IRL01 - Everwind Load Facility

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IESO Nova Scotia

1791 Barrington Street, Suite 1010
Halifax, Nova Scotia
B3J 3K9

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TABLE OF ABBREVIATIONS

Term	Definition
BDC	Battery Disconnect Control
BES	Bulk Electric System
BESS	Battery Energy Storage System
BPS	Bulk Power System
CB	Circuit Breaker
CBF	Circuit Breaker Fail
DCT	Double Circuit Tower
EMT	Electromagnetic Transient
FRT	Fault Ride Through
GFL	Grid Following
GFM	Grid Forming
HVRT	High Voltage Ride Through
IBR	Inverter Based Resource
IC	Interconnection Customer
IESO-NS	Nova Scotia Independent Energy System Operator
IR###	Interconnection Request No. ###
LVRT	Low Voltage Ride Through
MQT	Model Quality Test
NERC	North American Electric Reliability Corporation
NPCC	Northeast Power Coordinating Council
NSPI	Nova Scotia Power Inc.
PFC	Power Factor Correction
OLTC	On Load Tap Changer
PCO	Point of Change of Ownership
POI	Point of Interconnection to Transmission Owner facilities
PPC	Power Plant Controller
RMS	Root Mean Squared
RUG	Releasable User Guide
SIS	System Impact Study
RAS	Remedial Action Scheme
SMIB	Single Machine Infinite Bus
SVC	Static Var Compensator
TSIR	Transmission System Interconnection Requirements
UPS	Uninterruptible Power Supply
VSC	Voltage Source Converter
WECS	Wind Energy Conversion System

1 INTRODUCTION

The Interconnection Customer (IC) submitted an Interconnection Request (IR) for the connection of a load facility to the Nova Scotia (NS) Transmission System. The proposed Commercial Operation Date is December 31, 2027. The requested Point of Interconnection (POI) for the 325 MW load facility is via a new switching station 122C-Crandall Rd tying in both L-7011 and L-7012. This project is listed as Interconnection Request #IRL01 in the IESO-NS studies queue and will be referred to as IRL01 throughout this report.

The System Impact Study (SIS) for IRL01 has been conducted in both Root Mean Squared (RMS) and Electromagnetic Transient (EMT) domains. The RMS assessment has been conducted in PSS®E, while the EMT assessment has been conducted in PSCAD™. Both assessments are based on the NS Transmission System Interconnection Requirements (TSIR), applicable Northeast Power Coordinating Council (NPCC) planning criteria for Bulk Power System (BPS), and applicable North American Electric Reliability Corporation (NERC) planning criteria for Bulk Electricity System (BES).

1.1 Scope

The requested POI for IRL01 is a new switching station 122C-Crandall Rd, with in and out to existing 230kV lines L-7011 and L-7012. Two 230kV lines will run to the customer substation, 123C-Everwind Load Facility.

Figure 1 shows the approximate geographic location for IRL01, Figure 2 the substation location, Figure 3 the NSPI local Transmission Facilities and Figure 4 the proposed Transmission Interconnection to the site.

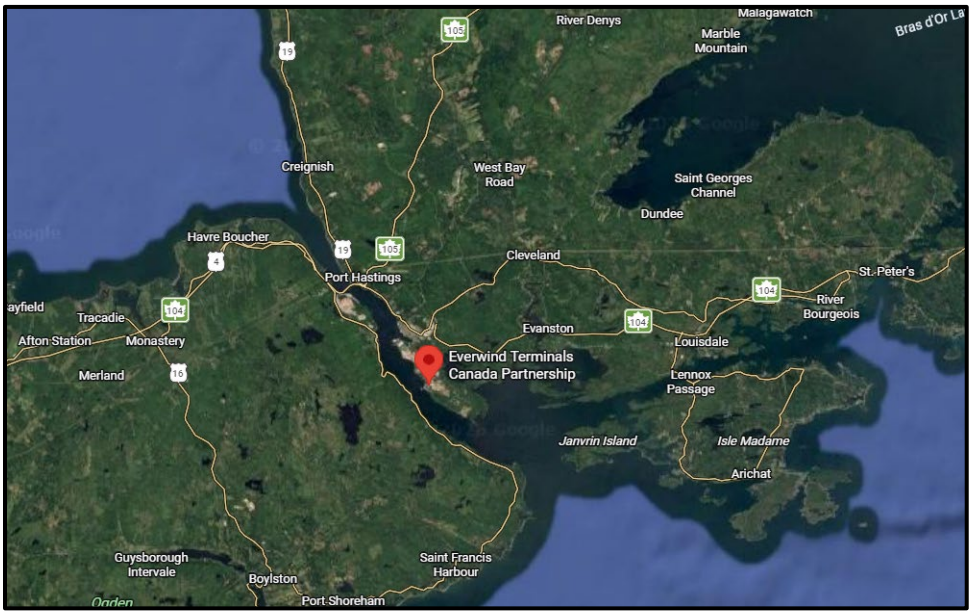


Figure 1: IRL01 Geographical Location

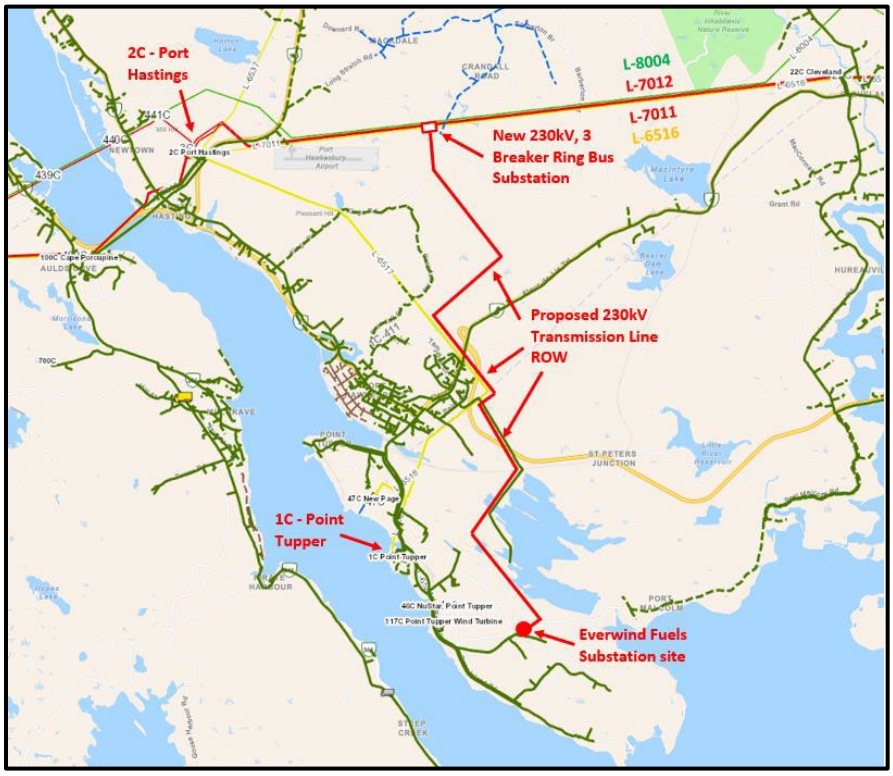


Figure 2: 123-C Substation Location

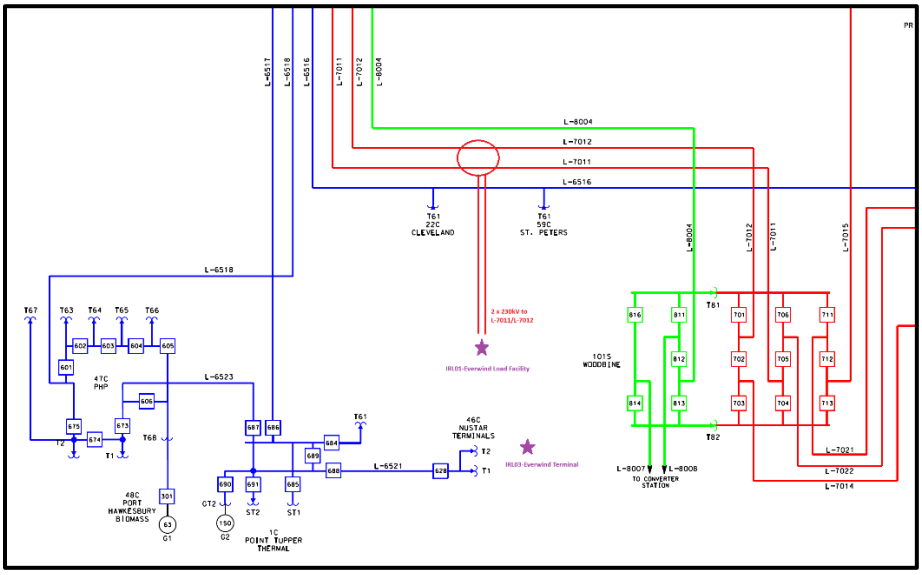


Figure 3: NSPI Interconnection Facilities

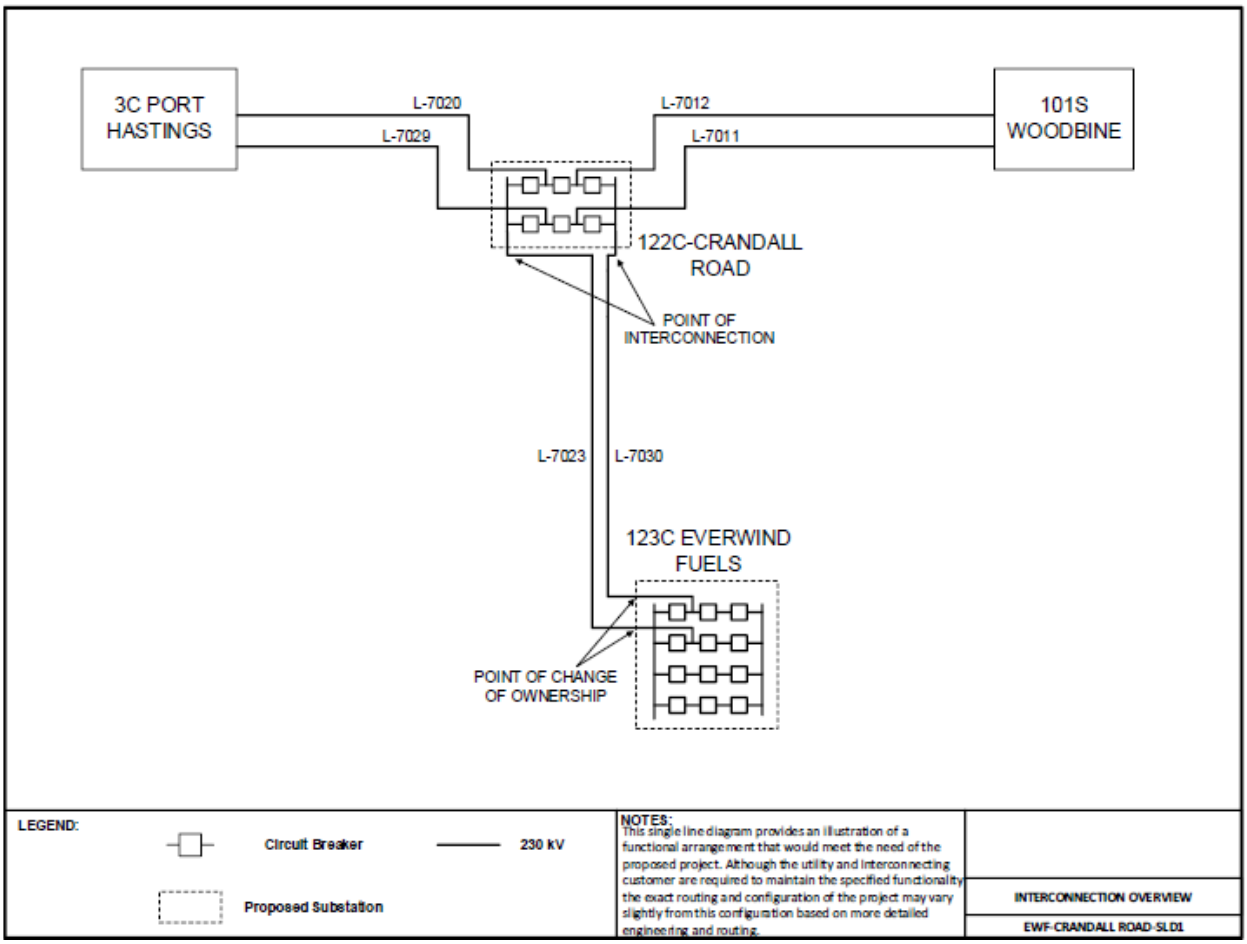


Figure 4: Proposed Interconnection Facilities

The scope of this study is to assess the impact of the proposed load facility on the interconnected system and includes, but is not limited to:

- Steady state analysis:
  - Identification of any thermal overload of transmission elements
  - Identification of any steady state voltage criteria violation
- Stability analysis:
  - Assess NPCC BPS and NERC BES classification criteria for the substation in PSS®E
  - Identification of any requirements necessary for the interconnected power system to maintain stable and well damped performance for normal contingencies in PSCAD™

- EMT analysis, Wide Area Model simulation to assess:
    - Control interactions between the proposed facility and surrounding Inverter Based Resource (IBR) facilities
    - Control interactions with neighbouring devices and/or with synchronous machines
- Assess the ability of the proposed facility to ride through a frequency deviation
- Review ability of the proposed facility to ride through voltage deviations
- Power factor requirement at the high side of the IC facility transformer(s)
- Assessment of harmonics
- Impact on any existing Remedial Action Schemes (RAS)

This report describes methodology, plant and equipment models, and results of the study work carried out to evaluate the impact of connecting IRL01 to the Nova Scotia transmission network.

1.2 Background

Nova Scotia is moving towards very high levels of IBR, while maintaining a stable and well damped grid. To achieve high levels of IBR, planning criteria have been developed to ensure that new IBR facilities are able to stay online during all expected operating scenarios and not adversely impact the ability of other facilities to do the same.

The SIS for all new interconnections includes all inertia sources that would be expected to be online for a particular study scenario. Facilities, such as the Maritime Link HVDC, that provide fast frequency response (not to be confused with inertia) are online and dispatched in study cases to provide performance comparable to that expected under the operating scenario under study. As the Maritime Link, existing IBR facilities and existing motor loads around the province require a minimum Short Circuit MVA for FRT or motor starts, online inertia resources will be maintained comparable to the existing levels when required to ensure no adverse impact to existing facilities as synchronous units are removed from service or dispatched with lesser frequency. Existing synchronous resources such as small generators and large motor loads in the province are dispatched to align with credible dispatches in the operating timeframe.

All new facilities (load, generation and BESS) will be required to stay online under a range of operating conditions with performance meeting all IESO-NS, NPCC and NERC criteria without causing adverse impact to existing facilities.

1.3 Study Queue Position

All in-service generation facilities are included in the SIS, except for Lingan Unit 2, which is assumed to be retired. Another project at the same local area by the same IC, IRL03 Everwind Terminal, is modelled and included in IRL01 study base cases.

If any included projects are subsequently withdrawn from the Queue, it may be necessary to update this SIS or perform a restudy.

2 PLANT AND EQUIPMENT MODEL

The study is based on technical information provided by the IC and interconnection of the load facility with an accompanying grid forming (GFM) BESS and 325MW of backup generation. The BESS and backup generation was not included in simulation cases and will require a GIP Interconnection Request to assess requirements to interconnect. However, the BESS was considered when looking at mitigation potential for RAS support and smoothing power ramps in the final plant configuration. The backup generation was considered as a backup when system generation was not available.

2.1 Load Facility

Table 1 provides a summarized overview of the project.

Table 1: Project Overview

Attribute	Description
Project name	Everwind Load Facility
Project identifier	IRL01
Project type	Technology Centre Load
Connection point	122C switching station to123C IC station
Connection Voltage	230 kV
[redacted]	[redacted]
[redacted]	[redacted]

2.2 BESS and Backup Generation

The facility is expected to install GFM BESS and EMS system to reduce voltage flicker and smooth active power ramping to limit the system impact. The BESS model and associated EMS control structure has not been received at this time.

The Load Interconnection Request also identified 325MW of backup generation for this facility. The IC is to submit a Generator Interconnection Request for the associated BESS and backup generation and a System Impact Study for the combined facility will be performed at that time. This facility is planned to be curtailed as needed by the system operator until such time as the Behind the Meter generation and BESS are in service.

2.3 Plant Control

IRL01 model and Releasable User Guide (RUG) were provided by the IC. [redacted]

2.4 PSS®E and PSCAD™ Models

The IRL01 facility was represented in both PSS®E and PSCAD™ as supplied by the IC. The PSS®E model shown below in Figure 5 is used for steady state and RMS domain assessment, while the PSCAD™ model is used for EMT and stability assessment of the facility load, UPS/converter interface, voltage ride through, frequency ride through, and control interaction performance.

[redacted]

Figure 5: PSS®E Model for IRL01

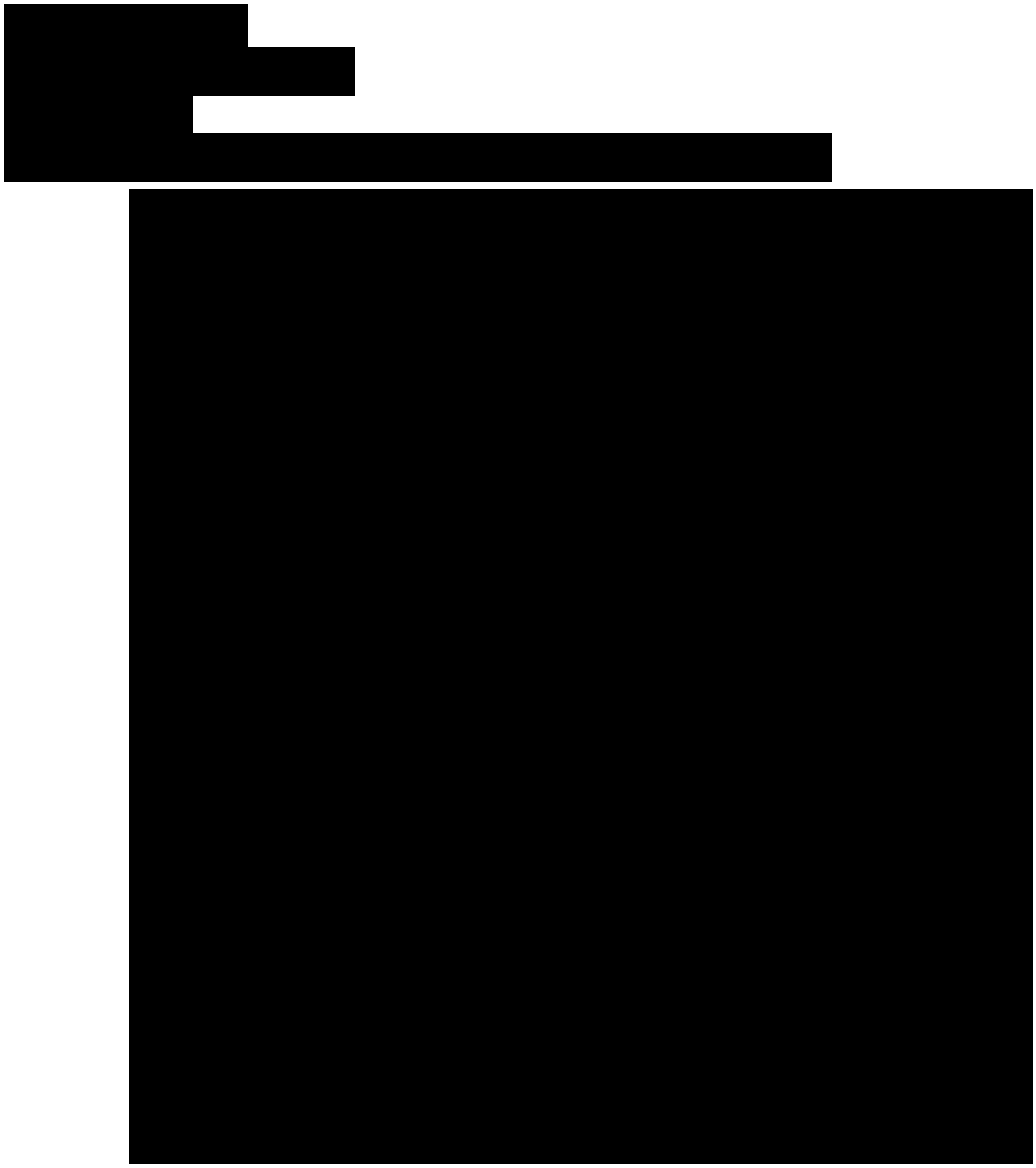


Figure 6: PSCAD™ Model for IRL01

Figure 7: PSCAD™ Model for IRL01 - Loads

Table 2 and Table 3 identify the PSS®E and the PSCAD™ plant models used for this SIS.

Table 2: PSS®E Model Files for IRL01

File Name	File Type	Comments
everwind_datacenter_base.sav	PSS®E savecase	IRL01 steady state SMIB plant model
everwind_datacenter_325MW.dyr	PSS®E dynamics model	Includes the following IRL01 dynamics models: • CMLDBLU2 Composite Motor Load (Blue Book version 2) • UVUFBLU1 Under Voltage / Under Frequency protection relay model
PERC2_V35.dll	PSS®E dynamics library	Power Electronic Reconnecting and Ceasing Model (for PSSE v3
Everwind Data Center – PSSE RUG.pdf	Documentation	Model descriptions and Model data

Table 3: PSCAD™ Model Files for IRL01		
File Name	File Type	Comments
DC_Centralized_UPS.pscx	PSCAD™ Project file	Runs using Intel® Fortran Compiler Classic 2021.12.0
DML_Components.pslx	PSCAD™ Library file	
Data_Center_325MW_PSCAD_RUG_Model_Development_V0.pdf	Documentation	Model descriptions and Model data

2.5 Model Quality Testing

The IC submitted MQT results and a RUG for the IRL01 models. The model incorporates a technology centre specific computational load profile intended to represent AI training behaviour and provides a more representative load response than earlier generic load representations. IESO-NS reviewed the submitted MQT material and performed additional assessment of the facility under Normal, Bypass, and Battery operating modes.

2.5.1 PSS®E

The PSS®E model received from IC was evaluated through the MQT performance testing during which several deficiencies were identified. The model is showing a reduction in the plant's active power output during initialization for Test 18 (balanced three phase to ground fault). For Test 602 (continuous operation under low voltage conditions), the plant demonstrates good performance at low voltage levels; however, when the POC voltage is increased, the plant's active power output becomes limited. Test 18 and Test 6 are critical tests for evaluating the plant's performance, and further work is required to address these deficiencies.

2.5.2 PSCAD™

The submitted model successfully initialized and completed the assessed MQT simulations without identified numerical instability. Battery mode results did not indicate material concerns. However, the Battery mode assessment primarily reflected facility support loads as the grid side response did not include the full Critical IT and Network load representation during those simulations. This will be reassessed when updated models are received.

Additional observations were identified during the review of Normal and Bypass mode results. Several disturbances resulted in significant post event increases in facility active power demand, particularly in Bypass mode, where apparent active power demand was observed to exceed the expected facility operating level. Similar behaviour was observed in a smaller number of Normal mode simulations. The physical basis, measurement location, aggregation methodology, and load restoration behaviour associated with these responses require further clarification from the IC.

Subject to clarification of the observed post disturbance active power behaviour and confirmation that the submitted response is representative of the intended facility operation, the PSCAD™ model is considered acceptable for the purpose of the present SIS. Final acceptance for commissioning and operation remains subject to submission of final as built model data, updated protection and control parameters, successful comparison against commissioning test results, and resolution of any identified modelling discrepancies. If field performance does not align with the submitted model, the IC shall provide updated models and implement mitigation as required to meet performance criteria.

2.5.3 Model Updates

Due to the complexity of the load, BESS and UPS equipment, the models have many generic components and, in addition to mitigation of the noted issues, will require a next generation set of models with associated MQT to finalize assessment and requirements for the facility.

3 SYSTEM TECHNICAL MODELS

To assess the performance of the plant models described in Section 2.4, Single Machine Infinite Bus (SMIB) models in PSS®E and PSCAD™ are used. To assess wide area impact, the large area models include transmission elements, generating facilities, load, and network support devices as outlined below.

3.1 System Data

The load forecast included in the "*2025 10-Year System Outlook*", dated July 14, 2025, produced by NSPI, and submitted to Nova Scotia Energy Board *(NSEB)* was used in this study. The winter peak load forecast for the near future is shown in Table 4, with 2029 used for this study.

Please note that the load forecast includes the power system losses but excludes the station service loads at power generating stations.

Table 4: Load Forecast for Study Period					
Forecast Year	System Peak	Interruptible contribution to peak	Firm Contribution	Demand Response	Growth %
2025	2,403	132	2,267	4	15.1
2026	2,408	133	2,263	12	0.2
2027	2,423	131	2,268	24	0.6
2028	2,443	133	2,274	36	0.8
2029	2,458	134	2,285	39	0.6
2030	2,474	132	2,303	39	0.7
2031	2,503	132	2,332	39	1.2
2032	2,535	133	2,364	38	1.3
2033	2,573	133	2,402	38	1.5
2034	2,618	132	2,449	37	1.8
2035	2,672	132	2,503	37	2.0

The rating of transmission facilities in the vicinity of IRL01 are shown in Table 5.

Table 5: Transmission Line Ratings (MVA)							
Line	Conductor	Design Temp. (C)	Limiting Element	Hot Season Normal	Warm Season Normal	Cool Season Normal	Cold Season Normal
L-7011	ACSR 795 Drake	60	Conductor	300	349	398	457
L-7012	ACSR 1113 Beaumont	70	Metering	429	462	462	462

3.2 Steady State

Steady State analysis in PSS®E used version 35.6.4. Analysis was performed in PSS®E using Python scripts to simulate a wide range of single contingencies, with the output reports summarizing bus voltages and branch flows that exceeded established limits.

System modifications and additions up to 2029 were modelled to develop base cases to best test system reliability in accordance with IESO-NS, NERC and NPCC design criteria.

Cases focused on seasonal peak cases and a wide range of variability in the local area. A combination of generation dispatches expected in the operating time frame were simulated, with a focus on corridor flows in reverse to that typically seen on relevant corridors.

The steady state power flow analysis was performed using the standard load flow contingencies to meet NERC and NPCC criteria.

3.3 Stability

Minimal stability analyses were performed in PSCAD™. A critical subset of the PSS®E contingencies was studied. Full stability study will be completed when model deficiencies are addressed.

3.4 Electromagnetic Transient

To supplement the analysis performed in RMS, EMT simulations in PSCAD™ is performed to assess model performance and stability in the microsecond timescale. For this assessment, SMIB models were used. Full wide area system simulation will be performed with user defined updated PSCAD™ models when they are received.

4 TECHNICAL ASSESSMENT

The models described in Sections 2 and 3 were used to simulate the system with the inclusion of IRL01. The results of these studies are described below.

4.1 Steady State

The steady state power flow analysis in PSS®E was conducted with IRL01 in service. Power Flow analysis identified transmission system thermal overload for normal contingencies that required the modification of RAS arming levels to mitigate.

The RAS will be subject to NSPI, Reliability Coordinator and NPCC review and approval processes for a functional modification per NPCC Directory #7 and NERC PRC-012 Remedial Action Schemes.

The RAS study may identify the IRL01 BESS as required to ramp up for several minutes to support operator redispatch of the system.

4.2 Stability Analysis

4.2.1 NPCC-BPS / NERC-BES

Compliance with NERC reliability standards is mandatory to maintain reliability of NSPI transmission system and its interconnection to the wider North American transmission system. NSPI is a member of NPCC and adheres to NPCC's requirements, including the requirements for BPS. The methodology for determining if a substation is BPS is defined in NPCC's criteria document A-10 titled "Classification of Bulk Power System Elements". The methodology in the latest A-10 document, dated March 27, 2020.

BES assessment will be run when PSSE dynamic models are updated with vendor specific equipment and noted issues are addressed. Potential implications:

- a requirement to meet NERC and NPCC criteria for BPS and BES redundant protection systems

4.2.2 RAS

A detailed RAS study for modifications of existing RAS to:

- Modifications to the Group 1- L-7011, NPCC #113:Limited Impact RAS
- Modifications to the Group 2- L-7012, NPCC #113:Limited Impact RAS
  Update to arming levels for existing 230kV n-1 RAS settings

4.3 Electromagnetic Transient Assessment

To expand on the Steady State and Stability Assessments described above, simulations were performed to evaluate the plant against applicable performance requirements and its impact on system stability. These contingency simulations were limited due to the generic nature of the models provided. As the project progresses and updated models are developed, additional assessment will be required to look at Control settings, damping, synchronous interactions and other transient phenomena. Additional validation of the performance of the PSCAD™ model against applicable planning requirements will be undertaken.

Potential implications:

- Requirements for specific plant and associated BESS and UPS control settings and performance requirements
- Coordination of controls with neighbouring IBR and HVDC facilities to avoid adverse interactions

Sections 4.3.1 to 4.3.3 were assessed in SMIB simulation.

4.3.1 Off Nominal Frequency Operation

Underfrequency dynamic simulation was performed to demonstrate plant ride through. Simulation results are a good match to those in the IC MQT and acceptable for a load. It is noted that the oscillatory behaviour in the top plot is due to high resolution plotting and not a concern.

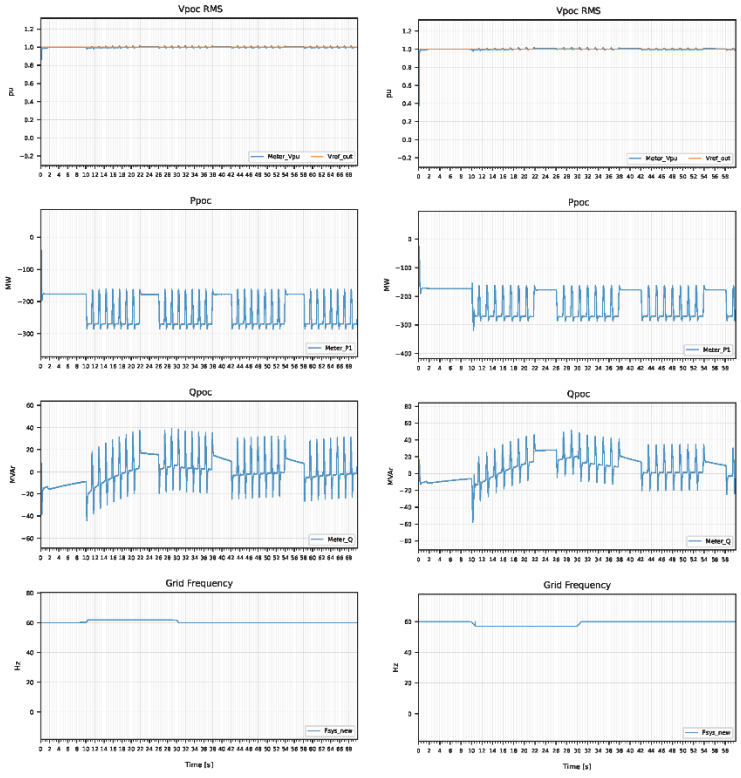


Figure 8: Overfrequency (a) and Underfrequency (b) tests

All load facilities are required to partake in the NSPI Under Frequency Load Shedding program, if needed, to ensure stable operation for the interconnected system during an underfrequency event.

4.3.2 Reactive Power Requirements and Voltage Control

The IC provided a unity power factor (1.0) representation for the computational IT load and a power factor of 0.95 for the auxiliary site load. Additional power factor information was not provided for individual cooling, fan, and pump loads. Review of the submitted PSCAD™ model indicates that facility reactive power behaviour is influenced by the combined operation of the computational load, UPS architecture, GFL rectifiers, GFM inverter controls, and associated voltage control functions. As a result, the overall facility does not behave as a fixed power factor load and exhibits dynamic active and reactive power demand characteristics under varying operating conditions.

The submitted PSCAD™ model includes voltage regulation functionality through the grid forming inverter, grid following rectifiers, UPS controller, and associated reactive power and voltage control functions. MQT results demonstrate stable voltage regulation at the Point of Interconnection, with POI voltage maintained close to nominal values during steady state operation despite variations in facility active and reactive power demand. The model also

demonstrates dynamic reactive power exchange over a range of operating conditions, indicating that the facility response cannot be represented solely through a constant facility power factor assumption.

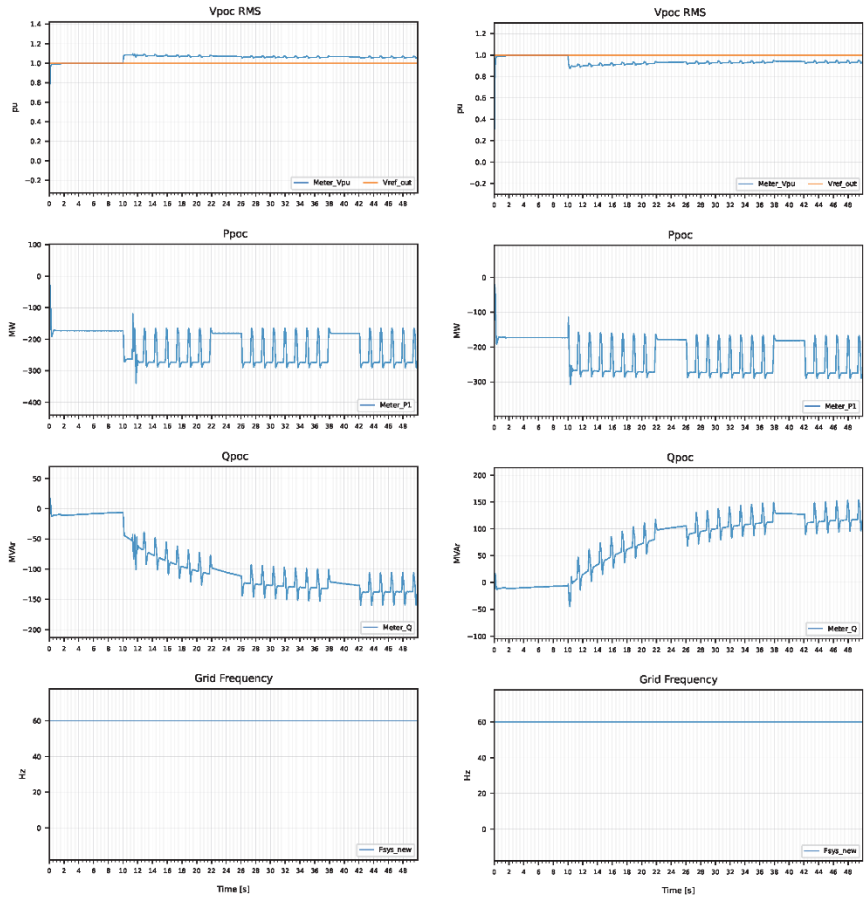


Figure 9: Over voltage (a) and Under voltage (b) tests

4.3.3 Fault Ride through

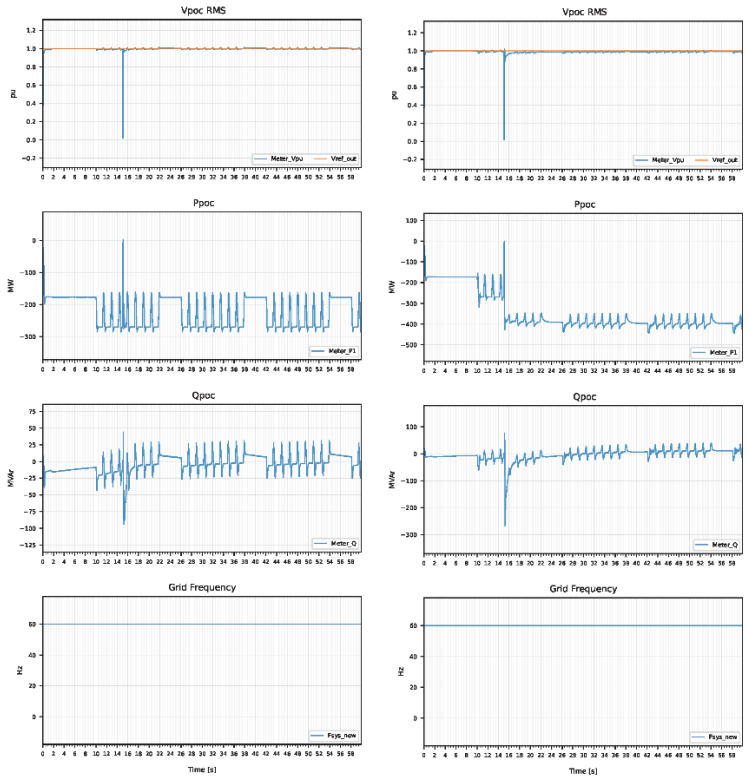
IRL01 is required to remain connected to the grid during and immediately following system disturbances. The PSCAD™ MQT simulations shown in Figure 10 and Figure 11 demonstrate that the facility remains connected and that Point of Interconnection (POI) voltage recovers following fault clearance under both normal and stressed system conditions. No complete facility disconnection was observed during the assessed fault ride through tests.

Figure 10 demonstrates acceptable ride through performance for the evaluated three phase fault event, with both Normal and Bypass operating modes remaining connected throughout the disturbance. While the Normal mode response recovers to a post disturbance operating condition

that is generally consistent with the pre-disturbance demand level, the Bypass mode response exhibits a noticeably higher post fault active power demand following fault clearance.

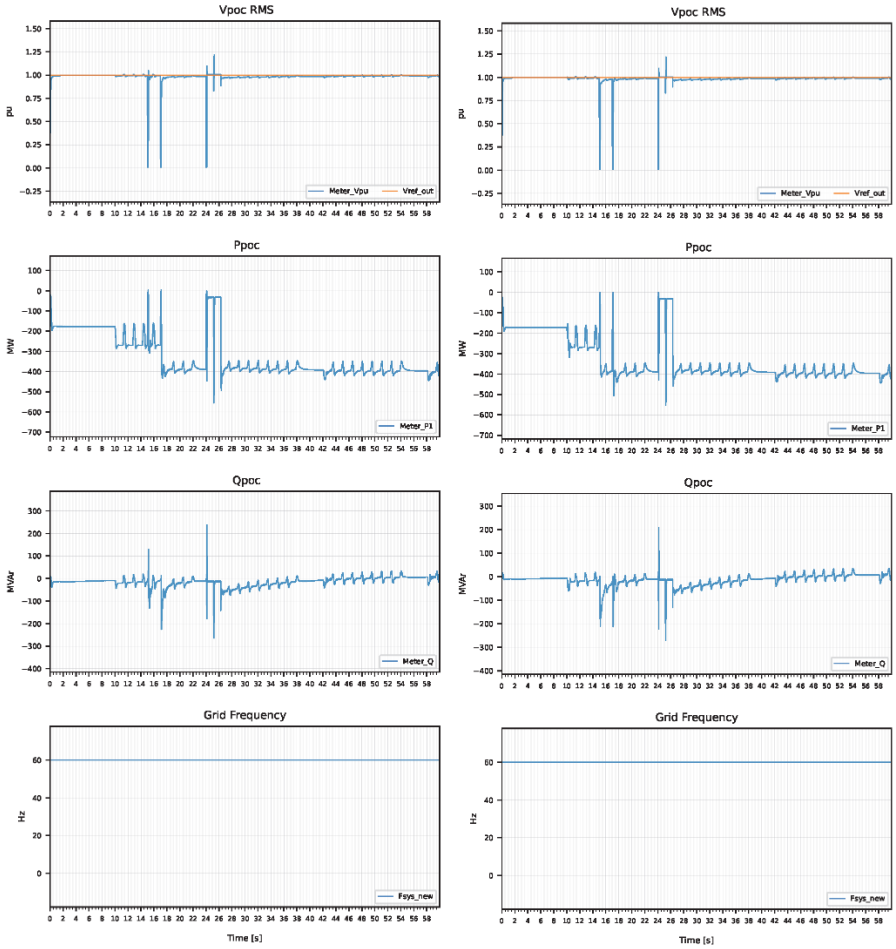
Figure 11 and several additional MQT cases show a more pronounced post disturbance increase in facility active power demand. In these cases, the active power demand settles at a level significantly above the pre-disturbance operating point and exceeds the nominal facility operating level. Similar behaviour was identified in multiple Bypass mode simulations and in a smaller number of Normal mode simulations.

Although the facility remains connected and demonstrates satisfactory voltage recovery, the observed post fault active power increase requires additional clarification from the IC.



a) Normal *b) Bypass*

Figure 10: 3-phase-to-ground fault at the POI for 0.15s, 0 pu residual voltage



a) Normal *b) Bypass*

Figure 11: 3-phase-to-ground fault at the POI for 120msapplied at 15, 17, and 24 s.

It was noted that the protection systems are not fully implemented in the provided models. The facility is expected to meet ride through criteria for a Hybrid facility. At a minimum:

- The load facility is to meet the Information Technology Industry Council (ITIC), formerly known as Computer & Business Equipment Manufacturer's Association (CBEMA), curve for voltage ride through
- Meet the ride through requirements in NERC PRC-024, Attachment 2 for the full Customer Hybrid Load/Generation Facility.

The Transmission System Interconnection Requirements for Nova Scotia are under revision to include requirements for Computation Loads and will incorporate elements of the NERC CLO standards currently underdevelopment. The Facility will be required to meet these criteria.

4.3.4 Control Interactions

Due to the generic nature of some plant components, EMT simulations were not performed to evaluate control interactions between IRL01 and nearby facilities. When manufacture models are available and meet TPR-015 and TPR-014 requirements, testing will be revisited. This has two primary forms, the first being interactions between the proposed facility and nearby IBR facilities while the second is concerned with the interactions between IRL01 and synchronous machines.

For this purpose, a full set of PSCAD™ contingencies will be applied to all PSCAD™ base cases.

4.4 Harmonics

IESO-NS requires IRL01 to meet Harmonics IEEE-519 standard limiting Total Harmonic Distortion.

IRL01 includes significant power electronic equipment, including UPS systems, rectifiers, and converter based equipment that may contribute harmonic distortion to the transmission system. Compliance with applicable harmonic performance requirements at the Point of Interconnection remains necessary. Consistent with NSPI interconnection practice and IEEE 519 requirements, the facility shall demonstrate that harmonic distortion at the POI remains within acceptable limits. A dedicated harmonic assessment is to be provided by the Interconnection Customer and any required filtering installed prior to commissioning.

5 OPERABILITY

IRL01, as a large load, may require defined operating boundaries to support reliable system operation under outage, weak grid, or contingency conditions. If required by system studies or operating procedures, curtailment or load management may include staged reduction of load, limiting noncritical auxiliary load, blocking non essential load transfers, controlled UPS operating modes, or other demand management functions during constrained system conditions. Ramp rate limits are determined by the System Operator and can change over time as the grid evolves.

For large transitions in facility demand, coordination with the System Operator may be required to ensure adequate generation scheduling and system security during constrained operating conditions. For ramping blocks of load up or down to a new steady state operating level, coordination with the System Operator may be required to pre-position generation resources and maintain acceptable system performance.

For transient spikes in load, additional information is required regarding the expected frequency, duration, magnitude, and operational purpose of rapid load changes in either direction. While the submitted PSCAD™ model includes computational load variability and ramping functions, the operating limits associated with these transient load changes have not yet been defined by the

IC. Until further information is available and accepted, the facility shall be limited to transient load changes of 10 MW per event, with a minimum of 10 minutes between events.

Prior to commissioning, final models reflecting the intended computational load profiles, load restoration behaviour, ramp rate limits, transient load characteristics, and facility operating philosophy shall be provided to support additional system studies and wide area assessments, if required.

6 SYSTEM UPGRADES AND COST ESTIMATE

A very preliminary non binding budget cost estimates include the additions/changes to NSPI systems only. Is included in Table 6.

Table 6: Preliminary Cost Estimate

Facility	Estimated Cost (CAD)
122C Crandall Road Switching Station, 7011 and 7012 in and out, 6 breaker,	$18,000,000
Two new, 13 km 1113 ACSR 230kV lines from 122C to 123C	$39,000,000
230kV revenue class PT's, Ct's & metering	$30,000
Install new 230kV railway (1) / highway (1) crossings	$400,000
Modifications to existing RAS	$1,500,000
Protection modifications at 3C and 101S	$200,000
Subtotal	$59,130,000
Contingency (25%)	$14,780,000
Total Estimated Cost:	**$73,910,000**

As models are updated and control interactions are studies in more detail, it is possible filter banks and reactive support may be needed in the neighbouring area to support the combined Everwind 420 MW load.

RAS changes will be assessed in detail when the customer models for the associated BESS are submitted as it may be required to support emergency grid operation.

7 CONCLUSIONS

It is concluded that the interconnection of the proposed IRL01 facility into the NS transmission system at the specified location has no adverse impacts on the reliability of the Nova Scotia grid, provided the items below are addressed.

7.1 Summary of Technical Points to be Addressed

This SIS was completed based on the assumption that IRL01 facility is in addition to IRL03 which will come online prior to this project.

7.1.1 Study Assumptions

The BESS in the Interconnection Request will be required in service to reduce voltage flicker and smooth active power ramping to limit the system impact.

Facility is to be curtailed or go to Behind the Meter generation when insufficient system generation is available.

7.1.2 Steady State Violations

Thermal limitations were noted that can be addressed with modification to existing RAS.

7.1.3 RAS Modifications

RAS studies and modifications as outlined in Section 4.2.1.

7.1.4 BES/BPS Analysis

BES/BPS analysis to be performed when acceptable manufacture specific models are received. It will be the responsibility of the IC to meet and NERC or NPCC criteria for the facility if it is found to be designated as BES or BPS. As this test is performed at least once every five years for in service plants and a facility can become BES/BPS at some time in the future, it is recommended that the facility is designed and build to meet all BPS/BES protection requirements.

7.1.5 Ramping, Steady State and Transient

For ramping blocks of load, up or down, to a new steady state, coordination with the system operator will be required to preposition generation to take blocks when the system is constrained. The onsite BESS will be sized to manage the maximum planned ramp for the facility.

For transient spikes in load, additional data is needed on the frequency and duration of load ramps, in either direction. Until further information is available, the facility is limited to transient spikes of 10 MW per event, with a minimum of 10 minutes between events. Prior to commissioning, models capable of simulating transient behaviour for the facility must be provided with sufficient time to run wide area simulation studies prior to interconnection.

7.1.6 Plant Performance

Model issues noted in Section 2.5 will require mitigation and successful demonstration that the facility passes all MQT tests. It is required that plant output be stable and well damped in response to contingencies.

The customer BESS will be assessed for its ability to reduce voltage flicker and smooth active power ramping to limit the system impact when the model is received. Until such time as the BESS is in service, restrictions may be placed on the range of operation of the facility.

It was noted that the protection systems are not fully implemented in the provided models. The facility is expected to meet ride through criteria for a Hybrid facility. At a minimum:

- The load facility is to meet the Information Technology Industry Council (ITIC), formerly known as Computer & Business Equipment Manufacturer's Association (CBEMA), curve for voltage ride through
- Meet the ride through requirements in NERC PRC-024, Attachment 2 for the full Customer Hybrid Load/Generation Facility.

The Transmission System Interconnection Requirements for Nova Scotia are under revision to include requirements for Computation Loads and will incorporate elements of the NERC CLO standards currently underdevelopment. The Facility will be required to meet these criteria.

7.1.7 Transmission System Interconnection Requirements

The facility shall meet the minimum requirements in the Nova Scotia Transmission System Interconnection Requirements which are currently located on the NSPI OASIS website for Transmission Customers: https://www.nspower.ca/oasis/transmission_customer_procedures, including requirements for Power Quality, Flicker and Harmonics. Test reports and studies are to be provided.

7.2 Facility Models

The submitted PSCAD™ model includes a hybrid UPS architecture incorporating distributed rack level UPS systems, centralized double conversion UPS systems, grid forming inverter functions, grid following PFC rectifiers, DC link systems, DC-DC converters, battery support systems, UPS supervisory controls, bypass transfer logic, BDC, load restoration functions, and associated voltage and reactive power control functionality. The model also includes computational load profiles and configurable load ramping functions intended to represent AI training and technology centre operating conditions. The facility can be represented in Normal, Bypass, and Battery operating modes, each of which may exhibit different dynamic behaviour under system disturbances.

Any discrepancy must be remedied prior to the facility receiving permission for commercial operation.

7.3 Commissioning Tests and Tuning

Any updates to the plant design and PSCAD™ model must be delivered to IESO NS with sufficient time to assess and run in simulation prior to the expected review and approval of commissioning tests.

If there are control parameter changes made to the installed plant in the operating time frame, updated models, benchmarked against field tests, must be provided to IESO NS to ensure that simulation models are accurate representations of the facility. Change in plant design, such as transformer specification, will require updated models to be submitted to the IESO NS for review of impact on plant performance. In the operational time frame, parameter changes may be required to accommodate rapidly evolving technology and regulatory requirements for the large scale integration of inverter based energy sources.