

June 16, 2014

The Board of Commissioners of Public Utilities
Prince Charles Building
120 Torbay Road, P.O. Box 21040
St. John's, Newfoundland & Labrador
A1A 5B2

Attention: Ms. Cheryl Blundon
Director Corporate Services & Board Secretary

Dear Ms. Blundon:

**Re: The Board's Investigation and Hearing into Supply Issues and Power Outages
on the Island Interconnection System**

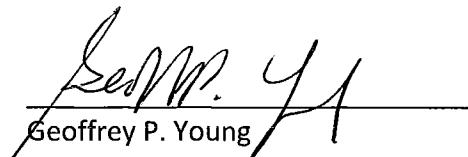
In accordance with the Board's Interim Report dated May 15, 2014, wherein the Board required the filing of reports on today's date with respect to the above noted matter, please find enclosed the original plus 12 copies of Hydro's:

- Hydro Place Emergency Power Report;
- Protection and Control Systems Report;
- Terminal Station and P&C Resource Requirements Report;
- Terminal Station Transformers Report; and
- Generation Availability Report.

Should you have any questions, please contact the undersigned.

Yours truly,

NEWFOUNDLAND AND LABRADOR HYDRO



Geoffrey P. Young
Senior Legal Counsel

GPY/cp

cc: Gerard Hayes – Newfoundland Power
Paul Coxworthy – Stewart McKelvey Stirling Scales
Sheryl Nisenbaum – Praxair Canada Inc.
Roberta Frampton Benefiel – Grand Riverkeeper Labrador

Thomas Johnson – Consumer Advocate
Thomas O’ Reilly – Cox & Palmer
Danny Dumaresque

*Investigation and Hearing into Supply Issues and Power Outages on the
Island Interconnected System*

**REPORT TO THE BOARD OF COMMISSIONERS OF PUBLIC UTILITIES
RELATED TO HYDRO PLACE EMERGENCY POWER**

Newfoundland and Labrador Hydro

June 16, 2014



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1 **1 BACKGROUND AND INTRODUCTION**

2

3 Overall, Hydro’s network and communications infrastructure performed well and as expected
4 throughout the full duration of the supply disruptions and rotating outages which occurred in
5 January, 2014. Hydro’s network services and tele-protection systems, and their associated
6 backup power systems which are located at various terminal stations, microwave sites, and
7 other remote/unstaffed locations, are critical to maintaining the integrity of the island
8 interconnected system. All of these systems operated as designed.

9

10 However, Hydro Place did experience a power outage on the morning of January 4 due to an
11 interruption in the building’s backup diesel generation system. Uninterruptible Power Supply
12 (UPS) backup batteries were effective in maintaining power to these systems for a period of
13 time following this interruption. However, for a period of 43 minutes the Energy Management
14 System (EMS)¹ computer was unavailable to Energy Control Centre (ECC) operators due to a
15 brief loss of power and the time required to restart and bring the EMS back into operation.

16

17 The Company’s administrative computing systems were unavailable during this period as well.
18 These systems host a very wide array of applications, databases, and services, and a gradual
19 restoration of the affected servers was required. This was completed by mid-afternoon.

20

21 A priority action identified through Hydro’s internal review of the January, 2014 system events
22 was to identify and address the factors which caused under-frequency synchronization and
23 over-heating issues on the backup diesels at Hydro Place. Another recommendation was to
24 review the adequacy of emergency lighting at Hydro Place from a safety perspective.

25

26 On May 15, 2014 the Board of Commissioners of Public Utilities (PUB) issued its Interim Report
27 in connection with the Board’s investigation and hearing into the supply disruptions and power

¹ The EMS is a sophisticated software application used by Operators in the Company’s Energy Control Centre (ECC) to manage and control Hydro’s power system.

- 1 outages which occurred on the island interconnected system in January, 2014. This Report is
2 filed in response to the request made by the PUB in its Interim Report that Hydro file a report
3 by June 16, 2014 in relation to:
- 4 a) The emergency generation system for Hydro Place addressing the outstanding work,
5 availability risk, and maintenance procedures; and
 - 6 b) A plan to ensure that there is adequate emergency lighting at Hydro Place in 2014.

1 **2 EMERGENCY GENERATION SYSTEM**

2
3 Hydro’s internal review determined that the unavailability of the Hydro Place backup diesel
4 generators on January 4, 2014 was due to a faulty actuator for the ventilation system louvers.
5 The failure of the ventilation louvers to open created a high temperature alarm, which shut the
6 emergency generation system down as a protective measure. When this occurred on January
7 4, the louvers were manually opened as a temporary measure and the generators were
8 restarted, which restored emergency power to Hydro Place.

9
10 The pneumatic actuators in the standby diesel units at Hydro Place have since been replaced
11 with electronically controlled actuators. To reduce the risk associated with this failure, they
12 have been designed to default to the open position in the event of a loss of system power to
13 Hydro Place, which creates an additional level of redundancy protection which did not exist in
14 the previous system. This work was completed in May, 2014. All preventative maintenance
15 work has been carried out as scheduled, and the system is tested on a biweekly basis to ensure
16 operational readiness. There is no maintenance work outstanding at this time.

17
18 Another action identified through Hydro’s internal review was to review the preventative
19 maintenance (PM) program for the Hydro Place emergency power system to address the risks
20 to reliable operation of the facilities, and refine as necessary. This review is in progress and
21 included a comparison of existing practices to those of other systems; consultations with
22 original equipment manufacturers and maintenance providers; as well as a review of relevant
23 information available from the Canadian Standards Association. Best practices have been
24 incorporated into an updated PM and testing program, which is currently under review by the
25 Company’s engineering personnel to ensure appropriate measures are incorporated. Once
26 these procedures have been updated, the PM program will be implemented and monitored for
27 compliance.

- 1 Hydro has taken the further step of confirming a protocol with Newfoundland Power which will
- 2 ensure that, in the event of a system interruption affecting the St. John's area, the feeder to
- 3 Hydro Place will not be subject to planned interruption, and that if there is an unplanned
- 4 interruption, this feeder will be restored on a priority basis.

1 **3 EMERGENCY LIGHTING**

2

3 The Hydro Place emergency power generation system is designed to also supply emergency
4 power to the building's emergency lighting system, which includes emergency stairwell lighting.

5 As an additional safety measure, battery powered emergency lighting has been installed in all
6 Hydro Place stairwells. This emergency lighting will provide sufficient lighting to allow safe
7 egress from the building in the unlikely event all other power has been interrupted.

8 Supplemental battery powered emergency lighting has also been installed in the emergency
9 generation system room.