newfoundland labrador hydro
a nalcor energy company

Hydro Place. 500 Columbus Drive.
P.O. Box 12400. St. John's. NL
Canada A1B 4K7
t. 709.737.1400 f. 709.737.1800
www.nlh.nl.ca

September 10, 2020

Board of Commissioners of Public Utilities
Prince Charles Building
120 Torbay Road, P.O. Box 21040
St. John's, NL A1A 5B2

Attention: Ms. Cheryl Blundon
Director of Corporate Services & Board Secretary

Dear Ms. Blundon:

Re: Holyrood Supplemental Capital Projects – Monthly Update

On April 7, 2020, Newfoundland and Labrador Hydro ("Hydro") filed its application for approval of capital projects necessary for the continued operation of the Holyrood Thermal Generation Station ("Holyrood TGS"). The application was approved on May 11, 2020 in Board Order P.U. 14(2020). In that Order, the Board directed Hydro to file monthly updates on the status of the approved capital projects from June to September 2020 and, thereafter, to provide updates as part of the Winter Readiness reports filed in October, November, and December 2020.

Projects Overview

Four projects were approved in Board Order P.U. 14(2020):

- **Boiler Condition Assessment and Miscellaneous Upgrades:** Scope involves Level 2 condition assessments on internal components of the main steam generators (boilers) and associated external high energy piping to identify required refurbishment or replacement work. Hydro will also replace or refurbish components that are identified as requiring immediate intervention. This project also includes the completion of required miscellaneous upgrades of condition based deficiencies identified in the 2019 Condition Assessment and Miscellaneous Upgrades project.
- **Overhaul Unit 2 Turbine Valves:** Scope includes the total disassembly, detailed internal inspection, refurbishment, and reassembly of all major steam valves. Valve refurbishment includes replacement of any identified damaged components.
- **Overhaul Unit 3 Boiler Feed Pump West:** Scope includes disassembly, inspection, reassembly, and re-commissioning of the pump. During overhaul, parts, including the volute impeller cartridge, are replaced as necessary.
- **Overhaul Unit 2 Generator:** Scope includes disassembly of generator end shields, hydrogen seals, hydrogen coolers, and bearings; removal of the generator rotor from the stator; cleaning of internal components; detailed visual inspection and non-destructive evaluation of internal components; detailed measurement of clearances and alignments; mechanical integrity testing of windings and core wedges; and replacement or refurbishment of components found to be damaged.

Status Update

Project schedules and cost updates for the four projects are provided in Tables 1 - 4. All projects remain on schedule and on budget.

Status of Units:

- Unit 2 is currently on its planned annual maintenance outage.
- Unit 1 planned maintenance outage is complete. Start-up commenced on August 25, 2020 and the unit was placed online on September 1, 2020. Unit 1 is currently in cold standby.
- Unit 3 planned maintenance outage is complete and the unit is operating in synchronous condenser mode.

Table 1: Project Status - Boiler Condition Assessment and Miscellaneous Upgrades

Project: Boiler Condition Assessment and Miscellaneous Upgrades	
Approved Budget:	3,056.7
Total Project YTD ($000)	1,767.0
Total Project Forecast ($000)	3,056.7

Major Milestones	Start Date	End Date	Status	Overall Project Update
Unit 3 Inspections	15-May-20	12-Jun-20	Complete	• Unit 3: No major findings requiring immediate attention were discovered during the Level 2 Condition Assessment. All work identified during the previous Level 2 Condition Assessment was completed in accordance with industry quality standards. • Unit 1: No major findings requiring immediate attention were discovered during the Level 2 Condition Assessment. All work identified during the previous Level 2 Condition Assessment was completed in accordance with industry quality standards. • Unit 2: To date, no major findings requiring immediate attention were discovered during the Level 2 Condition Assessment. Refurbishment work identified in the previous Level 2 Condition Assessment is currently in progress in accordance with industry quality standards. The table will be updated to include any major findings during subsequent monthly updates, as required. • Condition Assessment Report: The condition assessment report will be finalized after all on site work has been completed. • Expected to be completed on budget.
Unit 3 Refurbishments	15-May-20	12-Jun-20	Complete	
Unit 3 Major Findings	N/A	N/A	Complete	
Unit 1 Inspections	15-Jun-20	21-Aug-20	Complete	
Unit 1 Refurbishments	15-Jun-20	21-Aug-20	Complete	
Unit 1 Major Findings	N/A	N/A	Complete	
Unit 2 Inspections	24-Aug-20	16-Oct-20	In progress	
Unit 2 Refurbishments	24-Aug-20	16-Oct-20	In progress	
Unit 2 Major Findings	N/A	N/A	In progress	
Condition Assessment Report	Jun-20	31-Dec-20	In progress	

Table 2: Project Status – Overhaul Unit 2 Turbine Valves

Project: Overhaul Unit 2 Turbine Valves

Approved Budget:	2,919.5
Total Project YTD ($000)	1,244.0
Total Project Forecast ($000)	2,919.5

Major Milestones	Start Date	End Date	Status	Overall Project Update
Control Valves Disassembly	26-Jul-20	7-Aug-20	Complete	• Control Valves (x6) Control valve #6 valve stem runout was outside allowable tolerance. Valve stem was replaced with new. Control valve #2 stem was worn and runout was outside allowable tolerance. Valve stem was replaced with new. Control valve #1, #2 and #6 bushings were found to be fouled by scaling. Bushings were honed to remove scale. Control valve #3, #4 and #5 bushings' clearances were found to be greater than acceptable tolerance. Bushings were replaced with new. Upper Control Valve cam shaft was found to be out of tolerance for runout. Shaft was straightened to return it to acceptable runout tolerance. This finding is considered to be consistent with normal wear and tear for this component. All 6 crosshead bushings' (3 per control valve) clearances were found to be out of tolerance. Bushings were replaced with new. • Main Stop Valve (x1) Valve bushing clearances were found to be fouled by scaling. Bushings were honed to remove scale. Two of three poppet valves required lapping to restore sealing contact between valve discs and seat. NDE revealed cracks in vortex dam welds. Weld repairs are required. This finding is considered to be consistent with normal wear and tear for this component. Insufficient unused pin lip area was remaining on valve cap pin lips to permit locking at reassembly. Weld repairs were carried out to restore pin lips. NDE revealed a crack in one stud. Stud was replaced with new. • Reheat Stop/Intercept Valves (x2) Both Intercept Valves required lapping to restore sealing contact between valves and seats. Insufficient unused pin lip area was remaining on Intercept Valve pin lips to permit locking at reassembly. Weld repairs are required to restore pin lips. NDE revealed linear indications on valve seat welds for both Stop Valves. Weld repairs were carried out to restore seating surfaces. Both valve linkage anti-rotation pins were worn beyond reuse. Pins were replaced. • Blowdown Valve (x1) - No significant condition issues noted to date. • Extraction Steam Check Valves (x7) Four shafts were out of straightness tolerance, corroded and scored. Shafts were replaced with new. This finding is considered to be consistent with normal wear and tear for this component. All springs were found to be corroded beyond recommended re-use. Springs were replaced with new. • Expected to be completed on budget.
Control Valves Inspection	4-Aug-20	22-Aug-20	Complete	
Control Valves Refurbishment	4-Aug-20	11-Sep-20	In progress	
Control Valves Reassembly	20-Aug-20	11-Sep-20	In progress	
Main Stop Valve Disassembly	26-Jul-20	4-Aug-20	Complete	
Main Stop Valve Inspection	4-Aug-20	17-Aug-20	Complete	
Main Stop Valve Refurbishment	4-Aug-20	11-Sep-20	In progress	
Main Stop Valve Reassembly	22-Aug-20	11-Sep-20	In progress	
Reheat Stop/Intercept Valves Disassembly	26-Jul-20	4-Aug-20	Complete	
Reheat Stop/Intercept Valves Inspection	4-Aug-20	31-Aug-20	Complete	
Reheat Stop/Intercept Valves Refurbishment	4-Aug-20	12-Sep-20	In progress	
Reheat Stop/Intercept Valves Reassembly	25-Aug-20	12-Sep-20	In progress	
Blowdown Valve Disassembly	6-Aug-20	20-Aug-20	Complete	
Blowdown Valve Inspection	21-Aug-20	20-Aug-20	Complete	
Blowdown Valve Refurbishment	21-Aug-20	20-Aug-20	Complete	
Blowdown Valve Reassembly	25-Aug-20	26-Aug-20	Complete	
Extraction Steam Check Valves Disassembly	29-Jul-20	3-Aug-20	Complete	
Extraction Steam Check Valves Inspection	5-Aug-20	22-Aug-20	Complete	
Extraction Steam Check Valves Refurbishment	5-Aug-20	16-Sep-20	In progress	
Extraction Steam Check Valves Reassembly	24-Aug-20	16-Sep-20	In progress	
Commissioning	6-Oct-20	8-Oct-20	Not Started	
Unit 2 Outage	6-Jul-20	16-Oct-20	In progress	

Table 3: Project Status – Overhaul Unit 3 Boiler Feed Pump West

Project: Overhaul Unit 3 Boiler Feed Pump West	
Approved Budget:	367.9
Total Project YTD ($000)	260.0
Total Project Forecast ($000)	367.9

Major Milestones	Start Date	End Date	Status	Overall Project Update
BFP Disassembly	25-May-20	27-May-20	Complete	• Through detailed inspection, the impeller shaft was found to be out of tolerance for straightness and runout. Hydro is proceeding with all required refurbishment including shaft replacement. The refurbishment requirements have no impact on the overall schedule and cost. Letter explaining root cause has been submitted by Flowserve and was provided to Liberty for review. • Final commissioning will occur during start up when Unit 3 is returned to generation mode. • Expected to be completed on budget.
Spare Volute Installed	28-May-20	28-May-20	Complete	
BFP Reassembled	28-May-20	10-Jun-20	Complete	
Offline Commissioning	10-Jun-20	12-Jun-20	Complete	
Volute Refurbishment	25-Jun-20	30-Sep-20	In progress	
Final Commissioning	29-Oct-20	2-Nov-20	Not started	

Table 4: Project Status – Overhaul Unit 2 Generator

Project: Overhaul Unit 2 Generator	
Approved Budget:	1,294.1
Total Project YTD ($000)	920.0
Total Project Forecast ($000)	1,294.1

Major Milestones	Start Date	End Date	Status	Overall Project Update
Disassembly of generator end shields, hydrogen seals, hydrogen coolers, and bearings	25-Jul-20	15-Aug-20	Complete	• Collector-end and Turbine-end Hydrogen Seal sealing faces were found to be damaged. Replacement of the seals is required to restore sealing efficacy and minimise hydrogen loss. This finding is considered to be consistent with normal wear and tear for this component. • Two Stator Winding End-Caps damaged by a phenolic bolt that vibrated loose from the end-shield. Phenolic bolt lock nuts will be epoxied in at reassembly. Checks will be added to the inspection and test plan to ensure that these bolts are secure prior to closing unit. • Generator elevation relative to Turbine was found to be 0.012" high and out of tolerance when measured at the coupling. Correct generator elevation will be restored at reassembly. Incorrect alignment can result in issues with bearing temperature, vibration and premature bearing wear. • #4 and #5 Generator Bearings were found to be wiped on the lower halves. These were sent off-island for re-Babbiting. Re-Babbiting is now complete and the bearings are on-site ready for reassembly. This finding is not surprising given that the generator was found to be set 0.012" relative to the turbine. • There is time allocated in the Unit 2 outage schedule to address major findings, if required. • Expected to be completed on budget.
Removal of the generator rotor from the stator.	11-Aug-20	11-Aug-20	Complete	
Cleaning of Internal Components	16-Aug-20	11-Sep-20	In progress	
Detailed visual inspection and NDE of internal components	28-Jul-20	9-Sep-20	Complete	
Replacement or refurbishment of components found to be damaged (Hydrogen Seals, Generator Bearings and Stator Winding End-Caps)	14-Aug-20	4-Sep-20	Complete	
Generator Reassembly	4-Sep-20	6-Oct-20	In Progress	
Commissioning	6-Oct-20	8-Oct-20	Not Started	
Unit 2 Outage	6-Jul-20	16-Oct-20	In progress	

Hydro continues to manage the required work and planned outage schedules with an aim to achieving project completion prior to the 2020–2021 winter season. At the time of this monthly update, there are no significant execution risks or concerns.

The next monthly update will be incorporated in Hydro's Winter Readiness Planning Report to be filed by October 13, 2020.

Should you have any questions or comments about any of the enclosed, please contact the undersigned.

Yours truly,

NEWFOUNDLAND AND LABRADOR HYDRO

Shirley A. Walsh
Senior Legal Counsel, Regulatory
SAW/sk

ecc: **Board of Commissioners of Public Utilities**
Jacqui Glynn
PUB Official Email

Newfoundland Power
Gerard M. Hayes
Kelly C. Hopkins
Regulatory Email

Consumer Advocate
Dennis M. Browne, Q.C., Browne Fitzgerald Morgan & Avis
Stephen F. Fitzgerald, Browne Fitzgerald Morgan & Avis
Sarah G. Fitzgerald, Browne Fitzgerald Morgan & Avis
Bernice Bailey, Browne Fitzgerald Morgan & Avis

Industrial Customer Group
Paul L. Coxworthy, Stewart McKelvey
Denis J. Fleming, Cox & Palmer
Dean A. Porter, Poole Althouse

Praxair Canada Inc.
Sheryl E. Nisenbaum

Teck Resources Limited
Shawn Kinsella

Iron Ore Company of Canada
Gregory A.C. Moores, Stewart McKelvey

Labrador Interconnected Group
Senwung Luk, Olthuis Kleer Townshend LLP
Julia Brown, Olthuis Kleer Townshend LLP