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August 7, 2024

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. 1599319  
British Columbia Utilities Commission (BCUC or Commission)  
British Columbia Hydro and Power Authority (BC Hydro)  
Energy Management System Upgrade Project Application (EMS Project)  
Progress Report No. 2 - July 2023 to June 2024 (Report)**

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BC Hydro writes in compliance with BCUC Order G-27-24A to provide the Progress Report No. 2 for the EMS Project covering the period July 2023 to June 2024.

BC Hydro is providing the confidential Report to the BCUC only. The public version of the Report has been redacted to exclude commercially sensitive and contractor-specific information and is also available at [www.bchydro.com](http://www.bchydro.com). 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 final report for this Project is submitted to the BCUC, to maintain confidentiality over commercially sensitive information.

For further information, please contact Alicia Henderson at [bchydroregulatorygroup@bchydro.com](mailto:bchydroregulatorygroup@bchydro.com).

Yours sincerely,



Chris Sandve  
Chief Regulatory Officer

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Enclosure

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# **BC Hydro Energy Management System Upgrade Project**

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**Progress Report No. 2**

**July 2023 to June 2024**

**PUBLIC**

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## Table of Contents

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1	Background .....	1
2	Project Status .....	2
3	Project Schedule .....	3
4	Project Cost.....	4
5	Project Risks .....	5
5.1	Project Technology Risk .....	5
5.2	Project Delivery Risk.....	6
5.3	Readiness Risk .....	7

## List of Tables

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Table 1	Project Status Summary .....	2
Table 2	Project Schedule Update.....	3
Table 3	Project Expenditure Summary .....	4
Table 4	Project Technology Risks and Risk Mitigation.....	5
Table 5	Project Delivery Risks and Risk Mitigation .....	6
Table 6	Project Readiness Risks and Risk.....	8

## 1 Background

On March 11, 2022, BC Hydro filed an application under section 44.2 of *the Utilities Commission Act* seeking BCUC's acceptance of an expenditure schedule for upgrading the Energy Management System (**EMS**) from software version 3.0 to version 3.3 (**EMS Upgrade Project** or **Project**) on the basis that the current EMS is at end-of-life, that both the software and hardware of the EMS need to be upgraded, and that vendor support is a critical component of the EMS.

On February 28, 2023, the BCUC issued Order No. G-39-23 accepting the EMS Upgrade Project's capital expenditure estimated cost range of \$24.5 million to \$32.8 million. BC Hydro was directed to file semi-annual progress reports on the EMS Upgrade Project, with a start date of January 2023. The first semi-annual progress report was filed with the BCUC on August 14, 2023.

On March 17, 2023, BC Hydro filed an application with the BCUC seeking to amend the 2018 Major Capital Project Filing Guidelines. In September 2023, BC Hydro requested an amendment to its approvals sought to modify the BCUC directives to project reporting requirements for the EMS Upgrade Project to move from semi-annual to annual progress reports. This was approved on January 31, 2024.

BCUC Order No. G-27-24 (**Order**), specifically Directive 4, states:

The project reporting directives for the Energy Management System Upgrade in Appendix A to the Decision accompanying Order G-39-23 are superseded by Appendix C attached to this Order.






The second Progress Report is being filed, as directed, within 45 days of the end of the annual reporting period and covering the period ending June 30, 2024, and includes annual progress reporting details as set out in Appendix C of the Order. This report (**Report**) covers the period from July 1, 2023, to June 30, 2024 (**Reporting Period**).

## 2 Project Status

[Table 1](#) below provides a summary of the Project status as at the end of the Reporting Period.

**Table 1 Project Status Summary**

 *Green: No Concerns;*
 *Amber: Some Concerns but in Control;*
 *Red: Serious Concerns*

		Status as of: June 30, 2024
Overall Assessment		The EMS System was placed In-Service on May 18, 2024, meeting the committed In-Service date. The project team, including GE staff continue to support the system during the project warranty period which will continue through September 2024. There has been no material scope or schedule variance, and the project is forecasted to remain within budget.
Scope		There have been no material changes to Project scope.
Schedule		The EMS Upgrade Project is now In-Service and has met the committed In-Service Date of July 2024. The next major milestone is Project Completion, scheduled for December 2024.
Cost		The Project's forecast cost at completion is within the approved budget.
Risk		The Project is now In-Service. The Project risk profile has significantly improved, and several risks have been closed.

### 3 Project Schedule

[Table 2](#) below provides an update of key Project dates. The Project has a planned completion of December 2024.

**Table 2 Project Schedule Update**

Activity	Estimated at Implementation Start (Presented in Table 10 of the Application)		Current Estimated Dates (as of June 30, 2024)		Status & Comments
	Start Date	End Date	Start Date	End Date	
Updating the BC Hydro specific customizations	Oct-21	Nov-22	Oct-21	Nov-22	Activity is complete.
BC Hydro specific customizations functionality and integration testing	Nov-22	Mar-23	Nov-22	Apr-23	Activity is complete.
Pre-Factory Acceptance Testing	Apr-23	May-23	Apr-23	Jun-23	Activity is complete.
Factory Acceptance Testing	Jun-23	Jul-23	Jul-23	Dec-23	Activity is complete.
Site Acceptance Testing	Jul-23	Oct-23	Jan-24	Apr-24	Activity is complete.
Parallel Operations	Nov-23	Feb-24	Apr-24	May-24	Activity is complete.
In-Service Date		Apr-24		May-24	Activity is complete.
Stabilization	Mar-24	May-24	June-24	Sept-24	The duration for stabilization has not changed.
Project Closure	May-24	Aug-24	Aug-24	Oct-24	The duration for closure has not changed.
Project Completion Date		Oct-24 <sup>[1]</sup>		Dec-24	Planned completion date is December 2024.
		Jan-25			The Project is expected to meet the Committed Project Completion.

## 4 Project Cost

[Table 3](#) below summarizes the current financial status and shows that as of June 30, 2024, the Project cost is forecast to remain within the authorized budget. Currently, there is no forecast use of capital contingency or reserve. There was no access to the Special Reserve funding during this Reporting Period.

**Table 3 Project Expenditure Summary**

Ref	Cost Component
A	Pre-implementation Costs
B	Definition Phase Direct Costs
C	Definition Interests During Construction
D	Total Costs at end of Definition
E	Direct Implementation Costs
F	Server hardware
G	Server related software
H	Server dismantling costs
I	General Electric and Other Vendors
J	BC Hydro Resource costs
K	Total Direct Implementation Costs
M	Total Project Direct Cost Estimate
N	Contingency (M*15%)
O	Total Expected Cost plus Contingency (M+N)
P	Implementation Interest During Construction
Q	Total Interest During Construction (C+P)
R	Expected Cost Estimate (O+Q)
S	Project Reserve
T	Special Reserve
U	Total Project Reserve
V	Incremental Interest During Construction on Project Reserve
W	Total Authorized Budget (R+U)

**Notes:**

1. Minor differences attributable to rounding.
2. Direct costs are inclusive of inflation. Contracts with third parties are inclusive of inflation. Internal labour cost estimates are built using BC Hydro's standard labour rates, which are also inclusive of inflation.
3. As BC Hydro resources charge their time directly to Information and Operational Technology projects, capitalized overheads are not allocated to BC Hydro's Information Technology projects.
4. Implementation quote for server hardware (F) and software was based off quotes in USD; however, final purchasing costs were equivalent to the original quote, but in CAD.
5. As previously reported, planned additional testing has increased GE scope and pricing. Decision to increase onsite support during system go-live and subsequent week increased GE costs.
6. No use of project contingency or reserve is currently anticipated.







Risk Event/Threats	Mitigation Plans	Mitigation Status	Current Likelihood and Impact	Risk Level
Impacts on Project delivery due to the COVID-19 pandemic.  Update: <i>The risk related to the COVID-19 pandemic has been closed.</i>	<ul style="list-style-type: none"> <li>Added three-month contingency schedule to the Implementation phase to account for potential COVID-19 pandemic impacts; and</li> <li>Added Special Reserve funding to deal with any additional delays that may be encountered due to COVID-19 impacts.</li> </ul>	Complete  Complete	N/A	N/A
Supply chain delays for hardware may impact delivery schedule.  Update: <i>Risk materialized during the project. All planned procurement complete. System is In-Service. Risk has been closed.</i>	<ul style="list-style-type: none"> <li>Hardware orders have been placed at the start of the Implementation phase to provide longest possible lead time before the equipment is required.</li> </ul>	Complete	N/A	N/A
Poor product quality may result in a higher number of defects than anticipated and cause schedule delays.  Update: <i>System is In-Service. Risk has been closed.</i>	<ul style="list-style-type: none"> <li>GE delivery team includes several resources who have experience working on BC Hydro's EMS version 3.0 upgrade Project; and</li> <li>Special Reserve was added for additional rounds of testing due to high priority defect fixes.</li> </ul>	Complete  Complete	N/A	N/A

### 5.3 Readiness Risk

This risk assessment considers the material risks related to organizational readiness that have the potential to impact BC Hydro's ability to successfully undertake the Project.

[Table 6](#) below provides updates to Project Readiness Risks. The system is In-Service and Readiness Risks are now closed.

**Table 6 Project Readiness Risks and Risk**

Risk Event/Threats	Mitigation Plans	Mitigation Status	Current Likelihood and Impact	Risk Level
Resource constraints of key BC Hydro technical experts required for the deployment and configuration of the EMS.  Update: <i>System is In-Service. Risk is closed.</i>	<ul style="list-style-type: none"> <li>The EMS is supported by a group of specialist Real Time Systems engineers. Additional contract resources will be secured to augment this team of specialists during Project delivery to manage and reduce the risk of resource constraints.</li> </ul>	Complete	N/A	N/A