IRL03 – Everwind Terminal

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IESO Nova Scotia

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

REVISION TABLE

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TABLE OF ABBREVIATIONS

Term	Definition
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
GIA	Generator Interconnection Agreement
GIP	Generator Interconnection Procedure
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 Cooperation
NPCC	Northeast Power Coordinating Council
NSPI	Nova Scotia Power Inc.
OLTC	On Load Tap Changer
PCO	Point of Change of Ownership
POI	Point of Interconnection to Transmission Owner facilities
PPC	Power Plant Controller
SIS	System Impact Study
RAS	Remedial Action Scheme
SMIB	Single Machine Infinite Bus
SVC	Static Var Compensator
VSC	Voltage Source Converter
TSIR	Transmission System Interconnection Requirements
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 2026-09-1. The requested Point of Interconnection (POI) for the 95 MW load facility is an existing 138 kV substation, 46C Point Tupper Marine Terminal.

This project is listed as Interconnection Request #IRL03 in the IESO-NS studies queue and will be referred to as IRL03 throughout this report.

The System Impact Study (SIS) for IRL03 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 IRL03 is 46C Point Tupper Marine Terminal substation connected via a 138 kV line, L-6521, from 1C-Point Tupper.

Figure 1 shows the approximate geographic location for IRL03, Figure 2 the substation location, radial from L-6521 and Figure 3 the one-line load flow electrical configuration.

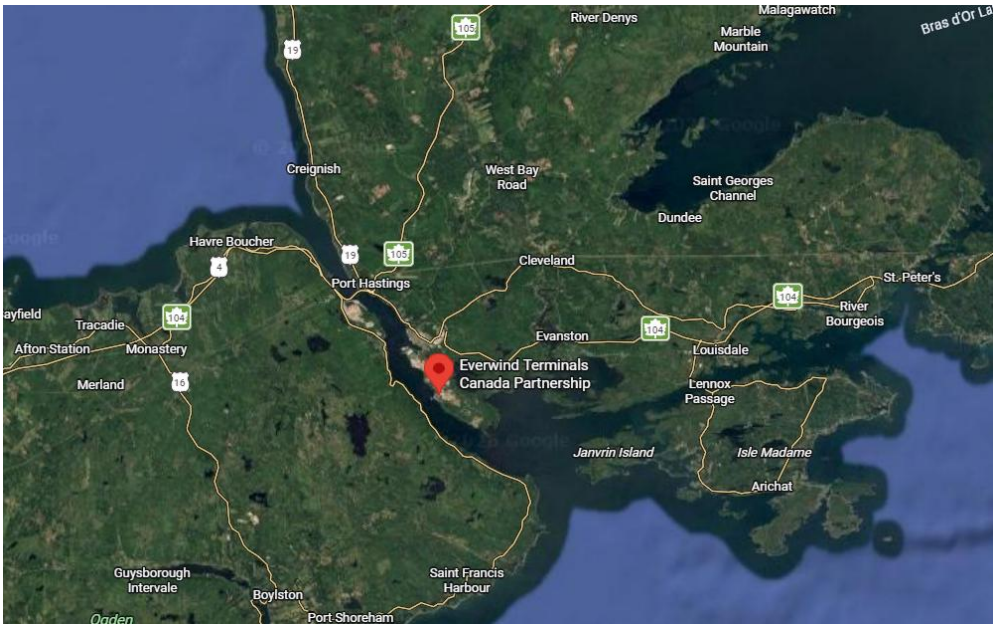

Figure 1: IRL03 Geographical Location

Figure 2: Substation Location

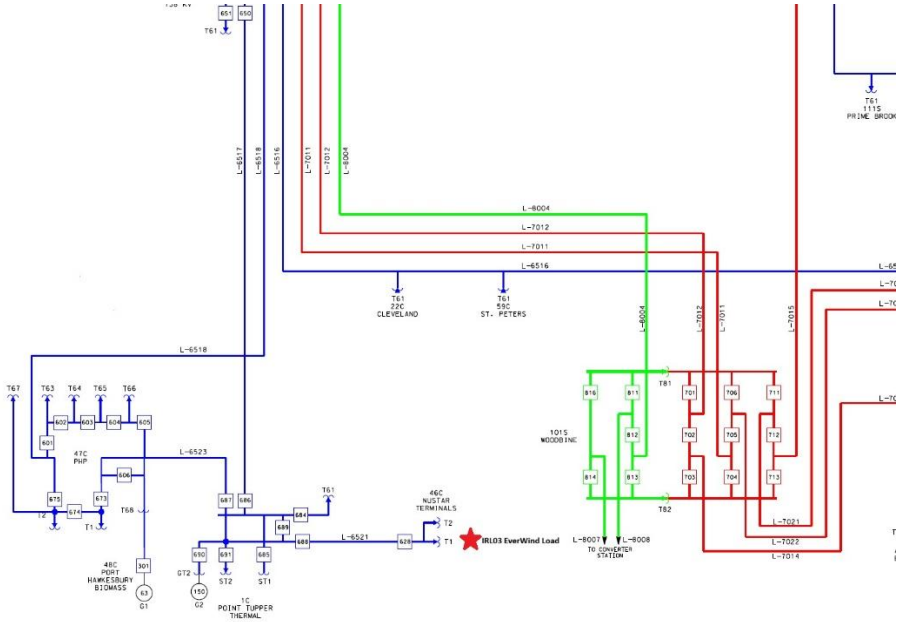

Figure 3: IRL03 Electrical Point of Interconnection

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 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 voltage flicker and 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 IRL03 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.

With the exception of IRL01, another project at the same location by the same IC, higher-queued Interconnections are modelled and included in IRL03 study base cases. If any of these included projects are subsequently withdrawn from the Queue, it may be necessary to update this SIS or perform a re-study.

IRL03 will be included in the SIS for IRL01 when IRL01 proceeds to final SIS.

2 PLANT AND EQUIPMENT MODEL

The study is based on technical information provided by the IC and interconnection of the load facility with the consideration for an accompanying grid forming (GFM) BESS. The BESS 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.

2.1 Load Facility

Table 1 provides a summarized overview of the project.

Table 1: Project Overview	
Attribute	Description
Project name	Everwind Terminal Substation Expansion
Project identifier	IRL03
Project type	Technology Centre Load
Connection point	46C Point Tupper Marine Terminal Substation
Connection Voltage	138 kV
[redacted]	[redacted]
[redacted]	[redacted]

2.2 Plant Control

The IRL03 PSS®E model and Releasable User Guide RUG has been provided the IC. [redacted]

2.3 PSS®E and PSCAD™ Models

The IRL03 facility was represented in both PSS®E and PSCAD™ as supplied by the IC. The PSS®E model shown below in Figure 4 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]

[redacted]

Figure 4: PSS®E Model for IRL03

[redacted]

Figure 5: PSCAD™ Model for IRL03

Figure 6: PSCAD™ Model for IRL03 - 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 IRL03		
File Name	File Type	Comments
everwind_datacenter_base.sav	PSS®E savecase	IRL03 steady-state SMIB plant model
everwind_datacenter_95MW.dyr	PSS®E dynamics model	Includes the following IRL03 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 IRL03		
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	

2.4 Model Quality Testing

The IC submitted MQT results and RUG for the IRL03 PSCAD™ model. IESO-NS reviewed the submitted MQT material at a high level for use in the SIS. No concerns or issues were noted. The model is accepted for the purpose of this SIS based on the submitted material. Final acceptance for commissioning and operation remains subject to submission of final as-built model data, updated protection and control parameters, and successful comparison against commissioning test results. If field performance does not align with the submitted model, the IC is responsible for providing updated models and implementing mitigation as required for any identified issues.

3 SYSTEM TECHNICAL MODELS

To assess the performance of the plant models described in Section 2.3, wide-area system models in PSS®E and PSCAD™ are used. These models consist of 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 IRL03 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-6517	ACSR 556.5 Dove	100	Conductor	229	232	247	267
L-6518	ACSR 556.5 Dove	100	Conductor	229	232	247	267
L-6521	ACSR 556.5 Dove	50	Conductor	110*	145*	172*	204*
L-6523	ACSR 795 Drake	100	Equipment	287	287	287	287

Note: * The trip rating on L-6521 is 72MVA. NSPI will review and advise on upgrading in the Facilities study.

3.2 Steady State

Steady State analysis in PSS®E used version 34.9.6. 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 and NPCC design criteria:

- Light load: Spring Minimum (SML);
- Off-Peak load: Summer Peak (SUM);
- High load: Winter Peak (WIN).

The 34.5 kV to .415 kV transformer is rated 71 MVA in both PSS®E and the PSCAD™ model. When plant is dispatched to 95 MW the transformer was overloaded. IC will resize in final design.

3.2.1 Steady State Base Cases

The following variables in the local area were studied over a wide range of base cases:

- Pt Tupper dispatch
- Biomass dispatch
- 120C Bear Head Windfarm
- Port Hawkesbury Paper load (max load / min load)
- Wind levels (high / low)

3.2.2 Steady State Contingencies

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

3.3 Stability

Stability analyses were performed in PSCAD™. A critical subset of the PSS®E contingencies was studied.

3.4 Electromagnetic Transient

To supplement the analysis performed in RMS, EMT simulations in PSCAD™ are performed to assess model performance and stability in the microsecond timescale.

3.4.1 Study Scenarios

The base cases used for the EMT simulations are a subset of the PSS®E load Flow scenarios considered critical to the local area. The dispatch scenarios described in Section 3.2.1 apply to PSCAD™ base cases.

Cases with minimum synchronous inertia and maximum IBR dispatch, having low inertia coupled with low damping (low load), are studied to analyze control interactions and/or ride through issues after the addition of the new facility.

This portion of SIS used a selected set of representative contingencies to study the impact of adding IRL03 on the interconnected grid.

3.4.2 PSCAD™ Model Version

Table 6 identifies the PSCAD™ wide area network model version used in this SIS.

Table 6: PSCAD™ Wide Area Network Model Files for IRL03

File Name	File Type	Comments
2026-15	Case Folder	Overall collection of files for the transmission system
NSPI_2026_01_16.py	Python Script	Script for configuring and running contingency simulations
PSCAD_Contingencies_IRL03.xlsx	Excel Workbook	Contingency list as described in Section 3.4.6

3.4.3 Model Overview

The Maritimes Area is included in the PSCAD™ model. Nova Scotia was divided in six major regions: Valley, Western, Northen, Halifax, Canso, and Sydney. Each of these regions is contained in a PSCAD™ project 'network'. Neighbouring regions are also included in six project networks: Central, East, North, South and West for New Brunswick, and PEI for Prince Edward Island (connected through New Brunswick). Note that all synchronous machines within represented networks are included using PSCAD™'s synchronous machine model for NS and NB networks. Synchronous machines in the PEI network are represented using voltage source components in series with a pre-calculated source impedance.

The PSCAD™ model for IRL03 includes all existing dynamic devices, including synchronous machines, wind farms, and static var compensators (SVC), as well as the voltage source converter HVDC Maritime Link. All the investigations presented here are based on EMT simulations using PSCAD™ software version 5.0.2.

3.4.4 Model Boundaries

Network equivalent voltage sources are used at the wide area model boundaries to represent the remainder of the Eastern North America power system. The network equivalent voltages, angles and impedances are precalculated such that power flows and short circuit levels are preserved according to the solved PSS®E load flow used to setup the scenario initial conditions. Table 7 enumerates the locations where the network equivalents are located.

Table 7: PSCAD™ Wide Area Network Mode Boundaries		
Region	Area	Bus Number
Central	NB	190230
North	NB	190493 and 190494 Eel River HVDC link
South	NB	190237
West	NB	190619, 190001, and 190028

3.4.5 Dynamic Plants

All synchronous machines in NS and all IBR facilities are represented using their latest available PSCAD™ models. It should be noted that different scenarios or dispatches may not have all synchronous machines and IBRs in service.

4 TECHNICAL ASSESSMENT

The models described in Sections 2 and 3 were used to simulate the system with the inclusion of IRL03. The results of these studies are described below.

4.1 Steady State

The steady state power flow analysis in PSS®E was conducted with IRL03 in service. Power flow analysis identified transmission system thermal overloads for normal contingencies. For contingencies c_2C_L6517, c_2C_L6518, c_2C_B61, and c_2C_B62 overloads up to 20% were observed.

IRL03 is connected to the 138kV Strait Area loop at 1C Point Tupper to 2C Port Hastings to 47C Port Hawkesbury Paper. Figure 7 below shows the Strait Area loop with the existing generation and PHP load as well as IRL03.

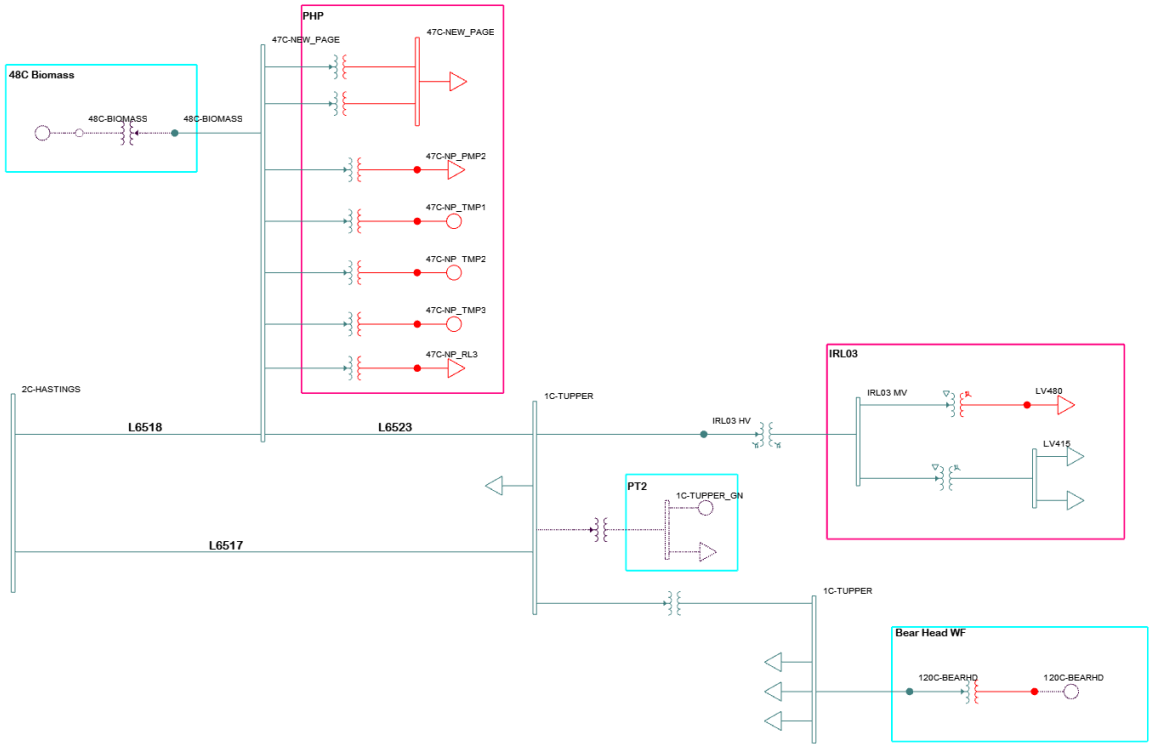

Figure 7: 138 kV Strait Area Loop

In the past, higher load on this section of line resulted in thermal overloads similar to those identified in this study. A disabled RAS exists that can be redesigned to mitigate the identified overloads.

The Strait Area Overload is presently classified as a Limited Impact Remedial Action Scheme (RAS) designated #139. It consists of load rejection protecting against post-contingency thermal overload of lines in the 2C Port Hastings to 1C Point Tupper to 47C Port Hawkesbury Paper (PHP) 138kV loop following the loss of one of the 3 lines. This RAS is armed automatically, dynamically calculated based on temperature.

Modification to this RAS will be required with the addition of 95 MW of load in the Strait Area 138kV loop with the IRL03 Terminal project.

Following the completion of this project, loss of one of the 3 lines could result in overloading of the remaining lines depending on the dispatch conditions of the generation and load in the Strait Area.

Strait Area loop Load = IRL03 + PHP

Strait Area loop Generation = PT2 + 48C Biomass +120C Bear Head WF

If one of the lines out of 2C (L6517 or L6518) trips, then the remaining line could potentially overload, dependent on the dispatches.

Arming:

> If Strait Area loop Load – Strait Area loop Generation exceeds the most limiting line rating of L6518, or L6517 then the RAS #139 should be armed.

Target:

> IRL03 Load is the required target load. A block sufficient to relieve the overload will be targeted. A detailed RAS study will be completed and submitted to the RAS entity (NSPI), the Reliability Coordinator and NPCC for approval. At this time, it is expected the load drop would be up to 45 MW.

RAS trigger:

> Any of the following breakers, 2C-650, 1C-686, 2C-647 or 47C-675 opens.

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.

As an alternative to a RAS, it is possible to use a BESS to ramp up for several minutes to allow for a controlled ramp down of the plant.

4.2 Stability Analysis

Stability analysis was performed in EMT simulation. For the RAS identified in Section 4.1, excess tripping is noted in EMT when RAS targets the entire IRL03 load. The RAS will require detailed PSCAD™ study to drop blocks of load in the precise amounts to ensure there is no impact to neighbouring customers. The BESS may be required to ramp for seconds or minutes to allow for a controlled load drop to relieve the overloaded line without adversely impacting other customers.

NPCC-BPS and NERC BES assessment will be run with IRL01 or the BESS application for this facility SIS. If both of those projects are withdrawn or do not proceed to SIS by Dec 31, 2026, the assessment will be performed in Q1 2027. The cost of study and any identified protection upgrades will be borne by the IC.

4.3 Electromagnetic Transient Assessment

To expand on the Steady State and Stability Assessments described above, additional contingency simulations were performed to evaluate the plant against applicable performance requirements

and its impact on system stability. These contingency simulations were also used to validate the performance of the PSCAD™ model against applicable planning requirements.

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.

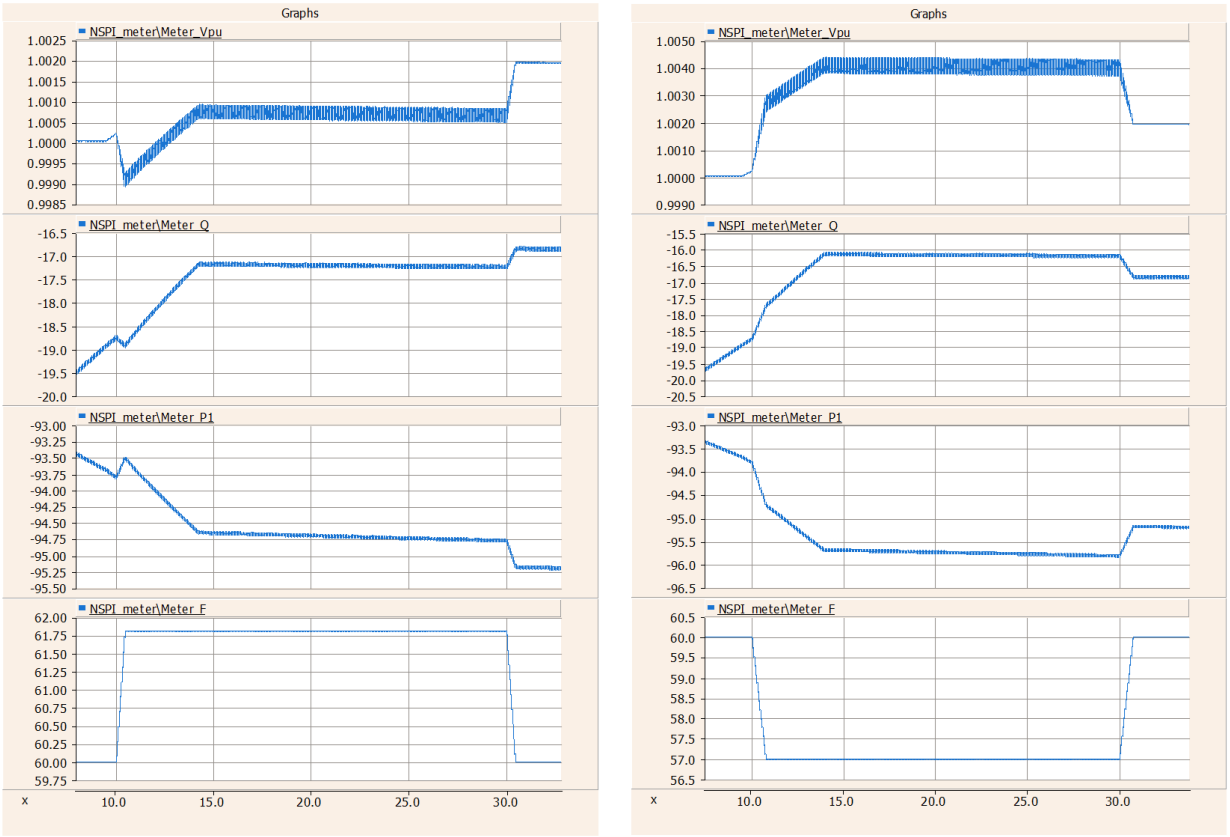

Figure 8: Underfrequency (a) and Over frequency (b) tests

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 power factor of 0.95 for the auxiliary site load and a unity power factor (1.0) representation for the IT load. No power factor information was provided for the cooling loads, fan loads, pump loads, or the overall facility. For the purpose of this SIS, and in accordance with current IESO-NS expectations for large load facilities, a power factor of 0.95 has been

conservatively assumed as the overall facility power factor. Additional information is required from the IC to confirm the final facility power factor characteristics.

The submitted PSCAD™ model includes voltage-control functionality through the GFM inverter, GFL rectifier, UPS controller, and Q-V droop controls. The IC must provide final POI voltage-control requirements, reactive-power operating range, voltage-regulation setpoints, or Q-V droop settings. For the purpose of this SIS, it is assumed that the facility will operate in accordance with NSPI voltage-performance requirements, as seen in the MQT tests. Final voltage-control philosophy and operating parameters shall be confirmed by the IC and reflected in the final PSS®E and PSCAD™ models. Undervoltage and overvoltage performance is acceptable.

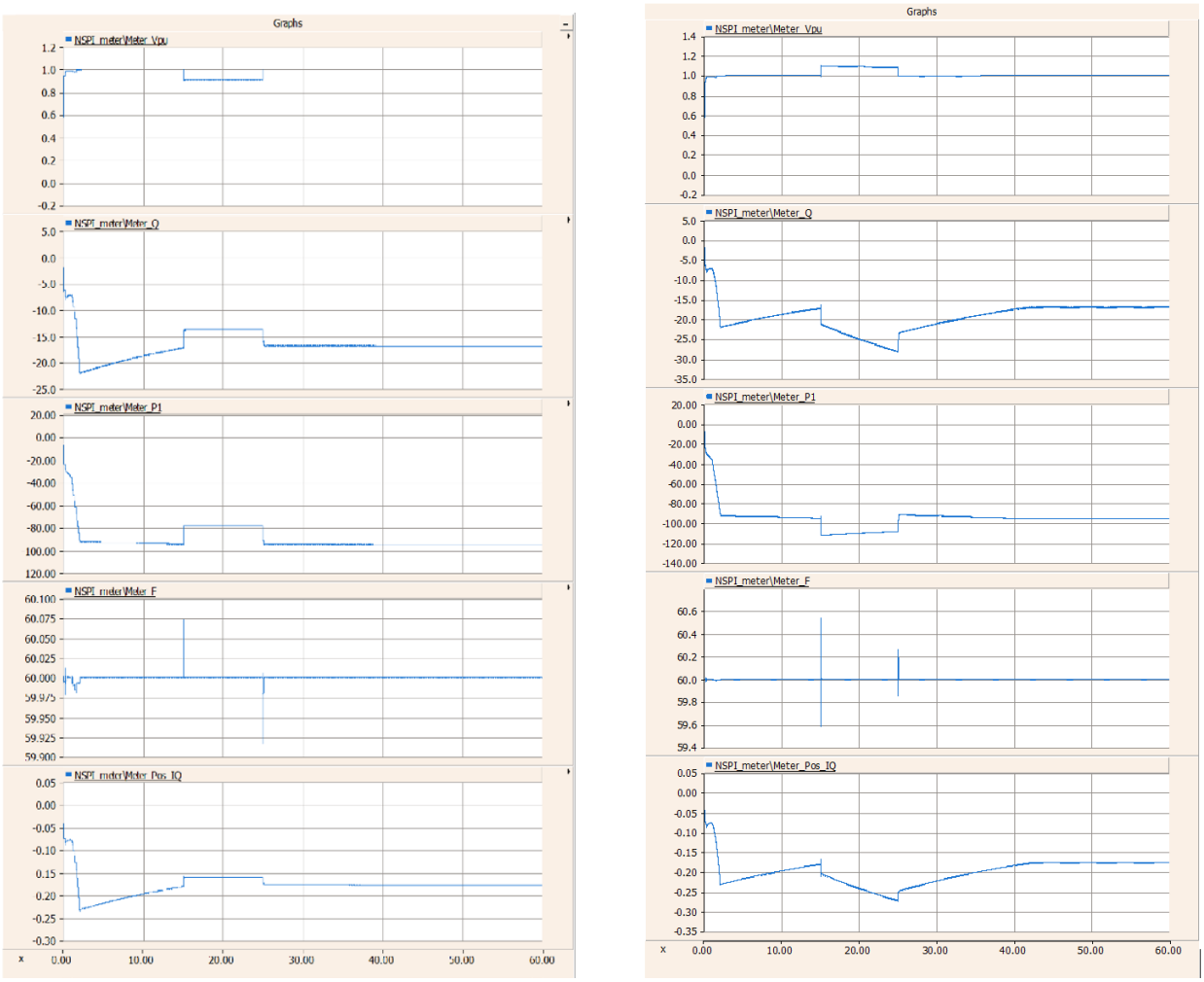

Figure 9: Undervoltage (a) and Over-voltage (b) tests

4.3.3 Fault Ride-through

IRL03 is required to remain connected to the grid during and immediately following a system disturbance. Demonstrated in Figure 10 and Figure 11 below, the MQT report for the PSCAD™ model confirmed that the IRL03 plant remains online and operational across the normal operating and stressed voltage conditions for close in fault conditions.

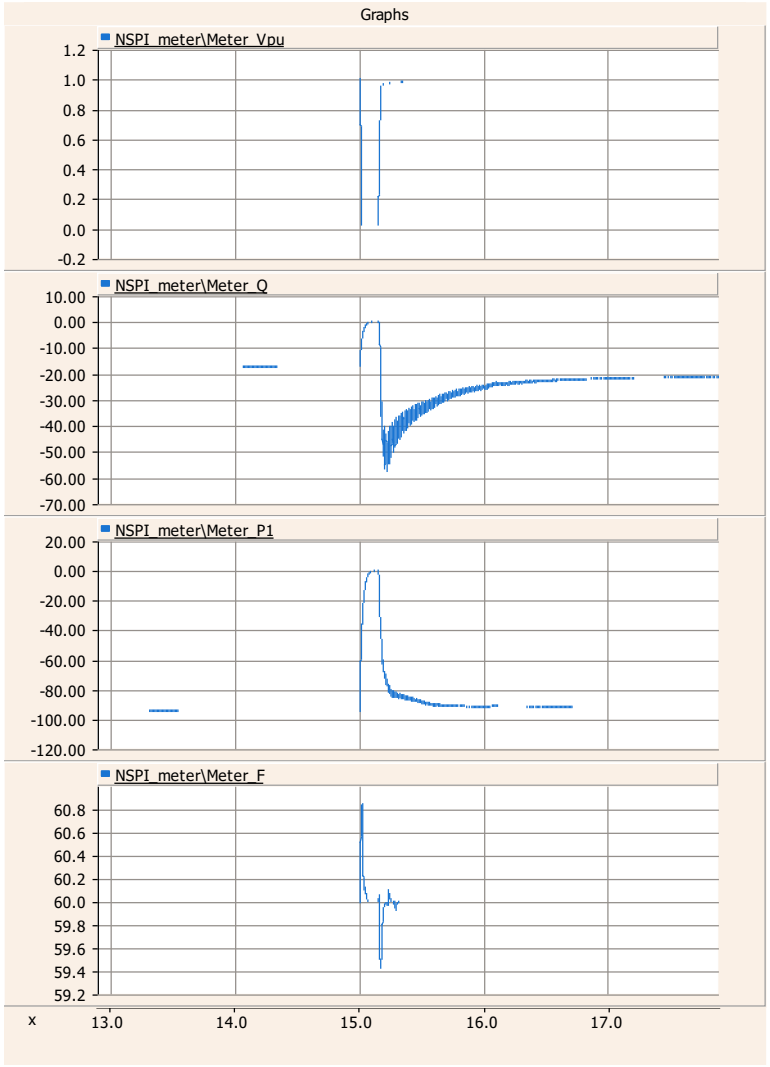

Figure 10: 3-phase-to-ground fault at the POI for 0.15 s with 0 pu residual voltage

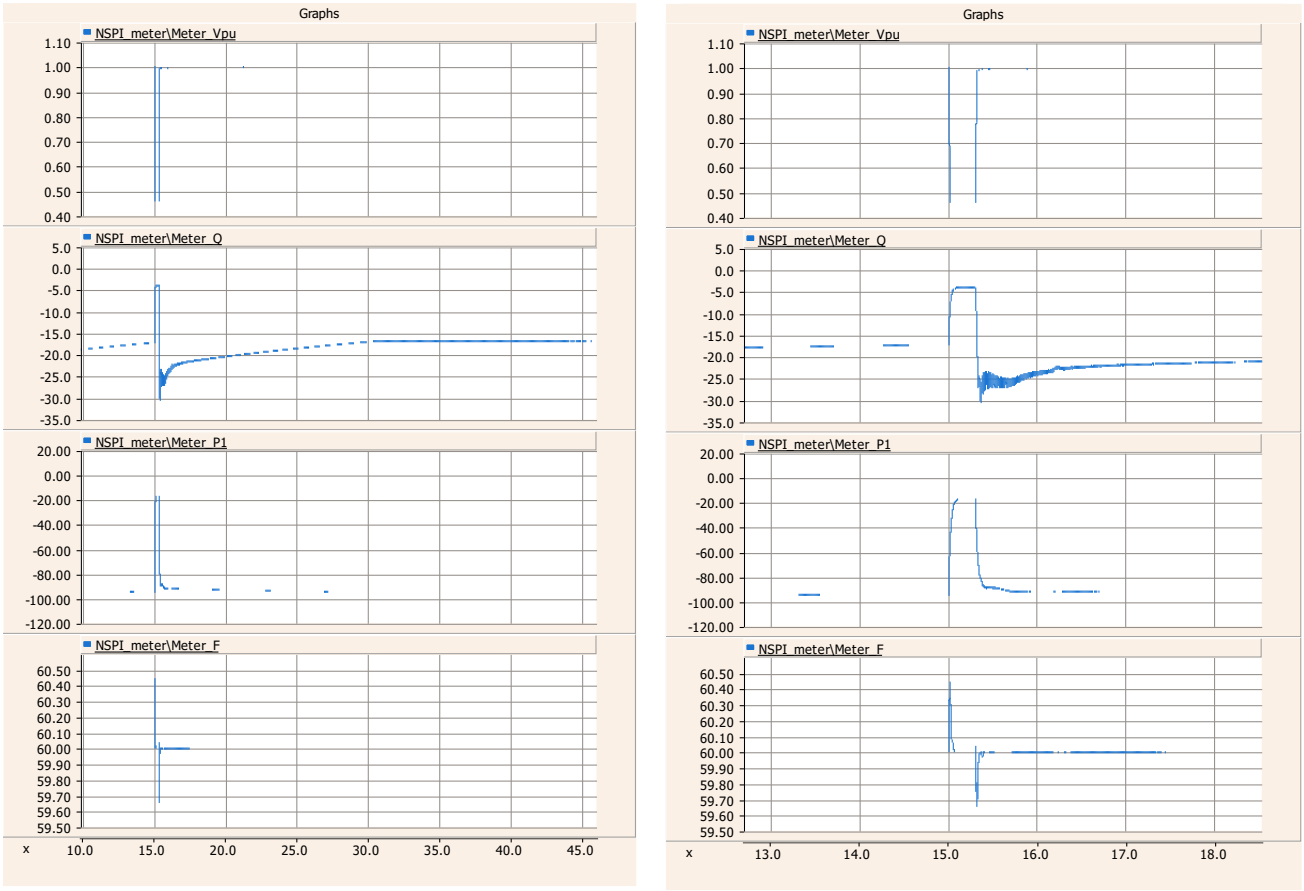

Figure 11: 3-phase-to-ground fault at the POI for 0.30 s with 0.45 pu residual voltage

4.3.4 Control Interactions

EMT simulations were performed to evaluate control interactions between IRL03 and nearby facilities. 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 IRL03 and synchronous machines.

For this purpose, a full set of PSCAD™ contingencies was applied to all PSCAD™ base cases. These assessments did not reveal that the presence of IRL03 resulted in unacceptable impacts on nearby IBR or synchronous machines.

4.4 Voltage Flicker

A Power Quality Tests Result Report (as described in the IEC 61400-21 standard) was not provided.

Facility shall not exceed the flicker emission limits established by the IEC 61000-3-7 standard.

4.5 Harmonics

IESO-NS requires IRL03 to meet Harmonics IEEE-519 standard limiting Total Harmonic Distortion (all frequencies) to a maximum of 2.5%, with no individual harmonic exceeding 1.5% for 138 kV.

IRL03 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

It is required that plant output be stable and well damped in response to contingencies.

IRL03, 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 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.

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 case simulation prior to interconnection.

6 SYSTEM UPGRADES AND COST ESTIMATE

System upgrades to the NSPI system include:

- RAS and protection changes as noted in Section 4.1. Alternatively, a BESS may be used to mitigate the condition and avoid a RAS

- Trip setting changes to increase capacity on L-6521 as noted in Section 3.1

The cost estimates are not yet available from NSPI and will be provided at a later date.

7 CONCLUSIONS

It is concluded that the interconnection of the proposed IRL03 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

7.1.1 Study Assumptions

This SIS was completed based on the assumption that IRL03 facility is in addition to IRL01 which will come online at a later date. The BESS associated with this facility will be in service no later than Q4 2027 and will be tuned to manage plant ramping and transient behaviour. If the BESS timeline changes, additional study will be required with updated study assumptions to determine any mitigations or limitations required.

7.1.2 Steady State Violations / RAS Modifications

An existing, disabled, RAS will require upgrade and rebuild as necessary to mitigate identified thermal overloads. The RAS description can be found in Section 4.1. As an alternative, the BESS may be able to ramp for seconds or minutes to allow for a controlled load drop to relieve the overloaded line without adversely impacting other customers and avoid a RAS.

It was noted that the IC 34.5 kV to .415 kV transformer is rated 71 MVA in both PSS®E and the PSCAD™ model. When plant is dispatched to 95 MW the transformer is overloaded.

7.1.3 BES/BPS Analysis

BES/BPS analysis to be performed with IRL01 or the Interconnection Request for associated BESS. If both of those projects are withdrawn, or do not proceed to SIS by Dec 31, 2026, the assessment will be performed in Q1 2027. The cost of study and any identified protection upgrades will be borne by IRL03.

7.1.4 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.

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.

7.1.5 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 voltage-control functionality through the GFM inverter, GFL rectifier, UPS controller, and Q-V droop controls. When updated models are submitted and accepted for use, PSCAD™ commissioning studies will be performed for use in benchmarking against commissioning results. 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.