BC Hydro
Power smart

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

November 24, 2025

[redacted]

via email: [redacted]

RE: CEAP IR #39 – [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 $289.1 M.

Major Scope of Work Identified:

- Add one 230 kV line position with associated equipment at BC Hydro's Kelly Lake substation (KLY)
- Replace both existing 500/230 kV, 300 MVA transformers (T1 & T4) with 500/230 kV 600 MVA transformers

- Add station equipment, including four new 230 kV circuit breakers and associated disconnects, and one 230 kV line terminal for the [redacted] project's transmission line
- Replace all existing disconnects associated with the existing and future 230 kV circuit breakers and replace 230 kV motorized disconnects associated with the transformers
- Upgrade the required substation facilities, infrastructures, and bus work to support new station equipment.
- Reconnect 2L90 and 2L93 transmission lines terminals
- Supply and install required Protection, Control and Telecommunications equipment

Exclusions:

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

Key Assumptions:

- Construction by contractor
- 24 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
- A certificate of public convenience and necessity (CPCN) requirement will be exempt
- 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
- If a CPCN is required for the project, it may impact project cost and schedule risks

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 3 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,

[redacted]

[redacted]

Manager, Customer Interconnections

BC Hydro

Encl.: CEAP_2025_IR39_[redacted]_Feasibility_Study.pdf

[redacted]

Interconnection Feasibility Study

BC Hydro EGBC Permit to Practice No: 1002449

2025 CEAP IR #39

Prepared for: [redacted]

Prepared by: [redacted] [redacted]

Specialist Engineer, Interconnection Planning

Reviewed by: [redacted]

Manager, Interconnection Planning

Accepted by: [redacted]

Manager, Transmission Planning

Report Metadata

Header:	2025 CEAP IR #39
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Confidentiality:	Public
Date:	2025 Nov 21
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Prepared for:	[redacted]
Prepared by:	[redacted]
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Checked by:	[redacted]
Title:	Sr. Engineer, Interconnection Planning
Reviewed by:	[redacted]
Title:	Manager, Interconnection Planning
Related Facilities:	Kelly Lake substation (KLY)
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Revisions

Revision	Date	Description
0	2025 Nov	Initial release

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Section: Entire report except listed below

Discipline: Transmission Planning

Contributed by:

[redacted] [redacted]

Specialist Engineer, Interconnection Planning

Section: **5.2, 5.3**

Discipline: Stations Planning

Contributed by:

[redacted] [redacted]

Engineer, Station Planning

Executive Summary

[redacted], the interconnection customer (IC), requests to interconnect its [redacted] (2025 CEAP IR #39) to the BC Hydro (BCH) system. [redacted] has one hundred eighty-nine (189) [redacted] inverters with total installed capacity of 706.9 MW. The IC's proposed Point of Interconnection (POI) is on the 230 kV bus of BC Hydro's Kelly Lake substation (KLY). The IC's project will connect to the POI via a new customer built 13.5 km long 230 kV transmission line. The proposed commercial operation date (COD) is September 30, 2031.

To interconnect the [redacted] 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 KLY substation to facilitate the interconnection of the [redacted].
2. The study finds a thermal overload violation under system normal operating conditions on the existing power transformers T1 and T4 at Kelly Lake (KLY) substation, which is caused by the connection of the [redacted].
3. The study does not find voltage performance violation or voltage stability concern, caused by the connection of the [redacted].
4. The existing transformers T1 and T4 at Kelly Lake will need to be replaced with new sets rated at 600 MVA each.
5. Under certain single contingencies, the interconnection of the [redacted] contributes to thermal overloads on KLY T1/T4, 1L204 (SVA–DUG), and 1L206 (SVA-WKA), especially in summer season. To address these overload concerns, the [redacted] will need to participate in a generation shedding or runback Remedial Action Scheme (RAS) to secure the system. The RAS function scope will be specified in the System Impact Study (SIS) if the need for RAS is determined.
6. [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 fault ride-through performance.

7. Upon the IC's submitted information, the [redacted] is capable of meeting the required dynamic reactive power capability over the full MW operating range per BC Hydro's TIR, which is subjected to further verification in the next 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 cost estimate 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

Appendices

Acronyms

The following are acronyms used in this report.

BCH	BC Hydro
BR	Bridge River
CEAP	Competitive Electricity Acquisition Process
COD	Commercial Operation Date
DTT	Direct Transfer Trip
ERIS	Energy Resource Interconnection Service
FeS	Feasibility Study
IBR	Inverter-Based Resources
IC	Interconnection Customer
IR	Interconnection Request
KLY	Kelly Lake Substation
LAPS	Local Area Protection Schemes
LM	Lower Mainland
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
TIR	BC Hydro "60 KV to 500 kV Technical Interconnection Requirements for Power Generators"
WECC	Western Electricity Coordinating Council

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)	KLY 230 kV	
IC's Proposed COD	September 30, 2031	
Type of Interconnection Service	NRIS ☒	ERIS ☐
Maximum Power Injection (MW)	679 MW (Summer)	679 MW (Winter)
Number of Inverters	189 x 3.74 MW	
Plant Fuel	Solar	

[redacted], the interconnection customer (IC), requests to interconnect its [redacted] (2025 CEAP IR #39) to the BC Hydro (BCH) system. [redacted] has one hundred eighty-nine (189) [redacted] inverters with total installed capacity of 706.9 MW. The IC's proposed Point of Interconnection (POI) is on the 230 kV bus of BCH's Kelly Lake substation (KLY). The IC's project will connect to the POI via a new customer built 13.5 km 230 kV transmission line. The proposed commercial operation date (COD) is September 30, 2031.

Figure 1-1 shows the Kelly Lake area transmission system diagram. KLY is a major substation in this area with two existing 500/230 kV transformers (KLY T1 & KLY T4) rated at 300 MVA each. KLY supplies local area loads through two 230 kV transmission lines 2L86 and 2L94. KLY is also connected to Bridge River system via 2L90 and South Interior west via 2L92 and 2L93. Generation in Northern Interior is transmitted via three 500 kV transmission lines 5L11, 5L12 and 5L13 to KLY and further from KLY to BC provincial loads center in Lower Mainland and Vancouver Island via 5L41 and 5L42.

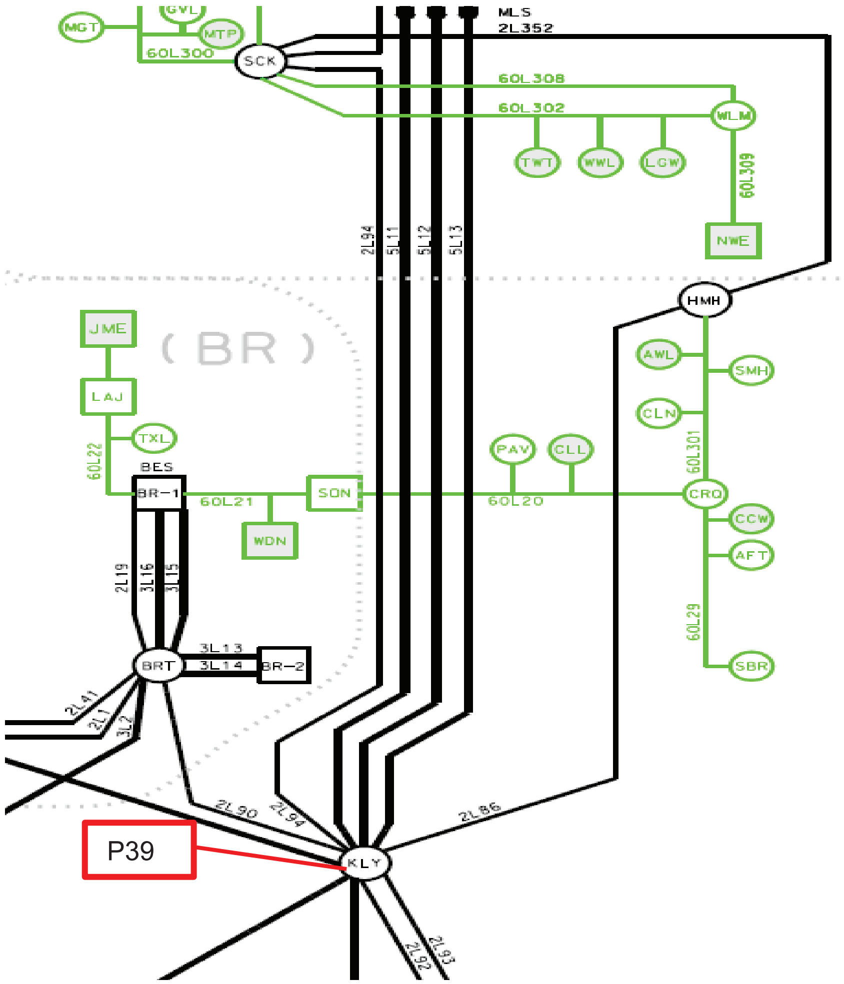

Figure 1-1: Kelly Lake Area Transmission System Diagram

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 generating project proceeds further.

Please note that, due to the compressed study timeline for CEAP 2025 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.

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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, 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 the BCH 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 study planning horizon are also incorporated. Additional assumptions are listed as follows.

1) Bridge River Transmission Reinforcement Project (BRTP)[1], which is to thermally uprate the existing line 2L90 between BRT and KLY, will be in-service in summer 2029.
2) In addition to the existing generators, the [redacted] projects in the study area ([redacted]) are included in the study cases.
3) 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.

[1] BC Hydro, Bridge River Transmission Reinforcement Project, see details in https://www.bchydro.com/energy-in-bc/projects/brt.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 – 31HW/32LS/32HS system conditions that include all the higher-queued generating projects ([redacted]) in the region. These base cases were prepared based on factors such as seasonal variation in load conditions, and generation patterns that stress the transmission system.

In addition to the base scenario, sensitivity scenarios are also checked to capture any performance violations under summer load conditions.

Various generation dispatch scenarios are considered in the base scenario studies, including:

- High Columbia generation and low Peace generation
- High Peace generation and a low Columbia generation

Sensitivity checks are performed for generation dispatch scenarios below:

- High Lower Mainland (LM) generation and High Bridge River generation
- High Columbia generation and High Bridge River generation

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 connection of [redacted] would cause new thermal overloads on the existing KLY T1/T4 under N-0 condition in summer season.

Thermal upgrades of the existing KLY T1 and T4 to 600 MVA each are required to accommodate the interconnection of the proposed project.

For critical single contingency (N-1) conditions, the study observed overloads on the KLY T1/T4, 1L206 and several pre-existing overloads on 138 kV circuits such as 1L203/1L205 (SVA–HLD) and 1L204 (SVA–DUG). While the [redacted] project does not exacerbate the overload on 1L203/1L205, it does contribute to increased loading on 1L204. To mitigate the overload concerns on KLY T1/T4, 1L204, and 1L206, the [redacted] Project will be required to participate in a generation shedding or runback Remedial Action Scheme (RAS), which will be determined during the System Impact Study (SIS) stage in future if needed.

5.1.2 Steady-State Voltage Analysis

With the connection of the IC's project, the stead-state voltage performance under system normal and single contingency conditions is acceptable for all 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] Project 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 solar inverter would provide +/-2.32 Mvar reactive capability at the zero MW output if the inverter's "reactive power at night" 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

[redacted] Project 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.

5.2 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 system impact study stage if needed.

5.3 Stations Requirements

Kelly Lake substation (KLY) will be upgraded to provide a 230 kV line termination to allow connection to the [redacted] facility.

Scope of substation work at KLY is as follows:

- Replace both existing 500/230 kV, 300 MVA transformers (T1 & T4) with 500/230 kV 600 MVA transformers.
- Add the following station equipment. Appendix C shows the Stations Planning's one-line sketch for KLY upgrades.
  - Four new 230 kV circuit breakers and associated disconnects
  - One 230 kV line terminal for the [redacted] 2LXXX transmission line
- Replace all the existing disconnects associated with the existing and future 230 kV circuit breakers and replace 230 kV motorized disconnects associated with the transformers.
- Upgrade the required substation facilities, infrastructures, and bus work to support new station equipment.
- Reconnect 2L90 and 2L93 transmission lines terminals.

Refer to one-line sketches Appendix C for further details.

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] Project 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 KLY substation to facilitate the interconnection of the [redacted] Project.
2. The study finds a thermal overload violation under system normal operating conditions on the existing power transformers T1 and T4 at KLY, which is caused by the connection of the [redacted] Project.
3. The study does not find voltage performance violation or voltage stability concern, caused by the connection of the [redacted] Project.
4. The existing transformers T1 and T4 at KLY will need to be replaced with new sets rated at 600 MVA each.
5. Under certain single contingencies, the interconnection of the [redacted] Project contributes to thermal overloads on KLY T1/T4, 1L204 (SVA–DUG), and 1L206 (SVA-WKA), especially in summer season. To address these overload concerns, the [redacted] Project will need to participate in a generation shedding or runback Remedial Action Scheme (RAS) to secure the system. The RAS function scope will be specified in the SIS if the need for RAS is determined.
6. [redacted] Project 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.
7. Upon the IC's submitted information, the [redacted] Project is capable of meeting the required dynamic reactive power capability over the full MW operating range per BCH's TIR, which is subjected to further verification in the next stage of the interconnection process.

Appendix A
Schematic Diagram of the IC’s Project

Figure A-1 shows the schematic diagram for the [redacted] Project.

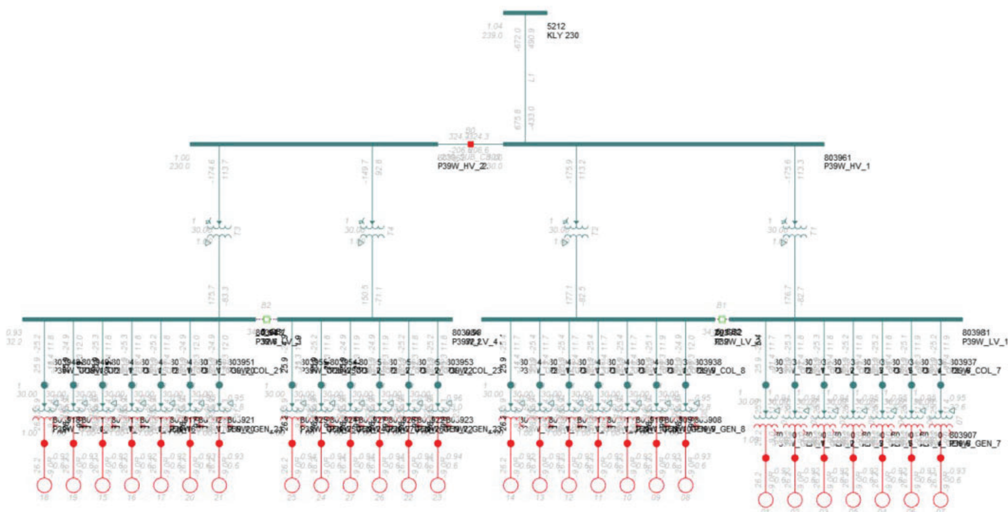

Figure A-1: [redacted] Project Plant Schematic Diagram.

Appendix B
Power Flow Study Results

Base Scenario (31HW/32HS/32LS)

Table B-1: Thermal Overload Study Results - High Columbia generation and low Peace generation Scenario

Case	IC's Plant Output (MW)	Contingency		Branch Loading (% of its seasonal normal rating)					
		Category	Description	KLY T1	KLY T4	1L203	1L204	1L205	1L206
						SVA-HLD	SVA-DUG	SVA-HLD	SVA-WKA
Winter Rating				356 MVA	356 MVA	191 MVA	143 MVA	150 MVA	191 MVA
31HW	MAX	P0	System Normal	80	76	77	54	68	40
		P1.3	KLY T1	N/A	126	74	61	63	45
		P1.3	KLY T4	128	N/A	74	60	63	44
		P1.2	5L87	105	99	90	26	82	24
		P2.3	KLY 5CB12 BF (tripping KLY T4, 5L42 and KLY 2RX2)	122	N/A	76	56	67	42
		P2.3	KLY 2CB2 BF (tripping KLY T1, 2L92 and SVA T3)	N/A	124	72	64	61	47
Summer Rating				300 MVA	300 MVA	173 MVA	143 MVA	119 MVA	169 MVA
32HS	MAX	P0	System Normal	88	83	88	50	88	40
		P1.3	KLY T1	N/A	138	84	56	83	44
		P1.3	KLY T4	141	N/A	84	56	83	44
		P1.2	5L87	117	111	102 (Pre-existing 110)	22	107 (Pre-existing 119)	21
		P2.3	KLY 5CB12 BF (tripping KLY T4, 5L42 and KLY 2RX2)	121	N/A	84	57	83	45
		P1.2	2L90	111	106	86	54	85	42
		P2.3	KLY 2CB2 BF (tripping KLY T1, 2L92 and SVA T3)	N/A	134	81	61	79	48
32LS	MAX	P0	System Normal	104	99	80	50	78	31
		P1.3	KLY T1	N/A	165	76	58	72	37
		P1.3	KLY T4	168	N/A	76	57	72	36
		P1.2	5L87	118	112	87	36	87	22
		P2.3	KLY 5CB12 BF (tripping KLY T4, 5L42 and KLY 2RX2)	152	N/A	76	58	73	37
		P1.2	2L90	121	115	79	52	76	33
		P2.3	KLY 2CB2 BF (tripping KLY T1, 2L92 and SVA T3)	N/A	162	73	62	69	40
		P1.2	3L2	110	104	80	51	77	32

Table B-2: Thermal Overload Study Results - High Peace generation Scenario

Case	IC's Plant Output (MW)	Contingency		Branch Loading (% of its seasonal normal rating)			
		Category	Description	KLY T1	KLY T4	1L204 SVA-DUG	1L206 SVA-WKA
Winter Rating				356 MVA	356 MVA	143 MVA	191 MVA
31HW	MAX	P0	System Normal	63	59	91	63
		P1.3	KLY T1	N/A	97	96	66
		P1.3	KLY T4	99	N/A	96	66
		P1.2	5L87	48	45	104 (Pre-existing 73)	71
		P1.2	1L206	66	63	136 (Pre-existing 105)	N/A
		P1.2	1L220	65	62	124 (Pre-existing 93)	16
		P1.2	2L265	60	57	111 (Pre-existing 96)	76
Summer Rating				300 MVA	300 MVA	143 MVA	169 MVA
32HS	MAX	P0	System Normal	83	79	99	74
		P1.3	KLY T1	N/A	131	106 (Pre-existing 79)	78
		P1.3	KLY T4	134	N/A	106 (Pre-existing 79)	78
		P1.2	5L87	52	49	124 (Pre-existing 96)	91
		P2.3	KLY 5CB12 BF (tripping KLY T4, 5L42 and KLY 2RX2)	97	N/A	111(Pre-existing 85)	82
		P2.3	KLY 2CB2 BF (tripping KLY T1, 2L92 and SVA T3)	N/A	142	99	74
		P1.2	1L204	88	83	N/A	115(Pre-existing 94)
		P1.2	1L206	88	83	147(Pre-existing 120)	N/A
		P1.2	1L220	87	82	134(Pre-existing 107)	20
		P1.2	1L243	87	83	112 (Pre-existing 87)	83
		P1.2	2L265	82	77	115(Pre-existing 101)	85
		P1.2	5L41/5L42	64	61	107(Pre-existing 86)	79
		P1.2	1L241	84	80	109(Pre-existing 81)	61
32LS	MAX	P0	System Normal	82	78	85	55
		P1.3	KLY T1	N/A	130	91	60
		P1.3	KLY T4	132	N/A	91	59
		P1.2	5L87	49	46	111(Pre-existing 89)	74
		P2.3	KLY 5CB12 BF (tripping KLY T4, 5L42 and KLY 2RX2)	96	N/A	96	63
		P1.2	2L90	110	104	90	59
		P2.3	KLY 2CB2 BF (tripping KLY T1, 2L92 and SVA T3)	N/A	135	87	57
		P1.2	1L206	86	81	120(Pre-existing 98)	N/A
		P1.2	1L220	85	81	114(Pre-existing 92)	9
		P1.2	1L243	89	84	103(Pre-existing 81)	68
		P1.2	1L241	84	80	105(Pre-existing 84)	23

Table B-3: Steady-State Voltage Study Results - High Columbia generation and low Peace generation Scenario

Case	IC's Plant Output (MW)	Contingency		Bus Voltage (PU)			
		Category	Description	KLY 500 kV	KLY 230 kV	SVA 230 kV	HMH 230 kV
31HW	MAX	P0	System Normal	1.07	1.05	1.05	1.04
		P1.2	Loss of [redacted]	1.07	1.07	1.05	1.06
		P1.3	KLY T1	1.06	1.04	1.05	1.04
		P1.2	2L90	1.07	1.05	1.05	1.04
		P1.2	2L93	1.07	1.05	1.04	1.04
		P1.2	5L87	1.06	1.04	1.03	1.03
		P2.3	KLY 5CB12 BF	1.07	1.06	1.05	1.04
32HS	MAX	P0	System Normal	1.07	1.05	1.04	1.05
		P1.2	Loss of [redacted]	1.07	1.07	1.05	1.06
		P1.3	KLY T1	1.07	1.04	1.03	1.04
		P1.2	2L90	1.07	1.05	1.04	1.05
		P1.2	2L93	1.07	1.05	1.03	1.05
		P1.2	5L87	1.06	1.04	1.02	1.04
		P2.3	KLY 5CB12 BF	1.08	1.06	1.04	1.05
32LS	MAX	P0	System Normal	1.06	1.05	1.04	1.05
		P1.2	Loss of [redacted]	1.07	1.07	1.05	1.07
		P1.3	KLY T1	1.07	1.03	1.03	1.04
		P1.2	2L90	1.06	1.05	1.04	1.05
		P1.2	2L93	1.06	1.05	1.03	1.05
		P1.2	5L87	1.05	1.04	1.03	1.05
		P2.3	KLY 5CB12 BF	1.07	1.05	1.04	1.05

Table B-4: Steady-State Voltage Study Results - High Peace generation Scenario

Case	IC's Plant Output (MW)	Contingency		Bus Voltage (PU)			
		Category	Description	KLY 500 kV	KLY 230 kV	SVA 230 kV	HMH 230 kV
31HW	MAX	P0	System Normal	1.07	1.06	1.05	1.05
		P1.2	Loss of [redacted]	1.07	1.07	1.06	1.06
		P1.3	KLY T1	1.07	1.04	1.04	1.03
		P1.2	2L90	1.06	1.05	1.05	1.05
		P1.2	2L93	1.07	1.05	1.04	1.05
		P1.2	5L87	1.05	1.05	1.04	1.04
		P2.3	KLY 5CB12 BF	1.06	1.05	1.05	1.04
32HS	MAX	P0	System Normal	1.06	1.05	1.05	1.05
		P1.2	Loss of [redacted]	1.07	1.07	1.06	1.07
		P1.3	KLY T1	1.06	1.04	1.04	1.04
		P1.2	2L90	1.06	1.05	1.04	1.05
		P1.2	2L93	1.06	1.05	1.04	1.05
		P1.2	5L87	1.03	1.03	1.03	1.04
		P2.3	KLY 5CB12 BF	1.05	1.05	1.04	1.05
32LS	MAX	P0	System Normal	1.06	1.05	1.05	1.06

		P1.2	Loss of [redacted]	1.08	1.08	1.07	1.08
		P1.3	KLY T1	1.06	1.05	1.05	1.06
		P1.2	2L90	1.06	1.05	1.04	1.05
		P1.2	2L93	1.06	1.05	1.04	1.06
		P1.2	5L87	1.03	1.03	1.03	1.04
		P2.3	KLY 5CB12 BF	1.05	1.05	1.05	1.06

<u>Additional Thermal Overload checks (32HS/32LS)</u>

Table B-5: Thermal Overload Study Results- High LM generation and high BR generation Scenario

Case	IC's Plant Output (MW)	Contingency		Branch Loading (% of its seasonal normal rating)	
		Category	Description	KLY T1	KLY T4
Summer Rating				300 MVA	300 MVA
32HS	MAX	P0	System Normal	111	105
		P1.3	KLY T1	N/A	176
		P1.3	KLY T4	180	N/A
		P1.2	3L2	125	118
		P2.3	SVA 2CB5 BF (tripping SVA T1&T3, 2L92 and 2L93)	133	126
		P2.3	KLY 5CB12 BF (tripping KLY T4, 5L42 and KLY 2RX2)	157	N/A
		P2.3	KLY 2CB2 BF (tripping KLY T1, 2L92 and SVA T3)	N/A	182
		P1.2	2L92/2L93	118	112
		P1.2	2L1	117	111
		P1.2	1L204	116	110
		P1.2	1L206/2L94	115	109
		P1.2	2L86/1L220/2L41/2L352	113	108
32LS	MAX	P0	System Normal	129	122
		P1.3	KLY T1	N/A	206
		P1.3	KLY T4	210	N/A
		P1.2	3L2	140	132
		P2.3	SVA 2CB5 BF (tripping SVA T1&T3, 2L92 and 2L93)	151	143
		P2.3	KLY 5CB12 BF (tripping KLY T4, 5L42 and KLY 2RX2)	199	N/A
		P2.3	KLY 2CB2 BF (tripping KLY T1, 2L92 and SVA T3)	N/A	214
		P1.2	2L92/2L93	136	129
		P1.2	2L1/2L94	133	126
		P1.2	1L204/2L86/2L352	132	125
		P1.2	1L206/1L220	131	124

Table B-6: Thermal Overload Study Results- High Columbia generation and high BR generation Scenario

Case	IC's Plant Output (MW)	Contingency		Branch Loading (% of its seasonal normal rating)	
		Category	Description	KLY T1	KLY T4
Summer Rating				300 MVA	300 MVA
32HS	MAX	P0	System Normal	109	104
		P1.3	KLY T1	N/A	165
		P1.3	KLY T4	176	N/A
		P1.2	5L87	142	135
		P1.2	3L2	126	119
		P2.3	KLY 5CB12 BF (tripping KLY T4, 5L42 and KLY 2RX2)	160	N/A
		P2.3	KLY 2CB2 BF (tripping KLY T1, 2L92 and SVA T3)	N/A	170
		P1.2	2L41	117	111
		P1.2	2L94	116	109
		P1.2	2L1/2L86/1L204/2L352	114	108
		P1.2	1L206/2L90	112	106
		P1.2	1L220/1L243	111	105
32LS	MAX	P0	System Normal	123	117
		P1.3	KLY T1	N/A	196
		P1.3	KLY T4	200	N/A
		P1.2	5L87	136	129
		P1.2	3L2	139	132
		P2.3	KLY 5CB12 BF (tripping KLY T4, 5L42 and KLY 2RX2)	184	N/A
		P2.3	KLY 2CB2 BF (tripping KLY T1, 2L92 and SVA T3)	N/A	194
		P1.2	2L41	132	125
		P1.2	2L1	129	122
		P1.2	1L243/1L204/2L94	128	121
		P1.2	2L86/2L352/1L206/1L220	126	120

Appendix C
One-Line Sketch for KLY Station Upgrade

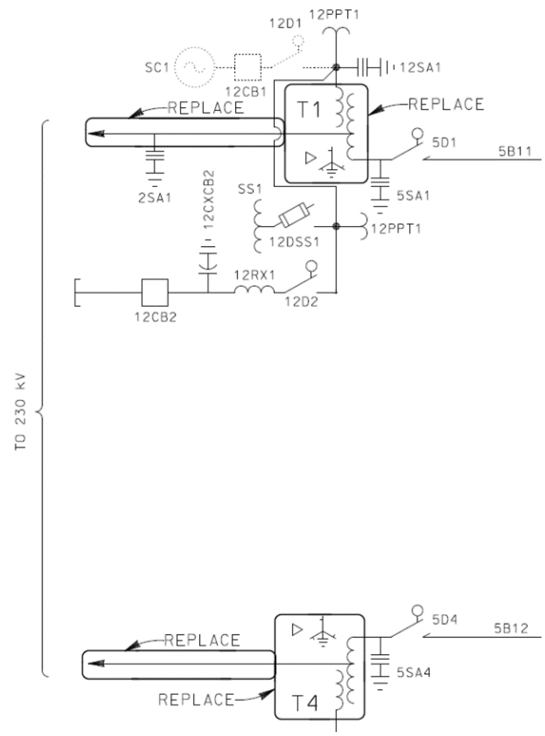

Figure C-1: Stations Planning One-Line Sketch for Kelly Lake Substation 500 kV Upgrade

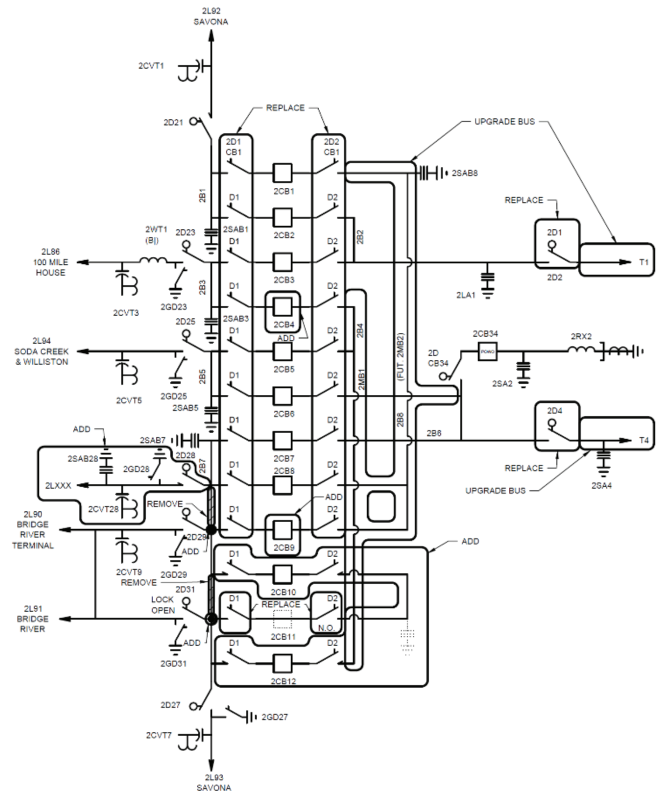

Figure C-2: Stations Planning One-Line Sketch for Kelly Lake Substation 230 kV Upgrade