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April 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: Cheryl Blundon
Director Corporate Services and Board Secretary

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

April 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, as contained in Hydro's Quarterly 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 March 2023.

2.0 System Hydrology

Reservoir inflows in March 2023 were approximately 72% below the month's historical average.[1] 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-Mar-2023	1,483	2,178	1,384	232	2,452	60

The aggregate reservoir storage level on March 31, 2023 was 1,483 GWh, which is 40% below the seasonal maximum operating level and 539% above the minimum storage limit.[2] Weather conditions were dry across the Island, with low precipitation and below freezing temperatures in all watersheds

[1] Calculated in terms of energy (gigawatt hours).

[2] 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, maximum generation at the Holyrood Thermal Generating Station ("Holyrood TGS"), and non-firm imports. 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.

throughout most of the month. Inflows to the Bay d'Espoir System overall were 77% below the month's historical average.

A snow survey of the watersheds was attempted from March 6 to 9, 2023 but weather conditions were unsafe for travel by helicopter during all scheduled survey days. No snow water equivalent data was collected in March as a result. Another survey was scheduled for April 3 to 6, 2023.

The Upper Salmon generating unit was taken offline for a planned inspection on March 6, 2023. Hydro Generation reported on March 10, 2023 that release of the Upper Salmon unit was delayed because of issues identified during the rotor/rim inspection. Long Pond reservoir storage was sharply declining while the Upper Salmon unit was offline as inflows throughout winter mainly come from the turbine flow at the Upper Salmon Generating Station. Preparations to release water at the North Salmon Spillway and bypass Upper Salmon were subsequently undertaken, and bypass flows at North Salmon Spillway began on March 13, 2023 after a visual survey of the downstream area by helicopter was completed. The Upper Salmon generating unit was scheduled to have an outage from June 11, 2023 to September 29, 2023 for stator realignment, and Hydro Generation communicated that the Upper Salmon unit would remain offline until that planned outage is complete. Bypass flows at North Salmon Spillway continued for the remainder of the month to support Long Pond reservoir storage and is expected to continue until the Upper Salmon generating unit is released for service.

Bay d'Espoir Unit 1 was taken offline for a planned outage on March 21, 2023 and released for service later that day. The Paradise River generating unit was taken offline for a planned outage on March 26, 2023 with a scheduled completion date of April 7, 2023.

Energy exports to mitigate spill were not required. The ponding balance at the end of March 2023 remained at 0 GWh.[3]

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

[3] Pursuant to the Pilot Agreement for the Optimization of Hydraulic Resources, exporting when system load is low allowed 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.

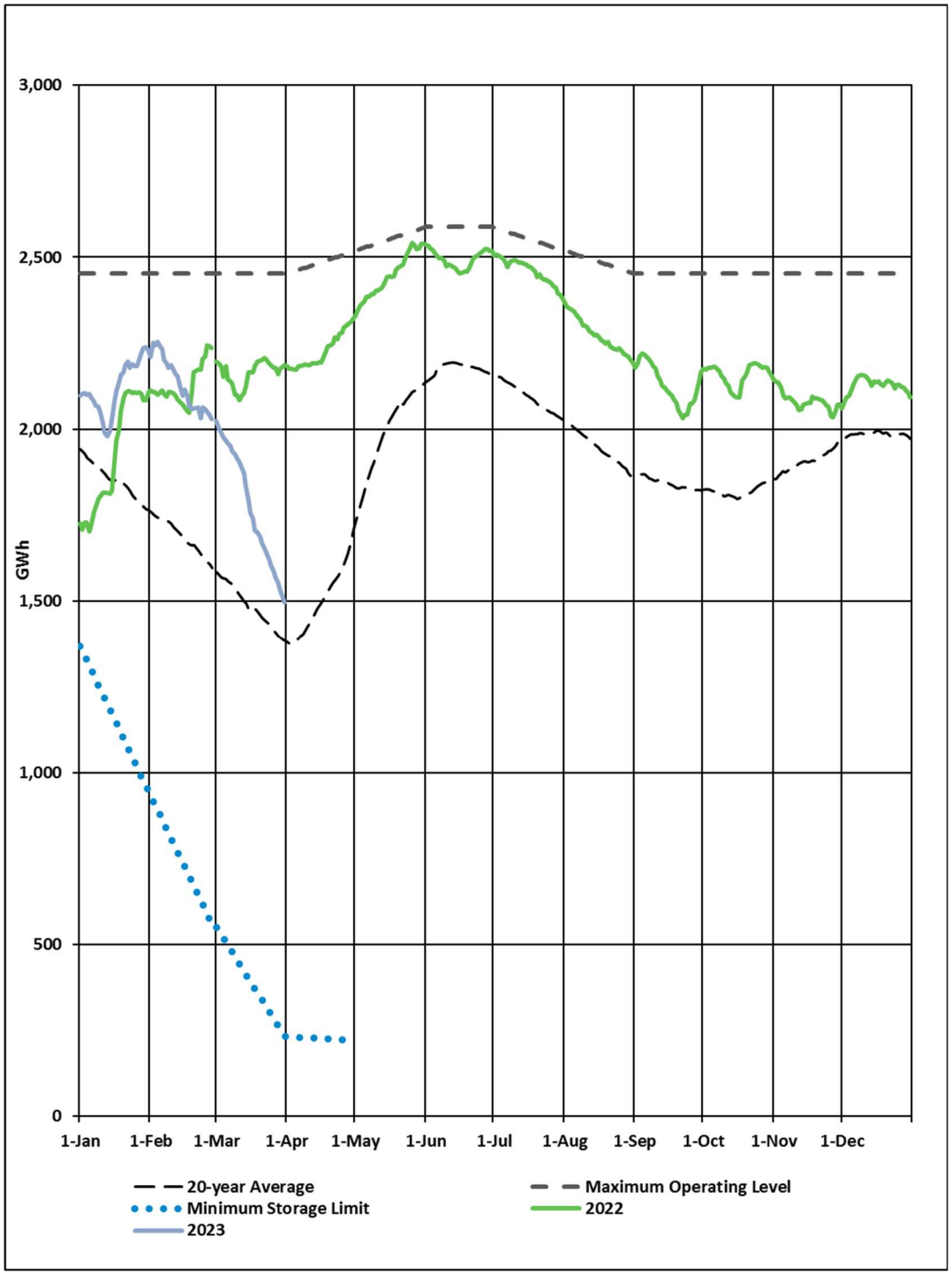

Figure 1: Total System Energy Storage[4]

[4] 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.

3.0 Production and Purchases

Appendix A provides a breakdown of power purchases, including imports, and production by plant during March 2023.

4.0 Thermal Production and Imports

All three units at the Holyrood TGS were required to generate in March 2023 for system requirements. Total energy production from the Holyrood TGS units and standby units was 140.0 GWh and 0.4 GWh, respectively. Standby generation was not required to support reservoir storage. Holyrood TGS and gas turbine operating hours are summarized in Table 2.

Table 2: Holyrood TGS and Gas Turbine Operating Hours

	Operating Hours	Synch Condense Hours	Available Hours
Holyrood TGS			
Unit 1	576.5	-	576.5
Unit 2	744	-	744
Unit 3	744	-	744
Gas Turbines			
Hardwoods	3.0	741	744
Stephenville	5.3	-	744
Holyrood	6.3	-	744

Table 3 summarizes the Muskrat Falls energy deliveries, ponding activity, Corner Brook Pulp and Paper Limited ("CBPP") energy repaid to Energy Marketing, and emergency supply to Nova Scotia in March 2023.

Table 3: Muskrat Falls Energy Deliveries and Export Activity

	Energy (GWh)
Muskrat Falls Energy Deliveries	
Muskrat Falls Power Purchase Agreement (Hydro)	55.6
Nova Scotia Block and Supplemental Energy[5]	104.1
Energy Marketing Bulk Surplus Exports[6]	0.8
Ponding Activity	
Ponding Exports	0.0
Ponding Balance	0.0
Other Activity	
CBPP Energy repaid to Energy Marketing	0.0
Emergency Supply to Nova Scotia[7]	0.0

5.0 Unit Deratings

Unit 1 at the Holyrood TGS experienced electrical issues during the month of February 2023 and Unit 1 encountered multiple forced outages. Investigation of these issues continued in March 2023. Unit 1 encountered additional forced outages from March 1 to 2, 2023 and March 5 to 12, 2023. Two failed resistors in the electrical system were identified as the root cause. The failed resistors were replaced and Unit 1 was returned to service on March 12, 2023; it remained online throughout the remainder of the month. On March 27, 2023, the west cooling water pump on Unit 1 failed resulting in a derating to 90 MW. Electricians repaired the cables at a junction box and this pump was returned to service with removal of the derating on April 1, 2023. Units 2 and 3 were online with full capability for the entire month of March 2023.

The Hardwoods, Stephenville, and Holyrood Gas Turbines were available at full capacity for the entire month of March 2023.

[5] Nova Scotia Block and Supplemental Energy quantities are reflected at the point of commercial transaction.
[6] Energy Marketing has updated its reporting of Bulk Surplus Exports and CBPP energy repaid to Energy Marketing. The Bulk Surplus Exports figure now reports only Muskrat Falls energy exported to external markets. CBPP Energy repaid to Energy Marketing continues to be reported separately.
[7] Under the Interconnection Operators Agreement between Hydro and Nova Scotia Power.

Appendix A

Production and Purchases

Table A-1: Generation and Purchases[1]

	March 2023 (GWh)	Year-to-Date 2023 (GWh)
Hydro Generation (Hydro)		
Bay d'Espoir		
Unit 1	43.3	127.9
Unit 2	43.4	127.1
Unit 3	42.6	125.0
Unit 4	34.3	108.7
Unit 5	32.9	98.9
Unit 6	37.5	116.3
Unit 7	97.1	284.5
Subtotal Bay d'Espoir	331.1	988.3
Upper Salmon	10.9	108.9
Granite Canal	21.4	65.8
Hinds Lake	48.8	113.0
Cat Arm		
Unit 1	40.1	95.1
Unit 2	41.4	99.6
Subtotal Cat Arm	81.4	194.6
Paradise River	1.7	9.2
Star Lake	13.0	36.4
Rattle Brook	0.2	1.8
Nalcor Exploits	52.5	158.7
Mini Hydro	0.0	0.0
Total Hydro Generation (Hydro)	**561.0**	**1,676.7**
Thermal Generation (Hydro)		
Holyrood TGS		
Unit 1	37.1	111.4
Unit 2	50.4	154.1
Unit 3	52.5	116.6
Subtotal Holyrood TGS Units	140.0	382.1
Holyrood Gas Turbine and Diesels	0.3	12.9
Hardwoods Gas Turbine	0.0	1.4
Stephenville Gas Turbine	0.0	1.3
Other Thermal	0.1	0.3
Total Thermal Generation (Hydro)	**140.3**	**398.1**
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	2.0	6.8
Co-Generation	4.6	12.7
Subtotal CBPP	6.6	19.5
Wind Purchases	20.6	53.4
Maritime Link Imports[2]	0.0	0.2
New World Dairy	0.3	0.8
LIL Imports[3]	154.4	530.3
Maritime Link Exports[4, 5]	103.7	331.7
Net LIL Delivery to IIS[6]	50.7	198.7
Total Purchases	**181.8**	**604.4**
Total[7]	**883.2**	**2,679.1**

[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 spilled energy on Hydro's behalf.
[5] Physical delivery of the Nova Scotia Block will typically only occur when the Labrador-Island Link ("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 ("IIS") is less than the total energy purchased by 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.