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October 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 September 30, 2024**

Please find enclosed Newfoundland and Labrador Hydro's Quarterly Report on Asset Performance in Support of Resource Adequacy for the Twelve Months Ended September 30, 2024.<sup>1</sup>

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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<sup>1</sup> 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 September 30, 2024

October 31, 2024

A report to the Board of Commissioners of Public Utilities



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## 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 October 1, 2023 to September 30, 2024 (“current period”).

This report contains forced outage rates for the current period for individual generating units at regulated hydraulic facilities,<sup>1</sup> the Holyrood Thermal Generating Station (“Holyrood TGS”), Hydro’s combustion 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.<sup>2</sup> This report also provides, for comparison purposes, the individual asset forced outage rates for the 12-month reporting period of October 1, 2022 to September 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<sup>3</sup> and the LIL.<sup>4</sup>

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 combined total and reflect the relative impact a unit’s performance has on overall generating performance. This measure is applied to

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<sup>1</sup> 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”).

<sup>2</sup> The LIL has been commissioned and is currently rated at 700 MW. Hydro continues to plan to execute the 900 MW pole overload test late in the fall of 2024 when higher system load conditions will permit.

<sup>3</sup> 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.

<sup>4</sup> The LIL was officially commissioned on April 13, 2023. Annual equivalent forced outage rate (“EqFOR”) data will not be available until 2024 year end.

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

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

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

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

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

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<sup>5</sup> 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.<sup>6</sup>

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.<sup>7</sup> 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 <sup>8</sup>	20.00
Combustion 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

<sup>6</sup> 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, rev. 2 (originally filed July 9, 2024), (“2024 Resource Plan”).

<sup>7</sup> 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”).

<sup>8</sup> 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.

1 3.03%. The DAFOR value was based on historical data reflective of Hydro’s maintenance program over  
2 the long-term.

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

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

15 Analyses performed for a range of Holyrood TGS DAUFOP assumptions indicate the sensitivity of supply  
16 adequacy to changes in the availability of the Holyrood TGS. From this analysis, a Forced Outage Rate of  
17 20.00% was recommended in the near-term, with a sensitivity value of 34.00%. Hydro will continue to  
18 analyze the operational data to ensure that forced outage rate assumptions for the Holyrood TGS are  
19 appropriate.

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

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<sup>9</sup> “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>>.

<sup>10</sup> Utilization forced outage probability (“UFOP”).

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

4 As the combustion turbines in the existing fleet vary in age and condition, each was considered on an  
 5 individual basis. For the Happy Valley Gas Turbine, a three-year, capacity-weighted average was applied  
 6 to the unit for the near-term analysis while a ten-year capacity-weighted average was applied for use in  
 7 the resource planning model. The DAUFOP values were based on historical data to reflect the unit’s past  
 8 performance. For the Holyrood Combustion Turbine the DAUFOP was calculated based on a scenario-  
 9 based approach rather than historical data, due to the unit’s minimal operating time and resultant small  
 10 data set. For the Hardwoods and Stephenville Gas Turbines, a fixed DAUFOP consistent with values  
 11 considered in Hydro’s previous near-term reliability reports was used for the near-term and long-term  
 12 analyses.<sup>12</sup> As presented in Hydro’s 2024 Resource Plan, the Hardwoods and Stephenville Gas Turbines  
 13 are proposed for retirement in 2030.

14 Now that the LIL is commissioned, multiple years of operational experience are required to better  
 15 inform the long-term selection of a bipole forced outage rate. In the interim, the bipole forced outage  
 16 rate will be addressed with a range of upper and lower limits as additional scenarios in the analysis -  
 17 currently 10% and 1%, respectively. As LIL performance statistics become available in the coming years,  
 18 the forced outage rate range may be narrowed. However, the current base-case assumption is a 5% LIL  
 19 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

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<sup>11</sup> The resource planning model does not differentiate between DAFOR and DAUFOP metrics; rather, it applies a forced outage rate only.

<sup>12</sup> “Reliability and Resource Adequacy Study Review – 2023 Near-Term Reliability Report – November Report,” Newfoundland and Labrador Hydro, November 15, 2023.



### 1 **3.0 Current Period Overview**

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

**Table 3: DAFOR and DAUFOP Overview (%)**

Asset Type	Measure	1-Oct-2022 to 30-Sep-2023	1-Oct-2023 to 30-Sep-2024	Near-Term Planning Analysis Value	Resource Planning Analysis Value
Hydraulic: Regulated	DAFOR	6.30	2.17	3.90	3.03
Hydraulic: Muskrat Falls Facility	DAFOR	3.83	0.48	3.88	3.03
Thermal	DAFOR/DAUFOP <sup>13</sup>	13.26	47.78	20.00	20.00
Combustion Turbines					
Hardwoods/Stephenville	DAUFOP	19.66	51.19	30.00	30.00
Happy Valley	DAUFOP	21.58	7.07	4.65	4.65
Holyrood	DAUFOP	2.58	0.00	4.90	4.90

5 The DAUFOP performance for the Hardwoods and Stephenville Gas Turbines has declined in the current  
6 period, while the Happy Valley Gas Turbine and the Holyrood Combustion Turbine have improved in the  
7 current period, compared to the previous period.

8 Table 4 presents LIL data for the current period only; data is not available for the previous period as it  
9 was operating in a pre-commissioned state. Since the previous filing, the performance of the LIL has  
10 remained relatively consistent, with no significant impacts to the EqFOR because of any operational  
11 events that have occurred.

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

**Table 4: EqFOR Overview (%)**

Asset Type	Measure	1-Oct-2022 to 30-Sep-2023	1-Oct-2023 to 30-Sep-2024	Base Planning Analysis Value	Range of Planning Analysis Values
LIL	EqFOR	N/A <sup>14</sup>	3.28 <sup>15</sup>	5	1–10

## 1 **4.0 Hydraulic Unit DAFOR Performance – Regulated Hydro**

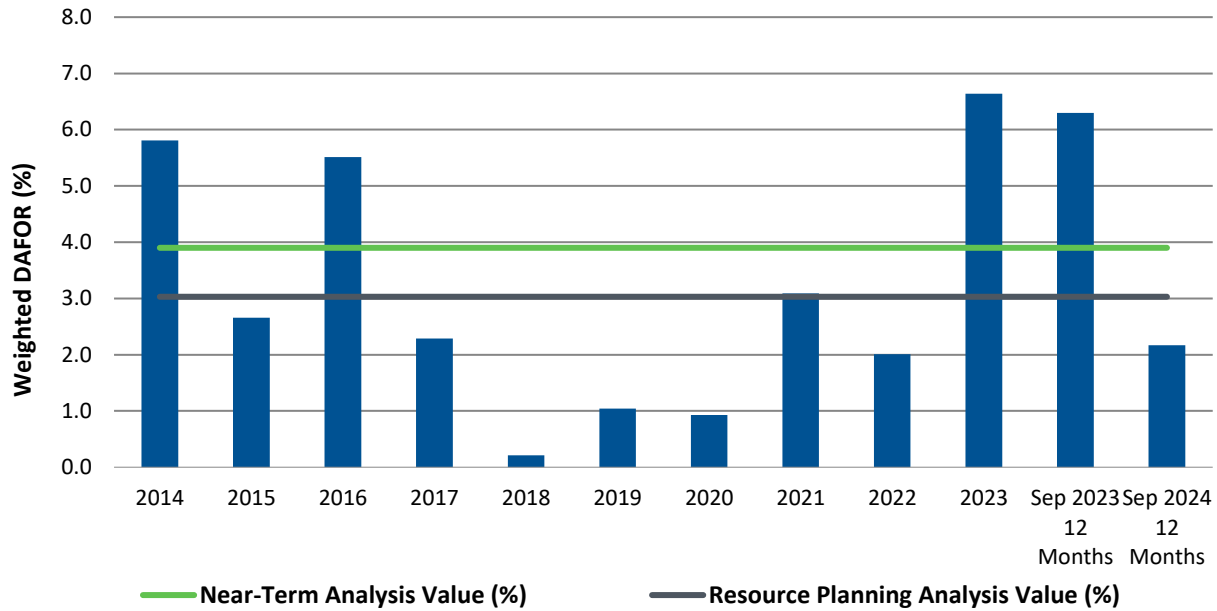
2 Detailed results for the current period and the previous period are presented in Table 5 and Chart 1.  
3 These results are compared to Hydro’s near-term and resource planning analysis values for forced  
4 outage rates, as used in the 2024 Resource Plan and the November 2023 Near-Term Report. Any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

**Table 5: Hydraulic Weighted DAFOR – Regulated Hydro**

Generating Unit	Maximum Continuous Unit Rating (MW)	12 Months Ended Sep 2023 (%)	12 Months Ended Sep 2024 (%)	Near-Term Analysis Value (%)	Resource Planning Analysis Value (%)
<b>All Hydraulic Units – Weighted</b>	<b>954.4</b>	<b>6.30</b>	<b>2.17</b>	<b>3.90</b>	<b>3.03</b>
<b>Hydraulic Units</b>					
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	2.64	3.90	3.03
BDE Unit 4	76.5	0.21	0.13	3.90	3.03
BDE Unit 5	76.5	0.00	3.83	3.90	3.03
BDE Unit 6	76.5	28.05	9.55	3.90	3.03
BDE Unit 7	154.4	0.00	3.87	3.90	3.03
CAT Unit 1	67	0.00	1.06	3.90	3.03
CAT Unit 2	67	0.18	0.07	3.90	3.03
HLK Unit	75	0.04	0.94	3.90	3.03
USL Unit	84	49.49	1.37	3.90	3.03
GCL Unit	40	1.05	1.88	3.90	3.03
PRV Unit	8	0.00	7.73	3.90	3.03

<sup>14</sup> The LIL was not commissioned until April 14, 2023.

<sup>15</sup> 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 5.04%. 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**

**1 4.1 Bay d’Espoir Facility**

**2 4.1.1 Bay d’Espoir Unit 5**

3 Considering individual hydraulic unit performance, the Bay d’Espoir Unit 5 DAFOR of 3.83% is above the  
 4 resource planning analysis value of 3.03% but is below the near-term planning analysis value of 3.90%  
 5 for an individual hydraulic unit. The DAFOR was materially impacted in the current period by a forced  
 6 extension to the planned annual outage, which occurred in May 2024, as previously reported.<sup>16</sup> The unit  
 7 has been operating without issue since it returned to service on May 25, 2024.

**8 4.1.2 Bay d’Espoir Unit 6**

9 Considering individual hydraulic unit performance, the Bay d’Espoir Unit 6 DAFOR of 9.55% is above the  
 10 resource planning analysis value of 3.03% and the near-term planning analysis value of 3.90% for an  
 11 individual hydraulic unit. As previously reported, this increase in DAFOR was primarily the result of the  
 12 forced extension to the planned outage, which occurred in May 2024 as a result of foreign material  
 13 impact to several stator bars.<sup>17</sup> To return the unit to service and allow the necessary preparation time

<sup>16</sup> “Quarterly Report on Asset Performance in Support of Resource Adequacy for the Twelve Months Ended June 30, 2024,” Newfoundland and Labrador Hydro, sec. 4.1.1, pp. 8-9.

<sup>17</sup> Ibid, sec. 4.1.2, pp. 9-10.

1 for a larger work scope, all affected stator bars were repaired and the unit returned to operation on  
2 May 30, 2024.

3 Again, as previously reported, given the new age of this asset, the extent of damage and the significant  
4 operational stresses imposed on the damaged bars, the appropriate long-term solution recommended  
5 by the original equipment manufacturer to prevent premature aging and failure of the asset was to  
6 proceed with the replacement of approximately 10 stator bars at the next available outage opportunity.  
7 A scheduled outage on Unit 6 commenced on July 5, 2024 to complete approved capital replacement  
8 work in the switchyard to replace a circuit breaker (B3T6). This outage offered the opportunity for Hydro  
9 to complete the replacement of these stator bars, without impacting generation availability. Since the  
10 previous filing of this report, Hydro completed the necessary work to replace the affected stator bars  
11 and the unit was returned to service on August 23, 2024.

#### 12 **4.1.3 Bay d’Espoir Unit 7**

13 The Bay d’Espoir Unit 7 DAFOR of 3.87% for the current period is above the resource planning analysis  
14 value of 3.03%, but is below the near-term planning analysis value of 3.90% for an individual hydraulic  
15 unit. This increase in DAFOR was the result of a forced outage, which occurred on August 2, 2024, when  
16 leaks were discovered in the generator bearing coolers following the completion of the scheduled  
17 annual outage on Unit 7. Initial investigation revealed that all four bearing coolers had experienced tube  
18 failures. A subsequent investigation into the root cause of these failures is ongoing. Hydro used two  
19 available spare coolers in inventory and worked with a local fabricator to assemble the outstanding  
20 coolers, using the undamaged tubes from the four original coolers, to return the unit to service.

21 The unit was returned to service on August 15, 2024. Hydro has initiated procurement of two new  
22 coolers, with anticipated delivery in November 2024. Hydro plans to install the new coolers to replace  
23 the two fabricated coolers during the next planned outage.

#### 24 **4.2 Paradise River Facility**

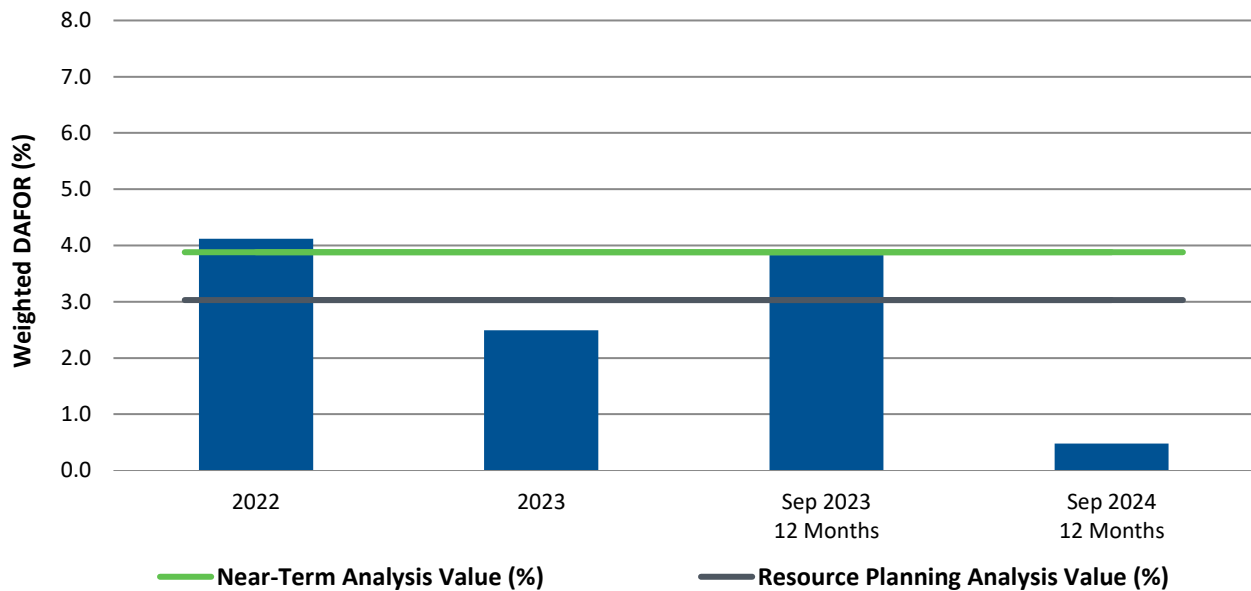
25 The Paradise River unit DAFOR of 7.73% is above the resource planning analysis value of 3.03% and the  
26 near-term planning analysis value of 3.90% for an individual hydraulic unit. This increase in DAFOR was  
27 the result of a leak in the penstock expansion joint located in the lower level of the plant. This leak  
28 developed in August 2024 and resulted in a two-week forced outage. The packing in the expansion joint  
29 was replaced in the affected area and the unit was returned to service on August 24, 2024.

## 1 5.0 Hydraulic Unit DAFOR Performance – Muskrat Falls

2 Detailed results for the current period and the previous period are presented in Table 6 and Chart 2.  
 3 These results are compared to Hydro’s near-term and resource planning analysis values for forced  
 4 outage rates, as used in the 2024 Resource Plan and the November 2023 Near-Term Report. Overall, the  
 5 plant performance for Muskrat Falls Facility shows improvement over the previous period, with the  
 6 performance of all individual units meeting the established near-term and resource planning analysis  
 7 values.

**Table 6: Hydraulic Weighted DAFOR – Muskrat Falls**

Generating Unit	Maximum Continuous Unit Rating (MW)	12 Months Ended Sep 2023 (%)	12 Months Ended Sep 2024 (%)	Near-Term Analysis Value (%)	Resource Planning Analysis Value (%)
<b>Muskrat Falls Units - weighted</b>	<b>824</b>	<b>3.83</b>	<b>0.48</b>	<b>3.88</b>	<b>3.03</b>
<b>Muskrat Falls Units</b>					
Muskrat Falls 1	206	6.14	1.29	3.88	3.03
Muskrat Falls 2	206	2.78	0.52	3.88	3.03
Muskrat Falls 3	206	3.67	0.10	3.88	3.03
Muskrat Falls 4	206	2.64	0.03	3.88	3.03



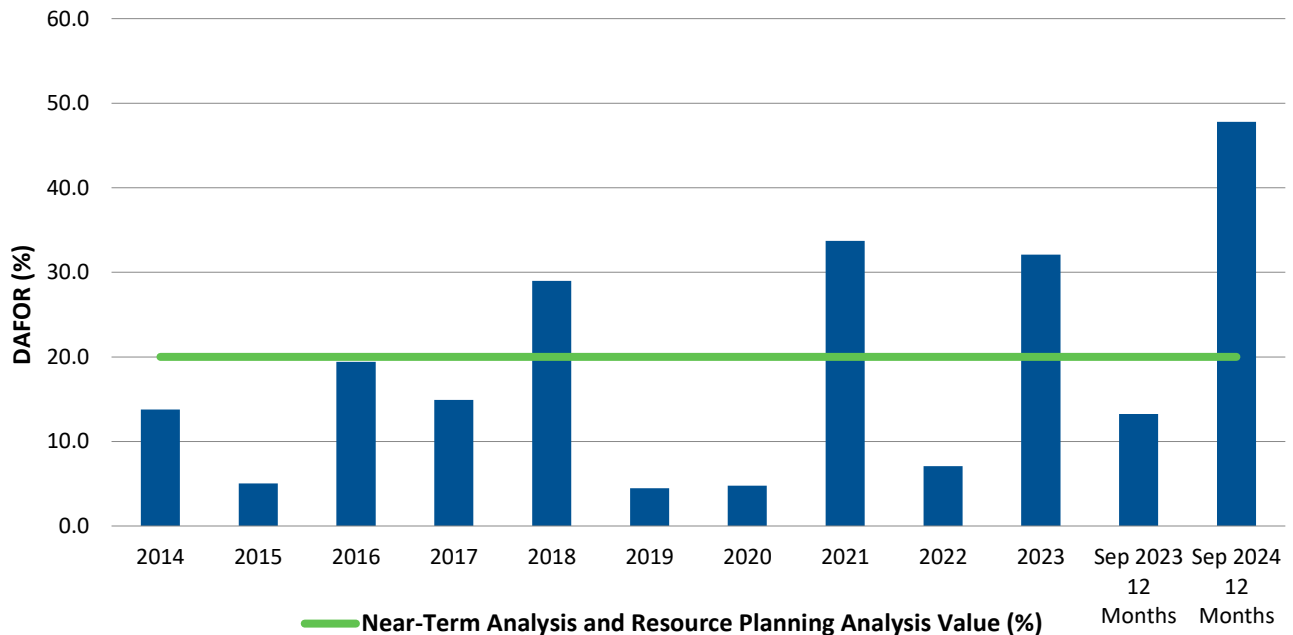
**Chart 2: Hydraulic Weighted DAFOR – Muskrat Falls**

## 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. Any individual unit with forced outage rates which exceed the established near-term and/or resource planning analysis values is discussed herein.

**Table 7: Thermal DAFOR**

Generating Unit	Maximum Continuous Unit Rating (MW)	12 months Ended Sep 2023 (%)	12 months Ended Sep 2024 (%)	Near-Term Planning and Resource Planning Analysis Value (%)
<b>All Thermal Units – Weighted</b>	<b>490</b>	<b>13.26</b>	<b>47.78</b>	<b>20.00</b>
<b>Thermal Units</b>				
Holyrood TGS Unit 1	170	20.90	11.13	20.00
Holyrood TGS Unit 2	170	5.11	95.54	20.00
Holyrood TGS Unit 3	150	15.52	19.24	20.00



**Chart 3: Thermal DAFOR**

1 For the current period, the weighted DAFOR for all thermal units of 47.78% is above the 20.00% near-  
2 term and resource planning analysis values. The individual unit DAFOR outcome for the current period  
3 of 11.13% for Unit 1 and 19.24% for Unit 3 at the Holyrood TGS is below the 20.00% analysis value. The  
4 performance of Unit 2 at the Holyrood TGS is discussed in Section 6.1.

## 5 **6.1 Holyrood TGS Unit 2**

6 Considering individual thermal unit performance, the DAFOR of 95.54% for Unit 2 at the Holyrood TGS is  
7 above the near-term and resource planning analysis value of 20.00% for a unit at the Holyrood TGS, and  
8 shows a decline in performance over the previous period. As previously reported, this elevated DAFOR is  
9 a result of a forced extension to the planned unit outage to overhaul the Unit 2 turbine and replace the  
10 L-0 blades at the General Electric (“GE”) shop in the United States.<sup>18</sup> Subsequent turbine rotor inspection  
11 at the GE shop identified additional and unexpected cracking on the L-1 blades, resulting in the required  
12 replacement of that set of blades.<sup>19</sup> The blades have been installed, and the turbine rotor was returned  
13 to site in December 2023. Upon evaluation, it was determined the journal bearings sustained damage  
14 during shipping and would require additional repair. The unit was reassembled in early 2024 and was  
15 officially released for service on May 17, 2024.

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

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<sup>18</sup> Approved in Board Order No. P.U. 17(2022).

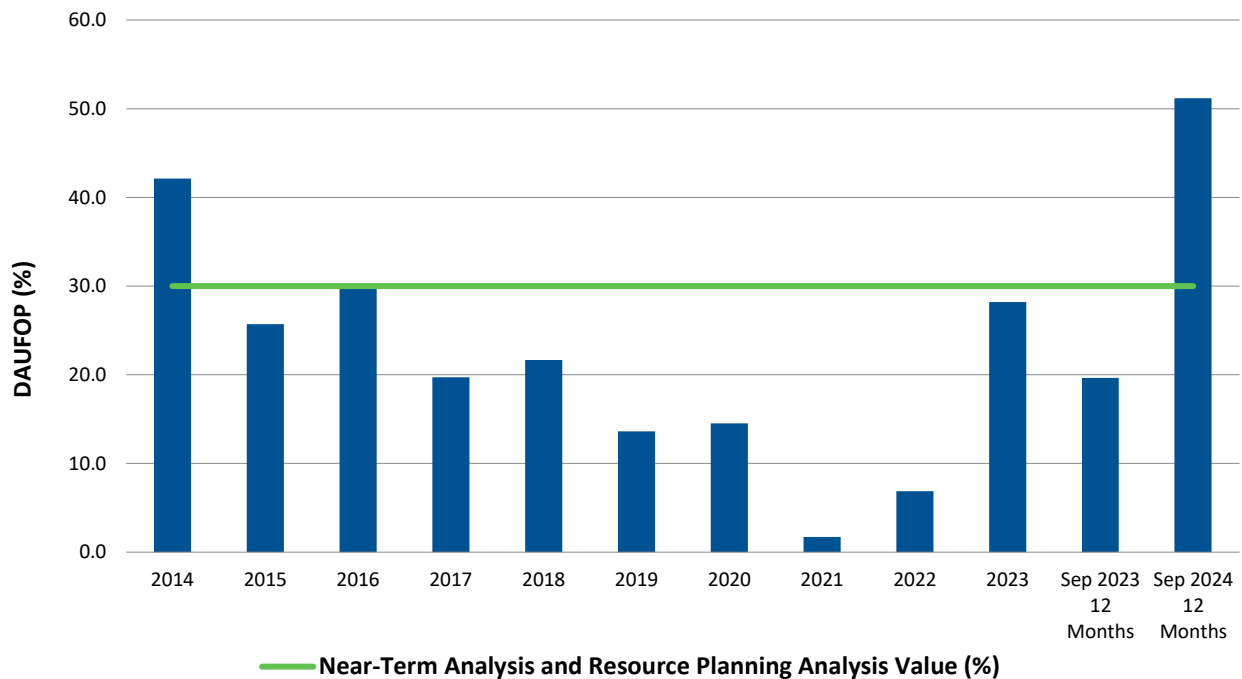
<sup>19</sup> These are the low pressure next-to-last stage (“L-1”) blades, a separate stage of blades from the last stage (“L-0”) blades.

## 1 7.0 Combustion Turbine DAUFOP Performance

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

**Table 8: Hardwoods/Stephenville Gas Turbine DAUFOP**

Gas Turbine Units	Maximum Continuous Unit Rating (MW)	12 months Ended Sep 2023 (%)	12 months Ended Sep 2024 (%)	Near-Term Planning and Resource Planning Analysis Value (%)
<b>Gas Turbines</b>	<b>100</b>	<b>19.66</b>	<b>51.19</b>	<b>30.00</b>
Stephenville	50	30.02	98.52	30.00
Hardwoods	50	8.91	0.00	30.00



**Chart 4: Gas Turbine DAUFOP: Hardwoods/Stephenville Units**

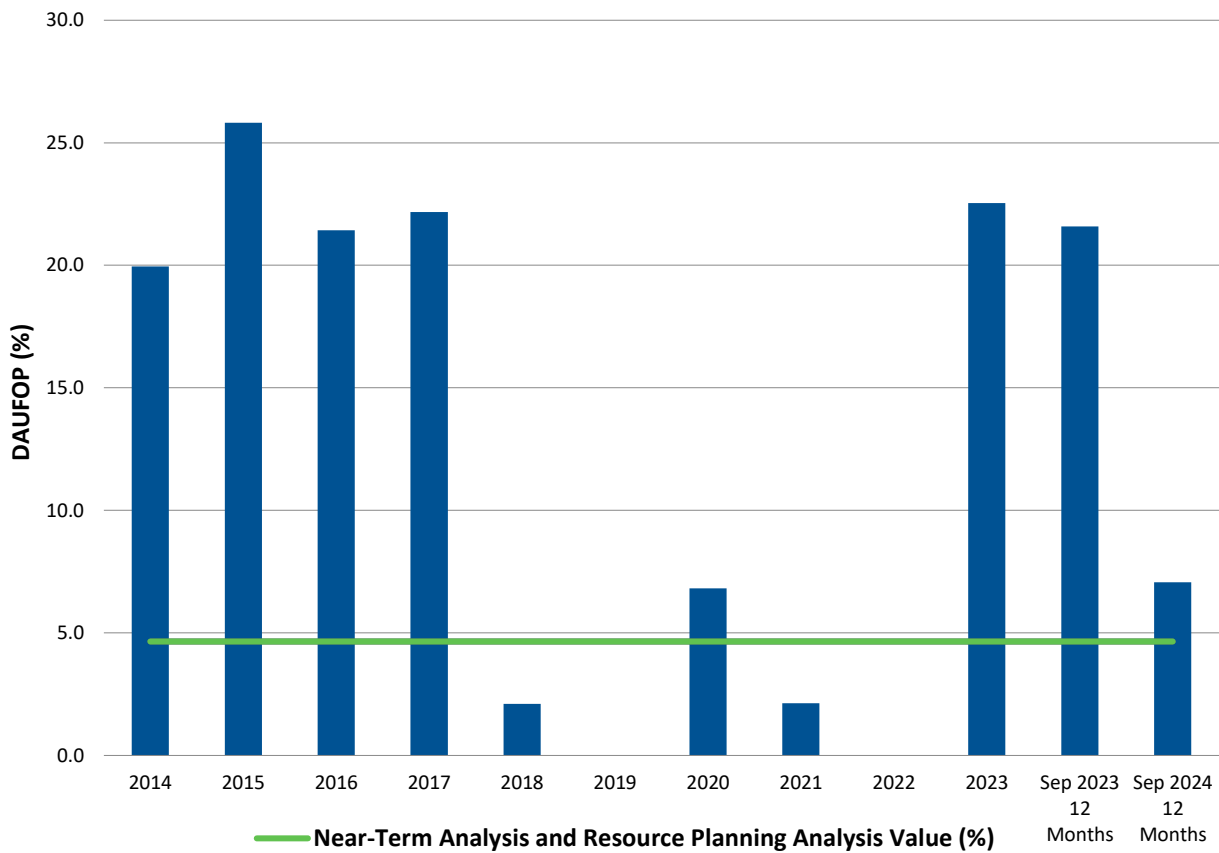
4 The combined DAUFOP for the Hardwoods and Stephenville Gas Turbines was 51.19% for the current  
5 period, as shown in Table 8 and Chart 4. This is above the near-term and resource planning analysis  
6 value of 30.00%. The Stephenville Gas Turbine DAUFOP for the current period is 98.52%, which is above



1 the near-term and resourcing planning assumption of 30.00%. The Hardwoods Gas Turbine DAUFOP for  
 2 the current period is 0.00%, which is below the near-term and resource planning assumption of 30.00%.  
 3 On a per-unit basis, the Stephenville Gas Turbine has declined in performance, while the Hardwoods Gas  
 4 Turbine has improved in performance when compared to the previous period. As the forced outage rate  
 5 for the Stephenville Gas Turbine exceeds the established near-term and resource planning analysis  
 6 values, a discussion on same is included in Section 7.1.

**Table 9: Happy Valley Gas Turbine DAUFOP**

Gas Turbine Unit	Maximum Continuous Unit Rating (MW)	12 months Ended Sep 2023 (%)	12 months Ended Sep 2024 (%)	Near-Term Planning and Resource Planning Analysis Value (%)
Happy Valley	25	21.58	7.07	4.65

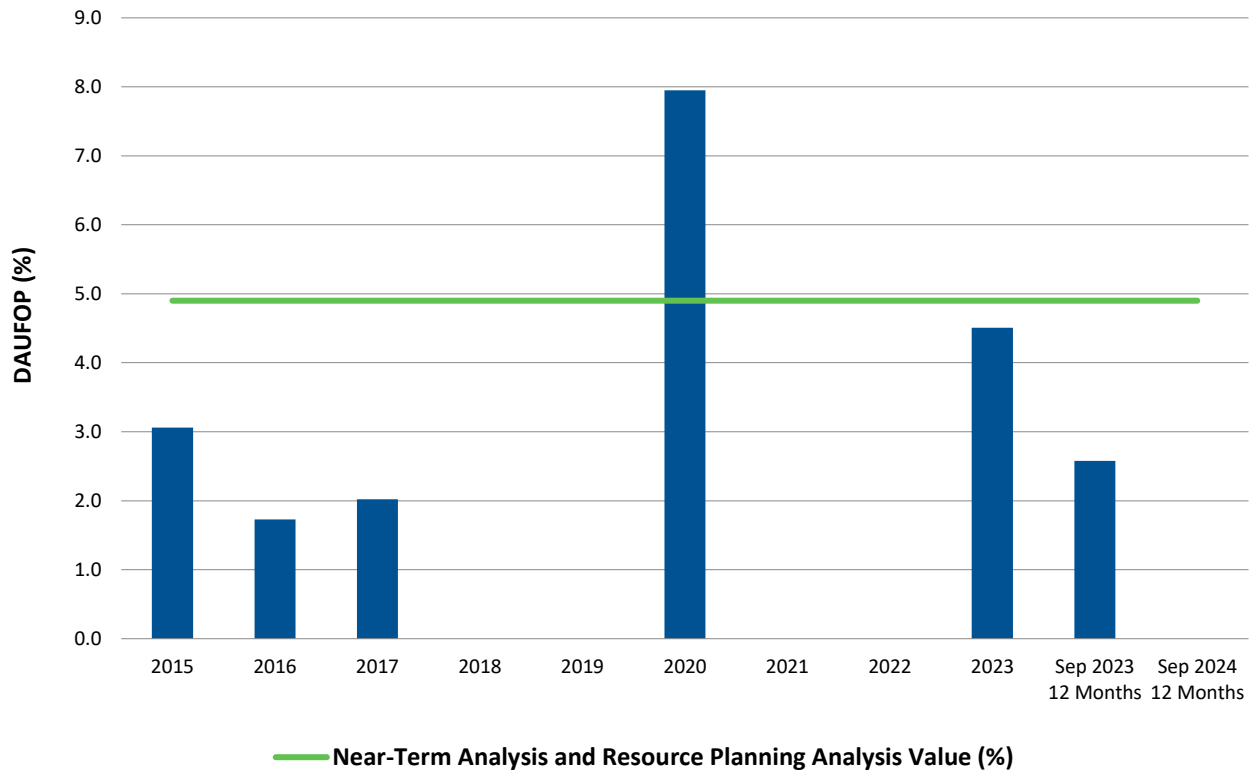


**Chart 5: Gas Turbine DAUFOP: Happy Valley Unit**

1 The DAUFOP for the Happy Valley Gas Turbine was 7.07% for the current period, as shown in Table 9  
 2 and Chart 5. This is above the near-term and resource planning analysis value of 4.65% and indicates an  
 3 improvement in performance over the previous period. As the forced outage rate for the Happy Valley  
 4 Gas Turbine exceeds the established near-term and resource planning analysis values, a discussion on  
 5 same is included in Section 7.2.

**Table 10: Holyrood Combustion Turbine DAUFOP**

Combustion Turbine Unit	Maximum Continuous Unit Rating (MW)	12 Months Ended Sep 2023 (%)	12 Months Ended Sep 2024 (%)	Near-Term Planning and Resource Planning Analysis Value (%)
Holyrood	123.5	2.58	0.00	4.90



**Chart 6: Combustion Turbine DAUFOP– Holyrood Unit**

1 The Holyrood Combustion Turbine DAUFOP of 0.00% for the current period is below the near-term and  
2 resource planning analysis value of 4.90%, and indicated an improvement in performance when  
3 compared to the previous period, as show in Table 10 and Chart 6.

4 **7.1 Stephenville Gas Turbine**

5 The Stephenville Gas Turbine DAUFOP was 98.52% for the current period, which is above the near-term  
6 and resource planning analysis value of 30.00%. This decline in performance is a result of the failure of  
7 the alternator cooling fan, as previously reported, which occurred on July 14, 2023.<sup>20</sup>

8 Commissioning has successfully been completed and the unit returned to service on  
9 September 27, 2024.

10 **7.2 Happy Valley Gas Turbine**

11 The Happy Valley Gas Turbine DAUFOP was 7.07% for the current period, which is above the near-term  
12 and resource planning analysis value of 4.65%. This performance is the result of a forced outage in the  
13 first quarter of 2024, which was previously reported.<sup>21</sup> There have been no new forced outages since the  
14 previous filing.

15 **8.0 Labrador-Island Link EqFOR Performance**

16 The EqFOR for the LIL was 3.28% for the current period, as shown in Table 11. This is well within the  
17 range of values used by Hydro in the resource planning analysis scenarios.

**Table 11: LIL EqFOR (%)**

Asset Type	Measure	1-Oct-2022 to 30-Sep-2023 <sup>22</sup>	1-Oct-2023 to 30-Sep-2024	Base Planning Analysis Value	Range of Planning Analysis Values
LIL	EqFOR	N/A	3.28	5	1–10

<sup>20</sup> 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>

<sup>21</sup> 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.

<sup>22</sup> EqFOR data is not available for the July 1, 2022 to June 30, 2023 period as Hydro began reporting EqFOR data post-commissioning.

- 1 The availability of the three Soldiers Pond synchronous condensers (“SC”) is critical to the reliable
- 2 delivery of electricity to the Island Interconnected System via the LIL. No operational issues concerning
- 3 the Soldiers Pond SCs resulted in outages or derating to the LIL in the current period.
  
- 4 A fulsome update on the total number of hours of operation for the Soldiers Pond SCs for the rolling 12-
- 5 month period is provided in in Appendix A of this report.

# Appendix A

## Soldiers Pond Synchronous Condensers



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

<b>Unit</b>	<b>Operating Hours<sup>1</sup></b>	<b>% Availability<sup>2</sup></b>
SC1	7,578.50	86.3%
SC2	8,465.75	96.4%
SC3	8,185.48	93.2%

- 1 Hydro has historically provided Information on the operation of the Soldiers Pond SCs within the
- 2 quarterly *Reliability and Resource Adequacy Study Review – Labrador-Island Link Update*.<sup>3</sup>

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<sup>1</sup> Hydro has provided its best estimate of operating hours for each unit for the 12 months ending September 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.

<sup>2</sup> Synchronous Condenser availability is calculated on the basis of the unit's operating hours, and therefore assumes that the unit is operating when available.

<sup>3</sup> For Hydro's most recent update, please refer to "Reliability and Resource Adequacy Study Review – Labrador-Island Link Update for the Quarter Ended September 30, 2024," Newfoundland and Labrador Hydro, October 3, 2024.