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July 31, 2024

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: Quarterly Report on Asset Performance in Support of Resource Adequacy for the Twelve Months Ended June 30, 2024

Please find enclosed Newfoundland and Labrador Hydro's ("Hydro") Quarterly Report on Asset Performance in Support of Resource Adequacy for the Twelve Months Ended June 30, 2024.[1]

Should you have any questions, please contact the undersigned.

Yours truly,

NEWFOUNDLAND AND LABRADOR HYDRO

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

Encl.

ecc:

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[1] Formerly titled "Quarterly Report of Generating Units for the Twelve Months Ended []".

Quarterly Report on Asset Performance in Support of Resource Adequacy

For the Twelve Months Ended June 30, 2024

July 31, 2024

A report to the Board of Commissioners of Public Utilities

newfoundland labrador hydro

Contents

List of Appendices

1.0 Introduction

In this report, Newfoundland and Labrador Hydro ("Hydro") provides data on forced outage rates of its generating facilities and the Labrador-Island Link ("LIL"). The data provided pertains to historical forced outage rates and assumptions Hydro uses in its assessments of resource adequacy. This report covers the performance for the current 12-month reporting period of July 1, 2023 to June 30, 2024 ("current period").

This report contains forced outage rates for the current period for individual generating units at regulated hydraulic facilities,[1] the Holyrood Thermal Generating Station ("Holyrood TGS"), Hydro's gas turbines, and the non-regulated Muskrat Falls Hydroelectric Generating Facility ("Muskrat Falls Facility"). In addition, equivalent forced outage rates are provided for the 900 MW LIL.[2] This report also provides, for comparison purposes, the individual asset forced outage rates for the 12-month reporting period of July 1, 2022 to June 30, 2023 ("previous period"). Further, total asset class data is presented based on the calendar year for the ten most recent years—2014 to 2023—with the exception of the Muskrat Falls Facility[3] and the LIL.[4]

The forced outage rates of Hydro's generating units are calculated using two measures:

1) Derated adjusted forced outage rate ("DAFOR") for the continuous (base-loaded) units; and

2) Derated adjusted utilization forced outage probability ("DAUFOP") for the standby units.

DAFOR is a metric that measures the percentage of time that a unit or group of units is unable to generate at its maximum continuous rating due to forced outages or unit deratings. The DAFOR for each unit is weighted to reflect differences in generating unit sizes to provide a company total and reflect the relative impact a unit's performance has on overall generating performance. This measure is applied to

[1] Regulated hydraulic facilities include the Bay d'Espoir Hydroelectric Generating Facility ("Bay d'Espoir Facility" or "BDE"), the Cat Arm Hydroelectric Generating Station ("Cat Arm Station" or "CAT"), the Hinds Lake Hydroelectric Generating Station ("Hinds Lake Station" or "HLK"), the Upper Salmon Hydroelectric Generating Station ("Upper Salmon Station" or "USL"), the Granite Canal Hydroelectric Generating Station ("Granite Canal Station" or "GCL"), and the Paradise River Hydroelectric Generating Station ("Paradise River Station" or "PRV").
[2] The LIL has been commissioned and is currently rated at 700 MW. Hydro is now planning to execute the 900 MW pole overload test late in the fall of 2024 when higher system load conditions will next be present.
[3] The final generating unit at the Muskrat Falls Facility was released for commercial operation on November 25, 2021. Annual DAFOR performance data is available beginning in 2022.
[4] The LIL was officially commissioned on April 13, 2023. Annual equivalent forced outage rate ("EqFOR") data will not be available until 2024 year end.

hydraulic units and, historically, was used for the thermal units; however, it does not apply to gas turbines because of their operation as standby units and their relatively low operating hours.

DAUFOP is a metric that measures the percentage of time that a unit or group of units will encounter a forced outage and not be available when required. DAUFOP is a measure primarily used for gas turbines; however, this measure will be applicable to the thermal units as their operation moves towards standby operation in the future. This metric includes the impact of unit deratings.

The forced outage rates include outages that remove a unit from service completely as well as instances when units are derated. If a unit's output is reduced by more than 2%, the unit is considered derated under Electricity Canada guidelines. These guidelines require that the derated levels of a generating unit be calculated by converting the operating time at the derated level into an equivalent outage time.

As the LIL is not a generating unit, the above noted forced outage rate measures do not apply to this asset. Instead, Hydro has determined an appropriate metric to be an EqFOR to measure the performance of this asset as it relates to the supply of electricity to the Island. This EqFOR measures the percentage of time that the LIL bipole in unable to deliver its maximum continuous rating[5] to the Island due to forced outages, derates, or unplanned monopole outages. The effect of deratings and unplanned monopole outages is converted to equivalent bipole outage time using the same methodology as outlined above for generating units.

In addition to forced outage rates, this report provides details for those outages which occurred in the current period that contributed materially to forced outage rates exceeding those used in Hydro's resource adequacy planning analysis for both the near and long term.

[5] The LIL maximum continuous rating is 700 MW at present.

2.0 Assumptions Used in Hydro's Assessment of System Reliability and Resource Adequacy

Hydro continually assesses the reliability of its system and its ability to meet customer requirements, filing both near- and long-term assessments with the Board of Commissioners of Public Utilities.[6]

As part of the ongoing *Reliability and Resource Adequacy Study Review* proceeding, Hydro detailed the process undertaken for determining the forced outage rates most appropriate for use in its near-term reliability assessments and long-term resource adequacy analysis. Table 1 and Table 2 summarize the most recent forced outage rate assumptions, as determined using the forced outage rate methodology.[7] Forced outage rate assumptions will be re-evaluated on an annual basis to incorporate the most recent data available.

Table 1: Hydro's Reliability and Resource Adequacy Study Analysis Values – Generating Units (%)

Asset Type	Measure	Near-Term Analysis Value	Resource Planning Analysis Value
Hydraulic: Regulated	DAFOR	3.90	3.03
Hydraulic: Muskrat Falls	DAFOR	3.88	3.03
Thermal	DAUFOP	20.00[8]	20.00
Gas Turbines			
Happy Valley	DAUFOP	4.65	4.65
Hardwoods and Stephenville	DAUFOP	30.00	30.00
Holyrood	DAUFOP	4.90	4.90

A three-year, capacity-weighted average was applied to the regulated hydraulic units (Bay d'Espoir Facility, Cat Arm Station, Hinds Lake Station, Granite Canal Station, Upper Salmon Station, and Paradise River Station) for a near-term analysis, resulting in a DAFOR of 3.90%, while a ten-year, capacity-weighted average was applied for use in the long-term resource planning model, resulting in a DAFOR of

[6] Hydro currently files an assessment of near-term system reliability and resource adequacy annually in November, the Near-Term Reliability Report. Hydro also files an assessment of longer-term system reliability and resource adequacy. The most recent filing was the "2024 Resource Adequacy Plan: An Update to the Reliability and Resource Adequacy Study," Newfoundland and Labrador Hydro, July 9, 2024, ("2024 Resource Plan").
[7] Values indicated for Hydro's near-term analysis reflect those used in the 2024 Resource Plan and the "Reliability and Resource Adequacy Study Review – 2023 Near-Term Reliability Report – November Report," Newfoundland and Labrador Hydro, November 15, 2023 ("November 2023 Near-Term Report").
[8] The Holyrood TGS base assumption is 20.00%. The sensitivity assumption is 34.00%. A sensitivity value of 34.00% was chosen to reflect actual performance at the Holyrood TGS for the 2021–2022 winter operating period.

3.03%. The DAFOR value was based on historical data reflective of Hydro's maintenance program over the long-term.

For the Muskrat Falls Facility, the near-term Forced Outage Rate was based on the forced outage rates of the units to date, to reflect the possibility of outages early in the lifetime of the Muskrat Falls Facility. In the long-term resource planning model, the regulated hydroelectric forced outage rate was used, as it is assumed that these assets will be maintained to the same standards as the remainder of the hydraulic fleet.

Historically, forced outage rates for the three units at the Holyrood TGS have been reported using the DAFOR metric, which is predominately used for units that operate in a continuous (base-loaded) capacity. As presented in Hydro's RRA Study 2022 Update,[9] there are reliability concerns associated with the operation of the units at the Holyrood TGS in a standby capacity. When considering standby or peaking operations of units at the Holyrood TGS, DAFOR is no longer the most appropriate measure of forced outage rates; instead, UFOP[10] and DAUFOP should be considered. Given the frequency of deratings historically experienced by these units, DAUFOP is a more appropriate measure.

Analyses performed for a range of Holyrood TGS DAUFOP assumptions indicate the sensitivity of supply adequacy to changes in the availability of the Holyrood TGS. From this analysis, a DAUFOP of 20.00% was recommended in the near-term, with a sensitivity value of 34.00%. Hydro will continue to analyze the operational data to ensure that forced outage rate assumptions for the Holyrood TGS are appropriate.

At present time, the operation of the units at the Holyrood TGS remains base-loaded to ensure the availability of capacity for the power system, as the LIL is recently commissioned and in the early operational stages. This will remain the case as Hydro continues to monitor LIL performance and reliability. If the LIL is found to perform well for an extended period, and system conditions permit, Hydro will have the opportunity to incrementally remove the Holyrood TGS units from service. To

[9] "Reliability and Resource Adequacy Study – 2022 Update," Newfoundland and Labrador Hydro, October 3, 2022 ("RRA Study 2022 Update"). <http://www.pub.nl.ca/applications/NLH2018ReliabilityAdequacy/correspondence/From%20NLH%20-%20Reliability%20and%20Resource%20Adequacy%20Study%20-%202022%20Update%20-2022-10-03.PDF>.
[10] Utilization forced outage probability ("UFOP").

ensure alignment with the assumptions used in the resource planning model (PLEXOS)[11] while appropriately reporting on current period versus historical performance, Hydro will continue to use the DAFOR performance measure and the 20.00% forced outage rate for the units at the Holyrood TGS.

As the combustion turbines (also refered to as "gas turbines") in the existing fleet vary in age and condition, each was considered on an individual basis. For the Happy Valley Gas Turbine, a three-year, capacity-weighted average was applied to the unit for the near-term analysis while a ten-year capacity-weighted average was applied for use in the resource planning model. The DAUFOP values were based on historical data to reflect the unit's past performance. For the Holyrood Gas Turbine the DAUFOP was calculated based on a scenario-based approach rather than historical data, due to the unit's minimal operating time and resultant small data set. For the Hardwoods and Stephenville Gas Turbines, a fixed DAUFOP consistent with values considered in Hydro's previous near-term reliability reports was used for the near-term and long-term analyses.[12] As presented in Hydro's 2024 Resource Plan, the Hardwoods and Stephenville Gas Turbines are proposed for retirement in 2030.

Now that the LIL is commissioned, multiple years of operational experience are required to better inform the long-term selection of a bipole forced outage rate. In the interim, the bipole forced outage rate will be addressed with a range of upper and lower limits as additional scenarios in the analysis, currently 10% and 1%, respectively. As LIL performance statistics become available in the coming years, the forced outage rate range may be narrowed. However, the current base-case assumption is a 5% LIL forced outage rate.

Table 2: Hydro's Reliability and Resource Adequacy Study Analysis Values – LIL (%)

Asset Type	Measure	Base Planning Analysis Value	Range of Planning Analysis Values
LIL	EqFOR	5	1–10

[11] The resource planning model does not differentiate between DAFOR and DAUFOP metrics; rather, it applies a forced outage rate only.
[12] "Reliability and Resource Adequacy Study Review – 2023 Near-Term Reliability Report – November Report," Newfoundland and Labrador Hydro, November 15, 2023.

3.0 Current Period Overview

As shown Table 3, regulated hydraulic DAFOR and the Muskrat Falls Facility DAFOR performance improved for the current period, while the thermal DAFOR performance declined for the current period, when compared to the previous period.

Table 3: DAFOR and DAUFOP Overview (%)

Asset Type	Measure	1-Jul-2022 to 30-Jun-2023	1-Jul-2023 to 30-Jun-2024	Near-Term Planning Analysis Value	Resource Planning Analysis Value
Hydraulic: Regulated	DAFOR	5.25	4.24	3.90	3.03
Hydraulic: Muskrat Falls Facility	DAFOR	3.74	0.42	3.88	3.03
Thermal	DAFOR/DAUFOP[13]	11.78	48.69[14]	20.00	20.00
Gas Turbines					
Hardwoods/Stephenville	DAUFOP	7.12	55.23	30.00	30.00
Happy Valley	DAUFOP	10.97	19.12	4.65	4.65
Holyrood	DAUFOP	2.54	3.36	4.90	4.90

The DAUFOP performance for the Hardwoods and Stephenville Gas Turbines, the Happy Valley Gas Turbine, and the Holyrood Gas Turbine have all declined in the current period compared to the previous period. Table 4 presents LIL data for the current period only; data is not available for the previous period as it was operating in a pre-commissioned state. Since the previous filing, the performance of the LIL has remained consistent, with no significant impacts to the EqFOR as a result of any operational events that have occurred.

[13] The resource planning model does not differentiate between DAFOR and DAUFOP; rather, it requires the selection of a forced outage rate percentage.

[14] The thermal DAFOR/DAUFOP in the current period has been significantly impacted by the forced outage extension experienced by Holyrood Unit 2, which lasted approximately eight months. This forced extension, in addition to the regularly scheduled annual outage and stand-by time, has resulted in minimal operation of the unit in the current period, further impacting the thermal DAFOR/DAUFOP. The experience with Unit 2 is expected to be an outlier and should not impact future planning.

Table 4: EqFOR Overview (%)

Asset Type	Measure	1-Jul-2022 to 30-Jun-2023	1-Jul-2023 to 30-Jun-2024	Base Planning Analysis Value	Range of Planning Analysis Values
LIL	EqFOR	N/A[15]	2.79[16]	5	1–10

4.0 Hydraulic Unit DAFOR Performance – Regulated Hydro

Detailed results for the current period and the previous period are presented in Table 5 and Chart 1. These results are compared to Hydro's near-term and resource planning analysis values for forced outage rates, as used in the 2024 Resource Plan and the November 2023 Near-Term Report. Any individual unit with forced outage rates which exceed the established near-term and/or resource planning analysis values is discussed herein.

Table 5: Hydraulic Weighted DAFOR – Regulated Hydro

Generating Unit	Maximum Continuous Unit Rating (MW)	12 Months Ended Jun 2023 (%)	12 Months Ended Jun 2024 (%)	Near-Term Analysis Value (%)	Resource Planning Analysis Value (%)
All Hydraulic Units – Weighted	**954.4**	**5.25**	**4.24**	**3.90**	**3.03**
Hydraulic Units					
BDE Unit 1	76.5	0.00	0.00	3.90	3.03
BDE Unit 2	76.5	0.15	0.00	3.90	3.03
BDE Unit 3	76.5	0.00	2.54	3.90	3.03
BDE Unit 4	76.5	0.18	0.23	3.90	3.03
BDE Unit 5	76.5	28.33	4.32	3.90	3.03
BDE Unit 6	76.5	0.00	34.39	3.90	3.03
BDE Unit 7	154.4	0.00	0.00	3.90	3.03
CAT Unit 1	67	0.00	1.02	3.90	3.03
CAT Unit 2	67	0.19	0.00	3.90	3.03
HLK Unit	75	0.17	0.88	3.90	3.03
USL Unit	84	35.55	15.93	3.90	3.03
GCL Unit	40	0.65	2.57	3.90	3.03
PRV Unit	8	0.00	0.30	3.90	3.03

[15] The LIL was not commissioned until April 14, 2023.
[16] This EqFOR is calculated on a base LIL capacity of 700 MW. On a base capacity of 900 MW, the EqFOR is calculated to be approximately 4.27%. Following the completion of the 900 MW test, all calculations will be adjusted to reflect the change in assumptions.

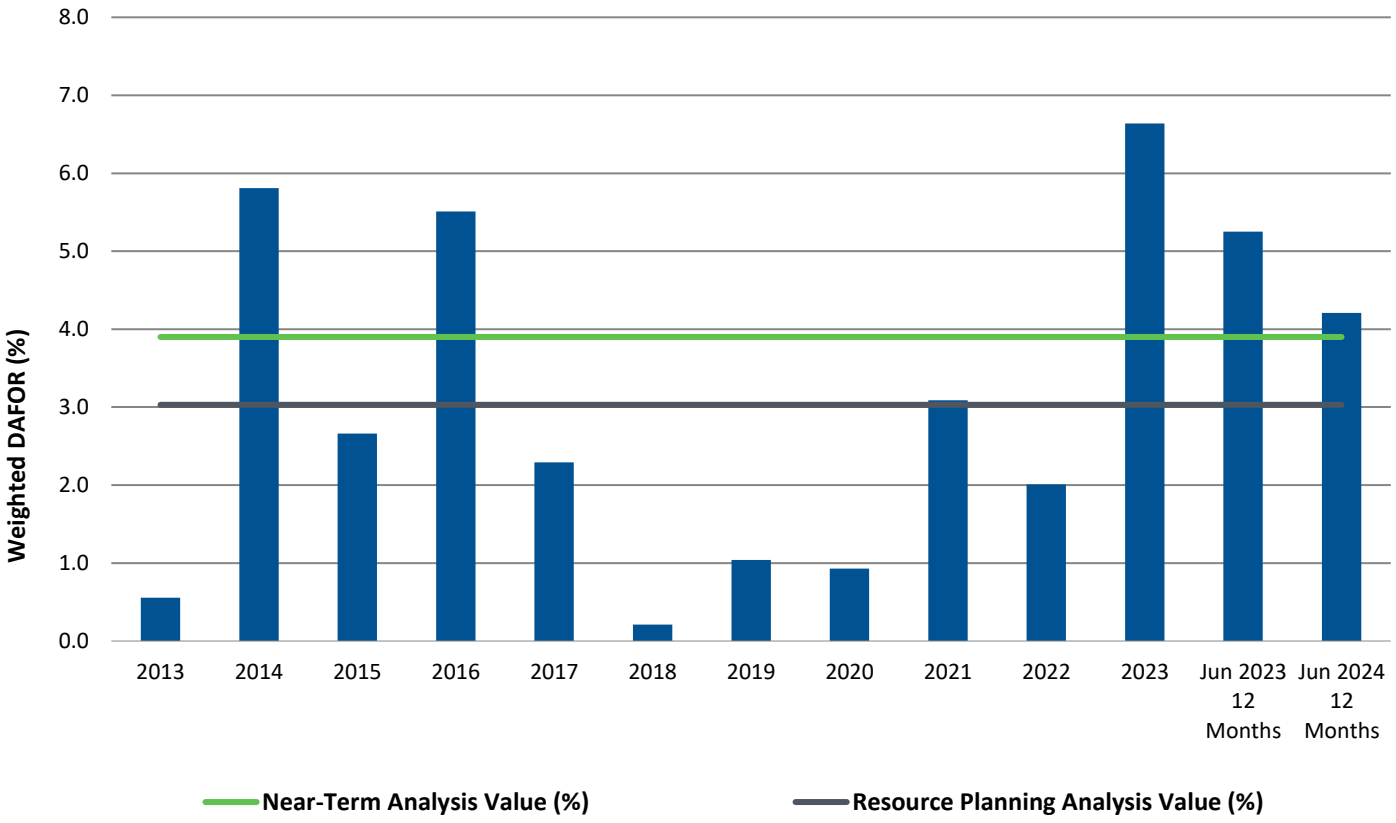

Chart 1: Hydraulic Weighted DAFOR – Regulated Hydro

4.1 Bay d'Espoir Facility

4.1.1 Bay d'Espoir Unit 5

Considering individual hydraulic unit performance, the Bay d'Espoir Unit 5 DAFOR of 4.32% is above the resource planning analysis value of 3.03% and is above the near-term planning analysis value of 3.90% for an individual hydraulic unit. The DAFOR was materially impacted in the current period by a forced extension to the planned annual outage, which occurred in May 2024.

During the scheduled inspection of Bay d'Espoir Penstock 3 and Surge Tank 3, which supply water to Units 5 and 6, significant deterioration of the floor of the surge tank bowl was discovered in several areas. This deterioration resulted in thickness readings below the acceptable criteria, with steel plating absent and concrete exposed, causing external seepage.[17] Without rectifying this issue, this seepage

[17] Exposed concrete creates a path for water to exit the transition area between the surge tank and the penstock, causing external seepage.

would continue to migrate from the surge tank, washing away critical bedding material, and increasing the risk of surge tank collapse. To mitigate this risk to the surge tank and penstock downstream, steel plates were installed over the exposed areas and seal welding was completed in the outer welds of the floor. This refurbishment was completed in May 2024, with Unit 5 returning to service on May 25, 2024;[18] the originally scheduled return to service date was May 18, 2024.

4.1.2 Bay d'Espoir Unit 6

Considering individual hydraulic unit performance, the Bay d'Espoir Unit 6 DAFOR of 34.39% is above the resource planning analysis value of 3.03% and is above the near-term planning analysis value of 3.90% for an individual hydraulic unit. As previously reported, this increase in DAFOR was primarily the result of a forced outage on July 25, 2023, as a result of the failure of a bushing on Transformer T6 ("T6"). This transformer was removed and a suitable spare transformer was installed in its place. The unit was successfully synchronized to the system for testing and released for normal service on October 7, 2023. An investigation into the cause of this transformer failure, as well as the previous failure of Transformer T5 ("T5")[19] in Bay d'Espoir has been completed; and, leveraging the support of industry experts, Hydro has proactively began implementing identified corrective actions to mitigate the risk of additional failures.

Since the previous filing, the unit experienced an additional outage that also resulted in material impacts to the DAFOR performance. During the planned annual inspection of Bay d'Espoir Unit 6 in May 2024, it was discovered that damage had occurred to the stator winding in approximately 15 locations. This winding was newly installed in 2022, with necessary warranty inspections completed in 2023. Subsequent inspection determined that a bolt had become liberated from the rotor assembly sometime between the 2023 warranty inspection and the most recent 2024 inspection, resulting in the damage observed on the stator. Following the discovery of this damage, Hydro contacted the original equipment manufacturer ("OEM") of the winding and engaged them to complete necessary inspection work to determine the extent of damage and to present Hydro with options, both short-term and long-term, to return the unit to operation without negatively impacting the life expectancy of this newly

[18] The work completed in the surge tank floor also impacted the return to service of Bay d'Espoir Unit 6. However, as discussed in Section 4.1.2, the return to service of Unit 6 was also impacted by damage to the stator, which resulted in a prolonged outage extension.
[19] Bay d'Espoir T5 had previously experienced a similar failure, resulting in a forced outage to Bay d'Espoir Unit 5 from July 3, 2022 to September 4, 2022. The required investigations into the failures of both T5 and T6 are being completed in parallel.

commissioned asset. This report resulted in the recommendation that in the short-term, to return the unit to service and allow the necessary preparation time for a larger work scope, all affected stator bars be repaired. This work was completed in May 2024 by internal resources with OEM oversight, with the unit returned to operation on May 30, 2024.

Given the new age of this asset, the extent of damage and the significant operational stresses imposed on the damaged bars, the appropriate long-term solution recommended by the OEM to prevent premature aging and failure of the asset is to proceed with the replacement of approximately 10 stator bars at the next available outage opportunity. A scheduled outage on Unit 6 commenced on July 5, 2024 to complete approved capital replacement work in the switchyard to replace a circuit breaker (B3T6). This outage offers an opportunity for Hydro to complete the replacement of these stator bars, without impacting generation availability. Hydro has commenced the work necessary to replace the affected stator bars, with the unit expected to return to service in August 2024.

4.2 Upper Salmon Station

The Upper Salmon Station unit DAFOR of 15.93% is above the resource planning analysis value of 3.03% and is above the near-term planning analysis value of 3.90% for an individual hydraulic unit. This increase in DAFOR was the result of a forced extension of a planned outage that occurred on March 10, 2023. Hydro has previously reported, in the November 2023 Near-Term Report, that this unit has experienced ongoing issues with the rotor rim keys and guidance block assemblies and that life extension activities were required to be completed prior to the unit returning to service.

An application was approved to undertake additional work to address the required life extension activities;[20] this work commenced in May 2023 with all work completed and the unit successfully returned to service on December 12, 2023.

A required inspection to assess the ongoing effectiveness of work completed in 2023 was completed on April 23, 2024, and yielded no findings of concern. Hydro is required to complete one additional inspection during the scheduled annual maintenance outage in late 2024.

[20] The "Application for Approval for Rotor Rim Shrinking and Stator Recentering at the Upper Salmon Hydroelectric Generating Station," Newfoundland and Labrador Hydro, April 26, 2022 was approved as per *Public Utilities Act,* RSNL 1990, c P-47, Board Order No. P.U. 18(2022), Board of Commissioners of Public Utilities, May 20, 2022.

5.0 Hydraulic Unit DAFOR Performance – Muskrat Falls

Detailed results for the current period and the previous period are presented in Table 6 and Chart 2. These results are compared to Hydro's near-term and resource planning analysis values for forced outage rates, as used in the 2024 Resource Plan and the November 2023 Near-Term Report. Any individual unit with performance that does not meet the established near-term and/or resource planning analysis values is discussed herein. Overall, the plant performance for Muskrat Falls Facility shows improvement over the previous period.

Table 6: Hydraulic Weighted DAFOR – Muskrat Falls

Generating Unit	Maximum Continuous Unit Rating (MW)	12 Months Ended Jun 2023 (%)	12 Months Ended Jun 2024 (%)	Near-Term Analysis Value (%)	Resource Planning Analysis Value (%)
Muskrat Falls Units - weighted	**824**	**3.74**	**0.42**	**3.88**	**3.03**
Muskrat Falls Units					
Muskrat Falls 1	206	5.24	0.37	3.88	3.03
Muskrat Falls 2	206	2.28	1.21	3.88	3.03
Muskrat Falls 3	206	4.41	0.11	3.88	3.03
Muskrat Falls 4	206	2.46	0.01	3.88	3.03

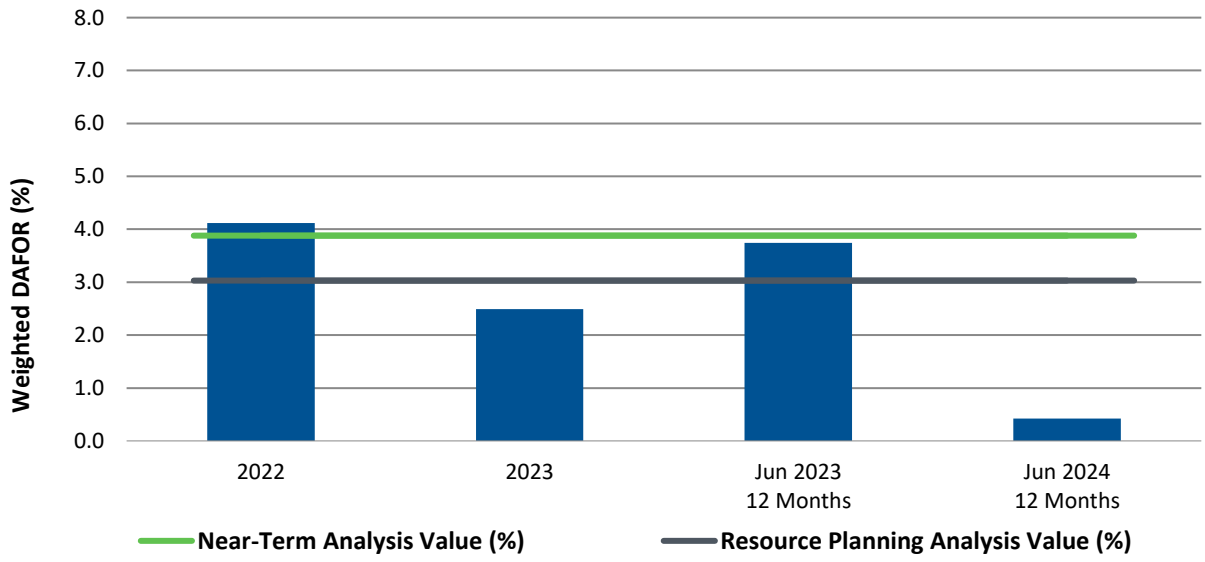

Chart 2: Hydraulic Weighted DAFOR – Muskrat Falls

6.0 Thermal Unit DAFOR Performance

Detailed results for the current and previous periods are presented in Table 7 and Chart 3. These results are compared to Hydro's near-term and resource planning analysis values for forced outage rates, as used in the 2024 Resource Plan and the November 2023 Near-Term Report.

Table 7: Thermal DAFOR

Generating Unit	Maximum Continuous Unit Rating (MW)	12 months Ended Jun 2023 (%)	12 months Ended Jun 2024 (%)	Near-Term Planning and Resource Planning Analysis Value (%)
All Thermal Units – Weighted	**490**	**11.78**	**48.69**	**20.00**
Thermal Units				
Holyrood TGS Unit 1	170	20.90	11.13	20.00
Holyrood TGS Unit 2	170	0.97	95.68	20.00
Holyrood TGS Unit 3	150	15.52	19.51	20.00

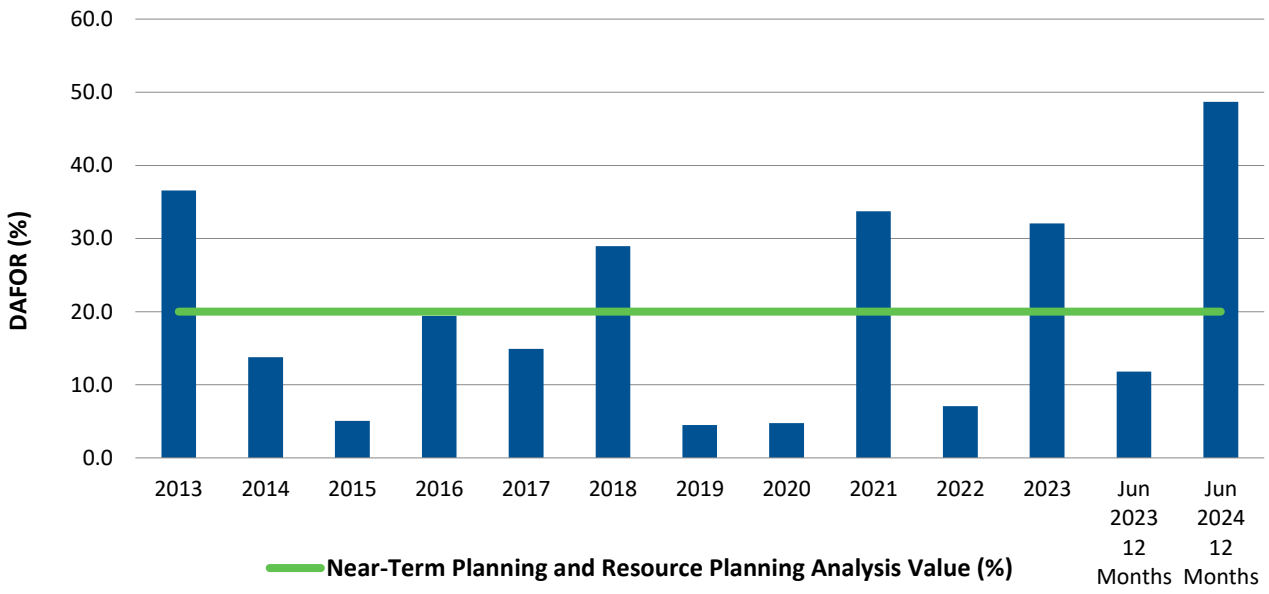

Chart 3: Thermal DAFOR

For the current period, the weighted DAFOR for all thermal units of 48.69% is above the 20.00% near-term and resource planning analysis values. The individual unit DAFOR outcome for the current period

of 11.13% for Unit 1 and 19.51% for Unit 3 at the Holyrood TGS is below the 20.00% analysis value. The performance of Unit 2 at the Holyrood TGS is further discussed in Section 6.1.

6.1 Holyrood TGS Unit 2

Considering individual thermal unit performance, the DAFOR of 95.68% for Unit 2 at the Holyrood TGS is above the near-term and resource planning analysis value of 20.00% for a unit at the Holyrood TGS; and shows a decline in performance over the previous period. This elevated DAFOR is a result of a forced extension to the planned unit outage to overhaul the Unit 2 turbine and replace the L-0 blades at the GE[21] shop in the United States.[22] Subsequent turbine rotor inspection at the GE shop identified additional and unexpected cracking on the L-1 blades, resulting in the required replacement of that set of blades.[23] The blades have been installed, and the turbine rotor was returned to site in December 2023. Upon evaluation, it was determined the journal bearings sustained damage during shipping and would require additional repair. The unit was reassembled in early 2024 and was officially released for service on May 17, 2024.

The elevated DAFOR in the current period has been significantly impacted by the aforementioned forced outage extension, which lasted approximately eight months. This forced extension, in addition to the regularly scheduled annual outage and stand-by time, has resulted in minimal operation of the unit in the current period, further elevating the DAFOR mathematically.

7.0 Gas Turbine DAUFOP Performance

DAUFOP Performance for the Hardwoods, Stephenville and Happy Valley Gas Turbines as well as the Holyrood Combustion Turbines for the period are presented in the charts and tables below.

[21] General Electric ("GE").
[22] Approved in Public Utilities Act, RSNL 1990, c P47, Board Order No. P.U. 17(2022), Board of Commissioners of Public Utilities, May 20, 2022.
[23] These are the low pressure next-to-last stage ("L-1") blades, a separate stage of blades from the last stage ("L-0") blades.

Table 8: Hardwoods/Stephenville Gas Turbine DAUFOP

Gas Turbine Units	Maximum Continuous Unit Rating (MW)	12 months Ended Jun 2023 (%)	12 months Ended Jun 2024 (%)	Near-Term Planning and Resource Planning Analysis Value (%)
Gas Turbines	**100**	**7.12**	**55.23**	**30.00**
SVL	50	10.98	96.29	30.00
HWD	50	2.67	10.37	30.00

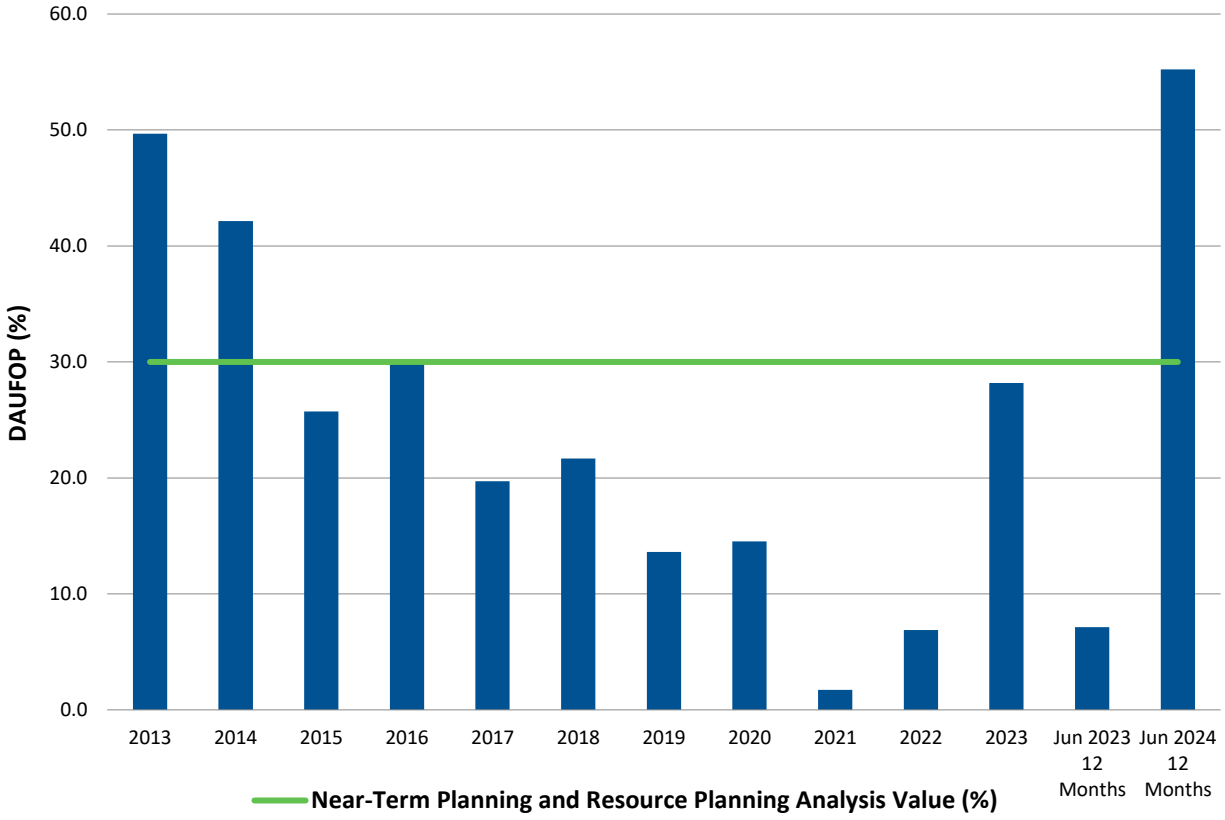

Chart 4: Gas Turbine DAUFOP: Hardwoods/Stephenville Units

The combined DAUFOP for the Hardwoods and Stephenville Gas Turbines was 55.23% for the current period, as shown in Table 8 and Chart 4. This is above the near-term and resource planning analysis value of 30.00%. The Stephenville Gas Turbine DAUFOP for the current period is 96.29%, which is above the near-term and resourcing planning assumption of 30.00%. The Hardwoods Gas Turbine DAUFOP for

the current period is 10.37%, which is below the near-term planning assumption of 30.00%. On a per-unit basis, both the Stephenville and Hardwoods Gas Turbines have declined in performance when compared to the previous period. The performance of the Stephenville Gas Turbine is discussed in Section 7.1.

Table 9: Happy Valley Gas Turbine DAUFOP

Gas Turbine Unit	Maximum Continuous Unit Rating (MW)	12 months Ended Jun 2023 (%)	12 months Ended Jun 2024 (%)	Near-Term Planning and Resource Planning Analysis Value (%)
Happy Valley	25	10.97	19.12	4.65

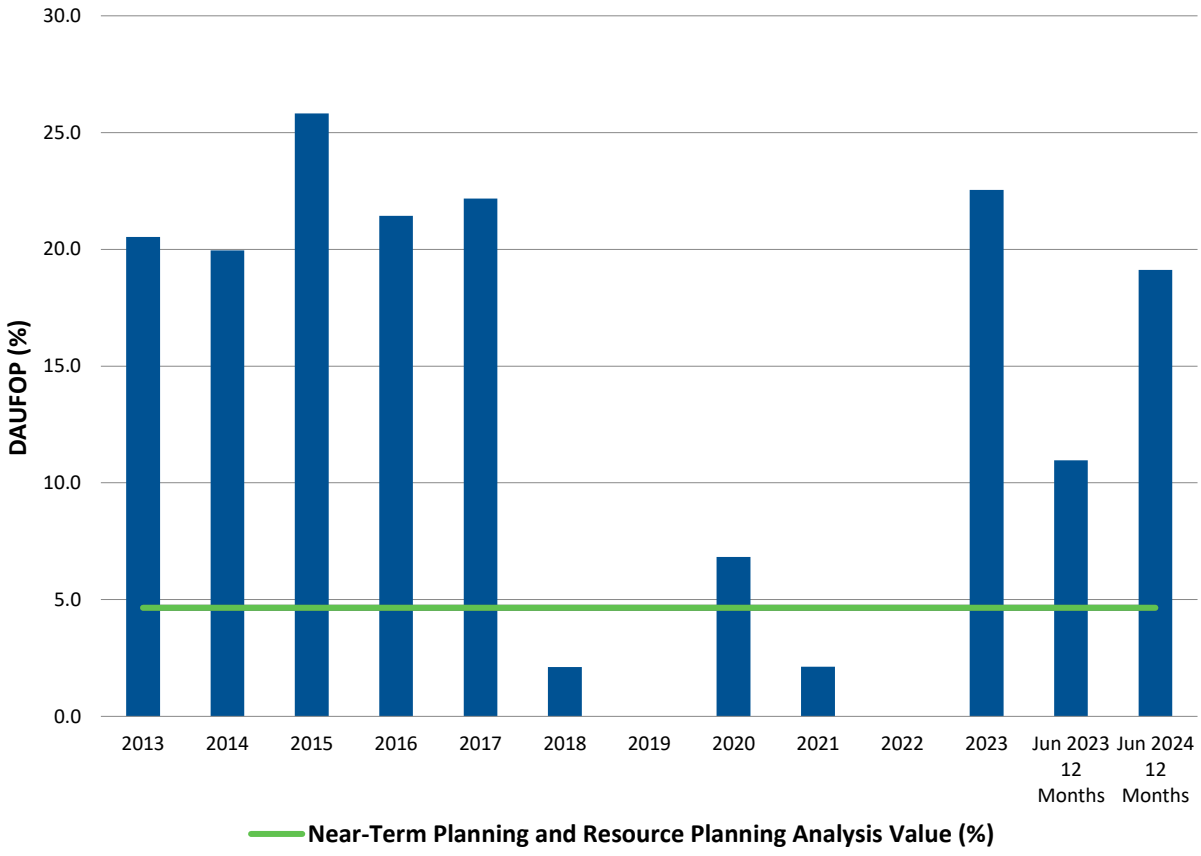

Chart 5: Gas Turbine DAUFOP: Happy Valley Unit

The DAUFOP for the Happy Valley Gas Turbine was 19.12% for the current period, as shown in Table 9 and Chart 5. This is above the near-term and resource planning analysis value of 4.65% and indicates a decline in performance over the previous period. The performance of the Happy Valley Gas Turbine is discussed in Section 7.2.

Table 10: Holyrood Gas Turbine DAUFOP

Combustion Turbine Unit	Maximum Continuous Unit Rating (MW)	12 Months Ended Jun 2023 (%)	12 Months Ended Jun 2024 (%)	Near-Term Planning and Resource Planning Analysis Value (%)
HRD	123.5	2.54	3.36	4.90

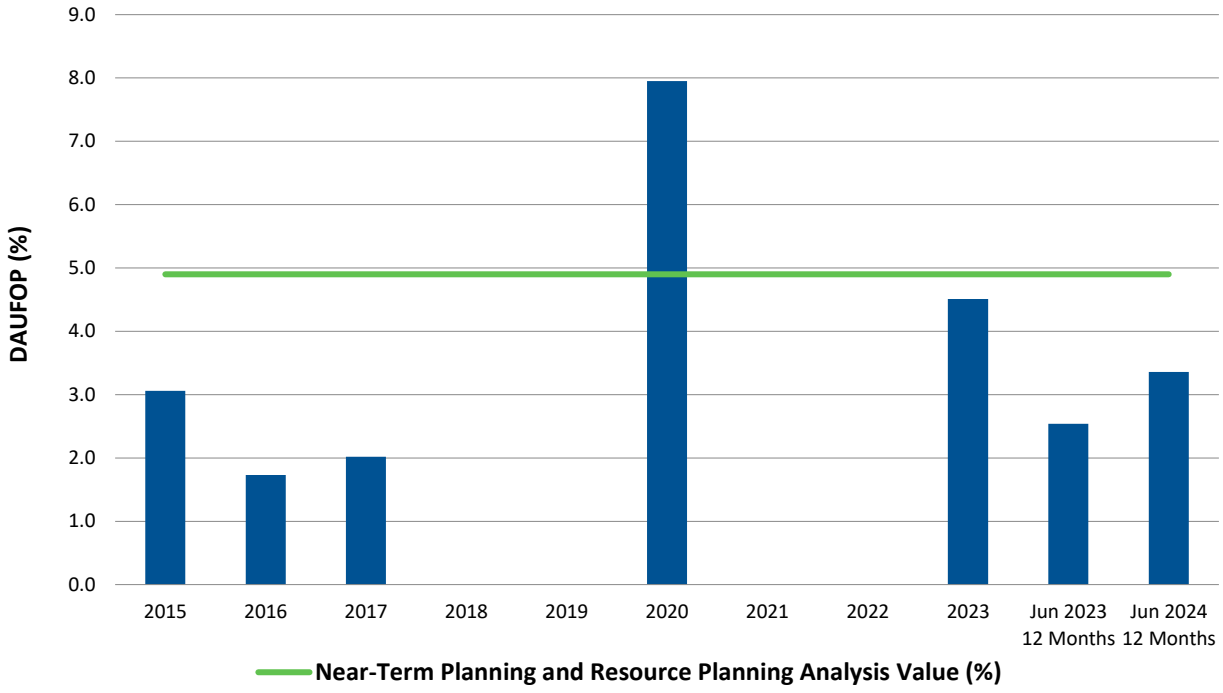

Chart 6: Combustion Turbine DAUFOP– Holyrood Unit

The Holyrood Combustion Turbine DAUFOP of 3.36% for the current period is below the near-term and resource planning analysis value of 4.90%, and indicated a decline in performance when compared to the previous period.

7.1 Stephenville Gas Turbine

The Stephenville Gas Turbine DAUFOP was 96.29% for the current period, which is above the near-term and resource planning analysis value of 30.00%. This decline in performance is a result of the failure of the alternator cooling fan, which occurred on July 14, 2023.[24]

An inspection was completed by the OEM who recommended that the alternator be removed from the unit. The rotor was removed from the alternator and sent to the OEM's facility in the United States where it underwent inspection and testing throughout December 2023. The rotor was returned to site in late February 2024 and was reinstalled in the unit on March 5, 2024. The exciter was also returned to site in mid-February 2024; however, it sustained damage during shipping and required additional repairs. The exciter was returned to site, following additional repairs, in early May 2024. The exciter has been installed and reassembly and realignment of the unit has continued through July 2024. Final assembly and commissioning of the unit is currently underway, with anticipated return to service by end of August 2024.

7.2 Happy Valley Gas Turbine

The Happy Valley Gas Turbine DAUFOP was 19.12% for the current period, which is above the near-term and resource planning analysis value of 4.65%. This decline in performance is a result of three forced outages, two of which occurred in the third quarter of 2023 and one in the first quarter of 2024 which were previously reported.[25,26] There have been no new forced outages since the previous filing.

[24] Additional information was provided in the "2023–2024 Winter Readiness Planning Report," Newfoundland and Labrador Hydro, December 11, 2023, sec. 2.2, p. 8 and sec. 7.4.1, p. 38. <http://www.pub.nl.ca/indexreports/winterreadiness/From%20NLH%20-%202023%E2%80%932024%20Winter%20Readiness%20Planning%20Report%20-%20Final%20Report%20-%202023-12-11.PDF>

[25] "Quarterly Report on Performance of Generating Units for the Twelve Months Ended September 30, 2023," Newfoundland and Labrador Hydro, October 30, 2023, sec. 6.2, pp. 14–15.

[26] Quarterly Report on Performance of Generating Units for the Twelve Months Ended March 31, 2024," Newfoundland and Labrador Hydro, April 30, 2024, sec. 7.2, p. 19.

8.0 Labrador-Island Link EqFOR Performance

The EqFOR for the LIL was 2.79% for the current period, as shown in Table 11. This is well within the range of values used by Hydro in the resource planning analysis scenarios. Additionally, it is below the base planning analysis value of 5.00%.

Table 11: LIL EqFOR (%)

Asset Type	Measure	1-Jul-2022 to 30-Jun-2023[27]	1-Jul-2023 to 30-Jun-2024	Base Planning Analysis Value	Range of Planning Analysis Values
LIL	EqFOR	N/A	2.79	5	1 – 10

The availability of the three Soldiers Pond synchronous condensers ("SC") is critical to the reliable delivery of electricity to the Island Interconnected System via the LIL. No operational issues concerning the Soldiers Pond SCs resulted in outages or derating to the LIL in the current period.

A fulsome update on the total number of hours of operation for the Soldiers Pond SCs for the rolling 12-month period is provided in in Appendix A of this report.

[27] EqFOR data is not available for the July 1, 2022 to June 30, 2023 period as Hydro began reporting EqFOR data post-commissioning.

Appendix A

Soldiers Pond Synchronous Condensers

Table A-1: Quarterly Rolling 12-Month Operating Hours for Soldiers Pond Synchronous Condensers

Unit	Operating Hours[28]
SC1	7,283.55
SC2	8,405.35
SC3	8,033.53

Hydro has historically provided Information on the operation of the Soldiers Pond SCs within the quarterly *Reliability and Resource Adequacy Study Review* – Labrador-Island Link Update.[29]

[28] Hydro has provided its best estimate of operating hours for each unit for the 12 months ending June 30, 2024 based on an assumption of 24/7 operation of all three SCs, and known outages (both planned and unplanned) recorded in its database.
[29] For Hydro's most recent update, please refer to "Reliability and Resource Adequacy Study Review – Labrador-Island Link Update for the Quarter Ended June 30, 2024", Newfoundland and Labrador Hydro, July 4, 2024.