

1 Q. State the day, month and year Hydro became aware that it could have difficulty in  
2 supplying the required generation to meet the forecast load for December 2013  
3 and the winter of 2014? Provide details, including its understanding of the  
4 anticipated deficit and the action, immediate and long-term, taken when it became  
5 aware of a potential inability to meet customers load requirements.  
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7

8 A. Hydro realized that it would not meet the forecast load on January 2, 2014. At that  
9 time, it enacted the final steps in its Generation Load Sequence and Generation  
10 Shortage protocol (please refer to PUB-NLH-033 for details of the protocol) and  
11 planned for a customer conservation request and probable rotating outages. At  
12 0800 hours on that day, the short-term forecast indicated that the evening peak  
13 would outstrip available supply.  
14

15 Prior to that date, at various points in December, Hydro was actively managing the  
16 system supply and load using its regular planning process and tools and the  
17 Generation Load Sequence and Generation Shortage protocol as required. There  
18 were a number of circumstances in December which prompted the Systems  
19 Operations team to actively and closely monitor both forecast load and supply.  
20

21 As explained in PUB-NLH-036, the Hardwoods Gas Turbine was out of service for an  
22 overhaul and alternator replacement with a scheduled return to service on  
23 December 19, 2013. Hydro used extended work days and weeks on the Hardwoods  
24 Gas Turbine throughout December to return the unit to service as quickly and safely  
25 as possible. The Hardwoods Gas Turbine, due to its location on the Avalon  
26 Peninsula, is a critical generating asset. It provides both transmission and system  
27 capacity backup during transmission and generation contingencies and there was a

1 concerted focus on returning this unit to service. To this end, in an effort to return  
2 the Hardwoods Gas Turbine to service on schedule following the failure of a jacking  
3 oil pump on that unit during testing, on December 11, 2013 the jacking oil pump  
4 from the Stephenville Gas Turbine<sup>1</sup> was temporarily removed and installed at  
5 Hardwoods. This caused the Stephenville Gas Turbine to be temporarily unavailable  
6 while a replacement pump was obtained and installed. While this capacity  
7 reduction did not result in customer supply issues, as demonstrated by Hydro  
8 successfully meeting a new record system supplied demand of 1,501 MW on  
9 December 14, 2013, it resulted in additional focus on any potential capacity  
10 shortfall during the upcoming days and weeks.

11  
12 On December 15, 2013, ice formation in the Exploits River made a sudden shift  
13 which caused substantial amounts of ice to accumulate in the water channels  
14 leading into the Grand Falls generating station, resulting in a reduction in available  
15 capacity of approximately 50 MW<sup>2</sup>. On December 16, 2013, Granite Canal  
16 Generating station was reduced to 32 MW due to axial vibration. This was further  
17 impacting Hydro's contingency reserve criterion. With the unavailability of the  
18 Stephenville Gas Turbine and the reduction in output at the Exploits River Grand  
19 Falls plant and Granite Canal, Hydro determined it would not be able to sustain its  
20 contingency reserve criterion during the forecast high demand periods. In addition  
21 to the work at Hardwoods, efforts were made to expedite the procurement of parts  
22 for the return of the Stephenville Gas Turbine to full service and the Exploits River  
23 Grand Falls plant staff worked extended days and weeks to safely remove ice in the

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<sup>1</sup> The Hardwoods and Stephenville Gas Turbines are sister units constructed in the mid- 1970's with many components identical which enables the interchanging of parts between these units.

<sup>2</sup> Prior to this time the Grand Falls and Bishop's Falls plants were operating at approximately 85 MW, well above their normal total winter output of 63 MW.

1 water passages for the plant to restore normal winter capacity. These efforts were  
2 sustained throughout the period.

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4 On December 21, 2013 a failure of a newly acquired fuel control valve during  
5 testing of the overhauled unit resulted in the Hardwoods Gas Turbine being  
6 unavailable until January 6, 2014 when an external specialist involved with the  
7 overhaul and alternator replacement was available. In the interim, Hydro  
8 dispatched to the Hardwoods Gas Turbine necessary staff and available external  
9 specialists to complete required assessments and repairs.

10  
11 On December 23, 2013, the Stephenville Gas Turbine was restored to 25 MW with  
12 the installation of the new part that replaced the part removed on December 11,  
13 2013. The recovery of the remaining 25 MW capacity was pending the delivery and  
14 installation of new insulating blankets, scheduled for early January, 2014. Efforts  
15 were being taken to determine means of expediting the recovery of this remaining  
16 capacity.

17  
18 On December 25, 2013, Unit 2 at Holyrood was reduced by 25 MW, to 142 MW due  
19 to a control valve issue. In addition, on December 26, 2013, Holyrood's available  
20 capacity was further reduced on Unit 3 by 100 MW to 50 MW due to a forced draft  
21 fan motor failure. Both of these problems at Holyrood were addressed quickly by  
22 available staff. The forced draft fan motor, which is very large and complex to  
23 remove, was removed from the plant over the next two days, without requiring  
24 Unit 3 to be taken out of service, and transported to a repair shop in St. John's for  
25 assessment. Subsequent repairs were scheduled to take 2-3 weeks with a return to  
26 service of mid-January. The control valve on Unit 2 required careful assessment to  
27 develop a plan to recover this lost capacity without removing the entire unit from  
28 service which was successfully accomplished over the following week.

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On December 26, the overall available Hydro system capacity was reduced by 233 MW from normal expected winter levels and it was determined that there could be difficulty in supplying the required customer demand based on weather and short-term daily customer load forecasts.

The following table provides an account of the events and actions each day leading up to the rotating outages on January 2, 2014.

Date	Event	Actions	Supply and Demand (at Peak)
Thursday, December 26	Holyrood unit 3 de-rated to 50 MW due to FD fan motor failure.	<ul style="list-style-type: none"> <li>Implemented Generation Loading Sequence and Generation Shortages protocol up to Step 8 (with the exception of Step 7)</li> <li>Communications with Newfoundland Power as to the status of generation assets, load forecasts and protocols.</li> <li>Communications internally to ensure awareness of the situation.</li> </ul>	Demand: 1,385 MW Supply: 1,426 MW
Friday, December 27		<ul style="list-style-type: none"> <li>Generation Loading Sequence and Generation Shortages not required.</li> <li>Communications with Newfoundland Power as to the status of generation assets, load forecasts and protocols.</li> </ul>	Demand: 1,331 MW Supply: 1,456 MW

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Date	Event	Actions	Supply and Demand (at Peak)
Saturday, December 28	Bay d’Espoir Unit 2 removed from service due to air supply issue with breaker B1T2. No customer impact. The unit was restored by 1138.	<ul style="list-style-type: none"><li>• Generation Loading Sequence and Generation Shortages not required.</li><li>• Forecast peak for December 29 of 1410 MW. Communications with Newfoundland Power regarding this. Preparations made between both utilities to prepare as per the Generation shortage protocol.</li><li>• Customer conservation message was discussed to potentially be required for December 29. Decision to be made early on December 29.</li></ul>	Demand: 1,354 MW Supply: 1,456 MW

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Date	Event	Actions	Supply and Demand (at Peak)
Sunday, December 29	Stephenville Gas Turbine failed to start. Crews dispatched and corrected the problem at 2224.	<ul style="list-style-type: none"> <li>Implemented Generation Loading Sequence and Generation Shortages protocol up to Step 13. This included asking Corner Brook Pulp and Paper to shed approximately 28 MW of processing load.</li> <li>Continued to discuss the potential of issuing a public conservation message but determined it was not required.</li> <li>Forecast peak for December 30 of 1,420 MW. Continued communications with Newfoundland Power regarding the continuing need to implement the Generation Loading Sequence and Generation Shortages protocol.</li> </ul>	Demand: 1,425 MW Supply: 1,470 MW (including load reduction from Corner Brook Pulp and Paper).

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Date	Event	Actions	Supply and Demand (at Peak)
Monday, December 30	None	<ul style="list-style-type: none"> <li>Implemented Generation Loading Sequence and Generation Shortages protocol up to Step 13. This included asking Corner Brook Pulp and Paper to shed approximately 30 MW in the morning and 52 MW in the evening.</li> <li>Internal meeting to discuss progress on generation and preparations going forward.</li> <li>Discussions with Corner Brook Pulp and Paper regarding a more formal capacity assistance arrangement. <ul style="list-style-type: none"> <li>Forecast peak for December 31 of 1,400 MW. Continued communications with Newfoundland Power regarding the continuing need to implement the Generation Loading Sequence and Generation Shortages protocol.</li> </ul> </li> </ul>	Demand: 1,417 MW (morning). 1,420 MW (evening) Supply: 1,458 MW (including load reduction from Corner Brook Pulp and Paper).

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Date	Event	Actions	Supply and Demand (at Peak)
Tuesday, December 31 (New Years Eve)	None	<ul style="list-style-type: none"> <li>• Generation Loading Sequence and Generation Shortages protocol not required.</li> <li>• Capacity Assistance agreement reached with Corner Brook Pulp and Paper for 20, 40 or 60 MW blocks of power.</li> <li>• Forecast peak for January 1 of 1,450 MW. Continued communications with Newfoundland Power regarding the continuing need to implement the Generation Loading Sequence and Generation Shortages protocol.</li> </ul>	Demand: 1,393 MW Supply: 1,453 MW
Wednesday, January 1, (New Years Day)	None	<ul style="list-style-type: none"> <li>• Generation Loading Sequence and Generation Shortages protocol implemented up to Step 13. This also includes capacity assistance from Corner Brook Pulp and Paper for 40 MW during peak.</li> <li>• Forecast peak for January 2 of over 1,500 MW. Continued communications with Newfoundland Power regarding the continuing need to implement the Generation Loading Sequence and Generation Shortages protocol.</li> </ul>	Demand: 1,440 MW Supply: 1,484 MW (including load reduction from Corner Brook Pulp and Paper).