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April 28, 2017

The 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 Corporate Services & Board Secretary

Dear Ms. Blundon:

Re: Newfoundland and Labrador Hydro - The Board's Investigation and Hearing into Supply Issues and Power Outages on the Island Interconnected System – Rolling 12 month performance of 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 12 copies of the quarterly report *Rolling 12 Month Performance of Hydro's Generating Units*.

We trust the foregoing is satisfactory. If you have any questions or comments, please contact the undersigned.

Yours truly,

NEWFOUNDLAND AND LABRADOR HYDRO

Michael Ladha
Legal Counsel & Assistant Corporate Secretary
TLP/bs

cc: Gerard Hayes – Newfoundland Power
Paul Coxworthy – Stewart McKelvey Stirling Scales
Sheryl Nisenbaum – Praxair Canada Inc.
ecc: Roberta Frampton Benefiel – Grand Riverkeeper Labrador
Dennis Browne, Q.C. – Consumer Advocate
Thomas O' Reilly, Q.C. – Cox & Palmer
Danny Dumaresque

Quarterly Report on Performance of Generating Units

For the Quarter ended March 31, 2017

April 28, 2017

A Report to the Board of Commissioners of Public Utilities

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Table of Contents

1.0 Introduction

In this report, Newfoundland and Labrador Hydro (Hydro) provides data on forced outage rates of its generating facilities. This data is provided in relation to historical forced outage rates and as well as in relation to assumptions used in Loss of Load Hours (LOLH) calculations for system planning purposes.

The forced outage rates are provided for individual generating units at hydraulic facilities, the three units at the Holyrood Thermal Generating Station, and Hydro's gas turbines, for the current 12-month reporting period of April 1, 2016 to March 31, 2017. The report also provides, for comparison purposes, the individual generating unit data on forced outage rates for the previous period April 1, 2015 to March 31, 2016. Further, total asset class data is presented on an annual basis for the years 2006-2015. This report provides data on outage rates for forced outages, not planned outages.

The forced outage rates of Hydro's generating units are presented using two measures: Derated Adjusted Forced Outage Rate (DAFOR) for the hydraulic and thermal units and Utilization Forced Outage Probability (UFOP) for the gas turbines.

Derated Adjusted Forced Outage Rate (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. 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, this measure is not applicable to gas turbines because of their nature as standby units, and relatively low operating hours.

Utilization Forced Outage Probability (UFOP) 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 is used for the gas turbines.

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 by Canadian Electricity Association (CEA) guidelines. Per CEA guidelines, to take into account the derated levels of a generating unit, the operating time at the derated level is converted into an equivalent outage time.

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

2.0 Period Ending March 31, 2017 Overview

Table 1: DAFOR and UFOP Overview

Class of Units	April 1, 2015 to March 31, 2016 (%)	April 1, 2016 to March 31, 2017 (%)	Base Planning Assumption (%)	ESRA Assumption[1] (%)
Hydraulic (DAFOR)	2.71	5.53	0.90	2.60
Thermal (DAFOR)	11.51	14.56	9.64	14.00
Gas Turbine (Combined) (UFOP)	11.68	12.49	10.62	20.00
Gas Turbine (Holyrood) (UFOP)	1.70	3.71	5.00	5.00

There was a decline in both hydraulic and thermal DAFOR performance for the current 12-month period ending March 2017, compared to the previous 12-month period ending March 2016 (see Table 1). The combined[2] gas turbine UFOP performance shows a decline in performance for the current period compared to the previous period.

[1] Energy Supply Risk Assessment, November 30, 2016, see section 5.0 for further details.

[2] Combined Gas Turbines include the Hardwoods, Happy Valley, and Stephenville units. The performance of the Holyrood CT was not included in the combined base planning or sensitivity numbers as these numbers were set prior to the Holyrood CT's in service date.

In the 10-year period prior to 2015, the hydraulic units showed a somewhat consistent DAFOR. The DAFOR of the current 12-month period compared to the previous 10 years is higher, primarily due to penstock issues experienced on Units 1 and 2 at Bay d'Espoir in 2016. The effect on the 12 month DAFOR results is still in the current period, and will be in the current 12 month period until after November 2017.

The Holyrood thermal units, in the 10-year period prior to 2015, exhibited more variability in DAFOR than the hydraulic units, but in many years were close to a consistent rate of approximately 10%. The forced outage rate of the current period ending March 2017 is 14.56%, which is above the base planning assumption of 9.64%, the sensitivity of 11.64%, and slightly above the ESRA assumption of 14.00%. This is primarily caused by an airflow derating on Unit 1 that started in the fall of 2016 and will continue until this unit is taken down for maintenance in 2017, as well as derating after the repairs of boiler tube failures on Units 1 and 2 during 2016.

Hydro's combined gas turbines' UFOP in the 10-year period prior to 2015 was generally consistent at approximately 10% until the year 2012 when the rate exceeded 50%. Since 2012, the UFOP has been improving each year. For the current 12-month period ending March 31, 2017, performance was affected by forced outages to the Hardwoods and Stephenville units.

Note that the data for 2006 to 2015 in Figures 1, 2 and 3 are annual numbers (January 1 to December 31), while the data for 2016 and 2017 are 12-month rolling numbers (April 1 to March 31 for each year).

3.0 Generation Planning Assumptions

The DAFOR and UFOP indicators used in Hydro's generation planning model are representative of a historic average of the actual performance of these units. These numbers are noted in the following table under the column "Base Planning Assumption". This is a long term outlook.

Hydro also provides a sensitivity number for DAFOR and UFOP as part of its generation planning analysis. This number takes into account a higher level of unavailability, should it occur, to assess the impact of higher unavailability of these units on overall generation requirements. During the 12-month period ending March 31, 2017, the gas turbine units performed well within this sensitivity range for UFOP, while both the hydraulic and thermal classes performed outside of the sensitivity range for DAFOR.

The new gas turbine (Holyrood CT) has a lower expected rate of unavailability than the original 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]

Hydro's generation long term planning assumptions for DAFOR and UFOP for the year 2017 are noted in Table 2:

Table 2: 2017 DAFOR and UFOP 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	20.62
Gas Turbines - New			5.0	10.0[4]

As part of Hydro's analysis of energy supply up to Muskrat Falls interconnection, Hydro completes comprehensive reviews of, and produces reports on, energy supply for the Island Interconnected System. The most recent report was filed on November 30, 2016. The report,

[3] Hydro selected a 5% UFOP for the new Holyrood CT following commentary on forced outage rates contained in the *Independent Supply Decision Review – Navigant (September 14, 2011).*

[4] In previous reports this sensitivity value was reported as 5.0%. The generation planning sensitivity for the Holyrood CT was updated to 10% in the September 2015 Q3 report for system planning purposes.

"Energy Supply Risk Assessment", (ESRA) outlines the shorter term DAFOR and UFOP and the resulting implication for meeting reliability criteria until the interconnection with the North American grid. This report is currently being updated for submission to the Board of Commissioners of Public Utilities (the Board) in May 2017.

Hydro's generation ESRA short term planning assumptions for DAFOR and UFOP are noted in Table 3:

Table 3: DAFOR and UFOP ESRA Analysis Assumptions

	DAFOR (%)	**UFOP (%)**
	ESRA Assumption	**ESRA Assumption**
All Hydraulic Units	2.6	
Bay d'Espoir Hydraulic Units	3.9	
Other Hydraulic Units	0.7	
Holyrood Plant	14.0	
Holyrood Unit 1	15.0	
Holyrood Unit 2	10.0	
Holyrood Unit 3	18.0	
Hardwoods & Stephenville Gas Turbines		20.0
Holyrood Gas Turbine		5.0

4.0 Hydraulic Unit Forced Outage Rate Performance

The hydraulic unit forced outage rates are measured using the CEA metric, DAFOR. Detailed results for the 12-month period ending March 31, 2017, are presented in Table 4, as well as the data for the 12-month period ending March 31, 2016. These are compared to Hydro's generation planning and ESRA assumptions for the forced outage rate.

Table 4: Hydraulic Weighted DAFOR

Generating Unit	Maximum Continuous Unit Rating (MW)	12 months ending March 2016 (%)	12 months ending March 2017 (%)	Hydro Generation Base Planning Assumption (%)	ESRA Planning Assumption (%)
All Hydraulic Units - weighted	954.4	2.76	5.55	0.90	2.60
Hydraulic Units					
Bay D'Espoir 1	76.5	26.91	30.54	0.90	3.90
Bay D'Espoir 2	76.5	0.07	31.30	0.90	3.90
Bay D'Espoir 3	76.5	0.00	0.02	0.90	3.90
Bay D'Espoir 4	76.5	0.42	0.69	0.90	3.90
Bay D'Espoir 5	76.5	3.09	0.48	0.90	3.90
Bay D'Espoir 6	76.5	0.00	1.31	0.90	3.90
Bay D'Espoir 7	154.4	0.00	0.00	0.90	3.90
Cat Arm 1	67	0.01	1.02	0.90	0.70
Cat Arm 2	67	1.39	0.00	0.90	0.70
Hinds Lake	75	0.16	0.25	0.90	0.70
Upper Salmon	84	0.00	0.91	0.90	0.70
Granite Canal	40	2.07	1.16	0.90	0.70
Paradise River	8	0.24	6.94	0.90	0.70

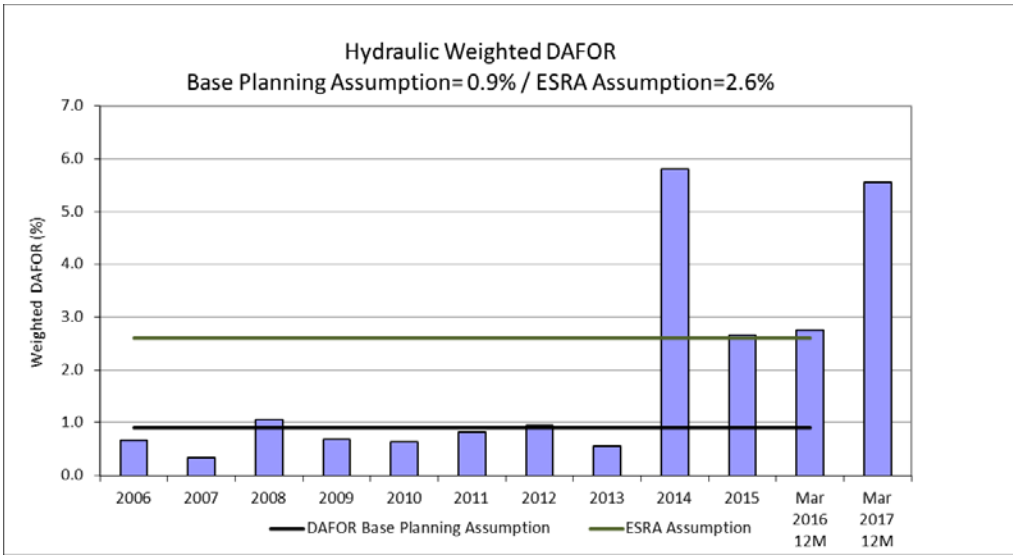

Figure 1: Hydraulic Weighted DAFOR

Considering the individual units' performance, the assumed Hydro generation base planning DAFOR was materially exceeded for Bay d'Espoir Unit 1 and Bay d'Espoir Unit 2. Also, there were exceedances compared to base planning assumption for Bay d'Espoir Unit 6, Granite Canal, Cat Arm Unit 1 and Paradise River for the current period.

The Bay d'Espoir Unit 1 DAFOR of 30.54% and Unit 2 DAFOR of 31.30%, exceeded the base planning assumption of 0.9% and the ESRA assumption of 3.9%, due to the units being removed from service on two separate occasions as a result of a leak in Penstock 1, which provides water to both Units 1 and 2. These penstock issues contributed 99.9% of the DAFOR for this period. After the first event occurred on May 21, 2016, a consultant was engaged to conduct an investigation into the issue, with the conclusion that the leak was a localized issue caused by, what was suspected to be, a defect at the weld. A repair procedure was proposed on June 2, 2016, with repairs carried out and completed on June 3, 2016. Unit 1 was returned to service on June 3, 2016, at 1938 hours and Unit 2 returned to service a short time later at 2014 hours.

The second leak in Penstock 1 occurred on September 14, 2016. Considering this leak was similar to the first and located in the same area, a new consultant was engaged to conduct a thorough investigation of the welds throughout the penstock, which included cutting sample sections from the penstock wall, for testing. An investigation was completed, and action was taken to refurbish a significant proportion of the welds along the upper section of the penstock between the Intake and Surge Tank. Both units were then returned to service on November 30, 2016.

The completed weld refurbishment provided a long term solution for the penstock. The investigation into this outage identified two additional long term recommendations to extend the reliable life of Penstock 1. The first recommendation is to add structural backfill to the upper portion of the penstock, planned for 2018. The second is to replace the internal protective coating, planned to start in 2021.

The Bay d'Espoir Unit 6 DAFOR of 1.31% exceeded the base planning assumption of 0.9% and the ESRA assumption of 3.9%, as a result of the unit being unavailable from February 22, 2017, to February 25, 2017, due to a high turbine bearing alarm, which caused the unit trip protection to operate and shut the unit down in a controlled fashion. An investigation was completed, and it was determined that the Babbitt bearing was damaged. The bearing was repaired and the unit was returned to service. The results of the investigation found no issues for long term bearing reliability.

The Granite Canal Unit DAFOR of 1.16% exceeded the base planning assumption of 0.9% and the ESRA assumption of 0.7%, as a result of the unit being unavailable from July 19, 2016, to July 22, 2016, due to water in the generator bearing oil. An investigation revealed that the generator bearing oil cooler experienced a leak, which resulted in water getting into the bearing oil. The leaking cooler was replaced with a new cooler and the unit was returned to service.

The Cat Arm Unit 1 DAFOR of 1.02% exceeded the base planning assumption of 0.9% and the ESRA assumption of 0.7%, as a result of the unit being unavailable from November 23, 2016, to November 25, 2016, due to a governor oil pump trip. An investigation into the issue revealed that the internal seals in the pump had failed, preventing the pump from maintaining the governor oil pressure. The oil system was completely cleaned, flushed and replaced with new oil. A new oil pump was installed and the unit returned to service. This issue has been resolved, and further improvements are under review from a long term reliability perspective.

The Paradise River unit DAFOR of 6.94% exceeded the base planning assumption of 0.9% and the ESRA assumption of 0.7%, primarily as a result of a forced outage from September 23, 2016, to September 30, 2016, which was related to a governor low oil level alarm. This alarm was caused when a seal broke on one of the governor servo motors, releasing oil from the governor oil sump into the powerhouse sump system. A new seal was installed and oil was added to the

governor system. The results of the investigation found no issues regarding long term governor reliability.

There were also repeated trips of the Paradise River unit in 2016 that had no obvious cause. Hydro investigated these trips and determined that it was most likely not a unit related issue, and was likely due to distribution system disturbances. In consultation with Newfoundland Power regarding their equipment at the nearby Monkstown Substation Newfoundland Power agreed to replace their recloser with one having the capability to capture system information, and assist in troubleshooting distribution issues. Since Newfoundland Power replaced the recloser, there have been no associated trips without identifiable cause. Newfoundland Power's recloser is the interconnection point of the Paradise River Unit to the grid.

5.0 Thermal Unit Forced Outage Rate Performance

The thermal unit forced outage rates are measured using the CEA metric, DAFOR. Detailed results for the 12-month period ending March 31, 2017, are presented in Table 5, as well as the data for the 12-month period ending March 31, 2016. These are compared to Hydro's generation base planning assumption for the forced outage rate.

Table 5: Thermal DAFOR

Generating Unit	Maximum Continuous Unit Rating (MW)	12 months ending March 2016 (%)	12 months ending March 2017 (%)	Hydro Generation Base Planning Assumption (%)	ESRA Planning Assumption (%)
All Thermal Units - weighted	490	13.54	13.96	9.64	14.00
Thermal Units					
Holyrood 1	170	12.28	20.49	9.64	15.00
Holyrood 2	170	18.33	14.92	9.64	10.00
Holyrood 3	150	8.98	3.06	9.64	18.00

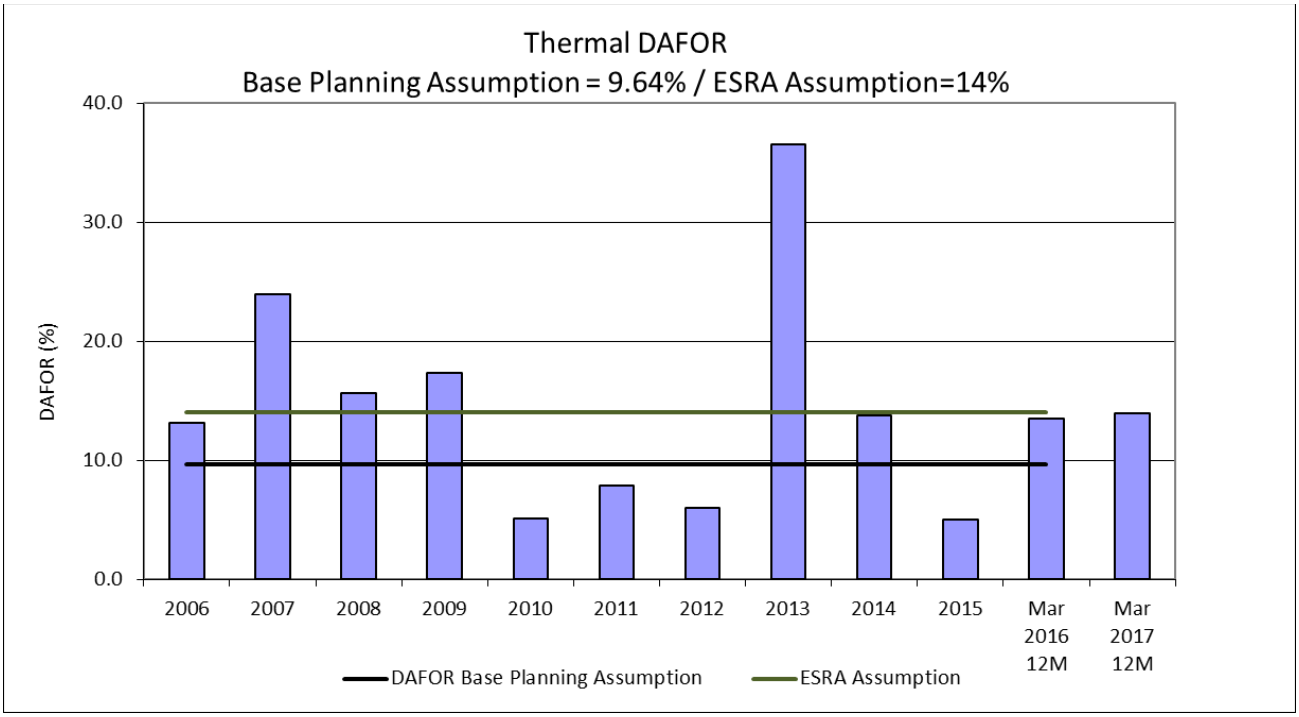

Figure 2: Thermal DAFOR

For the 12-month period ending March 31, 2017, the weighted DAFOR for all thermal units, of 14.56% is above the assumed Hydro generation base planning DAFOR value of 9.64%, and comparable to the ESRA assumption of 14.00%. Unit 1 DAFOR was 20.49% and Unit 2 DAFOR was 14.92%.The performance for both Units 1 and 2 was above the base planning assumption of 9.64% and the ESRA assumption of 15% (Unit 1) and 10% (Unit 2). Unit 3 DAFOR was 3.06%, which is better than the base planning assumption of 9.64% and ESRA assumption of 18.0%. The majority of the 13.96% DAFOR for the plant is due to deratings from airflow issues in the 2016/2017 winter season and deration after the replacement of failed boiler tubes in 2016.

The DAFOR performance for Holyrood Unit 1 (170 MW) was affected by the following events in the current 12 month to date period:

Following a forced outage to replace failed lower reheater tubes, the unit was returned to service on February 26, 2016, with a derating to 120 MW until its annual planned outage, which started on August 27, 2016. This derating was imposed to ensure the reliability of the

reheater until the remaining lower reheater tubes could be replaced during the 2016 annual maintenance outage. Prior to the tube failures, the unit had been derated to 155 MW due to air flow issues.

On July 15, 2016, the unit was removed from service to repair a feedwater isolator gland failure, to perform a wash of the air heaters, and to repair cracks in the forced draft fan ductwork. The unit was returned to service after approximately 35 hours of outage time.

On August 27, 2016, the unit was taken off line to commence the annual maintenance outage. The work scope included complete replacement of the lower reheater tubes, intended to eliminate the derating due to risk of boiler tube failure, and other work to address the air flow issues that resulted in the derating prior to the boiler tube concerns.

During return to service from annual maintenance on October 29, 2016, a turbine control system (Mark V) governor control card failed, causing a forced outage. The failed card was replaced and the unit was synchronized on November 2, 2016.

When Unit 1 was first returned to service, it remained derated due to air flow issues, although there was an improvement to 160 MW from 155 MW before the outage. As planned, combustion tuning was completed during the week of November 14, 2016, to diagnose the air flow issues on this unit. Tuning was completed by an expert from Foxboro (supplier of the distributed control system) with assistance from a boiler field expert from Babcock & Wilcox (B&W.) They determined that the air flow issues that Hydro was experiencing are due to fouling through various stages of the boiler and air heater leakage. Further improvements require an outage to fully correct this, which is planned for completion during the 2017 annual planned maintenance outage. Work will include boiler cleaning and air heater upgrades. Full load capability is expected upon completion of this work. Hydro recently completed work to address similar air flow restrictions on Unit 2

during two weeks in April 2017. Prior to this work, Unit 2 had been derated to 135MW, and is now rated at 165 MW.

Unit 1 load capability was reduced to 145 MW on January 20, 2017, due to increased fouling, particularly in the air heater. An air heater wash was completed on a maintenance outage from January 26 to 27, 2017, which restored the load capability to the pre-wash condition of 160 MW. However, the capability was further reduced due to continued fouling in the economizer, and at the end of February the unit was derated to 150 MW. On March 4, 2017, the unit capability was rated at 140 MW, and by the end of March this had further reduced to 135 MW. Correction of this problem requires an extended outage and the work has been planned for the 2017 annual outage. Full load capability is expected after the unit is returned to service after the outage.

On March 8, 2017, it was necessary to take a short forced outage to repair two air heater bearing cooling water leaks. The unit was taken off-line in a controlled manner and was returned to service approximately 23 hours later after completion of the repairs.

The DAFOR performance for Holyrood Unit 2 (170 MW) was primarily affected by the following events:

At the beginning of the current reporting period, Unit 2 was operating with a forced derating of 120 MW. The derating had been applied to ensure reliable operation until the complete lower reheater tube section could be replaced during the 2016 annual outage.

On May 26, 2016, the west forced draft fan variable frequency drive failed and caused the unit to trip. Siemens (the manufacturer of the drives) was contacted immediately and a technician was dispatched to travel to site. In parallel, the plant Electrical Engineer (in consultation with Siemens), Electricians, and Operations conducted an internal investigation and determined that there were no current faults with the fan and it could be safely

started. It was decided to put the unit back on line later in the day on May 26, 2016 while waiting for the Siemens technician. Because the reason for the trip had not been determined at that point, the unit load was restricted to 50 MW (below under-frequency load shedding limits in the event of a subsequent unit trip).

The Siemens technician performed on-line diagnostics on May 27, 2016, and May 28, 2016. Overnight on May 28, 2016, the unit was taken offline for a full internal inspection of the drive under direction of the Siemens technician. A control card on the drive unit was replaced and the unit was returned to service the next morning on May 29, 2016. Hydro engaged Siemens to review the variable frequency drive reliability. Siemens completed a review and provided a set of recommendations which have been implemented by Hydro.

Unit 2's annual planned maintenance outage started on June 20, 2016, and the unit was returned to service on September 15, 2016. During the outage all remaining lower reheater tubes were replaced, thus eliminating the 120 MW derating that had been previously applied. Upon start-up, the unit was derated to 130 MW until September 20, 2016, and to 150 MW until September 29, 2016 until on-line testing of the boiler safety valves could be completed. The unit was then capable of generating full load.

On November 6, 2016, the main steam inlet flange to the upper control valves was found leaking and the unit was derated to 70 MW until it was removed from service for gasket replacement on November 8. The unit was returned to service on November 10, 2016, but had to be taken off-line for another failure of the same gasket on November 16, 216. This time the gasket was changed and a contractor was hired to provide a supplementary seal of the gasket, further encapsulating the replaced gasket. The unit was returned to service on November 21, 2016. This problematic joint is scheduled for replacement during the planned outage in 2017.

On November 18, 2016, when attempting to go back on line after repair of the November 16, 2016, inlet flange leak, there was an issue discovered with turbine speed indication. After trouble shooting, it was determined that the speed probes had to be repositioned. The unit was returned to service at full capacity on November 21, 2016.

On January 20, 2017, the unit load capacity was reduced to 150 MW due to boiler fouling, particularly in the air heater and economizer. An air heater wash was completed on February 18, 2017, but due to economizer fouling, the unit remained derated to 150 MW at the end of February. Continued fouling during operation further reduced the load capability of the unit. On March 6, 2017, the capability was rated at 140 MW. On March 21, 2017, this was further reduced to approximately 135 MW. Hydro completed an early two week duration outage on Unit 2 on April 23, 2017. The outage addressed the fouling related air flow issues that were considered a significant effort and could not be completed during an air heater wash, or during peak winter season demand. Activities included, but were not limited to, cleaning and removal of hardened ash in the economizer section of the gas path. Issues affecting air flow restrictions were addressed and Unit 2 is now rated at 165 MW following this work, as tested on April 26, 2017. Additional work is scheduled during the 2017 planned annual outage to address air flow issues.

6.0 Gas Turbine UFOP Performance

The combined UFOP for the Hardwoods, Happy Valley and Stephenville gas turbines was 12.32% for the 12-month period ending March 31, 2017 (see Table 6). This is above the base planning assumption of 10.62%., but better than the ESRA assumption of 20.00%. The current period UFOP declined from the previous period UFOP of 8.29%. The Hardwoods UFOP for the current period is 15.97%, which is above than the base planning assumption of 10.62%, but better than the ESRA assumption of 20.00%. The Stephenville unit's current period UFOP is 15.96% compared to that of the previous period of 15.08%. Happy Valley's UFOP is 2.61% for the current period compared to 14.22% in the previous period. Hydro has determined an additional or replacement measure is appropriate for analyzing gas turbine performance with

respect to reliability. This measure will be discussed more in the next Energy Supply Risk Assessment planned for submittal to the Board in May 2017.

Table 6: Gas Turbine UFOP

Gas Turbine Units	Maximum Continuous Unit Rating (MW)	12 months ending March 2016 (%)	12 months ending March 2017 (%)	Hydro Generation Base Planning Assumption (%)	ESRA Planning Assumption (%)
Combined Gas Turbines	125	8.29	12.32	10.62	20.00
Stephenville	50	15.08	15.96	10.62	20.00
Hardwoods	50	3.05	15.97	10.62	20.00
Happy Valley	25	14.22	2.61	10.62	20.00

The Holyrood (HRD) CT UFOP of 2.24% for the current period is better than the base planning and ESRA assumptions of 5.00% (see Table 7).

Table 7: Holyrood CT UFOP

Combustion Turbine Units	Maximum Continuous Unit Rating (MW)	12 months ending March 2016 (%)	12 months ending March 2017 (%)	Hydro Generation Base Planning Assumption (%)	ESRA Planning Assumption (%)
Holyrood CT	123.5	2.81	2.24	5.00	5.00

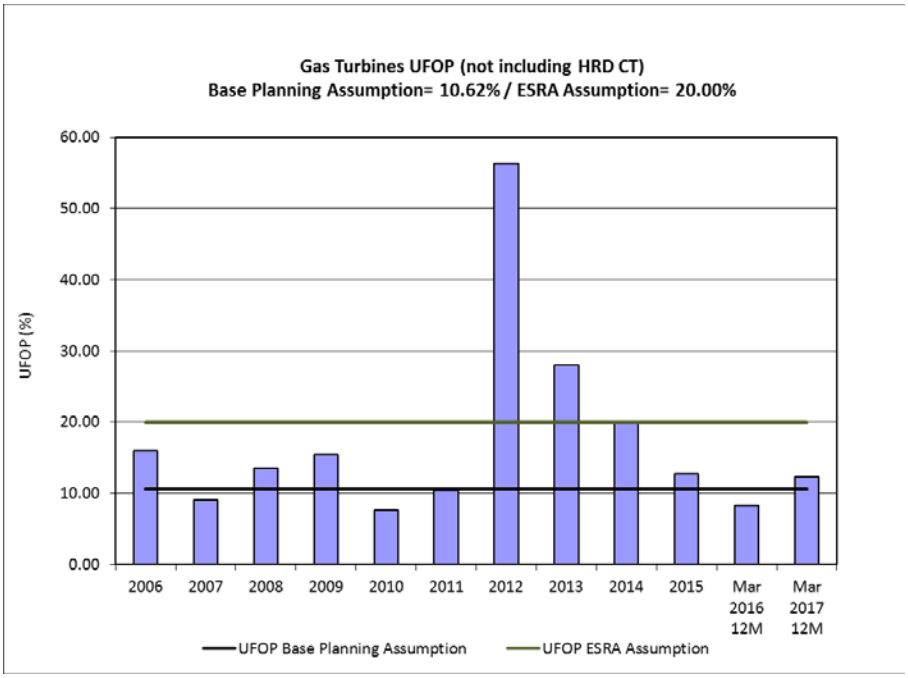

Figure 3: Gas Turbine UFOP

The Hardwoods unit UFOP was primarily affected by the following events in the reporting period:

On October 3, 2016, the Hardwoods gas turbine tripped due to a loss of fuel pressure when starting End B. It was determined that the main fuel valve was periodically closing during start up, resulting in intermittent failed starts. The unit remained available for service while the fuel valve issue was diagnosed. The fuel valve was replaced on February 10, 2017. No further issues have been experienced with this system since replacing the valve.

Also in October 2016, the Hardwoods gas turbine experienced four trips due to mounting and wiring issues with the vibration accelerometers installed on the alternator. The accelerometers were remounted and the wiring replaced. The repairs were completed and the unit was released for service on October 26, 2016. No further issues have been experienced with this system.

On November 24, 2016, Hardwoods experienced an extended outage following a lightning storm resulting in the trip of the unit while operating in synchronous condense mode. Post

trip, the unit was not able to synchronize to the electrical system. Hydro's investigation found blown fuses in the alternator's voltage sensing circuit and a fault on the automatic voltage regulator (AVR). The fuses were replaced and the AVR fault was diagnosed and corrected with technical support from the AVR manufacturer. The unit was tested and released for service on December 2, 2016.

The Stephenville unit UFOP was primarily affected by the following events in the reporting period:

A forced outage occurred from August 2 to August 5, 2016, due to a lube oil leak in the alternator module. The source of the leak was determined and the repair completed. The unit was then returned to service. No further issues have been experienced with this system.

A second forced outage occurred from August 9 to August 19, 2016. This outage was due to the presence of debris on the metallic chip detectors during a routine inspection. A review of unit operation was completed in consultation with the overhaul facility, and the unit was returned to service with continued monitoring. The debris was analyzed and found to be minor very fine particles and not a cause of concern. The lubricating oil was analyzed and found to be in satisfactory condition for continued operation. No further issues have been experienced to date.