Chris Sandve
Chief Regulatory Officer
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December 15, 2023

Patrick Wruck
Commission Secretary and Manager
Regulatory Services
British Columbia Utilities Commission
Suite 410, 900 Howe Street
Vancouver, BC V6Z 2N3

Dear Patrick Wruck:

RE: Project No. 1599301
British Columbia Utilities Commission (BCUC or Commission)
British Columbia Hydro and Power Authority (BC Hydro)
Peace to Kelly Lake Stations Sustainment Project (Project)
Compliance with BCUC Order Nos. G-57-23 and G-84-23
Semi-Annual Progress Report No.1 (May – October 2023)

BC Hydro writes in compliance with BCUC Order Nos. G-57-23 and G-84-23, to provide the Public Semi-Annual Report No.1 for the Project.

Confidential Version of Report

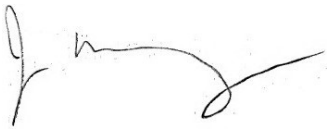
Commercially sensitive and contractor-specific information has been redacted from the public version of the Report. A confidential version of the Report is being filed with the BCUC only, under separate cover.

BC Hydro seeks this confidential treatment pursuant to section 42 of the *Administrative Tribunals Act* and Part 4 of the Commission's Rules of Practice and Procedure.

BC Hydro requests that the confidential version of the Report remains confidential for a two-year period after the Project Completion and Evaluation Report (PCER) for this Project is submitted to the BCUC, to maintain confidentiality over commercially sensitive information.

For further information, please contact Joe Maloney at 604-623-4348 or by email at bchydroregulatorygroup@bchydro.com.

Yours sincerely,



(for) Chris Sandve
Chief Regulatory Officer

dj/kl

Enclosure

BC Hydro
Power smart

BC Hydro Peace to Kelly Lake Stations Sustainment Project

Semi-Annual Progress Report No. 1

F2024 Six Month Period

May 2023 to October 2023

PUBLIC

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1 Background

The objective of the Peace to Kelly Lake Stations Sustainment Project (**Project**) is to address the aging and unreliable assets on the Peace to Kelly Lake portion of BC Hydro's 500 kV transmission system by replacing aging shunt reactors at Peace Canyon Generating Station (**PCN**) and Williston Substation (**WSN**), series capacitor control systems at Kennedy Capacitor Station (**KDY**) and McLeese Capacitor Station (**MLS**), and the 500 kV control buildings at KDY and WSN. These assets are old, in poor health, no longer meet operational requirements, and impact the reliability and operational flexibility of the transmission system.

The Project scope is summarized in section 4.2.2 of the Peace to Kelly Lake Stations Sustainment Project Section 44(2) Application (**Application**).

In Appendix A to Decision and Order No. G-57-23 and Order No. G-84-23, the BCUC directed BC Hydro to file semi-annual progress reports as follows:

- Actual costs incurred to date compared to the Project cost breakdown table estimate provided in Table 4-3 of the Cost Estimate and Schedule Update dated August 15, 2022 (**August 2022 Update**), highlighting variances with an explanation of significant variances;
- Updated forecast of costs, highlighting the reasons for significant changes in Project costs anticipated to be incurred; and
- The status of Project risks provided in Chapter 6 of the Application, highlighting the status of identified risks, changes in and additions to risks, the options available to address the risks, the actions that BC Hydro is taking to deal with the risks and the likely impact on the Project's schedule and cost.

The BCUC issued Decision and Order No. G-57-23 and Order No. G-84-23 accepting the capital expenditure schedule for the Project.

BC Hydro files Progress Report No. 1 (**Report**) for the period ending October 31, 2023 (**Reporting Period**). During the Reporting Period, there were no material changes pursuant to Order No. G-57-23.

2 Project Status

Table 1 provides a high-level status update for the Project.

Table 1 Project Status Dashboard[1]

G Green: No Concerns; A Amber: Some Concerns but in Control; R Red: Serious Concerns

Status as of:		October 31, 2023
Project	R	The Project rating of Red is based on the Cost rating as explained below.
Scope	G	No material scope risk has been identified.
Schedule	G	The forecast in-service date remains October 2028.
Cost	R	There is no change in the Authorized Cost of the Project, and it remains at $354.0 million. As of the end of the reporting period, the Expected Cost was forecast to increase by $26.2 million to $312.5 million. A Special Reserve draw of $26.2 million was requested in December 2023 as a number of contracts that were put to market have come in priced much higher than estimated. BC Hydro's Board of Directors approved the Special Reserve draw request on December 7, 2023, and this performance indicator will be set to Green following the December monthly project progression activities. Approximately 35% of the supply and install costs have been committed.

3 Project Schedule

As of the end of this Reporting Period, the forecast Project in-service date remains as October 2028.

Table 2 below provides the forecast dates for the Project major milestones as of October 31, 2023, and a comparison to the Project Major Milestones provided in Table 4-5 of the August 2022 Update.

[1] The presented key performance indicators are indicators of scope, schedule, and cost at the end of the reporting period that reflect performance against BC Hydro-approved scope, schedule, and cost.

Table 2 Project Major Milestones as of October 31, 2023

Row No.	Description of Major Milestone	Estimated Date in August 2022 Update	Actual Current Forecast	Status and Comments
1	BCUC section 44(2) Application Submitted by BC Hydro	Jan 2022	Jan 2022	Complete
3	Definition Phase Completion	Jan 2023	Mar 2023	Complete
4	Initial Construction Start	Apr 2023	Apr 2023	Complete
5	KDY New Control Building Ready for Protection and Control Panels	Oct 2023	Feb 2024	Delayed
6	WSN New Control Building Ready for Protection and Control Panels	Sept 2024	Sept 2024	On Track
7	MLS Replacement Assets In-Service Date	Oct 2027	Oct 2027	On Track
8	PCN Replacement Assets In-Service Date	July 2028	July 2028	On Track
9	WSN Replacement Assets In-Service Date	Apr 2027	Apr 2027	On Track
10	KDY Replacement Assets In-Service Date	Oct 2028	Oct 2028	On Track
11	Project In-Service Date	Oct 2028	Oct 2028	On Track
12	KDY Old Control Building Demolition and Removal	Aug 2028	Aug 2028	On Track
13	WSN Control Building Cutovers Completion (starts January 2025)	Feb 2031	Feb 2031	On Track
14	WSN Old Control Building Demolition and Removal	Dec 2031	Dec 2031	On Track

3.1 Schedule Variance Explanation

This section provides the reasons for variances of six months or greater between Table 4-5 of the August 2022 Update, and the Actual/Current Forecast as of October 31, 2023. In the Reporting Period, there were no schedule variances of six months or greater.

4 Project Costs

At the time of the August 2022 Update, the Project had an updated Authorized Cost of $354.0 million with an expected in-service date of October 2028. On December 8, 2022, BC Hydro's Board of Directors approved Implementation

Funding for the Project subject to the BCUC's acceptance of the capital expenditure schedule. There was no variance between the Authorized Cost filed in the August 2022 Update and the amount approved by the Board.

Table 3 provides the actual costs incurred to the end of the Reporting Period. The table also provides the Project's forecast Expected Cost and Authorized Cost as of October 31, 2023, and a comparison to the Project Cost Range Breakdown provided in Table 4-3 of the August 2022 Update.

As of the end of the Reporting Period, the actual costs incurred total $40.9 million. The forecast Expected Cost as of the end of the Reporting Period is $312.5 million, an increase of $26.2 million from the August 2022 Update's forecast of $286.3 million.

For the purpose of this Progress Report, BC Hydro has considered significant changes to be changes greater than one percent ($3.5 million) of the Authorized Cost. Variances greater than $3.5 million between the Project Cost Range Breakdown provided in Table 4-3 of the August 2022 Update (Table 3, column A) and the Project's forecast as of October 31, 2023 (Table 3, column B) are explained in section 4.1.

Table 3 Project Cost Summary Table as of October 31, 2023[2]

		A	B	C	D	E	F	G
Row No.	Description	August 2022 Update ($M)	Current Forecast at Oct 31, 2023 ($M)	Variance to August 2022 Update ($M) B-A	Variance to August 2022 Update (%) C/A	Actuals to Oct 31, 2023 ($M)	% of Current Forecast (%) E/B	% of August 2022 Update (%) E/A
	Pre-Implementation Phase Costs							
	(Excludes Interest During Construction and Capital Overhead)							
1	Feasibility	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
2	Definition	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
3	Partial Implementation	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
4	**Total Pre-Implementation Phase Costs**	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
	Implementation Phase Costs							
	Direct Construction Costs							
5	Williston Substation	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
6	Peace Canyon Generating Station	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
7	Kennedy Capacitor Station	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
8	McLeese Capacitor Station	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
9	Telecommunications Work	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
10	Dismantling	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
11	**Total Direct Construction Costs**	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]

[2] Due to the use of rounded numbers, certain columns and rows may not calculate precisely to the numbers provided.

Row No.	Description	A August 2022 Update ($M)	B Current Forecast at Oct 31, 2023 ($M)	C Variance to August 2022 Update ($M) B-A	D Variance to August 2022 Update (%) C/A	E Actuals to Oct 31, 2023 ($M)	F % of Current Forecast (%) E/B	G % of August 2022 Update (%) E/A
	Indirect Construction Costs							
12	Indirect Construction Costs	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
13	**Total Indirect Construction Costs**	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
14	**Total Implementation Phase Costs**	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
	(Before Contingency & Loadings)							
15	Contingency	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
16	Interest During Construction (**IDC**)	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
17	Capital Overhead	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
18	Escalation	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
19	**BC Hydro Expected Cost**	**286.3**	**312.5**	**26.2**	**9%**	**40.9**	**13%**	**14%**
20	Project Reserve[3]	67.6	41.4	-26.2	-39%	0	0%	0%
21	**BC Hydro Authorized Cost**	**354.0**	**354.0**	**0.0**	**0%**	**40.9**	**12%**	**12%**

1

[3] Project Reserve includes a Special Reserve of $26.2 million for price escalation risk.

4.1 Project Cost Forecast Variance Explanation

Table 4 below provides the reasons for the significant variances (defined as 1% of the Authorized Cost of a project) of $3.5 million or greater between the costs submitted in the August 2022 Update, and the forecast costs as of the end of the Reporting Period.

As noted in section 4.6.2 of the Application, critical design and procurement activities at KDY and WSN were advanced to early Implementation phase. Although funding for these activities was approved in the Definition phase (as noted as Partial Implementation costs in row 3 of Table 3 above), these funds are for Implementation phase activities. As a result, the Partial Implementation costs have been reallocated to the appropriate rows in the Implementation phase costs of Table 3 above.

Table 4 Project Cost Forecast Variance Explanation as of October 31, 2023

Row in Table 4	Explanation	Total Variance ($ million)
3	• **Not a cost variance.** Partial Implementation costs have been reallocated to Implementation Phase Direct and Indirect Costs.	[redacted]
5	• **Not a cost variance.** A portion of Partial Implementation costs, escalation, and telecommunication work costs have been reallocated to WSN work.	[redacted]
6	• A portion of escalation and telecommunication work costs have been reallocated to PCN work. The contract amount for the reactors was [redacted] higher than estimated in the August 2022 Update.	[redacted]
7	• A portion of Partial Implementation costs, escalation, and telecommunication work costs have been reallocated to KDY work. Bids for the KDY capacitor controls systems have come in [redacted] higher than estimated in the August 2022 Update. A portion of the Special Reserve will be allocated to KDY to address the contract cost increase.	[redacted]
8	• A portion of escalation and telecommunication work costs have been reallocated to MLS work. Bids for the MLS capacitor controls systems have come in [redacted] higher than estimated in the August 2022 Update. A portion of the Special Reserve will be allocated to MLS to address the contract cost increase.	[redacted]

Row in Table 4	Explanation	Total Variance ($ million)
9	• **Not a cost variance.** The telecommunication work costs originally included the telecom work for all sites. The telecommunication work costs for PCN, WSN, KDY, and MLS have now been reallocated to these specific sites. A portion has also been allocated to indirect costs. The remaining telecommunication work costs are for the remaining sites.	[redacted]
12	• **Not a cost variance.** A portion of Partial Implementation costs, escalation, and telecommunication work costs have been reallocated to Indirect costs.	[redacted]
18	• Escalation has been reallocated to Direct and Indirect Costs.	[redacted]
20	• A Special Reserve draw was requested, and approval was granted by the BC Hydro Board on December 7, 2023. A portion of the Special Reserve will be allocated to KDY and MLS work. Approximately 35% of the supply and install costs have been committed.	[redacted]

4.2 Actual Costs Incurred: Update on Project Activities

(i) Contract Management: All of the awarded contracts are progressing well with minimal contract changes. Regular progress meetings are being held with the vendors for each contract. The contracts still to be awarded are on track.

(ii) Construction Management: At WSN, construction started in April 2023 with the site expansion for the new control building and the new shunt reactor (5RX30). Work at WSN is continuing and on track. At KDY, construction also started in April 2023 with the installation of the control building foundation. Work is also ongoing and on track at this station.

(iii) Procurement & Quality Assurance: BC Hydro had awarded the following major works:

- Supply and delivery of shunt reactors for WSN and PCN;
- Supply and installation of pre-engineered control building envelope and installation of control building civil and electrical works at KDY to the First Nation's designated business partner;
- Design, supply, and installation of the control building at WSN; and

- External service provider for engineering design work at KDY, MLS, PCN, and other sites.

(iv) Engineering and Design: During the Reporting Period, detailed design progressed and construction drawings for the early civil and electrical works at WSN and KDY were issued.

(v) Environment and Heritage: There are no reportable environmental incidents and no archaeological finds or issues for the Project to date.

(vi) First Nations: Project updates have been shared with all Nations impacted by the Project during the Reporting Period. BC Hydro has also met with Nations impacted by WSN and KDY. Lheidli T'enneh First Nation, Horse Lake First Nation, Saulteau First Nations, West Moberly First Nations, and McLeod Lake Indian Band have raised no concerns or questions. Blueberry River First Nations, Halfway River First Nation, and Doig River First Nation have asked questions seeking to understand BC Hydro's contaminated soil stockpile protocols. BC Hydro is currently working with each of these Nations to address their questions and concerns on this topic. BC Hydro will continue to engage with First Nations on current and upcoming potential procurement opportunities.

(vii) Public Stakeholder Engagement: No new concerns were raised by public stakeholders during the Reporting Period. In April 2023, notifications were sent to the WSN neighbours advising them that construction has started. In June 2023, a sign was placed at WSN describing the scope of work at the substation and providing a contact number if people had questions or concerns.

5 Project Risks

This section describes the material Project risks that have the potential to impact the Project.[4] Over the life of the Project, risks and associated risk treatments are and will

[4] BC Hydro defines "material" in this case to be any risk with a pre-treatment risk level in the Executive Risk zone, as identified in the Project Delivery Risk Matrix, which was provided in Appendix O of the Application.

be identified, analyzed, monitored, and reviewed, in accordance with BC Hydro's project management practices and procedures.

Table 5 Summary of Material Project Risks and Treatments

From Application dated January 25, 2022						Updated for Reporting Period ending October 31, 2023		
1	2	3	4	5	6	7	8	9
Section in Application	**Risk Status**	**Description of Risk Event and Consequence**	**Consequence Type**	**Risk Level**	**Residual Risk Level**	**Risk Status**	**Risk Treatments (Identified in the Application or New)**	**Residual Risk Level**
6.3.1	Active	Due to the age and poor condition of the series capacitor control systems at KDY and MLS there is a risk that this equipment could fail before it is replaced under the Project. As a result, the repair or replacement would have to be done on an emergency basis, disrupting the Project schedule, and resulting in additional costs.	Reliability	10.5 **Probability:** Fairly Likely (L6.5) **Severity:** Localized load shedding (S4)	10 **Probability:** Possible (L6) **Severity:** Localized load shedding (S4)	Active	Completed – Advancing the design and procurement activities related to the new control building at KDY. Completed – Advancing the design and procurement activities related to the replacement of the series capacitor control systems at KDY and MLS. Completed – Planning the sequence of the series capacitor control system replacements, starting with the assets in the poorest condition first. New and Ongoing – KDY 5CX3 control system failed in July 2022 and replacement is being prioritized. Contract award is expected in December 2023.	10 **Probability:** Possible (L6) **Severity:** Localized load shedding (S4)
6.4.1	Identified	Due to the age of WSN and the potential for asset and site drawings not accurately reflecting the actual conditions, there is a risk that as-found conditions are worse or different than expected, including the incidence of hazardous materials. This may result in: (1) delays in Project construction; (2) increased cost to remedy the current condition (contractor to mitigate); (3) increased cost if delay is on critical path; and (4) redesign.	Financial Loss	10.5 **Probability:** Fairly Likely (L6.5) **Severity:** $10 M to $100 M (S4)	9 **Probability:** Possible (L6) **Severity:** $1M to $10M (S3)	Active	Completed – Complete ground penetrating radar and geotechnical studies in Definition Phase. Completed – Complete concrete sampling of the shunt reactor site foundations in Definition Phase to confirm usability. Completed – Include cost and schedule contingency for addressing differences in as found conditions in the Project schedule and cost estimate. Ongoing – Have the resident engineer onsite during construction to identify and resolve issues related to as found conditions.	
6.4.2	Identified	Due to working around energized equipment and cables in the switchyard and around energized panels within a congested building/station, there is a risk of worker injury which may result in work stoppage.	Worker Safety	10 **Probability:** Remote (L5) **Severity:** Fatality (S5)	9 **Probability:** Very Unlikely (L4) **Severity:** Fatality (S5)	Identified	Ongoing – Ensure contractors and BC Hydro Construction Services understand the risks and have robust safe work procedures in place for this work. Ongoing – Work only in designated areas. Ongoing – Have proper work coordination. Ongoing – Provide proper training and work methods. Ongoing – Perform regular site safety inspections. Ongoing – Use BC Hydro Construction Services (qualified electrical workers) for work within WSN. Ongoing – Use less invasive site excavation, such as hand digging or use of hydrovac, for underground circuits and foundation work at KDY and WSN to mitigate the risk of contacting energized underground equipment where required.	9 **Probability:** Very Unlikely (L4) **Severity:** Fatality (S5)

From Application dated January 25, 2022						Updated for Reporting Period ending October 31, 2023		
1	2	3	4	5	6	7	8	9
Section in Application	**Risk Status**	**Description of Risk Event and Consequence**	**Consequence Type**	**Risk Level**	**Residual Risk Level**	**Risk Status**	**Risk Treatments (Identified in the Application or New)**	**Residual Risk Level**
6.4.3	Identified	Due to system operation restrictions, there is a risk that the required outages during construction could be shortened or not available which could cause schedule delays of up to a year due to limited schedule windows.	Financial Loss	10 **Probability:** Possible (L6) **Severity:** $10 M to $100 M (S4)	8 **Probability:** Remote (L5) **Severity:** $1M to $10M (S3)	Active	Completed – Develop detailed Outage Staging Plan. Completed – Include schedule continency for outages. Ongoing – Co-ordinate outages with BC Hydro's Transmission Distribution System Operations. New and Ongoing – Update Outage Staging Plan throughout Project construction.	8 **Probability:** Remote (L5) **Severity:** $1 M to $10 M (S3)
6.4.4	Identified	Due to potential undetected quality issues during manufacturing and testing, there is a risk that equipment does not meet performance requirements and/or specifications during commissioning period, which would result in schedule delays and cost implications, to address equipment deficiencies.	Financial Loss	10 **Probability:** Possible (L6) **Severity:** $10 M to $100 M (S4)	9 **Probability:** Remote (L5) **Severity:** $10M to $100M (S4)	Identified	Ongoing – Perform inspections and quality surveillance at key stages throughout manufacturing following the Project Quality Plan. Planned – Observe/monitor factory testing. Planned – Engage equipment supplier representative(s) to oversee key activities such as installation and commissioning.	9 **Probability:** Remote (L5) **Severity:** $10 M to $100 M (S4)
6.4.5	Identified	Due to multiple projects occurring at WSN, there is a risk that work will be poorly coordinated which may result in change in outage availability, workplace shutdown, schedule delays, and safety incidents.	Financial Loss	10 **Probability:** Possible (L6) **Severity:** $10 M to $100 M (S4)	8 **Probability:** Remote (L5) **Severity:** $1 M to $10 M (S3)	Identified	Ongoing – Facilitate quarterly coordination meetings for the Projects occurring at WSN. Ongoing – Designate BC Hydro as the Prime Contractor at WSN and perform site safety coordination.	8 **Probability:** Remote (L5) **Severity:** $1 M to $10 M (S3)
6.4.6	Identified	Due to severe weather events and changing market conditions[5], there is a risk of disruptions in the global supply chain which may result in delays in the manufacturing and delivery of long-lead equipment. This would delay the start of work, which may result in re-scheduling or re-sequencing of work, or delay the Project in-service date, and could also impact Project cost.	Financial Loss	10 **Probability:** Likely (L7) **Severity:** $1 M to $10 M (S3)	9 **Probability:** Possible (L6) **Severity:** $1 M to $10 M (S3)	Active	Completed – Add schedule float and contract contingency to the Project schedule. New and Completed – Request Special Reserve draw. Ongoing – Identify alternative suppliers. Ongoing – Monitor equipment lead times and order equipment earlier if possible. Ongoing – Use blanket contracts where available.	9 **Probability:** Possible (L6) **Severity:** $1 M to $10 M (S3)

[5] Changing market conditions is an additional driver for this risk.