

1 Q. Further to the response to PUB-NLH-030, provide details, with examples, of the
2 implementation of any activity listed, providing the rationale for each activity and
3 the impact each had on reducing the duration of outages.

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6 A. In the response to PUB-NLH-030 Hydro provided a list of seven activities which it
7 may have undertaken prior to January 2014 when there was a forecast of severe
8 weather. Below are further details of these activities and some examples where
9 they have been applied. The benefits in reduced outage time can vary depending on
10 the nature and location of the trouble if any.

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12 1. Pre-event coordination call to coordinate response activities

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14 As referenced in PUB-NLH-054, Attachment 3, System Operations (upon receipt
15 of warnings from Environment Canada) issues notices of weather warnings to
16 regional and plant managers. Once the notification has been sent out System
17 Operations will follow up with field operations staff depending on the severity
18 of the event or system conditions to discuss the need for additional
19 preparations for the pending weather. As part of standing practice, field staff
20 will make further coordination calls as the situation warrants to secure the
21 power system.

22

23 The situation facing Hydro on January 3, 2014 warranted a broader and more
24 comprehensive coordination call. Hydro was initiating rolling blackouts due the
25 generation shortfall and a significant winter event was forecasted for the next
26 day. At 1100 hours, there was a coordination call between senior management,
27 System Operations, Engineering, Transmission and Rural Operations (TRO),

Hydro Generation, Communications and Holyrood Generation groups. The purpose of this call was to ensure that all groups were aware of the system status and to coordinate the response to the severe winter weather. During this call emphasis was placed on the need to maintain the continuity of the existing generation infrastructure and to ensure prompt response to any system issues in order to minimize customer impact. The deployment of crews, the extra snow clearing that was arranged and the emergency preparation activities that were initiated on January 3 helped ensure that there was a timely and efficient response to the outages experienced on January 4, 2014.

2. Enhanced staffing levels at the Energy Control Centre (ECC) and other control rooms as needed

During significant disruptions to the power system and during times of high call volume to the ECC, it is regular practice to bring in extra staff. The additional customer call volume requires extra staff, especially when outside of normal working hours so that there may be a delay in mobilizing the Customer Service Call Centre. Also, depending on the complexity of the issue, additional staff may be brought in to help manage the issue. Detailed records and logs are not kept of each time that additional staff is brought in to supplement control room staff.

On January 4-5, 2014, to ensure timely response to system issues and to manage higher than normal workloads and activity during outage and storm events, staff levels were increased at the following control rooms:

- a. Energy Control Centre – St. John’s
- b. Holyrood Thermal Generating Station – Holyrood
- c. Bay d’Espoir Hydroelectric Generating Station – Bay d’Espoir

1 The increased staffing levels balanced the larger workload among operators and
2 provided redundancy for rest breaks to help mitigate worker exhaustion and
3 stress.

4
5 3. Deployment of work crews to reduce response time in the event of an
6 unplanned outage or equipment problems

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8 Hydro deployed work crews in advance of the January 4, 2014 storm. Please
9 refer to Hydro's response to PUB-NLH-080, bullet 1, for the rationale and
10 benefit provided from this activity.

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12 Other examples of Hydro deploying work crews in advance of a forecasted
13 severe weather event include sending line crews to Change Islands when it is
14 anticipated ferry travel could be disrupted and scheduling crews in a remote
15 diesel generator supplied community when travel could be challenged due to
16 weather and/or there are critical loads on the system (such as critical
17 production times for a fish plant).

18
19 Advanced deployment of crews to specific sites prior to a storm provides
20 benefits when the storm is predicted to occur in a particular geographical area
21 or there are known system equipment issues at those sites which may require
22 attention during a storm. Most often, the benefits of keeping crews at their
23 home base and close to the center of operations outweighs the risk of having
24 them located at a remote location where there may not be problems. In the
25 case of generating stations, the majority of Hydro's large generating units are
26 located in the Bay d'Espoir area or in Cat Arm and Hinds Lake, close to the home
27 base location of the work crews that support those facilities. Similarly, for
28 Transmission and Rural Operations, Hydro's crews' home office or depot are

purposely located throughout the province in central locations with facilities to provide fast response to interruptions. For these reasons, the deployment of work crews to specific sites other than their home offices in advance of a weather event is not a common activity, but is one that is considered in advance of each major forecasted weather event. For example, for the weather event forecasted on January 4, 2014 it was decided that it would be prudent to ensure crews were scheduled to report to key terminal stations on the Avalon Peninsula. As a result, an employee was on site at Sunnyside the morning of January 4, 2014 which expedited the response efforts.

4. Additional inspections of equipment and vehicles (four wheel drive trucks; snowmobiles, ATVs and specialized vehicles) to ensure full functionality and full gas tanks

This is routinely done for TRO areas; however, since the event of 2013, this has been expanded to include all of Hydro operations in advance of any significant weather event. Prior to the severe weather events of January 4, 2014, Hydro Generation, Exploits Generation, TRO, Holyrood and Hydro Place staff ensured that full functionality and full fuel tanks for necessary equipment and vehicles. Having full fuel tanks and fully operational vehicles and equipment ensures no delay in crew mobilization should the need arise.

5. Additional communication with on-call personnel to ensure readiness to respond if needed

This occurs routinely in accordance with the operating instruction: A-003 Notification of Weather Warnings and Lightning Activity (as provided in Attachment 3 to Hydro's response to PUB-NLH-054.)

Records are not kept of these phone calls, but most recently, on January 3, 2014, all on-call personnel were alerted of impact of rolling outages as well as the threat posed by the forecasted winter storm.

This heightened sense of awareness ensure that on-call personnel are ready to mobilize should the need arise.

6. Scheduling of additional snow removal to ensure ongoing access to critical infrastructure during storm events

This activity was identified an area where improvements could be made as a result of Hydro's investigation into the January 11, 2013 outages. Hydro has snow clearing arrangements in place for all of its facilities where it is prudent¹ to do so, however, requesting additional or priority snow removal was not a part of normal pre-storm planning activities. The first major snowstorm where this was implemented was the storm of January 4-5, 2014.

Additional or priority snow removal requests that were made prior to January 4, 2014 storm include:

- a. Arranged ongoing clearing of Upper Salmon road to ensure access to Upper Salmon Generating Station;
- b. Arranged ongoing clearing and extra sanding of Hinds Lake road to ensure access to Hinds Lake Generating Station;
- c. Request to City of St. John's to maintain access to Captain Whelan Drive as a priority, to ensure access to Hydro Place;

¹ For some facilities, such as Cat Arm and Granite Canal, road access is not maintained through the winter due to the high cost and limited benefit provided by maintaining the roads open. Transportation to these facilities in the winter is through other means such as helicopter or snowmobile.

- 1 d. Arranged for the snow clearing contractor to maintain access to Holyrood
2 Thermal Generating Station; and
3 e. Arranged for priority snow clearing for access to Stephenville gas turbine.
4

5 By maintaining safe access² to key facilities travel time is greatly reduced.
6 During the outage on January 11, 2013 Hydro experienced many delays in
7 getting key personnel into Hydro Place and into the Holyrood Thermal
8 Generating Station. While no two storms are exactly the same, the proactive
9 approach taken during the 2014 storm made it easier for Hydro personnel to
10 access work facilities and reduced overall response time.
11

12 7. Test run of standby diesels and gas turbines
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14 Standby diesels and gas turbines are tested monthly to ensure availability in
15 accordance with the following operating instructions:

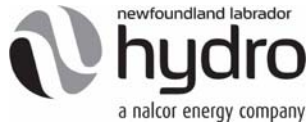
- 16 • T-051 – Diesel Testing; and
17 • T-054 – Gas Turbine Testing.
18

19 These instructions are attached as PUB-NLH-068, Attachments 1 and 2.
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21 As described in PUB-NLH-080, since the events of January 2-8, 2014, Hydro has
22 also started the practice of running up the gas turbines in Stephenville and
23 Hardwoods and the standby diesels in Hawke's Bay and St. Anthony in advance
24 of all significant forecasted weather events.

² It should be noted that depending on the severity of a storm it may not be possible to keep roads open, such as times when the Department of Transportation and Works removes its snow clearing equipment from the roads until the weather conditions improve.

1 By testing and proving the full operating capability of standby generating units
2 in advance, it allows Hydro to ensure that these assets will provide reliable
3 service under peak load or generation shortfall conditions and during power
4 system emergencies.



SYSTEM OPERATING INSTRUCTION

STATION:	St. Anthony and Hawke's Bay	Inst. No.	T-051
TITLE:	Diesel Testing	Page	1 of 1

Introduction

The St. Anthony and Hawkes Bay diesels have the capability to be operated locally, or remotely from the Energy Control Center. Remote operation from the Control Center is generally done only when there are problems on the system that requires these units to be placed in service. Such occurrences are rare, and consequently, Control Center staff may not be conversant with the operation of these units when they are required to be operated. There is also a requirement for these diesels to be operated monthly, so that operations and maintenance personnel can do the necessary monitoring, to ensure these units are available when required. Therefore, to ensure the necessary skills are kept up to date, and availability checks are performed, for the operation of these units, the following procedure has been developed.

Procedure

1. Diesels shall be exercised monthly.
2. All diesel units at both St. Anthony and Hawke's Bay plants shall be started and loaded to their normal maximum from the ECC.
3. The diesels shall remain at the normal maximum load for a duration of one hour.
4. The operator shall be present while the diesels are being exercised.
5. A record shall be kept, at the ECC, recording when the diesels were exercised.
6. Work orders/requests shall be submitted on any deficiencies that are noted during testing.

REVISION HISTORY

<u>Version Number</u>	<u>Date</u>	<u>Description of Change</u>
0	1998-03-19	Original Issue
1	2011-08-25	Minor rewording
PREPARED: Bob Butler		APPROVED:



SYSTEM OPERATING INSTRUCTION

STATION:	Hardwoods, Stephenville, and Happy Valley	Inst. No.	T-054
TITLE:	Gas Turbine Testing	Page	1 of 2

Introduction

Production from gas turbines may be required under peak load conditions or during power system emergencies or generation shortfalls. The gas turbines at Hardwoods, Stephenville and Happy Valley have the capability to be operated locally from its terminal station interface, or remotely from the Energy Control Centre. Control Centre staff place gas turbines in-service when there are problems on the power system that require support from these units. These units are expected to operate at their designed maximum continuous rating, free of constraints.

There is a requirement to regularly operate these gas turbines for operations and maintenance personnel to ensure these units are capable of delivering the rated capacity, when required.

To ensure the necessary familiarity with operating the gas turbines and capability checks are performed, the units shall be tested monthly according to the procedure below.

Procedure

1. Prior to all testing, ensure Gas Turbine Operator is present at the gas turbine site.
2. Gas turbines shall be started, each end separately and loaded to full rating, from the ECC.
3. Each end of the gas turbine shall remain at the full rating for duration of ten minutes. Consideration shall be given to minimize fuel consumption.
4. The following checks shall be made with the unit at a low output level:
 - a. With unit in Synchronous Condense Mode, generate using end A
 - b. With unit in Synchronous Condense Mode, generate using end B
 - c. With unit in Synchronous Condense Mode, generate using end A & B
 - d. With unit shut down, select generate on end A, and then shut down
 - e. With unit shut down, select generate on end B, and then shut down
 - f. With unit shut down, select generate using A & B
 - g. Verify MW and MVar setpoints



SYSTEM OPERATING INSTRUCTION

STATION:	Hardwoods, Stephenville, and Happy Valley	Inst. No.	T-054
TITLE:	Gas Turbine Testing	Page	2 of 2

Procedure (cont'd.)

There is one gas generator at Happy Valley. End A / B apply to Hardwoods; and End A at Stephenville.

5. Record in the system diary the tests performed and a summary of the results.
6. Generate work orders on any noted deficiencies uncovered during testing.

Note: Black start capability shall be checked annually at each gas turbine location.

REVISION HISTORY

<u>Version Number</u>	<u>Date</u>	<u>Description of Change</u>
0	2006-05-12	Original Issue
1	2011-08-25	Minor rewording
PREPARED: M. O'Keefe		APPROVED: