. Clear Fault after 16 cycles and trip the following elements: b.1. VALIANT4 (510918) 138.0 kV to VALIANT7 (510911) 345.0 kV to VALN2-1 (510938) 13.8 kV Three Winding #2
GROUP4_P4_LOCAL_FAULT_159	P4	Single Phase Fault with Stuck Breaker on VALIANT7 345.00 (510911) 345 kV Bus a. Apply Fault at the VALIANT7 345.00 (510911) 345 kV Bus b. Clear Fault after 16 cycles and trip the following elements: b.1. VALIANT4 (510918) 138.0 kV to VALIANT7 (510911) 345.0 kV to VALN3-1 (510939) 13.8 kV Three Winding #1
GROUP4_P4_LOCAL_FAULT_160	P4	Single Phase Fault with Stuck Breaker on JOHNCO 7 345.00 (514809) 345 kV Bus a. Apply Fault at the JOHNCO 7 345.00 (514809) 345 kV Bus b. Clear Fault after 16 cycles and trip the following elements: b.1. JOHNCO 4 (514808) 138.0 kV to JOHNCO 7 (514809) 345.0 kV to JOHNCO11 (514810) 13.8 kV Three Winding #1

Fault ID	Planning Event	Fault Description
GROUP4_P4_LOCAL_FAULT_161	P4	Single Phase Fault with Stuck Breaker on ROCKYPT4 138.00 (515164) 138 kV Bus a. Apply Fault at the ROCKYPT4 138.00 (515164) 138 kV Bus b. Clear Fault after 16 cycles and trip the following elements: b.1. ROCKYPT2 (515163) 69.0 kV to ROCKYPT4 (515164) 138.0 kV to ROCKYPT1 (515754) 13.2 kV Three Winding #1
GROUP4_P4_LOCAL_FAULT_162	P4	Single Phase Fault with Stuck Breaker on HUGO 7 345.00 (521157) 345 kV Bus a. Apply Fault at the HUGO 7 345.00 (521157) 345 kV Bus b. Clear Fault after 16 cycles and trip the following elements: b.1. HUGO 7 (521157) 345.0 kV to HUGOITC4 (520560) 138.0 kV to HUGO TERTA (521189) 13.8 kV Three Winding #1
GROUP4_P4_LOCAL_FAULT_163	P4	Single Phase Fault with Stuck Breaker on TUCO_INT 7345.00 (525832) 345 kV Bus a. Apply Fault at the TUCO_INT 7345.00 (525832) 345 kV Bus b. Clear Fault after 16 cycles and trip the following elements: b.1. TUCO_INT 7 (525832) 345.0 kV to TUCO_INT 6 (525830) 230.0 kV to TUCO_TR2 1 (525825) 13.2 kV Three Winding #2
GROUP4_P4_LOCAL_FAULT_164	P4	Single Phase Fault with Stuck Breaker on TUCO_INT 7345.00 (525832) 345 kV Bus a. Apply Fault at the TUCO_INT 7345.00 (525832) 345 kV Bus b. Clear Fault after 16 cycles and trip the following elements: b.1. TUCO_INT 7 (525832) 345.0 kV to TUCO_INT 6 (525830) 230.0 kV to TUCO_TR1 1 (525824) 13.2 kV Three Winding #1
GROUP4_P4_LOCAL_FAULT_165	P4	Single Phase Fault with Stuck Breaker on CANEYCK4 138.00 (515150) 138 kV Bus a. Apply Fault at the CANEYCK4 138.00 (515150) 138 kV Bus b. Clear Fault after 16 cycles and trip the following elements: b.1. JOHNCO 4 (514808) 138.0 kV to CANEYCK4 (515150) 138.0 kV Transmission Circuit #1 b.2. MADINDT4 (515149) 138.0 kV to CANEYCK4 (515150) 138.0 kV Transmission Circuit #1 b.3. CANEYCK4 (515150) 138.0 kV to LTLCITY4 (515151) 138.0 kV Transmission Circuit #1 b.4. CANEYCK4 (515150) 138.0 kV to TEXOMAJ4 (521067) 138.0 kV Transmission Circuit #1 b.5. CANEYCK4 (515150) 138.0 kV to GEN-2022-143 (769841) 138.0 kV Transmission Circuit #1
GROUP4_P4_LOCAL_FAULT_166	P4	Single Phase Fault with Stuck Breaker on RUSSET-4 138.00 (515120) 138 kV Bus a. Apply Fault at the RUSSET-4 138.00 (515120) 138 kV Bus b. Clear Fault after 16 cycles and trip the following elements: b.1. JOHNCO 4 (514808) 138.0 kV to RUSSET-4 (515120) 138.0 kV Transmission Circuit #1 b.2. RUSSET-4 (515120) 138.0 kV to GLASSES4 (515147) 138.0 kV Transmission Circuit #1 b.3. RUSSET-4 (515120) 138.0 kV to STIRLNG4 (515932) 138.0 kV Transmission Circuit #1 b.4. RUSSET-4 (515120) 138.0 kV to RUSSETT4 (521044) 138.0 kV Transmission Circuit #1

Fault ID	Planning Event	Fault Description
GROUP4_P4_LOCAL_FAULT_167	P4	Single Phase Fault with Stuck Breaker on SUNNYSD7 345.00 (515136) 345 kV Bus a. Apply Fault at the SUNNYSD7 345.00 (515136) 345 kV Bus b. Clear Fault after 16 cycles and trip the following elements: b.1. SUNNYSD4 (515135) 138.0 kV to UNIROY 4 (515137) 138.0 kV Transmission Circuit #1 b.2. SUNNYSD4 (515135) 138.0 kV to LONEGRV4 (515144) 138.0 kV Transmission Circuit #1 b.3. SUNNYSD4 (515135) 138.0 kV to ROCKYPT4 (515164) 138.0 kV Transmission Circuit #1 b.4. SUNNYSD4 (515135) 138.0 kV to CARTRCO4 (515561) 138.0 kV Transmission Circuit #1 b.5. SUNNYSD4 (515135) 138.0 kV to SUNNYSD7 (515136) 345.0 kV to SUNNYSD1 (515762) 13.8 kV Three Winding #1 b.6. SUNNYSD4 (515135) 138.0 kV to SUNNYSD7 (515136) 345.0 kV to SUNYSD 1 (515405) 13.8 kV Three Winding #1 b.7. SUNNYSD7 (515136) 345.0 kV to G17-075-TAP (560088) 345.0 kV Transmission Circuit #1 b.8. SUNNYSD7 (515136) 345.0 kV to G20-074-TAP (764115) 345.0 kV Transmission Circuit #1 b.9. SUNNYSD7 (515136) 345.0 kV to G20-074-TAP (764115) 345.0 kV Transmission Circuit #2 b.10. SUNNYSD7 (515136) 345.0 kV to G21-016-TAP (765451) 345.0 kV Transmission Circuit #1
GROUP4_P4_LOCAL_FAULT_168	P4	Single Phase Fault with Stuck Breaker on VALIANT4 138.00 (510918) 138 kV Bus a. Apply Fault at the VALIANT4 138.00 (510918) 138 kV Bus b. Clear Fault after 16 cycles and trip the following elements: b.1. V-WEYCO4 (510866) 138.0 kV to VALIANT4 (510918) 138.0 kV Transmission Circuit #1 b.2. IDABEL-4 (510886) 138.0 kV to VALIANT4 (510918) 138.0 kV Transmission Circuit #1 b.3. HUGO---4 (510901) 138.0 kV to VALIANT4 (510918) 138.0 kV Transmission Circuit #1 b.4. VALIANT4 (510918) 138.0 kV to HUGO PP4 (520948) 138.0 kV Transmission Circuit #1 b.5. VALIANT4 (510918) 138.0 kV to VALIANT2 (510910) 69.0 kV to VALN1-1 (510937) 13.8 kV Three Winding #1 b.6. VALIANT4 (510918) 138.0 kV to VALIANT7 (510911) 345.0 kV to VALN2-1 (510938) 13.8 kV Three Winding #2 b.7. VALIANT4 (510918) 138.0 kV to VALIANT7 (510911) 345.0 kV to VALN3-1 (510939) 13.8 kV Three Winding #1
GROUP4_P4_LOCAL_FAULT_169	P4	Single Phase Fault with Stuck Breaker on O.K.U.-7 345.00 (511456) 345 kV Bus a. Apply Fault at the O.K.U.-7 345.00 (511456) 345 kV Bus b. Clear Fault after 16 cycles and trip the following elements: b.1. O.K.U.-7 (511456) 345.0 kV to L.E.S.-7 (511468) 345.0 kV Transmission Circuit #1 b.2. O.K.U.-7 (511456) 345.0 kV to OKLAUN HVDC7 (511565) 345.0 kV Transmission Circuit #1 b.3. O.K.U.-7 (511456) 345.0 kV to GEN-2017-033 (588760) 345.0 kV Transmission Circuit #1 b.4. O.K.U.-7 (511456) 345.0 kV to G18-015-TAP (762467) 345.0 kV Transmission Circuit #1

Fault ID	Planning Event	Fault Description
GROUP4_P4_LOCAL_FAULT_170	P4	Single Phase Fault with Stuck Breaker on L.E.S.-7 345.00 (511468) 345 kV Bus a. Apply Fault at the L.E.S.-7 345.00 (511468) 345 kV Bus b. Clear Fault after 16 cycles and trip the following elements: b.1. FLE TAP4 (511423) 138.0 kV to L.E.S.-4 (511467) 138.0 kV Transmission Circuit #1 b.2. COMANC-4 (511437) 138.0 kV to L.E.S.-4 (511467) 138.0 kV Transmission Circuit #1 b.3. LWSTAP 4 (511439) 138.0 kV to L.E.S.-4 (511467) 138.0 kV Transmission Circuit #1 b.4. L.E.S.-4 (511467) 138.0 kV to SHERID4 (511474) 138.0 kV Transmission Circuit #1 b.5. L.E.S.-4 (511467) 138.0 kV to ELGINJT4 (511486) 138.0 kV Transmission Circuit #1 b.6. L.E.S.-4 (511467) 138.0 kV to COMMTAP4 (511494) 138.0 kV Transmission Circuit #1 b.7. L.E.S.-4 (511467) 138.0 kV to L.E.S.-2 (511466) 69.0 kV to LES#1-1 (511416) 13.8 kV Three Winding #1 b.8. L.E.S.-4 (511467) 138.0 kV to L.E.S.-2 (511466) 69.0 kV to LES#2-1 (511415) 13.8 kV Three Winding #2 b.9. L.E.S.-4 (511467) 138.0 kV to L.E.S.-7 (511468) 345.0 kV to LES#4-1 (511414) 13.8 kV Three Winding #1 b.10. L.E.S.-4 (511467) 138.0 kV to L.E.S.-7 (511468) 345.0 kV to LES#5-1 (511411) 13.8 kV Three Winding #2
GROUP4_P4_LOCAL_FAULT_171	P4	Single Phase Fault with Stuck Breaker on WELSH 7 345.00 (508359) 345 kV Bus a. Apply Fault at the WELSH 7 345.00 (508359) 345 kV Bus b. Clear Fault after 16 cycles and trip the following elements: b.1. SPPMAINBUS (5917) 345.0 kV to WELSH 7 (508359) 345.0 kV Transmission Circuit #1 b.2. NWTXARK7 (508072) 345.0 kV to WELSH 7 (508359) 345.0 kV Transmission Circuit #1 b.3. LYDIA 7 (508298) 345.0 kV to WELSH 7 (508359) 345.0 kV Transmission Circuit #1 b.4. WELSH 7 (508359) 345.0 kV to DIANA 7 (508832) 345.0 kV Transmission Circuit #1 b.5. WELSH 7 (508359) 345.0 kV to DIANA 7 (508832) 345.0 kV Transmission Circuit #2 b.6. WELSH 7 (508359) 345.0 kV to WILKES 7 (508841) 345.0 kV Transmission Circuit #1 b.7. WELSH 7 (508359) 345.0 kV to GEN-2021-038 (765660) 345.0 kV Transmission Circuit #1 b.8. WELSH 7 (508359) 345.0 kV to WELSH1-1 (509404) 18.0 kV Two Winding #1 b.9. WELSH 7 (508359) 345.0 kV to WELSH3-1 (509406) 18.0 kV Two Winding #1 b.10. LYDIA 7 (508298) 345.0 kV to VALIANT7 (510911) 345.0 kV Transmission Circuit #1 b.11. NWTXARK7 (508072) 345.0 kV to LYDIA 7 (508298) 345.0 kV Transmission Circuit #1

Fault ID	Planning Event	Fault Description
GROUP4_P4_LOCAL_FAULT_172	P4	Single Phase Fault with Stuck Breaker on VALIANT7 345.00 (510911) 345 kV Bus a. Apply Fault at the VALIANT7 345.00 (510911) 345 kV Bus b. Clear Fault after 16 cycles and trip the following elements: b.1. LYDIA 7 (508298) 345.0 kV to VALIANT7 (510911) 345.0 kV Transmission Circuit #1 b.2. PITTSB-7 (510907) 345.0 kV to VALIANT7 (510911) 345.0 kV Transmission Circuit #1 b.3. VALIANT7 (510911) 345.0 kV to HUGO 7 (521157) 345.0 kV Transmission Circuit #1 b.4. VALIANT7 (510911) 345.0 kV to G20-020-TAP (764520) 345.0 kV Transmission Circuit #1 b.5. VALIANT7 (510911) 345.0 kV to VALIANT4 (510918) 138.0 kV to VALN2-1 (510938) 13.8 kV Three Winding #2 b.6. VALIANT7 (510911) 345.0 kV to VALIANT4 (510918) 138.0 kV to VALN3-1 (510939) 13.8 kV Three Winding #1 b.7. LYDIA 7 (508298) 345.0 kV to WELSH 7 (508359) 345.0 kV Transmission Circuit #1 b.8. NWTXARK7 (508072) 345.0 kV to LYDIA 7 (508298) 345.0 kV Transmission Circuit #1
GROUP4_P4_LOCAL_FAULT_173	P4	Single Phase Fault with Stuck Breaker on VALIANT7 345.00 (510911) 345 kV Bus a. Apply Fault at the VALIANT7 345.00 (510911) 345 kV Bus b. Clear Fault after 16 cycles and trip the following elements: b.1. LYDIA 7 (508298) 345.0 kV to VALIANT7 (510911) 345.0 kV Transmission Circuit #1 b.2. PITTSB-7 (510907) 345.0 kV to VALIANT7 (510911) 345.0 kV Transmission Circuit #1 b.3. VALIANT7 (510911) 345.0 kV to HUGO 7 (521157) 345.0 kV Transmission Circuit #1 b.4. VALIANT7 (510911) 345.0 kV to G20-020-TAP (764520) 345.0 kV Transmission Circuit #1 b.5. VALIANT7 (510911) 345.0 kV to VALIANT4 (510918) 138.0 kV to VALN2-1 (510938) 13.8 kV Three Winding #2 b.6. VALIANT7 (510911) 345.0 kV to VALIANT4 (510918) 138.0 kV to VALN3-1 (510939) 13.8 kV Three Winding #1 b.7. LYDIA 7 (508298) 345.0 kV to WELSH 7 (508359) 345.0 kV Transmission Circuit #1 b.8. NWTXARK7 (508072) 345.0 kV to LYDIA 7 (508298) 345.0 kV Transmission Circuit #1

Fault ID	Planning Event	Fault Description
GROUP4_P4_LOCAL_FAULT_174	P4	Single Phase Fault with Stuck Breaker on VALIANT7 345.00 (510911) 345 kV Bus a. Apply Fault at the VALIANT7 345.00 (510911) 345 kV Bus b. Clear Fault after 16 cycles and trip the following elements: b.1. LYDIA 7 (508298) 345.0 kV to VALIANT7 (510911) 345.0 kV Transmission Circuit #1 b.2. PITTSB-7 (510907) 345.0 kV to VALIANT7 (510911) 345.0 kV Transmission Circuit #1 b.3. VALIANT7 (510911) 345.0 kV to HUGO 7 (521157) 345.0 kV Transmission Circuit #1 b.4. VALIANT7 (510911) 345.0 kV to G20-020-TAP (764520) 345.0 kV Transmission Circuit #1 b.5. VALIANT7 (510911) 345.0 kV to VALIANT4 (510918) 138.0 kV to VALN2-1 (510938) 13.8 kV Three Winding #2 b.6. VALIANT7 (510911) 345.0 kV to VALIANT4 (510918) 138.0 kV to VALN3-1 (510939) 13.8 kV Three Winding #1 b.7. LYDIA 7 (508298) 345.0 kV to WELSH 7 (508359) 345.0 kV Transmission Circuit #1 b.8. NWTXARK7 (508072) 345.0 kV to LYDIA 7 (508298) 345.0 kV Transmission Circuit #1
GROUP4_P4_LOCAL_FAULT_175	P4	Single Phase Fault with Stuck Breaker on VALIANT7 345.00 (510911) 345 kV Bus a. Apply Fault at the VALIANT7 345.00 (510911) 345 kV Bus b. Clear Fault after 16 cycles and trip the following elements: b.1. LYDIA 7 (508298) 345.0 kV to VALIANT7 (510911) 345.0 kV Transmission Circuit #1 b.2. PITTSB-7 (510907) 345.0 kV to VALIANT7 (510911) 345.0 kV Transmission Circuit #1 b.3. VALIANT7 (510911) 345.0 kV to HUGO 7 (521157) 345.0 kV Transmission Circuit #1 b.4. VALIANT7 (510911) 345.0 kV to G20-020-TAP (764520) 345.0 kV Transmission Circuit #1 b.5. VALIANT7 (510911) 345.0 kV to VALIANT4 (510918) 138.0 kV to VALN2-1 (510938) 13.8 kV Three Winding #2 b.6. VALIANT7 (510911) 345.0 kV to VALIANT4 (510918) 138.0 kV to VALN3-1 (510939) 13.8 kV Three Winding #1 b.7. LYDIA 7 (508298) 345.0 kV to WELSH 7 (508359) 345.0 kV Transmission Circuit #1 b.8. NWTXARK7 (508072) 345.0 kV to LYDIA 7 (508298) 345.0 kV Transmission Circuit #1

Fault ID	Planning Event	Fault Description
GROUP4_P4_LOCAL_FAULT_176	P4	Single Phase Fault with Stuck Breaker on VALIANT7 345.00 (510911) 345 kV Bus a. Apply Fault at the VALIANT7 345.00 (510911) 345 kV Bus b. Clear Fault after 16 cycles and trip the following elements: b.1. LYDIA 7 (508298) 345.0 kV to VALIANT7 (510911) 345.0 kV Transmission Circuit #1 b.2. PITTSB-7 (510907) 345.0 kV to VALIANT7 (510911) 345.0 kV Transmission Circuit #1 b.3. VALIANT7 (510911) 345.0 kV to HUGO 7 (521157) 345.0 kV Transmission Circuit #1 b.4. VALIANT7 (510911) 345.0 kV to G20-020-TAP (764520) 345.0 kV Transmission Circuit #1 b.5. VALIANT7 (510911) 345.0 kV to VALIANT4 (510918) 138.0 kV to VALN2-1 (510938) 13.8 kV Three Winding #2 b.6. VALIANT7 (510911) 345.0 kV to VALIANT4 (510918) 138.0 kV to VALN3-1 (510939) 13.8 kV Three Winding #1 b.7. LYDIA 7 (508298) 345.0 kV to WELSH 7 (508359) 345.0 kV Transmission Circuit #1 b.8. NWTXARK7 (508072) 345.0 kV to LYDIA 7 (508298) 345.0 kV Transmission Circuit #1
GROUP4_P4_LOCAL_FAULT_177	P4	Single Phase Fault with Stuck Breaker on VALIANT7 345.00 (510911) 345 kV Bus a. Apply Fault at the VALIANT7 345.00 (510911) 345 kV Bus b. Clear Fault after 16 cycles and trip the following elements: b.1. LYDIA 7 (508298) 345.0 kV to VALIANT7 (510911) 345.0 kV Transmission Circuit #1 b.2. PITTSB-7 (510907) 345.0 kV to VALIANT7 (510911) 345.0 kV Transmission Circuit #1 b.3. VALIANT7 (510911) 345.0 kV to HUGO 7 (521157) 345.0 kV Transmission Circuit #1 b.4. VALIANT7 (510911) 345.0 kV to G20-020-TAP (764520) 345.0 kV Transmission Circuit #1 b.5. VALIANT7 (510911) 345.0 kV to VALIANT4 (510918) 138.0 kV to VALN2-1 (510938) 13.8 kV Three Winding #2 b.6. VALIANT7 (510911) 345.0 kV to VALIANT4 (510918) 138.0 kV to VALN3-1 (510939) 13.8 kV Three Winding #1 b.7. LYDIA 7 (508298) 345.0 kV to WELSH 7 (508359) 345.0 kV Transmission Circuit #1 b.8. NWTXARK7 (508072) 345.0 kV to LYDIA 7 (508298) 345.0 kV Transmission Circuit #1

Fault ID	Planning Event	Fault Description
GROUP4_P4_LOCAL_FAULT_178	P4	Single Phase Fault with Stuck Breaker on VALIANT7 345.00 (510911) 345 kV Bus a. Apply Fault at the VALIANT7 345.00 (510911) 345 kV Bus b. Clear Fault after 16 cycles and trip the following elements: b.1. LYDIA 7 (508298) 345.0 kV to VALIANT7 (510911) 345.0 kV Transmission Circuit #1 b.2. PITTSB-7 (510907) 345.0 kV to VALIANT7 (510911) 345.0 kV Transmission Circuit #1 b.3. VALIANT7 (510911) 345.0 kV to HUGO 7 (521157) 345.0 kV Transmission Circuit #1 b.4. VALIANT7 (510911) 345.0 kV to G20-020-TAP (764520) 345.0 kV Transmission Circuit #1 b.5. VALIANT7 (510911) 345.0 kV to VALIANT4 (510918) 138.0 kV to VALN2-1 (510938) 13.8 kV Three Winding #2 b.6. VALIANT7 (510911) 345.0 kV to VALIANT4 (510918) 138.0 kV to VALN3-1 (510939) 13.8 kV Three Winding #1 b.7. LYDIA 7 (508298) 345.0 kV to WELSH 7 (508359) 345.0 kV Transmission Circuit #1 b.8. NWTXARK7 (508072) 345.0 kV to LYDIA 7 (508298) 345.0 kV Transmission Circuit #1
GROUP4_P4_LOCAL_FAULT_179	P4	Single Phase Fault with Stuck Breaker on VALIANT7 345.00 (510911) 345 kV Bus a. Apply Fault at the VALIANT7 345.00 (510911) 345 kV Bus b. Clear Fault after 16 cycles and trip the following elements: b.1. LYDIA 7 (508298) 345.0 kV to VALIANT7 (510911) 345.0 kV Transmission Circuit #1 b.2. PITTSB-7 (510907) 345.0 kV to VALIANT7 (510911) 345.0 kV Transmission Circuit #1 b.3. VALIANT7 (510911) 345.0 kV to HUGO 7 (521157) 345.0 kV Transmission Circuit #1 b.4. VALIANT7 (510911) 345.0 kV to G20-020-TAP (764520) 345.0 kV Transmission Circuit #1 b.5. VALIANT7 (510911) 345.0 kV to VALIANT4 (510918) 138.0 kV to VALN2-1 (510938) 13.8 kV Three Winding #2 b.6. VALIANT7 (510911) 345.0 kV to VALIANT4 (510918) 138.0 kV to VALN3-1 (510939) 13.8 kV Three Winding #1 b.7. LYDIA 7 (508298) 345.0 kV to WELSH 7 (508359) 345.0 kV Transmission Circuit #1 b.8. NWTXARK7 (508072) 345.0 kV to LYDIA 7 (508298) 345.0 kV Transmission Circuit #1

Fault ID	Planning Event	Fault Description
GROUP4_P4_LOCAL_FAULT_180	P4	Single Phase Fault with Stuck Breaker on VALIANT7 345.00 (510911) 345 kV Bus a. Apply Fault at the VALIANT7 345.00 (510911) 345 kV Bus b. Clear Fault after 16 cycles and trip the following elements: b.1. LYDIA 7 (508298) 345.0 kV to VALIANT7 (510911) 345.0 kV Transmission Circuit #1 b.2. PITTSB-7 (510907) 345.0 kV to VALIANT7 (510911) 345.0 kV Transmission Circuit #1 b.3. VALIANT7 (510911) 345.0 kV to HUGO 7 (521157) 345.0 kV Transmission Circuit #1 b.4. VALIANT7 (510911) 345.0 kV to G20-020-TAP (764520) 345.0 kV Transmission Circuit #1 b.5. VALIANT7 (510911) 345.0 kV to VALIANT4 (510918) 138.0 kV to VALN2-1 (510938) 13.8 kV Three Winding #2 b.6. VALIANT7 (510911) 345.0 kV to VALIANT4 (510918) 138.0 kV to VALN3-1 (510939) 13.8 kV Three Winding #1 b.7. LYDIA 7 (508298) 345.0 kV to WELSH 7 (508359) 345.0 kV Transmission Circuit #1 b.8. NWTXARK7 (508072) 345.0 kV to LYDIA 7 (508298) 345.0 kV Transmission Circuit #1
GROUP4_P4_LOCAL_FAULT_181	P4	Single Phase Fault with Stuck Breaker on VALIANT7 345.00 (510911) 345 kV Bus a. Apply Fault at the VALIANT7 345.00 (510911) 345 kV Bus b. Clear Fault after 16 cycles and trip the following elements: b.1. LYDIA 7 (508298) 345.0 kV to VALIANT7 (510911) 345.0 kV Transmission Circuit #1 b.2. PITTSB-7 (510907) 345.0 kV to VALIANT7 (510911) 345.0 kV Transmission Circuit #1 b.3. VALIANT7 (510911) 345.0 kV to HUGO 7 (521157) 345.0 kV Transmission Circuit #1 b.4. VALIANT7 (510911) 345.0 kV to G20-020-TAP (764520) 345.0 kV Transmission Circuit #1 b.5. VALIANT7 (510911) 345.0 kV to VALIANT4 (510918) 138.0 kV to VALN2-1 (510938) 13.8 kV Three Winding #2 b.6. VALIANT7 (510911) 345.0 kV to VALIANT4 (510918) 138.0 kV to VALN3-1 (510939) 13.8 kV Three Winding #1 b.7. LYDIA 7 (508298) 345.0 kV to WELSH 7 (508359) 345.0 kV Transmission Circuit #1 b.8. NWTXARK7 (508072) 345.0 kV to LYDIA 7 (508298) 345.0 kV Transmission Circuit #1

Fault ID	Planning Event	Fault Description
GROUP4_P4_LOCAL_FAULT_182	P4	Single Phase Fault with Stuck Breaker on VALIANT7 345.00 (510911) 345 kV Bus a. Apply Fault at the VALIANT7 345.00 (510911) 345 kV Bus b. Clear Fault after 16 cycles and trip the following elements: b.1. LYDIA 7 (508298) 345.0 kV to VALIANT7 (510911) 345.0 kV Transmission Circuit #1 b.2. PITTSB-7 (510907) 345.0 kV to VALIANT7 (510911) 345.0 kV Transmission Circuit #1 b.3. VALIANT7 (510911) 345.0 kV to HUGO 7 (521157) 345.0 kV Transmission Circuit #1 b.4. VALIANT7 (510911) 345.0 kV to G20-020-TAP (764520) 345.0 kV Transmission Circuit #1 b.5. VALIANT7 (510911) 345.0 kV to VALIANT4 (510918) 138.0 kV to VALN2-1 (510938) 13.8 kV Three Winding #2 b.6. VALIANT7 (510911) 345.0 kV to VALIANT4 (510918) 138.0 kV to VALN3-1 (510939) 13.8 kV Three Winding #1 b.7. LYDIA 7 (508298) 345.0 kV to WELSH 7 (508359) 345.0 kV Transmission Circuit #1 b.8. NWTXARK7 (508072) 345.0 kV to LYDIA 7 (508298) 345.0 kV Transmission Circuit #1
GROUP4_P4_LOCAL_FAULT_183	P4	Single Phase Fault with Stuck Breaker on VALIANT7 345.00 (510911) 345 kV Bus a. Apply Fault at the VALIANT7 345.00 (510911) 345 kV Bus b. Clear Fault after 16 cycles and trip the following elements: b.1. LYDIA 7 (508298) 345.0 kV to VALIANT7 (510911) 345.0 kV Transmission Circuit #1 b.2. PITTSB-7 (510907) 345.0 kV to VALIANT7 (510911) 345.0 kV Transmission Circuit #1 b.3. VALIANT7 (510911) 345.0 kV to HUGO 7 (521157) 345.0 kV Transmission Circuit #1 b.4. VALIANT7 (510911) 345.0 kV to G20-020-TAP (764520) 345.0 kV Transmission Circuit #1 b.5. VALIANT7 (510911) 345.0 kV to VALIANT4 (510918) 138.0 kV to VALN2-1 (510938) 13.8 kV Three Winding #2 b.6. VALIANT7 (510911) 345.0 kV to VALIANT4 (510918) 138.0 kV to VALN3-1 (510939) 13.8 kV Three Winding #1 b.7. LYDIA 7 (508298) 345.0 kV to WELSH 7 (508359) 345.0 kV Transmission Circuit #1 b.8. NWTXARK7 (508072) 345.0 kV to LYDIA 7 (508298) 345.0 kV Transmission Circuit #1

Fault ID	Planning Event	Fault Description
GROUP4_P4_LOCAL_FAULT_184	P4	Single Phase Fault with Stuck Breaker on VALIANT7 345.00 (510911) 345 kV Bus a. Apply Fault at the VALIANT7 345.00 (510911) 345 kV Bus b. Clear Fault after 16 cycles and trip the following elements: b.1. LYDIA 7 (508298) 345.0 kV to VALIANT7 (510911) 345.0 kV Transmission Circuit #1 b.2. PITTSB-7 (510907) 345.0 kV to VALIANT7 (510911) 345.0 kV Transmission Circuit #1 b.3. VALIANT7 (510911) 345.0 kV to HUGO 7 (521157) 345.0 kV Transmission Circuit #1 b.4. VALIANT7 (510911) 345.0 kV to G20-020-TAP (764520) 345.0 kV Transmission Circuit #1 b.5. VALIANT7 (510911) 345.0 kV to VALIANT4 (510918) 138.0 kV to VALN2-1 (510938) 13.8 kV Three Winding #2 b.6. VALIANT7 (510911) 345.0 kV to VALIANT4 (510918) 138.0 kV to VALN3-1 (510939) 13.8 kV Three Winding #1 b.7. LYDIA 7 (508298) 345.0 kV to WELSH 7 (508359) 345.0 kV Transmission Circuit #1 b.8. NWTXARK7 (508072) 345.0 kV to LYDIA 7 (508298) 345.0 kV Transmission Circuit #1
GROUP4_P4_LOCAL_FAULT_185	P4	Single Phase Fault with Stuck Breaker on VALIANT7 345.00 (510911) 345 kV Bus a. Apply Fault at the VALIANT7 345.00 (510911) 345 kV Bus b. Clear Fault after 16 cycles and trip the following elements: b.1. LYDIA 7 (508298) 345.0 kV to VALIANT7 (510911) 345.0 kV Transmission Circuit #1 b.2. PITTSB-7 (510907) 345.0 kV to VALIANT7 (510911) 345.0 kV Transmission Circuit #1 b.3. VALIANT7 (510911) 345.0 kV to HUGO 7 (521157) 345.0 kV Transmission Circuit #1 b.4. VALIANT7 (510911) 345.0 kV to G20-020-TAP (764520) 345.0 kV Transmission Circuit #1 b.5. VALIANT7 (510911) 345.0 kV to VALIANT4 (510918) 138.0 kV to VALN2-1 (510938) 13.8 kV Three Winding #2 b.6. VALIANT7 (510911) 345.0 kV to VALIANT4 (510918) 138.0 kV to VALN3-1 (510939) 13.8 kV Three Winding #1 b.7. LYDIA 7 (508298) 345.0 kV to WELSH 7 (508359) 345.0 kV Transmission Circuit #1 b.8. NWTXARK7 (508072) 345.0 kV to LYDIA 7 (508298) 345.0 kV Transmission Circuit #1

Fault ID	Planning Event	Fault Description
GROUP4_P4_LOCAL_FAULT_186	P4	Single Phase Fault with Stuck Breaker on VALIANT7 345.00 (510911) 345 kV Bus a. Apply Fault at the VALIANT7 345.00 (510911) 345 kV Bus b. Clear Fault after 16 cycles and trip the following elements: b.1. LYDIA 7 (508298) 345.0 kV to VALIANT7 (510911) 345.0 kV Transmission Circuit #1 b.2. PITTSB-7 (510907) 345.0 kV to VALIANT7 (510911) 345.0 kV Transmission Circuit #1 b.3. VALIANT7 (510911) 345.0 kV to HUGO 7 (521157) 345.0 kV Transmission Circuit #1 b.4. VALIANT7 (510911) 345.0 kV to G20-020-TAP (764520) 345.0 kV Transmission Circuit #1 b.5. VALIANT7 (510911) 345.0 kV to VALIANT4 (510918) 138.0 kV to VALN2-1 (510938) 13.8 kV Three Winding #2 b.6. VALIANT7 (510911) 345.0 kV to VALIANT4 (510918) 138.0 kV to VALN3-1 (510939) 13.8 kV Three Winding #1 b.7. LYDIA 7 (508298) 345.0 kV to WELSH 7 (508359) 345.0 kV Transmission Circuit #1 b.8. NWTXARK7 (508072) 345.0 kV to LYDIA 7 (508298) 345.0 kV Transmission Circuit #1
GROUP4_P4_LOCAL_FAULT_187	P4	Single Phase Fault with Stuck Breaker on VALIANT7 345.00 (510911) 345 kV Bus a. Apply Fault at the VALIANT7 345.00 (510911) 345 kV Bus b. Clear Fault after 16 cycles and trip the following elements: b.1. LYDIA 7 (508298) 345.0 kV to VALIANT7 (510911) 345.0 kV Transmission Circuit #1 b.2. PITTSB-7 (510907) 345.0 kV to VALIANT7 (510911) 345.0 kV Transmission Circuit #1 b.3. VALIANT7 (510911) 345.0 kV to HUGO 7 (521157) 345.0 kV Transmission Circuit #1 b.4. VALIANT7 (510911) 345.0 kV to G20-020-TAP (764520) 345.0 kV Transmission Circuit #1 b.5. VALIANT7 (510911) 345.0 kV to VALIANT4 (510918) 138.0 kV to VALN2-1 (510938) 13.8 kV Three Winding #2 b.6. VALIANT7 (510911) 345.0 kV to VALIANT4 (510918) 138.0 kV to VALN3-1 (510939) 13.8 kV Three Winding #1 b.7. LYDIA 7 (508298) 345.0 kV to WELSH 7 (508359) 345.0 kV Transmission Circuit #1 b.8. NWTXARK7 (508072) 345.0 kV to LYDIA 7 (508298) 345.0 kV Transmission Circuit #1

Fault ID	Planning Event	Fault Description
GROUP4_P4_LOCAL_FAULT_188	P4	Single Phase Fault with Stuck Breaker on VALIANT7 345.00 (510911) 345 kV Bus a. Apply Fault at the VALIANT7 345.00 (510911) 345 kV Bus b. Clear Fault after 16 cycles and trip the following elements: b.1. LYDIA 7 (508298) 345.0 kV to VALIANT7 (510911) 345.0 kV Transmission Circuit #1 b.2. PITTSB-7 (510907) 345.0 kV to VALIANT7 (510911) 345.0 kV Transmission Circuit #1 b.3. VALIANT7 (510911) 345.0 kV to HUGO 7 (521157) 345.0 kV Transmission Circuit #1 b.4. VALIANT7 (510911) 345.0 kV to G20-020-TAP (764520) 345.0 kV Transmission Circuit #1 b.5. VALIANT7 (510911) 345.0 kV to VALIANT4 (510918) 138.0 kV to VALN2-1 (510938) 13.8 kV Three Winding #2 b.6. VALIANT7 (510911) 345.0 kV to VALIANT4 (510918) 138.0 kV to VALN3-1 (510939) 13.8 kV Three Winding #1 b.7. LYDIA 7 (508298) 345.0 kV to WELSH 7 (508359) 345.0 kV Transmission Circuit #1 b.8. NWTXARK7 (508072) 345.0 kV to LYDIA 7 (508298) 345.0 kV Transmission Circuit #1
GROUP4_P4_LOCAL_FAULT_189	P4	Single Phase Fault with Stuck Breaker on VALIANT7 345.00 (510911) 345 kV Bus a. Apply Fault at the VALIANT7 345.00 (510911) 345 kV Bus b. Clear Fault after 16 cycles and trip the following elements: b.1. LYDIA 7 (508298) 345.0 kV to VALIANT7 (510911) 345.0 kV Transmission Circuit #1 b.2. PITTSB-7 (510907) 345.0 kV to VALIANT7 (510911) 345.0 kV Transmission Circuit #1 b.3. VALIANT7 (510911) 345.0 kV to HUGO 7 (521157) 345.0 kV Transmission Circuit #1 b.4. VALIANT7 (510911) 345.0 kV to G20-020-TAP (764520) 345.0 kV Transmission Circuit #1 b.5. VALIANT7 (510911) 345.0 kV to VALIANT4 (510918) 138.0 kV to VALN2-1 (510938) 13.8 kV Three Winding #2 b.6. VALIANT7 (510911) 345.0 kV to VALIANT4 (510918) 138.0 kV to VALN3-1 (510939) 13.8 kV Three Winding #1 b.7. LYDIA 7 (508298) 345.0 kV to WELSH 7 (508359) 345.0 kV Transmission Circuit #1 b.8. NWTXARK7 (508072) 345.0 kV to LYDIA 7 (508298) 345.0 kV Transmission Circuit #1

Fault ID	Planning Event	Fault Description
GROUP4_P4_LOCAL_FAULT_190	P4	Single Phase Fault with Stuck Breaker on VALIANT7 345.00 (510911) 345 kV Bus a. Apply Fault at the VALIANT7 345.00 (510911) 345 kV Bus b. Clear Fault after 16 cycles and trip the following elements: b.1. LYDIA 7 (508298) 345.0 kV to VALIANT7 (510911) 345.0 kV Transmission Circuit #1 b.2. PITTSB-7 (510907) 345.0 kV to VALIANT7 (510911) 345.0 kV Transmission Circuit #1 b.3. VALIANT7 (510911) 345.0 kV to HUGO 7 (521157) 345.0 kV Transmission Circuit #1 b.4. VALIANT7 (510911) 345.0 kV to G20-020-TAP (764520) 345.0 kV Transmission Circuit #1 b.5. VALIANT7 (510911) 345.0 kV to VALIANT4 (510918) 138.0 kV to VALN2-1 (510938) 13.8 kV Three Winding #2 b.6. VALIANT7 (510911) 345.0 kV to VALIANT4 (510918) 138.0 kV to VALN3-1 (510939) 13.8 kV Three Winding #1 b.7. LYDIA 7 (508298) 345.0 kV to WELSH 7 (508359) 345.0 kV Transmission Circuit #1 b.8. NWTXARK7 (508072) 345.0 kV to LYDIA 7 (508298) 345.0 kV Transmission Circuit #1
GROUP4_P4_LOCAL_FAULT_191	P4	Single Phase Fault with Stuck Breaker on VALIANT7 345.00 (510911) 345 kV Bus a. Apply Fault at the VALIANT7 345.00 (510911) 345 kV Bus b. Clear Fault after 16 cycles and trip the following elements: b.1. LYDIA 7 (508298) 345.0 kV to VALIANT7 (510911) 345.0 kV Transmission Circuit #1 b.2. PITTSB-7 (510907) 345.0 kV to VALIANT7 (510911) 345.0 kV Transmission Circuit #1 b.3. VALIANT7 (510911) 345.0 kV to HUGO 7 (521157) 345.0 kV Transmission Circuit #1 b.4. VALIANT7 (510911) 345.0 kV to G20-020-TAP (764520) 345.0 kV Transmission Circuit #1 b.5. VALIANT7 (510911) 345.0 kV to VALIANT4 (510918) 138.0 kV to VALN2-1 (510938) 13.8 kV Three Winding #2 b.6. VALIANT7 (510911) 345.0 kV to VALIANT4 (510918) 138.0 kV to VALN3-1 (510939) 13.8 kV Three Winding #1 b.7. LYDIA 7 (508298) 345.0 kV to WELSH 7 (508359) 345.0 kV Transmission Circuit #1 b.8. NWTXARK7 (508072) 345.0 kV to LYDIA 7 (508298) 345.0 kV Transmission Circuit #1

Fault ID	Planning Event	Fault Description
GROUP4_P4_LOCAL_FAULT_192	P4	Single Phase Fault with Stuck Breaker on VALIANT7 345.00 (510911) 345 kV Bus a. Apply Fault at the VALIANT7 345.00 (510911) 345 kV Bus b. Clear Fault after 16 cycles and trip the following elements: b.1. LYDIA 7 (508298) 345.0 kV to VALIANT7 (510911) 345.0 kV Transmission Circuit #1 b.2. PITTSB-7 (510907) 345.0 kV to VALIANT7 (510911) 345.0 kV Transmission Circuit #1 b.3. VALIANT7 (510911) 345.0 kV to HUGO 7 (521157) 345.0 kV Transmission Circuit #1 b.4. VALIANT7 (510911) 345.0 kV to G20-020-TAP (764520) 345.0 kV Transmission Circuit #1 b.5. VALIANT7 (510911) 345.0 kV to VALIANT4 (510918) 138.0 kV to VALN2-1 (510938) 13.8 kV Three Winding #2 b.6. VALIANT7 (510911) 345.0 kV to VALIANT4 (510918) 138.0 kV to VALN3-1 (510939) 13.8 kV Three Winding #1 b.7. LYDIA 7 (508298) 345.0 kV to WELSH 7 (508359) 345.0 kV Transmission Circuit #1 b.8. NWTXARK7 (508072) 345.0 kV to LYDIA 7 (508298) 345.0 kV Transmission Circuit #1
GROUP4_P4_LOCAL_FAULT_193	P4	Single Phase Fault with Stuck Breaker on VALIANT7 345.00 (510911) 345 kV Bus a. Apply Fault at the VALIANT7 345.00 (510911) 345 kV Bus b. Clear Fault after 16 cycles and trip the following elements: b.1. LYDIA 7 (508298) 345.0 kV to VALIANT7 (510911) 345.0 kV Transmission Circuit #1 b.2. PITTSB-7 (510907) 345.0 kV to VALIANT7 (510911) 345.0 kV Transmission Circuit #1 b.3. VALIANT7 (510911) 345.0 kV to HUGO 7 (521157) 345.0 kV Transmission Circuit #1 b.4. VALIANT7 (510911) 345.0 kV to G20-020-TAP (764520) 345.0 kV Transmission Circuit #1 b.5. VALIANT7 (510911) 345.0 kV to VALIANT4 (510918) 138.0 kV to VALN2-1 (510938) 13.8 kV Three Winding #2 b.6. VALIANT7 (510911) 345.0 kV to VALIANT4 (510918) 138.0 kV to VALN3-1 (510939) 13.8 kV Three Winding #1 b.7. LYDIA 7 (508298) 345.0 kV to WELSH 7 (508359) 345.0 kV Transmission Circuit #1 b.8. NWTXARK7 (508072) 345.0 kV to LYDIA 7 (508298) 345.0 kV Transmission Circuit #1
GROUP4_P4_LOCAL_FAULT_194	P4	Single Phase Fault with Stuck Breaker on TERRYRD7 345.00 (511568) 345 kV Bus a. Apply Fault at the TERRYRD7 345.00 (511568) 345 kV Bus b. Clear Fault after 16 cycles and trip the following elements: b.1. TERRYRD7 (511568) 345.0 kV to G17-171-TAP (760938) 345.0 kV Transmission Circuit #1 b.2. TERRYRD7 (511568) 345.0 kV to G20-074-TAP (764115) 345.0 kV Transmission Circuit #1

Fault ID	Planning Event	Fault Description
GROUP4_P4_LOCAL_FAULT_195	P4	Single Phase Fault with Stuck Breaker on G20-074-TAP 345.00 (764115) 345 kV Bus a. Apply Fault at the G20-074-TAP 345.00 (764115) 345 kV Bus b. Clear Fault after 16 cycles and trip the following elements: b.1. G20-074-TAP (764115) 345.0 kV to TERRYRD7 (511568) 345.0 kV Transmission Circuit #1 b.2. G20-074-TAP (764115) 345.0 kV to GEN-2020-074 (764105) 345.0 kV Transmission Circuit #1
GROUP4_P4_LOCAL_FAULT_196	P4	Single Phase Fault with Stuck Breaker on SUNNYSD7 345.00 (515136) 345 kV Bus a. Apply Fault at the SUNNYSD7 345.00 (515136) 345 kV Bus b. Clear Fault after 16 cycles and trip the following elements: b.1. SUNNYSD7 (515136) 345.0 kV to G17-075-TAP (560088) 345.0 kV Transmission Circuit #1 b.2. SUNNYSD7 (515136) 345.0 kV to SUNNYSD4 (515135) 138.0 kV to SUNYSD 1 (515405) 13.8 kV Three Winding #1
GROUP4_P4_LOCAL_FAULT_197	P4	Single Phase Fault with Stuck Breaker on G17-075-TAP 345.00 (560088) 345 kV Bus a. Apply Fault at the G17-075-TAP 345.00 (560088) 345 kV Bus b. Clear Fault after 16 cycles and trip the following elements: b.1. G17-075-TAP (560088) 345.0 kV to SUNNYSD7 (515136) 345.0 kV Transmission Circuit #1 b.2. G17-075-TAP (560088) 345.0 kV to GEN-2022-098 (768941) 345.0 kV Transmission Circuit #1
GROUP4_P4_LOCAL_FAULT_198	P4	Single Phase Fault with Stuck Breaker on HUGO 7 345.00 (521157) 345 kV Bus a. Apply Fault at the HUGO 7 345.00 (521157) 345 kV Bus b. Clear Fault after 16 cycles and trip the following elements: b.1. HUGO 7 (521157) 345.0 kV to HUGOITC4 (520560) 138.0 kV to HUGO TERTA (521189) 13.8 kV Three Winding #1 b.2. HUGO 7 (521157) 345.0 kV to VALIANT7 (510911) 345.0 kV Transmission Circuit #1
GROUP4_P4_LOCAL_FAULT_199	P4	Single Phase Fault with Stuck Breaker on SUNNYSD7 345.00 (515136) 345 kV Bus a. Apply Fault at the SUNNYSD7 345.00 (515136) 345 kV Bus b. Clear Fault after 16 cycles and trip the following elements: b.1. SUNNYSD4 (515135) 138.0 kV to SUNNYSD7 (515136) 345.0 kV to SUNYSD 1 (515405) 13.8 kV Three Winding #1 b.2. SUNNYSD4 (515135) 138.0 kV to SUNNYSD7 (515136) 345.0 kV to SUNNYSD1 (515762) 13.8 kV Three Winding #1
GROUP4_P4_LOCAL_FAULT_200	P4	Single Phase Fault with Stuck Breaker on G21-016-TAP 345.00 (765451) 345 kV Bus a. Apply Fault at the G21-016-TAP 345.00 (765451) 345 kV Bus b. Clear Fault after 16 cycles and trip the following elements: b.1. G21-016-TAP (765451) 345.0 kV to GEN-2021-016 (765450) 345.0 kV Transmission Circuit #1 b.2. G21-016-TAP (765451) 345.0 kV to SUNNYSD7 (515136) 345.0 kV Transmission Circuit #1

Fault ID	Planning Event	Fault Description
GROUP4_P4_LOCAL_FAULT_201	P4	Single Phase Fault with Stuck Breaker on JOHNCO 7 345.00 (514809) 345 kV Bus a. Apply Fault at the JOHNCO 7 345.00 (514809) 345 kV Bus b. Clear Fault after 16 cycles and trip the following elements: b.1. JOHNCO 7 (514809) 345.0 kV to PITTSB-7 (510907) 345.0 kV Transmission Circuit #1 b.2. JOHNCO 7 (514809) 345.0 kV to DMNDSPG7 (516006) 345.0 kV Transmission Circuit #1
GROUP4_P4_LOCAL_FAULT_202	P4	Single Phase Fault with Stuck Breaker on G17-171-TAP 345.00 (760938) 345 kV Bus a. Apply Fault at the G17-171-TAP 345.00 (760938) 345 kV Bus b. Clear Fault after 16 cycles and trip the following elements: b.1. G17-171-TAP (760938) 345.0 kV to L.E.S.-7 (511468) 345.0 kV Transmission Circuit #1 b.2. G17-171-TAP (760938) 345.0 kV to TERRYRD7 (511568) 345.0 kV Transmission Circuit #1
GROUP4_P4_LOCAL_FAULT_203	P4	Single Phase Fault with Stuck Breaker on L.E.S.-7 345.00 (511468) 345 kV Bus a. Apply Fault at the L.E.S.-7 345.00 (511468) 345 kV Bus b. Clear Fault after 16 cycles and trip the following elements: b.1. L.E.S.-7 (511468) 345.0 kV to G17-171-TAP (760938) 345.0 kV Transmission Circuit #1 b.2. L.E.S.-7 (511468) 345.0 kV to O.K.U.-7 (511456) 345.0 kV Transmission Circuit #1
GROUP4_P4_LOCAL_FAULT_204	P4	Single Phase Fault with Stuck Breaker on G20-087-TAP 345.00 (764550) 345 kV Bus a. Apply Fault at the G20-087-TAP 345.00 (764550) 345 kV Bus b. Clear Fault after 16 cycles and trip the following elements: b.1. G20-087-TAP (764550) 345.0 kV to TREASILD7 (511409) 345.0 kV Transmission Circuit #1 b.2. G20-087-TAP (764550) 345.0 kV to GEN-2020-087 (764555) 345.0 kV Transmission Circuit #1
GROUP4_P4_LOCAL_FAULT_205	P4	Single Phase Fault with Stuck Breaker on TREASILD7 345.00 (511409) 345 kV Bus a. Apply Fault at the TREASILD7 345.00 (511409) 345 kV Bus b. Clear Fault after 16 cycles and trip the following elements: b.1. TREASILD7 (511409) 345.0 kV to GRACMNT7 (515800) 345.0 kV Transmission Circuit #1 b.2. TREASILD7 (511409) 345.0 kV to G20-087-TAP (764550) 345.0 kV Transmission Circuit #1
GROUP4_P4_LOCAL_FAULT_206	P4	Single Phase Fault with Stuck Breaker on L.E.S.-7 345.00 (511468) 345 kV Bus a. Apply Fault at the L.E.S.-7 345.00 (511468) 345 kV Bus b. Clear Fault after 16 cycles and trip the following elements: b.1. L.E.S.-4 (511467) 138.0 kV to L.E.S.-7 (511468) 345.0 kV to LES#5-1 (511411) 13.8 kV Three Winding #2 b.2. L.E.S.-4 (511467) 138.0 kV to SHERID4 (511474) 138.0 kV Transmission Circuit #1

Fault ID	Planning Event	Fault Description
GROUP4_P4_LOCAL_FAULT_207	P4	Single Phase Fault with Stuck Breaker on O.K.U.-7 345.00 (511456) 345 kV Bus a. Apply Fault at the O.K.U.-7 345.00 (511456) 345 kV Bus b. Clear Fault after 16 cycles and trip the following elements: b.1. O.K.U.-7 (511456) 345.0 kV to G18-015-TAP (762467) 345.0 kV Transmission Circuit #1 b.2. O.K.U.-7 (511456) 345.0 kV to L.E.S.-7 (511468) 345.0 kV Transmission Circuit #1
GROUP4_P4_LOCAL_FAULT_208	P4	Single Phase Fault with Stuck Breaker on ELKCITY6 230.0 (511490) 230 kV Bus a. Apply Fault at the ELKCITY6 230.0 (511490) 230 kV Bus b. Clear Fault after 16 cycles and trip the following elements: b.1. ELKCITY6 (511490) 230.0 kV to Remove Bus #
GROUP4_P4_LOCAL_FAULT_209	P4	Single Phase Fault with Stuck Breaker on SWEETWT6 230.0 (511541) 230 kV Bus a. Apply Fault at the SWEETWT6 230.0 (511541) 230 kV Bus b. Clear Fault after 16 cycles and trip the following elements: b.1. SWEETWT6 (511541) 230.0 kV to Remove Bus #
GROUP4_P4_LOCAL_FAULT_210	P4	Single Phase Fault with Stuck Breaker on CHISHOLM7 345.0 (511553) 345 kV Bus a. Apply Fault at the CHISHOLM7 345.0 (511553) 345 kV Bus b. Clear Fault after 16 cycles and trip the following elements: b.1. CHISHOLM7 (511553) 345.0 kV to Remove Bus #
GROUP4_P4_LOCAL_FAULT_211	P4	Single Phase Fault with Stuck Breaker on CHISHOLM6 230.0 (511557) 230 kV Bus a. Apply Fault at the CHISHOLM6 230.0 (511557) 230 kV Bus b. Clear Fault after 16 cycles and trip the following elements: b.1. CHISHOLM6 (511557) 230.0 kV to Remove Bus #
GROUP4_P4_LOCAL_FAULT_212	P4	Single Phase Fault with Stuck Breaker on WWRDEHV7 345.0 (515375) 345 kV Bus a. Apply Fault at the WWRDEHV7 345.0 (515375) 345 kV Bus b. Clear Fault after 16 cycles and trip the following elements: b.1. WWRDEHV7 (515375) 345.0 kV to Remove Bus #
GROUP4_P4_LOCAL_FAULT_213	P4	Single Phase Fault with Stuck Breaker on BORDER 7 345.0 (515458) 345 kV Bus a. Apply Fault at the BORDER 7 345.0 (515458) 345 kV Bus b. Clear Fault after 16 cycles and trip the following elements: b.1. BORDER 7 (515458) 345.0 kV to Remove Bus #
GROUP4_P4_LOCAL_FAULT_214	P4	Single Phase Fault with Stuck Breaker on BECKHAM7 345.0 (516059) 345 kV Bus a. Apply Fault at the BECKHAM7 345.0 (516059) 345 kV Bus b. Clear Fault after 16 cycles and trip the following elements: b.1. BECKHAM7 (516059) 345.0 kV to Remove Bus #
GROUP4_P4_LOCAL_FAULT_215	P4	Single Phase Fault with Stuck Breaker on GRAPEVINE 6 230.0 (523771) 230 kV Bus a. Apply Fault at the GRAPEVINE 6 230.0 (523771) 230 kV Bus b. Clear Fault after 16 cycles and trip the following elements: b.1. GRAPEVINE 6 (523771) 230.0 kV to Remove Bus #
GROUP4_P4_LOCAL_FAULT_216	P4	Single Phase Fault with Stuck Breaker on WHEELER 3 115.0 (523776) 115 kV Bus a. Apply Fault at the WHEELER 3 115.0 (523776) 115 kV Bus b. Clear Fault after 16 cycles and trip the following elements: b.1. WHEELER 3 (523776) 115.0 kV to Remove Bus #

Fault ID	Planning Event	Fault Description
GROUP4_P4_LOCAL_FAULT_217	P4	Single Phase Fault with Stuck Breaker on WHEELER 6 230.0 (523777) 230 kV Bus a. Apply Fault at the WHEELER 6 230.0 (523777) 230 kV Bus b. Clear Fault after 16 cycles and trip the following elements: b.1. WHEELER 6 (523777) 230.0 kV to Remove Bus #
GROUP4_P4_LOCAL_FAULT_218	P4	Single Phase Fault with Stuck Breaker on POTTER_CO 7 345.0 (523961) 345 kV Bus a. Apply Fault at the POTTER_CO 7 345.0 (523961) 345 kV Bus b. Clear Fault after 16 cycles and trip the following elements: b.1. POTTER_CO 7 (523961) 345.0 kV to Remove Bus #
GROUP4_P4_LOCAL_FAULT_219	P4	Single Phase Fault with Stuck Breaker on G16-037-TAP 345.0 (560078) 345 kV Bus a. Apply Fault at the G16-037-TAP 345.0 (560078) 345 kV Bus b. Clear Fault after 16 cycles and trip the following elements: b.1. G16-037-TAP (560078) 345.0 kV to Remove Bus #

Appendix E: GEN-2018-055 Dynamic Stability results

Fault ID	25SP			25WP		
	Volt Violation	Volt Recovery	Stable	Volt Violation	Volt Recovery	Stable
GROUP4_P1_LOCAL_FAULT_001	Pass	Pass	Stable	Pass	Pass	Stable
GROUP4_P1_LOCAL_FAULT_002	Pass	Pass	Stable	Pass	Pass	Stable
GROUP4_P1_LOCAL_FAULT_003	Pass	Pass	Stable	Pass	Pass	Stable
GROUP4_P1_LOCAL_FAULT_004	Pass	Pass	Stable	Pass	Pass	Stable
GROUP4_P1_LOCAL_FAULT_005	Pass	Pass	Stable	Pass	Pass	Stable
GROUP4_P1_LOCAL_FAULT_006	Pass	Pass	Stable	Pass	Pass	Stable
GROUP4_P1_LOCAL_FAULT_007	Pass	Pass	Stable	Pass	Pass	Stable
GROUP4_P1_LOCAL_FAULT_008	Pass	Pass	Stable	Pass	Pass	Stable
GROUP4_P1_LOCAL_FAULT_009	Pass	Pass	Stable	Pass	Pass	Stable
GROUP4_P1_LOCAL_FAULT_010	Pass	Pass	Stable	Pass	Pass	Stable
GROUP4_P1_LOCAL_FAULT_011	Pass	Pass	Stable	Pass	Pass	Stable
GROUP4_P1_LOCAL_FAULT_012	Pass	Pass	Stable	Pass	Pass	Stable
GROUP4_P1_LOCAL_FAULT_013	Pass	Pass	Stable	Pass	Pass	Stable
GROUP4_P1_LOCAL_FAULT_014	Pass	Pass	Stable	Pass	Pass	Stable
GROUP4_P1_LOCAL_FAULT_015	Pass	Pass	Stable	Pass	Pass	Stable
GROUP4_P1_LOCAL_FAULT_016	Pass	Pass	Stable	Pass	Pass	Stable
GROUP4_P1_LOCAL_FAULT_017	Pass	Pass	Stable	Pass	Pass	Stable
GROUP4_P1_LOCAL_FAULT_018	Pass	Pass	Stable	Pass	Pass	Stable
GROUP4_P1_LOCAL_FAULT_019	Pass	Pass	Stable	Pass	Pass	Stable
GROUP4_P1_LOCAL_FAULT_020	Pass	Pass	Stable	Pass	Pass	Stable
GROUP4_P1_LOCAL_FAULT_021	Pass	Pass	Stable	Pass	Pass	Stable
GROUP4_P1_LOCAL_FAULT_022	Pass	Pass	Stable	Pass	Pass	Stable
GROUP4_P1_LOCAL_FAULT_023	Pass	Pass	Stable	Pass	Pass	Stable

Fault ID	25SP			25WP		
	Volt Violation	Volt Recovery	Stable	Volt Violation	Volt Recovery	Stable
GROUP4_P1_LOCAL_FAULT_024	Pass	Pass	Stable	Pass	Pass	Stable
GROUP4_P1_LOCAL_FAULT_025	Pass	Pass	Stable	Pass	Pass	Stable
GROUP4_P1_LOCAL_FAULT_026	Pass	Pass	Stable	Pass	Pass	Stable
GROUP4_P1_LOCAL_FAULT_027	Pass	Pass	Stable	Pass	Pass	Stable
GROUP4_P1_LOCAL_FAULT_028	Pass	Pass	Stable	Pass	Pass	Stable
GROUP4_P1_LOCAL_FAULT_029	Pass	Pass	Stable	Pass	Pass	Stable
GROUP4_P1_LOCAL_FAULT_030	Pass	Pass	Stable	Pass	Pass	Stable
GROUP4_P1_LOCAL_FAULT_031	Pass	Pass	Stable	Pass	Pass	Stable
GROUP4_P1_LOCAL_FAULT_032	Pass	Pass	Stable	Pass	Pass	Stable
GROUP4_P1_LOCAL_FAULT_033	Pass	Pass	Stable	Pass	Pass	Stable
GROUP4_P1_LOCAL_FAULT_034	Pass	Pass	Stable	Pass	Pass	Stable
GROUP4_P1_LOCAL_FAULT_035	Pass	Pass	Stable	Pass	Pass	Stable
GROUP4_P1_LOCAL_FAULT_036	Pass	Pass	Stable	Pass	Pass	Stable
GROUP4_P1_LOCAL_FAULT_037	Pass	Pass	Stable	Pass	Pass	Stable
GROUP4_P1_LOCAL_FAULT_038	Pass	Pass	Stable	Pass	Pass	Stable
GROUP4_P1_LOCAL_FAULT_039	Pass	Pass	Stable	Pass	Pass	Stable
GROUP4_P1_LOCAL_FAULT_040	Pass	Pass	Stable	Pass	Pass	Stable
GROUP4_P1_LOCAL_FAULT_041	Pass	Pass	Stable	Pass	Pass	Stable
GROUP4_P1_LOCAL_FAULT_042	Pass	Pass	Stable	Pass	Pass	Stable
GROUP4_P1_LOCAL_FAULT_043	Pass	Pass	Stable	Pass	Pass	Stable
GROUP4_P1_LOCAL_FAULT_044	Pass	Pass	Stable	Pass	Pass	Stable
GROUP4_P1_LOCAL_FAULT_045	Pass	Pass	Stable	Pass	Pass	Stable
GROUP4_P1_LOCAL_FAULT_046	Pass	Pass	Stable	Pass	Pass	Stable
GROUP4_P1_LOCAL_FAULT_047	Pass	Pass	Stable	Pass	Pass	Stable
GROUP4_P1_LOCAL_FAULT_048	Pass	Pass	Stable	Pass	Pass	Stable
GROUP4_P1_LOCAL_FAULT_049	Pass	Pass	Stable	Pass	Pass	Stable
GROUP4_P1_LOCAL_FAULT_050	Pass	Pass	Stable	Pass	Pass	Stable
GROUP4_P1_LOCAL_FAULT_051	Pass	Pass	Stable	Pass	Pass	Stable
GROUP4_P1_LOCAL_FAULT_052	Pass	Pass	Stable	Pass	Pass	Stable
GROUP4_P1_LOCAL_FAULT_053	Pass	Pass	Stable	Pass	Pass	Stable
GROUP4_P1_LOCAL_FAULT_054	Pass	Pass	Stable	Pass	Pass	Stable
GROUP4_P1_LOCAL_FAULT_055	Pass	Pass	Stable	Pass	Pass	Stable
GROUP4_P1_LOCAL_FAULT_056	Pass	Pass	Stable	Pass	Pass	Stable
GROUP4_P1_LOCAL_FAULT_057	Pass	Pass	Stable	Pass	Pass	Stable
GROUP4_P1_LOCAL_FAULT_058	Pass	Pass	Stable	Pass	Pass	Stable
GROUP4_P1_LOCAL_FAULT_059	Pass	Pass	Stable	Pass	Pass	Stable
GROUP4_P1_LOCAL_FAULT_060	Pass	Pass	Stable	Pass	Pass	Stable
GROUP4_P1_LOCAL_FAULT_061	Pass	Pass	Stable	Pass	Pass	Stable
GROUP4_P1_LOCAL_FAULT_062	Pass	Pass	Stable	Pass	Pass	Stable
GROUP4_P1_LOCAL_FAULT_063	Pass	Pass	Stable	Pass	Pass	Stable

Fault ID	25SP			25WP		
	Volt Violation	Volt Recovery	Stable	Volt Violation	Volt Recovery	Stable
GROUP4_P1_LOCAL_FAULT_064	Pass	Pass	Stable	Pass	Pass	Stable
GROUP4_P1_LOCAL_FAULT_065	Pass	Pass	Stable	Pass	Pass	Stable
GROUP4_P1_LOCAL_FAULT_066	Pass	Pass	Stable	Pass	Pass	Stable
GROUP4_P1_LOCAL_FAULT_067	Pass	Pass	Stable	Pass	Pass	Stable
GROUP4_P1_LOCAL_FAULT_067	Pass	Pass	Stable	Pass	Pass	Stable
GROUP4_P1_LOCAL_FAULT_068	Pass	Pass	Stable	Pass	Pass	Stable
GROUP4_P1_LOCAL_FAULT_069	Pass	Pass	Stable	Pass	Pass	Stable
GROUP4_P1_LOCAL_FAULT_070	Pass	Pass	Stable	Pass	Pass	Stable
GROUP4_P1_LOCAL_FAULT_071	Pass	Pass	Stable	Pass	Pass	Stable
GROUP4_P1_LOCAL_FAULT_072	Pass	Pass	Stable	Pass	Pass	Stable
GROUP4_P1_LOCAL_FAULT_073	Pass	Pass	Stable	Pass	Pass	Stable
GROUP4_P1_LOCAL_FAULT_074	Pass	Pass	Stable	Pass	Pass	Stable
GROUP4_P1_LOCAL_FAULT_075	Pass	Pass	Stable	Pass	Pass	Stable
GROUP4_P1_LOCAL_FAULT_076	Pass	Pass	Stable	Pass	Pass	Stable
GROUP4_P1_LOCAL_FAULT_077	Pass	Pass	Stable	Pass	Pass	Stable
GROUP4_P1_LOCAL_FAULT_078	Pass	Pass	Stable	Pass	Pass	Stable
GROUP4_P1_LOCAL_FAULT_079	Pass	Pass	Stable	Pass	Pass	Stable
GROUP4_P1_LOCAL_FAULT_080	Pass	Pass	Stable	Pass	Pass	Stable
GROUP4_P1_LOCAL_FAULT_081	Pass	Pass	Stable	Pass	Pass	Stable
GROUP4_P1_LOCAL_FAULT_082	Pass	Pass	Stable	Pass	Pass	Stable
GROUP4_P1_LOCAL_FAULT_083	Pass	Pass	Stable	Pass	Pass	Stable
GROUP4_P1_LOCAL_FAULT_084	Pass	Pass	Stable	Pass	Pass	Stable
GROUP4_P1_LOCAL_FAULT_085	Pass	Pass	Stable	Pass	Pass	Stable
GROUP4_P1_LOCAL_FAULT_086	Pass	Pass	Stable	Pass	Pass	Stable
GROUP4_P1_LOCAL_FAULT_087	Pass	Pass	Stable	Pass	Pass	Stable
GROUP4_P1_LOCAL_FAULT_088	Pass	Pass	Stable	Pass	Pass	Stable
GROUP4_P1_LOCAL_FAULT_089	Pass	Pass	Stable	Pass	Pass	Stable
GROUP4_P1_LOCAL_FAULT_090	Pass	Pass	Stable	Pass	Pass	Stable
GROUP4_P1_LOCAL_FAULT_091	Pass	Pass	Stable	Pass	Pass	Stable
GROUP4_P1_LOCAL_FAULT_092	Pass	Pass	Stable	Pass	Pass	Stable
GROUP4_P1_LOCAL_FAULT_093	Pass	Pass	Stable	Pass	Pass	Stable
GROUP4_P1_LOCAL_FAULT_094	Pass	Pass	Stable	Pass	Pass	Stable
GROUP4_P1_LOCAL_FAULT_095	Pass	Pass	Stable	Pass	Pass	Stable
GROUP4_P1_LOCAL_FAULT_096	Pass	Pass	Stable	Pass	Pass	Stable
GROUP4_P1_LOCAL_FAULT_097	Pass	Pass	Stable	Pass	Pass	Stable
GROUP4_P1_LOCAL_FAULT_098	Pass	Pass	Stable	Pass	Pass	Stable
GROUP4_P1_LOCAL_FAULT_099	Pass	Pass	Stable	Pass	Pass	Stable
GROUP4_P1_LOCAL_FAULT_100	Pass	Pass	Stable	Pass	Pass	Stable
GROUP4_P1_LOCAL_FAULT_101	Pass	Pass	Stable	Pass	Pass	Stable
GROUP4_P1_LOCAL_FAULT_102	Pass	Pass	Stable	Pass	Pass	Stable

Fault ID	25SP			25WP		
	Volt Violation	Volt Recovery	Stable	Volt Violation	Volt Recovery	Stable
GROUP4_P1_LOCAL_FAULT_103	Pass	Pass	Stable	Pass	Pass	Stable
GROUP4_P1_LOCAL_FAULT_104	Pass	Pass	Stable	Pass	Pass	Stable
GROUP4_P1_LOCAL_FAULT_106	Pass	Pass	Stable	Pass	Pass	Stable
GROUP4_P1_LOCAL_FAULT_107	Pass	Pass	Stable	Pass	Pass	Stable
GROUP4_P1_LOCAL_FAULT_108	Pass	Pass	Stable	Pass	Pass	Stable
GROUP4_P1_LOCAL_FAULT_109	Pass	Pass	Stable	Pass	Pass	Stable
GROUP4_P1_LOCAL_FAULT_110	Pass	Pass	Stable	Pass	Pass	Stable
GROUP4_P1_LOCAL_FAULT_111	Pass	Pass	Stable	Pass	Pass	Stable
GROUP4_P1_LOCAL_FAULT_112	Pass	Pass	Stable	Pass	Pass	Stable
GROUP4_P1_LOCAL_FAULT_113	Pass	Pass	Stable	Pass	Pass	Stable
GROUP4_P1_LOCAL_FAULT_114	Pass	Pass	Stable	Pass	Pass	Stable
GROUP4_P1_LOCAL_FAULT_115	Pass	Pass	Stable	Pass	Pass	Stable
GROUP4_P1_LOCAL_FAULT_116	Pass	Pass	Stable	Pass	Pass	Stable
GROUP4_P1_LOCAL_FAULT_117	Pass	Pass	Stable	Pass	Pass	Stable
GROUP4_P1_LOCAL_FAULT_118	Pass	Pass	Stable	Pass	Pass	Stable
GROUP4_P1_LOCAL_FAULT_119	Pass	Pass	Stable	Pass	Pass	Stable
GROUP4_P1_LOCAL_FAULT_120	Pass	Pass	Stable	Pass	Pass	Stable
GROUP4_P1_LOCAL_FAULT_121	Pass	Pass	Stable	Pass	Pass	Stable
GROUP4_P1_LOCAL_FAULT_122	Pass	Pass	Stable	Pass	Pass	Stable
GROUP4_P1_LOCAL_FAULT_123	Pass	Pass	Stable	Pass	Pass	Stable
GROUP4_P1_LOCAL_FAULT_124	Pass	Pass	Stable	Pass	Pass	Stable
GROUP4_P1_LOCAL_FAULT_125	Pass	Pass	Stable	Pass	Pass	Stable
GROUP4_P1_LOCAL_FAULT_126	Pass	Pass	Stable	Pass	Pass	Stable
GROUP4_P1_LOCAL_FAULT_127	Pass	Pass	Stable	Pass	Pass	Stable
GROUP4_P1_LOCAL_FAULT_128	Pass	Pass	Stable	Pass	Pass	Stable
GROUP4_P1_LOCAL_FAULT_129	Pass	Pass	Stable	Pass	Pass	Stable
GROUP4_P1_LOCAL_FAULT_130	Pass	Pass	Stable	Pass	Pass	Stable
GROUP4_P1_LOCAL_FAULT_131	Pass	Pass	Stable	Pass	Pass	Stable
GROUP4_P1_LOCAL_FAULT_132	Pass	Pass	Stable	Pass	Pass	Stable
GROUP4_P1_LOCAL_FAULT_133	Pass	Pass	Stable	Pass	Pass	Stable
GROUP4_P1_LOCAL_FAULT_134	Pass	Pass	Stable	Pass	Pass	Stable
GROUP4_P1_LOCAL_FAULT_135	Pass	Pass	Stable	Pass	Pass	Stable
GROUP4_P1_LOCAL_FAULT_136	Pass	Pass	Stable	Pass	Pass	Stable
GROUP4_P1_LOCAL_FAULT_137	Pass	Pass	Stable	Pass	Pass	Stable
GROUP4_P1_LOCAL_FAULT_138	Pass	Pass	Stable	Pass	Pass	Stable
GROUP4_P1_LOCAL_FAULT_139	Pass	Pass	Stable	Pass	Pass	Stable
GROUP4_P1_LOCAL_FAULT_140	Pass	Pass	Stable	Pass	Pass	Stable
GROUP4_P1_LOCAL_FAULT_141	Pass	Pass	Stable	Pass	Pass	Stable
GROUP4_P1_LOCAL_FAULT_142	Pass	Pass	Stable	Pass	Pass	Stable
GROUP4_P1_LOCAL_FAULT_143	Pass	Pass	Stable	Pass	Pass	Stable

Fault ID	25SP			25WP		
	Volt Violation	Volt Recovery	Stable	Volt Violation	Volt Recovery	Stable
GROUP4_P1_LOCAL_FAULT_144	Pass	Pass	Stable	Pass	Pass	Stable
GROUP4_P1_LOCAL_FAULT_145	Pass	Pass	Stable	Pass	Pass	Stable
GROUP4_P1_LOCAL_FAULT_146	Pass	Pass	Stable	Pass	Pass	Stable
GROUP4_P1_LOCAL_FAULT_147	Pass	Pass	Stable	Pass	Pass	Stable
GROUP4_P1_LOCAL_FAULT_148	Pass	Pass	Stable	Pass	Pass	Stable
GROUP4_P1_LOCAL_FAULT_149	Pass	Pass	Stable	Pass	Pass	Stable
GROUP4_P1_LOCAL_FAULT_150	Pass	Pass	Stable	Pass	Pass	Stable
GROUP4_P1_LOCAL_FAULT_151	Pass	Pass	Stable	Pass	Pass	Stable
GROUP4_P1_LOCAL_FAULT_152	Pass	Pass	Stable	Pass	Pass	Stable
GROUP4_P1_LOCAL_FAULT_153	Pass	Pass	Stable	Pass	Pass	Stable
GROUP4_P1_LOCAL_FAULT_154	Pass	Pass	Stable	Pass	Pass	Stable
GROUP4_P1_LOCAL_FAULT_155	Pass	Pass	Stable	Pass	Pass	Stable
GROUP4_P1_LOCAL_FAULT_156	Pass	Pass	Stable	Pass	Pass	Stable
GROUP4_P1_LOCAL_FAULT_157	Pass	Pass	Stable	Pass	Pass	Stable
GROUP4_P1_LOCAL_FAULT_158	Pass	Pass	Stable	Pass	Pass	Stable
GROUP4_P1_LOCAL_FAULT_159	Pass	Pass	Stable	Pass	Pass	Stable
GROUP4_P1_LOCAL_FAULT_160	Pass	Pass	Stable	Pass	Pass	Stable
GROUP4_P1_LOCAL_FAULT_161	Pass	Pass	Stable	Pass	Pass	Stable
GROUP4_P1_LOCAL_FAULT_162	Pass	Pass	Stable	Pass	Pass	Stable
GROUP4_P1_LOCAL_FAULT_163	Pass	Pass	Stable	Pass	Pass	Stable
GROUP4_P1_LOCAL_FAULT_164	Pass	Pass	Stable	Pass	Pass	Stable
GROUP4_P1_LOCAL_FAULT_165	Pass	Pass	Stable	Pass	Pass	Stable
GROUP4_P1_LOCAL_FAULT_166	Pass	Pass	Stable	Pass	Pass	Stable
GROUP4_P1_LOCAL_FAULT_167	Pass	Pass	Stable	Pass	Pass	Stable
GROUP4_P1_LOCAL_FAULT_168	Pass	Pass	Stable	Pass	Pass	Stable
GROUP4_P1_LOCAL_FAULT_169	Pass	Pass	Stable	Pass	Pass	Stable
GROUP4_P1_LOCAL_FAULT_170	Pass	Pass	Stable	Pass	Pass	Stable
GROUP4_P1_LOCAL_FAULT_171	Pass	Pass	Stable	Pass	Pass	Stable
GROUP4_P1_LOCAL_FAULT_172	Pass	Pass	Stable	Pass	Pass	Stable
GROUP4_P1_LOCAL_FAULT_173	Pass	Pass	Stable	Pass	Pass	Stable
GROUP4_P1_LOCAL_FAULT_174	Pass	Pass	Stable	Pass	Pass	Stable
GROUP4_P1_LOCAL_FAULT_175	Pass	Pass	Stable	Pass	Pass	Stable
GROUP4_P4_LOCAL_FAULT_001	Pass	Pass	Stable	Pass	Pass	Stable
GROUP4_P4_LOCAL_FAULT_002	Pass	Pass	Stable	Pass	Pass	Stable
GROUP4_P4_LOCAL_FAULT_003	Pass	Pass	Stable	Pass	Pass	Stable
GROUP4_P4_LOCAL_FAULT_004	Pass	Pass	Stable	Pass	Pass	Stable
GROUP4_P4_LOCAL_FAULT_005	Pass	Pass	Stable	Pass	Pass	Stable
GROUP4_P4_LOCAL_FAULT_006	Pass	Pass	Stable	Pass	Pass	Stable
GROUP4_P4_LOCAL_FAULT_007	Pass	Pass	Stable	Pass	Pass	Stable
GROUP4_P4_LOCAL_FAULT_008	Pass	Pass	Stable	Pass	Pass	Stable

Fault ID	25SP			25WP		
	Volt Violation	Volt Recovery	Stable	Volt Violation	Volt Recovery	Stable
GROUP4_P4_LOCAL_FAULT_009	Pass	Pass	Stable	Pass	Pass	Stable
GROUP4_P4_LOCAL_FAULT_010	Pass	Pass	Stable	Pass	Pass	Stable
GROUP4_P4_LOCAL_FAULT_011	Pass	Pass	Stable	Pass	Pass	Stable
GROUP4_P4_LOCAL_FAULT_012	Pass	Pass	Stable	Pass	Pass	Stable
GROUP4_P4_LOCAL_FAULT_013	Pass	Pass	Stable	Pass	Pass	Stable
GROUP4_P4_LOCAL_FAULT_014	Pass	Pass	Stable	Pass	Pass	Stable
GROUP4_P4_LOCAL_FAULT_015	Pass	Pass	Stable	Pass	Pass	Stable
GROUP4_P4_LOCAL_FAULT_016	Pass	Pass	Stable	Pass	Pass	Stable
GROUP4_P4_LOCAL_FAULT_017	Pass	Pass	Stable	Pass	Pass	Stable
GROUP4_P4_LOCAL_FAULT_018	Pass	Pass	Stable	Pass	Pass	Stable
GROUP4_P4_LOCAL_FAULT_019	Pass	Pass	Stable	Pass	Pass	Stable
GROUP4_P4_LOCAL_FAULT_020	Pass	Pass	Stable	Pass	Pass	Stable
GROUP4_P4_LOCAL_FAULT_021	Pass	Pass	Stable	Pass	Pass	Stable
GROUP4_P4_LOCAL_FAULT_022	Pass	Pass	Stable	Pass	Pass	Stable
GROUP4_P4_LOCAL_FAULT_023	Pass	Pass	Stable	Pass	Pass	Stable
GROUP4_P4_LOCAL_FAULT_024	Pass	Pass	Stable	Pass	Pass	Stable
GROUP4_P4_LOCAL_FAULT_025	Pass	Pass	Stable	Pass	Pass	Stable
GROUP4_P4_LOCAL_FAULT_026	Pass	Pass	Stable	Pass	Pass	Stable
GROUP4_P4_LOCAL_FAULT_027	Pass	Pass	Stable	Pass	Pass	Stable
GROUP4_P4_LOCAL_FAULT_028	Pass	Pass	Stable	Pass	Pass	Stable
GROUP4_P4_LOCAL_FAULT_029	Pass	Pass	Stable	Pass	Pass	Stable
GROUP4_P4_LOCAL_FAULT_030	Pass	Pass	Stable	Pass	Pass	Stable
GROUP4_P4_LOCAL_FAULT_031	Pass	Pass	Stable	Pass	Pass	Stable
GROUP4_P4_LOCAL_FAULT_032	Pass	Pass	Stable	Pass	Pass	Stable
GROUP4_P4_LOCAL_FAULT_033	Pass	Pass	Stable	Pass	Pass	Stable
GROUP4_P4_LOCAL_FAULT_034	Pass	Pass	Stable	Pass	Pass	Stable
GROUP4_P4_LOCAL_FAULT_035	Pass	Pass	Stable	Pass	Pass	Stable
GROUP4_P4_LOCAL_FAULT_036	Pass	Pass	Stable	Pass	Pass	Stable
GROUP4_P4_LOCAL_FAULT_037	Pass	Pass	Stable	Pass	Pass	Stable
GROUP4_P4_LOCAL_FAULT_038	Pass	Pass	Stable	Pass	Pass	Stable
GROUP4_P4_LOCAL_FAULT_039	Pass	Pass	Stable	Pass	Pass	Stable
GROUP4_P4_LOCAL_FAULT_040	Pass	Pass	Stable	Pass	Pass	Stable
GROUP4_P4_LOCAL_FAULT_041	Pass	Pass	Stable	Pass	Pass	Stable
GROUP4_P4_LOCAL_FAULT_042	Pass	Pass	Stable	Pass	Pass	Stable
GROUP4_P4_LOCAL_FAULT_043	Pass	Pass	Stable	Pass	Pass	Stable
GROUP4_P4_LOCAL_FAULT_044	Pass	Pass	Stable	Pass	Pass	Stable
GROUP4_P4_LOCAL_FAULT_045	Pass	Pass	Stable	Pass	Pass	Stable
GROUP4_P4_LOCAL_FAULT_046	Pass	Pass	Stable	Pass	Pass	Stable
GROUP4_P4_LOCAL_FAULT_047	Pass	Pass	Stable	Pass	Pass	Stable
GROUP4_P4_LOCAL_FAULT_048	Pass	Pass	Stable	Pass	Pass	Stable

Fault ID	25SP			25WP		
	Volt Violation	Volt Recovery	Stable	Volt Violation	Volt Recovery	Stable
GROUP4_P4_LOCAL_FAULT_049	Pass	Pass	Stable	Pass	Pass	Stable
GROUP4_P4_LOCAL_FAULT_050	Pass	Pass	Stable	Pass	Pass	Stable
GROUP4_P4_LOCAL_FAULT_051	Pass	Pass	Stable	Pass	Pass	Stable
GROUP4_P4_LOCAL_FAULT_052	Pass	Pass	Stable	Pass	Pass	Stable
GROUP4_P4_LOCAL_FAULT_053	Pass	Pass	Stable	Pass	Pass	Stable
GROUP4_P4_LOCAL_FAULT_054	Pass	Pass	Stable	Pass	Pass	Stable
GROUP4_P4_LOCAL_FAULT_055	Pass	Pass	Stable	Pass	Pass	Stable
GROUP4_P4_LOCAL_FAULT_056	Pass	Pass	Stable	Pass	Pass	Stable
GROUP4_P4_LOCAL_FAULT_057	Pass	Pass	Stable	Pass	Pass	Stable
GROUP4_P4_LOCAL_FAULT_058	Pass	Pass	Stable	Pass	Pass	Stable
GROUP4_P4_LOCAL_FAULT_059	Pass	Pass	Stable	Pass	Pass	Stable
GROUP4_P4_LOCAL_FAULT_060	Pass	Pass	Stable	Pass	Pass	Stable
GROUP4_P4_LOCAL_FAULT_061	Pass	Pass	Stable	Pass	Pass	Stable
GROUP4_P4_LOCAL_FAULT_062	Pass	Pass	Stable	Pass	Pass	Stable
GROUP4_P4_LOCAL_FAULT_063	Pass	Pass	Stable	Pass	Pass	Stable
GROUP4_P4_LOCAL_FAULT_064	Pass	Pass	Stable	Pass	Pass	Stable
GROUP4_P4_LOCAL_FAULT_065	Pass	Pass	Stable	Pass	Pass	Stable
GROUP4_P4_LOCAL_FAULT_066	Pass	Pass	Stable	Pass	Pass	Stable
GROUP4_P4_LOCAL_FAULT_067	Pass	Pass	Stable	Pass	Pass	Stable
GROUP4_P4_LOCAL_FAULT_068	Pass	Pass	Stable	Pass	Pass	Stable
GROUP4_P4_LOCAL_FAULT_069	Pass	Pass	Stable	Pass	Pass	Stable
GROUP4_P4_LOCAL_FAULT_070	Pass	Pass	Stable	Pass	Pass	Stable
GROUP4_P4_LOCAL_FAULT_071	Pass	Pass	Stable	Pass	Pass	Stable
GROUP4_P4_LOCAL_FAULT_072	Pass	Pass	Stable	Pass	Pass	Stable
GROUP4_P4_LOCAL_FAULT_073	Pass	Pass	Stable	Pass	Pass	Stable
GROUP4_P4_LOCAL_FAULT_074	Pass	Pass	Stable	Pass	Pass	Stable
GROUP4_P4_LOCAL_FAULT_075	Pass	Pass	Stable	Pass	Pass	Stable
GROUP4_P4_LOCAL_FAULT_076	Pass	Pass	Stable	Pass	Pass	Stable
GROUP4_P4_LOCAL_FAULT_077	Pass	Pass	Stable	Pass	Pass	Stable
GROUP4_P4_LOCAL_FAULT_078	Pass	Pass	Stable	Pass	Pass	Stable
GROUP4_P4_LOCAL_FAULT_079	Pass	Pass	Stable	Pass	Pass	Stable
GROUP4_P4_LOCAL_FAULT_080	Pass	Pass	Stable	Pass	Pass	Stable
GROUP4_P4_LOCAL_FAULT_081	Pass	Pass	Stable	Pass	Pass	Stable
GROUP4_P4_LOCAL_FAULT_082	Pass	Pass	Stable	Pass	Pass	Stable
GROUP4_P4_LOCAL_FAULT_083	Pass	Pass	Stable	Pass	Pass	Stable
GROUP4_P4_LOCAL_FAULT_084	Pass	Pass	Stable	Pass	Pass	Stable
GROUP4_P4_LOCAL_FAULT_085	Pass	Pass	Stable	Pass	Pass	Stable
GROUP4_P4_LOCAL_FAULT_086	Pass	Pass	Stable	Pass	Pass	Stable
GROUP4_P4_LOCAL_FAULT_087	Pass	Pass	Stable	Pass	Pass	Stable
GROUP4_P4_LOCAL_FAULT_088	Pass	Pass	Stable	Pass	Pass	Stable

Fault ID	25SP			25WP		
	Volt Violation	Volt Recovery	Stable	Volt Violation	Volt Recovery	Stable
GROUP4_P4_LOCAL_FAULT_089	Pass	Pass	Stable	Pass	Pass	Stable
GROUP4_P4_LOCAL_FAULT_090	Pass	Pass	Stable	Pass	Pass	Stable
GROUP4_P4_LOCAL_FAULT_091	Pass	Pass	Stable	Pass	Pass	Stable
GROUP4_P4_LOCAL_FAULT_092	Pass	Pass	Stable	Pass	Pass	Stable
GROUP4_P4_LOCAL_FAULT_093	Pass	Pass	Stable	Pass	Pass	Stable
GROUP4_P4_LOCAL_FAULT_094	Pass	Pass	Stable	Pass	Pass	Stable
GROUP4_P4_LOCAL_FAULT_095	Pass	Pass	Stable	Pass	Pass	Stable
GROUP4_P4_LOCAL_FAULT_096	Pass	Pass	Stable	Pass	Pass	Stable
GROUP4_P4_LOCAL_FAULT_097	Pass	Pass	Stable	Pass	Pass	Stable
GROUP4_P4_LOCAL_FAULT_098	Pass	Pass	Stable	Pass	Pass	Stable
GROUP4_P4_LOCAL_FAULT_099	Pass	Pass	Stable	Pass	Pass	Stable
GROUP4_P4_LOCAL_FAULT_100	Pass	Pass	Stable	Pass	Pass	Stable
GROUP4_P4_LOCAL_FAULT_101	Pass	Pass	Stable	Pass	Pass	Stable
GROUP4_P4_LOCAL_FAULT_102	Pass	Pass	Stable	Pass	Pass	Stable
GROUP4_P4_LOCAL_FAULT_103	Pass	Pass	Stable	Pass	Pass	Stable
GROUP4_P4_LOCAL_FAULT_104	Pass	Pass	Stable	Pass	Pass	Stable
GROUP4_P4_LOCAL_FAULT_105	Pass	Pass	Stable	Pass	Pass	Stable
GROUP4_P4_LOCAL_FAULT_106	Pass	Pass	Stable	Pass	Pass	Stable
GROUP4_P4_LOCAL_FAULT_107	Pass	Pass	Stable	Pass	Pass	Stable
GROUP4_P4_LOCAL_FAULT_108	Pass	Pass	Stable	Pass	Pass	Stable
GROUP4_P4_LOCAL_FAULT_109	Pass	Pass	Stable	Pass	Pass	Stable
GROUP4_P4_LOCAL_FAULT_110	Pass	Pass	Stable	Pass	Pass	Stable
GROUP4_P4_LOCAL_FAULT_111	Pass	Pass	Stable	Pass	Pass	Stable
GROUP4_P4_LOCAL_FAULT_112	Pass	Pass	Stable	Pass	Pass	Stable
GROUP4_P4_LOCAL_FAULT_113	Pass	Pass	Stable	Pass	Pass	Stable
GROUP4_P4_LOCAL_FAULT_114	Pass	Pass	Stable	Pass	Pass	Stable
GROUP4_P4_LOCAL_FAULT_115	Pass	Pass	Stable	Pass	Pass	Stable
GROUP4_P4_LOCAL_FAULT_116	Pass	Pass	Stable	Pass	Pass	Stable
GROUP4_P4_LOCAL_FAULT_117	Pass	Pass	Stable	Pass	Pass	Stable
GROUP4_P4_LOCAL_FAULT_118	Pass	Pass	Stable	Pass	Pass	Stable
GROUP4_P4_LOCAL_FAULT_119	Pass	Pass	Stable	Pass	Pass	Stable
GROUP4_P4_LOCAL_FAULT_120	Pass	Pass	Stable	Pass	Pass	Stable
GROUP4_P4_LOCAL_FAULT_121	Pass	Pass	Stable	Pass	Pass	Stable
GROUP4_P4_LOCAL_FAULT_122	Pass	Pass	Stable	Pass	Pass	Stable
GROUP4_P4_LOCAL_FAULT_123	Pass	Pass	Stable	Pass	Pass	Stable
GROUP4_P4_LOCAL_FAULT_124	Pass	Pass	Stable	Pass	Pass	Stable
GROUP4_P4_LOCAL_FAULT_125	Pass	Pass	Stable	Pass	Pass	Stable
GROUP4_P4_LOCAL_FAULT_126	Pass	Pass	Stable	Pass	Pass	Stable
GROUP4_P4_LOCAL_FAULT_127	Pass	Pass	Stable	Pass	Pass	Stable
GROUP4_P4_LOCAL_FAULT_128	Pass	Pass	Stable	Pass	Pass	Stable

Fault ID	25SP			25WP		
	Volt Violation	Volt Recovery	Stable	Volt Violation	Volt Recovery	Stable
GROUP4_P4_LOCAL_FAULT_129	Pass	Pass	Stable	Pass	Pass	Stable
GROUP4_P4_LOCAL_FAULT_130	Pass	Pass	Stable	Pass	Pass	Stable
GROUP4_P4_LOCAL_FAULT_131	Pass	Pass	Stable	Pass	Pass	Stable
GROUP4_P4_LOCAL_FAULT_132	Pass	Pass	Stable	Pass	Pass	Stable
GROUP4_P4_LOCAL_FAULT_133	Pass	Pass	Stable	Pass	Pass	Stable
GROUP4_P4_LOCAL_FAULT_134	Pass	Pass	Stable	Pass	Pass	Stable
GROUP4_P4_LOCAL_FAULT_135	Pass	Pass	Stable	Pass	Pass	Stable
GROUP4_P4_LOCAL_FAULT_136	Pass	Pass	Stable	Pass	Pass	Stable
GROUP4_P4_LOCAL_FAULT_137	Pass	Pass	Stable	Pass	Pass	Stable
GROUP4_P4_LOCAL_FAULT_138	Pass	Pass	Stable	Pass	Pass	Stable
GROUP4_P4_LOCAL_FAULT_139	Pass	Pass	Stable	Pass	Pass	Stable
GROUP4_P4_LOCAL_FAULT_140	Pass	Pass	Stable	Pass	Pass	Stable
GROUP4_P4_LOCAL_FAULT_141	Pass	Pass	Stable	Pass	Pass	Stable
GROUP4_P4_LOCAL_FAULT_142	Pass	Pass	Stable	Pass	Pass	Stable
GROUP4_P4_LOCAL_FAULT_143	Pass	Pass	Stable	Pass	Pass	Stable
GROUP4_P4_LOCAL_FAULT_144	Pass	Pass	Stable	Pass	Pass	Stable
GROUP4_P4_LOCAL_FAULT_145	Pass	Pass	Stable	Pass	Pass	Stable
GROUP4_P4_LOCAL_FAULT_146	Pass	Pass	Stable	Pass	Pass	Stable
GROUP4_P4_LOCAL_FAULT_147	Pass	Pass	Stable	Pass	Pass	Stable
GROUP4_P4_LOCAL_FAULT_148	Pass	Pass	Stable	Pass	Pass	Stable
GROUP4_P4_LOCAL_FAULT_149	Pass	Pass	Stable	Pass	Pass	Stable
GROUP4_P4_LOCAL_FAULT_150	Pass	Pass	Stable	Pass	Pass	Stable
GROUP4_P4_LOCAL_FAULT_151	Pass	Pass	Stable	Pass	Pass	Stable
GROUP4_P4_LOCAL_FAULT_152	Pass	Pass	Stable	Pass	Pass	Stable
GROUP4_P4_LOCAL_FAULT_153	Pass	Pass	Stable	Pass	Pass	Stable
GROUP4_P4_LOCAL_FAULT_154	Pass	Pass	Stable	Pass	Pass	Stable
GROUP4_P4_LOCAL_FAULT_155	Pass	Pass	Stable	Pass	Pass	Stable
GROUP4_P4_LOCAL_FAULT_156	Pass	Pass	Stable	Pass	Pass	Stable
GROUP4_P4_LOCAL_FAULT_157	Pass	Pass	Stable	Pass	Pass	Stable
GROUP4_P4_LOCAL_FAULT_158	Pass	Pass	Stable	Pass	Pass	Stable
GROUP4_P4_LOCAL_FAULT_159	Pass	Pass	Stable	Pass	Pass	Stable
GROUP4_P4_LOCAL_FAULT_161	Pass	Pass	Stable	Pass	Pass	Stable
GROUP4_P4_LOCAL_FAULT_162	Pass	Pass	Stable	Pass	Pass	Stable
GROUP4_P4_LOCAL_FAULT_163	Pass	Pass	Stable	Pass	Pass	Stable
GROUP4_P4_LOCAL_FAULT_164	Pass	Pass	Stable	Pass	Pass	Stable
GROUP4_P4_LOCAL_FAULT_165	Pass	Pass	Stable	Pass	Pass	Stable
GROUP4_P4_LOCAL_FAULT_166	Pass	Pass	Stable	Pass	Pass	Stable
GROUP4_P4_LOCAL_FAULT_167	Pass	Pass	Stable	Pass	Pass	Stable
GROUP4_P4_LOCAL_FAULT_168	Pass	Pass	Stable	Pass	Pass	Stable
GROUP4_P4_LOCAL_FAULT_169	Pass	Pass	Stable	Pass	Pass	Stable

Fault ID	25SP			25WP		
	Volt Violation	Volt Recovery	Stable	Volt Violation	Volt Recovery	Stable
GROUP4_P4_LOCAL_FAULT_170	Pass	Pass	Stable	Pass	Pass	Stable
GROUP4_P4_LOCAL_FAULT_171	Pass	Pass	Stable	Pass	Pass	Stable
GROUP4_P4_LOCAL_FAULT_172	Pass	Pass	Stable	Pass	Pass	Stable
GROUP4_P4_LOCAL_FAULT_173	Pass	Pass	Stable	Pass	Pass	Stable
GROUP4_P4_LOCAL_FAULT_174	Pass	Pass	Stable	Pass	Pass	Stable
GROUP4_P4_LOCAL_FAULT_175	Pass	Pass	Stable	Pass	Pass	Stable
GROUP4_P4_LOCAL_FAULT_176	Pass	Pass	Stable	Pass	Pass	Stable
GROUP4_P4_LOCAL_FAULT_177	Pass	Pass	Stable	Pass	Pass	Stable
GROUP4_P4_LOCAL_FAULT_178	Pass	Pass	Stable	Pass	Pass	Stable
GROUP4_P4_LOCAL_FAULT_179	Pass	Pass	Stable	Pass	Pass	Stable
GROUP4_P4_LOCAL_FAULT_180	Pass	Pass	Stable	Pass	Pass	Stable
GROUP4_P4_LOCAL_FAULT_181	Pass	Pass	Stable	Pass	Pass	Stable
GROUP4_P4_LOCAL_FAULT_182	Pass	Pass	Stable	Pass	Pass	Stable
GROUP4_P4_LOCAL_FAULT_183	Pass	Pass	Stable	Pass	Pass	Stable
GROUP4_P4_LOCAL_FAULT_184	Pass	Pass	Stable	Pass	Pass	Stable
GROUP4_P4_LOCAL_FAULT_186	Pass	Pass	Stable	Pass	Pass	Stable
GROUP4_P4_LOCAL_FAULT_187	Pass	Pass	Stable	Pass	Pass	Stable
GROUP4_P4_LOCAL_FAULT_188	Pass	Pass	Stable	Pass	Pass	Stable
GROUP4_P4_LOCAL_FAULT_189	Pass	Pass	Stable	Pass	Pass	Stable
GROUP4_P4_LOCAL_FAULT_190	Pass	Pass	Stable	Pass	Pass	Stable
GROUP4_P4_LOCAL_FAULT_191	Pass	Pass	Stable	Pass	Pass	Stable
GROUP4_P4_LOCAL_FAULT_192	Pass	Pass	Stable	Pass	Pass	Stable
GROUP4_P4_LOCAL_FAULT_193	Pass	Pass	Stable	Pass	Pass	Stable
GROUP4_P4_LOCAL_FAULT_194	Pass	Pass	Stable	Pass	Pass	Stable
GROUP4_P4_LOCAL_FAULT_195	Pass	Pass	Stable	Pass	Pass	Stable
GROUP4_P4_LOCAL_FAULT_196	Pass	Pass	Stable	Pass	Pass	Stable
GROUP4_P4_LOCAL_FAULT_197	Pass	Pass	Stable	Pass	Pass	Stable
GROUP4_P4_LOCAL_FAULT_198	Pass	Pass	Stable	Pass	Pass	Stable
GROUP4_P4_LOCAL_FAULT_199	Pass	Pass	Stable	Pass	Pass	Stable
GROUP4_P4_LOCAL_FAULT_200	Pass	Pass	Stable	Pass	Pass	Stable
GROUP4_P4_LOCAL_FAULT_201	Pass	Pass	Stable	Pass	Pass	Stable
GROUP4_P4_LOCAL_FAULT_202	Pass	Pass	Stable	Pass	Pass	Stable
GROUP4_P4_LOCAL_FAULT_203	Pass	Pass	Stable	Pass	Pass	Stable
GROUP4_P4_LOCAL_FAULT_204	Pass	Pass	Stable	Pass	Pass	Stable
GROUP4_P4_LOCAL_FAULT_205	Pass	Pass	Stable	Pass	Pass	Stable
GROUP4_P4_LOCAL_FAULT_206	Pass	Pass	Stable	Pass	Pass	Stable
GROUP4_P4_LOCAL_FAULT_207	Pass	Pass	Stable	Pass	Pass	Stable
GROUP4_P4_LOCAL_FAULT_208	Pass	Pass	Stable	Pass	Pass	Stable
GROUP4_P4_LOCAL_FAULT_209	Pass	Pass	Stable	Pass	Pass	Stable
GROUP4_P4_LOCAL_FAULT_210	Pass	Pass	Stable	Pass	Pass	Stable

Fault ID	25SP			25WP		
	Volt Violation	Volt Recovery	Stable	Volt Violation	Volt Recovery	Stable
GROUP4_P4_LOCAL_FAULT_211	Pass	Pass	Stable	Pass	Pass	Stable
GROUP4_P4_LOCAL_FAULT_212	Pass	Pass	Stable	Pass	Pass	Stable
GROUP4_P4_LOCAL_FAULT_213	Pass	Pass	Stable	Pass	Pass	Stable
GROUP4_P4_LOCAL_FAULT_214	Pass	Pass	Stable	Pass	Pass	Stable
GROUP4_P4_LOCAL_FAULT_215	Pass	Pass	Stable	Pass	Pass	Stable
GROUP4_P4_LOCAL_FAULT_216	Pass	Pass	Stable	Pass	Pass	Stable
GROUP4_P4_LOCAL_FAULT_217	Pass	Pass	Stable	Pass	Pass	Stable
GROUP4_P4_LOCAL_FAULT_218	Pass	Pass	Stable	Pass	Pass	Stable
GROUP4_P4_LOCAL_FAULT_219	Pass	Pass	Stable	Pass	Pass	Stable

Appendix F: SImulation plots

Available Upon Request