

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

November 24, 2025

[REDACTED]  
[REDACTED]  
[REDACTED]  
via email: [REDACTED]

**RE: CEAP IR #7 – [REDACTED] – Interconnection Feasibility Study**

Dear [REDACTED]

Enclosed is the Interconnection Feasibility Study for the proposed Interconnection Request (IR), [REDACTED], submitted under Attachment M-2: Transmission Service and Interconnection Service Procedures for Competitive Electricity Acquisition Process (CEAP) 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 project to BC Hydro's Transmission System, being the Network Upgrades, based on the findings of the Interconnection Feasibility 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 to accommodate the interconnection of the Generating Facility to the BC Hydro's Transmission System. Pursuant to the OATT, BC Hydro will design, procure, construct, install, and own the Network Upgrades. While BC Hydro will pay the costs for the Network Upgrades, the Interconnection Customer provides security for such costs.

### **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 Feasibility Study). The deposit amounts specified in the OATT are not proxy Interconnection Study costs. If actual Interconnection Study costs exceed the deposit amount, the Interconnection Customer must pay the remaining balance in cash. Please refer to the answer for question no. 53 in the posted [Questions & Answers for 2025 Call for Power](#) for typical study cost ranges.

### **Cost Estimate**

Based on the Interconnection Feasibility Study, the non-binding good faith estimated cost (typical accuracy range of +150%/-50%) for Network Upgrades required to interconnect your project is \$36.6 M.

### **Major Scope of Work Identified:**

- Add one 230 kV line position with associated equipment including circuit breaker, disconnects and instrument transformers at BC Hydro Nicola substation (NIC)
- Upgrade required substation facilities, infrastructures, and bus work to support new station equipment
- Terminate the Interconnection Customer's 230kV line at NIC

- Supply and install required Protection, Control and Telecommunications equipment

**Exclusions:**

- GST
- Permits
- Right-of-Way & property costs

**Key Assumptions:**

- Construction by contractor
- 8 months of construction is considered
- No construction during winter season
- Execution of early Engineering and Procurement Agreement
- No expansion of existing stations or control buildings to accommodate new equipment
- Impact Benefit Agreements with First Nations are not considered

**Key Risks:**

- Expansion of the existing control building may be required leading to increased costs and/or a longer project schedule
- 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
- Ground improvements may be required leading to increased construction costs
- Contaminated soil may be encountered leading to increased construction costs
- Cost of materials and major equipment may be affected by market conditions and escalation

**Study Limitations and Exclusions*****Protection, Control, and Telecommunications***

The Interconnection Feasibility Study does not include a detailed review of the protection, control, and telecommunications system requirements specific to your Interconnection Request. Based on a high-level review, we have identified proxy costs for protection, control, and telecom Network Upgrades drawn from comparable interconnection projects with similar scope and complexity; these proxy costs have been included solely for indicative budgeting purposes. The relative interconnection cost determined by the Interconnection Feasibility Study includes a telecommunications component based on an assumed solution to deliver teleprotection and telecontrol circuit requirements necessary for the Interconnection Request. Protection, control, and telecommunications system requirements will be reviewed in detail in the System Impact Study if you are a successful participant of the CEAP and meet applicable requirements.

For Interconnection Feasibility Study purposes, it is assumed that any applicant-proposed works that could obstruct or impair the performance of existing BC Hydro microwave systems or new links from the proposed Interconnection Customer Interconnection Facilities (ICIF) to the BC Hydro microwave system would be identified and either relocated or repositioned as determined in a System Impact Study if you are a successful participant of the CEAP and meet applicable requirements. Such works may include, but are not

limited to, towers, turbines, dams, support structures, panels, surface materials deposited or redistributed, water surface changes, or vegetation.

***Generation Shedding/Curtailment Scheme and Electromagnetic Transient (EMT) Studies***

The generation shedding/curtailment scheme reviews (e.g., Remedial Action Scheme (RAS), and a direct transfer trip for anti-islanding scheme) and EMT studies are completed in a System Impact Study. The outcomes of these studies may result in additional requirements, which could include Network Upgrades or ICIF. Any costs associated with completion of these studies, and resulting requirements, are not included in the Interconnection Feasibility Study cost estimate.

***Revenue Metering***

Please note that revenue metering requirements have not been determined with the Interconnection Feasibility Study. As such, any costs associated with revenue metering and other interconnection components are not included in the cost estimate provided above. Once these requirements are defined, costs that are attributable to the Interconnection Customer are to be paid in cash. For more details on revenue metering requirements and responsibilities, please refer to:

<https://www.bchydro.com/content/dam/BCHydro/customer-portal/documents/distribution/standards/ds-rmr-complex-revenue-metering.pdf>.

**Schedule**

Based on the Interconnection Feasibility Study, the non-binding good faith estimated in-service date for your Interconnection Request's Network Upgrades is Quarter 4 2032 (calendar year). To achieve this timeline, we may need to expedite certain activities, including engineering design and procurement of long-lead equipment.

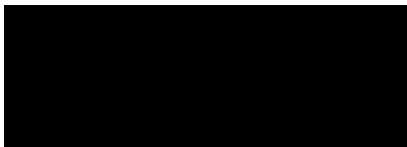
Timely actions required from you to minimize risks to the schedule:

- Submission of additional technical data required for the System Impact Study and Facilities Study
- Submission of any required information or document such as demonstration of Site Control
- Execution of Combined Study Agreement and Standard Generator Interconnection Agreement
- Financial commitments and securities

Please note that changes to your Interconnection Request or delays in data submission or financial commitments may also impact the target in-service date.

If you have any questions, please contact the BC Hydro CEAP team at ceap2025@bchydro.com.

Sincerely,



Manager, Customer Interconnections

BC Hydro

Encl.: CEAP\_2025\_IR7\_ [redacted] \_Feasibility\_Study.pdf



# Interconnection Feasibility Study

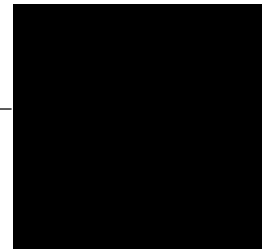
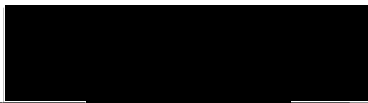
**BC Hydro EGBC Permit to Practice No: 1002449**

**2025 CEAP IR #7**

Prepared for:

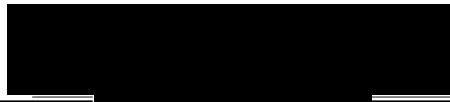


Prepared by:



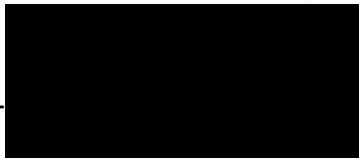
Specialist Engineer, Interconnection  
Planning

Reviewed by:



Manager, Interconnection Planning

Accepted by:



Manager, Transmission Planning

## Report Metadata

Header: 2025 CEAP IR #7  
Subheader: Interconnection Feasibility Study  
Title: [REDACTED]  
Subtitle: 2025 CEAP IR #7  
Report Number: 300-APR-00031  
Revision: 0  
Confidentiality: Public  
Date: 2025 Nov 21  
Volume: 1 of 1

Prepared for: [REDACTED]  
Prepared by: [REDACTED] P.Eng.  
Title: Specialist Engineer, Interconnection Planning  
Checked by: [REDACTED]  
Title: Sr. Engineer, Interconnection Planning  
Reviewed by: [REDACTED]  
Title: Manager, Interconnection Planning

Related Facilities: NIC  
Additional Metadata: Transmission Planning 2025-048  
Filing Subcode 1350

## Revisions

Revision	Date	Description
0	2025 Nov	Initial release

## Disclaimer of Warranty, Limitation of Liability

This report was prepared solely for internal purposes. All parties other than BC Hydro are third parties.

BC Hydro does not represent, guarantee or warrant to any third party, either expressly or by implication:

any information, product or process disclosed, described or recommended in this report.

BC Hydro does not accept any liability of any kind arising in any way out of the use by a third party of any information, product or process disclosed, described or recommended in this report, nor does BC Hydro accept any liability arising out of reliance by a third party upon any information, statements or recommendations contained in this report. Should third parties use or rely on any information, product or process disclosed, described or recommended in this report, they do so entirely at their own risk.

This report was prepared by the British Columbia Hydro And Power Authority ("BCH") or, as the case may be, on behalf of BCH by persons or entities including, without limitation, persons or entities who are or were employees, agents, consultants, contractors, subcontractors, professional advisers or representatives of, or to, BCH (individually and collectively, "BCH Personnel").

This report is to be read in the context of the methodology, procedures and techniques used, BCH's or BCH's Personnel's assumptions, and the circumstances and constraints under which BCH's mandate to prepare this report was performed. This report is written solely for the purpose expressly stated in this report, and for the sole and exclusive benefit of the person or entity who directly engaged BCH to prepare this report. Accordingly, this report is suitable only for such purpose, and is subject to any changes arising after the date of this report. This report is meant to be read as a whole, and accordingly no section or part of it should be read or relied upon out of context.

Unless otherwise expressly agreed by BCH:

- (a) any assumption, data or information (whether embodied in tangible or electronic form) supplied by, or gathered from, any source (including, without limitation, any consultant, contractor or subcontractor, testing laboratory and equipment suppliers, etc.) upon which BCH's opinion or conclusion as set out in this report is based (individually and collectively, "Information") has not been verified by BCH or BCH's Personnel; BCH makes no representation as to its accuracy or completeness and disclaims all liability with respect to the Information;
- (b) except as expressly set out in this report, all terms, conditions, warranties, representations and statements (whether express, implied, written, oral, collateral, statutory or otherwise) are excluded to the maximum extent permitted by law and, to the extent they cannot be excluded, BCH disclaims all liability in relation to them to the maximum extent permitted by law;
- (c) BCH does not represent or warrant the accuracy, completeness, merchantability, fitness for purpose or usefulness of this report, or any information contained in this report, for use or consideration by any person or entity. In addition, BCH does not accept any liability arising out of reliance by a person or entity on this report, or any information contained in this report, or for any errors or omissions in this report. Any use, reliance or publication by any person or entity of this report or any part of it is at their own risk; and
- (d) In no event will BCH or BCH's Personnel be liable to any recipient of this report for any damage, loss, cost, expense, injury or other liability that arises out of or in connection with this report including, without limitation, any indirect, special, incidental, punitive or consequential loss, liability or damage of any kind.

## Copyright Notice

Copyright and all other intellectual property rights in, and to, this report are the property of, and are expressly reserved to, BCH. Without the prior written approval of BCH, no part of this report may be reproduced, used or distributed in any manner or form whatsoever.

## Contributors

The following accept responsibility for the content in the specified sections. Professionals apply their signature and/or seal as appropriate.

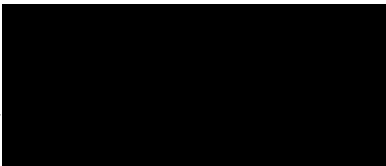
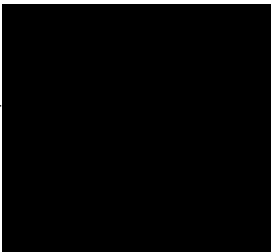
**Section:**

Entire report  
except listed  
below

**Discipline:**

Transmission Planning

Contributed by:

  
Specialist Engineer, Transmission  
Planning 


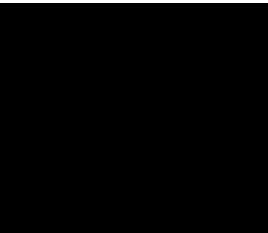
**Section:**

5.2, 5.3

**Discipline:**

Stations Planning

Contributed by:

  
Engineer, Station Planning 

## Executive Summary

██████████ the Interconnection Customer (IC), requests to interconnect its ██████████ (2025 CEAP IR #7) to the BC Hydro (BCH) system. ██████████ (hereafter referred to as ██████████ has sixty-two (62) ██████████ type-3 wind turbine generators (WTG), with a total capacity of 365.8 MW. The proposed Point of Interconnection (POI) is at BCH's Nicola substation (NIC). The IC will construct a 230 kV transmission line, about 57.7 km in length, connecting to the proposed POI. The proposed commercial operation date (COD) is December 31, 2032.

To interconnect the ██████████ and its facilities to the BCH Transmission System at the proposed POI, this Feasibility Study has made the recommendations and conclusions as follow:

1. A new 230 kV line position is required at NIC substation to facilitate the interconnection of ██████████
2. The connection of ██████████ does not cause any performance violation (i.e., thermal overload, voltage performance violation or voltage stability concern) under system normal conditions.
3. For critical single contingency (N-1) conditions, the study found several pre-existing thermal overloads on 1L203, 1L205, 1L244\_A, 1L244\_B and SVA T3, which will be addressed by planned generation shedding or runback remedial action scheme (RAS) proposed in earlier queued Interconnection Requests (IR). ██████████ may need to participate in the generation runback or shedding RAS to secure the system. The RAS function scope will be specified in the System Impact Study (SIS) stage if the need for RAS is determined.
4. ██████████ is required to install anti-islanding protection within its facility to disconnect the IC's generating plant from the grid when an inadvertent island with the local load forms. The anti-islanding protection shall be configured in the manner that does not compromise the required fault ride-through performance.
5. ██████████ is required to have the dynamic reactive power capability at a minimum of +/- 33% of its MPO at the high voltage side of

the IC's switchyard over the full MW operating range, per BCH's TIR Section 6.4.2.

6. The "STATCOM option" for the proposed type-3 WTGs is required so that each turbine can provide reactive power capability at zero MW output. BCH recognizes that Type-3 WTGs with the STATCOM option have an inherent limitation—providing only partial required reactive power capability during turbine standstill.
7. Fast Frequency Response, also known as Virtual Inertia Control (VIC) in the proposed wind turbines, is required at [REDACTED]. The proposed wind turbine generators, when equipped with the VIC option, are expected to temporarily boost the MW output to limit the system frequency drop during a major frequency event. The VIC settings should be determined in coordination with BCH in the later stage of the interconnection process.

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 on October 14, 2025.

A non-binding good faith estimated cost for required network upgrades and estimated schedule for construction are included in a separate letter to the IC.

Please note that, this Feasibility Study report does not include the descriptions of Protection, Control, and Telecommunications requirements and the associated upgrade scopes; however, as discussed in Section 2 "Purpose and Scopes of Study", the associated cost implications are captured and delivered in the cover letter to the IC.

# Contents

<b>Executive Summary</b>	<b>vi</b>
<b>1 Introduction</b>	<b>1</b>
<b>2 Purpose and Scopes of Study</b>	<b>4</b>
<b>3 Standard and Criteria</b>	<b>5</b>
<b>4 Assumptions and Conditions</b>	<b>6</b>
<b>5 System Studies and Results</b>	<b>7</b>
5.1 Power Flow Study Results	7
5.1.1 Thermal Overload Analysis	7
5.1.2 Steady-State Voltage Analysis	7
5.1.3 Reactive Power Capability Evaluation	8
5.1.4 Anti-Islanding Requirements	8
5.1.5 Other Performance Requirements	8
5.2 Fault Analysis	8
5.3 Stations Requirements	9
<b>6 Cost Estimate and Schedule</b>	<b>10</b>
<b>7 Conclusions</b>	<b>11</b>

## Appendices

Appendix A	Schematic Diagram of the IC's Project
Appendix B	Power Flow Study Results
Appendix C	One-Line Sketch for Nicola Substation Upgrade

## Acronyms

The following are acronyms used in this report.

BCH BC Hydro

[REDACTED] Step-Up Substation

CEAP Competitive Electricity Acquisition Process

COD Commercial Operation Date

DTT Direct Transfer Trip

ERIS Energy Resource Interconnection Service

[REDACTED]

IBR Inverter-Based Resources

IC Interconnection Customer

IR Interconnection Request

[REDACTED] Step-Up Substation

LAPS Local Area Protection Schemes

[REDACTED] Step-Up Substation

MPO Maximum Power Output

NERC North American Electric Reliability Corporation

NIC Nicola Substations

NRIS Network Resource Interconnection Service

OATT Open Access Transmission Tariff

POI Point of Interconnection

RAS Remedial Action Scheme

[REDACTED]

TIR BC Hydro “60 kV to 500 kV Technical Interconnection Requirements for Power Generators”

WECC Western Electricity Coordinating Council

WTG Wind Turbine Generator

# 1 Introduction

Table 1-1 below summarizes the project reviewed in this Feasibility Study.

Table 1-1 Summary of Project Information

Project Name	[REDACTED]	
Name of Interconnection Customer (IC)	[REDACTED]	
Point of Interconnection (POI)	Nicola Substation	
IC's Proposed COD	December 31, 2032	
Type of Interconnection Service	NRIS <input checked="" type="checkbox"/>	ERIS <input type="checkbox"/>
Maximum Power Injection (MW)	343.4 (Summer)	343.4 (Winter)
Number of Turbines	62 x 5.9 MW	
Plant Fuel	Wind	

[REDACTED] the Interconnection Customer (IC), requests to interconnect its [REDACTED] (2025 CEAP IR: #7) to the BC Hydro (BCH) system. [REDACTED] (hereafter referred to as [REDACTED]) has sixty-two (62) [REDACTED] type-3 wind turbine generators (WTG), with a total capacity of 365.8 MW. The proposed Point of Interconnection (POI) is at BCH's Nicola substation (NIC). The IC will construct a 230 kV transmission line, about 57.7 km in length, connecting to the proposed POI. The proposed commercial operation date (COD) is December 31, 2032.

Figure 1-1 shows the Nicola region transmission system diagram. Nicola substation (NIC) is a major substation in this area with two existing 500/230 kV transformers (NIC T2 & T3) rated at 1200 MVA each and two 230/138 kV transformers (NIC T5 & T6) rated at 300 MVA each.

NIC presently supplies three 138 kV transmission lines – 1L251 to the [REDACTED] Copper Mountain substation (CUM) and Similco substation (SCO), 1L243 to BC Hydro's Highland substation (HLD) and 1L244 to BC Hydro's Westbank substation (WBK).

The Nicola region presently has four non-BCH generating facilities below.

- Pennask-Shinish Wind Farm (PSW)
- Kwoiek Creek Generating Station (KCH)



potential transformer overload associated with the industrial load increase in Highland region.

- 1L243 reconductoring: this line rating upgrade is required to accommodate an industrial load increase in Highland region.
- 1L251 series capacitor project: Line 1L251 will be series compensated to accommodate an industrial load increase on 1L251.

## 2 Purpose and Scopes of Study

This Feasibility Study is a preliminary evaluation of the system impact of interconnecting the proposed project to the BCH system based on power flow and short circuit analysis in accordance with BCH's Open Access Transmission Tariff (OATT) and produces the estimated cost of required Network Upgrades and the implementation schedule.

Per OATT, the Feasibility Study is performed individually for each of the participating projects in the CEAP process and focuses specifically on the BCH regional transmission system where the proposed generating project is connected and affects.

This is a "limited scope" study which is restricted to power flow studies of P0, P1 and P2 planning events as defined in TPL-001-4 and short circuit analysis. The study does not address other technical aspects such as transient stability and switching transients and impact of multiple contingencies. These subjects will be addressed in subsequent System Impact Study (SIS) if the project proceeds further. In addition, any potential impacts to the adjacent external systems to BCH would be addressed in subsequent detailed and coordinated studies with the relevant adjacent entities if the proposed generator project proceeds further.

Please note that, due to the compressed study timeline for 2025 CEAP Feasibility Studies, this report does not include the descriptions of the Protection, Control, and Telecommunication requirements and the associated upgrade scopes. Instead, the network upgrades associated with Protections, Controls and Telecommunications are incorporated with cost estimates in a separate cover letter to the IC.

### 3 Standard and Criteria

The Feasibility Study is performed in compliance with the North American Electric Reliability Corporation (NERC) and Western Electricity Coordinating Council (WECC) reliability standards, the BCH interconnection requirements in the TIR, and upon the ratings of the existing BCH transmission facilities described in Operating Orders, specifically:

- NERC standards: TPL-001-4 and FAC-002-3 relevant to the scope of this Feasibility Study.
- WECC criteria TPL-001-WECC-CRT-4 Transmission System Planning Performance, July 1, 2023.
- BC Hydro's 60 kV to 500 kV Technical Interconnection Requirements for Power Generators, Rev 2.1.1, Effective: Sept 22, 2025.
- BC Hydro Operating Order 5T-10, Ratings for All Transmission Circuits 60 kV or Higher, Sept 17, 2025.
- BC Hydro Operating Order 5T-14, Ratings for All Transmission and Distribution Transformer, Sept 22, 2025.
- BC Hydro System Operating Order 7T-22 System Voltage Control, Sept 19, 2023.

## 4 Assumptions and Conditions

This Feasibility Study is performed based on the IC's submitted data and information available to BCH on Oct 14, 2025 for the study purpose. Assumptions are made wherever the IC's input is unavailable. Appendix A shows the schematic diagram of the IC's project used in the study model.

The power flow study cases used in this Feasibility Study are established based upon BCH's base resource plan and load forecasts available at the time of performing the study, which includes existing and future generators, transmission facilities, and loads in addition to the subject interconnection project in this study. Applicable seasonal conditions and the appropriate study years for the planning horizon are also incorporated. Additional assumptions are listed as follows.

- 1) The generation in the study area are dispatched to the patterns that stress the transmission system in the study area. In these patterns, the associated generators are typically set to their Maximum Power Outputs (MPO) unless otherwise specified.
- 2) For performing this study, Nicola Substation Transformation Capacity Reinforcement project (i.e. addition of NIC T7) and 1L243 reconductoring is assumed already completed by the time the IC's generating project enters service.
- 3) The West Kelowna Transmission Project (WKTP) is a major transmission capital project in the study area. The leading alternative for WKTP is Alternative 3E<sup>1</sup>, which will build a new 138 kV line from BCH's West Bank substation (WBK) to FortisBC's Recreation substation (REC). The considered in-service date for WKTP is November 2032.

---

<sup>1</sup> BC Hydro, West Kelowna Transmission Project, see details in <https://www.bchydro.com/energy-in-bc/projects/wktp.html>

## 5 System Studies and Results

### 5.1 Power Flow Study Results

Power flow studies were performed to evaluate whether the IC's generating project would cause any unacceptable system performance (e.g., equipment overloads, steady-state voltage violation and voltage instability) and to determine the system reinforcement requirement based on steady state performance analysis.

The study focuses on the base scenario – 32HW/33LS/33HS system conditions that include all the higher-queued generating projects and planned transmission upgrades in the region. These base cases were prepared based on factors such as load conditions, seasonal variation in ambient temperatures, and generation patterns that stress the transmission system.

The studies are performed for system normal conditions and under critical system contingencies in the P1 and P2 events specified by NERC TPL-001-4. Study results are summarized below.

#### 5.1.1 Thermal Overload Analysis

Appendix B shows the details of thermal overload analysis results. The study finds that the addition of [REDACTED] would not cause any new thermal overloads under system normal (N-0) conditions or single contingencies (N-1) studied.

For critical single contingency (N-1) conditions, the study observed several pre-existing thermal overloads on 1L203, 1L205, 1L244\_A, 1L244\_B and SVA T3. Those overloads will be addressed by the planned generation shedding or runback RAS [REDACTED] which are proposed in earlier queued IRs. [REDACTED] marginally contributes to these overloads and may need to participate in the generation runback RAS, which will be determined during the SIS stage in future if needed.

#### 5.1.2 Steady-State Voltage Analysis

With the addition of the IC's project, the steady-state voltage performance under system normal and single contingency conditions is acceptable for the studied load conditions. Appendix B shows the details in the steady-state voltage study results.

### 5.1.3 Reactive Power Capability Evaluation

The BCH TIR requires an IBR power plant to have the dynamic reactive power capability at a minimum of +/- 33% of its MPO at the high voltage side of the IC's switchyard over the full MW operating range.

Based on the power flow model data submitted by the IC, the proposed [REDACTED] [REDACTED] would be capable of meeting the BCH's reactive capability requirement at the plant's maximum MW output, which is subjected to further verification in the next stage of the interconnection process.

In addition, according to the IC-provided reactive capability data, the proposed WTG would provide a reactive capability of between +1.7 Mvar and -1.9 Mvar at the zero MW output if the turbine's "STATCOM" function is enabled. This function needs to be re-confirmed if the IC's project proceeds to next stage of the interconnection process.

### 5.1.4 Anti-Islanding Requirements

The [REDACTED] is not arranged for islanded operation. In addition, the IC is required to install anti-islanding protection within its facility to disconnect the IC's wind farm from the grid when an inadvertent island with the local load forms.

### 5.1.5 Other Performance Requirements

Fast Frequency Response, also known as Virtual Inertia Control (VIC) in the proposed wind turbines, is required at [REDACTED]. The proposed wind turbine generators, when equipped with the VIC option, are expected to temporarily boost the MW output to limit the system frequency drop during a major frequency event. The VIC settings should be determined in coordination with BCH in the later stage of the interconnection process.

## 5.2 Fault Analysis

The short circuit analysis in the Feasibility Study is based upon the latest BCH system model, which includes the generating facility information and associated impedance data provided by the IC. A more detailed study will be performed at the SIS stage if needed.

### 5.3 Stations Requirements

NIC will be upgraded to provide a 230 kV line termination for interconnecting the [REDACTED]

The scope of substation work at NIC is as follows.

- Add station equipment — circuit breaker, disconnects and instrument transformers. Appendix C shows the Stations Planning’s one-line sketch for Nicola substation upgrade.
- Upgrade required substation facilities, infrastructures, and bus work to support new station equipment.
- Terminate the 230 kV line from [REDACTED] at the station.

## 6 Cost Estimate and Schedule

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.

## 7 Conclusions

To interconnect the [REDACTED] and its facilities to the BCH Transmission System at the POI, this Feasibility Study has identified the following conclusions and requirements:

1. A new 230 kV line position is required at NIC substation to facilitate the interconnection of [REDACTED]
2. The connection of [REDACTED] does not cause any performance violation (i.e., thermal overload, voltage performance violation or voltage stability concern) under system normal conditions.
3. For critical single contingency (N-1) conditions, the study found several pre-existing thermal overloads on 1L203, 1L205, 1L244\_A, 1L244\_B and SVA T3. [REDACTED] may need to participate in the generation runback or shedding RAS to secure the system. The RAS function scope will be specified in the SIS stage if the need for RAS is determined.
4. [REDACTED] is required to install anti-islanding protection within its facility to disconnect the IC's generating plant from the grid when an inadvertent island with the local load forms. The anti-islanding protection shall be configured in the manner that does not compromise the required ride-through performance.
5. [REDACTED] is required to have the dynamic reactive power capability at a minimum of +/- 33% of its MPO at the high voltage side of the IC's switchyard over the full MW operating range, per BCH's TIR Section 6.4.2.
6. The "STATCOM option" for the proposed type-3 WTGs is required so that each turbine can provide reactive power capability at zero MW output. BCH recognizes that Type-3 WTGs with the STATCOM option have an inherent limitation—providing only partial reactive power capability during turbine standstill.
7. Fast Frequency Response, also known as Virtual Inertia Control (VIC) in the proposed wind turbines, is required at the [REDACTED]. The proposed wind turbine generators, when equipped with the VIC option, are expected to temporarily boost the MW output to limit the system frequency

drop during a major frequency event. The VIC settings should be determined in coordination with BCH in the later stage of the interconnection process.



## Appendix A

### Schematic Diagram of the IC's Project

Figure A-1 shows the schematic diagram for the IC's project. This wind project has two main power transformers (MPT) at the IC's step-up substation. Each MPT has two switchable shunt capacitors (2x20 Mvar) connected at the 34 kV side.

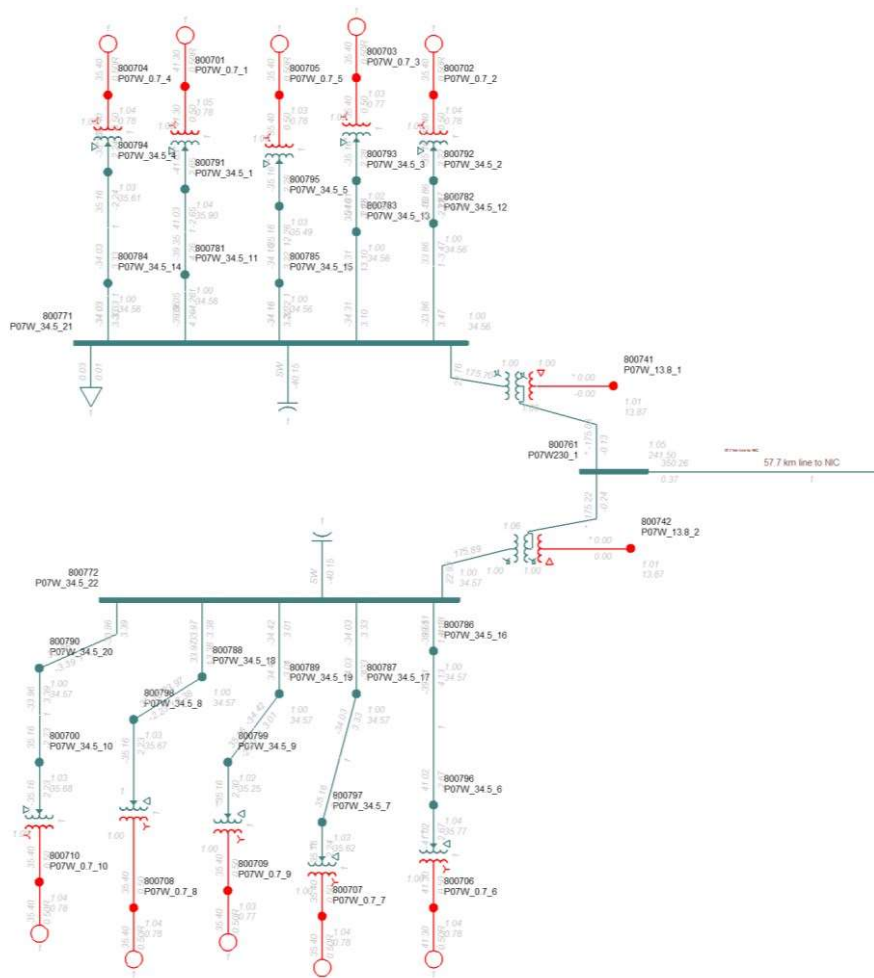


Figure A-1: [Redacted] Plant Schematic Diagram.

## Appendix B

### Power Flow Study Results

#### Base Scenario (32HW/33HS/33LS)

Table B-1: Thermal Overload Study Results

Case	SIW Regional Generation	Contingency		Branch Loading (% of its seasonal normal rating)								
				NIC T3	NIC T5	2L265	1L243	1L244_A (Note 1)	1L244_B (Note 2)	1L205	1L203	SVA T3
		Cat.	Description	-	-	NIC-VVW	NIC-HLD	NIC- [REDACTED]	[REDACTED] WBK	HLD-SVA	HLD-SVA	-
Winter Rating in MVA				1425	287	318.7	300.9	251.9	219.9	149.6	191.2	178
32HW	Max	P0	System Normal	14.1	18.7	39.2	34.2	64.9	55.5	76.1	83.7	46.7
	Max	P1.2	1L244_A	9.1	2.3	37.1	38.6	0	<b>140.5</b>	72.2	80.5	44.7
	Max	P1.2	1L244_B	16.4	26.3	40.9	32	95.5	0	78	85.3	47.1
	Max	P1.2	1L251	17.1	28.1	39.7	31.5	62.8	57.9	78.4	85.6	48.6
	Max	P1.2	2L265	17.1	15	0	24.1	63.5	57.6	86.1	92	35.5
	Max	P2.1	Open 1L203 at SVA	15.4	25	46.5	54.5	63.5	57.2	<b>141.4</b>	0	36.7
	Max	P1.2	1L205	15	22.9	43.2	47.7	64	56.6	0	<b>118.7</b>	40
	Max	P1.2	5L87	9.3	11.5	58.6	13.6	65.9	53.5	95.9	<b>100.2</b>	92
	Max	P1.2	5L98	15.8	22.7	33	33.9	82.3	32.9	75.9	83.5	50.8
	Max	P1.3	SVA T1 (Trip 2L92)	15.4	20.6	33.3	40.5	64.5	56	69.6	78.3	62.3
	Max	P1.3	NIC T2 (Trip NIC T6)	26	23.6	42	30.7	61.3	59.9	79.2	86.3	50.4
	Max	P2.1	Open 1L243 at HLD	14.9	22	42.2	44.8	64.2	56.4	66.3	75.4	41.9
	Max	P2.1	Open 1L244_B at WBK	17.2	29	41	31.2	<b>106.5</b>	13.3 **	78.7	85.8	47.6
	Max	P2.3	NIC 1CB19	31.4	36.5	43.1	27.1	58.1	63.6	82.5	89.0	53.3
Max	P2.3	NIC 2CB11	32.3	17.4	0	19.2	59.3	62.7	90.7	95.8	39.4	
Summer Rating in MVA				1200	287	318.7	252.6	229.1	169.7	118.6	172.8	150
33HS	Max	P0	System Normal	18.2	19.5	37.1	45.1	69.8	65.2 *	97.5	93.6	59.2
	Max	P1.2	1L244_A	12.3	3.3	35.4	50	0	<b>158.9 *</b>	92.8	90.1	56.9
	Max	P1.2	1L244_B	20.9	27.3	38.7	42.5	<b>104.7</b>	0	<b>100.1</b>	95.5	59.6
	Max	P1.2	1L251	21.7	28.9	37.5	42.2	67.5	67.8 *	<b>100.3</b>	95.6	61.4
	Max	P1.2	2L265	21	16.4	0	34.9	68.5	67.4 *	<b>107.8</b>	<b>101.2</b>	53.8
	Max	P2.1	Open 1L203 at SVA	19.6	25.9	44.5	69.5	68.3	67.1 *	<b>180.3</b>	0	47
	Max	P1.2	1L205	19.2	23.8	40.8	61.4	68.8	66.4 *	0	<b>132.9</b>	51.2
	Max	P1.2	5L87	13	13.7	52.2	24.2	70.9	63.6 *	<b>118.7</b>	<b>109.1</b>	<b>106.4</b>
	Max	P1.2	5L98	20.4	24.2	32.3	45.1	90	40.4 *	96.8	93.2	64.4
	Max	P1.3	SVA T1 (Trip 2L92)	19.8	21.5	31.8	53	69.3	65.8 *	88.6	87.2	78.4
	Max	P1.3	NIC T2 (Trip NIC T6)	33.4	24.8	39.5	40.8	65.7	70.3 *	<b>101.6</b>	96.6	63.8
	Max	P2.1	Open 1L243 at HLD	18.7	21.6	38.9	53.2	69.3	65.8 *	89.8	87.9	55.7
	Max	P2.1	Open 1L244_B at WBK	21.9	30	38.9	41.7	<b>116.8</b>	17.3 **	<b>100.8</b>	96	60.2

	Max	P2.3	NIC 1CB19	40.1	38.0	40.3	36.8	62.7	74.5 *	<b>105.5</b>	99.5	67.2
	Max	P2.3	NIC 2CB11	39.9	19.5	0	29.1	63.8	73.2 *	<b>113.7</b>	<b>105.5</b>	58.6
Summer Rating in MVA				1200	287	318.7	252.6	229.1	169.7	118.6	172.8	150
33LS	Max	P0	System Normal	24.4	27.9	8.1	60.4	81.9	47.9 *	92.1	89.6	67
	Max	P1.2	1L244_A	17.4	9	5.4	66.1	0	<b>158.8 *</b>	86.4	85.5	64.3
	Max	P1.2	1L244_B	26.2	33	9.3	58.7	<b>104.5</b>	0	93.7	90.8	67.3
	Max	P1.2	1L251	27.6	36.4	8.6	57.8	79.8	50.3 *	94.5	91.4	69
	Max	P1.2	2L265	25.2	27.1	0	57.7	81.5	48.4 *	94.8	91.6	63.4
	Max	P2.1	Open 1L203 at SVA	25.8	34.1	15.2	84.1	80.4	49.7 *	<b>171.8</b>	0	55.3
	Max	P1.2	1L205	25.4	32	12.2	75.8	80.9	49.1 *	0	<b>126.8</b>	59.4
	Max	P1.2	5L87	20.6	23.5	20.6	44.5	82.7	46.9 *	<b>108.4</b>	<b>101.6</b>	<b>103.3</b>
	Max	P1.2	5L98	26.8	32.7	1.9	60.6	<b>102.2</b>	23.1 *	91.5	89.2	71.9
	Max	P1.3	SVA T1 (Trip 2L92)	26.3	30.3	0.8	69.6	81.3	48.6 *	82.2	82.4	89.5
	Max	P1.3	NIC T2 (Trip NIC T6)	45.1	35.8	12.7	54.5	76.2	55.2 *	97.9	93.9	73.6
	Max	P2.1	Open 1L243 at HLD	23.9	26	6.3	53.2	82.3	47.4 *	<b>100.1</b>	95.5	70.3
	Max	P2.1	Open 1L244_B at WBK	27.2	35.7	9.5	57.9	<b>116.5</b>	16.9 **	94.5	91.4	67.9
Max	P2.3	NIC 1CB19	51.2	47.9	13.9	51.2	73.4	59.0 *	<b>101.5</b>	96.5	77.0	
Max	P2.3	NIC 2CB11	47.6	33.8	0	50.2	75.5	56.1 *	<b>102.4</b>	97.2	68.1	

Note 1: 1L244\_A assumed uprated to a summer continuous rating of 961A or higher [redacted] enters service.

Note 2: by default, the line loading on 1L244\_B is measured at WBK end, except:

- If marked with asterisk "\*\*", the line loading is measured on Section from PSW tap to BDM tap.
- If marked with double asterisk "\*\*", the line loading is measured on Section from [redacted] to PSW tap.

**Table B-2: Steady-State Voltage Study Results**

Case	IC's Plant Output	Contingency		Bus Voltage (PU)			
		Cat.	Description	NIC 230	NIC 138	VVW 230	P22W 230
32HW	Max	P0	System Normal	1.04	1.02	1.02	1.05
	Max	P1.2	2L265	1.04	1.03	N/A*	1.05
	Max	P1.2	5L98	1.03	1.01	1.01	1.05
	Max	P1.3	NIC T2 (+T6)	1.04	1.02	1.02	1.05
	Max	P2.3	NIC 2CB11	1.04	1.02	N/A*	1.05
33HS	Max	P0	System Normal	1.05	1.02	1.01	1.05
	Max	P1.2	2L265	1.05	1.02	N/A*	1.05
	Max	P1.2	5L98	1.03	1.01	0.99	1.05
	Max	P1.3	NIC T2 (+T6)	1.04	1.02	1.01	1.05
	Max	P2.3	NIC 2CB11	1.05	1.02	N/A*	1.05
33LS	Max	P0	System Normal	1.05	1.02	1.05	1.05
	Max	P1.2	2L265	1.05	1.02	N/A*	1.05
	Max	P1.2	5L98	1.03	1.01	1.03	1.05
	Max	P1.3	NIC T2 (+T6)	1.05	1.02	1.04	1.05
	Max	P2.3	NIC 2CB11	1.05	1.02	N/A*	1.05

Note \*: VVW T2 and T3 will be isolated after 2L265 fault is cleared. The VVW 230 bus will be isolated.

## Appendix C

### One-Line Sketch for Nicola Substation Upgrade

Figure C-1 shows the Stations Planning's One-Line Sketch for Nicola substation Upgrade.

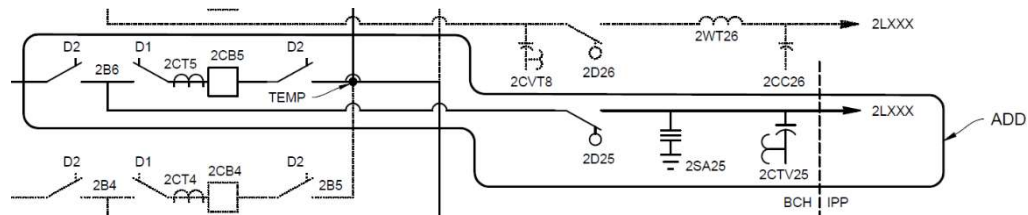


Figure C-1: One-Line Sketch for Nicola Substation Upgrade.