newfoundland labrador hydro

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July 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 June 30, 2021

Please find enclosed Newfoundland and Labrador Hydro's "Quarterly Report on Performance of Generating Units for the Twelve Months Ended June 30, 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/kd

Encl.

ecc: **Board of Commissioners of Public Utilities**
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Quarterly Report on Performance of Generating Units for the Twelve Months Ended June 30, 2021

July 30, 2021

A report to the Board of Commissioners of Public Utilities

newfoundland labrador hydro

Contents

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 June 30, 2021.

This report contains forced outage rates for the current 12-month reporting period of July 1, 2020 to June 30, 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 July 1, 2019 to June 30, 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.

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

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

2.0 Overview for Period Ending June 30, 2021

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

Class of Units	July 1, 2019 to June 30, 2020	July 1, 2020 to June 30, 2021	Base Planning Assumption	Near-Term Planning Assumption[1]
Hydraulic (DAFOR)	1.24	1.21	0.90	2.60
Thermal (DAFOR)	2.03	5.92	9.64	14.00
Combined Gas Turbine (UFOP)	6.88	3.79	10.62	20.00
Holyrood Gas Turbine (UFOP)	3.32	1.94	5.00	5.00
Hardwoods/Stephenville Gas Turbine (DAUFOP)	12.48	3.10	-	30.00
Happy Valley Gas Turbine (DAUFOP)	1.84	9.79	-	15.00
Holyrood Gas Turbine (DAUFOP)	3.32	1.94	-	5.00

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

As shown in Table 1, hydraulic DAFOR performance remained consistent, but there was a decline in thermal DAFOR performance for the current 12-month period ending June 30, 2021 compared to the 12-month period ending June 30, 2020. The Combined Gas Turbine UFOP and the Holyrood Gas Turbine UFOP performance are improved in the current period. The DAUFOP performance for Hardwoods/Stephenville Gas Turbines and the Holyrood Gas Turbine improved in the current period compared to the 12-month period ending June 30, 2020. Conversely, performance for the Happy Valley Gas Turbine declined in the current period compared to the 12-month period ending June 30, 2020.

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

3.0 Generation Planning Assumptions

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

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

Hydro's DAFOR and UFOP planning assumptions are provided in Table 2. The Holyrood Gas Turbine has a lower expected rate of unavailability than the older gas turbines (5% compared to 10.62%) as the unit is 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: 2017[3] 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

The DAFOR and DAUFOP assumptions used in developing the May 2018 "Near-Term Generation 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

4.0 Hydraulic Unit DAFOR Performance

Detailed results for the 12-month period ending June 30, 2021 are presented in Table 4, as well as the data for the 12-month period ending June 30, 2020. These are compared to Hydro's short-term generation adequacy assumptions, as used in the May 2018 "Near-Term Generation Adequacy Report," 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 June 2020 (%)	12 months ending June 2021 (%)	Historical Base Planning Assumption (%)	Historical Near-Term Planning Assumption (%)
All Hydraulic Units - weighted	954.4	1.24	1.21	0.90	2.60
Hydraulic Units					
Bay D'Espoir 1	76.5	4.12	5.30	0.90	3.90
Bay D'Espoir 2	76.5	3.89	0.00	0.90	3.90
Bay D'Espoir 3	76.5	1.85	2.59	0.90	3.90
Bay D'Espoir 4	76.5	0.00	5.21	0.90	3.90
Bay D'Espoir 5	76.5	0.96	0.00	0.90	3.90
Bay D'Espoir 6	76.5	0.66	0.09	0.90	3.90
Bay D'Espoir 7	154.4	0.00	0.47	0.90	3.90
Cat Arm 1	67	0.19	0.58	0.90	0.70
Cat Arm 2	67	0.00	0.59	0.90	0.70
Hinds Lake	75	1.93	0.55	0.90	0.70
Upper Salmon	84	0.05	0.06	0.90	0.70
Granite Canal	40	1.17	1.77	0.90	0.70
Paradise River	8	6.79	1.78	0.90	0.70

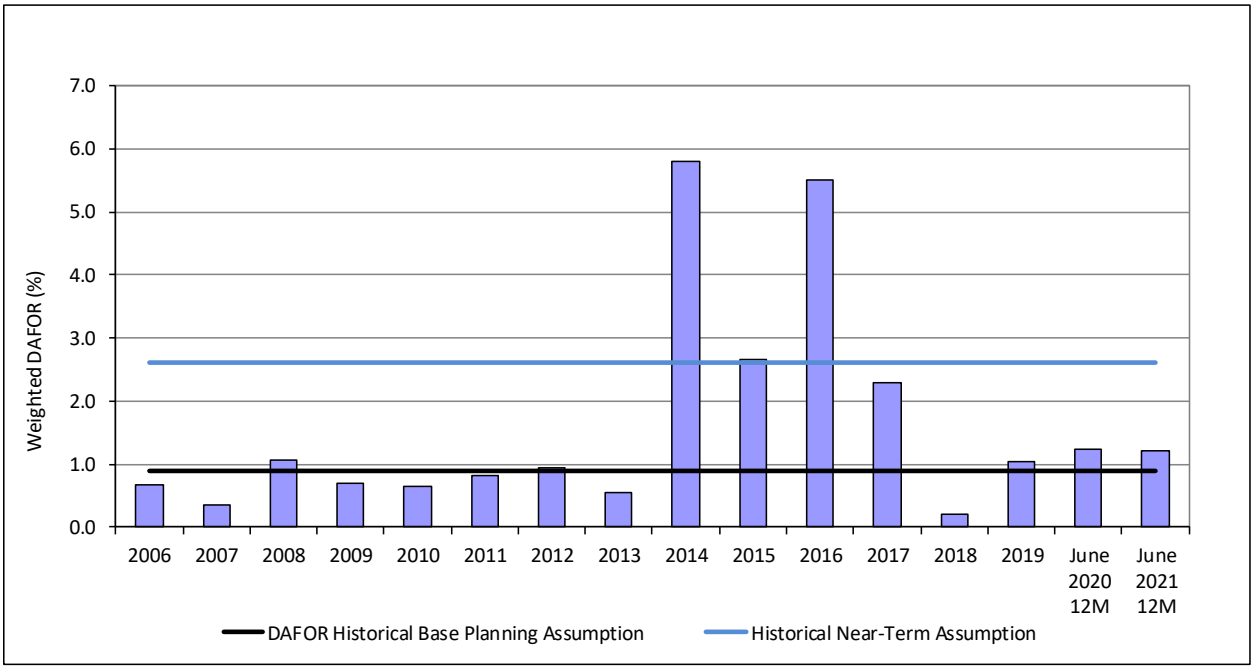

Figure 1: Hydraulic Weighted DAFOR

Considering individual hydraulic unit performance, the Bay d'Espoir Unit 1 DAFOR of 5.30% and the Bay d'Espoir Unit 4 DAFOR of 5.21% did not meet either the historical base planning assumption of 0.9% or the historical near-term planning assumption of 3.90% for an individual Bay d'Espoir unit. The Bay

d'Espoir Unit 3 DAFOR of 2.59% did not meet the historical base planning assumption of 0.9% but is below the historical near-term planning assumption of 3.90% for an individual Bay d'Espoir unit.

As previously reported, Bay d'Espoir Unit 1 experienced a forced outage on July 11, 2020 which was the result of ambient humidity causing moisture in stator windings following the annual planned outage. Corrective measures were implemented to improve the humidity levels and the unit was successfully returned to service on July 15, 2020. Since the previous filing, Bay d'Espoir Unit 1 has experienced two additional forced outages which impacted the DAFOR performance. The first, from May 14, 2021 to May 20, 2021, was a forced extension of the planned outage, as a result of findings in the scheduled inspection of Penstock #1. During the inspection, 16 distinct indications were identified over an approximately 200 foot span of the penstock with indications ranging in length from 2 inches to 8 feet. The indications were similar in condition to those discovered in recent years and were shallow in depth. Weld refurbishment and final inspection was completed and the penstock was returned to service. This discovery was not unexpected given the known condition of the Bay d'Espoir Penstocks. Hydro will use the information obtained through the inspection and refurbishment process to inform its long-term plan for the penstocks; the details of Hydro's long-term plan are expected to be filed with the Board in early 2022. The final outage that impacted Bay d'Espoir Unit 1 DAFOR performance occurred May 29 to June 3, 2021 when the unit was removed from service to investigate elevated governor oil temperatures. The investigation discovered misalignment of the permanent magnet generator ("PMG") coupling which caused excessive strain and subsequent shearing of the drive pins which then contributed to the failure of a piston seal ring in the servomotor. The necessary repairs were completed and the unit returned to service. Work orders were entered to inspect other units with similar PMG couplings during the next planned outage and preventative maintenance programs were updated to include the verification of alignment of the PMG coupling.

Also previously reported, Bay d'Espoir Unit 3 and Unit 4 experienced forced deratings from 76.5 MW to 25 MW and 45 MW, respectively, in the month of July 2020 due to increased bearing temperatures resulting from fouling of the generator bearing coolers and oil degradation. The coolers have since undergone a chemical cleaning and the oil degradation issues have been addressed. The units are now operating at rated capacity and bearing temperatures remain inside the acceptable range. A more comprehensive review is ongoing to provide long-term solutions to further reduce generator bearing temperatures associated with Bay d'Espoir Units 1 to 6. Data collection over a full cycle of annual operation, including summertime operation, is required to complete the review and determine an

appropriate path forward. Additionally, Bay d'Espoir Unit 4 has experienced two shear pin failures on January 17, 2021 and March 4, 2021. Shear pin failures are not uncommon; however, additional investigation was undertaken as part of the Bay d'Espoir Unit 4 annual maintenance outage to confirm there was no underlying cause for these repeat failures.

The Granite Canal Unit's DAFOR of 1.77% did not meet either the historical near-term planning assumption of 0.9% or the historical base planning assumption of 0.7%. As previously reported, a forced outage occurred on October 1, 2020 which was caused by a leak in the governor oil manifold. Additionally, the Granite Canal Unit was unavailable due to a forced outage from February 25, 2021 to February 26, 2021 and another from February 28, 2021 to March 3, 2021. These two outages were the result of governor pressure issues caused by the accumulator system. These issues have been resolved and preventative maintenance procedures have been updated to prevent future occurrence of similar issues.

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

5.0 Thermal Unit DAFOR Performance

Detailed results for the 12-month period ending June 30, 2021 and the 12-month period ending June 30, 2020 are presented in Table 5. These results are compared to Hydro's short-term generation adequacy assumptions, as used in the May 2018 "Near-Term Generation Adequacy Report," 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 June 2020 (%)	12 months ending June 2021 (%)	Historical Base Planning Assumption (%)	Historical Near-Term Planning Assumption (%)
All Thermal Units - weighted	490	2.03	5.92	9.64	14.00
Thermal Units					
Holyrood 1	170	0.38	4.69	9.64	15.00
Holyrood 2	170	4.27	6.07	9.64	10.00
Holyrood 3	150	0.37	7.82	9.64	18.00

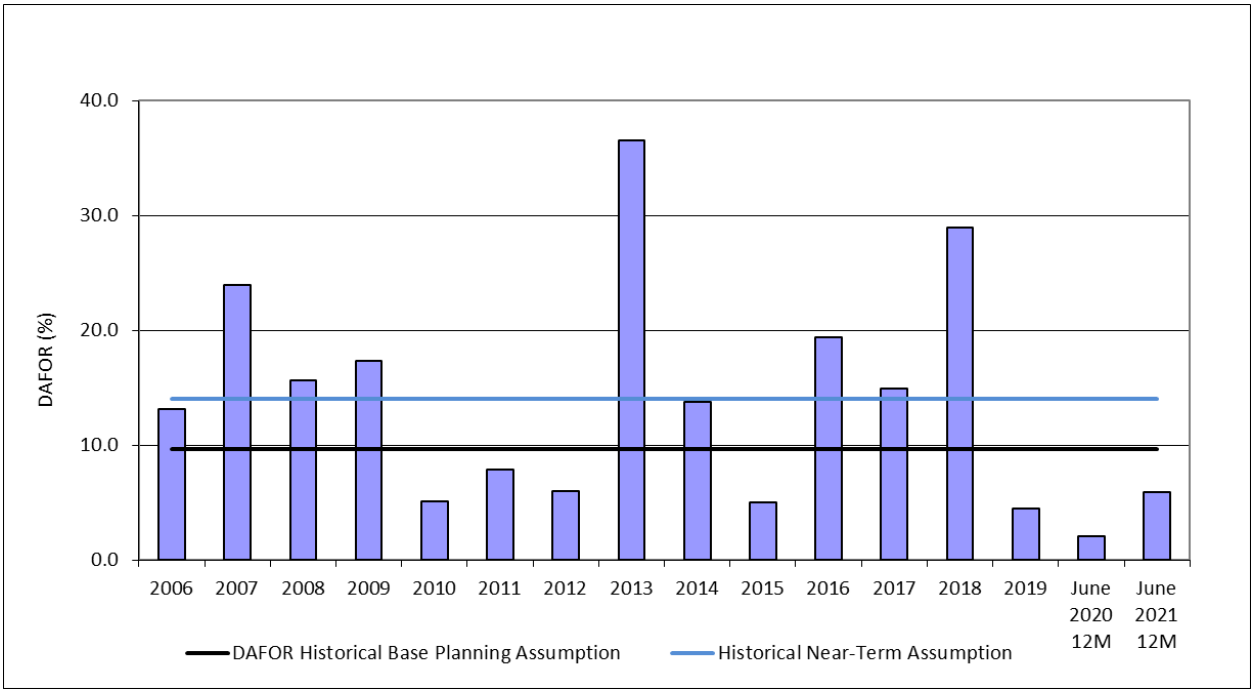

Figure 2: Thermal DAFOR

For the 12-month period ending June 30, 2021, the weighted DAFOR for all thermal units of 5.92% is below the historical base planning assumption DAFOR value of 9.64% and the historical near-term planning assumption of 14.00%. Unit 1 DAFOR was 4.69%, which is below the historical base planning assumption of 9.64% and the historical near-term planning assumption of 15.00%. Unit 2 DAFOR was 6.07%, which is below the historical base planning assumption of 9.64% and the historical near-term assumption of 10.00%. Unit 3 DAFOR was 7.82%, which is below the historical base planning assumption of 9.64% and the historical near-term planning assumption of 18.00%.

The current period DAFOR for all three Holyrood units has declined over the 12-month period ending June 30, 2021.

6.0 Gas Turbine UFOP Performance

The combined UFOP for the Hardwoods, Happy Valley, and Stephenville Gas Turbines was 3.79% for the 12-month period ending June 30, 2021 (Table 6 and Figure 3). This performance is better than the base planning assumption of 10.62% and the near-term assumption of 20.00% and is improved over performance during the 12-month period ending June 30, 2020. The Hardwoods Gas Turbine UFOP for the current period is 0.66%, as compared to the base planning assumption of 10.62%. The Stephenville

Gas Turbine UFOP for the current period is 1.95%, as compared to the historical base planning assumption of 10.62%. The Happy Valley Gas Turbine UFOP is 9.79% for the current period, as compared to the base planning assumption of 10.62%. On an individual unit basis, gas turbine UFOP performance for the current period has improved for the Hardwoods and Stephenville Units, but has declined for the Happy Valley Unit over the 12-month period ending June 30, 2020.

Table 6: Gas Turbine UFOP

Gas Turbine Units	Maximum Continuous Unit Rating (MW)	12 Months Ending June 2020 (%)	12 months ending June 2021 (%)	Historical Base Planning Assumption (%)	Historical Near-Term Planning Assumption (%)
Combined Gas Turbines	125	6.88	3.79	10.62	20.00
Stephenville	50	11.63	1.95	10.62	20.00
Hardwoods	50	4.52	0.66	10.62	20.00
Happy Valley	25	1.84	9.79	10.62	20.00

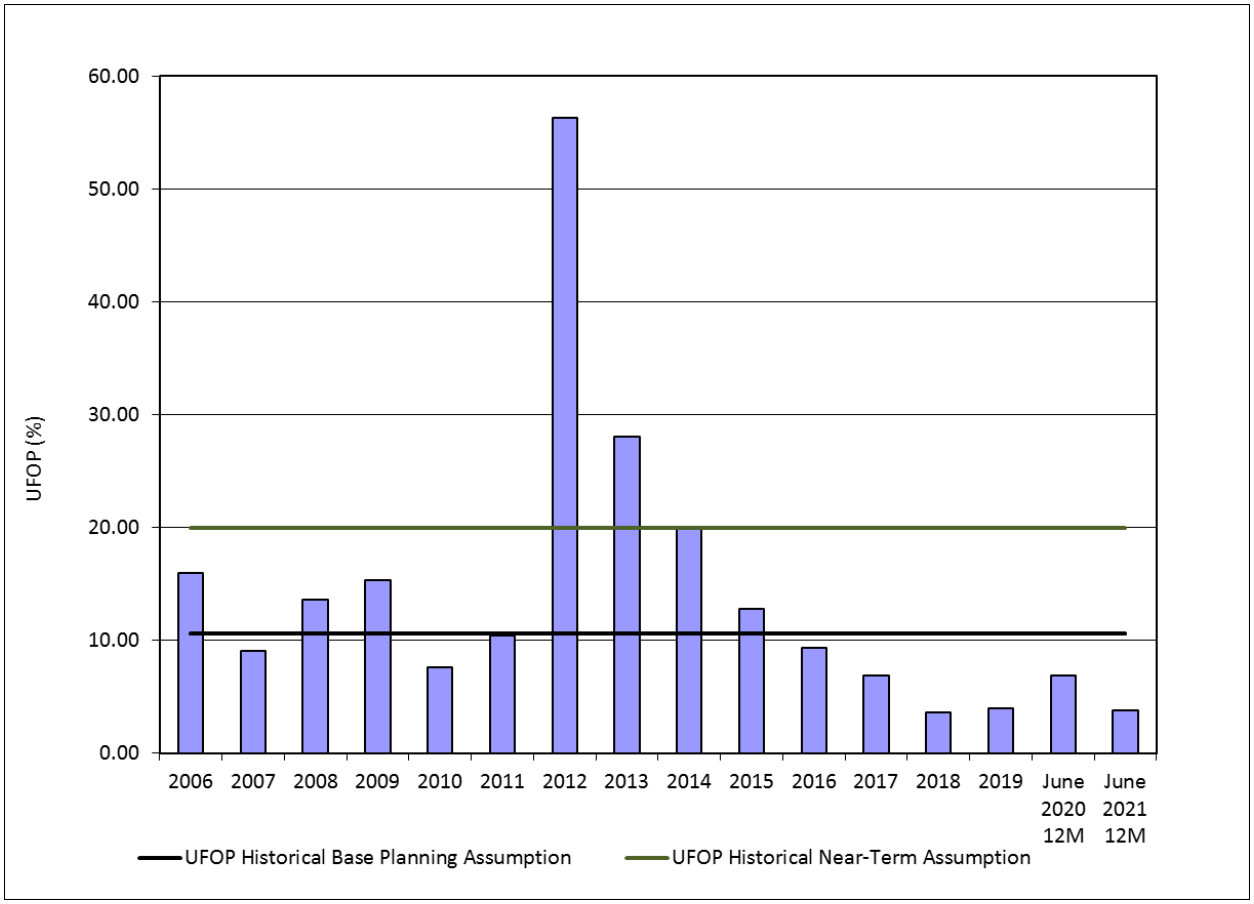

Figure 3: Gas Turbine UFOP: Hardwoods/Happy Valley/Stephenville Units

The Holyrood Gas Turbine UFOP for the current period is 1.94%, which is below the historical base and near-term planning assumptions of 5.00% (Table 7 and Figure 4) and has improved when compared to the 12-month period ending June 30, 2020.

Table 7: Holyrood Gas Turbine UFOP

Gas Turbine Units	Maximum Continuous Unit Rating (MW)	12 Months Ending June 2020 (%)	12 months ending June 2021 (%)	Historical Base Planning Assumption (%)	Historical Near-Term Planning Assumption (%)
Holyrood GT	123.5	3.32	1.94	5.00	5.00

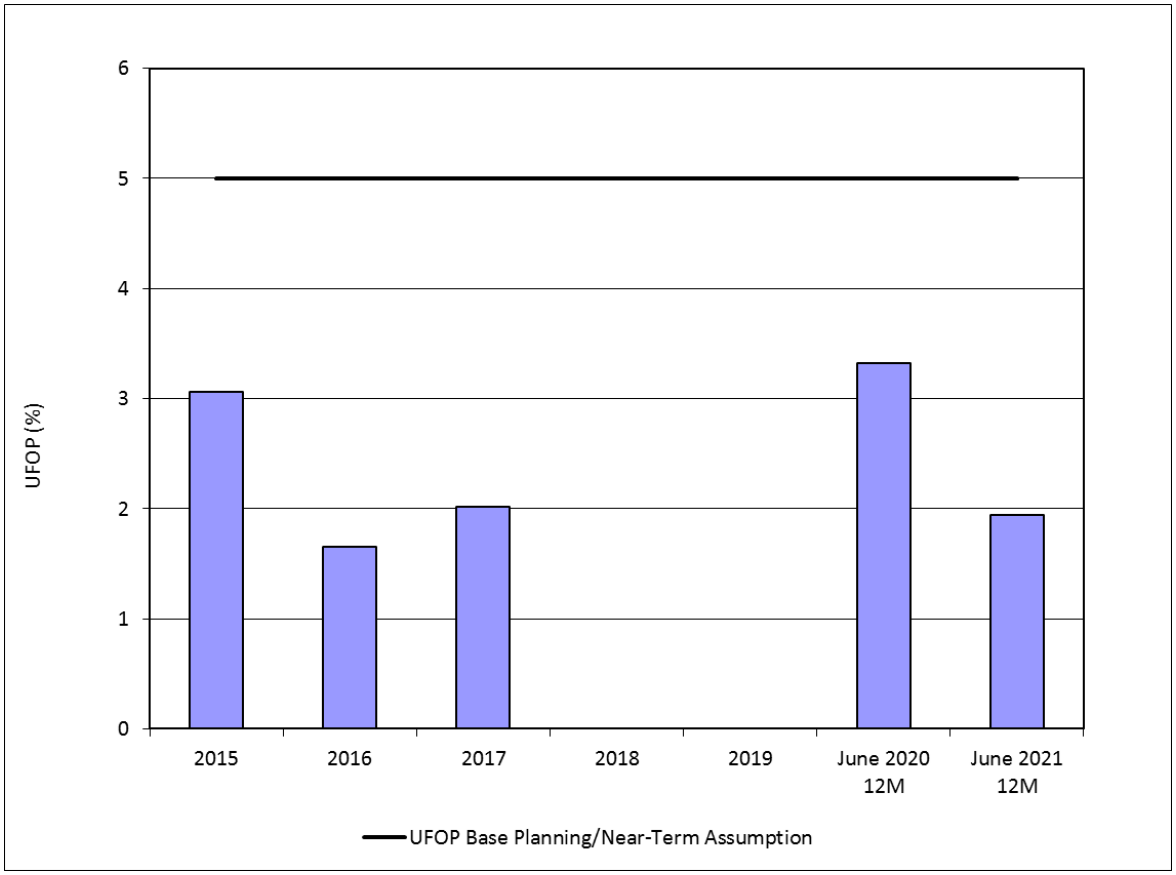

Figure 4: Gas Turbine UFOP: Holyrood Unit

7.0 Gas Turbine DAUFOP Performance

The combined DAUFOP for the Hardwoods and Stephenville Gas Turbines was 3.10% for the 12-month period ending June 30, 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 3.01%, which is below the near-term planning assumption of 30.00% and below the DAUFOP for the 12-month period ending June 30, 2020. The Stephenville Gas Turbine DAUFOP for the current period is 1.95%, which is below the near-term planning assumption of 30.00%, and indicates an improvement in performance over the 12-month period ending June 30, 2020.

Table 8: Hardwoods/Stephenville Gas Turbine DAUFOP

Gas Turbine Units	Maximum Continuous Unit Rating (MW)	12 Months Ending June 2020 (%)	12 months ending June 2021 (%)	Historical Near-Term Planning Assumption (%)
Gas Turbines (HWD/SVL)	100	12.48	3.10	30.00
Stephenville	50	14.15	1.95	30.00
Hardwoods	50	10.17	3.01	30.00

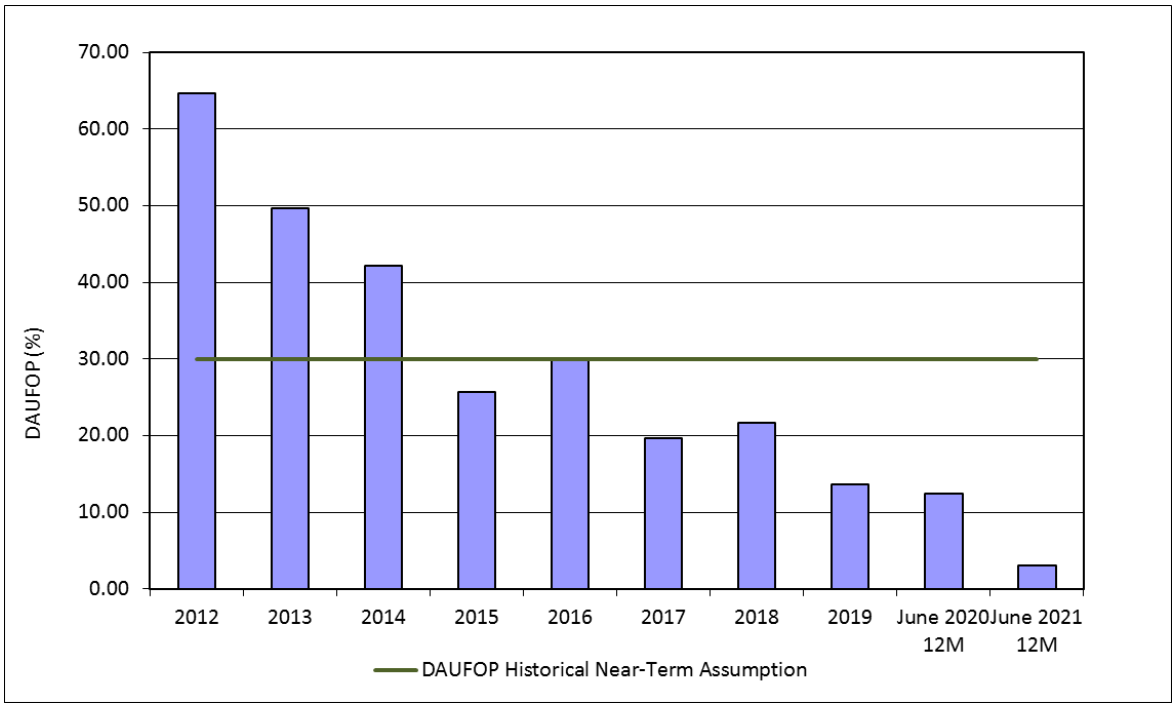

Figure 5: Gas Turbine DAUFOP: Hardwoods/Stephenville Units

The DAUFOP for the Happy Valley Gas Turbine was 9.79% for the 12-month period ending June 30, 2021 (Table 9 and Figure 6). This is below the near-term planning assumption of 15.00%, and shows a decline in performance over the 12-month period ending June 30, 2020.

Table 9: Happy Valley Gas Turbine DAUFOP

Gas Turbine Units	Maximum Continuous Unit Rating (MW)	12 Months Ending June 2020 (%)	12 months ending June 2021 (%)	Historical Near-Term Planning Assumption (%)
Happy Valley	25	1.84	9.79	15.00

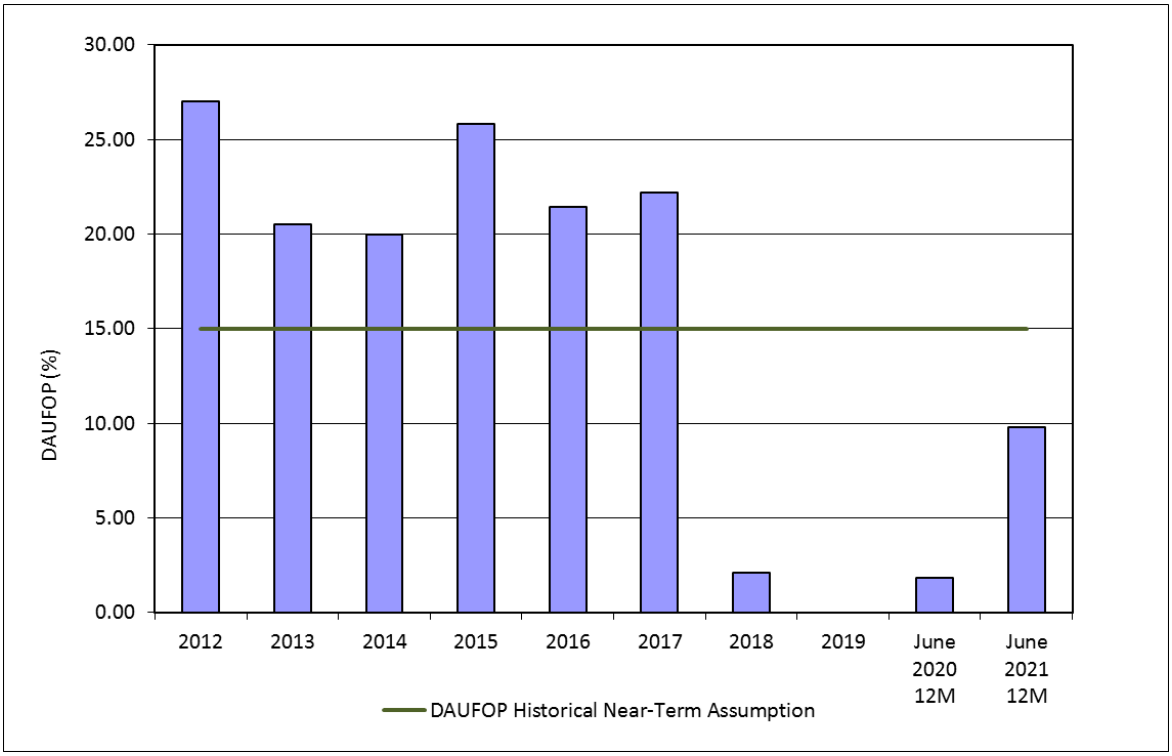

Figure 6: Gas Turbine DAUFOP: Happy Valley Unit

The Holyrood Gas Turbine DAUFOP of 1.94% for the current period is below the near-term planning assumption of 5.00% (Table 10 and Figure 7) and has improved from the 12-month period ending June 30, 2020.

Table 10: Holyrood Gas Turbine DAUFOP

Gas Turbine Units	Maximum Continuous Unit Rating (MW)	12 Months Ending June 2020 (%)	12 months ending June 2021 (%)	Historical Near-Term Planning Assumption (%)
Holyrood GT	123.5	3.32	1.94	5.00

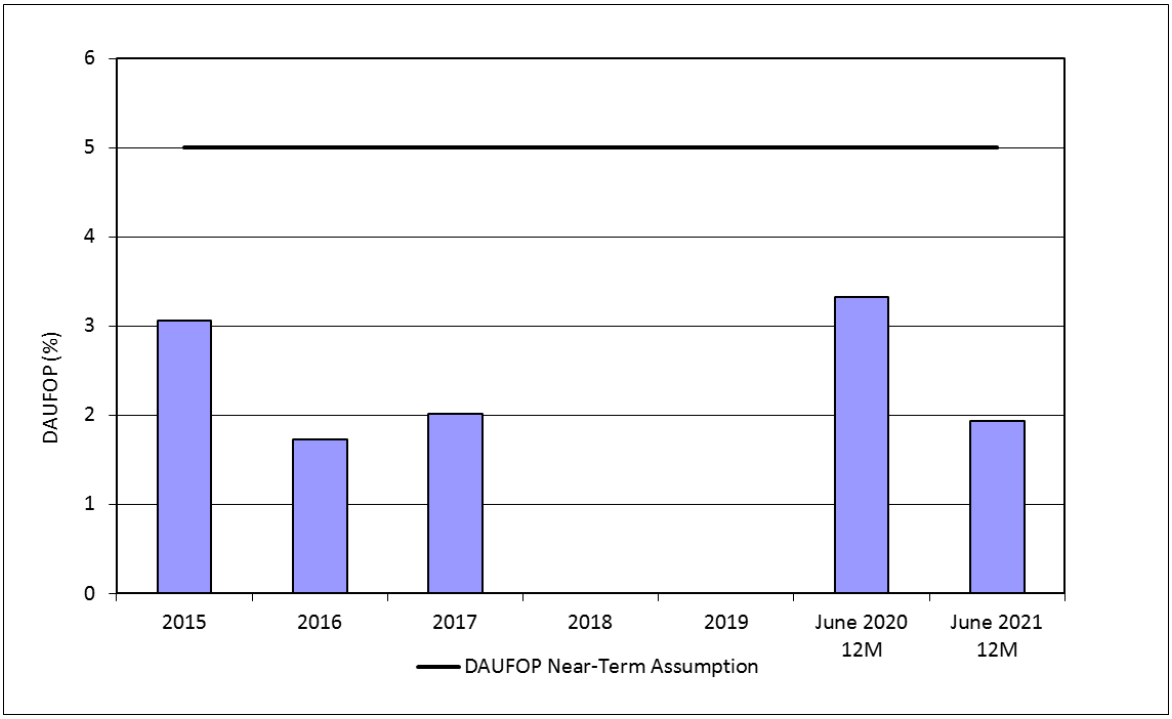

Figure 7: Gas Turbine DAUFOP: Holyrood Unit

8.0 Updated Planning Assumptions/Analysis Values

As part of the Study, 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 11 summarizes the most recent forced outage rate assumptions as calculated using the forced outage rate methodology.[4]

[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.

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

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

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

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

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

9.0 Comparison of Planning Assumptions and Analysis Values

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

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

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

		Historical Planning Assumptions		Reliability and Resource Planning Assumptions	
Generating Unit Type	**Measure**	**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

The generating unit performance presented earlier in this report is again presented in Tables 13 to 17 with comparison to the previous assumptions, as well as the recently revised values. Hydro notes that on an asset class basis, the 12-month rolling performance of its generating units has no violations of Hydro's current planning assumptions pertaining to asset availability, with the exception of the Happy Valley and Holyrood Gas Turbines which do not meet their respective resource planning analysis values but are below the near-term planning analysis values.

Table 13: Hydraulic Weighted DAFOR Performance Comparison

				May 2018		November 2020	
Generating Unit	**Maximum Continuous Unit Rating (MW)**	**12 months ending June 2020 (%)**	**12 months ending June 2021 (%)**	**Historic Base Planning Assumption (%)**	**Historic Near-Term Planning Assumption (%)**	**Near-Term Planning Analysis Value (%)**	**Resource Planning Analysis Value (%)**
All Hydraulic Units - weighted	954.4	1.24	1.21	0.90	2.60	2.60	2.10
Hydraulic Units							
Bay D'Espoir 1	76.5	4.12	5.30	0.90	3.90	2.60	2.10
Bay D'Espoir 2	76.5	3.89	0.00	0.90	3.90	2.60	2.10
Bay D'Espoir 3	76.5	1.85	2.59	0.90	3.90	2.60	2.10
Bay D'Espoir 4	76.5	0.00	5.21	0.90	3.90	2.60	2.10
Bay D'Espoir 5	76.5	0.96	0.00	0.90	3.90	2.60	2.10
Bay D'Espoir 6	76.5	0.66	0.09	0.90	3.90	2.60	2.10
Bay D'Espoir 7	154.4	0.00	0.47	0.90	3.90	2.60	2.10
Cat Arm 1	67	0.19	0.58	0.90	0.70	2.60	2.10
Cat Arm 2	67	0.00	0.59	0.90	0.70	2.60	2.10
Hinds Lake	75	1.93	0.55	0.90	0.70	2.60	2.10
Upper Salmon	84	0.05	0.06	0.90	0.70	2.60	2.10
Granite Canal	40	1.17	1.77	0.90	0.70	2.60	2.10
Paradise River	8	6.79	1.78	0.90	0.70	2.60	2.10

Table 14: Thermal DAFOR Performance Comparison

				May 2018		November 2020	
Generating Unit	**Maximum Continuous Unit Rating (MW)**	**12 months ending June 2020 (%)**	**12 months ending June 2021 (%)**	**Historic Base Planning Assumption (%)**	**Historic Near-Term Planning Assumption (%)**	**Near-Term Planning Analysis Value (%)**	**Resource Planning Analysis Value (%)**
All Thermal Units - weighted	490	2.03	5.92	9.64	14.00	15.00	N/A
Thermal Units							
Holyrood 1	170	0.38	4.69	9.64	15.00	15.00	-
Holyrood 2	170	4.27	6.07	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

				May 2018		November 2020	
Gas Turbine Units	**Maximum Continuous Unit Rating (MW)**	**12 months ending June 2020 (%)**	**12 months ending June 2021 (%)**	**Historic Base Planning Assumption (%)**	**Historic Near-Term Planning Assumption (%)**	**Near-Term Planning Analysis Value (%)**	**Resource Planning Analysis Value (%)**
Gas Turbines (HWD/SVL)	100	12.48	3.10	N/A	30.00	30.00	N/A
Stephenville	50	14.15	1.95	N/A	30.00	30.00	N/A
Hardwoods	50	10.17	3.01	N/A	30.00	30.00	N/A

Table 16: Happy Valley Gas Turbine DAUFOP Performance Comparison

				May 2018		November 2020	
Gas Turbine Units	**Maximum Continuous Unit Rating (MW)**	**12 months ending June 2020 (%)**	**12 months ending June 2021 (%)**	**Historic Base Planning Assumption (%)**	**Historic Near-Term Planning Assumption (%)**	**Near-Term Planning Analysis Value (%)**	**Resource Planning Analysis Value (%)**
Happy Valley	25	1.84	9.79	N/A	15.00	12.00	9.70

Table 17: Holyrood Gas Turbine DAUFOP Performance Comparison

				May 2018		November 2020	
Gas Turbine Units	**Maximum Continuous Unit Rating (MW)**	**12 months ending June 2020 (%)**	**12 months ending June 2021 (%)**	**Historic Base Planning Assumption (%)**	**Historic Near-Term Planning Assumption (%)**	**Near-Term Planning Analysis Value (%)**	**Resource Planning Analysis Value (%)**
Holyrood GT	123.5	3.32	1.94	N/A	5.00	4.90	1.70