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November 17, 2023

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

Attention: Jo-Anne Galarneau
Executive Director and Board Secretary

Re: Monthly Energy Supply Report for the Island Interconnected System for October 2023

Enclosed please find Newfoundland and Labrador Hydro's Monthly Energy Supply Report for the Island Interconnected System as directed by the Board of Commissioners of Public Utilities.

Should you have any questions, please contact the undersigned.

Yours truly,

NEWFOUNDLAND AND LABRADOR HYDRO

Shirley A. Walsh
Senior Legal Counsel, Regulatory
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Encl.

ecc:

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Monthly Energy Supply Report for the Island Interconnected System for October 2023

November 17, 2023

A report to the Board of Commissioners of Public Utilities

newfoundland labrador hydro

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1.0 Introduction

On February 8, 2016, the Board of Commissioners of Public Utilities ("Board") requested Newfoundland and Labrador Hydro ("Hydro") file a biweekly report containing, but not limited to, the following:

1) System Hydrology Report;

2) The thermal plant operated in support of hydrology;

3) Production by plant/unit; and

4) Details of any current or anticipated long-term derating.

In July 2016, the Board indicated that a monthly report would thereafter be sufficient. This report provides data for October 2023.[1]

2.0 System Hydrology

Reservoir inflows in October 2023 were 78% above the month's historical average.[2] Table 1 summarizes the aggregate storage position of Hydro's reservoirs at the end of the reporting period.

Table 1: System Hydrology Storage Levels

Date	2023 (GWh)	2022 (GWh)	20-Year Average (GWh)	Minimum Storage Limit (GWh)	Maximum Operating Level (GWh)	Maximum Operating Level (%)
31-Oct-2023	2,113	2,145	1,850	1,048	2,452	86

The aggregate reservoir storage level on October 31, 2023 was 2,113 GWh, which is 14% below the seasonal maximum operating level and 102% above the minimum storage limit.[3] Inflows across Hydro's

[1] Effective April 2023, Hydro added Section 2.1 (Ponding), Section 2.2 (Spill Activity), and Appendix A (Ponding and Spill Transactions) within this report. "Newfoundland and Labrador Hydro – Streamlining of Quarterly Regulatory Report to Parties – Board's Decision on Reporting," Board of Commissioners of Public Utilities, May 11, 2023.
[2] Calculated in terms of energy (gigawatt hours).
[3] Minimum storage limits are developed annually to provide guidance in the reliable operation of Hydro's major reservoirs—Victoria, Meelpaeg, Long Pond, Cat Arm, and Hinds Lake. The minimum storage limit is designed to indicate the minimum level of aggregate storage required such that if there was a repeat of Hydro's critical dry sequence, or other less severe sequence, Hydro's load can still be met through the use of the available hydraulic storage supplemented with maximized deliveries of power from the Muskrat Falls Hydroelectric Generating Facility over the Labrador-Island Link ("LIL"). Hydro's long-term critical dry sequence is defined as January 1959 to March 1962 (39 months). Other dry periods are also considered during this analysis to ensure that no other shorter-term historic dry sequence could result in insufficient storage.

system continued to be above the long-term historical average in October 2023. Inflows to the reservoirs of the Bay d'Espoir system were 191% of average during the month, while inflows to the Hinds Lake Reservoir were 163% of average and inflows to the Cat Arm Reservoir were 142% of average. During the first two weeks of October 2023, inflows to Hydro's reservoirs were below average with very little precipitation. Inflows increased during the second half of the month as two significant rainfall events occurred across the Island. The first event occurred during October 13 to 14, 2023 which brought approximately 60–100 mm of rain to the Bay d'Espoir system, as well as 80 mm of rain to the Hinds Lake Reservoir and 90 mm to the Cat Arm Reservoir. A second rain event occurred the following weekend during October 21 to 22, 2023, which brought an additional 60–80 mm of rain to the Bay d'Espoir system, as well as approximately 60 mm to the Hinds Lake Reservoir and 70 mm to the Cat Arm Reservoir.

There were multiple outages on the Bay d'Espoir units throughout the month of October 2023. Bay d'Espoir Unit 1 was taken offline on October 8, 2023 for a planned outage and remained offline for the remainder of the month. Bay d'Espoir Unit 2 was taken offline on October 16, 2023 and remained offline for the rest of the month.[4] Bay d'Espoir Unit 6 was offline from the start of the month until October 7, 2023, at which point the unit was returned to service for the remainder of the month. Bay d'Espoir Unit 7 was also taken offline for a planned outage on October 11, 2023, returning to service on October 15, 2023.

The Upper Salmon Hydroelectric Generating Station ("Upper Salmon Station") outage continued in October 2023, with the unit remaining offline for the full month.[5]

Figure 1 plots the 2022 and 2023 storage levels, minimum storage limits, maximum operating level storage, and 20-year average aggregate storage for comparison.

[4] Bay d'Espoir Units 1 and 2 returned to service on November 10 and November 9, 2023, respectively.
[5] Upper Salmon Station's release for service is currently estimated for the end of November 2023.

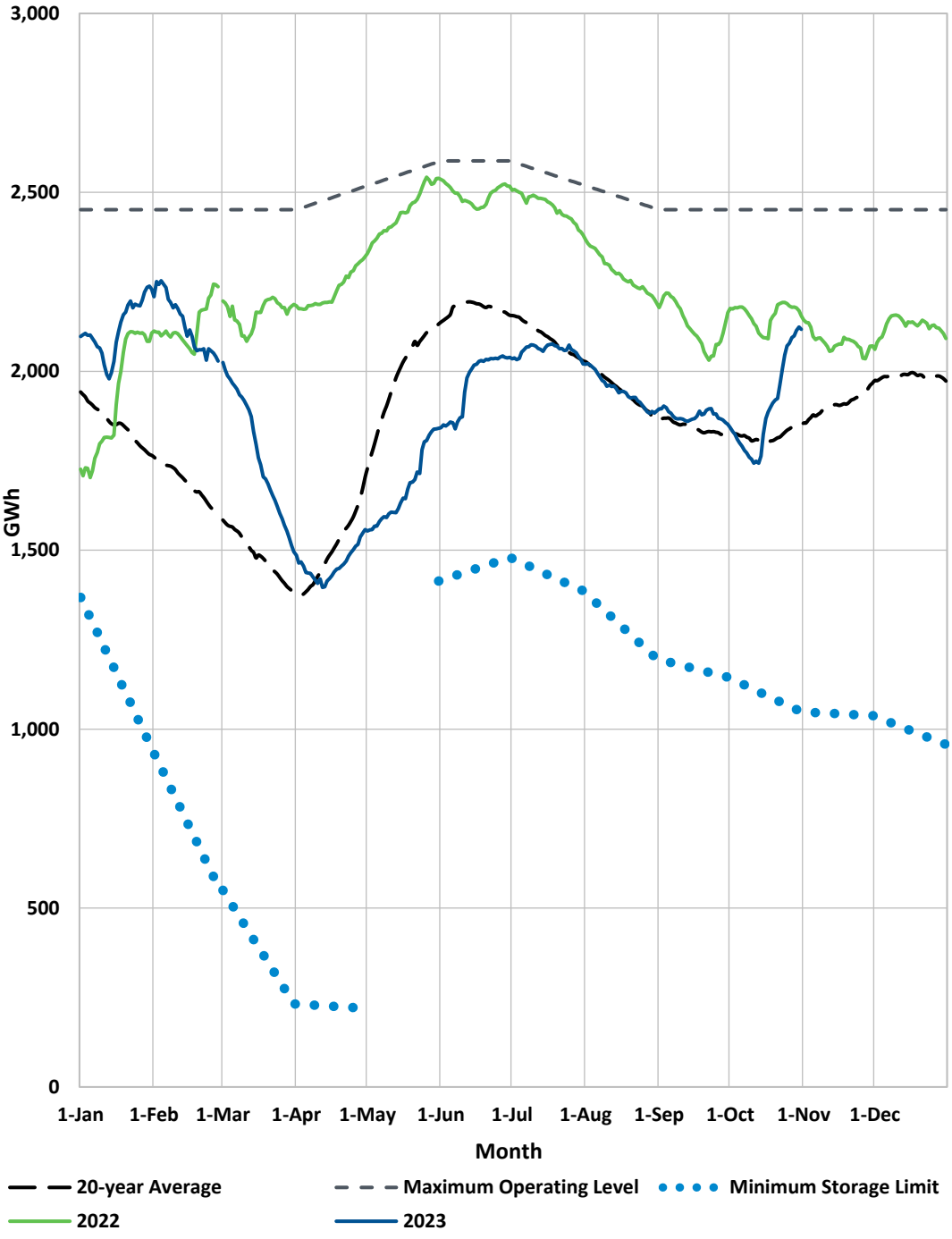

Figure 1: Total System Energy Storage[6]

[6] Data points in Figure 1 represent storage at the beginning of each day. Table 1 reports the end-of-day storage values, which results in a small difference between the storage data presented in Table 1 and Figure 1.

2.1 Ponding

In Order No. P.U. 49(2018),[7] the Board approved Hydro's application for approval of a Pilot Agreement for the Optimization of Hydraulic Resources ("Pilot Agreement").[8] The intent of the Pilot Agreement is to optimize Hydro's hydraulic resources through the strategic use of its storage capabilities, taking advantage of the variability of energy pricing in external markets over time.

Appendix A provides a log of imported and exported energy transactions under the Pilot Agreement during the month. No ponding imports or exports occurred in October 2023.

2.2 Spill Activity

Bypass flows at North Salmon Spillway continued throughout October 2023 to support Long Pond Reservoir storage while the unit at the Upper Salmon Station is offline. Bypass at this location is expected to continue until the unit at the Upper Salmon Station is released for service, currently estimated for the end of November 2023. Spill was not required at any additional locations in October 2023.

A summary of the amount spilled or bypassed in both MCM[9] and GWh for October 2023 as well as year-to-date ("YTD") totals are provided in Table 2. Appendix A provides a log of spill avoidance export transactions during the month.[10] Energy exports to mitigate spill were not required in October 2023.

Table 2: Spill Activity[11]

	Burnt Dam Spillway		Granite Canal Bypass		Upper Salmon Bypass		Cat Arm Spillway	
	MCM	**GWh**	**MCM**	**GWh**	**MCM**	**GWh**	**MCM**	**GWh**
31-Oct-2023	0	0	0	0	351.3	45.8	0	0
YTD Total	**122.7**	**80.8**	**19.8**	**1.9**	**3206.6**	**418.1**	**40.7**	**36.6**

[7] *Public Utilities Act*, RSNL 1990, c P-47, Board Order No. P.U. 49(2018), Board of Commissioners of Public Utilities, December 18, 2018.
[8] The Third Amended and Restated Pilot Agreement for the Optimization of Hydraulic Resources was approved as per *Public Utilities Act*, RSNL 1990, c P-47, Board Order No. P.U. 35(2022), Board of Commissioners of Public Utilities, December 16, 2022.
[9] Million cubic metres ("MCM").
[10] Pursuant to the Pilot Agreement, exporting when system load is low allows for sustained generation from Island hydraulic facilities and the utilization of water (energy) that would have otherwise been spilled, while not increasing the risk of spill elsewhere in the system.
[11] Numbers may not add due to rounding.

3.0 Production and Purchases

Appendix B provides a breakdown of power purchases, including the import and export activity over the LIL and Maritime Link, and production by plant during October 2023. There was no Corner Brook Pulp and Paper Limited ("CBPP") energy repaid to Energy Marketing in October 2023.

4.0 Thermal Production

Two Holyrood Thermal Generating Station ("Holyrood TGS") units were online for generation requirements during October 2023 and total energy production from the Holyrood TGS was 41.6 GWh during the month. The operating hours for the Holyrood TGS and the Hardwoods, Stephenville, and Holyrood Gas Turbines are summarized in Table 3. Standby generation was not required to support reservoir storage. Operation of the Hardwoods gas turbine was for testing purposes.

Table 3: Holyrood TGS and Gas Turbines Operating Hours

	Operating Hours	Synch Condense Hours	Available Hours
Holyrood TGS			
Unit 1	552.8	0	552.8
Unit 2	0	0	0
Unit 3	97.2	378.5	475.7
Gas Turbines			
Hardwoods	1.4	666.1	667.5
Stephenville	0	0	0
Holyrood	0	0	744

5.0 Unit Deratings

Unit 1 at the Holyrood TGS was returned to service on October 8, 2023 after completion of the planned annual maintenance outage. The unit remained online for the month of October 2023 but was derated to 122 MW as a result of various issues, such as fuel oil contamination and flame scanner issues. To date, the fuel oil contamination has improved and has not resulted in any interruptions to service. Hydro is managing the situation by completing additional maintenance as required and through controlling the consumption of fuel oil from Tank 2. Load constraint issues were further impacted by a shortage of functioning flame scanners. Hydro successfully completed this upgrade in early November 2023, and all 12 burners in the Unit 1 boiler are now available.

Unit 2 at the Holyrood TGS was offline on a forced extension to the planned annual maintenance outage for the entire month of October 2023. This is a result of cracking discovered on the low pressure turbine blades.

Unit 3 at the Holyrood TGS was operating in synchronous condenser mode until October 16, 2023 when it was taken offline to complete the changeover to generation mode. On October 24, 2023, during start-up activities, the east forced draft fan motor failed. The unit was returned to service on October 27, 2023 but limited to 50 MW because of the fan motor failure. The unit remained derated to 50 MW for the remainder of October 2023 while the motor vendor worked to restore the motor. The expected return to service of the unit is November 27, 2023.

The Hardwoods Gas Turbine was available for the full month of October 2023 with the exception of a planned maintenance outage from October 16 to 22, 2023 to complete maintenance activities.

The Holyrood Gas Turbine was available at full capacity for the entire month of October 2023.

The Stephenville Gas Turbine remained unavailable during the full month of October 2023 due to damage to the generator resulting from the failure of a generator cooling fan. The onsite work to repair the generators started in late October 2023. The exact return to service date remains unknown, but is currently estimated to be January 2024.

Appendix A

Ponding and Spill Transactions

Table A-1: Ponding Transactions[1]

Date	Ponding Imports (MWh)	Ponding Exports (MWh)	Ponding Imports Purchased by Hydro (MWh)	Transfer of Pond Balance to Spill Avoidance (MWh)	Energy Losses to Export (MWh)	Cumulative Ponded Energy (MWh)
Opening Balance						-
Total[2]	-	-	-	-	-	

Table A-2: Avoided Spill Energy[1]

Date	Avoided Spill Exports (MWh)	Energy Losses to Export (MWh)	Transfer of Pond Balance to Spill Avoidance (MWh)	Cumulative Avoided Spill Energy (MWh)
Opening Balance				**73,427**
Total[2]	-	-	-	

[1] Numbers may not add due to rounding.
[2] As of October 31, 2023.

Appendix B

Production and Purchases

Table B-1: Generation and Purchases (GWh)[1]

	October 2023	YTD October 2023
Hydro Generation (Hydro)		
Bay d'Espoir		
Unit 1	10.1	380.1
Unit 2	20.8	386.8
Unit 3	32.6	269.6
Unit 4	21.2	208.8
Unit 5	19.3	184.3
Unit 6	18.9	182.3
Unit 7	54.0	616.0
Subtotal Bay d'Espoir	176.9	2,227.8
Upper Salmon	0.0	108.9
Granite Canal	25.3	209.3
Hinds Lake	28.9	337.2
Cat Arm		
Unit 1	30.6	301.2
Unit 2	27.3	331.8
Subtotal Cat Arm	57.9	633.1
Paradise River	3.8	25.2
Star Lake	0.0	107.3
Rattle Brook	1.5	13.7
Nalcor Exploits	53.2	526.8
Mini Hydro	0.0	0.0
Total Hydro Generation (Hydro)	**347.5**	**4,189.2**
Thermal Generation (Hydro)		
Holyrood TGS		
Unit 1	37.4	188.2
Unit 2	0.0	200.8
Unit 3	4.2	130.4
Subtotal Holyrood TGS Units	41.6	519.5
Holyrood Gas Turbine and Diesels	0.0	15.1
Hardwoods Gas Turbine	0.0	1.6
Stephenville Gas Turbine	0.0	1.5
Other Thermal	0.1	0.5
Total Thermal Generation (Hydro)	**41.7**	**538.1**
Purchases		
Requested Newfoundland Power and Vale CBPP	0.0	0.1
Capacity Assistance	0.0	0.0
Firm Energy Power Purchase Agreement	0.0	0.0
Secondary	2.4	25.4
Co-Generation	1.9	32.2
Subtotal CBPP	4.2	57.6
Wind Purchases	13.8	141.6
Maritime Link Imports[2]	0.0	0.2
New World Dairy	0.1	1.8
LIL Imports[3]	293.2	2,200.0
Maritime Link Exports[4,5]	223.2	1,580.6
Net LIL Delivery to IIS[6]	70.0	619.4
Total Purchases	**311.4**	**2,401.3**
Total[7]	**700.6**	**7,128.7**

[1] Gross generation.
[2] Includes energy flows as a result of purchases and inadvertent energy.
[3] Includes purchases as a result of testing activity as well as deliveries that are then exported over the Maritime Link.
[4] Totals include the provision of emergency and inadvertent energy to Nova Scotia Power Inc., provision of the Nova Scotia Block, the Supplemental Block, and export activity conducted by Energy Marketing including the export of CBPP repaid energy and spilled energy on Hydro's behalf.
[5] Physical delivery of the Nova Scotia Block will only occur when the LIL is online and able to transfer power. CBPP energy repaid to Energy Marketing may be used to supply the Nova Scotia Block while the LIL is offline.
[6] Net energy delivered to the Island Interconnected System is less than the total energy delivery to Hydro under the Muskrat Falls Power Purchase Agreement because of transmission losses on the LIL.
[7] Actuals reflect rounded values to the nearest tenth of a GWh. Differences between total versus addition of individual components due to rounding.