

January 29, 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 December 31, 2020**

Please find enclosed a copy of Newfoundland and Labrador Hydro's "Quarterly Report on Performance of Generating Units for the Twelve Months Ended December 31, 2020."

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/kd

Encl.

ecc: **Board of Commissioners of Public Utilities**  
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Randy Dillon, Town of Happy Valley-Goose Bay



# Quarterly Report on Performance of Generating Units for the Twelve Months Ended December 31, 2020

**January 29, 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 December 31, 2020.

This report contains forced outage rates for the current 12-month reporting period of January 1, 2020 to December 31, 2020 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 previous period of January 1, 2019 to December 31, 2019. Further, total asset class data is presented based on the calendar year for the years 2006 to 2018.

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 in order 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

1 generating unit are calculated by converting the operating time at the derated level into an equivalent  
2 outage time.

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

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

## 15 **2.0 Overview for Period Ending December 31, 2020**

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

Class of Units	Jan 1, 2019 to Dec 31, 2019	Jan 1, 2020 to Dec 31, 2020	Base Planning Assumption	Near-Term Planning Assumption <sup>1</sup>
Hydraulic (DAFOR)	1.04	0.93	0.90	2.60
Thermal (DAFOR)	4.48	4.76	9.64	14.00
Combined Gas Turbine (UFOP)	3.98	6.40	10.62	20.00
Holyrood Gas Turbine (UFOP)	0.00	7.95	5.00	5.00
Hardwoods/Stephenville Gas Turbine (DAUFOP)	13.61	14.53	-	30.00
Happy Valley Gas Turbine (DAUFOP)	0.00	6.82	-	15.00
Holyrood Gas Turbine (DAUFOP)	0.00	7.95	-	5.00

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

1 There was a slight improvement in hydraulic DAFOR performance and a slight decline in thermal DAFOR  
2 performance for the current 12-month period ending December 31, 2020 compared to the previous 12-  
3 month period ending December 31, 2019 (Table 1). The gas turbine UFOP and DAUFOP show a decline in  
4 performance for all units for the current period compared to the previous period.

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

### 6 **3.0 Generation Planning Assumptions**

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

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

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

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<sup>2</sup> 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: 2017<sup>3</sup> 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 Near-Term Generation Adequacy Assumption	DAUFOP 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 December 31, 2020 are presented in Table 4, as well as
- 5 the data for the 12-month period ending December 31, 2019. These are compared to Hydro’s short-
- 6 term generation adequacy assumptions, as used in the May 2018 “Near-Term Generation Adequacy
- 7 Report,” and Hydro’s long-term generation planning assumptions for the forced outage rate.

<sup>3</sup> 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 December 2019 (%)	12 months ending December 2020 (%)	Historical Base Planning Assumption (%)	Historical Near-Term Planning Assumption (%)
<b>All Hydraulic Units - weighted</b>	954.4	1.04	0.93	0.90	2.60
<b>Hydraulic Units</b>					
Bay D'Espoir 1	76.5	3.74	1.44	0.90	3.90
Bay D'Espoir 2	76.5	3.76	0.00	0.90	3.90
Bay D'Espoir 3	76.5	2.00	2.46	0.90	3.90
Bay D'Espoir 4	76.5	0.08	5.44	0.90	3.90
Bay D'Espoir 5	76.5	0.40	1.15	0.90	3.90
Bay D'Espoir 6	76.5	0.00	0.72	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	0.00	2.13	0.90	0.70
Upper Salmon	84	0.10	0.00	0.90	0.70
Granite Canal	40	0.74	0.90	0.90	0.70
Paradise River	8	9.15	1.32	0.90	0.70

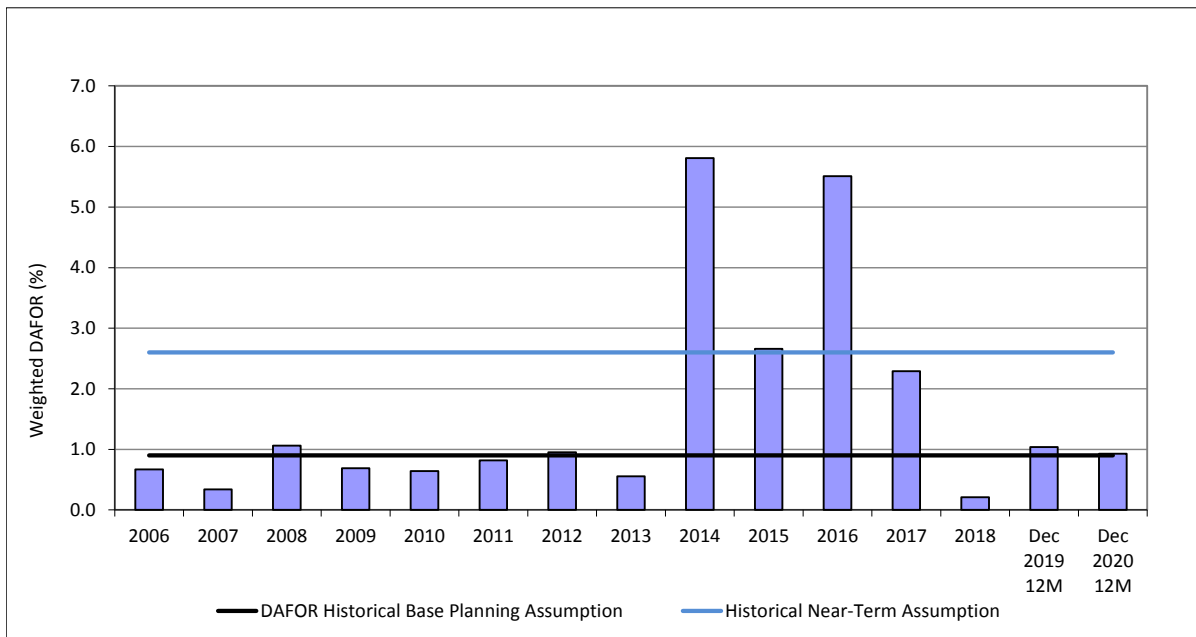


Figure 1: Hydraulic Weighted DAFOR

1 Considering individual hydraulic unit performance, the Bay d’Espoir Unit 4 DAFOR of 5.44% did not meet  
2 either the historical base planning assumption of 0.9% or the historical near-term planning assumption  
3 of 3.9% for an individual Bay d’Espoir unit. The Bay d’Espoir Units 1, 3, and 5 DAFOR of 1.44%, 2.46%,  
4 and 1.15%, respectively, did not meet the historical base planning assumption of 0.9% but are below the  
5 historical near-term planning assumption of 3.9% for an individual Bay d’Espoir unit.

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

10 As previously reported, Bay d’Espoir Unit 3 and Unit 4 experienced forced deratings from 76.5 MW to 25  
11 MW and 45 MW, respectively, in the month of July due to increased bearing temperatures resulting  
12 from fouling of the generator bearing coolers and oil degradation. The coolers have since undergone a  
13 chemical cleaning and the oil degradation issues have been addressed. The units are now operating at  
14 rated capacity and bearing temperatures remain inside the acceptable range. A more comprehensive  
15 review is ongoing to provide long-term solutions to further reduce generator bearing temperatures  
16 associated with Bay d’Espoir Units 1 to 6.

17 As previously reported, Bay d’Espoir Unit 5 experienced a forced outage for the period of June 2, 2020  
18 to June 4, 2020 as a result of the unit’s permanent magnet generator becoming decoupled during  
19 operation. This issue was repaired and the unit returned to service.

20 The Hinds Lake unit DAFOR of 2.13% did not meet either the historical base planning assumption of 0.9%  
21 or the historical near-term planning assumption of 0.7% for the unit. This was the result of four forced  
22 outages, as previously reported, all of which have been resolved. These outages include a forced outage  
23 to investigate arcing on the slip ring assembly on January 23, 2020, an issue with the brake speed switch  
24 on March 11, 2020, a failure to stop due to excessive wicket gate leakage on April 15, 2020, and a trip  
25 due to a faulty scroll case pressure switch on June 4, 2020.

26 The Granite Canal unit’s DAFOR of 0.9% met the historical near-term planning assumption of 0.9% but is  
27 above the historical base planning assumption of 0.7%. This was largely the result of a forced outage on  
28 October 1, 2020, which was caused by a leak in the governor oil manifold. In addition to this forced  
29 outage, the unit experienced six additional forced outages in the current period. These outages were all

1 short in duration and determined to be the result of malfunctioning field devices. Each outage has been  
2 investigated and the issues are resolved.

3 The Paradise River unit DAFOR of 1.32% did not meet either the historical base planning assumption of  
4 0.9% or the historical near-term assumption of 0.7% for the unit. This was the result of a forced outage  
5 which occurred from August 8, 2020 to August 11, 2020, the result of an issue with the unit breaker  
6 auxiliary position switch. This issue was resolved, and the unit breaker was replaced with a spare during  
7 the 2020 annual maintenance outage in November 2020.

## 8 **5.0 Thermal Unit DAFOR Performance**

9 Detailed results for the 12-month period ending December 31, 2020 and the 12-month period ending  
10 December 31, 2019 are presented in Table 5. These results are compared to Hydro’s short-term  
11 generation adequacy assumptions, as used in the May 2018 “Near-Term Generation Adequacy Report,”  
12 and Hydro’s long-term generation planning assumptions for the forced outage rate.

**Table 5: Thermal DAFOR**

Generating Unit	Maximum Continuous Unit Rating (MW)	12 Months Ending December 2019 (%)	12 months ending December 2020 (%)	Historical Base Planning Assumption (%)	Historical Near- Term Planning Assumption (%)
<b><i>All Thermal Units - weighted</i></b>	490	4.48	4.76	9.64	14.00
<b>Thermal Units</b>					
Holyrood 1	170	0.93	3.97	9.64	15.00
Holyrood 2	170	10.24	7.78	9.64	10.00
Holyrood 3	150	0.67	0.52	9.64	18.00

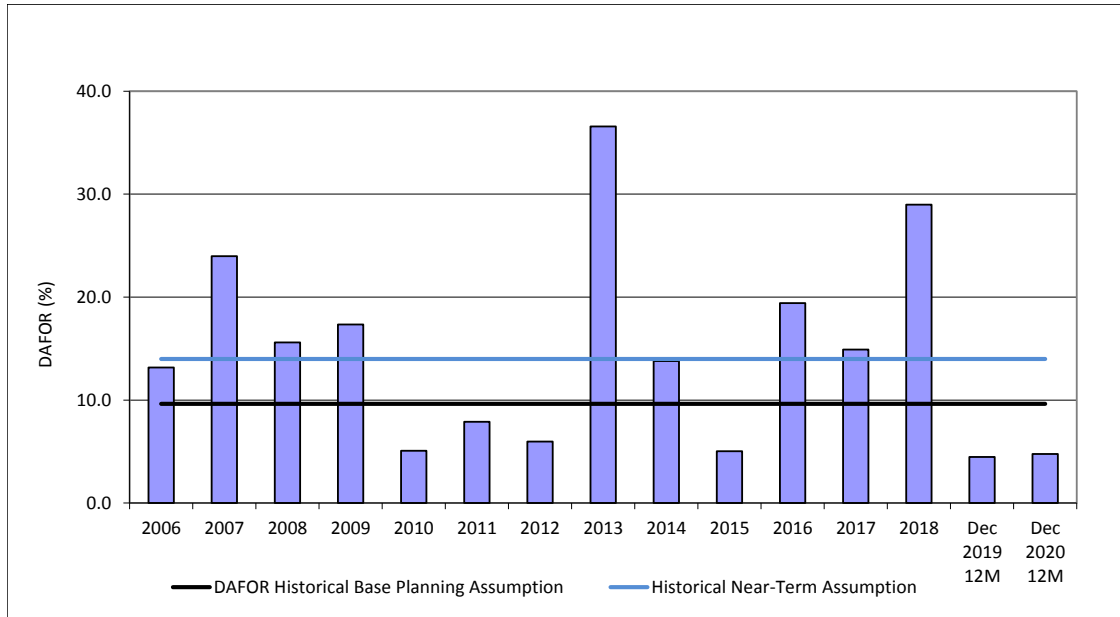


Figure 2: Thermal DAFOR

1 For the 12-month period ending December 31, 2020, the weighted DAFOR for all thermal units of 4.76%  
 2 is 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 3.97%, which is below the historical base planning  
 4 assumption of 9.64% and the historical near-term planning assumption of 15%. Unit 2 DAFOR was  
 5 7.78%, which is below the historical base planning assumption of 9.64% and the historical near-term  
 6 assumption of 10.0%. Unit 3 DAFOR was 0.52%, which is below the historical base planning assumption  
 7 of 9.64% and the historical near-term planning assumption of 18%.

8 The current period DAFOR for Unit 2 and Unit 3 has improved over the previous period, while the  
 9 performance of Unit 1 has declined.

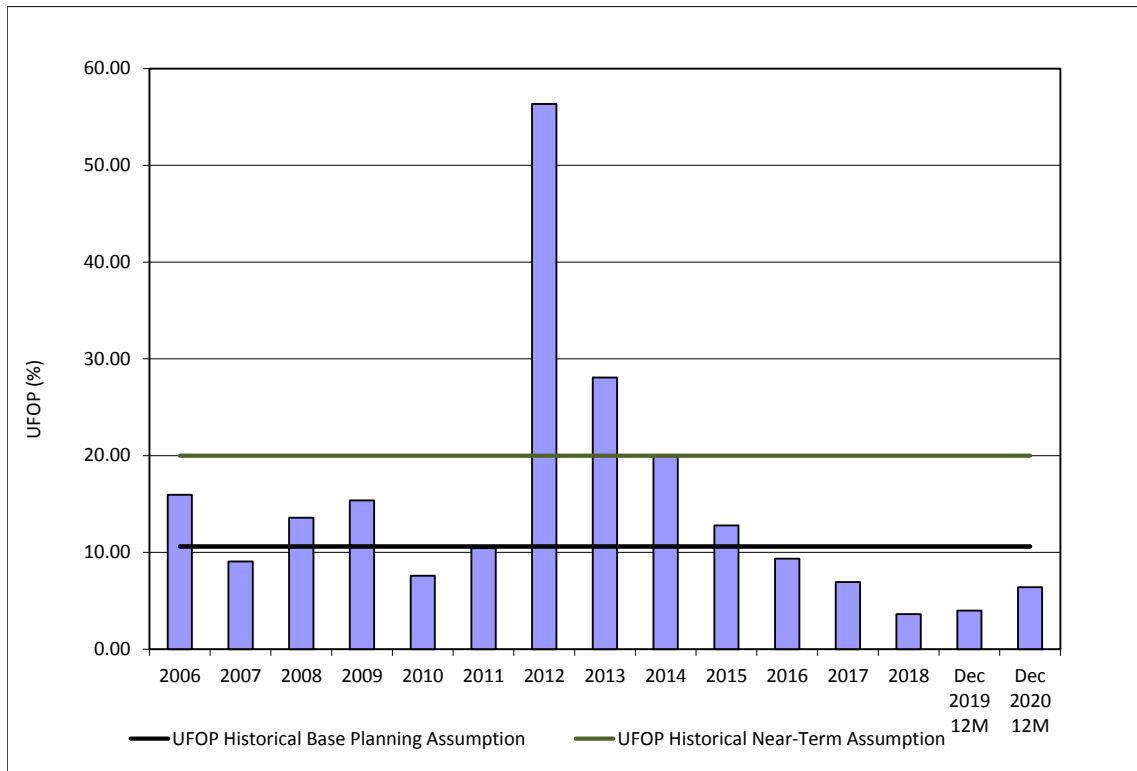
## 10 6.0 Gas Turbine UFOP Performance

11 The combined UFOP for the Hardwoods, Happy Valley, and Stephenville Gas Turbines was 6.40% for the  
 12 12-month period ending December 31, 2020 (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% but has declined over the  
 14 previous period. The Hardwoods Gas Turbine UFOP for the current period is 4.64%, as compared to the  
 15 base planning assumption of 10.62%. The Stephenville Gas Turbine UFOP for the current period is  
 16 8.13%, which is below both the historical base planning assumption of 10.62% and the historical near-

1 term planning assumption of 20.00%. The Happy Valley Gas Turbine UFOP is 6.82% for the current  
 2 period, as compared to the base planning assumption of 10.62%. On an individual unit basis, gas turbine  
 3 UFOP performance for the Hardwoods, Stephenville and Happy Valley Gas Turbines for the current  
 4 period has declined over the previous period.

**Table 6: Gas Turbine UFOP**

Gas Turbine Units	Maximum Continuous Unit Rating (MW)	12 months ending December 2019 (%)	12 months ending December 2020 (%)	Historical Base Planning Assumption (%)	Historical Near-Term Planning Assumption (%)
<b>Combined Gas Turbines</b>	125	3.98	6.40	10.62	20.00
Stephenville	50	4.80	8.13	10.62	20.00
Hardwoods	50	4.13	4.64	10.62	20.00
Happy Valley	25	0.00	6.82	10.62	20.00

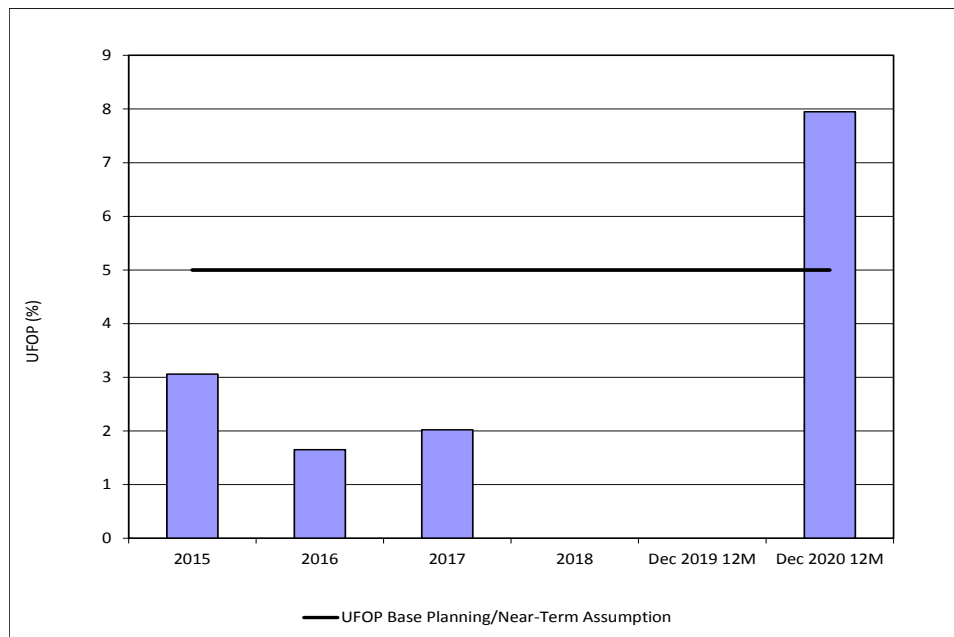


**Figure 3: Gas Turbine UFOP: Hardwoods/Happy Valley/Stephenville Units**

1 The Holyrood Gas Turbine UFOP for the current period is 7.95%, which is above the historical base and  
 2 near-term planning assumptions of 5.00% (Table 7 and Figure 4) and has declined over the UFOP for the  
 3 previous period. The UFOP performance for the Holyrood Gas Turbine was impacted by three forced  
 4 outages in the current period. The first outage, a forced outage from May 26 to May 27, was the result  
 5 of an issue with the unit’s turning gear motor electrical circuit, which has since been resolved. The  
 6 second and third outages were both approximately two hours in duration and occurred on August 11,  
 7 due to fuel pressure differential, and on September 3, due to the automatic voltage regulator  
 8 configuration following a planned outage. Both of these issues were isolated events and have been  
 9 resolved. Though short in duration, the impact of these three outages is significant, primarily as a result  
 10 of the reduced operation this unit has experienced in the current period when compared to previous  
 11 reporting periods.

**Table 7: Holyrood Gas Turbine UFOP**

Gas Turbine Units	Maximum Continuous Unit Rating (MW)	12 months ending December 2019 (%)	12 months ending December 2020 (%)	Historical Base Planning Assumption (%)	Historical Near-Term Planning Assumption (%)
Holyrood GT	123.5	0.00	7.95	5.00	5.00



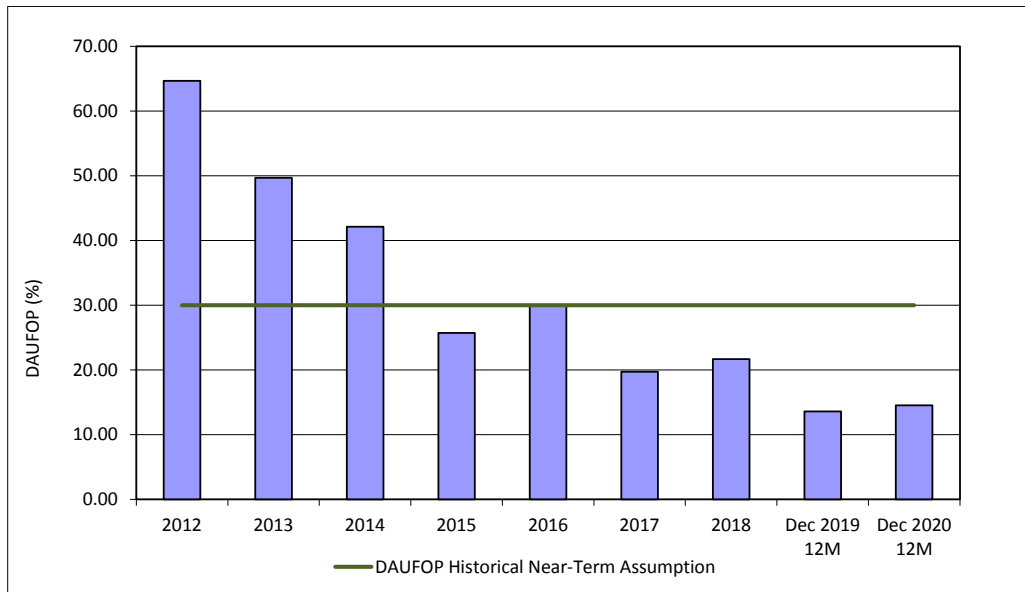
**Figure 4: Gas Turbine UFOP: Holyrood Unit**

## 7.0 Gas Turbine DAUFOP Performance

The combined DAUFOP for the Hardwoods and Stephenville Gas Turbines was 14.53% for the 12-month period ending December 31, 2020 (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 16.25%, which is below the near-term planning assumption of 30.00% and below the DAUFOP for the previous period. The Stephenville Gas Turbine DAUFOP for the current period is 8.13%, which is below the near-term planning assumption of 30.00%, and indicates a decline in performance over the previous period.

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

Gas Turbine Units	Maximum Continuous Unit Rating (MW)	12 months ending December 2019 (%)	12 months ending December 2020 (%)	Historical Near-Term Planning Assumption (%)
<i>Gas Turbines (HWD/SVL)</i>	100	13.61	14.53	30.00
Stephenville	50	5.66	8.13	30.00
Hardwoods	50	20.52	16.25	30.00

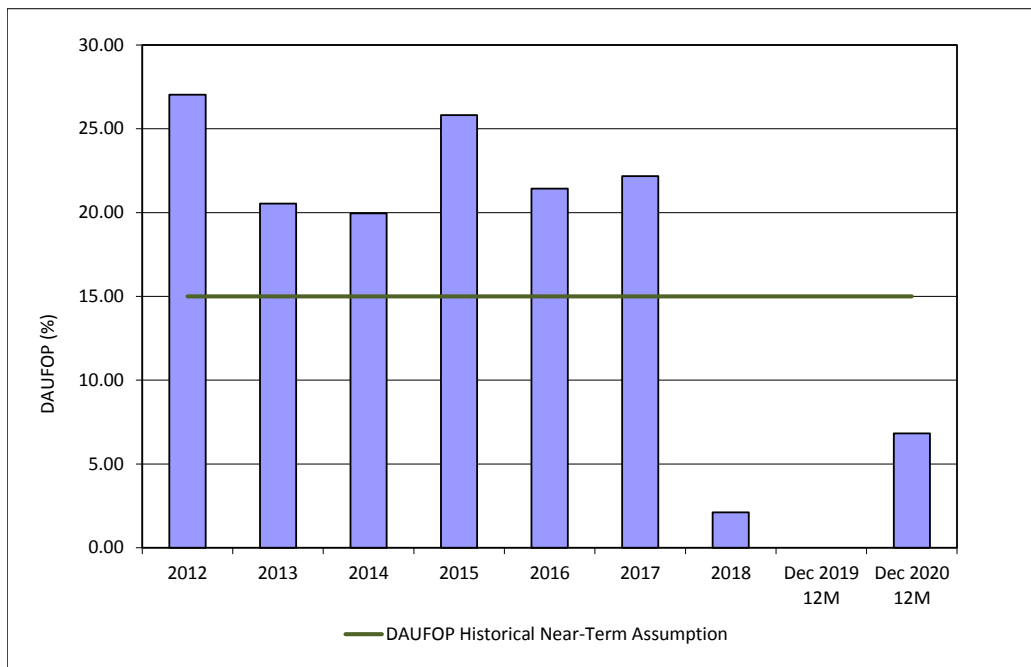


**Figure 5: Gas Turbine DAUFOP: Hardwoods/Stephenville Units**

- 1 The DAUFOP for the Happy Valley Gas Turbine was 6.82% for the 12-month period ending
- 2 December 31, 2020 (Table 9 and Figure 6). This is below the near-term planning assumption of 15.00%,
- 3 and shows a decline in performance over the previous period.

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

Gas Turbine Units	Maximum Continuous Unit Rating (MW)	12 months ending December 2019 (%)	12 months ending December 2020 (%)	Historical Near-Term Planning Assumption (%)
Happy Valley	25	0.00	6.82	15.00



**Figure 6: Gas Turbine DAUFOP: Happy Valley Unit**

- 4 The Holyrood Gas Turbine DAUFOP of 7.95% for the current period is above the near-term planning
- 5 assumption of 5.00% (Table 10 and Figure 7) and has declined over the previous period. The DAUFOP
- 6 performance of the Holyrood Gas Turbine was impacted by the forced outages discussed in Section 6.0.



Table 10: Holyrood Gas Turbine DAUFOP

Gas Turbine Units	Maximum Continuous Unit Rating (MW)	12 months ending December 2019 (%)	12 months ending December 2020 (%)	Historical Near-Term Planning Assumption (%)
Holyrood GT	123.5	0.00	7.95	5.00

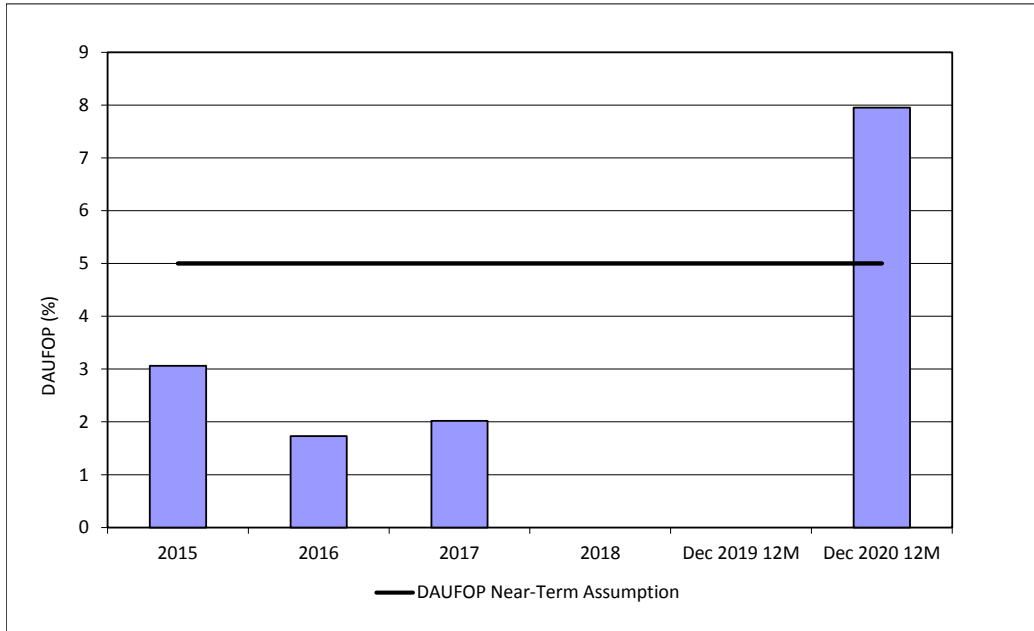


Figure 7: Gas Turbine DAUFOP: Holyrood Unit

## 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  
4 analysis. Table 11 summarizes the most recent forced outage rate assumptions as calculated using the  
5 forced outage rate methodology.<sup>4</sup>

<sup>4</sup> 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.

**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	9.7
Hardwoods and Stephenville	DAUFOP	30.0	N/A
Holyrood	DAUFOP	4.9	1.7

1 A 5-year capacity-weighted average was applied to the hydroelectric units (Bay d’Espoir, Cat Arm, Hinds  
 2 Lake, Granite Canal, Upper Salmon, and Paradise River) for the near-term analysis, resulting in a DAFOR  
 3 of 2.6%, while a 10-year capacity-weighted average was applied for use in the resource planning model,  
 4 resulting in a DAFOR of 2.1%. The DAFOR value was based on historical data reflective of Hydro’s  
 5 maintenance program over the long-term.

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

12 As the gas turbines in the existing fleet are in varied condition, each was considered on an individual  
 13 basis rather than applying a weighted average across all units. For the Happy Valley Gas Turbine, a 3-  
 14 year capacity-weighted average was applied to the unit for the near-term analysis, resulting in a  
 15 DAUFOP of 12%, while a 10-year capacity-weighted average was applied for use in the resource planning  
 16 model resulting in a DAUFOP of 9.7%. The DAUFOP values were based on historical data founded upon  
 17 the unit’s past reliable performance. For the Holyrood Gas Turbine, a scenario-based approach was used  
 18 to estimate an appropriate value for the near-term analysis, resulting in a DAUFOP of 4.9%. For the  
 19 Hardwoods and Stephenville Gas Turbines, a DAUFOP of 30% was used for the near-term analysis,  
 20 consistent with the metrics that were considered in Hydro’s May 2018 “Near-Term Generation  
 21 Adequacy Report.” As the Hardwoods and Stephenville Gas Turbines are being considered for

1 retirement in the near term, these units were not included in the long- term analysis; therefore, there is  
2 no resource planning analysis value listed for these facilities.

### 3 **9.0 Comparison of Planning Assumptions and Analysis Values**

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

7 Hydro notes that the Study did not utilize UFOP in its analysis. The analysis instead utilized the DAUFOP  
8 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	9.7
Hardwoods and Stephenville	DAUFOP	-	30.0	30.0	N/A
Holyrood	DAUFOP	-	5.0	4.9	1.7

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

Table 13: Hydraulic Weighted DAFOR Performance Comparison

Generating Unit	Maximum Continuous Unit Rating (MW)	12 months ending December 2019 (%)	12 months ending December 2020 (%)	May 2018		November 2020	
				Historic Base Planning Assumption (%)	Historic Near-Term Planning Assumption (%)	Near-Term Planning Analysis Value (%)	Resource Planning Analysis Value (%)
<b>All Hydraulic Units - weighted</b>	954.4	1.04	0.93	0.90	2.60	2.60	2.10
<b>Hydraulic Units</b>							
Bay D'Espoir 1	76.5	3.74	1.44	0.90	3.90	2.60	2.10
Bay D'Espoir 2	76.5	3.76	0.00	0.90	3.90	2.60	2.10
Bay D'Espoir 3	76.5	2.00	2.46	0.90	3.90	2.60	2.10
Bay D'Espoir 4	76.5	0.08	5.44	0.90	3.90	2.60	2.10
Bay D'Espoir 5	76.5	0.40	1.15	0.90	3.90	2.60	2.10
Bay D'Espoir 6	76.5	0.00	0.72	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	0.00	2.13	0.90	0.70	2.60	2.10
Upper Salmon	84	0.10	0.00	0.90	0.70	2.60	2.10
Granite Canal	40	0.74	0.90	0.90	0.70	2.60	2.10
Paradise River	8	9.15	1.32	0.90	0.70	2.60	2.10

Table 14: Thermal DAFOR Performance Comparison

Generating Unit	Maximum Continuous Unit Rating (MW)	12 months ending December 2019 (%)	12 months ending December 2020 (%)	May 2018		November 2020	
				Historic Base Planning Assumption (%)	Historic Near-Term Planning Assumption (%)	Near-Term Planning Analysis Value (%)	Resource Planning Analysis Value (%)
<b>All Thermal Units - weighted</b>	490	4.48	4.76	9.64	14.00	15.00	N/A
<b>Thermal Units</b>							
Holyrood 1	170	0.93	3.97	9.64	15.00	15.00	-
Holyrood 2	170	10.24	7.78	9.64	10.00	15.00	-
Holyrood 3	150	0.67	0.52	9.64	18.00	15.00	-

Table 15: Hardwoods/Stephenville Gas Turbine DAUFOP Performance

Gas Turbine Units	Maximum Continuous Unit Rating (MW)	12 months ending December 2019 (%)	12 months ending December 2020 (%)	May 2018		November 2020	
				Historic Base Planning Assumption (%)	Historic Near-Term Planning Assumption (%)	Near-Term Planning Analysis Value (%)	Resource Planning Analysis Value (%)
<b>Gas Turbines (HWD/SVL)</b>	100	13.61	14.53	N/A	30.00	30.00	N/A
Stephenville	50	5.66	8.13	N/A	30.00	30.00	N/A
Hardwoods	50	20.52	16.25	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 December 2019 (%)	12 months ending December 2020 (%)	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	0.00	6.82	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 December 2019 (%)	12 months ending December 2020 (%)	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	7.95	N/A	5.00	4.90	1.70