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May 15, 2020

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

Dear Mr. Wruck:

**RE: Project No. 3698674**  
**British Columbia Utilities Commission (BCUC or Commission)**  
**British Columbia Hydro and Power Authority (BC Hydro)**  
**John Hart Generating Station Replacement Project**  
**PUBLIC Semi-Annual Progress Report No. 13**  
**October 2019 to March 2020 (Report)**

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BC Hydro writes in compliance with Commission Order No. C-2-13, to provide its public Report. Commercially sensitive and contractor-specific information has been redacted pursuant to section 42 of the *Administrative Tribunals Act* and Part 4 of the Commission's Rules of Practice and Procedure.

A confidential version of the Report is being filed with the Commission only under separate cover.

For further information, please contact Chris Sandve at 604-974-4641 or by email at [bchydroregulatorygroup@bchydro.com](mailto:bchydroregulatorygroup@bchydro.com).

Yours sincerely,



(for) Fred James  
Chief Regulatory Officer

st/rh

Enclosure

Copy to: BCUC Project No. 3698674 (John Hart Generating Station Replacement Project) Registered Intervener Distribution List.

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# **John Hart Generating Station Replacement Project**

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## **Semi-Annual Progress Report No. 13**

**F2020 Six Month Period**

**October 2019 to March 2020**

**PUBLIC**

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## 1 Introduction

The John Hart Generating Station Replacement Project (**the Project**) was initiated to address the risks of: 1) the deteriorating condition and reliability of the existing generating equipment and facilities; 2) the failure of the powerhouse superstructure and wood stave penstocks in the event of a major earthquake; and 3) environmental impact of flow interruptions on the Campbell River. The Commission issued a Certificate of Public Convenience and Necessity (**CPCN**) for the Project in February 2013. In December 2013, the Board of Directors approved full Implementation phase funding. In February 2014, the Board of Directors approved the execution of the Project Agreement and associated commitments to construct the replacement John Hart facility (**the Facility**).

The Project was built under a Design-Build-Finance-Rehabilitate (**DBFR**) procurement model where the successful proponent, InPower BC General Partnership (**Project Co**), is responsible for design, construction and then asset management, which involves planning and managing the maintenance of the new assets, during the 15 years following construction. BC Hydro remains the operator of the assets during the period and BC Hydro Operations' staff will perform the maintenance work.

The Project Agreement between BC Hydro and Project Co is a fixed price contract. Project Co bills BC Hydro monthly for work progressed. The payments for the scope of work covered by the fixed price are called Progress Payments (**Progress Payments**). See section [2.3.1](#) for further details on Progress Payments made to date. The Progress Payments were subject to deductions during construction and commissioning for impacts to the Existing (original generating) Units' availability and for unavailability of new Generating Unit / Low Level Commercial Assets (**GU/LL Assets**). These deductions that arose from events that occurred during commissioning and construction are called Remittances (**Remittances**). Deductions

1 that have arisen (or will arise) from events during the Services Period are called  
2 Non-Availability Event Deductions (**NAED**). Decommissioning is also a fixed  
3 payment amount which is also subject to Remittances. In this case, the Remittances  
4 are for variances from baselines related to contaminated soil volumes removed. See  
5 section [4.3](#)<sup>1</sup> for all Remittance amounts on the Project.

6 Under the DBFR procurement model, Project Co is financing 40 per cent of their  
7 direct construction costs and all of their management costs during construction.  
8 These Project Co costs get paid back to Project Co via monthly Availability  
9 Payments (**Availability Payments**) over the 15 years following construction. There  
10 are two components to the Availability Payments; the first component is debt  
11 repayment of the costs financed by Project Co during construction and the second  
12 component is for asset management services that Project Co will provide for the first  
13 15 years.

14 The Availability Payments started in May 2018 when the first new **GU/LL Asset**  
15 came in-service and they will end in October 2033. This repayment period is called  
16 the Availability Term (**the Availability Term**).

17 There are two parts to the Availability Term. The Bridging Period (**the Bridging**  
18 **Period**) was the first part and the Services Period (**the Services Period**) is the  
19 second part.

20 The Bridging Period started at the beginning of the Availability Term, with the first  
21 GU/LL Asset coming in service as noted above and ended at Service  
22 Commencement (**Service Commencement**) in June 2019. Service Commencement  
23 is a contractually defined term which marked the transition point for the site from  
24 construction to the Services Period; after Service Commencement, BC Hydro  
25 Operations staff began performing the Project Co prescribed maintenance of the

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<sup>1</sup> Under the Project Agreement, Remittances can either be paid by Project Co to BC Hydro or they can be netted off of payments from BC Hydro to Project Co. To date, these amounts owing to BC Hydro have been netted off of BC Hydro payments to Project Co.

1 Facility. The Services Period ends at the end of the Availability Term in  
2 October 2033.

3 BC Hydro remains the owner and operator of the assets through all periods.

4 This extended procurement model; and the associated contractual requirements for  
5 four, eight, and twelve-year Condition Assessments and end-of-term handback  
6 provisions; were put in place to incent a focus on long term asset-quality in the  
7 design, installation and commissioning. In other words, they essentially provide an  
8 extended warrantee on the assets.

9 The Project Agreement includes a schedule of Maximum Availability Payments for  
10 each month of the Availability Term. During the Services Period portion of the  
11 Availability Term, these maximum payments are subject to deductions for asset  
12 unavailability, Non-Performance Events, or for variances from labour or Project Co  
13 insurance baselines in the Project Agreement. The key difference between  
14 availability deductions from events that occurred during the Bridging Period (called  
15 Remittances) and deductions from events occurring during the Services Period  
16 (called Non-Availability Event Deductions) is that Remittances are deducted off of  
17 Progress or Decommissioning Payments, but Non-Availability Event Deductions are  
18 deducted off of Availability Payments. See [Appendix E](#) for further details on asset  
19 availability during the Services Period and Availability Payments made to date.

20 Total Completion (**Total Completion**) is another contractually defined milestone  
21 related to construction. Total Completion marks completion of Asset Performance  
22 Verification Testing and of construction and decommissioning work (with acceptable  
23 deficiencies and a deficiency plan as agreed to between BC Hydro and Project Co).  
24 Total Completion is expected to be achieved in June 2020. BC Hydro and Project Co  
25 are working with the Independent Certifier to support their review of whether the  
26 requirements for Total Completion have been met.

1 Following close-out reporting, ongoing semi-annual reporting to the BCUC will  
2 continue on asset availability, Availability Payments, and Condition Assessment  
3 outcomes.

4 The first four-year Asset Condition Assessment is expected to be conducted in  
5 summer 2022.

## 6 **2 Project Status**

7 This Semi-Annual Progress Report No. 13 (**Report No. 13**) provides information  
8 concerning the Project from October 1, 2019 to March 31, 2020 (**the Reporting**  
9 **Period**). Report No. 13 follows the Project report methodology laid out in British  
10 Columbia Utilities Commission (**BCUC** or **Commission**) Order No. G-68-14 except  
11 for the Key Performance Indicator Methodology changes which are outlined in  
12 [Appendix G](#).

### 13 **2.1 General Project Status Since the Last Semi-Annual Progress** 14 **Report**

15 The assets have continued to perform well to date. See [Appendix E](#), Progression of  
16 Availability Payments, for further details on asset availability during the Services  
17 Period and Availability Payments made to date.

18 Deficiency work has continued to progress through the reporting period and  
19 decommissioning and site restoration work is substantially complete.

20 [Table 1](#) provides a Project Status dashboard for the Reporting Period.



**Table 1 Project Status Dashboard**

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

Status as of:		March 31, 2020
Overall Assessment <sup>2</sup>	●G	BC Hydro is now receiving beneficial use of the assets, all of the Project risk-drivers were met early, and the assets are all performing well to-date.
Schedule	●G	Due to the current COVID-19 situation, some deficiency close out planned for summer 2020 has been deferred. It will be rescheduled at a later date depending on Covid status, crew availability, and river flow levels. This will likely mean a deferral to summer 2021 with final documentation from Project Co to follow in fall 2021. BC Hydro's close out reporting to the BC Hydro Board, and then to the BCUC, will follow the final reports from Project Co. Schedule remains green because the remaining work does not impact the benefits being derived from the key assets being In-Service and does not present an increased risk to Generating Unit performance or availability.
Cost	●G	The total Project cost forecast is \$1,001 million, which is \$1 million less than forecast in the last Progress Report, and \$49 million less than the Board approved P50 Expected Amount of \$1,050 million. See section 4 for more details on Project Costs.
Environment <sup>2</sup>	●G	There were no significant environmental incidents in the Reporting Period.
Risks	●G	BC Hydro is managing some contract risks as outlined in section 2.2.2.1. Contingency for these risks has been retained within the current forecast Project cost.
Safety	●G	There were no Major or Moderate injuries, and no Worksafe BC inspections, during the reporting period. Project Co's safety record remains top-quartile in the industry. Refer to section 2.3.2.6.

The post-financial close, Board approved (P50 Expected Amount and the Authorized Amount) cost range for the Project is \$1,050 million to \$1,118 million. The Expected Amount is \$110 million more than the Design-Bid-Finance-Rehabilitate P50 amount of \$940 million but within the CPCN Design-Bid-Build range of \$1,014 million to \$1,159 million.

## 2.2 Major Accomplishments, Work Completed and Key Decisions

### 2.2.1 Government Agency Approvals

No further approvals are required on the Project.

<sup>2</sup> The key performance indicator guidance for environment has been updated and now aligns with BC Hydro's Incident Management System (IMS) rating system. The 'Overall Assessment' (or Project Health) indicator has also been updated to reflect the Environment key performance indicator guidance changes. See [Appendix G](#) for further details.

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**2.2.2 Construction**

**2.2.2.1 BC Hydro Contract Management**

*Submittals*

BC Hydro continues to process all submittals in accordance with the timeline requirements as laid out in the Project Agreement.

*Quality*

The Project team is closely monitoring Project Co's progress towards closing deficiencies.

*Issues and Risks*

In December 2019, the claim related to the [REDACTED] was settled for [REDACTED], which is included in the actuals to date. [REDACTED]

There are five remaining notices of potential claims from Project Co:

1. [REDACTED]
2. [REDACTED]
3. [REDACTED]
4. [REDACTED]

1 5.

2

3

4 There have not been any changes to items one through four since Progress Report  
5 No. 11.

6 **2.2.2.2 Project Co Management, Engineering, and Design**

7 Work on final documentation items; such as as-built drawings, operations and  
8 maintenance manuals, and commissioning reports; are now largely complete. The  
9 remainder will be finalised after completion of all deficiency work.

10 **2.2.2.3 Procurement and Manufacturing**

11 There are no ongoing procurement and manufacturing activities.

12 **2.2.2.4 Construction and Commissioning**

13 Items that were contingent on prior completion of certain decommissioning  
14 components, such as security systems near the decommissioned tailrace and old  
15 powerhouse, are now substantially complete. Some other deficiency work which  
16 required out of province contractors/engineers to attend site and to work in close  
17 quarters with our crews has been deferred due to Covid considerations. This work  
18 will be rescheduled at a future suitable time based on Covid restrictions, river flow  
19 levels, and crew availability. This will likely be in summer 2021. Deferred work is  
20 work that does not affect near-term asset health; examples of this are a final sudden  
21 short circuit test on one Generating Unit, some remedial work on a guide bearing  
22 and correcting clearance on the wicket gates. Any work that affects the operation,  
23 maintenance and health of the Generating Units (including work on a generator  
24 collector ring, addressing leakage on a guide bearing, and fixing operation of a  
25 circuit breaker) remains scheduled for completion this summer.

1    **2.2.2.5    Decommissioning & Restoration**

2    Decommissioning and restoration are substantially complete.

3    Final decommissioning work is still expected to be completed this summer's outage  
4    schedule. This includes removal of the old high voltage disconnects from the  
5    substation.

6    Restoration of land impacted by construction staging and restoration of the Canyon  
7    View Trail is complete and the new tailrace viewing area linked to the trail is nearly  
8    complete.

9    Two totem poles are being added to the tailrace viewing area to acknowledge the  
10    depth of First Nations spiritual, cultural, and physical presence in the area, and our  
11    commitment to a lasting relationship with the First Nations. A totem ceremony was  
12    planned but canceled due to Covid considerations.

13    **2.3            Key Project Agreement Developments, Challenges and Issues**

14    **2.3.1           Progress Payments under the Project Agreement**

15    Under the terms of the Project Agreement, there is a maximum amount that  
16    Project Co can invoice for Eligible Costs (**Eligible Costs**) each month. Eligible Costs  
17    are all direct construction costs properly and reasonably invoiced by the  
18    Design-Builder to Project Co for design and construction for the original scope of  
19    work. The total commitment to Project Co for Eligible Costs under the Project  
20    Agreement is fixed as noted in section [1](#).

21    BC Hydro has provided a table in [Appendix B](#) which shows the Maximum Eligible  
22    Costs amount that can be billed each month under the Project Agreement, the actual  
23    amounts approved to date, and the monthly and cumulative variances.

24    [Appendix C](#) shows the summary of the work breakdown for the work to be  
25    completed by Project Co, the total Eligible billing allowed for each category, and the

1 approved value (and corresponding percentage) of the work completed to date for  
2 each category.

3 As discussed in section [1](#), BC Hydro pays Project Co 60 percent of the progressed  
4 (billed) Eligible Amounts as Progress Payments. The remaining 40 per cent of the  
5 Eligible Amounts (along with the fixed amount for Project Co's Interest During  
6 Construction (**IDC**)), <sup>3</sup> and the fixed amount for Project Co Ineligible Costs (**Ineligible**  
7 **Costs**) <sup>4</sup> are booked as a liability (debt) on BC Hydro's balance sheet which is being  
8 repaid to Project Co through the Availability Term.

### 9 **2.3.2 Contract Management**

#### 10 **2.3.2.1 BC Hydro Initiated Changes and Impact to Cost and Schedule**

11 There have been no material BC Hydro initiated changes that have impacted overall  
12 cost or schedule to date.

#### 13 **2.3.2.2 Material Changes to the Project Agreement and Exercise of Project** 14 **Agreement Rights**

15 During the Reporting Period, BC Hydro agreed to a change to the Project  
16 Agreement which allowed BC Hydro to make partial payment for decommissioning  
17 work completed to date. This partial payment is reflected in the actuals-to-date in  
18 section [4](#) and in [Appendix D](#). The remainder of the decommissioning payment will be  
19 made when Total Completion is achieved as certified by the Independent Certifier.

#### 20 **2.3.2.3 Changes to Project Financing Arrangements**

21 There have been no changes to Project financing arrangements since Financial  
22 Close.

---

<sup>3</sup> As estimated at financial close of the Project Agreement for the portion of the costs being financed by Project Co.

<sup>4</sup> Project Co indirect or 'ineligible' costs include bidding fees, insurance during construction, and Project Co overhead costs during construction.

1    **2.3.2.4      *Project Reserve Draws***

2    There have been no Project reserve draws to date.

3    **2.3.2.5      *Material Environmental Incidents***

4    There were no material environmental incidents in the reporting period.

5    **2.3.2.6      *Material Safety Incidents***

6    Project Co's life-to-date All-Injury-Frequency statistic at the end of March 2020 was  
7    0.63 with 3.79 million Project Co hours worked to date. The calendar-year-to-date  
8    All-Injury-Frequency statistic is 0.00.

9    **2.4            Plans During the Next Six Months**

10   The plans for the next six months include:

- 11   •    Submittal of the Decommissioning Summary Report to the Comptroller of Water  
12        Rights Office;
- 13   •    Deficiency management;
- 14   •    Planning for and advancing Project close-out activities; and
- 15   •    Conducting Facility maintenance activities as prescribed by Project Co.

16   **2.5            Site Photographs**

17   Refer to [Appendix A](#) for photographs.

18   **3               Project Schedule**

19   **3.1            Project Agreement Target and Commercial Operation Dates**

20   The updated work schedule is shown in [Table 2](#) on the next page.

**Table 2 Project Co Work Schedule<sup>5</sup>**

John Hart Generating Station Replacement Project																													
Activity Name		Start	Finish	Previous Report's Finish	Variance - Previous Report	2018				2019				2020															
						J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D
John Hart Generating Station Replacement Project		03-Feb-14 A	15-Jun-20	22-Oct-19	-158																								
Original Contractual Milestones		02-May-18 A	15-Jun-20	22-Oct-19	-237																								
Contractual-Asset-1SD#1 - Power Tunnel with either Low Level Outlet or 1st Unit			02-May-18 A	02-May-18	0																								
Contractual-Asset-1SD#2 - 1st or 2nd Unit			21-Jul-18 A	21-Jul-18	0																								
Contractual-Asset-1SD#3 - Remaining Assets (2nd Unit, 3rd Unit & Bypass) & S			10-Oct-18 A	10-Oct-18	0																								
Total Completion Date			15-Jun-20*	22-Oct-19	-237																								
Project Milestones		02-May-18 A	09-Nov-18 A	09-Nov-18	0																								
1st ISD - Asset - Power Tunnel & Low Level Outlet			02-May-18 A	02-May-18	0																								
2nd ISD - Asset- 1st Unit			21-Jul-18 A	21-Jul-18	0																								
3rd ISD - Asset-Set - 2nd Unit			26-Oct-18 A	26-Oct-18	0																								
3rd ISD - Asset-Set - 3rd Unit			05-Nov-18 A	05-Nov-18	0																								
3rd ISD - Asset-Set - Bypass System			09-Nov-18 A	09-Nov-18	0																								
Engineering		03-Feb-14 A	14-May-19 A	14-May-19	0																								
Intake Design		15-Apr-14 A	21-Nov-17 A	21-Nov-17	0																								
Power Tunnel Design		25-Feb-14 A	06-Apr-18 A	06-Apr-18	0																								
Powerhouse Design		28-Feb-14 A	14-Jun-18 A	14-Jun-18	0																								
Bypass System Design		24-Mar-14 A	07-Apr-17 A	07-Apr-17	0																								
Tailrace System Design		03-Feb-14 A	30-May-18 A	30-May-18	0																								
Switchyard System Design		08-Mar-14 A	04-Jul-17 A	04-Jul-17	0																								
Existing Facilities Design		03-Jan-17 A	14-May-19 A	14-May-19	0																								
Procurement		08-Sep-14 A	23-Nov-17 A	23-Nov-17	0																								
Unit 1, 2 & 3 Supply		09-Mar-15 A	23-Nov-17 A	23-Nov-17	0																								
Unit 1, 2 & 3 Design		08-Sep-14 A	24-Aug-17 A	24-Aug-17	0																								
Construction and Commissioning		25-Aug-14 A	01-Nov-19 A	22-Oct-19	-9																								
Intake Construction & Commissioning		25-Aug-14 A	28-Apr-18 A	28-Apr-18	0																								
Power Tunnel Construction & Commissioning		29-Jul-15 A	29-Apr-18 A	29-Apr-18	0																								
Powerhouse Construction & Commissioning		08-Jan-15 A	01-Feb-19 A	01-Feb-19	0																								
Bypass System Construction & Commissioning		11-Sep-17 A	09-Nov-18 A	09-Nov-18	0																								
Tailrace Construction & Commissioning		23-Feb-15 A	12-Apr-18 A	12-Apr-18	0																								
Switchyard Construction & Commissioning		30-Jun-17 A	05-Nov-18 A	05-Nov-18	0																								
Decommissioning Construction & Commissioning		12-Dec-18 A	01-Nov-19 A	22-Oct-19	-9																								

<sup>5</sup> Variances from the previous quarter are workday variances.

## 4 Project Costs

### 4.1 Project Cost Summary

[Table 3](#) below provides a summary of:

- The Board approved Project Cost, the current forecast Project Cost and the variance between the two; and
- The plan to date amounts based on the Board approved cost schedule, the actual costs to date and the variance between the two.

**Table 3      Total Project Expenditure Summary  
(\$ million) (Public Version)**

Description	Board Approved (Plan)	Forecast	Forecast vs Plan	Plan to Date	Actuals to Date	Actuals vs Plan to Date
Total Project Co Costs <sup>6</sup>	781	772	(9)	781	772	(9)
BC Hydro Costs Including Contingency	187	170	(17)	187	166	(21)
BC Hydro loadings	82	59	(23)	82	59	(23)
Total Owner's Costs	269	229	(40)	269	225	(44)
P50 Project Cost <sup>7</sup>	1,050	1,001	(49)	1,050	997	(53)
Project Reserve	68	-	(68)	-	-	-
Authorized Project Cost	1,118	1,001	(117)	1,050	997	(53)

Further variance explanations are provided in the (confidential) cost breakdown in the confidential filing of the more detailed cost breakdown in [Appendix D](#).

<sup>6</sup> The total Project Co Costs include the cost to decommission existing John Hart facilities.

<sup>7</sup> The Project Cost excludes Net Book Value write-downs and costs related to Impact Benefit Agreements.



## **4.2 BC Hydro Construction Payments to Project Co**

In addition to the fixed amount for Progress Payments for the planned Project scope, BC Hydro must also pay Project Co for Design Development Changes and for Change Notices and Innovation Proposals that are accepted by BC Hydro.

The net cost of Project Changes and Design Development Changes to date is approximately [REDACTED].<sup>8</sup> These are being paid within the current Project forecast amount.

There have also been two accepted Innovation Proposals, Innovation Proposal 001 and Innovation Proposal 003. Innovation Proposal 001 was the only material one, with a value of [REDACTED] which was paid in 2016 (refer to Semi-Annual Progress Report No. 6 for more detail). Innovation Proposal 003 was agreed and paid in April 2018 with a value of [REDACTED].

## **4.3 Project Co Payments to BC Hydro during Construction**

As outlined in section [1](#), payments from Project Co to BC Hydro for asset non-availability or for variances from Project Agreement baselines during construction and commissioning (i.e., prior to and during the Bridging Period) are called Remittances. Remittances related to construction are netted off of the implementation Progress Payments and Remittances related to decommissioning are netted off of the Decommissioning payments to Project Co. All Remittances are included as reductions in Project implementation costs.

As of March 31, 2020, [REDACTED] has been netted off the Progress Payment Amounts for minor outages related to construction and commissioning. Another [REDACTED], which is still owing from Project Co to BC Hydro for outages during construction and commissioning, will be deducted off of remaining Progress Payment Amounts. There is a further Remittance amount of [REDACTED] which has

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<sup>8</sup> This is less than the [REDACTED] reported in Progress Report No. 12 because one item that was previously accrued has been removed and two new changes resulted in credits to BC Hydro.

been netted off the Decommissioning Payment to account for contaminated soil volumes (that had to be removed from the old Penstock and Powerhouse areas) being less than baselines in the Project Agreement.

## 5 Material Project Risks

All material Project risks that have potential to impact the Project by [REDACTED] [REDACTED] have now been closed. There are some remaining risks on the project which are treated with contingency in the Project's Estimate-at-Completion forecast but these are well below the threshold. The two risks that were included in Progress Report No. 12 are updated below and they will not be reported on in subsequent reports.

**Table 4 Material Project Risks**

<b>Risk Event/ Description</b>	<b>Risk and Response Summary</b>	<b>Residual Consequence<sup>9</sup></b>	<b>Residual Probability</b>
Geotechnical Issue (Amended)	<p>There was a risk that geotechnical conditions encountered at site could be determined to be outside planned expectations.</p> <p>To treat this risk for horizontal sections of water conveyance tunnels, the Project Agreement outlines a baseline of rock conditions. Determination that there is exceedance of these conditions in the horizontal water conveyance tunnels would have resulted in a differing site condition compensation event.</p> <p>For all other areas (intake, powerhouse, tailrace, adits, and access tunnels), Project Co carried the risk of as found conditions if geotechnical conditions encountered at site were outside planned expectations. In such an event, there was risk of Project schedule delays, Project Co default, or a formal dispute as defined in the Project Agreement.</p>	(N/A)	(N/A)

<sup>9</sup> The residual consequence is the anticipated total consequence regardless of which budget it is paid from. All or part of any consequences would be covered first from existing budgets and then from contingency before using Project Reserve.

Risk Event/ Description	Risk and Response Summary	Residual Consequence <sup>9</sup>	Residual Probability
	<p>Status:</p> <p>The excavation portion of the Tunnel Work was completed in June 2017. [REDACTED]</p> <p>[REDACTED]</p> <p>[REDACTED]</p> <p>[REDACTED]</p> <p>[REDACTED]</p> <p>[REDACTED]</p> <p>[REDACTED]</p>		
Owner's Costs (management of contract dispute / resolution, and/or step-in) (no change)	<p>Due to the cost of managing a contract dispute and/or managing BC Hydro's step-in rights under the Project Agreement, owner's costs may be increased, and/or the Project schedule may be delayed.</p> <p>This risk has been managed through the procurement process which selected an experienced Design-Builder with the competence to deliver large hydropower projects. [REDACTED]</p> <p>[REDACTED]</p> <p>There is also an Independent Certifier who reviews and signs off on monthly progress payments and the Commissioning Notices to Operate (<b>CNOs</b>). BC Hydro is a knowledgeable owner proactively managing the contract and submittals to mitigate claims.</p> <p>Status:</p> <p>[REDACTED]</p>	(N/A)	(N/A)

## John Hart Generating Station Replacement Project

# **John Hart Generating Station Replacement Project**

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## **Semi-Annual Progress Report No. 13**

### **Appendix A**

### **Site Photographs**

**Figure A-1 Remediated Topsoil at the Main and Service Access Area**



**Figure A-2 Penstock Area Replanted with Native Species to Return it to Wildland Standards**



Over 57,000 native plants were planted from 21 different native plant species. Successful establishment of these native plants will keep out invasive plant species (primarily scotch brooms) and provide wildlife habitat. Native species planted include: western hemlock, Douglas fir, Douglas maple, Sitka spruce, big leaf maple and others. Other areas of the penstock corridor were treated with coarse woody debris to facilitate natural recolonization of native plants.



**Figure A-3** Updated Trail, Stairs (also shown in A-4) and Kayak/Canoe Launch Area Below the Old Powerhouse



**Figure A-4** Closer View of the New Stairs Referenced in A-3 Above



**Figure A-5**      **New 3D Colourful Salmon at the Tailrace Viewing Area**



**Figure A-6**      **New Recreational Kayak/Canoe Launch Area**





# **John Hart Generating Station Replacement Project**

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## **Semi-Annual Progress Report No. 13**

### **Appendix B**

#### **Project Co Direct (Progression) Payments to Date**

**PUBLIC**

**REDACTED**

# **John Hart Generating Station Replacement Project**

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## **Semi-Annual Progress Report No. 13**

### **Appendix C**

#### **Project Progression of Eligible Costs**

**PUBLIC**

**REDACTED**

# **John Hart Generating Station Replacement Project**

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## **Semi-Annual Progress Report No. 13**

### **Appendix D**

#### **Detailed Project Expenditures**

**PUBLIC**

**REDACTED**

**REDACTED**

# **John Hart Generating Station Replacement Project**

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## **Semi-Annual Progress Report No. 13**

### **Appendix E**

#### **Progression of Availability Payments**

**PUBLIC**



Section 1 explained that there are two distinct periods in the Availability Term called:  
1) the Bridging Period (**the Bridging Period**); and 2) the Services Period (**the Services Period**).

During the Bridging Period, the maximum possible Availability Payments were multiplied by a Ramp Rate percentage which depended on the number of Commercial Assets in Commercial Operation.

Table E-1 below outlines the original Target Dates for the GU/LL Assets and the Bypass System; the Revised Target Dates for the GU/LL Assets under Innovation Proposal 001; the added interim date of October 10, 2018 for the completion of the automation of the Bypass System; the actual Commercial Operation Dates for the GU/LL assets; the actual completion date of the automation of the automation of the Bypass System; and the Ramp Rate attained with each Commercial Asset coming in service.

**Table E-1 Project Agreement ISDs**

Contractual Ramp Rate Item No. and Associated Incremental Ramp Rate (%) <sup>1</sup>	Original Target Commercial Operation Dates and GU/LL Assets	Revised Target Commercial Operation Dates and GU/LL Assets following Innovation Proposal 001	Actual / Forecast Commercial Operation Dates	Status and Comments <sup>2</sup>
1 (█%)	May 2, 2018 1st GU	May 2, 2018 Tunnel and LLO OR Tunnel and 1st GU	May 2, 2018 (Actual) Tunnel and LLO	Met
2 (█%)	July 21, 2018 2nd GU	July 21, 2018 1st unit (if LLO 1st) OR 2nd unit (if a GU was 1st)	July 21, 2018 (Actual) 1st GU	Met

<sup>1</sup> The Ramp Rate percentage is multiplied by the value, in the relevant month, in the schedule of Availability Payments which is included in the Project Agreement.

<sup>2</sup> Met” means attained on or before the Target Date, ‘Late’ means completed but not attained on or before the Target Date, ‘On Track’ means it is forecasting to occur on or before the Target Date, ‘Missed’ means not completed and the Target Date has passed.

Contractual Ramp Rate Item No. and Associated Incremental Ramp Rate (%) <sup>1</sup>	Original Target Commercial Operation Dates and GU/LL Assets	Revised Target Commercial Operation Dates and GU/LL Assets following Innovation Proposal 001	Actual / Forecast Commercial Operation Dates	Status and Comments <sup>2</sup>
3 (■%)	October 10, 2018 3rd GU & Service Commencement	October 10, 2018 Remaining unit(s) & Service Commencement	October 26, 2018 (Actual) 2nd GU	Late
			November 5, 2018 (Actual) 3rd unit	Late
			March 29, 2019 (Actual) Completion of the Original Conditions Precedent for Service Commencement (Renamed 'Interim Service Commencement')	Late
4 (■%)	February 1, 2019 Bypass System	February 1, 2019 Target Bypass System Completion Date for the last Ramp Rate Increment Remained Unchanged	February 1, 2019 (Actual) = the later of Bypass System completion (November 9, 2018) and February 1, 2019	Met
(No Ramp Rate increment)	N/A	Partial Repayment of the increment to Innovation Proposal 001 for automated Bypass System completion delays beyond Oct 10, 2018	Nov 9, 2018 (Actual)	Late
N/A	August 13, 2019 Project Total Completion	August 13, 2019	Expected in spring 2020	Missed
N/A	October 9, 2033 Service Period End	October 9, 2033	October 9, 2033	Fixed end-date

- 1 The table below shows the Availability Payments paid to Project Co to
- 2 March 31, 2020.

**Table E-2 Availability Payments to Project Co<sup>3</sup>**  
 (\$ million)

A  Date	B Non-Indexing (Debt Repayment) Portion				C Indexing (Asset Management Fee) Portion				D  Total Availability Payments Net of Deductions
	B1	B2	B3	B4	C1	C2	C3	C4	
	Maximum	Cost of Delays to In-Service Dates	Availability Deductions	Actual Net Non-Indexing Portion	Maximum	Cost of Delays to In-Service Dates	Immediate Callout Billable Hours Deductions	Actual Net Indexing Portion	
May 2018 – Sep 2019	44.7	(3.5)	(0.1)	41.1	7.9	(0.8)	-	7.0	48.2
Oct 2019	3.1	NA	-	3.1	1.7	NA	-	1.7	4.8
Nov 2019	3.1	NA	-	3.1	0.6	NA	-	0.6	3.7
Dec 2019	3.1	NA	-	3.1	0.6	NA	-	0.6	3.6
Jan 2020	3.1	NA	-	3.0	0.6	NA	-	0.6	3.7
Feb 2020	3.1	NA	-	3.0	0.6	NA	-	0.6	3.7
Mar 2020	3.1	NA	-	3.1	0.6	NA	-	0.6	3.7
<b>Total</b>	63.3	(3.5)	(0.1)	<b>59.7</b>	12.5	(0.8)	-	11.6	<b>71.3</b>

The table above has been expanded since the last Progress Report.

- The cost of delays to the In-Service Dates and the Availability Payment deductions were previously each shown in one column. We have now split each to show the separate impacts on the Non-Indexing and Indexing Payments.
- None of the adjustments show up in the Project actuals. They show up elsewhere in BC Hydro statements of accounts as explained in the next two bullets.
  - ▶ Section B shows the deductions to the Non-Indexing (debt repayment) portion of the Availability Payments. These deductions show up as a

<sup>3</sup> Minor addition errors occur due to rounding.

1 write-off of part of the debt provision on the BC Hydro balance sheet for the  
2 money owing to Project Co for the portion of the construction costs they  
3 financed. There are two types of Non-Indexing deductions; the first is for  
4 delays in the Asset In-Service Dates (which have now passed), and the  
5 second is for Assets not being available during the Services Period.

- 6 ► Section C shows the deductions to the Indexing (asset management fee)  
7 portion of the Availability Payments. The budget for the Indexing portion of  
8 the Availability Payments is held by BC Hydro Operations. Therefore,  
9 deductions to these payments show up in their cost center. To date,  
10 Indexing Payment deductions have occurred for the following items:

- 11 1. Delays in the Asset In-Service Dates (See the summary in [Table E-1](#). No  
12 further deductions for this item can occur.); and  
13 2. Minor deductions for BC Hydro crews being called out for forced outages  
14 and priority alarms (which BC Hydro recovers cost for at a fixed rate  
15 under the Project Agreement).

# **John Hart Generating Station Replacement Project**

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## **Semi-Annual Progress Report No. 13**

### **Appendix F**

#### **Key Contractual Terminology**

1 Below are explanations of key contractual terminology and acronyms used in this  
2 report.

- 3 • **Actual Commercial Operation Date** is the later of the Target Commercial  
4 Operation Date and the date on which all of the conditions precedent to  
5 Commercial Operation of the applicable Commercial Asset(s) have been  
6 satisfied as certified by the Independent Certifier.
- 7 • **Availability Payments** are the payments from BC Hydro to Project Co during  
8 the Availability Term to repay the costs financed by Project Co during the  
9 Implementation (construction) Phase and for asset management fees. These  
10 payments started when the first commercial asset attained Commercial  
11 Operation in May 2018 and they will end in October 2033.
- 12 • The **Availability Term** is the period when Availability Payments are made and  
13 it encompasses both the Bridging and the Services Periods. It started in  
14 May 2018 and ends in October 2033.
- 15 • **Bridging Period** is the duration between: 1) the time that the first GU/LL  
16 (**GU/LL**) Asset attains Commercial Operation; and 2) the time that the last  
17 GU/LL Asset is in Commercial Operation and all Conditions Precedent to  
18 Service Commencement have been met. During the majority of the Bridging  
19 Period, both the Existing and the new Facility are in operation.
- 20 • **Bypass System** – is the automatic system that controls three  
21 pressure-reducing 'bypass valves' to restore flow to the river in event of a Unit  
22 outage. The term bypasses is used to refer to the individual bypass valves  
23 which were initially manually operable.
- 24 • **Commercial Assets** are the GU/LL Assets, the conditions precedent to Service  
25 Commencement, and automatic operability of the Bypass System.

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- 1 • **A Commercial Asset's Operation Date** is the later of when the relevant  
2 Commercial Asset is completed and the Target Date for that asset. This is the  
3 date that the Ramp Rate percentage increment of the Availability Payments  
4 related to that asset can start being paid to Project Co.
  - 5 • **Comptroller** – Comptroller of Water Rights.
  - 6 • **Conditions Precedent** to Service Commencement are the things that must be  
7 complete under the Project Agreement before the Services Period can start.  
8 This includes all assets being in service, Balance of Plant work, BC Hydro staff  
9 training, and submittal of key documentation.
  - 10 • **CPCN** – Certificate of Public Convenience and Necessity
  - 11 • **DBFR** (Design-Build-Finance-Rehabilitate) is the Procurement Model for the  
12 Project. Under this model, BC Hydro holds one contract with the consortium  
13 InPower BC (Project Co) which then has subcontracts with the suppliers and  
14 vendors. Under this model, Project Co is financing part of the construction costs  
15 and will only get paid for these costs in the 15 years after construction. The  
16 'Rehabilitate' component of this model is that Project Co retains a significant  
17 amount of the asset quality risk during the first 15 years and must meet specific  
18 asset condition assessment criteria every four years. Project Co will also  
19 provide asset management services during this 15-year period.
  - 20 • **Effective Date** means the date of the Project Agreement between BC Hydro  
21 Power Authority and InPower BC General Partnership. The Effective Date was  
22 February 25, 2014.
  - 23 • **Eligible Costs** are all costs properly and reasonably invoiced by the  
24 Design-Builder to Project Co for design and construction for the original scope  
25 of work.

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- 1 • **EFRS** – The Environmental Flow Release System, providing flows of 4 cm to  
2 10 cm into the Elk Falls Canyon to meet operational Water Use Plan  
3 obligations.
  - 4 • **Existing Facility** means the original John Hart Generating Station, including  
5 the Existing Powerhouse, Existing Penstocks, Existing Intake, Existing Surge  
6 Towers, Existing Tailrace, Existing Intake Control Building (Concrete), Existing  
7 Intake Control Building (Steel), Existing Intake Gates, Existing Site Office  
8 Building, Existing Units, Substation, Dams, Spillway and all associated  
9 buildings, structures, facilities, systems, monitoring instruments and other  
10 infrastructure, as it existed on the Effective Date.
  - 11 • **Existing Units** are the old generating units in the Existing Facility.
  - 12 • **Facility** means the new hydro-electricity generating facilities, including the  
13 Power Intake, Water Conveyances, Generating Units, Powerhouse, any  
14 modifications to the Dams, any modifications or improvements to other portions  
15 of the Existing Facility (to the extent incorporated into the design of the Facility),  
16 and all associated buildings, structures, tunnels, shafts, roads and infrastructure  
17 and all other civil, structural, mechanical, electrical, instrumentation and other  
18 equipment and systems to be designed, constructed, procured or otherwise  
19 provided by Project Co pursuant to the Project Agreement.
  - 20 • **Generating Units** are the new units in the new powerhouse. This term refers to  
21 all machinery and equipment making up a new complete and independent  
22 hydro-electric generator including the water passages, Turbine, Generator, Unit  
23 Transformer, protection and control system and replacements thereof.
  - 24 • **GU/LL Asset** means any one of the three Generating Units (**GUs**) or the Low  
25 Level Outlet (**LLO**) (including the Environmental Flow Release System and  
26 manual operability of the bypasses).



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- 1 • **Ineligible Costs** means the indirect or ‘ineligible’ costs include bidding fees,  
2 insurance during construction, and Project Co overhead costs during  
3 construction.
  - 4 • **KPI** – Key Performance Indicator.
  - 5 • **LLO** – the Low Level Outlet valve, which includes the Environmental Flow  
6 Release Valve and the bypasses (with manual operability). The Low Level  
7 Outlet Valve is capable of providing up to 40 cm into the upper Elk Falls  
8 canyon.
  - 9 • The **LLO System** includes the Low Level Outlet, the Environmental Flow  
10 Release System and the automated Bypass System.
  - 11 • **PPM** – Project and Portfolio Management
  - 12 • **Progress Payments** are the payments for progression of Implementation  
13 works.
  - 14 • **The Project** is the John Hart Generating Station Redevelopment Project.
  - 15 • **Project Co** means InPower BC General Partnership.
  - 16 • The **Ramp Rate** is the percentage increment of the Availability Payments that  
17 Project Co becomes entitled to as the Commercial Operation Dates for the  
18 Commercial Assets are attained. The Ramp Rate is multiplied by the relevant  
19 month’s value in the schedule of Availability Payments which is included in the  
20 Project Agreement. This determines the Availability Payment amount that  
21 Project Co will receive.
  - 22 • **Remittances** means a payment from Project Co to BC Hydro for specific  
23 events such as non-availability of the GU/LL assets during the Bridging Period.
  - 24 • **Service Commencement** is when the Bridging Period ends and the Services  
25 Period begins. This occurs either on October 10, 2018 or when all of the GU/LL

1 assets are in Commercial Operation and all of the Conditions Precedent to  
2 Service Commencement have been met, whichever is later. The key difference  
3 at Service Commencement is that the Facility is handed over to BC Hydro  
4 operations and BC Hydro's crews will be used in maintenance and operation of  
5 the Facility.

- 6 • **Services Period** starts at Service Commencement and ends on  
7 October 9, 2033. During this period, Project Co provides asset management  
8 services and retains asset quality risk. The other key difference at Service  
9 Commencement is that BC Hydro's crews will be used in maintenance and  
10 operation of the Facility.
- 11 • **Target Commercial Operation Dates** (for the Commercial Assets) and the  
12 **Target Service Commencement Date** are the earliest possible dates that the  
13 percentage of the Availability Payments related to each Commercial Asset can  
14 start.
- 15 • **Total Completion** marks completion of construction and decommissioning on  
16 the Project, with deficiencies or trailing costs as allowed under the Project  
17 Agreement.

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# **John Hart Generating Station Replacement Project**

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## **Semi-Annual Progress Report No. 13**

### **Appendix G**

#### **Key Performance Indicator Methodology**




1 The table below outlines the Key Performance Indicator Methodology. Note that the Overall Project Health Indicator  
 2 and the Environment Indicator guidances have been updated in this report. The key performance indicator guidance  
 3 now aligns with BC Hydro's Incident Management System (**IMS**) rating system. The "Overall Assessment" (or Project  
 4 Health) indicator has also been updated removing Project Manager discretion on making Project Health red or amber  
 5 if Environment is red or amber. The methodology from the last report is shown between the new text in the two  
 6 amended rows below and the original methodology from 2014 is shown in a separate table at the end of this  
 7 appendix.

Indicator	Red	Amber	Green
Overall Project Health (Amended)	<b>Amended Guidance:</b> Cost, schedule, safety, or environment is red; or, subject to Project Manager discretion if Indigenous Relations or Regulatory are red. <b>Guidance Last Report:</b> Serious Concerns – If cost or schedule is red or some of the sub-components are red.	<b>Amended Guidance:</b> Cost, schedule, safety, or environment is amber; or, subject to Project Manager discretion if Indigenous Relations or Regulatory are amber. <b>Guidance Last Report:</b> Some concerns – If cost or schedule are amber or some of the sub-components are amber or red with low risk	<b>Amended Guidance:</b> All other cases. <b>Guidance Last Report:</b> No Concerns – if cost or schedule are green or some of the sub-components are green or amber with low risk.
Environment (Amended)	<b>Amended Guidance:</b> Any Major incident; Moderate preventable externally reportable PCB Spill; Moderate preventable Archaeology incident; Minor or Moderate preventable SF6 incident; Minor, Moderate or Major preventable fish incidents; or Moderate or Major regulatory action. 'Major', 'Moderate' and 'Minor' are defined in BC Hydro's Incident Management System and our internal Project and Portfolio Management Environment practice.	<b>Amended Guidance:</b> Any Moderate incident not categorized as 'Red', or multiple Minor Incidents or Near Misses if a pattern of risk is emerging. <b>Guidance Last Report:</b> A new environmental related issue or event has arisen, or the risk associated with an existing environmental related issue or	All other cases.

Indicator	Red	Amber	Green
	<b>Guidance Last Report:</b> As a result of an Environmental related issue or event: <ul style="list-style-type: none"> <li>• The project is forecasting to miss a Commercial Asset ISD or Service Commencement;</li> <li>• The project is forecasting to exceed its Expected Cost;</li> <li>• An external reportable environmental incident has occurred;</li> <li>• A violation of environmental regulation or law, or of a condition of an Environmental Assessment Certificate, or of an environmental condition of a CPCN has occurred;</li> <li>• An Environmental incident(s) has occurred which would be rated at a consequence level of S3 or greater under the project delivery risk matrix;</li> <li>• The shareholder or regulator is directing BC Hydro with respect to the project in a manner that causes 1 or 2 above; or</li> <li>• An adverse reputational impact is forecast.</li> </ul> A reportable incident is an incident which BC Hydro is required by law or regulation to report to the regulator or agency.	event has increased, which results in a 50 per cent or more probability that this indicator will be red in the future.	
Schedule – In-Service-Dates (No change)	Project is forecasting to miss the Works Completion Date which is the Target Commercial Operation (In-Service) Date of February 1, 2019 as included in the original plan.	Project is forecasting to miss or has missed one of the interim Target Commercial Operation (In-Service) Dates or risk is seen to the final Target Commercial Operation Date of February 1, 2019.	All other cases.

Indicator	Red	Amber	Green
Cost (No change)	Project actual or forecast costs exceed the expected (P50) budget of \$1,050 million by greater than 5 per cent or > \$100k.	Project actual or forecast costs exceed the expected P50 budget of \$1,050 million by < 5 per cent or < \$100k or a new issue or event has arisen, or risk associated with an existing issue or event has increased, and as a result BC Hydro wishes to signal that there is significant risk of the cost indicator going red in the future.	All other cases.
Safety (No change)	Serious contractor safety performance issues reported that have resulted in a lost time injury.	Re-occurring safety performance issues or poor audit results requiring mitigation. Treatment plan(s) developed and implemented.	All other cases.
Risks (No change)	Material risks previously identified have materialized with treatment plan(s) in place; New material risk(s) materialized, treatment plans in place. The Project is forecasting to exceed the Upper Bound of \$1,118 million.	Project risks have materialized and been treated. The Project is forecasting to be within the Upper Bound of \$1,118 million.	Material risks identified, up-to-date treatment plan developed. Lower ranked risks are monitored and addressed.

Negotiated Key Performance Indicator methodology filed with the BCUC in 2014

	Red 	Amber 	Green 
Overall	Serious Concerns – if any of the sub-components are red	Some Concerns but in Control	No Concerns – all sub-components are green
Schedule – In Service Dates	Project is forecasting to miss ISD for one or multiple assets specified in the Project Agreement (per <a href="#">Table 2</a> )	Project is forecasting to miss a Project Agreement work progress item (per <a href="#">Table 3</a> ), the contractor has taken action to rectify, ISDs for key assets are not at risk	All other cases - ISD expected to be met
Cost	Project is forecast to exceed the Upper Bound of the Project (\$1,118 million)	Forecast to complete exceeds P50 budget (\$1,050 million) and a draw on Board Project Reserve is required	Forecast to complete is expected to be within P50 cost amount (\$1,050 million <sup>1</sup> )
Environmental	A violation of environmental regulation or law, multiple environmental incidents have occurred with adverse impact to BC Hydro's reputation is forecast	A new reportable environmental related issue or re-occurring environmental issues identified in audits.	All other cases
Risks	Material risks previously identified have materialized, with treatment plan(s) in place; New material risk(s) materialized, treatment plan(s) in place. The Project is forecasting to exceed the Upper Bound of \$1,118 million	Project risks have materialized and treated. The Project is forecasting to be within the Upper Bound of \$1,118 million	Material risks identified, up-to-date treatment plan developed. Lower ranked risks are monitored and addressed
Safety	Serious contractor safety performance issues reported that has resulted in a lost time injury	Re-occurring safety performance issues or poor audit results requiring mitigation. Treatment plan(s) developed and implemented	All other cases