GEN-2025-SR18

SURPLUS SERVICE IMPACT STUDY

By SPP Generator Interconnection

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REVISION HISTORY

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CONTENTS

LIST OF TABLES

LIST OF FIGURES

APPENDICES

EXECUTIVE SUMMARY

1898 & Co., a part of Burns & McDonnell, was retained by the Southwest Power Pool (SPP) to conduct the Surplus Interconnection Service Impact Study (Study) for GEN-2025-SR18. The purpose of the Study is to evaluate the use of Surplus Interconnection Service made available by GEN-2018-031 at its existing Point of Interconnection (POI) at the Blue Valley 161 kV substation in the City of Independence (INDN) control area.

GEN-2025-SR18, the proposed Surplus Generating Facility (SGF), will connect to the Blue Valley 161 kV bus via the same bay connection. GEN-2018-031, the Existing Generating Facility (EGF), and has an effective Generator Interconnection Agreement (GIA) with a POI capacity of 50 MW and is making 50 MW of Surplus Interconnection Service available. According to the SPP Open Access Transmission Tariff (SPP Tariff), the available Surplus Interconnection Service for the SGF is limited to the amount of Interconnection Service granted to the EGF at the same POI. Furthermore, Surplus Interconnection Service can only be accommodated without requiring Network Upgrades, except those specified in the SPP Tariff.

The proposed SGF configuration includes 15 x Cummins C3250 D6e diesel generators, each rated at 4.063 MVA. While the SGF has a total generating capability of 48.76 MW, its injection at the POI must be limited to 50 MW. A Power Plant Controller (PPC) will be implemented as part of GEN-2025-SR18 to regulate and limit power injection as required. The dynamic model data for the GEN-2025-SR18 project is provided in Appendix A.

Information pertaining to the SGF and EGF configuration is shown in Table 1 below.

Table 1: EGF & SGF Configuration

Request	Interconnection Queue Capacity (MW)	Fuel Type	Point of Interconnection
GEN-2025-SR18 (SGF)	50	Diesel	Blue Valley 161 kV (#548807)
GEN-2018-031 (EGF)	50	Battery Storage	Blue Valley 161 kV (#548807)

The detailed SGF configuration is captured in Table 2 below.

Table 2: SGF Interconnection Configuration

Facility	SGF Configuration
Point of Interconnection	Blue Valley 161 kV (548807)
Configuration/Capacity	15 x Cummins C3250 D6e (diesel) = 48.756 MW [dispatch] Units are rated at 4.063 MVA, PPC to limit GEN-2025-SR18 to 50 MW at the POI Total POI injection of w/ GEN-2018-031 to 50 MW at the POI
Generation Interconnection Line (Shared with the EGF and unchanged)	Length = 0.30 miles
	R = 0.000402 pu
	X = 0.000999 pu
	B = 0.000390 pu
	Rating MVA = 150.3 MVA
Main Substation Transformer[1]	X12 = 9.4950% R12 = 0.3390%, X23 = 14.591% R23 = 0.05210%, X13 = 3.2980% R13 = 0.1180%, Voltage = 161/34.5/13.8 kV (YN0yn0d1), Winding1-2 MVA = 67 MVA, Winding2-3 MVA = 67 MVA, Winding3-1 MVA = 67 MVA, Winding MVA Base= 40 MVA
Equivalent GSU Transformer[1]	X2 = 26.40%, R2 = 0.0000%, Voltage = 34.5/0.48 kV, Winding MVA = 100.0 MVA, Rating MVA = 60.9 MVA
Equivalent Collector Line[2]	R = 0.000335 pu
	X = 0.000380 pu
	B = 0.0004 pu
Generator Dynamic Model[3] & Power Factor	15 x Cummins C3250 D6e (GENROU)[3] Leading: 0.8 Lagging: 0.8

1) X and R based on Winding MVA, 2) All pu are on 100 MVA Base, equivalent based on average derated MVA base provided by IC, 3) DYR stability model name.

The scope of this study included reactive power analysis, short circuit analysis, and dynamic stability analysis. SPP determined that steady-state analysis was not required because the addition of the SGF does not increase the maximum active power output of 50 MW. In addition, the EGF was previously studied at maximum Interconnection Service under all necessary reliability conditions.

1898 & Co. performed the analyses using the study data provided for the SGF and the DISIS-2021-001 study models:

- 2025 Summer Peak (25SP)
- 2025 Winter Peak (25W)

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

The results of the reactive power analysis using the 25SP model showed that the SGF project needed a 0.04 MVAr shunt reactor at the project substation to set the MVAr injection at the POI to zero. This is necessary to offset the capacitive effect on the transmission network caused by the project's transmission line and collector system during reduced generation conditions. The information gathered from the reactive power analysis is provided as information to the Interconnection Customer and Transmission Owner (TO) and/or Transmission Operator (TOP). The applicable reactive power requirements will be further reviewed by the TO and/or TOP.

The short circuit analysis was performed using the 25SP Scenario 2 stability model modified for short circuit analysis. The results from the short circuit analysis compared the 25SP model with the EGF online and SGF not connected. The maximum contribution to three-phase fault current in the immediate transmission systems due to the addition of the SGF was not greater than 0.406 kA. The maximum three-phase fault current level within 5 buses of the POI with the EGF and SGF online was 59.961 kA for the 25SP model. There were several buses with a maximum three-phase fault current over 40 kA. The maximum contribution to three-phase fault currents due to the addition of the SGF was about 2.234% and 0.4072 kA. These buses are highlighted in Appendix B.

The dynamic stability analysis was performed using Siemens PTI PSS/E version 34 software for the two modified study models: 25SP and 25W, each with two dispatch scenarios. 100 fault events were simulated, which included three-phase faults and single-line-to-ground stuck breaker faults.

- Scenario 1: SGF at maximum assumed dispatch, 48.76 MW and EGF disconnected, with the POI limited to 50 MW.
- Scenario 2: The second scenario is selected based on a combination of SGF and EGF dispatch scenarios, with the project dispatches varied by 10% increments of the total EGF capacity. The resulting selected worst-case scenario included a combination of the SGF dispatched to 34.129 MW and the EGF to 16.402 MW for a total POI injection of 50 MW.

There were no damping or voltage recovery violations attributed to the GEN-2025-SR18 surplus request observed during simulated faults. A few faults showed other generator tripping issues which were also observed in the base cases. Additionally, few faults near the POI showed the diesel generator's (Surplus Generator) rotor angle shift more than 200 degrees. Given the unit's low inertia, stable speed response, and no adverse impact on overall system frequency and stability, these instances were determined as non-violations. Furthermore, 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.

[1] Power System Simulator for Engineering

The results of the dynamic stability for Scenario 1 and Scenario 2 showed several existing base case issues that were found in both the original DISIS-2021-001 model and the model with Project included. Associated stability plots and existing DISIS base case issues are documented in Appendix C.

The results of the study showed that the Surplus Interconnection Service Request by GEN-2025-SR18 did not negatively impact the reliability of the Transmission System. There were no additional Interconnection Facilities or Network Upgrades identified by the analyses.

SPP has determined that GEN-2025-SR18 may utilize the requested 48.756 MW of Surplus Interconnection Service being made available by the EGF. The combined generation from both the SGF and the EGF may not exceed 50 MW at the POI.

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

In accordance with FERC Order No. 827, both SGF and EGF 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

1898 & Co., a part of Burns & McDonnell, was retained by the Southwest Power Pool (SPP) to conduct the Surplus Service Impact Study (Study) for GEN-2025-SR18, the Surplus Generating Facility (SGF). The Study aims to assess the SGF's impact on transmission system reliability and to determine any necessary additional Interconnection Facilities, in accordance with the SPP Generator Interconnection Procedures (GIP) outlined in Attachment V, Section 3.3 of the SPP Open Access Transmission Tariff (SPP Tariff).

The availability of Surplus Interconnection Service for the SGF is constrained by the Interconnection Service previously granted to the existing interconnection customer for the Existing Generating Facility (EGF) at the same Point of Interconnection (POI). Surplus Interconnection Service is only permissible to the extent it does not require additional Network Upgrades beyond those stipulated in the SPP Tariff. The scope of the Study depends on the specifications of both the EGF and SGF.

The criteria sections below outline the analyses performed within the Study's scope. All analyses were performed using the Siemens PTI PSS/E version 34 software. The results of each analysis are presented in the following sections.

REACTIVE POWER ANALYSIS

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

SHORT CIRCUIT ANALYSIS

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

STABILITY ANALYSIS

SPP requires that a dynamic stability analysis be performed to determine whether the SGF, EGF, and the transmission system will remain stable and within applicable criteria. Dynamic stability analysis was performed on two dispatch scenarios, the first where the SGF was online at 100% of the assumed dispatch with the EGF offline and disconnected, and the second which is determined to be the worst-case scenario based on a dispatch test described in the Stability Methodology and Criteria section. The stability analyses will identify any additional Interconnection Facilities and Network Upgrades necessary.

STEADY-STATE ANALYSIS

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

SPP determined that steady-state analysis was not required because the addition of the SGF does not increase the maximum active power output of 50 MW. In addition, the EGF was previously studied at maximum Interconnection Service under all necessary reliability conditions.

NECESSARY INTERCONENCTION FACILITIES & NETWORK UPGRADES

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

STUDY LIMITATIONS

The assessments and conclusions provided in this report are based on assumptions and information provided to 1898 & Co. by others. While the assumptions and information provided may be appropriate for the purposes of this report, 1898 & Co. does not guarantee that those conditions assumed will occur. In addition, 1898 & Co. did not independently verify the accuracy

[2] SPP Open Access Transmission Tariff Section 3.3.4.1

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.

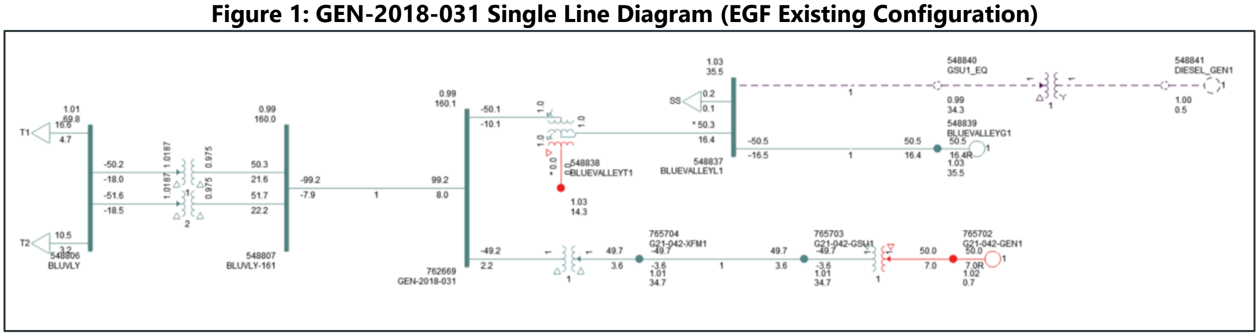
SURPLUS INTERCONNECTION SERVICE REQUEST

The Interconnection Customer has requested a Surplus Interconnection Service Impact Study (Study) for GEN-2025-SR18 to evaluate the Surplus Interconnection Service being made available by GEN-2018-031 at its existing Point of Interconnection (POI) at the Blue Valley 161 kV substation in the City of Independence (INDN) control area.

GEN-2025-SR18, the proposed Surplus Generating Facility (SGF), will connect to the Blue Valley 161 kV POI bus via a separate bay connection. GEN-2018-031 (EGF) has a nameplate capacity of 50.531 MW and is making 50 MW of Surplus Interconnection Service available at its POI. Per the SPP Tariff the amount of Surplus Interconnection Service available to the SGF is limited by the amount of Interconnection Service granted to the EGF at the same POI. In addition, the Surplus Interconnection Service is only available up to the amount that can be accommodated without requiring additional Network Upgrades except those specified in the SPP Tariff.

At the time of the posting of this report, the EGF is an active existing generator at the same POI at Blue Valley 161 kV substation. GEN-2018-031 is a battery storage plant, has a maximum summer and winter queue capacity of 50 MW, and has Energy Resource Interconnection Service (ERIS). The EGF was originally studied in the DISIS-2018-001 cluster study. Figure 1 shows the power flow model single line diagram for the EGF configuration.

Figure 1: GEN-2018-031 Single Line Diagram (EGF Existing Configuration)



The proposed SGF configuration consists of 15 x Cummins C3250 D6e Battery Inverters, each rated at 4.063 MVA. While the SGF has a total generating capability of 48.76 MW, its injection at the POI must be limited to 50 MW. Combined generation from the SGF and EGF cannot exceed 50 MW at the POI. A Power Plant Controller (PPC) will be implemented as part of GEN-2025-SR18 to regulate and limit power injection as required.

The SGF and EGF information is shown in Table 3 below, and the proposed SGF configuration is captured in Figure 2 and detailed in Table 4.

Table 3: EGF & SGF Configuration

Request	Interconnection Queue Capacity (MW)	Fuel Type	Point of Interconnection
GEN-2025-SR18 (SGF)	50	Diesel	Blue Valley 161 kV (#548807)
GEN-2018-031 (EGF)	50	Battery Storage	Blue Valley 161 kV (#548807)

Figure 2: GEN-2018-031 & GEN-2025-SR18 Single Line Diagram (EGF & SGF Configuration)

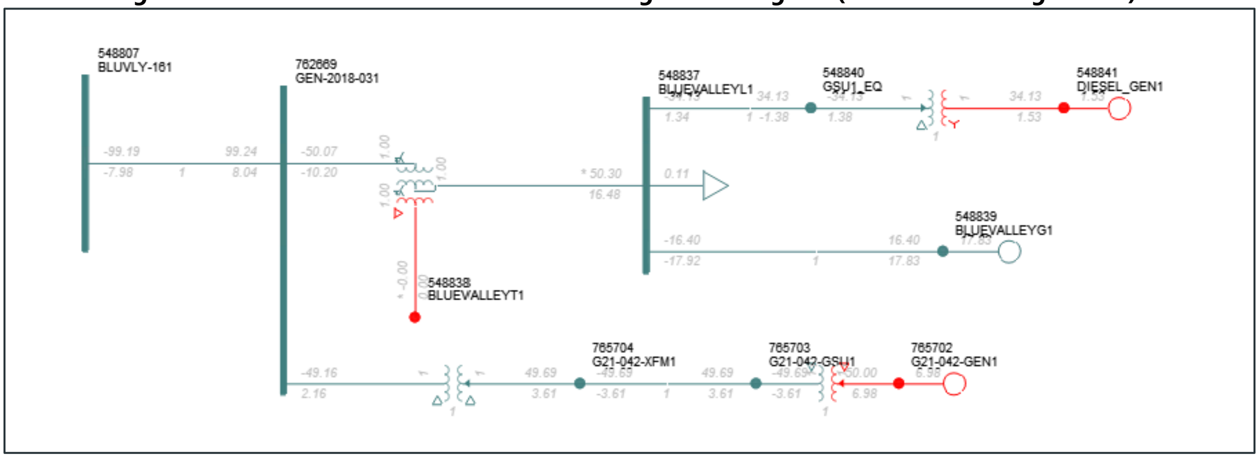


Table 4: SGF Interconnection Configuration

Facility	SGF Configuration
Point of Interconnection	Blue Valley 161 kV (548807)
Configuration/Capacity	15 x Cummins C3250 D6e (diesel) = 48.756 MW [dispatch] Units are rated at 4.063 MVA PPC to limit total POI injection of GEN-2025-SR18 w/ GEN-2018-031 to 50 MW at the POI
Generation Interconnection Line (Shared with the EGF and unchanged)	Length = 0.30 miles
	R = 0.000402 pu
	X = 0.000999 pu
	B = 0.000390 pu
	Rating MVA = 150.3 MVA
Main Substation Transformer[1]	X12 = 9.4950% R12 = 0.3390%, X23 = 14.591% R23 = 0.05210%, X13 = 3.2980% R13 = 0.1180%, Voltage = 161/34.5/13.8 kV (YN0yn0d1), Winding1-2 MVA = 67 MVA, Winding2-3 MVA = 67 MVA, Winding3-1 MVA = 67 MVA, Winding MVA Base= 40 MVA
Equivalent GSU Transformer[1]	X2 = 26.40%, R2 = 0.0000%, Voltage = 34.5/0.48 kV, Winding MVA = 100.0 MVA, Rating MVA = 60.9 MVA
Equivalent Collector Line[2]	R = 0.000335 pu
	X = 0.000380 pu
	B = 0.0004 pu
Generator Dynamic Model[3] & Power Factor	15 x Cummins C3250 D6e (GENROU)[3] Leading: 0.8 Lagging: 0.8

1) X and R based on Winding MVA, 2) All pu are on 100 MVA Base, equivalent based on average derated MVA base provided by IC, 3) DYR stability model name.

REACTIVE POWER ANALYSIS

The reactive power analysis was performed using the 25SP model to determine the capacitive charging effects due to the SGF 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 set the project reactive power contribution to the POI to approximately zero.

METHODOLOGY AND CRITERIA

To determine the shunt reactor size required to compensate for the current charging attributed to the SGF collection system, all SGF components were switched offline and the EGF generator was switched offline while its other collector system elements remained in-service. A shunt reactor was tested at the project's collection substation 34.5 kV bus to set the MVAr injection at the POI to zero. All SGF components except for the generator were then switched online and an additional shunt reactor was tested at the project's collection substation 34.5 kV bus to set the MVAr injection at the POI to 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).

RESULTS

The results from the analysis showed that the EGF needed an approximately 0.13 MVAr shunt reactor at the EGF substation, and the SGF needed an approximately 0.04 MVAr shunt reactor at the SGF substation. For both the EGF and SGF, a 0.17 MVAr shunt reactor is needed to set the MVAr injection at the POI to zero. The final shunt reactor requirements are shown in Table 5.

Figure 3 illustrates the shunt reactor size needed to set the POI MVAr to approximately zero with the EGF alone, and

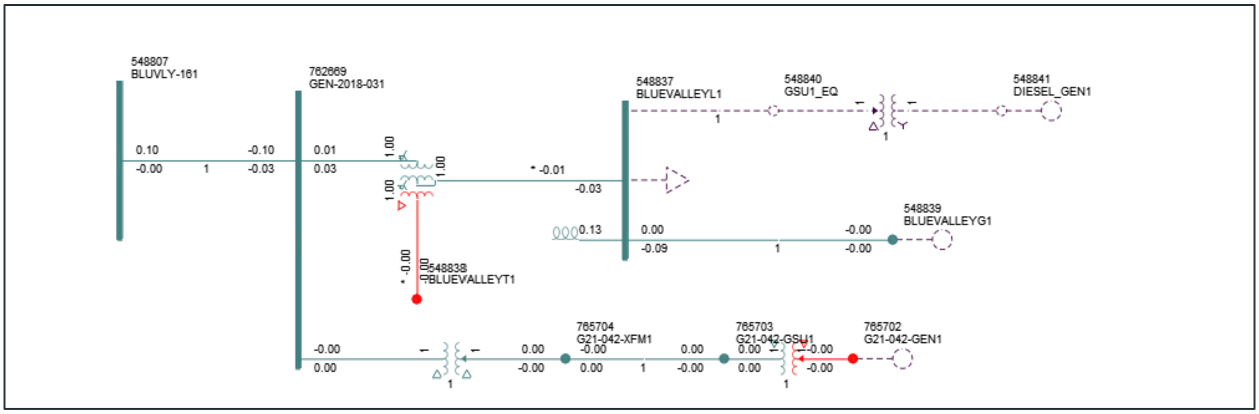


Figure 4 illustrates the shunt reactor size needed to set the POI MVAr to approximately zero with the EGF and SGF online.

Table 5: Shunt Reactor Size for Reactive Power Analysis

Machine	POI Bus Number	POI Bus Name	Shunt Size (MVAr)
			25SP
GEN-2018-031 (EGF)	548807	Blue Valley 161 kV	-0.13
GEN-2025-SR18 (SGF)	548807	Blue Valley 161 kV	-0.04
GEN-2018-031 (EGF) & GEN-2025-SR18 (SGF)	548807	Blue Valley 161 kV	-0.17

Figure 3: EGF Single Line Diagram (Shunt Sizes)

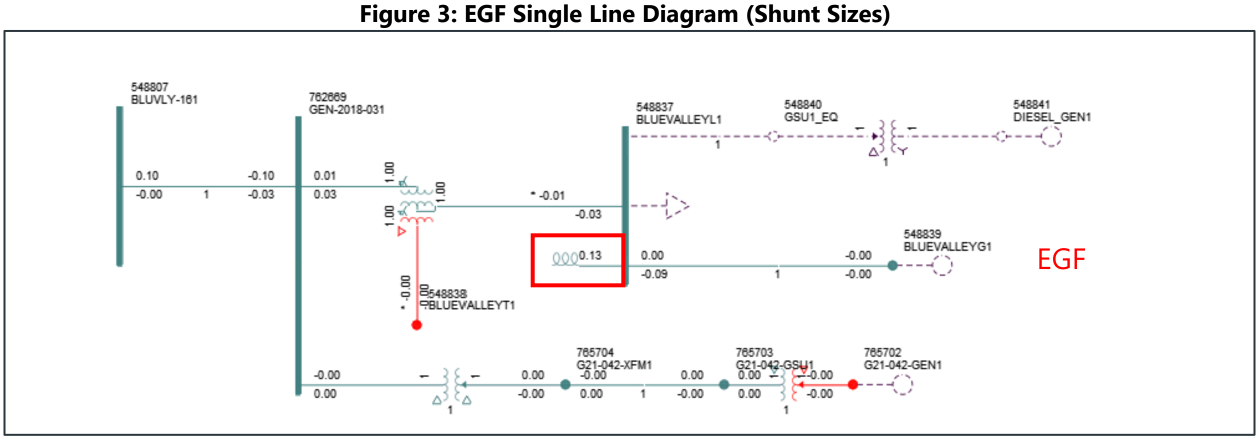
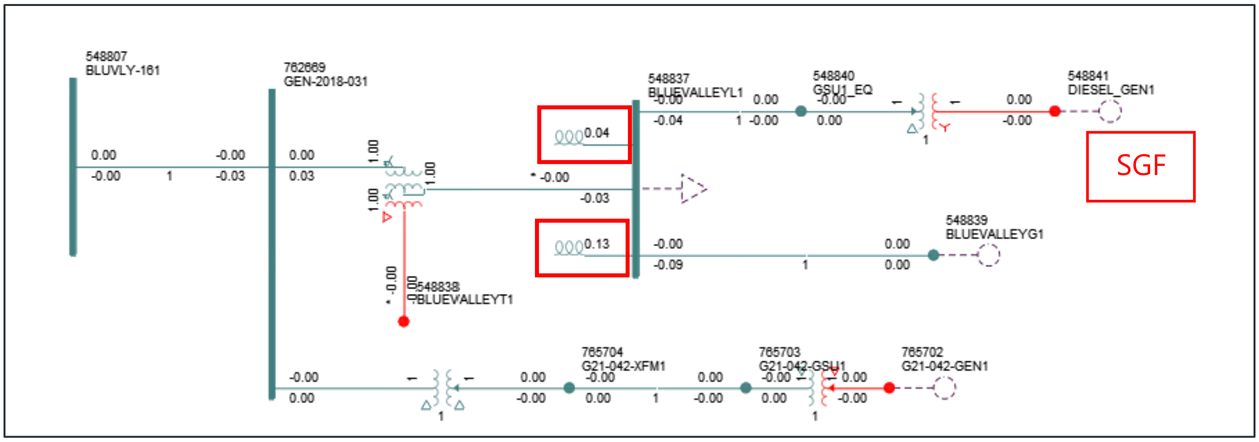


Figure 4: SGF & EGF Single Line Diagram (Shunt Sizes)



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

SHORT CIRCUIT ANALYSIS

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

METHODOLOGY

The short circuit analysis included applying a 3-phase fault on buses up to 5 levels away from the 161 kV POI bus. The PSS/E "Automatic Sequence Fault Calculation (ASCC)" fault analysis module was used to calculate the fault current levels in the transmission system with and without the SGF online. The first scenario was studied with both the SGF and EGF in service. In the second scenario the SGF was disconnected while the EGF was online to determine the impact of the SGF.

1898 & Co. created a short circuit model using the 25SP DISIS-2021-001 stability study model by adjusting the SGF short circuit parameters consistent with the submitted data. The adjusted parameters used in the short circuit analysis are shown in Table 6 below. No other changes were made to the model.

Table 6: Short Circuit Model Parameters*

Parameter	Value by Generator Bus#	Value by Generator Bus#
	548839 (EGF – BESS)	548841 (SGF - Diesel)
R (pu)	0.000	0.000
X''d (pu)	1.000	0.140
X'd (pu)	1.000	0.191
Xd (pu)	1.000	2.700
-R (pu)	0.000	0.000
-X (pu)	0.000	0.202

*pu values based on Machine MVA Base

RESULTS

The short circuit analysis was performed using the 25SP Scenario 2 stability model modified for short circuit analysis. The results of the short circuit analysis compared the 25SP model with the EGF online and SGF not connected. The GEN-2025-SR18 POI bus fault current magnitudes for the comparison cases are provided in Table 7 showing a fault current of 19.572 kA with the EGF and SGF online. The addition of the SGF configuration increased the POI bus fault current by

0.406 kA. Table 8 shows the maximum fault current magnitudes and fault current increases with the SGF project online.

The maximum fault current calculated within 5 buses of the POI was 59.961kA for the 25SP model. There were several buses with a maximum three-phase fault current over 40 kA. The maximum contribution to three-phase fault currents due to the addition of the SGF was about 2.234% and 0.4072 kA. These buses are highlighted in Appendix B.

Table 7: POI Short Circuit Comparison Results

Case	EGF Only Current (kA)	SGF & EGF Current (kA)	kA Change	%Change
25SP	19.166	19.572	0.406	2.12%

Table 8: 25SP Short Circuit Comparison Results

Voltage (kV)	Max. Current (EGF & SGF) (kA)	Max kA Change	Max %Change
69	23.734	0.104	0.439%
115	N/A	N/A	N/A
138	N/A	N/A	N/A
161	59.961	0.4072	2.234 %
230	N/A	N/A	N/A
345	24.300	0.039	0.162%
Max	**59.961**	**0.4072**	**2.234%**

DYNAMIC STABILITY ANALYSIS

The dynamic stability analysis was performed in accordance with SPP's Disturbance Performance Requirements[3] to identify the impact of the SGF project. The dynamic model data for the GEN-2025-SR18 project is provided in Appendix A, and existing base case issues and simulation plots can be found in Appendix C.

METHODOLOGY AND CRITERIA

The dynamic stability analysis was performed using models developed with the requested 15 x Cummins C3250 D6e diesel generators operating at 3.25 MW each to model the SGF generating facility. This stability analysis was performed using Siemens PTI's PSS/E version 34.9 software.

The Project details were used to create modified stability models for this impact study based on the DISIS-2021-001 stability study models:

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

In Scenario 1 the SGF is at 100% of the assumed dispatch (SGF = 48.756 MW) to inject 48.3 MW at the POI while the EGF generator was offline and disconnected. To determine the appropriate EGF/SGF dispatch combination for Scenario 2, dispatch models were created in 10% increments of the total EGF capacity and simulated with a POI fault. The dispatch scenarios tested are shown in the Table 9 . The nearby synchronous machine angle deviation and POI bus voltage deviation results were used to select the worst-case dispatch combination with both the EGF and SGF online for this impact study. The worst-case scenario selected is bolded in Table 9.

Table 9: Dispatch Tests for Scenario 2

Dispatch Scenarios			
GEN-2018-031 EGF (MW)	GEN-2025-SR18 SGF (MW)	EGF+SGF (MW)	POI (MW)
45.6494	4.8756	50.525	50.000
40.7798	9.7512	50.531	50.000
35.9042	14.6268	50.531	50.000
31.0286	19.5024	50.531	50.000
26.162	24.378	50.54	50.000
21.2774	29.2536	50.531	50.000

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

Dispatch Scenarios			
GEN-2018-031 EGF (MW)	GEN-2025-SR18 SGF (MW)	EGF+SGF (MW)	POI (MW)
16.402	**34.129**	**50.531**	**50.000**
11.555	39.005	50.560	50.000
6.720	43.881	50.601	50.000
1.899	48.756	50.655	50.000

The study scenarios are shown in Table 10.

Table 10: Study Scenarios (Generator Dispatch MW)

Scenario	GEN-2018-031 EGF (MW)	GEN-2025-SR18 SGF (MW)	EGF + SGF (MW)
1	0.00 (Offline)	48.765	48.756
2	16.402	34.129	50.531

The power flow models and associated dynamic database were initialized (no-fault test) to confirm that there were no errors in the initial conditions of the system and the dynamic data. The following system adjustments were made to address existing base case issues that are not attributed to the surplus request:

- The PSSE dynamic simulation iterations and acceleration factor were adjusted as needed to resolve PSSE dynamic simulation crashes.

During the fault simulations, the active power (PELEC), reactive power (QELEC), and terminal voltage (ETERM) were monitored for the EGF and SGF and other current and prior queued projects in Group 3[4]. In addition, voltages of five (5) buses away from the POI of the SGF were monitored and plotted.

FAULT DEFINITIONS

1898 & Co. developed fault events as required for the Study for simulation on the 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. 100 faults were simulated for the Study. The fault definitions can be found in Appendix D.

SCENARIO 1 RESULTS

Table 11 shows the relevant results of the fault events simulated for each of the modified models in Scenario 1.

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[4] Based on the DISIS-2021 Cluster Groups

Table 11: Scenario 1 Dynamic Stability Results (EGF = 0 MW, SGF = 48.756 MW)

Fault ID	25SP			25WP		
	Voltage Violation	Voltage Recovery	Stable	Voltage Violation	Voltage Recovery	Stable
G03_P1_300098_5MOCITYB2-344557_5MAURER_Ckt1.idv	Pass	Pass	Stable	Pass	Pass	Stable
G03_P1_300098_5MOCITYB2-541248_LBRTYST5_Ckt1.idv	Pass	Pass	Stable	Pass	Pass	Stable
G03_P1_300110_5PITTSV-300331_2PITTSV_Ckt1.idv	Pass	Pass	Stable	Pass	Pass	Stable
G03_P1_300110_5PITTSV-301561_5HOLDENB1_Ckt1.idv	Pass	Pass	Stable	Pass	Pass	Stable
G03_P1_300110_5PITTSV-548808_ECKLES-161_Ckt1.idv	Pass	Pass	Stable	Pass	Pass	Stable
G03_P1_301563_5MOCITYB1-300098_5MOCITYB2_CktZ1.idv	Pass	Pass	Stable	Pass	Pass	Stable
G03_P1_541201_SIBLEY-541200_PHILL_Ckt1.idv	Pass	Pass	Stable	Pass	Pass	Stable
G03_P1_541201_SIBLEY-541250_SIBLEYPL_3Winding.idv	Pass	Pass	Stable	Pass	Pass	Stable
G03_P1_541205_BLSPE-541206_PRALEE_Ckt1.idv	Pass	Pass	Stable	Pass	Pass	Stable
G03_P1_541205_BLSPE-541220_FROSTRD5_Ckt1.idv	Pass	Pass	Stable	Pass	Pass	Stable
G03_P1_541205_BLSPE-541229_ODESSA_Ckt1.idv	Pass	Pass	Stable	Pass	Pass	Stable
G03_P1_541235_DUNCAN-541205_BLSPE_Ckt1.idv	Pass	Pass	Stable	Pass	Pass	Stable
G03_P1_541235_DUNCAN-543091_DUNCNRD2_Ckt1.idv	Pass	Pass	Stable	Pass	Pass	Stable
G03_P1_541250_SIBLEYPL-541201_SIBLEY_3Winding.idv	Pass	Pass	Stable	Pass	Pass	Stable
G03_P1_541250_SIBLEYPL-541202_SIBLEY_Ckt1.idv	Pass	Pass	Stable	Pass	Pass	Stable
G03_P1_541250_SIBLEYPL-541215_HLLMRK_Ckt1.idv	Pass	Pass	Stable	Pass	Pass	Stable
G03_P1_541250_SIBLEYPL-541235_DUNCAN_Ckt1.idv	Pass	Pass	Stable	Pass	Pass	Stable
G03_P1_541250_SIBLEYPL-541244_ORRICK_Ckt1.idv	Pass	Pass	Stable	Pass	Pass	Stable
G03_P1_541250_SIBLEYPL-541263_SIBLEY_Ckt2.idv	Pass	Pass	Stable	Pass	Pass	Stable
G03_P1_541250_SIBLEYPL-541263_SIBLEY_Ckt3.idv	Pass	Pass	Stable	Pass	Pass	Stable
G03_P1_542972_HAWTH-541201_SIBLEY_Ckt1.idv	Pass	Pass	Stable	Pass	Pass	Stable
G03_P1_542972_HAWTH-542980_NASHUA_Ckt1.idv	Pass	Pass	Stable	Pass	Pass	Stable
G03_P1_542972_HAWTH-543665_HAWTHN5_3Winding.idv	Pass	Pass	Stable	Pass	Pass	Stable
G03_P1_542973_HAWTHS5-542997_LEEDS_Ckt1.idv	Pass	Pass	Stable	Pass	Pass	Stable
G03_P1_542973_HAWTHS5-542997_LEEDS_Ckt2.idv	Pass	Pass	Stable	Pass	Pass	Stable
G03_P1_542973_HAWTHS5-543020_BRMGHAM5_Ckt1.idv	Pass	Pass	Stable	Pass	Pass	Stable
G03_P1_542973_HAWTHS5-543130_HAWTHS_XF5_CktZ2.idv	Pass	Pass	Stable	Pass	Pass	Stable
G03_P1_542973_HAWTHS5-543665_HAWTHN5_Ckt1.idv	Pass	Pass	Stable	Pass	Pass	Stable
G03_P1_542973_HAWTHS5-543665_HAWTHN5_Ckt2.idv	Pass	Pass	Stable	Pass	Pass	Stable
G03_P1_542976_LEVEE-543665_HAWTHN5_Ckt1.idv	Pass	Pass	Stable	Pass	Pass	Stable
G03_P1_542976_LEVEE-543666_NEASTN5_Ckt1.idv	Pass	Pass	Stable	Pass	Pass	Stable
G03_P1_543000_BLUEVLY5-543665_HAWTHN5_Ckt1.idv	Pass	Pass	Stable	Pass	Pass	Stable
G03_P1_543000_BLUEVLY5-543665_HAWTHN5_Ckt2.idv	Pass	Pass	Stable	Pass	Pass	Stable
G03_P1_543000_BLUEVLY5-548821_SUB_Ckt1.idv	Pass	Pass	Stable	Pass	Pass	Stable
G03_P1_543004_BLUMILS5-548808_ECKLES-161_Ckt1.idv	Pass	Pass	Stable	Pass	Pass	Stable

Fault ID	25SP			25WP		
	Voltage Violation	Voltage Recovery	Stable	Voltage Violation	Voltage Recovery	Stable
G03_P1_543091_DUNCNRD2-541235_DUNCAN_Ckt1.idv	Pass	Pass	Stable	Pass	Pass	Stable
G03_P1_543091_DUNCNRD2-548806_BLUVLY_Ckt1.idv	Pass	Pass	Stable	Pass	Pass	Stable
G03_P1_543665_HAWTHN5-542972_HAWTH_3Winding.idv	Pass	Pass	Stable	Pass	Pass	Stable
G03_P1_543665_HAWTHN5-543015_AVONDAL5_Ckt1.idv	Pass	Pass	Stable	Pass	Pass	Stable
G03_P1_548800_SUB-548806_BLUVLY_Ckt1.idv	Pass	Pass	Stable	Pass	Pass	Stable
G03_P1_548800_SUB-548809_SHRNKRD_Ckt1.idv	Pass	Pass	Stable	Pass	Pass	Stable
G03_P1_548800_SUB-548826_STRLNGRD_Ckt1.idv	Pass	Pass	Stable	Pass	Pass	Stable
G03_P1_548802_SUB-543110_MILCKJT2_Ckt1.idv	Pass	Pass	Stable	Pass	Pass	Stable
G03_P1_548802_SUB-543165_SUGRCK_TP_E269000_Ckt1.idv	Pass	Pass	Stable	Pass	Pass	Stable
G03_P1_548806_BLUVLY-543091_DUNCNRD2_Ckt1.idv	Pass	Pass	Stable	Pass	Pass	Stable
G03_P1_548806_BLUVLY-548800_SUB_Ckt1.idv	Pass	Pass	Stable	Pass	Pass	Stable
G03_P1_548806_BLUVLY-548802_SUB_Ckt1.idv	Pass	Pass	Stable	Pass	Pass	Stable
G03_P1_548806_BLUVLY-548807_BLUVLY-161_Ckt1.idv	Pass	Pass	Stable	Pass	Pass	Stable
G03_P1_548806_BLUVLY-548807_BLUVLY-161_Ckt2.idv	Pass	Pass	Stable	Pass	Pass	Stable
G03_P1_548806_BLUVLY-548809_SHRNKRD_Ckt1.idv	Pass	Pass	Stable	Pass	Pass	Stable
G03_P1_548806_BLUVLY-548810_SUB_Ckt1.idv	Pass	Pass	Stable	Pass	Pass	Stable
G03_P1_548806_BLUVLY-548811_SUB_Ckt1.idv	Pass	Pass	Stable	Pass	Pass	Stable
G03_P1_548806_BLUVLY-548827_SUB_Ckt1.idv	Pass	Pass	Stable	Pass	Pass	Stable
G03_P1_548807_BLUVLY-161-543004_BLUMILS5_Ckt1.idv	Pass	Pass	Stable	Pass	Pass	Stable
G03_P1_548807_BLUVLY-161-548806_BLUVLY_Ckt1.idv	Pass	Pass	Stable	Pass	Pass	Stable
G03_P1_548807_BLUVLY-161-548806_BLUVLY_Ckt2.idv	Pass	Pass	Stable	Pass	Pass	Stable
G03_P1_548807_BLUVLY-161-548814_SUB_Ckt1.idv	Pass	Pass	Stable	Pass	Pass	Stable
G03_P1_548808_ECKLES-161-300110_5PITTSV_Ckt1.idv	Pass	Pass	Stable	Pass	Pass	Stable
G03_P1_548808_ECKLES-161-301563_5MOCITYB1_Ckt1.idv	Pass	Pass	Stable	Pass	Pass	Stable
G03_P1_548808_ECKLES-161-541250_SIBLEYPL_Ckt1.idv	Pass	Pass	Stable	Pass	Pass	Stable
G03_P1_548809_SHRNKRD-548806_BLUVLY_Ckt1.idv	Pass	Pass	Stable	Pass	Pass	Stable
G03_P1_548811_SUB-548806_BLUVLY_Ckt1.idv	Pass	Pass	Stable	Pass	Pass	Stable
G03_P1_548814_SUB-542973_HAWTHS5_Ckt1.idv	Pass	Pass	Stable	Pass	Pass	Stable
G03_P1_548814_SUB-548815_SUB_Ckt1.idv	Pass	Pass	Stable	Pass	Pass	Stable
G03_P1_548815_SUB-548802_SUB_Ckt1.idv	Pass	Pass	Stable	Pass	Pass	Stable
G03_P1_548815_SUB-548809_SHRNKRD_Ckt1.idv	Pass	Pass	Stable	Pass	Pass	Stable
G03_P1_548815_SUB-548811_SUB_Ckt1.idv	Pass	Pass	Stable	Pass	Pass	Stable
G03_P1_548815_SUB-548814_SUB_Ckt1.idv	Pass	Pass	Stable	Pass	Pass	Stable
G03_P4_CON-541200_PHILL-ConID-104514.idv	Pass	Pass	Stable	Pass	Pass	Stable
G03_P4_HOL-301563_5MOCITYB1.idv	Pass	Pass	Stable	Pass	Pass	Stable
G03_P4_HOL-541201_SIBLEY.idv	Pass	Pass	Stable	Pass	Pass	Stable

Fault ID	25SP			25WP		
	Voltage Violation	Voltage Recovery	Stable	Voltage Violation	Voltage Recovery	Stable
G03_P4_HOL-541250_SIBLEYPL.idv	Pass	Pass	Stable	Pass	Pass	Stable
G03_P4_HOL-542973_HAWTHS5.idv	Pass	Pass	Stable	Pass	Pass	Stable
G03_P4_HOL-543665_HAWTHN5.idv	Pass	Pass	Stable	Pass	Pass	Stable
G03_P4_HOL-548806_BLUVLY.idv	Pass	Pass	Stable	Pass	Pass	Stable
G03_P4_HOL-548807_BLUVLY-161.idv	Pass	Pass	Stable	Pass	Pass	Stable
G03_P4_HOL-548808_ECKLES-161.idv	Pass	Pass	Stable	Pass	Pass	Stable
G03_P4_HOL-548814_SUB.idv	Pass	Pass	Stable	Pass	Pass	Stable
G03_P4_HOL-548815_SUB.idv	Pass	Pass	Stable	Pass	Pass	Stable
G03_P4_TO-542972_HAWTH-ConID-Evergy-134.idv	Pass	Pass	Stable	Pass	Pass	Stable
G03_P4_TO-542972_HAWTH-ConID-Evergy-135.idv	Pass	Pass	Stable	Pass	Pass	Stable
G03_P4_TO-542972_HAWTH-ConID-Evergy-136.idv	Pass	Pass	Stable	Pass	Pass	Stable
G03_P4_TO-542972_HAWTH-ConID-Evergy-137.idv	Pass	Pass	Stable	Pass	Pass	Stable
G03_P4_TO-542973_HAWTHS5-ConID-Evergy-132.idv	Pass	Pass	Stable	Pass	Pass	Stable
G03_P4_TO-542973_HAWTHS5-ConID-Evergy-133.idv	Pass	Pass	Stable	Pass	Pass	Stable
G03_P4_TO-542980_NASHUA-ConID-Evergy-144.idv	Pass	Pass	Stable	Pass	Pass	Stable
G03_P4_TO-542985_NEASTS5-ConID-Evergy-145.idv	Pass	Pass	Stable	Pass	Pass	Stable
G03_P4_TO-543665_HAWTHN5-ConID-Evergy-129.idv	Pass	Pass	Stable	Pass	Pass	Stable
G03_P4_TO-543665_HAWTHN5-ConID-Evergy-130.idv	Pass	Pass	Stable	Pass	Pass	Stable
G03_P4_TO-543665_HAWTHN5-ConID-Evergy-131.idv	Pass	Pass	Stable	Pass	Pass	Stable
G03_P4_TO-548807_BLUVLY-161-ConID-INDN-12.idv	Pass	Pass	Stable	Pass	Pass	Stable
G03_P4_TO-548807_BLUVLY-161-ConID-INDN-13.idv	Pass	Pass	Stable	Pass	Pass	Stable
G03_P4_TO-548807_BLUVLY-161-ConID-INDN-14.idv	Pass	Pass	Stable	Pass	Pass	Stable
G03_P4_TO-548807_BLUVLY-161-ConID-INDN-15.idv	Pass	Pass	Stable	Pass	Pass	Stable
G03_P4_TO-548808_ECKLES-161-ConID-INDN-16.idv	Pass	Pass	Stable	Pass	Pass	Stable
G03_P4_TO-548808_ECKLES-161-ConID-INDN-17.idv	Pass	Pass	Stable	Pass	Pass	Stable
G03_P4_TO-548808_ECKLES-161-ConID-INDN-18.idv	Pass	Pass	Stable	Pass	Pass	Stable
G03_P4_TO-548808_ECKLES-161-ConID-INDN-19.idv	Pass	Pass	Stable	Pass	Pass	Stable
G03_P4_TO-548814_SUB-ConID-INDN-10.idv	Pass	Pass	Stable	Pass	Pass	Stable
G03_P4_TO-548814_SUB-ConID-INDN-11.idv	Pass	Pass	Stable	Pass	Pass	Stable

There were no damping or voltage recovery violations attributed to the GEN-2025-SR18 surplus request observed during the simulated faults. A few faults showed other generator tripping issues which were also observed in the base cases. Additionally, few faults near the POI showed the diesel generator’s (Surplus Generator) rotor angle shift more than 200 degrees. Given the unit’s low inertia, stable speed response, and no adverse impact on overall system frequency and stability, these instances were determined as non-violations. Furthermore, 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. Associated stability plots and existing DISIS base case issues are documented in Appendix C.

SCENARIO 2 RESULTS

Table 12 shows the relevant results of the fault events simulated for each of the modified models in Scenario 2.

Table 12: Scenario 2 Dynamic Stability Results (EGF = 16.402 MW, SGF = 34.129 MW)

Fault ID	25SP			25WP		
	Voltage Violation	Voltage Recovery	Stable	Voltage Violation	Voltage Recovery	Stable
G03_P1_300098_5MOCITYB2-344557_5MAURER_Ckt1.idv	Pass	Pass	Stable	Pass	Pass	Stable
G03_P1_300098_5MOCITYB2-541248_LBRTYST5_Ckt1.idv	Pass	Pass	Stable	Pass	Pass	Stable
G03_P1_300110_5PITTSV-300331_2PITTSV_Ckt1.idv	Pass	Pass	Stable	Pass	Pass	Stable
G03_P1_300110_5PITTSV-301561_5HOLDENB1_Ckt1.idv	Pass	Pass	Stable	Pass	Pass	Stable
G03_P1_300110_5PITTSV-548808_ECKLES-161_Ckt1.idv	Pass	Pass	Stable	Pass	Pass	Stable
G03_P1_301563_5MOCITYB1-300098_5MOCITYB2_CktZ1.idv	Pass	Pass	Stable	Pass	Pass	Stable
G03_P1_541201_SIBLEY-541200_PHILL_Ckt1.idv	Pass	Pass	Stable	Pass	Pass	Stable
G03_P1_541201_SIBLEY-541250_SIBLEYPL_3Winding.idv	Pass	Pass	Stable	Pass	Pass	Stable
G03_P1_541205_BLSPE-541206_PRALEE_Ckt1.idv	Pass	Pass	Stable	Pass	Pass	Stable
G03_P1_541205_BLSPE-541220_FROSTRD5_Ckt1.idv	Pass	Pass	Stable	Pass	Pass	Stable
G03_P1_541205_BLSPE-541229_ODESSA_Ckt1.idv	Pass	Pass	Stable	Pass	Pass	Stable
G03_P1_541235_DUNCAN-541205_BLSPE_Ckt1.idv	Pass	Pass	Stable	Pass	Pass	Stable
G03_P1_541235_DUNCAN-543091_DUNCNRD2_Ckt1.idv	Pass	Pass	Stable	Pass	Pass	Stable
G03_P1_541250_SIBLEYPL-541201_SIBLEY_3Winding.idv	Pass	Pass	Stable	Pass	Pass	Stable
G03_P1_541250_SIBLEYPL-541202_SIBLEY_Ckt1.idv	Pass	Pass	Stable	Pass	Pass	Stable
G03_P1_541250_SIBLEYPL-541215_HLLMRK_Ckt1.idv	Pass	Pass	Stable	Pass	Pass	Stable
G03_P1_541250_SIBLEYPL-541235_DUNCAN_Ckt1.idv	Pass	Pass	Stable	Pass	Pass	Stable
G03_P1_541250_SIBLEYPL-541244_ORRICK_Ckt1.idv	Pass	Pass	Stable	Pass	Pass	Stable
G03_P1_541250_SIBLEYPL-541263_SIBLEY_Ckt2.idv	Pass	Pass	Stable	Pass	Pass	Stable
G03_P1_541250_SIBLEYPL-541263_SIBLEY_Ckt3.idv	Pass	Pass	Stable	Pass	Pass	Stable
G03_P1_542972_HAWTH-541201_SIBLEY_Ckt1.idv	Pass	Pass	Stable	Pass	Pass	Stable
G03_P1_542972_HAWTH-542980_NASHUA_Ckt1.idv	Pass	Pass	Stable	Pass	Pass	Stable
G03_P1_542972_HAWTH-543665_HAWTHN5_3Winding.idv	Pass	Pass	Stable	Pass	Pass	Stable
G03_P1_542973_HAWTHS5-542997_LEEDS_Ckt1.idv	Pass	Pass	Stable	Pass	Pass	Stable
G03_P1_542973_HAWTHS5-542997_LEEDS_Ckt2.idv	Pass	Pass	Stable	Pass	Pass	Stable
G03_P1_542973_HAWTHS5-543020_BRMGHAM5_Ckt1.idv	Pass	Pass	Stable	Pass	Pass	Stable
G03_P1_542973_HAWTHS5-543130_HAWTHS_XF5_CktZ2.idv	Pass	Pass	Stable	Pass	Pass	Stable

Fault ID	25SP			25WP		
	Voltage Violation	Voltage Recovery	Stable	Voltage Violation	Voltage Recovery	Stable
G03_P1_542973_HAWTHS5-543665_HAWTHN5_Ckt1.idv	Pass	Pass	Stable	Pass	Pass	Stable
G03_P1_542973_HAWTHS5-543665_HAWTHN5_Ckt2.idv	Pass	Pass	Stable	Pass	Pass	Stable
G03_P1_542976_LEVEE-543665_HAWTHN5_Ckt1.idv	Pass	Pass	Stable	Pass	Pass	Stable
G03_P1_542976_LEVEE-543666_NEASTN5_Ckt1.idv	Pass	Pass	Stable	Pass	Pass	Stable
G03_P1_543000_BLUEVLY5-543665_HAWTHN5_Ckt1.idv	Pass	Pass	Stable	Pass	Pass	Stable
G03_P1_543000_BLUEVLY5-543665_HAWTHN5_Ckt2.idv	Pass	Pass	Stable	Pass	Pass	Stable
G03_P1_543000_BLUEVLY5-548821_SUB_Ckt1.idv	Pass	Pass	Stable	Pass	Pass	Stable
G03_P1_543004_BLUMILS5-548808_ECKLES-161_Ckt1.idv	Pass	Pass	Stable	Pass	Pass	Stable
G03_P1_543091_DUNCNRD2-541235_DUNCAN_Ckt1.idv	Pass	Pass	Stable	Pass	Pass	Stable
G03_P1_543091_DUNCNRD2-548806_BLUVLY_Ckt1.idv	Pass	Pass	Stable	Pass	Pass	Stable
G03_P1_543665_HAWTHN5-542972_HAWTH_3Winding.idv	Pass	Pass	Stable	Pass	Pass	Stable
G03_P1_543665_HAWTHN5-543015_AVONDAL5_Ckt1.idv	Pass	Pass	Stable	Pass	Pass	Stable
G03_P1_548800_SUB-548806_BLUVLY_Ckt1.idv	Pass	Pass	Stable	Pass	Pass	Stable
G03_P1_548800_SUB-548809_SHRNKRD_Ckt1.idv	Pass	Pass	Stable	Pass	Pass	Stable
G03_P1_548800_SUB-548826_STRLNGRD_Ckt1.idv	Pass	Pass	Stable	Pass	Pass	Stable
G03_P1_548802_SUB-543110_MILCKJT2_Ckt1.idv	Pass	Pass	Stable	Pass	Pass	Stable
G03_P1_548802_SUB-543165_SUGRCK_TP_E269000_Ckt1.idv	Pass	Pass	Stable	Pass	Pass	Stable
G03_P1_548806_BLUVLY-543091_DUNCNRD2_Ckt1.idv	Pass	Pass	Stable	Pass	Pass	Stable
G03_P1_548806_BLUVLY-548800_SUB_Ckt1.idv	Pass	Pass	Stable	Pass	Pass	Stable
G03_P1_548806_BLUVLY-548802_SUB_Ckt1.idv	Pass	Pass	Stable	Pass	Pass	Stable
G03_P1_548806_BLUVLY-548807_BLUVLY-161_Ckt1.idv	Pass	Pass	Stable	Pass	Pass	Stable
G03_P1_548806_BLUVLY-548807_BLUVLY-161_Ckt2.idv	Pass	Pass	Stable	Pass	Pass	Stable
G03_P1_548806_BLUVLY-548809_SHRNKRD_Ckt1.idv	Pass	Pass	Stable	Pass	Pass	Stable
G03_P1_548806_BLUVLY-548810_SUB_Ckt1.idv	Pass	Pass	Stable	Pass	Pass	Stable
G03_P1_548806_BLUVLY-548811_SUB_Ckt1.idv	Pass	Pass	Stable	Pass	Pass	Stable
G03_P1_548806_BLUVLY-548827_SUB_Ckt1.idv	Pass	Pass	Stable	Pass	Pass	Stable
G03_P1_548807_BLUVLY-161-543004_BLUMILS5_Ckt1.idv	Pass	Pass	Stable	Pass	Pass	Stable
G03_P1_548807_BLUVLY-161-548806_BLUVLY_Ckt1.idv	Pass	Pass	Stable	Pass	Pass	Stable
G03_P1_548807_BLUVLY-161-548806_BLUVLY_Ckt2.idv	Pass	Pass	Stable	Pass	Pass	Stable
G03_P1_548807_BLUVLY-161-548814_SUB_Ckt1.idv	Pass	Pass	Stable	Pass	Pass	Stable
G03_P1_548808_ECKLES-161-300110_5PITTSV_Ckt1.idv	Pass	Pass	Stable	Pass	Pass	Stable
G03_P1_548808_ECKLES-161-301563_5MOCITYB1_Ckt1.idv	Pass	Pass	Stable	Pass	Pass	Stable
G03_P1_548808_ECKLES-161-541250_SIBLEYPL_Ckt1.idv	Pass	Pass	Stable	Pass	Pass	Stable
G03_P1_548809_SHRNKRD-548806_BLUVLY_Ckt1.idv	Pass	Pass	Stable	Pass	Pass	Stable
G03_P1_548811_SUB-548806_BLUVLY_Ckt1.idv	Pass	Pass	Stable	Pass	Pass	Stable
G03_P1_548814_SUB-542973_HAWTHS5_Ckt1.idv	Pass	Pass	Stable	Pass	Pass	Stable

Fault ID	25SP			25WP		
	Voltage Violation	Voltage Recovery	Stable	Voltage Violation	Voltage Recovery	Stable
G03_P1_548814_SUB-548815_SUB_Ckt1.idv	Pass	Pass	Stable	Pass	Pass	Stable
G03_P1_548815_SUB-548802_SUB_Ckt1.idv	Pass	Pass	Stable	Pass	Pass	Stable
G03_P1_548815_SUB-548809_SHRNKRD_Ckt1.idv	Pass	Pass	Stable	Pass	Pass	Stable
G03_P1_548815_SUB-548811_SUB_Ckt1.idv	Pass	Pass	Stable	Pass	Pass	Stable
G03_P1_548815_SUB-548814_SUB_Ckt1.idv	Pass	Pass	Stable	Pass	Pass	Stable
G03_P4_CON-541200_PHILL-ConID-104514.idv	Pass	Pass	Stable	Pass	Pass	Stable
G03_P4_HOL-301563_5MOCITYB1.idv	Pass	Pass	Stable	Pass	Pass	Stable
G03_P4_HOL-541201_SIBLEY.idv	Pass	Pass	Stable	Pass	Pass	Stable
G03_P4_HOL-541250_SIBLEYPL.idv	Pass	Pass	Stable	Pass	Pass	Stable
G03_P4_HOL-542973_HAWTHS5.idv	Pass	Pass	Stable	Pass	Pass	Stable
G03_P4_HOL-543665_HAWTHN5.idv	Pass	Pass	Stable	Pass	Pass	Stable
G03_P4_HOL-548806_BLUVLY.idv	Pass	Pass	Stable	Pass	Pass	Stable
G03_P4_HOL-548807_BLUVLY-161.idv	Pass	Pass	Stable	Pass	Pass	Stable
G03_P4_HOL-548808_ECKLES-161.idv	Pass	Pass	Stable	Pass	Pass	Stable
G03_P4_HOL-548814_SUB.idv	Pass	Pass	Stable	Pass	Pass	Stable
G03_P4_HOL-548815_SUB.idv	Pass	Pass	Stable	Pass	Pass	Stable
G03_P4_TO-542972_HAWTH-ConID-Evergy-134.idv	Pass	Pass	Stable	Pass	Pass	Stable
G03_P4_TO-542972_HAWTH-ConID-Evergy-135.idv	Pass	Pass	Stable	Pass	Pass	Stable
G03_P4_TO-542972_HAWTH-ConID-Evergy-136.idv	Pass	Pass	Stable	Pass	Pass	Stable
G03_P4_TO-542972_HAWTH-ConID-Evergy-137.idv	Pass	Pass	Stable	Pass	Pass	Stable
G03_P4_TO-542973_HAWTHS5-ConID-Evergy-132.idv	Pass	Pass	Stable	Pass	Pass	Stable
G03_P4_TO-542973_HAWTHS5-ConID-Evergy-133.idv	Pass	Pass	Stable	Pass	Pass	Stable
G03_P4_TO-542980_NASHUA-ConID-Evergy-144.idv	Pass	Pass	Stable	Pass	Pass	Stable
G03_P4_TO-542985_NEASTS5-ConID-Evergy-145.idv	Pass	Pass	Stable	Pass	Pass	Stable
G03_P4_TO-543665_HAWTHN5-ConID-Evergy-129.idv	Pass	Pass	Stable	Pass	Pass	Stable
G03_P4_TO-543665_HAWTHN5-ConID-Evergy-130.idv	Pass	Pass	Stable	Pass	Pass	Stable
G03_P4_TO-543665_HAWTHN5-ConID-Evergy-131.idv	Pass	Pass	Stable	Pass	Pass	Stable
G03_P4_TO-548807_BLUVLY-161-ConID-INDN-12.idv	Pass	Pass	Stable	Pass	Pass	Stable
G03_P4_TO-548807_BLUVLY-161-ConID-INDN-13.idv	Pass	Pass	Stable	Pass	Pass	Stable
G03_P4_TO-548807_BLUVLY-161-ConID-INDN-14.idv	Pass	Pass	Stable	Pass	Pass	Stable
G03_P4_TO-548807_BLUVLY-161-ConID-INDN-15.idv	Pass	Pass	Stable	Pass	Pass	Stable
G03_P4_TO-548808_ECKLES-161-ConID-INDN-16.idv	Pass	Pass	Stable	Pass	Pass	Stable
G03_P4_TO-548808_ECKLES-161-ConID-INDN-17.idv	Pass	Pass	Stable	Pass	Pass	Stable
G03_P4_TO-548808_ECKLES-161-ConID-INDN-18.idv	Pass	Pass	Stable	Pass	Pass	Stable
G03_P4_TO-548808_ECKLES-161-ConID-INDN-19.idv	Pass	Pass	Stable	Pass	Pass	Stable
G03_P4_TO-548814_SUB-ConID-INDN-10.idv	Pass	Pass	Stable	Pass	Pass	Stable

Fault ID	25SP			25WP		
	Voltage Violation	Voltage Recovery	Stable	Voltage Violation	Voltage Recovery	Stable
G03_P4_TO-548814_SUB-ConID-INDN-11.idv	Pass	Pass	Stable	Pass	Pass	Stable

There were no damping or voltage recovery violations attributed to the GEN-2025-SR18 surplus request observed during the simulated faults. A few faults showed other generator tripping issues which were also observed in the base cases. Additionally, few faults near the POI showed the diesel generator's (Surplus Generator) rotor angle shift more than 200 degrees. Given the unit's low inertia, stable speed response, and no adverse impact on overall system frequency and stability, these instances were determined as non-violations. Furthermore, 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. Associated stability plots and existing DISIS base case issues are documented in Appendix C.

NECESSARY INTERCONNECTION FACILITIES

This study identified the impact of the Surplus Interconnection Service request GEN-2025-SR18 on the transmission system reliability and any additional Interconnection Facilities or Network Upgrades necessary. The Surplus Interconnection Service is only available up to the amount that can be accommodated without requiring additional Network Upgrades unless (a) those additional Network Upgrades are either (1) located at the Point of Interconnection substation and at the same voltage level as the Generating Facility with an effective GIA, or (2) are System Protection Facilities; and (b) there are no material adverse impacts on the cost or timing of any Interconnection Requests pending at the time the Surplus Interconnection Service request is submitted.

INTERCONNECTION FACILITIES

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

NETWORK UPGRADES

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

SURPLUS INTERCONNECTION SERVICE DETERMINATION AND REQUIREMENTS

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

SURPLUS SERVICE DETERMINATION

SPP determined the request for Surplus Interconnection Service does not negatively impact the reliability of the Transmission System and no required Network Upgrades or Interconnection Facilities were identified.

1898 & Co. evaluated the impact of the requested Surplus Interconnection Service on the prior study results and determined that the requested SGF resulted in similar dynamic stability and short circuit analyses therefore the prior study steady-state results should not be negatively impacted.

SPP has determined that GEN-2025-SR18 may utilize the requested 48.756 MW of Surplus Interconnection Service being made available by GEN-2018-031.

SURPLUS SERVICE REQUIREMENTS

The amount of Surplus Interconnection Service available to be used is limited by the amount of Interconnection Service granted to the existing interconnection customer at the same POI. The combined generation from both the SGF and the EGF may not exceed 50 MW at the POI, which is the total Interconnection Service amount currently granted to the EGF.

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

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