

1 Q. Further to PR-PUB-NLH-132, please provide those specifically attributable to the de-
2 rate of Holyrood Unit 3 due to the failed FD fan motor.

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5 A. As indicated in Hydro's responses to PR-PUB-NLH-132 and PUB-NLH-034 (in the
6 *Island Interconnected System Supply Issues and Power Outages* proceeding,
7 attached as PR-PUB-NLH-133 Attachment 1), Unit No. 3 at Holyrood was derated to
8 50 MW (from 150 MW) going into 2014 due to a failed FD fan motor. The unit was
9 restored to its full capacity on January 12, 2014 at 1615 hours. This loss of capacity
10 in combination with other generation supply issues resulted in the requirement for
11 additional energy supply costs. In the dynamic situation that was occurring at the
12 time, Hydro was not able to track the replacement power costs specifically
13 attributable to this derating or to the other generation supply issues involved in the
14 supply shortfall.

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16 In order to be responsive the request, Hydro is able to provide an estimate of costs
17 by determining the prorated replacement power costs for the period. The
18 proration is performed by multiplying the estimated hourly replacement costs by
19 the ratio of Unit 3 capacity unavailability due to the FD Fan issues (in MW) and total
20 capacity unavailable (in MW), during that hour. The following table indicates the
21 estimated cost per day – for the period January 1 to January 12, 2014.

Table 1

Date	Total Daily Costs ⁽¹⁾ (\$\$\$)	Unit 3 HRD FD Fan Related Issues ⁽²⁾ (\$\$\$)
1-Jan-14	186,948	80,930
2-Jan-14	928,590	404,902
3-Jan-14	1,170,057	515,444
4-Jan-14	794,547	34,403
5-Jan-14	1,202,978	259,784
6-Jan-14	978,292	179,485
7-Jan-14	4,819	1,339
8-Jan-14	674,290	230,327
9-Jan-14	63,281	32,258
10-Jan-14	525,331	216,371
11-Jan-14	59,199	30,519
12-Jan-14	8,251	4,508
	6,596,584	1,990,270

- Notes:
1. Net daily costs as per PR-PUB-NLH-132, Attachment 1. Unit 3 was restored to full capability at 1615 hours January 12.
 2. Costs estimated by the proration of total hourly costs by the ratio of Unit 3 unavailability due to FD Fan issues (in MW) and total capacity unavailable (in MW).

Island Interconnected System Supply Issues and Power Outages

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1 Q. List all generation and transmission equipment that was not available for
2 operations on December 1, 2013, January 1, 2014, January 5, 2014 and on January
3 8, 2014 and why such was not available. Include in the answer the status of each
4 on January 15, 2014.

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7 A. Please refer to PUB-NLH-034, Attachment 1.

December 1, 2013

Generation	Location	Equipment	Reason for Unavailability
	Hardwoods	Gas Turbine	Planned outage for overhaul and to replace alternator (Oct. 3 – Dec. 19).
	Stephenville	Gas Turbine	End A available at full capacity (25 MW). Turbine End B was unavailable at full capacity due to cooling issues (derated to 15 MW). Awaiting insulating blankets for installation. Capacity of End A and B together is 30 MW since both ends share load.
Transmission	Location	Equipment	Reason for Unavailability
	Bay d'Espoir Terminal Station	Breaker B13L20	Planned maintenance (Nov. 15 - Dec. 6), the bypass switch was utilised.
	Holyrood Terminal Station	Transformer T7	Issues with the high side transformer disconnect switch. Awaiting the opportunity for a bus outage in order to conduct repairs.

January 1, 2014

Generation	Location	Equipment	Reason for Unavailability
	Hardwoods	Gas Turbine	Unit unavailable as assessment and work were underway to correct the fuel valve issues discovered during final testing following the unit alternator replacement and overhaul.
	Stephenville	Gas Turbine	End A was available at 25 MW. Turbine End B was unavailable as it was not tested after new pipe couplings were installed on December 31. There was a concern of tripping End A during these tests and making it unavailable. End B was not restored until after the testing on January 3.
	Holyrood	Unit No. 3	Forced derating to 50 MW (100 MW unavailable) due to a forced draft fan motor failure. Awaiting the replacement coils in order to rewind the motor prior to re-installation.
	Granite Canal	Granite Canal Unit	Unit was derated to 32 MW due to vibration issues experienced above this generation level.
	Exploits	Exploits generation	Exploits generation reduced to 40 MW from 63 MW due to frazil ice issues. The ice removal process was ongoing.
Transmission	Location	Equipment	Reason for Unavailability
	Holyrood Terminal Station	Transformer T7	Issues with the high side transformer disconnect switch. Awaiting the opportunity for a bus outage in order to conduct repairs.

January 5, 2014

Generation	Location	Equipment	Reason for Unavailability
	Hardwoods	Gas Turbine	Unit unavailable as assessment and work were underway to correct the fuel valve issues discovered during final testing following the unit alternator replacement and overhaul.
	Stephenville	Gas Turbine	End A available at 25 MW. It was determined that Turbine End B could be run at full capacity (25 MW) due to the cold ambient temperatures. The installation of insulating blankets was still required for the longer term.
	Holyrood	Unit No. 3	Forced derating to 50 MW (100 MW unavailable) due to a forced draft fan motor failure. Awaiting the replacement coils in order to rewind the motor prior to re-installation.
	Holyrood	Unit No. 1	Unit outaged (165 MW unavailable) due to vibration issues experienced following the trip during the Sunnyside issues on January 4, 2014 at 0905 hours. The unit was ran up several times and ready to re-sync during the evening hours on January 5.
	Granite Canal	Granite Canal Unit	The unit was operated at 40 MW with personnel on site to monitor. No vibration issues were experienced and ice issues (which had since cleared) were suspected.
	Exploits	Exploits generation	Exploits generation reduced to 37 MW from 63 MW due to frazil ice issues. The ice removal process was ongoing.
Transmission	Location	Equipment	Reason for Unavailability
	Sunnyside Terminal Station	Transformer T1, Breaker B1L03, Bus 2, and Transmission Line TL212	Outaged due to Transformer T1 fire (with subsequent equipment contamination) and breaker B1L03 breaker failure on January 4, 2014.
	Western Avalon Terminal Station	Transformer T5	Forced outage occurred on January 4, 2014. Tap changer issue.
	Holyrood Terminal Station	Transformer T5	Transformer taken out of service for testing/troubleshooting following the issues experienced at the Holyrood 230 kV switchyard during the attempted re-start of Unit No. 1 on January 5 at 2127 hours.
	Holyrood Terminal Station	Transformer T7	Issues with the high side transformer disconnect switch. Awaiting the opportunity for a bus outage in order to conduct repairs.

January 8, 2014

Generation	Location	Equipment	Reason for Unavailability
	Hardwoods	Gas Turbine	Unit unavailable as assessment and work were underway to correct the fuel valve issues discovered during final testing following the unit alternator replacement and overhaul. Available in synchronous condenser mode.
	Stephenville	Gas Turbine	Both ends underwent testing on this day. End B tripped at 0830 hours. After an assessment later that evening, it was determined that both ends were unavailable. End A became available again in the afternoon on January 9. An assessment of End B was underway.
	Holyrood	Unit No. 3	Forced derating to 50 MW (100 MW unavailable) due to a forced draft fan motor failure. Work to re-wind the motor was ongoing.
	Holyrood	Unit No. 1	Unit outaged (165 MW unavailable) due to switchyard equipment issues experienced during the attempted re-start on January 5, 2014 at 2127 hours. Unit No. 1 was restored to service on January 8, 2014.
	Exploits	Exploits generation	Exploits generation reduced to 45 MW from 63 MW due to frazil ice issues. The ice removal process was ongoing.

Transmission	Location	Equipment	Reason for Unavailability
	Sunnyside Terminal Station	Transformer T1, Breaker B1L03, Bus 2, and Transmission Line TL212	Outaged due to Transformer T1 fire (with subsequent equipment contamination) and breaker B1L03 breaker failure on January 4, 2014. The extent of the damage was being assessed.
	Western Avalon Terminal Station	Transformer T5	Forced outage experienced during the system disturbance caused by Sunnyside issues on January 4, 2014. Tap changer issue.
	Holyrood Terminal Station	Breakers B1L17, B2L42, B3L18	Breakers taken out of service for testing/troubleshooting following the issues experienced at the Holyrood 230 KV switchyard during the attempted resynchronisation of Unit No. 1 on January 5 at 2127 hours.
	Holyrood Terminal Station	Transformer T5	Transformer taken out of service for testing/troubleshooting following the issues experienced at the Holyrood 230 KV switchyard during the attempted re-start of Unit No. 1 on January 5 at 2127 hours.
	Holyrood Terminal Station	Transformer T7	Issues with the high side transformer disconnect switch. Awaiting the opportunity for a bus outage in order to conduct repairs.

January 15, 2014

Generation	Location	Equipment	Status Update
	Hardwoods	Gas Turbine	Both ends returned to service on January 12 at 1800 hours
	Stephenville	Gas Turbine	End A available at 25 MW. End B unavailable since the trip on January 8. Work is ongoing with the OEM to assess the extent of the damage and repairs.
	Holyrood	Unit No. 3	Unit restored to full capacity January 12 at 1615 hours
	Holyrood	Unit No. 1	Unit returned to service January 8 at 1539 hours
	Granite Canal	Granite Canal Unit	Unit had tripped the previous day (January 14) due to problems with a pressure switch on the governor system. Repairs were made and the unit was returned to service at 2107 hours on January 15 at full capacity (40 MW).
	Exploits	Exploits generation	Generation restored on January 14 (70 MW)

Transmission	Location	Equipment	Status Update
	Sunnyside Terminal Station	Transformer T1, Breaker B1L03, Bus 2, and Transmission Line TL212	Outaged due to Transformer T1 fire (with subsequent equipment contamination) and breaker B1L03 breaker failure on January 4, 2014. An internal investigation on T1 was performed, a bushing failure is suspected. A TapRoot investigation is ongoing and a report from the OEM will be received by mid-February. An overhaul was completed on breaker B1L03. Function testing is in progress with a planned return to service of late January. Bus 2 and Transmission Line TL212 were returned to service on January 16.
	Western Avalon Terminal Station	Transformer T5	Transformer T5 still unavailable. It was inspected and tested, revealing a tap changer problem. A plan is being developed to repair the tap changer.
	Holyrood Terminal Station	Breakers B1L17, B2L42, B3L18	Breaker B1L17 is isolated from the power system. The plan is to have the breaker rebuilt and restored to service by the end of January. Breaker B2L42 was unavailable on January 15. It was returned to service on January 16. B3L18 was returned to service on January 8.
	Holyrood Terminal Station	Transformer T5	There were no issues with the transformer and it was returned to service on January 9 at 1707 hours.
	Holyrood Terminal Station	Transformer T7	Issues with the high side transformer disconnect switch. Awaiting the opportunity for a bus outage in order to conduct repairs.