

6911 Southpoint Drive (B03)
Burnaby, BC
V3N 4X8

June 26, 2026



via email: 

RE:  Project - Queue #11 Interconnection System Impact Study Report

Dear ,

Enclosed is the Interconnection System Impact Study for the proposed Interconnection Request (IR), queue #11 –  Project, submitted under Tariff Supplement 79: BC Hydro Generating Plant Interconnections of the Open Access Transmission Tariff (OATT). This letter provides a non-binding good faith estimate of the cost and time to construct the facilities required to interconnect your IR to BC Hydro's Transmission System, being the Network Upgrades, based on the findings of the Interconnection System Impact Study.

Open Access Transmission Tariff

The OATT defines Network Upgrades as additions, modifications, and upgrades to BC Hydro's Transmission System required at or beyond the Point of Interconnection (POI) to accommodate the interconnection of the Generating Facility to BC Hydro's Transmission System.

Interconnection Study Costs

The Interconnection Customer is responsible for paying the full cost of all Interconnection Studies in cash. Interconnection Study costs vary depending on the scope, complexity, and other factors such as whether any scope is shared with another Interconnection Customer (not applicable to this Interconnection System Impact Study). Per Tariff Supplement 79, BC Hydro as the Interconnection Customer is responsible for paying the full cost of this Interconnection System Impact Study.

Cost Estimate

Based on the Interconnection System Impact Study, the non-binding good faith estimated cost (typical accuracy range of +100%/-35%) for Network Upgrades required to interconnect your IR is **\$811 K**.

Major Scope of Work Identified:

- Protection and Control
 - Install two relays for new Generator G3 and integrate using existing port expander
 - Extend Transformer T2 protection zone to include G3 breaker
 - Update protection one-line diagram and complete real time digital simulation testing
 - Implement alarms for new equipment per BC Hydro standards and confirm existing alarm system capacity
 - Update operations databases, displays, and the energy management system to support required control, indication, telemetry, and alarms

- No additional station, transmission, or telecommunications Network Upgrades identified

Exclusions:

- Applicable taxes
- Outage costs
- Permits
- Right of Way & Property Costs

Key Assumptions:

- Construction by contractor
- Six (6) months of construction is considered
- No expansion of existing stations or control buildings to accommodate new equipment

Key Risks:

- Major equipment delivery presents potential project cost and schedule risks, based on variance in equipment lead times
- No defined supply chain strategy; construction costs may increase depending on delivery method
- Project schedule may be longer than expected, leading to increased overhead costs
- Cost of materials and major equipment may be affected by market conditions and escalation

Technical Interconnection Requirements

As part of our commitment to maintaining a reliable and responsive grid, BC Hydro maintains its Technical Interconnection Requirements (TIR) documentation, including the 60 kV to 500 kV TIR for Power Generators. You will be required to meet the TIR as your project will be connecting to the BC Hydro Transmission system. BC Hydro looks forward to working closely with you so that you can meet the TIR and can assist with any technical questions you may have. For more details on the TIR, please refer to:

<https://app.bchydro.com/content/dam/BCHydro/customer-portal/documents/transmission/tgi/60kv-500kv-TIR-for-power-generators.pdf>

Schedule

Based on the Interconnection System Impact Study, the non-binding good faith estimated in-service date for your Interconnection Request's Network Upgrades is **Q3 2026**.

Timely actions required from you for the rest of the interconnection process to minimize risks to the schedule:

- Providing your written authority for BC Hydro to proceed with a Facilities Study.
- Execution of a Terms and Conditions for Modifications (TCM) per Tariff Supplement #79

Please note that changes to your Interconnection Request, changes in earlier queued Interconnection Requests, or delays in receiving financial commitments may also impact the target in-service date.

If you have any questions, please contact the Transmission Generator Interconnections team at transmission.generators@bchydro.com.

Sincerely,

[REDACTED]

[REDACTED]

Interconnections Manager, Transmission Generator Interconnections
BC Hydro

Encl.: External Queue 11_ [REDACTED] Project_System Impact Study.pdf

[REDACTED] Project

System Impact Study

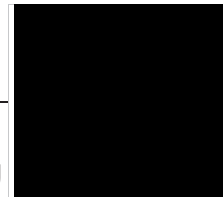
BC Hydro EGBC Permit to Practice No: 1002449

[REDACTED]

Prepared for: BC Hydro Generation

Prepared by:

[REDACTED]



[REDACTED]
Senior Engineer, Interconnection Planning

Reviewed by:

[REDACTED]

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Manager, Interconnection Planning

Accepted by:

[REDACTED]

[REDACTED]
Manager, Transmission Planning

Report Metadata

Header: [REDACTED] Project
Subheader: System Impact Study
Title: [REDACTED] Project
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Report Number: 000-APR-00077
Revision: 0
Confidentiality: Public
Date: 2026 Jun 24
Volume: 1 of 1

Prepared for: BC Hydro Generation
Prepared by: [REDACTED]
Title: Senior Engineer, Interconnection Planning
Checked by: [REDACTED]
Title: Specialist Engineer, Interconnection Planning
Reviewed by: [REDACTED]
Title: Manager, Interconnection Planning

Related Facilities: Fort Nelson Generating Station (FNG)
Additional Metadata: Transmission Planning 2025-143
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Revisions

Revision	Date	Description
0	2026 Jun	Initial release

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The first two authors have been involved in the development of the *Journal of Management Inquiry* since its inception in 1992. The third author has been involved in the journal since 1997. The authors have been involved in the development of the journal since its inception in 1992. The authors have been involved in the development of the journal since its inception in 1992.

BC Hydro Generation, the Interconnection Customer (IC), proposed the [REDACTED] [REDACTED] Project and requests to connect its Fort Nelson generator G3 to the BC Hydro Fort Nelson regional transmission system, which is an addition to the existing units G1 and G2 at FNG. [REDACTED]

The [REDACTED] Project will feature a [REDACTED] dual-fuel (gas & diesel) turbine generator with maximum power output of 14 MW [REDACTED]. The Point of Interconnection (POI) of the FNG units is at the 138 kV bus [REDACTED] of the FNG station. The IC's proposed commercial operation date (COD) is July 30th, 2026.

1. With the addition of the FNG G3, when the FNG plant is connected to the AESO system, the study does not find any steady state performance violation under system normal conditions and under P1 contingencies.
2. Under certain single contingencies in the Alberta region, angular instability concerns were observed at FNG G1 and G3 following the loss of 7L29 (from Alberta's Rainbow Lake 791S to Rainbow Co-gen 850S) under the studied system conditions. This is a pre-existing issue, and it is being addressed through BC Hydro-AESO coordination on the development of a Corrective Action Plan (CAP).
3. The planned operation of G3 (or G3 with G1) in an island was evaluated. The assessment identified no network upgrade. Several performance risk areas were identified; they are associated with voltage and frequency control, cold load pickup, and transformer energization. A few key operating requirements for islanded operation and operational measures to manage the risks are recommended. Refer to Appendix E for the recommendations.
4. Protection and control modifications are required for the FNG G3 addition. The identified protection work is limited to local station modifications at FNG, while the identified control work includes both local station updates and control centre database, display, telemetry, alarm, and EMS updates

The above conclusions are made based on the IC's input data and study assumptions listed in Section 4, which represent the best available information for this SIS.

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Acronyms

The following are acronyms used in this report.

AESO	Alberta Electric System Operator
AIES	Alberta Interconnected Electric System
BCH	British Columbia Hydro and Power Authority
CAP	Corrective Action Plan
COD	Commercial Operation Date
DTT	Direct Transfer Trip
ERIS	Energy Resource Interconnection Service
FNG	Fort Nelson Generating Station
HS	Heavy Summer Load Conditions
HW	Heavy Winter Load Conditions
IC	Interconnection Customer
LS	Light Summer Load Conditions
MPO	Maximum Power Output
NERC	North American Electric Reliability Corporation
NRIS	Network Resource Interconnection Service
OATT	Open Access Transmission Tariff
POI	Point of Interconnection
RAS	Remedial Action Scheme
SIS	System Impact Study
TIR	BC Hydro “60 KV to 500 kV Technical Interconnection Requirements for Power Generators”
TOV	Temporary Overvoltage
WECC	Western Electricity Coordinating Council

BC Hydro Generation, the Interconnection Customer (IC), proposed the [REDACTED] [REDACTED] Project and requests to connect its Fort Nelson generator G3 to the Fort Nelson regional transmission system. [REDACTED]

The project overview is provided in Table 1-1 below.

Project Name	[REDACTED] roject	
Name of Interconnection Customer (IC)	BC Hydro Generation	
Point of Interconnection (POI)	Fort Nelson Generation Station 138 kV bus	
IC's Proposed COD	July 30 th , 2026	
Type of Interconnection Service	NRIS ☒	ERIS ☐
Maximum Power Injection (MW)	70.46 MW (Summer)	70.46 MW (Winter)
Number of Generator Units	One dual fuel (gas & diesel) turbine generator	
Plant Fuel	Gas & diesel	

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The proposed unit FNG G3 is connected to the 13.8 kV side of the existing transformer FNG T2 through a new 13.8 kV breaker. FNG G3 will share the step-up transformer T2 with the existing unit G2. [REDACTED]

Appendix A further shows the area interconnection diagram of the FNG G3 addition project.

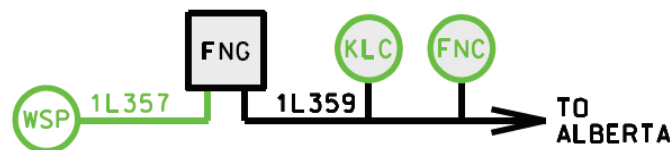


Figure 1-1: Fort Nelson Area Transmission System Diagram

The purpose of the System Impact Study (SIS) is to assess the impact to the BC Hydro transmission system of interconnecting the proposed Customer's facility, in accordance with the relevant BCH Open Access Transmission Tariff (OATT).

The SIS is performed in accordance with the North American Electric Reliability Corporation (NERC) reliability standards, Western Electricity Coordinating Council (WECC) performance criterion, and BC Hydro transmission planning requirements, specifically:

- NERC standards: FAC-002-3, TPL-001-4
- WECC Performance Criterion: TPL-001-WECC-CRT-4
- BC Hydro's 60 kV to 500 kV Technical Interconnection Requirements for Power Generators (hereafter referred to as the "TIR") per NERC Standard FAC-001-3
- BC Hydro's Transmission Asset Planning FAC-002-3 Study Guide

This study investigates potential thermal overloading, voltage performance and stability constraints of the transmission system as a result of the proposed interconnection and identifies the requirements of the Network Upgrades in the BC Hydro transmission system to accommodate the IC's proposed interconnection.

This SIS focuses on the impact of the proposed interconnection on the BC Hydro system. Relevant adjacent-system contingencies have been considered where applicable. BC Hydro coordinates and cooperates with neighboring systems in accordance with FAC-002-3 where such coordination is required.

This study is performed based on the information in the IC's interconnection data form submitted in November 2024.

Further assumptions were made for this study:

- 1) The 2026 Heavy Winter (HW) and 2026 Heavy/Light Summer (HS/LS) study cases are selected to study the proposed interconnection of the subject generating project.
- 2) Regional generation is dispatched to the patterns that stress the transmission system in the study area. In these patterns, the regional generations are typically set to their Maximum Power Outputs (MPO) unless otherwise specified.
- 3) The facility ratings used in this study are based on BC Hydro operating order 5T-10 dated Mar 3, 2026, and 5T-14 dated April 8, 2026.
- 4) BC Hydro's Fort Nelson Area load forecast data are based on 2024/25 Distribution Forecast.
- 5) Project dynamics data for G3 are derived from OEM's documentations and are the best available data at the time of this study. Project dynamics data will be updated upon unit commissioning test.
- 6) The fault clearing times used in this system impact study for transient stability study purpose are summarized in Table 4-1 below. The fault clearing time assumptions for various AIES area contingencies are adopted upon AESO Study Scope "P3082 Fort Nelson Generating Station Gas".

Table 4-1 Summary of Fault Clearing Times

Contingency	3-Ph Fault Location	Fault Clearing Time (Cycles)	
		Close End	Far End
FNG 144 Bus	FNG 144 Bus	8	-
FNG G1	FNG G1	8	8
1L357	Close to WSP	5	6
1L359	Close to FNG	12	13
7L29 (Rainbow Lake 791S to Rainbow Co-gen 850S, AB)	Close to RBW 791S (AB)	6	30
7L113 (Ring Creek 853S to Arcenciel 930S, AB)	Close to Arcenciel 930S (AB)	6	42
7L82 (Hotchkiss 788S to Ring Creek 853S, AB)	Close to Hotchkiss 788S (AB)	6	42
RBW G5 (AB)	RBW Cogen 850S G5	8	-

5.1 Power Flow Study Results

The study focuses on the 2026 light summer (26LS) system load condition which is typically a stressed condition for a generation interconnection project, taking into consideration factors such as load conditions, seasons and generation patterns. The 2026 heavy summer (26HS) and 2026 heavy winter (26HW) cases are also checked to capture any possibility of performance violations under higher load conditions.

The study finds no thermal overloads on transformers or lines under system normal conditions and single contingencies (P1) for all load conditions (26LS, 26HS, 26HW) studied. Appendix B shows the details of selected thermal overload analysis results.

With the connection of the FNG G3 project, the steady-state voltage performance under system normal and single contingency conditions (P1) is acceptable for all the load conditions (26LS, 26HS, 26HW). Appendix B shows the details of selected steady-state voltage study results.

FNG G3 is a [REDACTED] 14 MW synchronous turbine generator [REDACTED] [REDACTED]. Based on the steady-state studies completed in this SIS, no voltage violation or additional reactive support requirement has been identified under the studied system normal and P1 conditions.

Transient stability studies have been performed using the 2026 light summer base case to assess the impact of adding the 14 MW FNG G3 in accordance with the TPL-001-WECC-CRT-4 Performance Criteria.

The BCH Planning Coordinator Office (PCO) has communicated the finding of angular instability to AESO and a Corrective Action Plan (CAP) is being developed jointly by BC Hydro and the AESO. This pre-existing issue is being addressed through BC Hydro–AESO coordination on the development of a Corrective Action Plan (CAP).

An islanding study was performed to assess the ability of FNG G3, either operating alone or together with G1, to support the local loads under separated operating conditions following the loss of 1L359. The study identified no network upgrade.

In accordance with FAC-002-3, the potential impact of the proposed interconnection on adjacent systems has been considered as part of this SIS. The Fort Nelson regional system is interconnected with the AIES, and therefore relevant Alberta contingencies were considered in this SIS.

As stated in Section 5.2, the study identified a pre-existing angular stability issue under certain Alberta contingencies; it is not introduced by the addition of FNG G3 and is being addressed through BC Hydro–AESO coordination. No other incremental reliability impact to adjacent utilities has been identified for the proposed interconnection.

No station work is required for this project.

5.8.1 Protection

- Add two SEL-300G relays for the new generator G3.
- Extend the existing protection zone of transformer T2 to include the G3 unit breaker [REDACTED].
- Update the FNG protection one-line diagram and carry out in-house Real Time Digital Simulation (RTDS) tests.

5.8.2 Control

- Provide alarms for the new equipment and protection systems in accordance with BC Hydro standardized alarm guidelines. The adequacy of the existing station alarm system shall be confirmed during the estimating stage. If existing alarm capacity is inadequate, additional control scope may be required.
- If further points are required for SCADA control, additional control scope may be required.
- Use the existing SEL-3610 port expander to connect the new protection relays for engineering access.

In addition to the local station work, offsite control centre work is required to update the database and displays at FVO/SIO, and to revise EMS as needed to

5.8.3 Telecommunications

5.9 Revenue Metering

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The non-binding good faith estimated cost and time to construct the Network Upgrades required to interconnect the proposed project will be provided in a separate letter to the IC.

To interconnect the [REDACTED] Project at the proposed POI, this System Impact Study (SIS) has identified the following requirements and conclusions:

1. With the addition of the FNG G3, when the FNG plant is connected to the AESO system, the study does not find any steady state performance violation under system normal conditions and under P1 contingencies.
2. Under certain single contingencies in the Alberta region, angular instability concerns were observed at FNG G1 and G3 following the loss of 7L29 (from Alberta's Rainbow Lake 791S to Rainbow Co-gen 850S) under the studied system conditions. This is a pre-existing issue, and it is being addressed through BC Hydro-AESO coordination on the development of a Corrective Action Plan (CAP).
3. The planned operation of G3 (or G3 with G1) in an island was evaluated. The assessment identified no network upgrade. Several performance risk areas were identified; they are associated with voltage and frequency control, cold load pickup, and transformer energization. A few key operating requirements for islanded operation and operational measures to manage the risks are recommended. Refer to Appendix E for the recommendations.
4. Protection and control modifications are required for the FNG G3 addition. The identified protection work is limited to local station modifications at FNG, while the identified control work includes both local station updates and control centre database, display, telemetry, alarm, and EMS updates required to accommodate the new unit G3. No telecommunications work is required for this project.

Area Interconnection Diagram for the FNG G3 Addition Project

The image consists of a single, uniform black rectangle filling the entire frame. There are no discernible features, text, or patterns other than the solid color.

Appendix B

Power Flow Study Results

Table B-1: Summary of Branch Loading Analysis Results

Case	FNG G1 and G3 Output (MW)	Contingency		Branch Loading (%)			
		Category	Description	1L357 (FNG-WSP)	1L359 (FNG-KLC)	1L359 (KLC-FNC)	1L359 (FNC-AB Border)
Summer Rating				47.8 MVA	174.7 MVA	174.7 MVA	174.7 MVA
26LS	MAX	P0	System Normal	15	28	26	20
		P1	1L357	-	31	30	24
		P1	FNG G1	15	6	5	3
26HS	MAX	P0	System Normal	27	24	23	17
		P1	1L357	-	31	30	24
		P1	FNG G1	27	3	1	9
Winter Rating				47.8 MVA	221.1 MVA	221.1 MVA	221.1 MVA
26HW	MAX	P0	System Normal	42	15	15	9
		P1	1L357	-	24	24	18
		P1	FNG G1	42	8	3	15

Table B-2: Steady-State Voltage Study Results

Case	FNG G1 and G3 Output (MW)	Contingency		Bus Voltage (kV)			
		Category	Description	FNG 144	WSP 144	KLC 144	RBW 144
26LS	MAX	P0	System Normal	150.2	150.1	150.2	148.9
		P1	1L357	150.3	-	150.1	148.9
		P1	FNG G1	150.6	150.5	150.9	148.9
26HS	MAX	P0	System Normal	151.8	151.7	151.8	148.9
		P1	1L357	152.3	-	151.8	148.8
		P1	FNG G1	151.5	151.3	151.6	148.9
26HW	MAX	P0	System Normal	152.0	151.6	151.8	148.9
		P1	1L357	152.5	-	152.0	148.9
		P1	FNG G1	150.7	150.4	150.8	148.9

Appendix C

Transient Stability Study Results

Table C-1: Transient Stability Study Results for 26LS

Category	Contingency	3-Ph Fault Location	Fault Clearing Time (Cycles)		FNG G3 Performance	FNG G1 Performance
			Close End	Far End		
P1.1	FNG 144 Bus	FNG 144 Bus	8	-	Acceptable	Acceptable
P1.1	FNG G1	FNG G1	8	8	Acceptable	Acceptable
P1.1	1L357	Close to WSP	5	6	Acceptable	Acceptable
P1.1	7L29	Close to Rainbow Cogen 850S (AB)	6	30	Unstable	Unstable
P1.1	7L29	Close to Rainbow Lake 791S (AB)	6	30	Acceptable	Acceptable
P1.1	7L113	Close to Arcenciel 930S (AB)	6	42	Acceptable	Acceptable
P1.1	7L82	Close to Hotchkiss 788S (AB)	6	42	Acceptable	Acceptable
P1.1	RBW G5	RBW Cogen 850S G5	8	-	Acceptable	Acceptable

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[illegible]

Operational Recommendations for FNG G3 Islanded Scenarios

A dedicated islanding study was completed to assess system performance with G3 operating as the only generating source or together with G1 under islanded conditions. [REDACTED]