newfoundland labrador hydro
a nalcor energy company

Hydro Place. 500 Columbus Drive.
P.O. Box 12400. St. John's. NL
Canada A1B 4K7
t. 709.737.1400 f. 709.737.1800
www.nlh.nl.ca

October 31, 2019

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: The Board of Commissioners of Public Utilities Investigation and Hearing into Supply Issues and Power Outages on the Island Interconnected System – Rolling 12 Month Performance of Newfoundland and Labrador Hydro's Generating Units

In accordance with item 2.8 of the Liberty Report Recommendations dated December 17, 2014, please find attached the original plus twelve copies of Newfoundland and Labrador Hydro's ("Hydro") "Quarterly Report on Performance of Generating Units for the Quarter Ended September 30, 2019" ("Report").

On November 16, 2018, Hydro filed the "Reliability and Resource Adequacy Study" ("Study") with the Board of Commissioners of Public Utilities ("Board"). The Study included Hydro's proposed planning assumptions for consultation and discussion with the Board and other stakeholders. For the Report, which covers the performance of Hydro's generating units for the quarter ended September 30, 2019, the assumptions that were reported in the previous 2018 quarterly reports have been maintained for clarity prior to the transition to reporting against the new assumptions.

We trust the foregoing is satisfactory. 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.

cc: **Newfoundland Power**
Mr. Gerard M. Hayes

Consumer Advocate
Mr. Dennis M. Browne, Q.C, Browne Fitzgerald Morgan & Avis

Industrial Customer Group
Mr. Paul L. Coxworthy, Stewart McKelvey
Mr. Denis J. Fleming, Cox & Palmer

Mr. Danny Dumaresque

ecc: **Board of Commissioners of Public Utilities**
Ms. Jacqui Glynn
Maureen P. Green, Q.C.
PUB Official Email

Newfoundland Power
Mr. Ian F. Kelly, Q.C, Curtis Dawe
Regulatory Email

Consumer Advocate
Mr. Stephen F. Fitzgerald, Browne Fitzgerald Morgan & Avis
Ms. Sarah G. Fitzgerald, Browne Fitzgerald Morgan & Avis
Ms. Bernice Bailey, Browne Fitzgerald Morgan & Avis

Industrial Customer Group
Mr. Dean A. Porter, Poole Althouse

Grand Riverkeeper® Labrador Inc.
Ms. Roberta Frampton Benfiel
Ms. Prunelle Thibault-Bédard
Mr. Philip Raphals, The Helios Centre

Teck Resources Limited
Mr. Shawn Kinsella

Quarterly Report on Performance of Generating Units for the Quarter Ended September 30, 2019

October 31, 2019

A Report to the Board of Commissioners of Public Utilities

newfoundland labrador hydro
a nalcor energy company

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. On November 16, 2018, Hydro filed its "Reliability and Resource Adequacy Study" ("Study") with the Board of Commissioners of Public Utilities ("Board"). The Study included Hydro's proposed planning assumptions for further discussion with the Board and the parties. An updated version of the Study will be filed with the Board on November 15, 2019. This report covers the performance of Hydro's generating units for the quarter ending September 30, 2019. The assumptions used throughout are the same as reported in the 2018 quarterly reports except for the new assumptions included and identified in Table 12. While the new assumptions form the basis of Hydro's current planning processes, this report includes the historic assumptions and style to maintain similarity to previous reports to provide clarity while the Board assesses the Study.

This report contains forced outage rates for the current 12-month reporting period of October 1, 2018 to September 30, 2019, 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 October 1, 2017 to September 30, 2018. 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 the 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 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.

Note that the data for 2006 to 2018 in Figures 1 through 7 are annual numbers (January 1 to December 31), while the data for 2018 is also shown with 2019 as 12-month rolling numbers (October 1 to September 30 for each year).

As part of the 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.

2.0 Overview for Period Ending September 30, 2019

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

Class of Units	Oct 1, 2017 to Sep 30, 2018	Oct 1, 2018 to Sep 30, 2019	Base Planning Assumption	Near-Term Planning Assumption[1]
Hydraulic (DAFOR)	1.79	0.65	0.90	2.60
Thermal (DAFOR)	29.77	6.08	9.64	14.00
Combined Gas Turbine (UFOP)	7.03	4.35	10.62	20.00
Holyrood Gas Turbine (UFOP)	0.08	0.00	5.00	5.00
Hardwoods/Stephenville Gas Turbine (DAUFOP)	24.83	17.81	-	30.00
Happy Valley Gas Turbine (DAUFOP)	15.39	0.00	-	15.00
Holyrood Gas Turbine (DAUFOP)	0.08	0.00	-	5.00

There was an improvement in hydraulic DAFOR and in thermal DAFOR performance for the current 12-month period ending September 30, 2019, compared to the previous 12-month period ending September 30, 2018 (Table 1). The combined[2] gas turbine UFOP and DAFOP also show an improvement in performance for the current period compared to the previous period.

For the Holyrood TGS thermal units, the forced outage rate of the current period ending September 30, 2019 is 6.08%, which is below the base planning assumption of 9.64%, the sensitivity of 11.64% (section 3.0), and below the near-term planning assumption of 14.00%.

The Holyrood TGS DAFOR for the current period reflects a material improvement during the 2018–2019 winter season due to the work that was completed during the 2018 annual outages to improve the performance of all units with respect to air flow limitations. All three units were successfully tested to full load and have remained at that capability, with minor exceptions.

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

[1] Refer to "Near-Term Generation Adequacy Report," Newfoundland and Labrador Hydro, November 15, 2017, s 5.0 for further details.
[2] Combined gas turbines include the Hardwoods, Happy Valley, and Stephenville units. The performance of the Holyrood unit was not included in the combined base planning or sensitivity numbers as these numbers were set prior to its in service date.

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 historic assumptions and style to maintain similarity to previous reports to provide clarity while the Board assesses the Study.

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 implication 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 ("LIL"). The results of this analysis were presented to the 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%) due to the fact that the unit is new and can be expected to have better availability than the older units.[3]

Table 2: 2017[4] 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

[3] 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.
[4] Refer to "Near-Term Generation Adequacy Report," Newfoundland and Labrador Hydro, November 15, 2017, s 5.0 for further details.

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 September 30, 2019 are presented in Table 4, as well as the data for the 12-month period ending September 30, 2018. 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.

Table 4: Hydraulic Weighted DAFOR

Generating Unit	Maximum Continuous Unit Rating (MW)	12 Months Ending September 2018 (%)	12 Months Ending September 2019 (%)	Hydro Generation Base Planning Assumption (%)	Near-Term Planning Assumption (%)
All Hydraulic Units: Weighted	954.4	1.79	0.65	0.90	2.60
Hydraulic Units					
Bay D'Espoir 1	76.5	8.24	2.40	0.90	3.90
Bay D'Espoir 2	76.5	11.66	2.38	0.90	3.90
Bay D'Espoir 3	76.5	0.00	0.00	0.90	3.90
Bay D'Espoir 4	76.5	0.14	0.08	0.90	3.90
Bay D'Espoir 5	76.5	0.00	0.39	0.90	3.90
Bay D'Espoir 6	76.5	0.43	0.09	0.90	3.90
Bay D'Espoir 7	154.4	0.00	0.00	0.90	3.90
Cat Arm 1	67	0.98	0.13	0.90	0.70
Cat Arm 2	67	0.00	0.15	0.90	0.70
Hinds Lake	75	0.03	0.05	0.90	0.70
Upper Salmon	84	0.14	0.05	0.90	0.70
Granite Canal	40	0.49	0.68	0.90	0.70
Paradise River	8	0.00	7.29	0.90	0.70

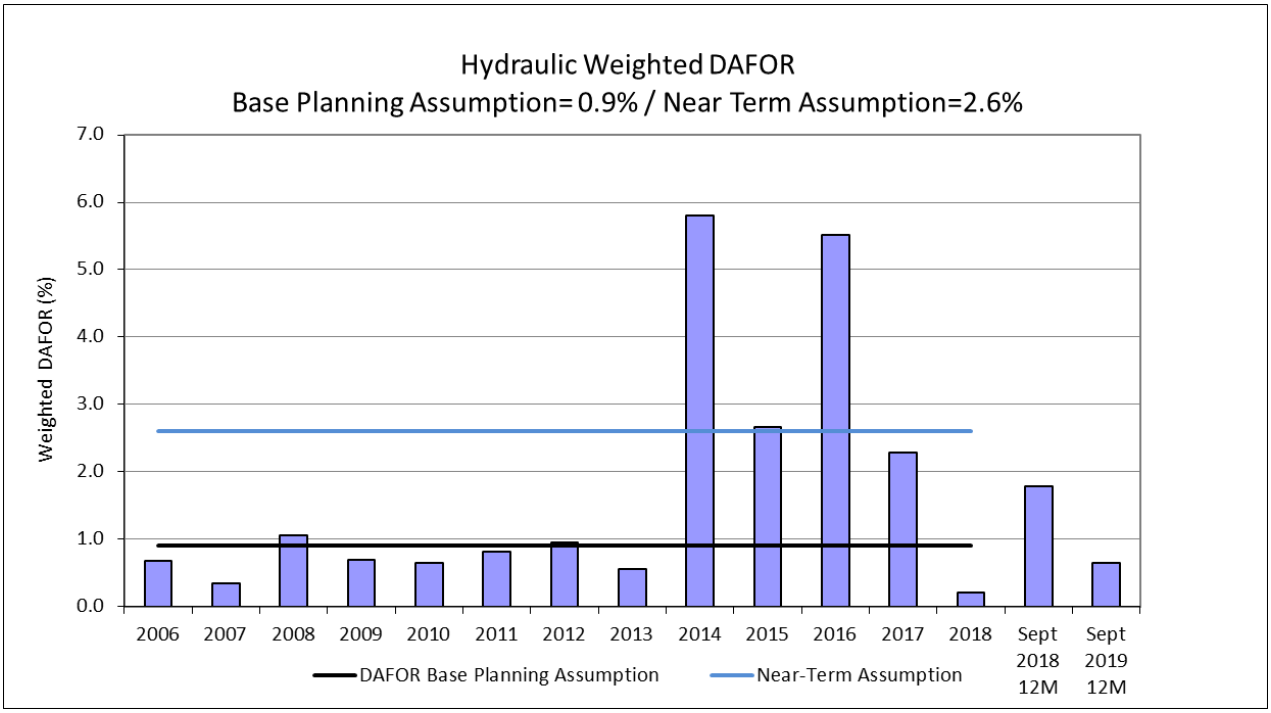

Figure 1: Hydraulic Weighted DAFOR

Considering individual hydraulic unit performance, the performance of Bay d'Espoir Unit 1, Bay d'Espoir Unit 2, and the Paradise River unit did not meet Hydro generation base planning DAFOR for the current period.

The Bay d'Espoir Unit 1 DAFOR of 2.40% and the Bay d'Espoir Unit 2 DAFOR of 2.38% did not meet the base planning assumption of 0.9% but are below the near-term assumption of 3.9% for an individual Bay d'Espoir unit. This was due to forced outages on Bay d'Espoir Units 1 and 2 for the period of September 22, 2019 to October 4, 2019, as a result of a leak in Penstock 1. This leak has since been repaired and the units returned to service.

The Paradise River unit DAFOR of 7.29% did not meet the base planning assumption of 0.9% nor the near-term assumption of 0.7% for the unit. This was the result of two forced outages. The first was a starting failure that occurred on January 13, 2019, as previously reported. The second was a forced outage from July 29, 2019 to August 9, 2019, as a result of a leak in the penstock expansion joint located in the lower level of the plant. This leak has been repaired and the unit returned to service.

5.0 Thermal Unit DAFOR Performance

Detailed results for the 12-month period ending September 30, 2019, are presented in Table 5, as well as the data for the 12-month period ending September 30, 2018. 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 September 2018 (%)	12 Months Ending September 2019 (%)	Hydro Generation Base Planning Assumption (%)	Near-Term Planning Assumption (%)
All Thermal Units: Weighted	490	29.77	6.08	9.64	14.00
Thermal Units					
Holyrood 1	170	35.49	3.25	9.64	15.00
Holyrood 2	170	30.64	9.56	9.64	10.00
Holyrood 3	150	18.17	4.01	9.64	18.00

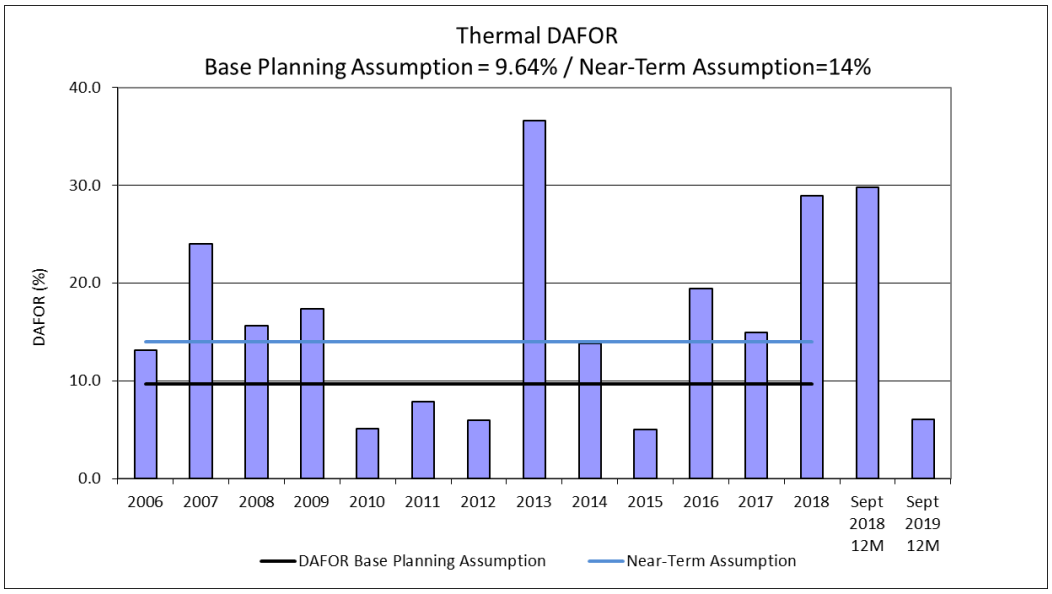

Figure 2: Thermal DAFOR

For the 12-month period ending September 30, 2019, the weighted DAFOR for all thermal units of 6.08% is below the assumed base planning DAFOR value of 9.64%, and below the near-term assumption of 14.00%. Unit 1 DAFOR was 3.25% below the base planning assumption of 9.64% and below the near-term assumption of 15%. Unit 2 DAFOR was 9.56% which was below the base planning assumption of

9.64% and the near-term assumption of 10%. Unit 3 DAFOR was 4.01%, which is below the base planning assumption of 9.64% and the near-term assumption of 18.0%. The current period DAFOR for all units is improved over the previous period.

6.0 Gas Turbine UFOP Performance

The combined UFOP for the Hardwoods, Happy Valley, and Stephenville Gas Turbines was 4.35% for the 12-month period ending September 30, 2019 (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 the previous period. The Hardwoods Gas Turbine UFOP for the current period is 6.08%, as compared to the base planning assumption of 10.62%. The Stephenville Gas Turbine UFOP for the current period is 2.01%, as compared to the base planning assumption of 10.62%. The Happy Valley Gas Turbine UFOP is 0.00% for the current period, as compared to the base planning assumption of 10.62%. On an individual unit basis, gas turbine performance for the Stephenville and Happy Valley units for the current period are improved over the previous period. The UFOP for Hardwoods Gas Turbine for the current period is increased over the previous period. Hydro's combined gas turbine UFOP in the 10-year period prior to 2015 was generally consistent at approximately 10%, until 2012 when the rate exceeded 50%. Since 2012, the gas turbine combined UFOP has improved each year.

Table 6: Gas Turbine UFOP

Gas Turbine Units	Maximum Continuous Unit Rating (MW)	12 Months Ending September 2018 (%)	12 Months Ending September 2019 (%)	Hydro Generation Base Planning Assumption (%)	Near-Term Planning Assumption (%)
Combined Gas Turbines	125	7.03	4.35	10.62	20.00
Stephenville	50	4.95	2.01	10.62	20.00
Hardwoods	50	3.19	6.08	10.62	20.00
Happy Valley	25	15.39	0.00	10.62	20.00

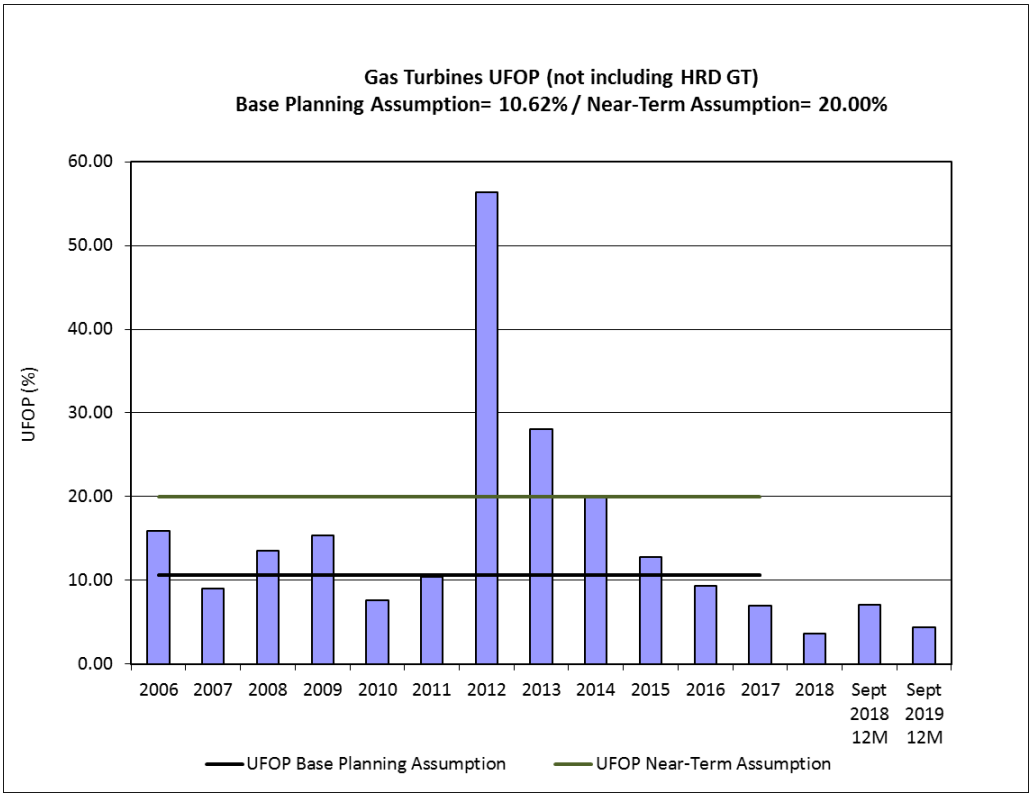

Figure 3: Gas Turbine UFOP: Hardwoods/Happy Valley/Stephenville Units

The Holyrood Gas Turbine UFOP of 0.00% for the current period is better than the base and near-term planning assumptions of 5.00% (Table 7 and Figure 4) and is improved over the UFOP for the previous period.

Table 7: Holyrood Gas Turbine UFOP

Gas Turbine Units	Maximum Continuous Unit Rating (MW)	12 Months Ending September 2018 (%)	12 Months Ending September 2019 (%)	Hydro Generation Base Planning Assumption (%)	Near-Term Planning Assumption (%)
Holyrood	123.5	0.08	0.00	5.00	5.00

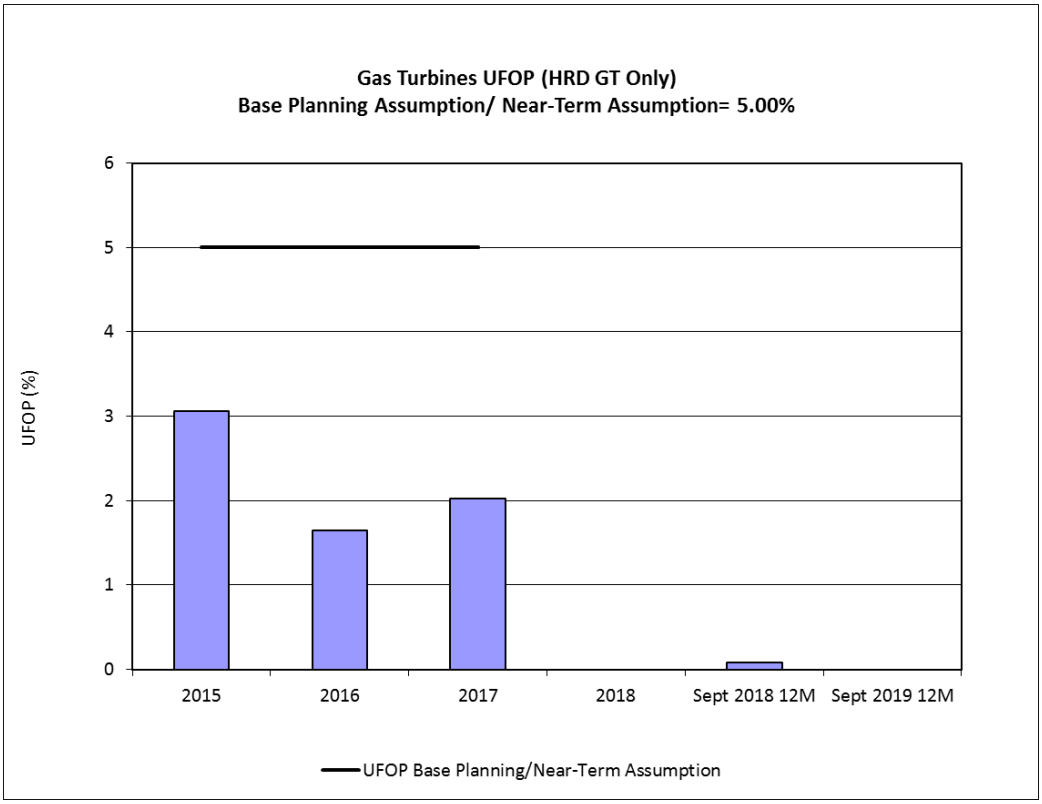

Figure 4: Gas Turbine UFOP: Holyrood Unit

7.0 Gas Turbine DAUFOP Performance

The combined DAUFOP for the Hardwoods and Stephenville Gas Turbines was 17.81% for the 12-month period ending September 30, 2019 (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 18.47%, which is below the near-term planning assumption of 30.00% but above the DAUFOP for the previous period. The Stephenville Gas Turbine DAUFOP for the current period is 16.22%, which is below the near-term planning assumption of 30.00%, and improved over the previous period.

Table 8: Hardwoods/Stephenville Gas Turbine DAUFOP

Gas Turbine Units	Maximum Continuous Unit Rating (MW)	12 Months Ending September 2018 (%)	12 Months Ending September 2019 (%)	Near-Term Planning Assumption (%)
Gas Turbines	100	24.83	17.81	30.00
Stephenville	50	51.20	16.22	30.00
Hardwoods	50	14.47	18.47	30.00

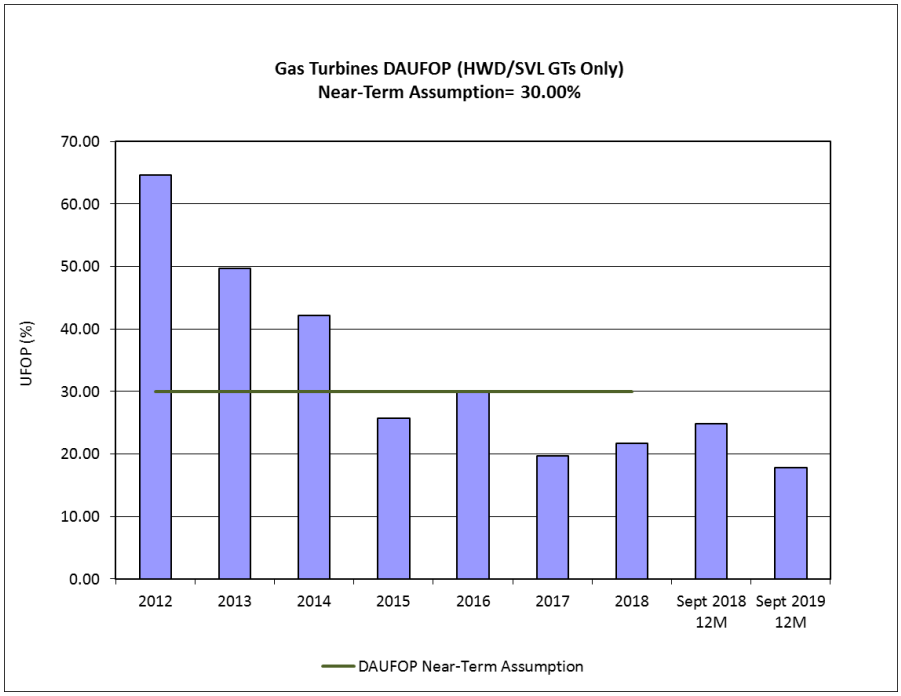

Figure 5: Gas Turbine DAUFOP: Hardwoods/Stephenville Units

The DAUFOP for the Happy Valley Gas Turbine was 0.00% for the 12-month period ending September 30, 2019 (Table 9 and Figure 6). This is below the near-term planning assumption of 15.00%, and improved over the previous period.

Table 9: Happy Valley Gas Turbine DAUFOP

Gas Turbine Units	Maximum Continuous Unit Rating (MW)	12 Months Ending September 2018 (%)	12 Months Ending September 2019 (%)	Near-Term Planning Assumption (%)
Happy Valley	25	15.39	0.00	15.00

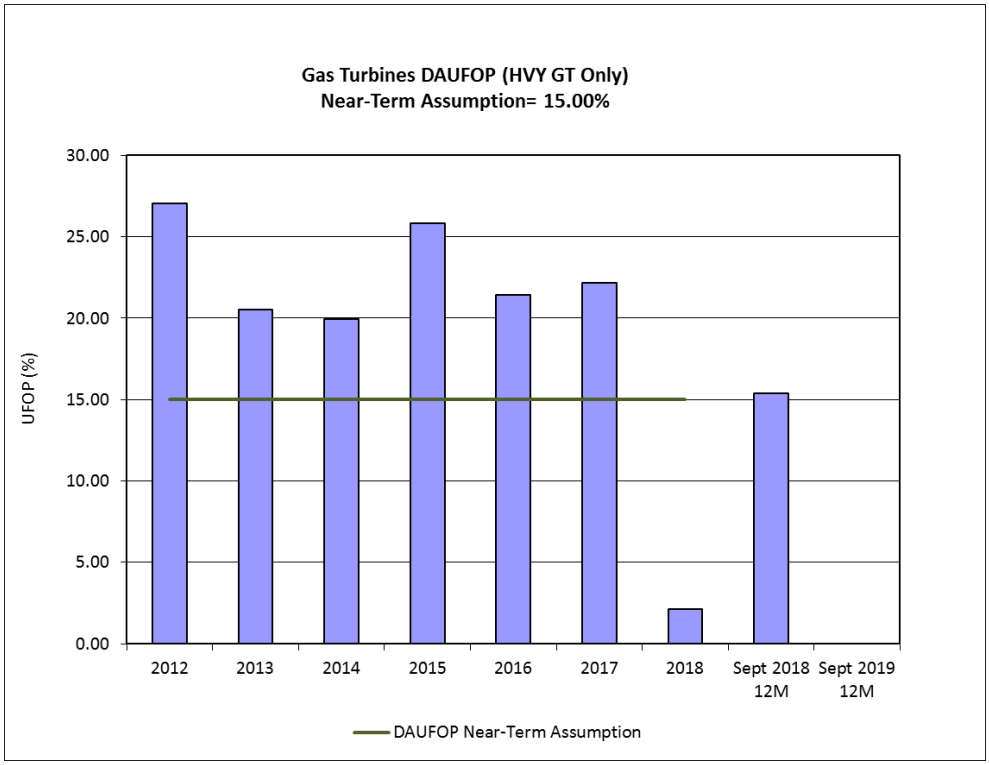

Figure 6: Gas Turbine DAUFOP: Happy Valley Unit

The Holyrood Gas Turbine DAUFOP of 0.00% for the current period is better than the near-term planning assumption of 5.00% (Table 10 and Figure 7) and improved over the previous period.

Table 10: Holyrood Gas Turbine DAUFOP

Gas Turbine Units	Maximum Continuous Unit Rating (MW)	12 Months Ending September 2018 (%)	12 Months Ending September 2019 (%)	Near-Term Planning Assumption (%)
Holyrood	123.5	0.08	0.00	5.00

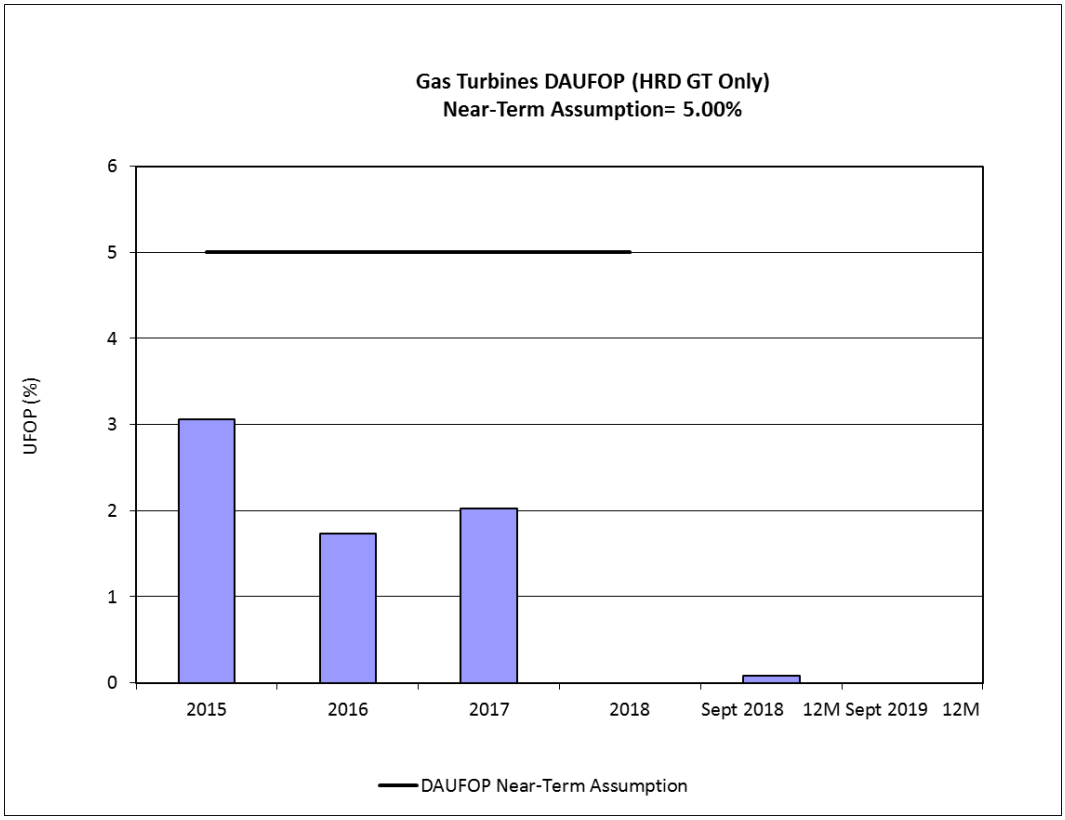

Figure 7: Gas Turbine DAUFOP: Holyrood Unit

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.[5]

[5] Values indicated for Hydro's near-term analysis reflect those used in Hydro's "Near-Term Generation Adequacy Report," filed with the Board on May 15, 2019. Values indicated for Hydro's resource planning analysis reflect those used in Hydro's "Reliability and Resource Adequacy Study," November 16, 2018.

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

Unit Type	Measure	Near-Term Analysis Value (%)	Resource Planning Analysis Value (%)
Hydraulic	DAFOR	2.8	1.9
Thermal	DAFOR	15.0	N/A
Gas Turbines			
Happy Valley	DAUFOP	9.8	12.6
Hardwoods and Stephenville	DAUFOP	30.0	N/A
Holyrood	DAUFOP	1.7	2.2

For the hydroelectric units (Bay d'Espoir, Cat Arm, Hinds Lake, Granite Canal, Upper Salmon, and Paradise River) a 3-year capacity-weighted average was applied to these units for the near-term analysis, resulting in a DAFOR of 2.8%, while a 10-year capacity-weighted average was applied for use in the resource planning model, resulting in a DAFOR of 1.9%. 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 2021, 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 3-year capacity-weighted average was applied to the unit for the near-term analysis, resulting in a DAUFOP of 9.8%, while a 10-year capacity-weighted average was applied for use in the resource planning model resulting in a DAUFOP of 12.59%. The DAUFOP values were based on historical data founded upon the unit's past reliable performance. For the Holyrood Gas Turbine, a 3-year capacity-weighted average was applied to the unit for the near-term analysis, resulting in a DAUFOP of 1.7%. 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 2021, these units were not included in the long- term analysis and, therefore, have no resource planning analysis value listed.

9.0 Comparison of Planning Assumptions and Analysis Values

As Hydro's reliability and adequacy planning assumptions have been historically used in reporting on the performance of Hydro's generating units, a comparison of the values used historically to 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**	**Base Planning Assumption**	**Near-Term Planning Assumption**	**Near-Term Analysis Value**	**Resource Planning Analysis Value**
Hydraulic	DAFOR	0.9	2.6	2.8	1.9
Thermal	DAFOR	9.64	14.0	15.0	N/A
Gas Turbines					
Happy Valley	DAUFOP	-	15.0	9.8	12.6
Hardwoods and Stephenville	DAUFOP	-	30.0	30.0	N/A
Holyrood	DAUFOP	-	5.0	1.7	2.2

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. No data is provided for the UFOP performance, as Hydro does not plan to use this metric in future for reliability assessments.

Table 13: Hydraulic Weighted DAFOR Performance Comparison

				May 2018		November 2018	
Generating Unit	Maximum Continuous Unit Rating (MW)	12 Months Ending September 2018 (%)	12 Months Ending September 2019 (%)	Base Planning Assumption (%)	Near-Term Planning Assumption (%)	Near-Term Planning Analysis Value (%)	Resource Planning Analysis Value (%)
All Hydraulic Units: Weighted	954.4	1.79	0.65	0.90	2.60	3.50	1.93
Hydraulic Units							
Bay D'Espoir 1	76.5	8.24	2.40	0.90	3.90	3.50	1.93
Bay D'Espoir 2	76.5	11.66	2.38	0.90	3.90	3.50	1.93
Bay D'Espoir 3	76.5	0.00	0.00	0.90	3.90	3.50	1.93
Bay D'Espoir 4	76.5	0.14	0.08	0.90	3.90	3.50	1.93
Bay D'Espoir 5	76.5	0.00	0.39	0.90	3.90	3.50	1.93
Bay D'Espoir 6	76.5	0.43	0.09	0.90	3.90	3.50	1.93
Bay D'Espoir 7	154.4	0.00	0.00	0.90	3.90	3.50	1.93
Cat Arm 1	67	0.98	0.13	0.90	0.70	3.50	1.93
Cat Arm 2	67	0.00	0.15	0.90	0.70	3.50	1.93
Hinds Lake	75	0.03	0.05	0.90	0.70	3.50	1.93
Upper Salmon	84	0.14	0.05	0.90	0.70	3.50	1.93
Granite Canal	40	0.49	0.68	0.90	0.70	3.50	1.93
Paradise River	8	0.00	7.29	0.90	0.70	3.50	1.93

Table 14: Thermal DAFOR Performance Comparison

				May 2018		November 2018	
Generating Unit	Maximum Continuous Unit Rating (MW)	12 Months Ending September 2018 (%)	12 Months Ending September 2019 (%)	Base Planning Assumption (%)	Near-Term Planning Assumption (%)	Near-Term Planning Analysis Value (%)	Resource Planning Analysis Value (%)
All Thermal Units: Weighted	490	29.77	6.08	9.64	14.00	15.00	N/A
Thermal Units							
Holyrood 1	170	35.49	3.25	9.64	15.00	15.00	-
Holyrood 2	170	30.64	9.56	9.64	10.00	15.00	-
Holyrood 3	150	18.17	4.01	9.64	18.00	15.00	-

Table 15: Hardwoods/Stephenville Gas Turbine DAUFOP Performance

				May 2018		November 2018	
Gas Turbine Units	Maximum Continuous Unit Rating (MW)	12 Months Ending September 2018 (%)	12 Months Ending September 2019 (%)	Base Planning Assumption (%)	Near-Term Planning Assumption (%)	Near-Term Planning Analysis Value (%)	Resource Planning Analysis Value (%)
Gas Turbines	100	24.83	17.81	N/A	30.00	30.00	N/A
Stephenville	50	51.20	16.22	N/A	30.00	30.00	N/A
Hardwoods	50	14.47	18.47	N/A	30.00	30.00	N/A

Table 16: Happy Valley Gas Turbine DAUFOP Performance Comparison

				May 2018		November 2018	
Gas Turbine Units	Maximum Continuous Unit Rating (MW)	12 Months Ending September 2018 (%)	12 Months Ending September 2019 (%)	Base Planning Assumption (%)	Near-Term Planning Assumption (%)	Near-Term Planning Analysis Value (%)	Resource Planning Analysis Value (%)
Happy Valley	25	15.39	0.00	N/A	15.00	13.92	12.59

Table 17: Holyrood Gas Turbine DAUFOP Performance Comparison

				May 2018		November 2018	
Gas Turbine Units	Maximum Continuous Unit Rating (MW)	12 Months Ending September 2018 (%)	12 Months Ending September 2019 (%)	Base Planning Assumption (%)	Near-Term Planning Assumption (%)	Near-Term Planning Analysis Value (%)	Resource Planning Analysis Value (%)
Holyrood	123.5	0.08	0.00	N/A	5.00	3.06	2.24