Newfoundland and Labrador Hydro
Hydro Place. 500 Columbus Drive
P.O. Box 12400. St. John's. NL
Canada A1B 4K7
t. 709.737.1400 I f. 709.737.1800
nlhydro.com

March 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 February 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
SAW/kd.sk

Encl.

ecc:

Board of Commissioners of Public Utilities
Jacqui H. Glynn
PUB Official Email

Consumer Advocate
Dennis M. Browne, KC, Browne Fitzgerald Morgan Avis & Wadden
Stephen F. Fitzgerald, Browne Fitzgerald Morgan Avis & Wadden
Sarah G. Fitzgerald, Browne Fitzgerald Morgan Avis & Wadden
Bernice Bailey, Browne Fitzgerald Morgan Avis & Wadden
Bernard M. Coffey, KC

Linde Canada Inc.
Sheryl E. Nisenbaum
Peter Strong

Newfoundland Power Inc.
Dominic J. Foley
Lindsay S.A. Hollett
Regulatory Email

Teck Resources Limited
Shawn Kinsella

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

Monthly Energy Supply Report for the Island Interconnected System

February 2023

March 17, 2023

A report to the Board of Commissioners of Public Utilities

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List of Appendices

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 February 2023.

2.0 System Hydrology

Reservoir inflows in February 2023 were approximately 9% above 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 (%)
28-Feb-2023	2,000	2,195	1,597	560	2,452	82

The aggregate reservoir storage level on February 28, 2023 was 2,000 GWh, which is 18% below the seasonal maximum operating level and 257% above the minimum storage limit.[2] There were no major precipitation events in February and daily average temperatures below freezing for all areas except along the Bay d'Espoir System on February 20 and 21, 2023, when 30 to 60 mm of mixed precipitation

[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.

fell and temperatures peaked at 5 to 6°C. Inflows to the Bay d'Espoir System overall were 10% above the month's historical average.

Generation prioritization continued along the Bay d'Espoir System with all plants maximized to the extent possible while reservoir levels remained high. There were some generation reductions required at the Granite Canal Hydroelectric Generating Station ("Granite Canal") and the Upper Salmon Hydroelectric Generating Station ("Upper Salmon") to manage the risks associated with frazil ice during extreme cold conditions. Generation increased at the Cat Arm Hydroelectric Generating Station ("Cat Arm") on February 9, 2023 both to manage the rate of decline in Long Pond and lower reservoir levels at Cat Arm in preparation for the spring runoff. Energy exports to mitigate spill were not required in February 2023.

Spill releases from the Burnt Dam Spillway that began on January 16, 2023 ended on February 2, 2023. Bypass releases from North Salmon Dam Spillway that began on January 16, 2023 ended on February 1, 2023. At the end of February 2023, the ponding balance remained at 0 GWh.[3]

A brief outage (less than one hour duration) occurred at Granite Canal on February 21, 2023 to modify protection settings.

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.

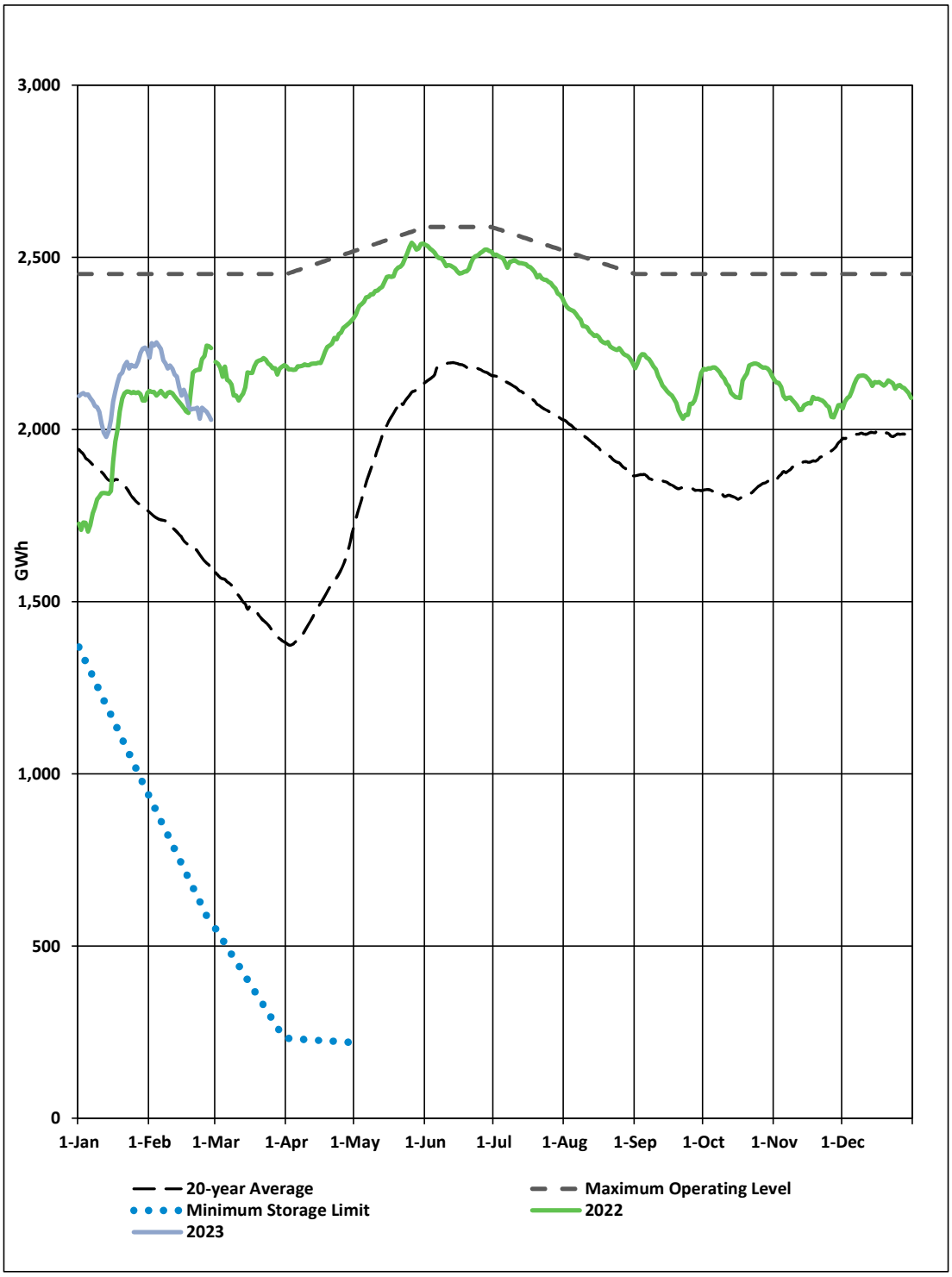

Figure 1: Total System Energy Storage[4]

[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 February 2023.

4.0 Thermal Production and Imports

All three units at the Holyrood TGS were required to generate in February 2023 for system requirements; however, various conditions required each of the three units to undergo multiple outages throughout the month, see Section 5.0 for more details. Unit 1 at the Holyrood TGS operated for a total of 293.5 hours throughout the month, Unit 2 for a total of 640.8 hours, and Unit 3 for a total of 359.0 hours. Total energy production from the Holyrood TGS during February 2023 was 113.1 GWh.

Standby units operated for a total of 269.8 hours during the month to support system requirements. Total standby production during the month was 11.6 GWh. Standby generation was not required to support reservoir storage. During February 2023, the Hardwoods and Stephenville Gas Turbines were also operated in sync condense mode for 621.5 and 47.1 hours, respectively.

Table 2 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 February 2023.

Table 2: Muskrat Falls Energy Deliveries and Export Activity

	Energy (GWh)
Muskrat Falls Energy Deliveries	
Muskrat Falls Power Purchase Agreement (Hydro)	126.7
Nova Scotia Block and Supplemental Energy[5]	127.0
Energy Marketing Bulk Surplus Exports[6]	0.1
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]	0.4

[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.

5.0 Unit Deratings

Unit 1 at the Holyrood TGS tripped offline on February 1, 2023 with a failed potential transformer on the generator. The failed components were replaced and the unit was returned to service on February 5, 2023; however, unit voltages were unstable overnight, indicating that the issue had not been resolved. Unit 1 was removed from service on February 6, 2023 for further investigation. On February 7, 2023, additional work was completed to resolve the issue and the unit was once again returned to service. It operated normally with full capability until February 16, 2023 when related issues again developed and the unit was removed from service. An investigation by Electrical Engineering continued for the remainder of the month with additional short periods of operation to further the investigation. From February 26, 2023 to March 1, 2023, Unit 1 was online and able to supply high load during the peak periods that occurred from February 23, 2023 to March 1, 2023. The unit was removed from service on March 1, 2023 and investigation is ongoing with assistance from the original equipment manufacturer and other industry experts.

On February 14, 2023, Unit 2 at the Holyrood TGS was taken offline due to a valve packing leak on the east boiler feed pump discharge valve. This issue was corrected and the unit was returned to service on February 15, 2023 with full capability. The unit tripped on February 17, 2023 due to an issue with the main fuel oil trip valve settings. The valve positioner was adjusted and the unit was returned to service with full capability later on the same day.

On February 6, 2023, Unit 3 at the Holyrood TGS was taken offline due to a boiler tube leak; repairs were made and the unit was returned to service on February 18, 2023 with full capability. On February 21, 2023, the unit was removed from service to repair a combustion air leak on an expansion joint; repairs were made to the unit and it was returned to service on February 22, 2023 with full capability.

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

The Hardwoods Gas Turbine was available at full capacity for the entire month of February 2023, with the exception of a unit outage on February 2, 2023 to replace a vibration probe on one of the generator bearings. The unit was derated by 50% on February 4, 2023 due to a failed ignitor lead on End A and again on February 24, 2023 to investigate a potential fuel leak on End B.

The Stephenville Gas Turbine was available at full capacity for the entire month of February 2023, with the exception of a 50% derating on February 2, 2023 due to a failed igniter lead on End A.

Appendix A

Production and Purchases

Table A-1: Generation and Purchases[1]

	February 2023 (GWh)	Year-to-Date 2023 (GWh)
Hydro Generation (Hydro)		
Bay d'Espoir		
Unit 1	40.2	84.5
Unit 2	40.0	83.6
Unit 3	39.3	82.4
Unit 4	36.5	74.4
Unit 5	33.7	65.9
Unit 6	37.6	78.8
Unit 7	89.4	187.4
Subtotal Bay d'Espoir	316.7	657.1
Upper Salmon	45.2	98.0
Granite Canal	19.9	44.4
Hinds Lake	33.9	64.2
Cat Arm		
Unit 1	31.3	55.0
Unit 2	32.2	58.2
Subtotal Cat Arm	63.5	113.2
Paradise River	2.9	7.5
Star Lake	10.9	23.4
Rattle Brook	0.4	1.5
Nalcor Exploits	48.2	106.2
Mini Hydro	0.0	0.0
Total Hydro Generation (Hydro)	**541.5**	**1,115.7**
Thermal Generation (Hydro)		
Holyrood TGS		
Unit 1	22.6	74.3
Unit 2	59.3	103.8
Unit 3	31.3	64.1
Subtotal Holyrood TGS Units	113.1	242.1
Holyrood Gas Turbine and Diesels	10.3	12.6
Hardwoods Gas Turbine	0.6	1.4
Stephenville Gas Turbine	0.6	1.3
Other Thermal	0.0	0.3
Total Thermal Generation (Hydro)	**124.8**	**257.8**
Purchases		
Requested Newfoundland Power and Vale CBPP	0.1	0.1
Capacity Assistance	0.0	0.0
Firm Energy Power Purchase Agreement	0.0	0.0
Secondary	2.8	4.8
Co-Generation	3.7	8.1
Subtotal CBPP	6.6	12.9
Wind Purchases	16.5	32.8
Maritime Link Imports[2]	0.0	0.2
New World Dairy	0.3	0.5
LIL Imports[3]	244.5	376.0
Maritime Link Exports[4, 5]	127.9	228.0
Net LIL Delivery to IIS[6]	116.6	148.0
Total Purchases	**267.9**	**422.5**
Total[7]	**934.2**	**1,796.0**

[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.