



CMD 23-M7

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## Event Initial Report

## Rapport initial d'événement

### **NB Power**

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**Partial Loss of Class IV Power and  
Heavy Water Leak at the Point  
Lepreau Nuclear Generating Station**

### **Énergie NB**

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**Perte partielle d'alimentation  
électrique de catégorie IV et fuite  
d'eau lourde à la centrale nucléaire  
de Point Lepreau**

Commission Meeting

Réunion de la Commission

January 25, 2023

Le 25 janvier 2023

# EVENT INITIAL REPORT (EIR)

E-DOCS# 6936497

EIR: Partial Loss of Class IV Power and Heavy Water Leak at the Point Lepreau Nuclear Generating Station	
Prepared by: Directorate of Power Reactor Regulation	
Licensee: New Brunswick Power	Location: Point Lepreau Nuclear Generating Station (PLNGS)
Date Event was Discovered: 2022-12-14	<b>Have Regulatory Reporting Requirements been met?</b> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>  <b>Proactive Disclosure:</b> Licensee: Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> CNSC: Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
Overview	
<b>Reporting Criteria:</b>  From Event Initial Reporting (EIR) Process document:  <i>4) Any actuation of a special safety systems that was caused by an unexpected circumstance or combinations of circumstances from which the industry should learn lessons to prevent recurrence. (i.e., not just spurious trips)</i>  <i>15) Issues, events, occurrences that the Directors-General (DGs) or their designates judge to have potential for repercussions outside the CNSC and for which the DGs or their designates believe the Commission should be informed.</i>	
<b>Description:</b>  At approximately 00:55 on December 14, 2022, PLNGS experienced a partial Loss of Class IV power due to an electrical fault on a cable from the Unit Service Transformer (UST). The electrical protection scheme disconnected Class IV bus 5321-BUB from the UST and prevented the System Service Transformer (SST) from providing power to bus 5321-BUB to avoid a potential loss of all Class IV power. Bus 5321-BUB feeds Primary Heat Transport (PHT) System pumps 3312-P2 and 3312-P4 and part of the pumps and compressors in other systems.  The partial loss of power caused the PHT System pumps 3312-P2 and 3312-P4 to trip. Shutdown System 1 (SDS1) and Shutdown System 2 (SDS2) tripped as designed and safely shutdown the reactor.  At approximately 03:00, NB Power observed indications of a heavy water leak in the Reactor Building and entered their procedure for a small coolant leak. At 04:40, NB Power declared a Radiation Alert due to high tritium levels. The D <sub>2</sub> O Recovery system was actuated to return the leaking coolant water to the PHT system and maintain cooling.  NB Power identified the leak on a 3/8" instrumentation line connected to the PHT system. At 16:42, NB Power crimped the instrumentation line to stop the leak. Shortly after that, Class IV power was successfully restored to bus 5321-BUB.  The fundamental safety functions of control, cool, and contain were maintained throughout the event: reactor power was controlled as both shutdown systems functioned as designed and the unit was placed in a Guaranteed Shutdown State (GSS); cooling was maintained by the PHT, D <sub>2</sub> O Recovery, and the Shutdown Cooling systems; and containment was isolated following the indications of a leak.	
<b>Cause(s):</b>  NB Power determined the cause of the partial Loss of Class IV power from the UST was due to a fault with cable PA-18 which connects the UST to bus 5321-BUB. The electrical protection operated as designed by disconnecting the UST from bus 5321-BUB and preventing the SST from connecting to bus 5321-BUB, resulting in the partial Loss of Class IV power.  NB Power found that the leak originated from a 3/8" instrumentation line used to measure pressure across a Restriction Orifice (3312-RO4). This instrument line is part of the PHT system but is not used for regular operation. NB Power determined the cause of the tube failure to be high cycle fatigue.	
Impact of the Event	
<b>On People:</b>  How many workers have been (or may be) affected?  No injuries were reported, and no regulatory dose limits were exceeded during the event or the response.  How many members of the public have been (or may be) affected by the event?  No members of the public were affected.	
How were they affected?  N/A	

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### On the Environment:

A small quantity of tritium was released through normal monitored pathways. The releases were below Action Levels and well below the Derived Release Limits.

### Other Implications:

None.

## Licensee Actions

### Taken or in Progress:

NB Power followed their upset response procedures and initiated the transition to GSS following the reactor trip. They declared a Radiation Alert and isolated containment following the detection of a heavy water leak. NB Power notified the CNSC Duty Officer and activated their emergency organization to respond to the incident.

NB Power successfully restored Class IV power by repairing the cable on the UST, stopped the leak that was identified on the instrumentation line by applying a crimp and cleaned up the heavy water spill. Subsequently, NB Power terminated the Radiation Alert, unboxed containment, and safely transitioned to their normal outage management activities. The emergency organization was stood down and the Outage Control Centre activated. The Outage Control Centre was focused on the following tasks:

- Inspection, Extent of Condition, Maintenance, and Testing of the UST and Cables
- Inspection, Extent of Condition, Maintenance, and Testing of the PHT Instrumentation Line
- Clean-Up of the Reactor Building
- Restoration of PHT Inventory

The leaking instrumentation line was cut and capped. As part of the extent of condition, three similar instrumentation lines were also cut and capped.

NB Power communicated information about the event to the Indigenous Communities and the public in a timely manner. NB Power provided a verbal report on the event to the Commission on December 16, 2022.

On December 21, 2022, NB Power submitted a Preliminary Event Report as per REGDOC 3.1.1.

### Planned:

NB Power is in the process of conducting causal analysis and will submit a REGDOC 3.1.1 Detailed Event Report. NB Power committed to providing a presentation on the event to the Commission.

## CNSC Actions

### Taken or in Progress:

The CNSC Duty Officer was notified by PLNGS, in a timely manner, that there was a partial Loss of Class IV power and Radiation Alert. The CNSC Emergency Operations Centre (EOC) was partially activated to monitor NB Power's response during the evolution of the incident.

CNSC regulatory operations and technical staff verified NB Power's compliance with their processes and procedures during the event. CNSC inspectors were present at site and obtained information through discussions with NB Power staff, monitoring activities in NB Power's Incident Command Centre, observations of meetings, and review of station databases. CNSC staff confirmed that the safety of workers, the public, and the environment were maintained.

CNSC staff communicated information on the regulatory oversight of the incident to Federal and Provincial Government Representatives, Indigenous Communities, and members of the public.

The CNSC EOC remained in partial activation until the termination of the Radiation Alert at PLNGS. CNSC staff continue to monitor the outage through review of station records, attendance at outage and decision-making meetings, discussions with licensee staff, and on-site field inspections.

### Planned:

CNSC staff will review the REGDOC 3.1.1 Detailed Event Report and causal analysis once complete. The scope of some upcoming CNSC compliance inspections have been adjusted to include verification activities as a result of this event.

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**Additional reporting to the Commission Members anticipated:**

- Yes
- No

If Yes, provide method of reporting:

Name and Title	Signature
<p><b>Alex Viktorov</b> Directorate of Power Reactor Regulation</p>	<p> Recoverable Signature</p> <p><b>X</b> </p> <hr/> <p>Signed by: Viktorov, Alexandre Director General</p> <p>Date</p>