BC Hydro
Power smart

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

July 30, 2024

[redacted]

[redacted]

[redacted]

RE: CEAP IR 105 - Mackenzie Wind Project - Interconnection Feasibility Study Report

Enclosed is the Interconnection Feasibility study report for the proposed Mackenzie Wind Project 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.

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 $39.9 M.

Major Scope of Work Identified:

- Expand the substation on both East and West sides of the station at BC Hydro Kenney (KDS) substation
- Supply and install one 230kV line position with the associated substation equipment at KDS
- Construct underground conduits and/or trenches from the control building to the line position designated to connect Mackenzie Wind
- Supply and install one rack, fibre patch panel, and all dielectric fibre entrance cable
- Supply and install protection relays and other required protection equipment
- Supply and install two digital teleprotection circuits and connect to protective equipment
- Other Telecom and Protection work, as required

Exclusions:

- GST
- Right-of-Way
- Permits

Key Assumptions:

- Construction will be done by contractor
- 2 years of construction
- The relocation of 138kV bus showing the future breakers and line terminals is feasible towards the South of the station with no issues for Morfee customers
- The relocation of the transmission line 1L365 required to connect transformer T5 is feasible
- The relocation of the 138/25kV transformers and the distribution switchyard including all the 25kV equipment is feasible
- Property is available to be purchased on the East and West sides of the station
- The 230kV cable laying is feasible within the 230kV and 138kV station switchyards taking into the account the very large bending radius of the 230kV cable

Key Risks:

- Expansion of the existing control building may be required leading to increased costs and/or a longer project schedule
- No defined supply chain strategy, construction costs may increase depending on delivery method
- Project schedule may be longer than expected, leading to increased costs
- Costs may be affected by market conditions and escalation

Please note that the Revenue Metering requirements and associated costs required to interconnect your project have not been determined at this stage and, therefore, not included in the above estimate. Revenue Metering 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 project's Network Upgrades is Quarter 3, 2031 (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, delays in data submission, or financial commitments may also impact the target in-service date.

Next Steps

In September 2024, we will issue a final invoice for the Feasibility Study costs. This invoice will reflect the total amount due, taking into account the $15,000 Feasibility Study deposit you have already paid and any remaining amount on the non-refundable $15,000 Interconnection request deposit that we did not spend in reviewing and validating your interconnection request.

If you have any questions, please contact the BC Hydro CEAP Team at ceap2024@bchydro.com.

Sincerely,

Senior Manager, Transmission Interconnections

BC Hydro

Encl.: CEAP2024_IR_105_Mackenzie Wind_FeS_Report_final.pdf

[redacted]

Mackenzie Wind Project

Interconnection Feasibility Study

BC Hydro EGBC Permit to Practice No: 1002449

2024 CEAP IR # 105

[redacted]

[redacted]

[redacted]

[redacted]

Report Metadata

Header:	Mackenzie Wind Project
Subheader:	Interconnection Feasibility Study
Title:	Mackenzie Wind Project
Subtitle:	2024 CEAP IR # 105
Report Number:	850-APR-00013
Revision:	0
Confidentiality:	Public
Date:	2024 Jul 30
Volume:	1 of 1

[redacted]

Related Facilities:	KDS (230 kV)
Additional Metadata:	Transmission Planning 2024-105 Filing Subcode 1350

Revisions

Revision	Date	Description
0	2024 Jul	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

Executive Summary

[redacted]., the interconnection customer (IC), requests to interconnect its Mackenzie Wind Project (2024 CEAP IR # 105) to the BC Hydro system. Mackenzie Wind Project has forty-seven (47) [redacted] Type-4 wind turbine generators, adding a total capacity of 197.4 MW into the BC Hydro system. The Point of Interconnection (POI) is at the 230 kV bus of BC Hydro's Kennedy substation (KDS). The Mackenzie Wind project is interconnected with the POI via an approx. 63 km customer built new 230 kV transmission line. The IC's proposed commercial operation date (COD) is Oct 8, 2028.

To interconnect the Mackenzie Wind Project and its facilities to the BCH Transmission System at the proposed POI, this Feasibility Study has identified the following conclusions and requirements:

1. A 230 kV line position is required at KDS substation.
2. The connection of Mackenzie Wind Project does not cause any performance violation (i.e. thermal overload, voltage performance violation or voltage stability concern) under system normal conditions.
3. The connection of Mackenzie Wind Project will exacerbate the existing thermal overloads on 500 kV lines under single system contingencies , non-firm transfer conditions, and during the summer and winter load operations.

   IC is required to participate in the existing generation shedding RAS to mitigate the potential thermal overloads.
4. If the KDS 500/230 kV transformer is forced out of service, the Mackenzie Wind Project could be inadvertently islanded with BC Hydro loads, which is not allowed. An Anti-islanding transfer trip scheme is required to trip IC's generation at their site substation (P105) under various system contingencies. In addition, the IC is required to install anti-islanding protection within their facility to disconnect the IC's wind farm from the grid when an inadvertent island with the local loads forms.
5. A new IC owned interconnectiopn line 2LXXX will be IC's Bulk Electric System (BES) line and the IC will be responsible for the compliance with applicable NERC MRS requirements

6. According to BC Hydro's TIR, the IC's project must have sufficient reactive power capability over full MW operating range including at the zero MW output level. The Mackenzie Wind Project as submitted does not meet the reactive capability requirement at near zero MW output level.

7. BC Hydro will provide line protections for 2LXXX at BC Hydro's Kennedy Substation (KDS) (BC Hydro end only). As part of the line protection, telecommunication facilities will be required between KDS and Mackenzie Wind (P105) to accommodate the new protection schemes. The IC shall provide required relays, telecom facility and associated equipment at its facilities to accommodate the new protection schemes.

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 May 22, 2024.

A 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.

Contents

Appendices

Acronyms

The following are acronyms used in this report.

BCH	BC Hydro
CEAP	Competitive Electricity Acquisition Process
COD	Commercial Operation Date
DTT	Direct Transfer Trip
ERIS	Energy Resource Interconnection Service
FeS	Feasibility Study
FVO	Fraser Valley Office
IBR	Inverter-Based Resources
IC	Interconnection Customer
LAPS	Local Area Protection Schemes
MPO	Maximum Power Output
NERC	North American Electric Reliability Corporation
NRIS	Network Resource Interconnection Service
OATT	Open Access Transmission Tariff
P105	Project 105 - Mackenzie Wind
POI	Point of Interconnection
RAS	Remedial Action Scheme
SIO	South Interior Office
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	Mackenzie Wind - KDS – 197.4 MW	
Name of Interconnection Customer (IC)	[redacted]	
Point of Interconnection (POI)	230 kV bus of Kennedy Substation	
IC's Proposed COD	8th October 2028	
Type of Interconnection Service	NRIS ☒	ERIS ☐
Maximum Power Injection (MW)	188 (Summer)	189 (Winter)
Number of Generator Units	47 x 4.2 MW WTGs	
Plant Fuel	Wind	

[redacted], the interconnection customer (IC), requests to interconnect its Mackenzie Wind Project (2024 CEAP IR #105) to the BC Hydro system. Mackenzie Wind Project has forty-seven (47) [redacted] Type-4 wind turbine generators, adding a total capacity of 197.4 MW into the BC Hydro system. The Point of Interconnection (POI) is at the 230 kV bus of the BC Hydro's Kennedy 230 kV substation (KDS) in Central Interior region. The Mackenzie Wind project is interconnected with the POI via an approx. 63 km customer built new 230 kV transmission line. The proposed commercial operation date (COD) is Oct 8, 2028.

Figure 1-1 shows the Central Interior region 500/230/138 kV transmission system diagram. There is an existing Remedial Action Scheme (RAS), named HMH Under Voltage Remedial Action Scheme (HMH Undervoltage RAS), implemented to address the local 60 kV low voltage issues at HMH under the internal fault of HMH 2CB1 (loss of HMH 230 kV bus tie and 2L86 (HMH - KLY) at the same time) during high load conditions. This RAS will open the 60 kV transmission line 60L301 (HMH – AWL) to remove HMH load from the system.

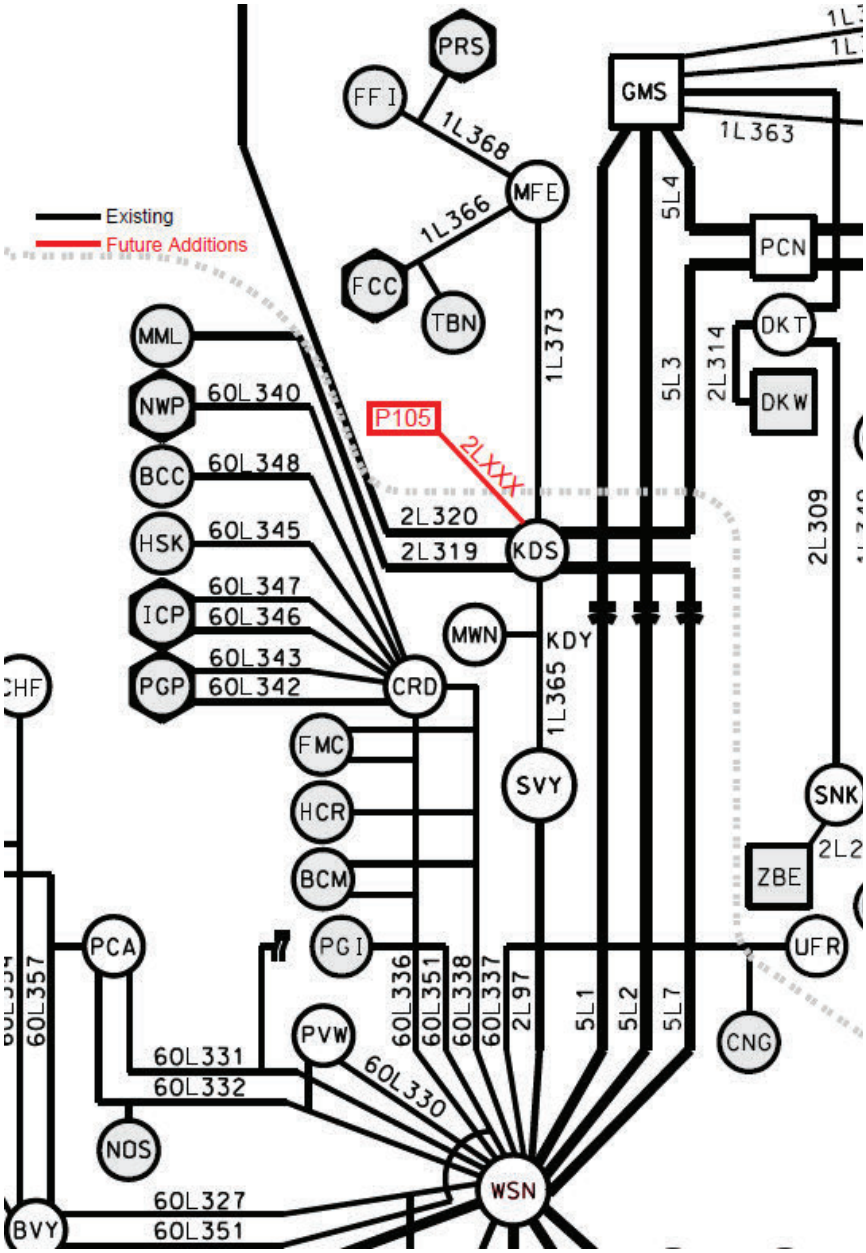

Figure 1-1: Central Interior 500/230/138 kV Transmission System Diagram with the Proposed Mackenzie Wind Interconnection

2 Purpose and Scopes of Study

This Feasibility Study is a preliminary evaluation of the system impact of interconnecting the proposed project to the BC Hydro system based on power flow and short circuit analysis in accordance with BCH's Open Access Transmission Tariff (OATT). A non-binding good faith estimated cost of required Network Upgrades and estimated time to construct will be provided.

Per OATT, the Feasibility Study is performed individually for each of the participating projects in the CEAP and focuses specifically on the BC Hydro regional transmission system where the proposed generating project is proposed to be constructed. An assessment of the incremental effect on the 500kV bulk transmission system is beyond this study scope.

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 would be addressed in subsequent System Impact Study if the project is a Successful Participant of the CEAP.

In case impact to the adjacent external systems to BC Hydro is observed, such impact would be addressed in subsequent detailed and coordinated studies with the relevant adjacent entities if the proposed interconnection proceeds further.

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, and 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.
- BC Hydro Operating Order 5T-10, Ratings for All Transmission Circuits 60 kV or Higher, April 16, 2024.
- BC Hydro Operating Order 5T-14, Ratings for All Transmission and Distribution Transformer, November 8, 2022.
- BC Hydro System Operating Order 7T-22 System Voltage Control, September 19, 2023.

4 Assumptions and Conditions

This Feasibility Study is performed based on the IC's submitted data and information available to BC Hydro on May 22, 2024 for the study purpose. Appendix A shows the plant single line diagram for the IC's project used in the study model. Certain assumptions were, as set out below, made to the extent required.

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

Additional assumptions are listed as follows.

1. The regional generation are 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.
2. Other higher queue projects are included.

5 System Studies and Results

Based upon the IC's submitted information and the area system conditions, the proposed POI is at the 230 kV bus of KDS substation, approx. 63 km from the IC's substation. A new 230 kV line position at KDS with associated substation equipment is required to interconnect the IC's generating project to the BCH system. The new line 2LXXX from KDS to IC's substation (P105) will become IC's Bulk Electric System (BES) line and the IC will be responsible for the compliance with applicable MRS requirements.

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 reinforcement requirement based on steady state performance analysis.

Steady-state power flow studies have been conducted with the focus on the 2029 light summer (29LS) system condition, taking into considerations of factors such as load conditions, seasonal variation in ambient temperatures, and generation patterns that stress the transmission system. The 2031 heavy winter (31HW), 2032 light summer (32LS), and 2032 heavy summer (32HS) cases are also checked at a high level to capture any performance violations under high load conditions.

5.1.1 Branch Loading Analysis

The study finds no transformer or line overload under system normal operating conditions for all load conditions studied (29LS, 31HW, 32LS, and 32HS).

Under system single contingencies, the following thermal overloads have been identified:

- The connection of Mackenzie Wind farm will exacerbate the pre-existing thermal overload on the BC Hydro 500 kV lines 5L1/5L2/5L7/5L11/5L12/5L13 (GMS-Kelly Lake-Williston) under single 500 kV contingencies or WSN 500 kV breaker internal fault (WSN 5CB5, 5CB15, 5CB7, 5CB17, 5CB14, 5CB13), with high generation outputs in the Peace River area and under non-firm transfer operations in both summer and winter conditions.

Mackenzie wind farm is required to participate in the existing generation shedding RAS to mitigate the potential thermal overload issue. The overload detection mechanism and exact omitigation actions will be determined in discussion with BCH at the next study stage.

The loading on key transmission elements is summarized below.

Table 5-1: Summary of Branch Loading Study Results

Case	IC's Plant Output	Contingency Identified		Branch Loading	
				5L12	5L13
		Cat.	Description	WSN-KLY	WSN-KLY
Summer Rating (Amp)				1950	1950
29LS	MAX	P0	System Normal	76.4 %	77.9 %
	MAX	P2	WSN 5CB13	117.4 %	119.8 %
32LS	MAX	P0	System Normal	76.9 %	78.5 %
	MAX	P2	WSN 5CB13	120.2 %	122.7 %
32HS	MAX	P0	System Normal	72.8 %	74.3 %
	MAX	P2	WSN 5CB13	111.5 %	113.8 %
Winter Rating (Amp)				1950	1950
31HW	MAX	P0	System Normal	65.9 %	67.2 %
	MAX	P2	WSN 5CB13	100.4 %	102.5 %

5.1.2 Steady-State Voltage Analysis

With the existing HMH RAS, the voltage performance under system normal condition (P0), P1, and P2 single contingencies (TPL-001-4 Table 1) is acceptable.

Mackenzie Wind project does not contribute to the low voltage performance concern identified under heavy load conditions.

5.1.3 Reactive Power Capability Evaluation

The BCH TIR requires IBR generators have the dynamic reactive power capability at a minimum of +/- 33% of its Maximum Power Output (MPO) at the high voltage side of the IC's switchyard over the full MW operating range.

Based on the PSS/E power flow data submitted for this project, the study finds that the proposed generating project can meet the BC Hydro's reactive capability requirement, which needs to be re-confirmed if the IC's project proceeds further.

Furthermore, the BCH TIR requires the IC's project to provide sufficient reactive power capability over full MW operating range including at zero MW output level. According to the IC-provided reactive capability curve, the proposed wind farm does not meet the BC Hydro's reactive capability requirement at the plant's zero MW output.

5.1.4 Anti-Islanding Requirements

If the KDS 500/230 kV transformer is forced out of service, the Mackenzie Wind Project could be inadvertently islanded with BC Hydro loads, which is not allowed. An Anti-islanding transfer trip scheme is required to isolate Mackenzie Wind project at IC's substation for various contingencies to avoid potential islanding operation with BC Hydro loads.

In addition, the project is required to install anti-islanding protection within their facility to disconnect the Mackenzie Wind project from the grid when an inadvertent island with the local loads forms as a back up of the anti-islanding transfer trip protection.

5.2 Fault Analysis

The short circuit analysis in the FeS is based upon the latest BC Hydro 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 system impact study stage if needed.

5.3 Stations Requirements

The Point of Interconnection requested by the customer is at the 230 kV bus of existing BC Hydro's KDS substation in Central Interior region via an approx. 63 km customer built new 230 kV transmission line.

To interconnect this customer as per the transmission planning recommendation is not feasible using the rigid bus/flexible bus at Kennedy substation since the 230 kV switchyard was not planned to accommodate new transmission lines.

An option to expand the 230 kV switchyard outside the station by using 230 kV underground cables has been investigated. This configuration is considered

feasible at this stage but an in depth-analysis is required due to the extend of complexity related to the construction staging and customer outages.

Following is the scope of station work at Kennedy substation:

- Expand the substation on both East and West sides of the station.
- Add one 230kV line position with the associated substation equipment. Refer to the attached one-line diagram for details.
- Expand the existing control building, if required, to accommodate the new P&C panels and other equipment.
- Terminate the Mackenzie Wind customer line.
- Other associated station work.

Following assumptions are made related to Station scope of work.

- The relocation of 138kV bus showing the future breakers and line terminals is feasible towards the South of the station with no issues for other customers.
- The relocation of the transmission line 1L365 required to connect the transformer T5 is feasible.
- The relocation of the 138/25kV transformers and the distribution switchyard including all the 25kV equipment is feasible.
- Property is available to be purchased on the East and West sides of the station.
- The 230kV cable laying is feasible within the 230kV and 138kV station switchyards taking into the account the very large bending radius of the 230kV cable.

5.4 Protection & Control Requirements

For successful integration of Machenzie Wind Project, BC Hydro will provide line protections for 2LXXX at BC Hydro's Kennedy Substation. As part of the line protection addition, telecommunication facilities will be required between KDS and Mackenzie Wind (P105).

The IC is to provide the following for the interconnection of Mackenzie Wind:

- Entrance protection that complies with the latest version of the “60 kV to 500 kV BC Hydro Technical Interconnection Requirements for Power Generators.”
- Provide two SEL-411L-1 relays (firmware and options specified by BC Hydro) relays at the entrance of Mackenzie Wind (P105) to provide protection coverage for 2LXXX. BC Hydro P&C Planning will provide core settings for these relays to protect transmission line 2LXXX during a transmission line fault. Non-core protection such as local breaker failure, auto-reclosing, backup protection for station elements will not be provided by BC Hydro P&C Planning.
- The IC is responsible for NERC PRC-related tasks, settings to compliance standards within their facilities.
- The IC is responsible for providing a communications link for remote interrogation of the line protection relays and PPIS equipment by BCH servers.
- Provide anti-islanding protection as per Regional System Planning requirements.

5.5 Telecommunications Requirements

BC Hydro performed a high-level feasibility assessment of a telecom solution to meet the following requirements.

Teleprotection Requirements for Telecom

- WECC Level 3 PY & SY, KDS – P105, with C37.94 interfaces

Telecontrol Requirements for Telecom

- Provide P105 SCADA circuits to FVO and SIO.

Other Requirements for Telecom

- None identified.

Certain assumptions were made for determining a potential telecom solution. Details of the telecom solution (e.g. assumptions made, alternatives investigated and work required for BCH and the IC) would be provided at the next study stage.

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 Mackenzie Wind Project and its facilities to the BCH Transmission System at the POI, this Feasibility Study has identified the following conclusions and requirements:

1. A 230 kV line position is required at KDS substation.

2. The connection of Mackenzie Wind Project does not cause any performance violation (i.e. thermal overload, voltage performance violation or voltage stability concern) under system normal conditions.

3. The connection of Mackenzie Wind Project will exacerbate the existing thermal overloads on 500 kV lines under single system contingencies , non-firm transfer conditions, and during the summer and winter load operations.

   IC is required to participate in the existing generation shedding RAS to mitigate the potential thermal overloads.

4. If the KDS 500/230 kV transformer is forced out of service, the Mackenzie Wind Project could be inadvertently islanded with BC Hydro loads, which is not allowed. An Anti-islanding transfer trip scheme is required to trip IC's generation at their site substation (P105) under various system contingencies. In addition, the IC is required to install anti-islanding protection within their facility to disconnect the IC’s wind farm from the grid when an inadvertent island with the local loads forms.

5. A new IC owned interconnectiopn line 2LXXX will be IC’s Bulk Electric System (BES) line and the IC will be responsible for the compliance with applicable NERC MRS requirements

6. According to BC Hydro’s TIR, the IC’s project must have sufficient reactive power capability over full MW operating range including at the zero MW output level. The Mackenzie Wind Project as submitted does not meet the reactive capability requirement at near zero MW output level.

7. BC Hydro will provide line protections for 2LXXX at BC Hydro’s Kennedy Substation (KDS) (BC Hydro end only). As part of the line protection, telecommunication facilities will be required between KDS and Mackenzie Wind (P105) to accommodate the new protection schemes. The IC shall provide required relays, telecom facility and associated equipment at its facilities to accommodate the new protection schemes.

Appendix A
Plant Single Line Diagram Used for Power Flow Study

Figure A-1 shows MackenzieWind Project single line diagram used for power flow study.

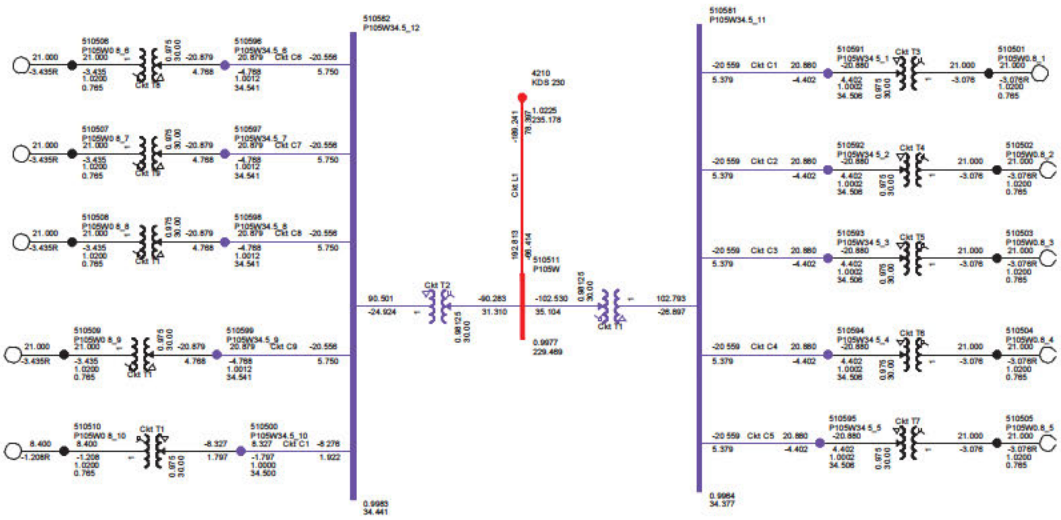

Figure A-1: Mackenzie Wind Project Single Line Diagram for Power Flow Study.

As seen in the diagram, Mackenzie Wind Project has two main power transformers dividing the plant into two parts.

- Part 1 has five (5) feeders
- Part 2 has five (5) feeders

Appendix B
One-Line Sketch at Kennedy Substation

Figure B-1 shows the Stations Planning One-Line Sketch at KDS 230 kV substation.

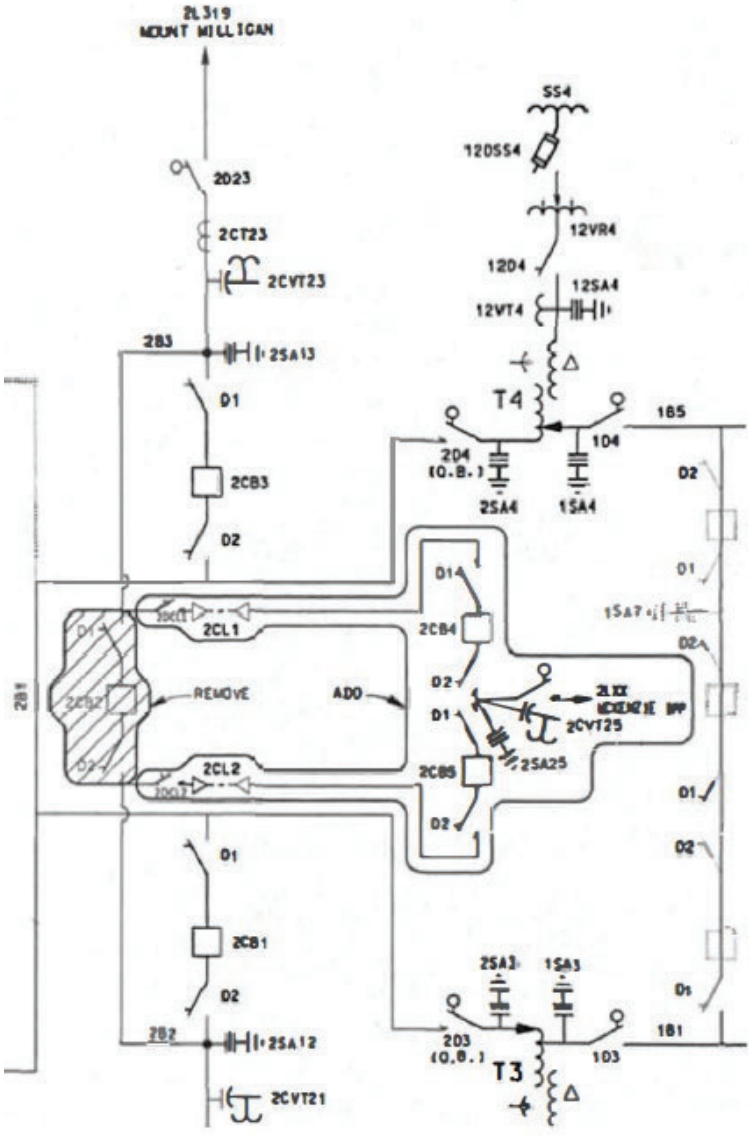

Figure B-1: KDS 230 kV Substation Planning One-Line Sketch