

April 30, 2021

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

Attention: Ms. Cheryl Blundon
Director of Corporate Services & Board Secretary

Dear Ms. Blundon:

Re: Quarterly Report on Performance of Generating Units for the Twelve Months Ended March 31, 2021

Please find enclosed Newfoundland and Labrador Hydro's "Quarterly Report on Performance of Generating Units for the Twelve Months Ended March 31, 2021."

If you have any questions or comments, please contact the undersigned.

Yours truly,

NEWFOUNDLAND AND LABRADOR HYDRO



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

Encl.

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Quarterly Report on Performance of Generating Units for the Twelve Months Ended March 31, 2021

April 30, 2021

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. The data provided pertains to historical forced outage rates and assumptions Hydro uses in its assessments of resource adequacy. This report covers the performance of Hydro’s generating units for the 12 months ended March 31, 2021.

This report contains forced outage rates for the current 12-month reporting period of April 1, 2020 to March 31, 2021 for individual generating units at hydraulic facilities, the Holyrood Thermal Generating Station (“Holyrood TGS”), and Hydro’s gas turbines. The report also provides, for comparison purposes, the individual generating unit data on forced outage rates for the period of April 1, 2019 to March 31, 2020. Further, total asset class data is presented based on the calendar year for the years 2006 to 2019.

The forced outage rates of Hydro’s generating units are calculated using three measures: 1) Derated Adjusted Forced Outage Rate (“DAFOR”) for the hydraulic and thermal units, 2) Utilization Forced Outage Probability (“UFOP”), and 3) Derated Adjusted Utilization Forced Outage Probability (“DAUFOP”) for the gas turbines.

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 hydraulic and thermal units; however, it is not applicable to gas turbines because of their operation as standby units and their relatively low operating hours.

UFOP and DAUFOP are measures used for gas turbines. UFOP 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 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. 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 Canadian Electricity Association (“CEA”) guidelines. CEA guidelines require that derated levels of a generating unit are calculated by converting the operating time at the derated level into an equivalent outage time.

1 In addition to forced outage rates, this report provides details for those outages that contributed
 2 materially to forced outage rates exceeding those used in Hydro’s generation planning analysis for both
 3 the near- and long-term.

4 The assumptions referred to throughout this report are the same as those reported in the 2018
 5 quarterly reports except for the new assumptions identified in Table 12. As part of its Reliability and
 6 Resource Adequacy Study (“Study”), Hydro detailed the process undertaken to determine the forced
 7 outage rates most appropriate for use in its near-term reliability assessments and long-term resource
 8 adequacy analysis. The values have been updated to reflect the most current outage data and the
 9 revised forced outage rates that resulted from this process are included in Sections 8.0 and 9.0 of this
 10 report. The potential impacts of these revised forced outage rates on future performance reporting are
 11 also discussed. While the new assumptions form the basis of Hydro’s current planning processes, this
 12 report includes the historical assumptions and style to maintain similarity to previous reports.

13 **2.0 Overview for Period Ending March 31, 2021**

Table 1: DAFOR, UFOP, and DAUFOP Overview (%)

Class of Units	April 1, 2019 to March 31, 2020	April 1, 2020 to March 31, 2021	Base Planning Assumption	Near-Term Planning Assumption¹
Hydraulic (DAFOR)	1.14	0.89	0.90	2.60
Thermal (DAFOR)	4.04	6.75	9.64	14.00
Combined Gas Turbine (UFOP)	4.85	4.87	10.62	20.00
Holyrood Gas Turbine (UFOP)	0.00	7.21	5.00	5.00
Hardwoods/Stephenville Gas Turbine (DAUFOP)	13.20	5.66	-	30.00
Happy Valley Gas Turbine (DAUFOP)	1.88	9.53	-	15.00
Holyrood Gas Turbine (DAUFOP)	0.00	7.21	-	5.00

¹ Refer to “Near-Term Generation Adequacy Report,” Newfoundland and Labrador Hydro, November 15, 2017, s 5.0 for further details.

1 As shown in Table 1, there was an improvement in hydraulic DAFOR performance and a decline in
2 thermal DAFOR performance for the current 12-month period ending March 31, 2021 compared to the
3 12-month period ending March 31, 2020. The Combined Gas Turbine UFOP is consistent in the current
4 period, but the Holyrood Gas Turbine UFOP performance has declined. The DAUFOP performance for
5 Hardwoods/Stephenville Gas Turbines improved in the current period compared to the 12-month period
6 ending March 31, 2020. Conversely, performance for the Happy Valley and Holyrood Gas Turbines
7 declined in the current period compared to the 12-month period ending March 31, 2020.

8 Hydro began reporting DAUFOP performance in January 2018 for its gas turbines.

9 **3.0 Generation Planning Assumptions**

10 The Study introduced new generation planning assumptions; however, the assumptions used
11 throughout this report are the same as reported in previous quarterly reports. The potential impacts of
12 these revised assumptions on reporting of generation unit performance are discussed in Section 9.0 of
13 this report. While the new assumptions form the basis of Hydro's current planning processes, this report
14 includes the historical assumptions and style to maintain similarity to previous reports while the
15 regulatory process surrounding the Study remains underway.

16 Hydro produces reports based on comprehensive reviews of energy supply for the Island Interconnected
17 System. This is part of Hydro's analysis of energy supply up to the Muskrat Falls interconnection. The
18 "Near-Term Generation Adequacy Report," filed on May 22, 2018, contains analysis based on the near-
19 term DAFOR and DAUFOP and the resulting implications for meeting reliability criteria until the
20 interconnection with the North American grid. The near-term analysis has been updated since that time
21 to reflect changes in assumptions with respect to the in-service of the Labrador-Island Link. The results
22 of this analysis were presented to the Board as part of the "Labrador-Island Link In-Service Update,"
23 submitted October 1, 2018.

24 Hydro's DAFOR and UFOP planning assumptions are provided in Table 2. The Holyrood Gas Turbine has a
25 lower expected rate of unavailability than the older gas turbines (5% compared to 10.62%) as the unit is
26 new and can be expected to have better availability than the older units.²

² Hydro selected a 5% UFOP for the new Holyrood Gas Turbine following commentary on forced outage rates contained in the "Independent Supply Decision Review," Navigant Consulting Ltd., September 14, 2011.

Table 2: 2017³ DAFOR and UFOP Long-Term Planning Assumptions (%)

	DAFOR		UFOP	
	Base Planning Assumption	Sensitivity	Base Planning Assumption	Sensitivity
Hydraulic Units	0.90	0.90		
Thermal Units	9.64	11.64		
Gas Turbines: Existing			10.62	20.00
Gas Turbines: New			5.0	10.0

- 1 The DAFOR and DAUFOP assumptions used in developing the May 2018 “Near-Term Generation
- 2 Adequacy Report” are noted in Table 3.

Table 3: DAFOR and DAUFOP Near-Term Generation Adequacy Analysis Assumptions (%)

	DAFOR	DAUFOP
	Near-Term Generation Adequacy Assumption	Near-Term Generation Adequacy Assumption
All Hydraulic Units	2.6	
Bay d’Espoir Hydraulic Units	3.9	
Other Hydraulic Units	0.7	
Holyrood TGS	14.0	
Hardwoods and Stephenville Gas Turbines		30.0
Happy Valley Gas Turbine		15.0
Holyrood Gas Turbine		5.0

3 **4.0 Hydraulic Unit DAFOR Performance**

- 4 Detailed results for the 12-month period ending March 31, 2021 are presented in Table 4, as well as the
- 5 data for the 12-month period ending March 31, 2020. These are compared to Hydro’s short-term
- 6 generation adequacy assumptions, as used in the May 2018 “Near-Term Generation Adequacy Report,”
- 7 and Hydro’s long-term generation planning assumptions for the forced outage rate.

³ Refer to “Near-Term Generation Adequacy Report,” Newfoundland and Labrador Hydro, November 15, 2017, s 5.0 for further details.

Table 4: Hydraulic Weighted DAFOR

Generating Unit	Maximum Continuous Unit Rating (MW)	12 Months Ending March 2020 (%)	12 Months Ending March 2021 (%)	Historical Base Planning Assumption (%)	Historical Near-Term Planning Assumption (%)
All Hydraulic Units - Weighted	954.4	1.14	0.89	0.90	2.60
Hydraulic Units					
Bay D'Espoir 1	76.5	3.73	1.45	0.90	3.90
Bay D'Espoir 2	76.5	3.75	0.00	0.90	3.90
Bay D'Espoir 3	76.5	2.07	2.55	0.90	3.90
Bay D'Espoir 4	76.5	0.09	5.60	0.90	3.90
Bay D'Espoir 5	76.5	0.25	1.09	0.90	3.90
Bay D'Espoir 6	76.5	0.63	0.08	0.90	3.90
Bay D'Espoir 7	154.4	0.00	0.46	0.90	3.90
Cat Arm 1	67	0.19	0.15	0.90	0.70
Cat Arm 2	67	0.15	0.27	0.90	0.70
Hinds Lake	75	1.04	0.77	0.90	0.70
Upper Salmon	84	0.04	0.06	0.90	0.70
Granite Canal	40	0.74	2.22	0.90	0.70
Paradise River	8	7.79	1.31	0.90	0.70

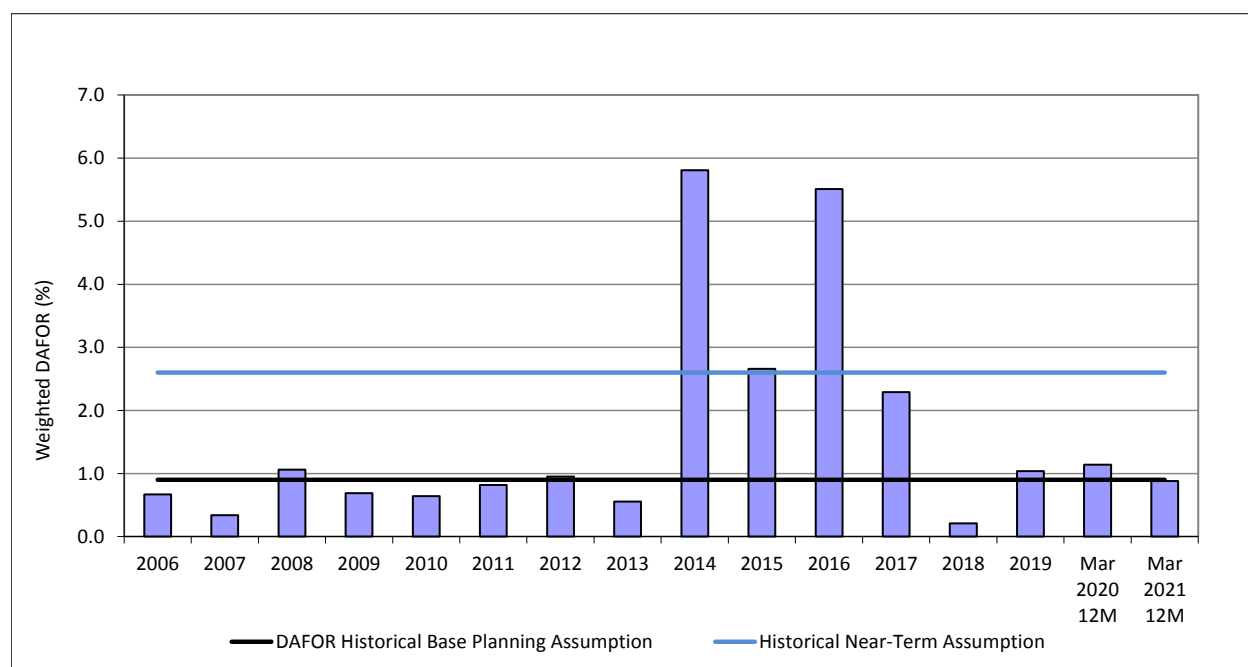


Figure 1: Hydraulic Weighted DAFOR

- 1 Considering individual hydraulic unit performance, the Bay d’Espoir Unit 4 DAFOR of 5.60% did not meet
- 2 either the historical base planning assumption of 0.9% or the historical near-term planning assumption

1 of 3.90% for an individual Bay d'Espoir unit. The Bay d'Espoir Units 1, 3, and 5 DAFOR of 1.45%, 2.55%,
2 and 1.09%, respectively, did not meet the historical base planning assumption of 0.9% but are below the
3 historical near-term planning assumption of 3.90% for an individual Bay d'Espoir unit.

4 As previously reported, Bay d'Espoir Unit 1 experienced a forced outage on July 11, 2020 which was the
5 result of ambient humidity causing moisture in stator windings following the annual planned outage.
6 Corrective measures were implemented to improve the humidity levels and the unit was successfully
7 returned to service on July 15, 2020.

8 Also previously reported, Bay d'Espoir Unit 3 and Unit 4 experienced forced deratings from 76.5 MW to
9 25 MW and 45 MW, respectively, in the month of July 2020 due to increased bearing temperatures
10 resulting from fouling of the generator bearing coolers and oil degradation. The coolers have since
11 undergone a chemical cleaning and the oil degradation issues have been addressed. The units are now
12 operating at rated capacity and bearing temperatures remain inside the acceptable range. A more
13 comprehensive review is ongoing to provide long-term solutions to further reduce generator bearing
14 temperatures associated with Bay d'Espoir Units 1 to 6. Data collection over a full cycle of annual
15 operation, notably including conditions this coming summer, is required to complete the review and
16 confirm any opportunities. Additionally, since the previous filing, Bay d'Espoir Unit 4 has experienced
17 two shear pin failures on January 17, 2021 and March 4, 2021. Shear pin failures are not uncommon;
18 however, additional investigation will be completed later in 2021 during the Bay d'Espoir Unit 4
19 maintenance outage.

20 Hydro previously reported that Bay d'Espoir Unit 5 experienced a forced outage for the period of June 2,
21 2020 to June 4, 2020 as a result of the unit's permanent magnet generator becoming decoupled during
22 operation. This issue was repaired and the unit has been returned to service. Additionally, preventative
23 maintenance procedures have been updated to prevent future occurrence of similar issues.

24 The Hinds Lake Unit DAFOR of 0.77% did not meet the historical near-term planning assumption of 0.7%,
25 but is below the historical base planning assumption of 0.9% for the unit. This was the result of two
26 forced outages, as previously reported, which have been resolved. These outages include a forced
27 outage resulting from failure to stop due to excessive wicket gate leakage on April 15, 2020 and a trip
28 due to a faulty scroll case pressure switch on June 4, 2020.

1 The Granite Canal Unit’s DAFOR of 2.22% did not meet either the historical near-term planning
 2 assumption of 0.9% or the historical base planning assumption of 0.7%. As previously reported, a forced
 3 outage occurred on October 1, 2020 which was caused by a leak in the governor oil manifold. Since the
 4 previous filing, the Granite Canal Unit was unavailable due to a forced outage from February 25, 2021 to
 5 February 26, 2021 and another from February 28, 2021 to March 3, 2021. These two outages were the
 6 result of governor pressure issues caused by the accumulator system. These issues have been resolved
 7 and preventative maintenance procedures have been updated to prevent future occurrence of similar
 8 issues.

9 The Paradise River Unit DAFOR of 1.31% did not meet either the historical base planning assumption of
 10 0.9% or the historical near-term assumption of 0.7% for the unit. This was the result of a forced outage
 11 which occurred from August 8, 2020 to August 11, 2020, resulting from an issue with the unit breaker
 12 auxiliary position switch. This issue was resolved, and the unit breaker was replaced with a spare during
 13 the annual maintenance outage in November 2020.

14 5.0 Thermal Unit DAFOR Performance

15 Detailed results for the 12-month period ending March 31, 2021 and the 12-month period ending March
 16 31, 2020 are presented in Table 5. These results are compared to Hydro’s short-term generation
 17 adequacy assumptions, as used in the May 2018 “Near-Term Generation Adequacy Report,” and Hydro’s
 18 long-term generation planning assumptions for the forced outage rate.

Table 5: Thermal DAFOR

Generating Unit	Maximum Continuous Unit Rating (MW)	12 Months Ending March 2020 (%)	12 Months Ending March 2021 (%)	Historical Base Planning Assumption (%)	Historical Near- Term Planning Assumption (%)
<i>All Thermal Units - Weighted</i>	490	4.04	6.75	9.64	14.00
Thermal Units					
Holyrood 1	170	0.31	4.85	9.64	15.00
Holyrood 2	170	10.29	7.80	9.64	10.00
Holyrood 3	150	0.37	7.82	9.64	18.00

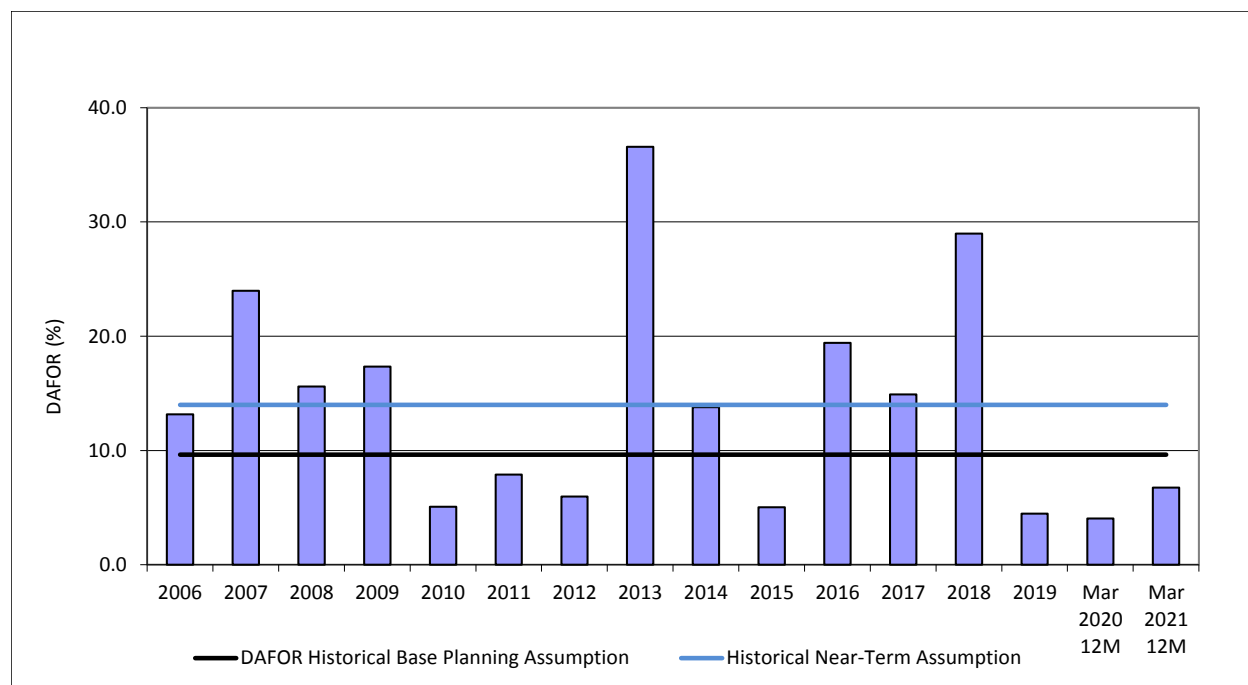


Figure 2: Thermal DAFOR

1 For the 12-month period ending March 31, 2021, the weighted DAFOR for all thermal units of 6.75% is
 2 below the historical base planning assumption DAFOR value of 9.64% and the historical near-term
 3 planning assumption of 14.00%. Unit 1 DAFOR was 4.85%, which is below the historical base planning
 4 assumption of 9.64% and the historical near-term planning assumption of 15.00%. Unit 2 DAFOR was
 5 7.80%, which is below the historical base planning assumption of 9.64% and the historical near-term
 6 assumption of 10.00%. Unit 3 DAFOR was 7.83%, which is below the historical base planning assumption
 7 of 9.64% and the historical near-term planning assumption of 18.00%.

8 The current period DAFOR for Unit 2 has improved over the 12-month period ending March 31, 2020,
 9 while the performance of Unit 1 and Unit 3 has declined.

10 6.0 Gas Turbine UFOP Performance

11 The combined UFOP for the Hardwoods, Happy Valley, and Stephenville Gas Turbines was 4.87% for the
 12 12-month period ending March 31, 2021 (Table 6 and Figure 3). This performance is better than the
 13 base planning assumption of 10.62% and the near-term assumption of 20.00% and is consistent with
 14 performance during the 12-month period ending March 31, 2020. The Hardwoods Gas Turbine UFOP for
 15 the current period is 3.37%, as compared to the base planning assumption of 10.62%. The Stephenville
 16 Gas Turbine UFOP for the current period is 3.80%, which is below both the historical base planning

1 assumption of 10.62% and the historical near-term planning assumption of 20.00%. The Happy Valley
 2 Gas Turbine UFOP is 9.53% for the current period, as compared to the base planning assumption of
 3 10.62%. On an individual unit basis, gas turbine UFOP performance for the current period has improved
 4 for the Stephenville Unit, but has declined for the Hardwoods and Happy Valley Units over the 12-month
 5 period ending March 31, 2020.

Table 6: Gas Turbine UFOP

Gas Turbine Units	Maximum Continuous Unit Rating (MW)	12 Months Ending March 2020 (%)	12 Months Ending March 2021 (%)	Historical Base Planning Assumption (%)	Historical Near-Term Planning Assumption (%)
Combined Gas Turbines	125	4.85	4.87	10.62	20.00
Stephenville	50	8.16	3.80	10.62	20.00
Hardwoods	50	1.35	3.37	10.62	20.00
Happy Valley	25	1.88	9.53	10.62	20.00

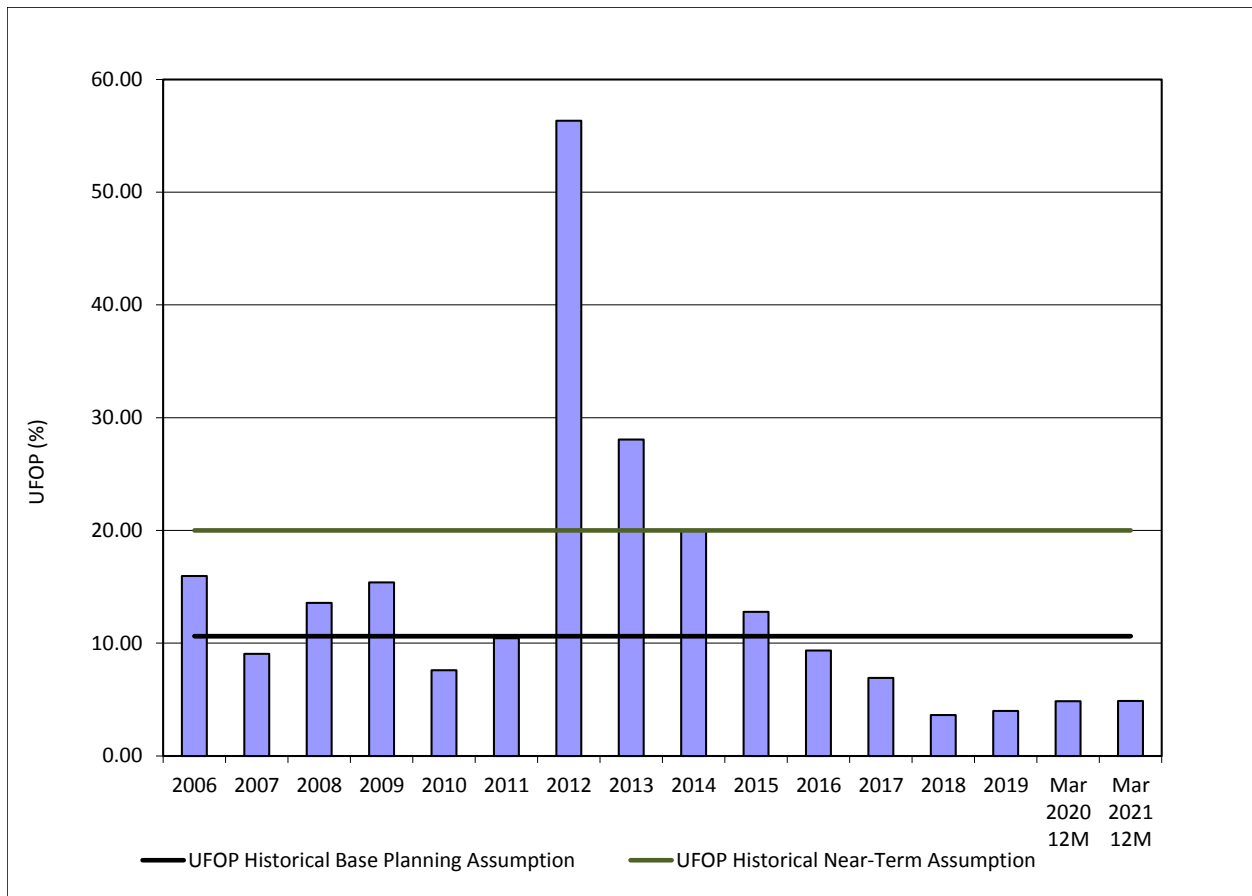


Figure 3: Gas Turbine UFOP: Hardwoods/Happy Valley/Stephenville Units

1 The Holyrood Gas Turbine UFOP for the current period is 7.21%, which is above the historical base and
 2 near-term planning assumptions of 5.00% (Table 7 and Figure 4) and has declined when compared to
 3 the 12-month period ending March 31, 2020. The UFOP performance for the Holyrood Gas Turbine was
 4 impacted by three forced outages in the current period, as previously reported. The first outage, a
 5 forced outage from May 26, 2020 to May 27, 2020, was the result of an issue with the unit’s turning gear
 6 motor electrical circuit, which has since been resolved. The second outage occurred on August 11, 2020
 7 due to fuel pressure differential. The third outage occurred on September 3, 2020 due to the automatic
 8 voltage regulator configuration following a planned outage. Both the second and third outages were
 9 approximately two hours in duration. These issues were isolated events and have been resolved. Though
 10 short in duration, the impact of these three outages on the outage rate is significant, primarily as a
 11 result of the reduced operation this unit has experienced in the current period when compared to
 12 previous reporting periods.

Table 7: Holyrood Gas Turbine UFOP

Gas Turbine Units	Maximum Continuous Unit Rating (MW)	12 Months Ending March 2020 (%)	12 Months Ending March 2021 (%)	Historical Base Planning Assumption (%)	Historical Near- Term Planning Assumption (%)
Holyrood GT	123.5	0.00	7.21	5.00	5.00

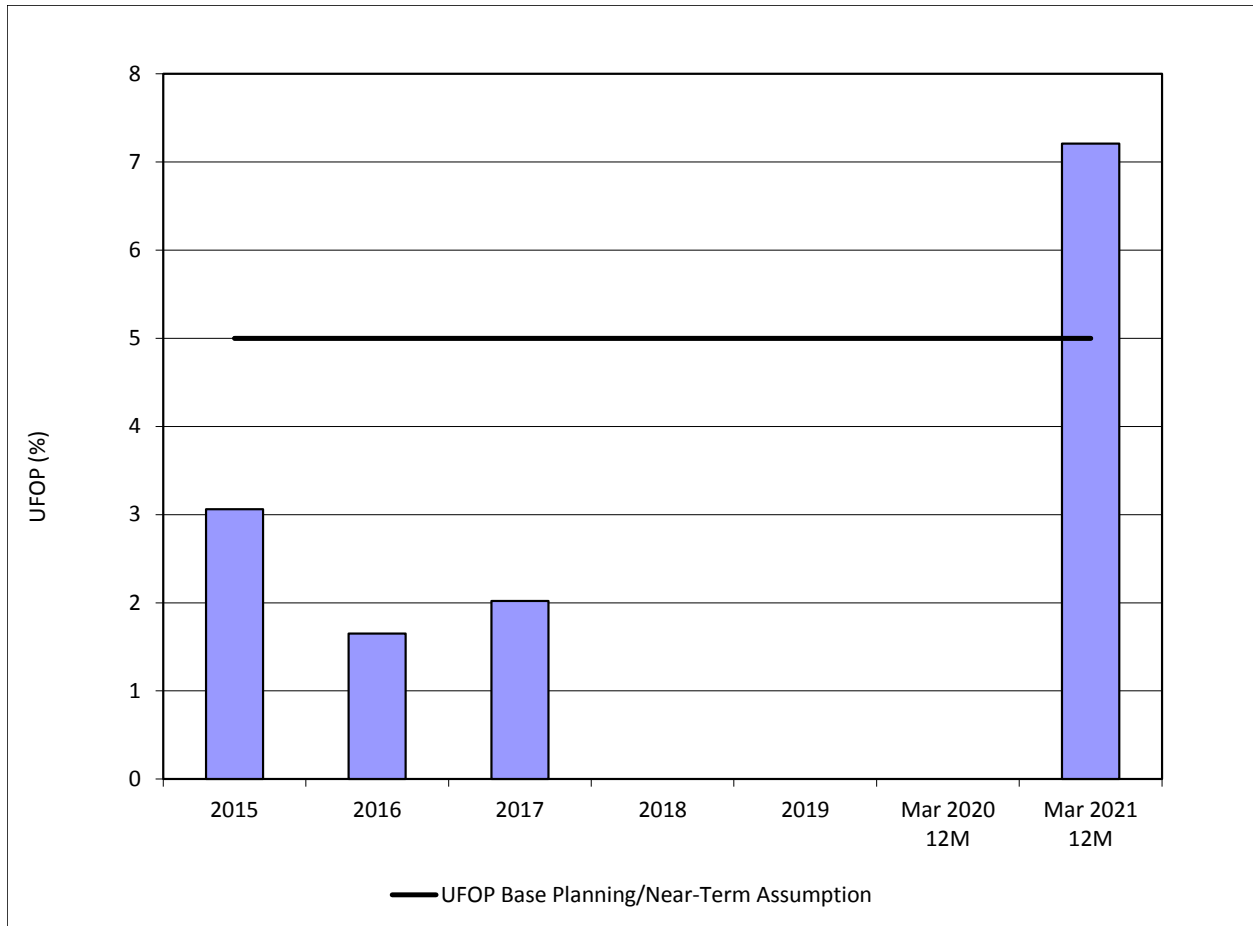


Figure 4: Gas Turbine UFOP: Holyrood Unit

7.0 Gas Turbine DAUFOP Performance

The combined DAUFOP for the Hardwoods and Stephenville Gas Turbines was 5.66% for the 12-month period ending March 31, 2021 (Table 8 and Figure 5). This is below the near-term planning assumption of 30.00%. The Hardwoods Gas Turbine DAUFOP for the current period is 6.37%, which is below the near-term planning assumption of 30.00% and below the DAUFOP for the 12-month period ending March 31, 2020. The Stephenville Gas Turbine DAUFOP for the current period is 3.80%, which is below the near-term planning assumption of 30.00%, and indicates an improvement in performance over the 12-month period ending March 31, 2020.

Table 8: Hardwoods/Stephenville Gas Turbine DAUFOP

Gas Turbine Units	Maximum Continuous Unit Rating (MW)	12 Months Ending March 2020 (%)	12 Months Ending March 2021 (%)	Historical Near-Term Planning Assumption (%)
Gas Turbines (HWD/SVL)	100	13.20	5.66	30.00
Stephenville	50	9.19	3.80	30.00
Hardwoods	50	15.44	6.37	30.00

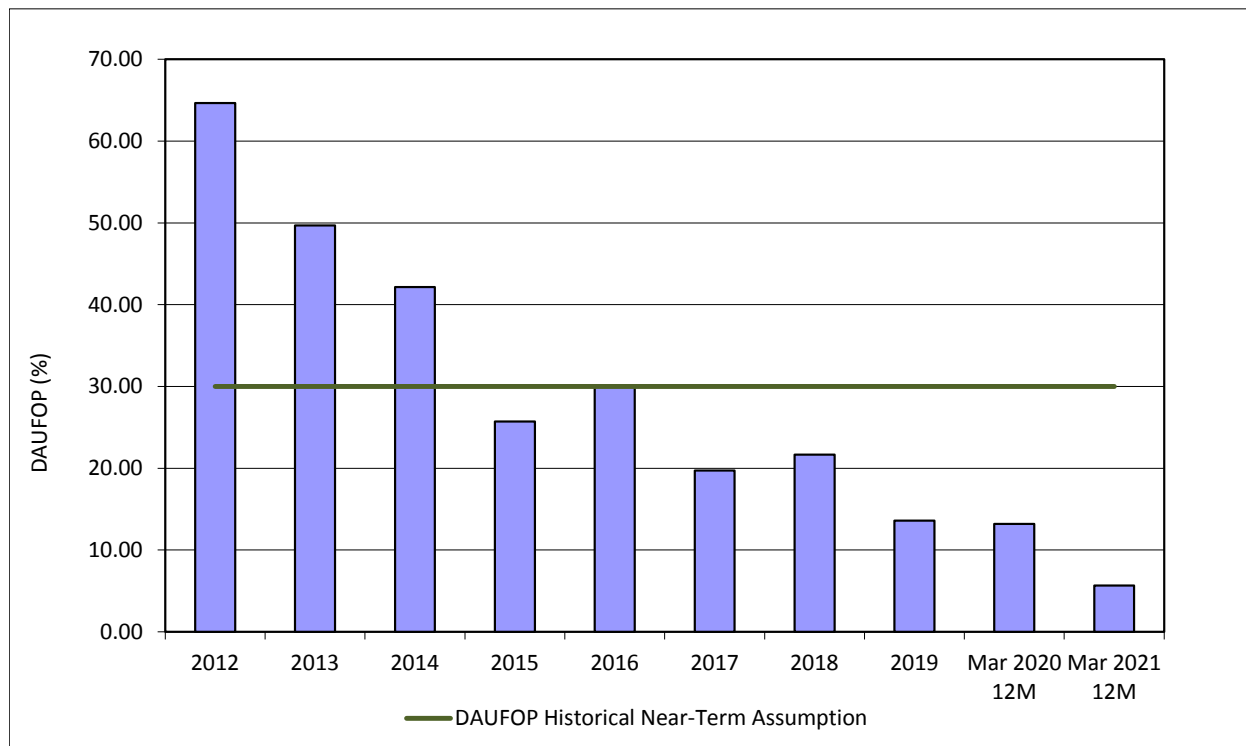


Figure 5: Gas Turbine DAUFOP: Hardwoods/Stephenville Units

1 The DAUFOP for the Happy Valley Gas Turbine was 9.53% for the 12-month period ending March 31,
 2 2021 (Table 9 and Figure 6). This is below the near-term planning assumption of 15.00%, and shows a
 3 decline in performance over the 12-month period ending March 31, 2020.

Table 9: Happy Valley Gas Turbine DAUFOP

Gas Turbine Units	Maximum Continuous Unit Rating (MW)	12 Months Ending March 2020 (%)	12 Months Ending March 2021 (%)	Historical Near-Term Planning Assumption (%)
Happy Valley	25	1.88	9.53	15.00

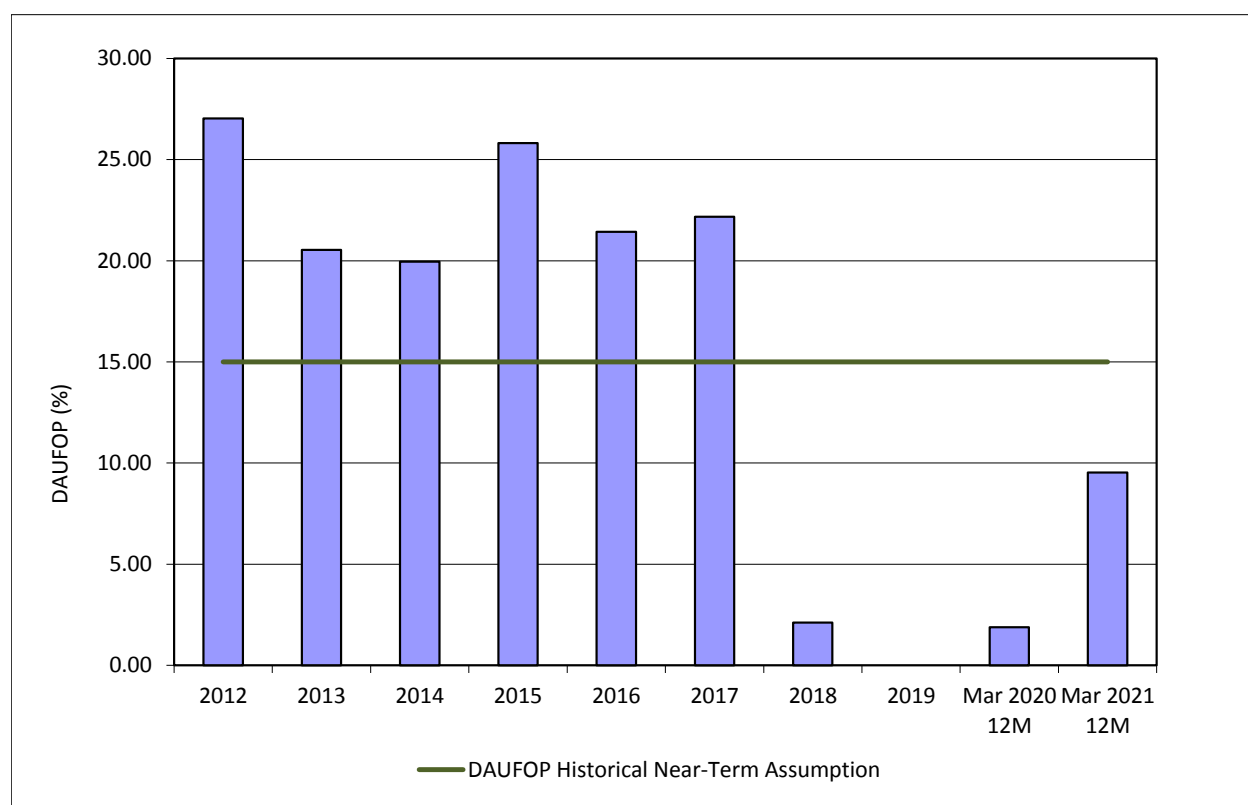


Figure 6: Gas Turbine DAUFOP: Happy Valley Unit

4 The Holyrood Gas Turbine DAUFOP of 7.21% for the current period is above the near-term planning
 5 assumption of 5.00% (Table 10 and Figure 7) and has declined from the 12-month period ending March
 6 31, 2020. The DAUFOP performance of the Holyrood Gas Turbine was impacted by the forced outages
 7 discussed in Section 6.0.

Table 10: Holyrood Gas Turbine DAUFOP

Gas Turbine Units	Maximum Continuous Unit Rating (MW)	12 Months Ending March 2020 (%)	12 Months Ending March 2021 (%)	Historical Near-Term Planning Assumption (%)
Holyrood GT	123.5	0.00	7.21	5.00

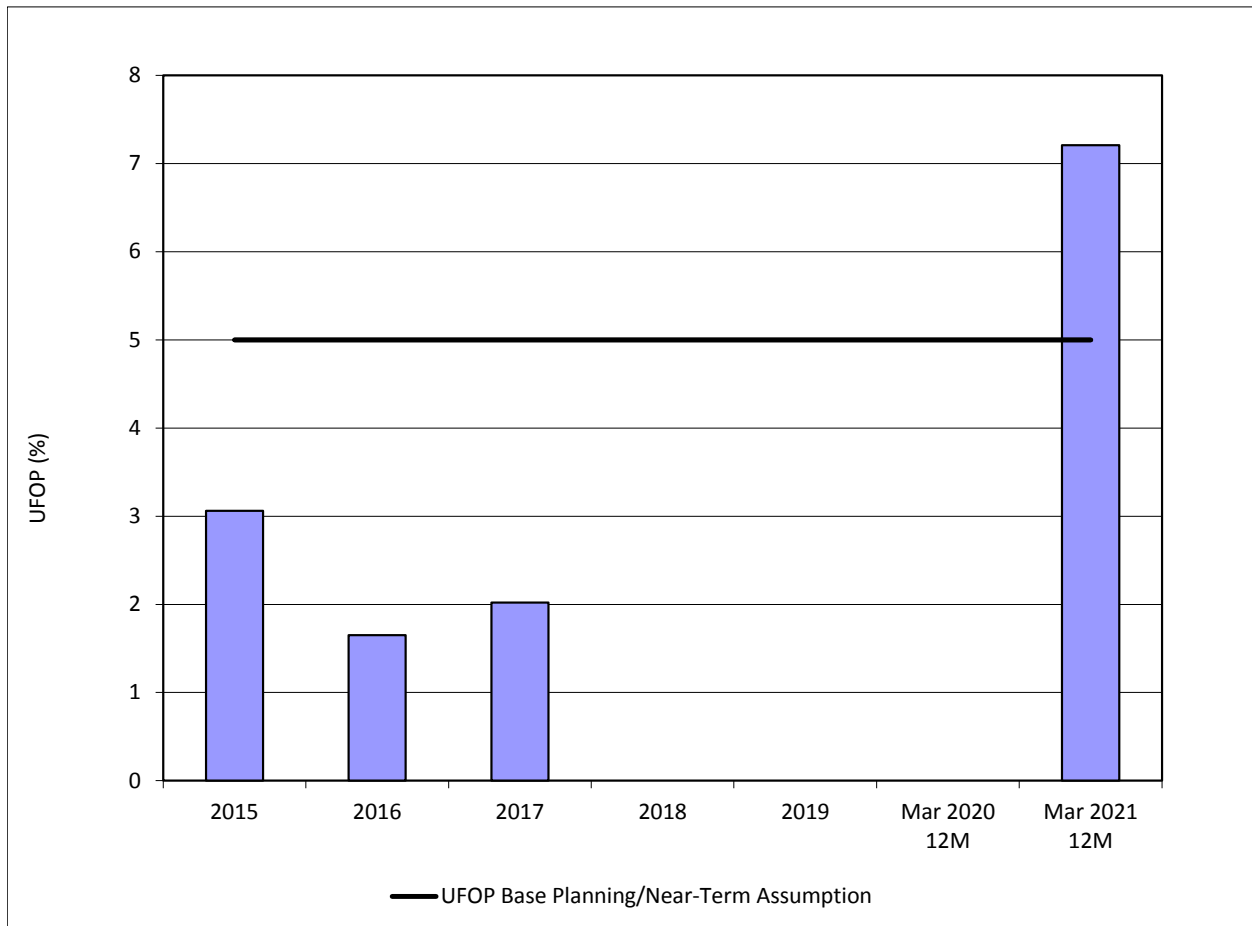


Figure 7: Gas Turbine DAUFOP: Holyrood Unit

1 8.0 Updated Planning Assumptions/Analysis Values

- 2 As part of the Study, Hydro detailed the process undertaken for determining the forced outage rates
- 3 most appropriate for use in its near-term reliability assessments and long-term resource adequacy

1 analysis. Table 11 summarizes the most recent forced outage rate assumptions as calculated using the
 2 forced outage rate methodology.⁴

Table 11: Hydro’s Reliability and Resource Adequacy Study Analysis Values

Unit Type	Measure	Near-Term Analysis Value (%)	Resource Planning Analysis Value (%)
Hydraulic	DAFOR	2.6	2.1
Thermal	DAFOR	15.0	N/A
Gas Turbines			
Happy Valley	DAUFOP	12.0	9.7
Hardwoods and Stephenville	DAUFOP	30.0	N/A
Holyrood	DAUFOP	4.9	1.7

3 A five-year capacity-weighted average was applied to the hydroelectric units (Bay d’Espoir, Cat Arm,
 4 Hinds Lake, Granite Canal, Upper Salmon, and Paradise River) for the near-term analysis, resulting in a
 5 DAFOR of 2.6%, while a ten-year capacity-weighted average was applied for use in the resource planning
 6 model, resulting in a DAFOR of 2.1%. The DAFOR value was based on historical data reflective of Hydro’s
 7 maintenance program over the long-term.

8 DAFORs of 15%, 18%, and 20% were applied to each of the units at the Holyrood TGS to determine the
 9 sensitivity of the system to Holyrood TGS availability in the near-term. This is consistent with the May
 10 2018 “Near-Term Generation Adequacy Report.” As the Holyrood TGS units are being retired from
 11 generation mode in the near term, the units were not included in the long-term analysis and thus there
 12 is no resource planning analysis value listed for these units. For the total plant, an all units weighted
 13 value of 15% is used for the near-term.

14 As the gas turbines in the existing fleet are in varied condition, each was considered on an individual
 15 basis rather than applying a weighted average across all units. For the Happy Valley Gas Turbine, a
 16 three-year capacity-weighted average was applied to the unit for the near-term analysis, resulting in a
 17 DAUFOP of 12%, while a ten-year capacity-weighted average was applied for use in the resource
 18 planning model resulting in a DAUFOP of 9.7%. The DAUFOP values were based on historical data

⁴ Values indicated for Hydro’s near-term analysis reflect those used in Hydro’s “Near-Term Generation Adequacy Report,” filed with the Board on November 18, 2020.

1 founded upon the unit’s past reliable performance. For the Holyrood Gas Turbine, a scenario-based
 2 approach was used to estimate an appropriate value for the near-term analysis, resulting in a DAUFOP
 3 of 4.9%. For the Hardwoods and Stephenville Gas Turbines, a DAUFOP of 30% was used for the near-
 4 term analysis, consistent with the metrics that were considered in Hydro’s May 2018 “Near-Term
 5 Generation Adequacy Report.” As the Hardwoods and Stephenville Gas Turbines are being considered
 6 for retirement in the near term, these units were not included in the long-term analysis; therefore, there
 7 is no resource planning analysis value listed for these facilities.

8 **9.0 Comparison of Planning Assumptions and Analysis Values**

9 As Hydro’s reliability and adequacy planning assumptions have historically been used in reporting on the
 10 performance of Hydro’s generating units, a comparison of the historical values to those used in the most
 11 recent analysis is provided in Table 12 for clarity.

12 Hydro notes that the Study did not utilize UFOP in its analysis. The analysis instead utilized the DAUFOP
 13 measure with changes as shown in Table 12.

Table 12: Comparison of Hydro’s Planning Assumptions (%)

Generating Unit Type	Measure	Historical Planning Assumptions		Reliability and Resource Planning Assumptions	
		Historical Base Planning Assumption	Historical Near-Term Planning Assumption	Near-Term Analysis Value	Resource Planning Analysis Value
Hydraulic	DAFOR	0.9	2.6	2.6	2.1
Thermal	DAFOR	9.64	14.0	15.0	N/A
Gas Turbines					
Happy Valley	DAUFOP	-	15.0	12.0	9.7
Hardwoods and Stephenville	DAUFOP	-	30.0	30.0	N/A
Holyrood	DAUFOP	-	5.0	4.9	1.7

14 The generating unit performance presented earlier in this report is again presented in Tables 13 to 17
 15 with comparison to the previous assumptions, as well as the recently revised values. Hydro notes that
 16 on an asset class basis, the 12-month rolling performance of its generating units has no violations of
 17 Hydro’s current planning assumptions pertaining to asset availability, with the exception of the Holyrood
 18 Gas Turbine.

Table 13: Hydraulic Weighted DAFOR Performance Comparison

Generating Unit	Maximum Continuous Unit Rating (MW)	12 Months Ending March 2020 (%)	12 Months Ending March 2021 (%)	May 2018		November 2020	
				Historic Base Planning Assumption (%)	Historic Near-Term Planning Assumption (%)	Near-Term Planning Analysis Value (%)	Resource Planning Analysis Value (%)
All Hydraulic Units - Weighted	954.4	1.14	0.89	0.90	2.60	2.60	2.10
Hydraulic Units							
Bay D'Espoir 1	76.5	3.73	1.45	0.90	3.90	2.60	2.10
Bay D'Espoir 2	76.5	3.75	0.00	0.90	3.90	2.60	2.10
Bay D'Espoir 3	76.5	2.07	2.55	0.90	3.90	2.60	2.10
Bay D'Espoir 4	76.5	0.09	5.60	0.90	3.90	2.60	2.10
Bay D'Espoir 5	76.5	0.25	1.09	0.90	3.90	2.60	2.10
Bay D'Espoir 6	76.5	0.63	0.08	0.90	3.90	2.60	2.10
Bay D'Espoir 7	154.4	0.00	0.46	0.90	3.90	2.60	2.10
Cat Arm 1	67	0.19	0.15	0.90	0.70	2.60	2.10
Cat Arm 2	67	0.15	0.27	0.90	0.70	2.60	2.10
Hinds Lake	75	1.04	0.77	0.90	0.70	2.60	2.10
Upper Salmon	84	0.04	0.06	0.90	0.70	2.60	2.10
Granite Canal	40	0.74	2.22	0.90	0.70	2.60	2.10
Paradise River	8	7.79	1.31	0.90	0.70	2.60	2.10

Table 14: Thermal DAFOR Performance Comparison

Generating Unit	Maximum Continuous Unit Rating (MW)	12 Months Ending March 2020 (%)	12 Months Ending March 2021 (%)	May 2018		November 2020	
				Historic Base Planning Assumption (%)	Historic Near-Term Planning Assumption (%)	Near-Term Planning Analysis Value (%)	Resource Planning Analysis Value (%)
All Thermal Units - Weighted	490	4.04	6.75	9.64	14.00	15.00	N/A
Thermal Units							
Holyrood 1	170	0.31	4.85	9.64	15.00	15.00	-
Holyrood 2	170	10.29	7.80	9.64	10.00	15.00	-
Holyrood 3	150	0.37	7.82	9.64	18.00	15.00	-

Table 15: Hardwoods/Stephenville Gas Turbine DAUFOP Performance Comparison

Gas Turbine Units	Maximum Continuous Unit Rating (MW)	12 Months Ending March 2020 (%)	12 Months Ending March 2021 (%)	May 2018		November 2020	
				Historic Base Planning Assumption (%)	Historic Near-Term Planning Assumption (%)	Near-Term Planning Analysis Value (%)	Resource Planning Analysis Value (%)
Gas Turbines (HWD/SVL)	100	13.20	5.66	N/A	30.00	30.00	N/A
Stephenville	50	9.19	3.80	N/A	30.00	30.00	N/A
Hardwoods	50	15.44	6.37	N/A	30.00	30.00	N/A

Table 16: Happy Valley Gas Turbine DAUFOP Performance Comparison

Gas Turbine Units	Maximum Continuous Unit Rating (MW)	12 Months Ending March 2020 (%)	12 Months Ending March 2021 (%)	May 2018		November 2020	
				Historic Base Planning Assumption (%)	Historic Near-Term Planning Assumption (%)	Near-Term Planning Analysis Value (%)	Resource Planning Analysis Value (%)
Happy Valley	25	1.88	9.53	N/A	15.00	12.00	9.70

Table 17: Holyrood Gas Turbine DAUFOP Performance Comparison

Gas Turbine Units	Maximum Continuous Unit Rating (MW)	12 Months Ending March 2020 (%)	12 Months Ending March 2021 (%)	May 2018		November 2020	
				Historic Base Planning Assumption (%)	Historic Near-Term Planning Assumption (%)	Near-Term Planning Analysis Value (%)	Resource Planning Analysis Value (%)
Holyrood GT	123.5	0.00	7.21	N/A	5.00	4.90	1.70