

1 Q. Reference: ***Combustor Inspection Major and Overhaul, Holyrood Combustion***  
2 ***Turbine report, August 29, 2016, page 8***

3 *“After the March 4, 2015 power outage event, Hydro implemented practices and*  
4 *strategies which impacted the utilization of standby generation on the Island*  
5 *Interconnected System, especially on the Avalon Peninsula.”*

6 Since the March 4, 2015 power outage event, has Hydro completed any detailed  
7 engineering studies into the appropriate use of standby generation including the  
8 Holyrood CT for spinning reserve and contingencies related to transmission and  
9 generation outages? If so, please provide a copy of all such studies.

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12 A. As outlined in Hydro’s application, since the March 4, 2015 outage event, Hydro has  
13 reviewed its transmission reliability criteria and commenced the practice of  
14 operating standby generating units that support the Avalon in advance of Avalon  
15 transmission system contingencies, rather than starting them after the event has  
16 occurred, to improve customer reliability. As part of this review, system load flows  
17 were run under contingency scenarios to determine the thresholds of Avalon load  
18 at which additional Avalon generation resources are required to be operated in  
19 order to position the system to better withstand the single largest contingency and  
20 avoid a sustained customer outage. Hydro operates the system to ensure that  
21 transmission line loadings<sup>1</sup> and delivery point voltages are within acceptable limits  
22 following the contingency.

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24 Coupled with the load flow studies, and considering the cost impacts, Hydro  
25 performed an economic analysis to determine the economic breakpoints in

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<sup>1</sup> Transmission line flows are reduced to thermal rating limits within 30 minutes of the contingency event.

1 operating the Holyrood CT (its largest standby unit) within the day, versus running  
2 an additional Holyrood unit for 24 hours, when the latter is available. This analysis  
3 was provided in response to an undertaking filed during Hydro's recent general rate  
4 application and is attached as NP-NLH-008, Attachment 1.

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6 On a daily basis, Hydro assesses the Island available and spinning reserves, as well  
7 as the Avalon reserves, and staffs and / or operates standby units as required. The  
8 Island available and spinning reserves are determined in light of the current Island  
9 load forecast and generation availability. Generation (including standby units as  
10 required) is dispatched to ensure that there are adequate spinning reserves to  
11 cover the loss of the single largest unit. The Avalon reserves are assessed in  
12 consideration of the Avalon load forecast and Avalon generation and transmission  
13 availability. Through load flows, Hydro determined the impact of the single largest  
14 contingency and dispatches Avalon resources to position the system to better  
15 withstand this single largest contingency and to avoid a sustained customer outage.  
16 Examples of a reserves assessment and a standby staffing / operation guideline  
17 issued during this past April (April 1) are attached as NP-NLH-008, Attachments 2  
18 and 3.

**Undertaking 65****Re: 12-Hour Breakpoint****Undertaking to provide an analysis showing how the 12-hour breakpoint determined.**

To determine the Avalon load levels for starting thermal units, the economics of operating a Holyrood unit at minimum load (70 MW) were compared to operating the Avalon standby generation (Holyrood CT and Hardwoods GT) at base loads (50 MW total). At 2015 fuel prices, it was determined that the economic "breakeven point" occurs when standby units are operated 17 hours per day. That is, the cost of fuel consumed by a Holyrood unit operating at 70 MW for 24 hours equals the cost of fuel consumed by the standby generators operating at 50 MW for 17 hours. To account for changes in fuel prices, the practice of starting up standby units early to allow for starting failures to ensure they are ready for the peak demand hours, and uncertainties in load forecasts and load flow results, a more conservative threshold of 12 hours/day was considered appropriate. That is the standby generation will be used in place of Holyrood only in cases when the customer demand indicates they are required to operate for 12 hours per day or less.



**Morning Status Update (April 1, 2016)**

Cc: to:

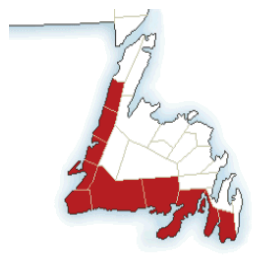
04/01/2016 06:50 AM

Good Morning,

**Weather**

Current St. John's temperature is +2 deg C and forecast to rise to +8 deg C this afternoon with periods of rain or drizzle. Winds are currently light at 15 km/h - forecasted to increase to the 40-60 km/h range this afternoon.

Currently there are rainfall warnings in place for the south and west coasts of the Island portion of the province.



**Island**

Current Island load is 1,035 MW. The peak Island load forecasts for this morning and evening are 1,200 MW and 1,070 MW respectively. With these load forecasts and current generation/transmission availability **there are no issues expected.**

**Avalon**

Current Avalon load is 530 MW with no appreciable wind generation. The peak Avalon load forecasts for this morning and evening are 610 MW and 550 MW respectively. With the same level of wind generation, the Avalon reserves are forecast to be 360 MW for this morning and 420 MW for this evening, **well clear of any alerts.**

In terms of preparation for this morning :

- Three Holyrood units are online and currently generating 360 MW;
- NP Hydro generation on the Avalon will be increased as required .

We will continue to monitor and provide any updates if things change .

Regards,

You owe it to yourself, and your family, to make it home safely every day. What have you done today so that nobody gets hurt?

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**Standby Staffing/Operation - April 1**

to:

04/01/2016 10:00 AM

Cc:

Hi

Here is the Avalon Capability with all HRD Units available :

**Avalon Resource Status:**

HRD Unit 1 @ 120 MW  
HRD Unit 2 @ 120 MW  
HRD Unit 3 @ 150 MW  
HRD CT @ 123.5 MW  
HWD GT @ 40 MW  
HRD Diesels available

Sustained Load <b>=950 MW</b>
Load Under Worst Case Contingency <b>=805 MW</b>
HRD CT Operation <b>&gt;735 MW</b>
Hardwoods (one end) and Black Start Diesels Operation <b>&gt;710 MW</b>
Hardwoods Staffing <b>&gt;685 MW</b>

For **this evening**, based on the current Avalon (560 MW) and Island (1080 MW) load forecasts, **we will not require standby operation or staffing** .

For **tomorrow morning**, based on the current Avalon (455 MW) and Island (1000 MW) load forecasts, **we will not require standby operation or staffing** .

For **tomorrow evening**, based on the current Avalon (500 MW) and Island (1025 MW) load forecasts, **we will not require standby operation or staffing** .

**Please note that we are monitoring our forecast for early next week - Monday/Tuesday. Current indications are that we will have to operate standby generation for Island spinning reserve support on these days.**

As always, this is based on current load forecasts and equipment availability and will be monitored for changes.

Regards,



You owe it to yourself, and your family, to make it home safely every day. What have you done today so that nobody gets hurt?