



Event Initial Report

Rapport initial d'événement

Canadian Nuclear Laboratories

Safety stand-down at Canadian Nuclear Laboratories' Whiteshell Site following the discovery of non-compliances in the fire protection program

Les Laboratoires Nucléaires Canadiens

Arrêt des activités au site de Whiteshell des Laboratoires Nucléaires Canadiens suivant la découverte de non-conformités dans le programme de protection-incendie

Commission Meeting

Réunion de la Commission

June 28, 2023

Le 28 juin 2023

EVENT INITIAL REPORT (EIR)

E-DOCS-#7031216

EIR: Safety stand-down at Canadian Nuclear Laboratories' Whiteshell Site following the discovery of non-compliances in the fire protection program

Prepared by: Directorate of Nuclear Cycle and Facilities Regulation - Canadian Nuclear Laboratories Regulatory Program Division

Licensee: Canadian Nuclear Laboratories	Location: Whiteshell Laboratories
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Date Event was Discovered: 2023-04-27	Have Regulatory Reporting Requirements been met? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Proactive Disclosure: Licensee: Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> CNSC: Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
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Overview

Reporting Criteria: #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.

Description:

Canadian Nuclear Laboratories (CNL) performed a planned self-assessment of the Whiteshell Laboratories (WL) Fire Protection Program against the requirements of CSA N393:13, *Fire Protection For Facilities That Process, Handle, Or Store Nuclear Substances*. CSA N393 is included in the compliance verification criteria of section 10.1, *Fire Protection Program*, of the WL Licence Conditions Handbook as a licensing basis publication. The self-assessment was conducted April 24-26, 2023 and reviewed fire response training, equipment and response capability for compliance with CSA N393. The self-assessment reviewed fire protection records for the calendar years 2020, 2021, and 2022.

This assessment determined that training records for members of the on-site fire brigade were incomplete, and therefore CNL could not demonstrate that fire response staff were adequately trained and competent to provide fire suppression activities consistent with the Fire Protection Program for the WL site. Deficiencies were also identified with the procedures for equipment inspection, testing, and maintenance, and the use of incomplete or expired Personal Protective Equipment. The deficiencies identified in the training and equipment of fire response staff had a direct impact on CNL's ability to maintain minimum complement of fire response personnel at the WL site.

On April 27, 2023, CNL contacted the CNSC Duty Officer to report this event in accordance with section 29(1)(a) of the *General Nuclear Safety Regulations* and paragraph 27(b)(ii) of the *Nuclear Safety and Control Act*. CNL immediately placed the WL site into a safe shutdown state. Only essential compliance and maintenance work were to be conducted at this time.

On May 1, 2023, pursuant to REGDOC-3.1.2, *Reporting Requirements, Volume I: Non-Power Reactor Class I Nuclear Facilities and Uranium Mines and Mills*, CNL submitted a preliminary report of the event.

On May 19, 2023, CNL provided the full event report which identified additional non-compliances with the fire protection program linked to training of firefighters, the conduct of drills, the maintenance and availability of personal protective equipment for firefighters, annual inspection and maintenance for fire extinguishers, and the supply of firewater (i.e., pressure and flow). Several fire hydrants were also identified as unavailable (8 of 28), fixed suppression systems (sprinklers) had not been properly maintained and tested in Whiteshell Reactor-1 (WR-1), and emergency lighting in buildings had not been tested to National Fire Protection Association (NFPA) standards.

Activities at the Whiteshell site continue to be limited to regulatory compliance activities, fire program recovery actions, training, and in-depth review of all Safety and Control Areas (SCA). CNL has in place a process to control and approve work on the WL site which is supported by fire screenings. No decommissioning work will be conducted on site in this current posture.

Cause(s):

The apparent cause of this event includes a lack of verification of WL fire response training, equipment and response capability. CNL has undertaken a root cause analysis (RCA) to determine other potential causes. CNL submitted the complete RCA on June 19, 2023 and it is currently under review by CNSC staff.

Impact of the Event

On People:

How many workers have been (or may be) affected? All workers have been affected.

How many members of the public have been (or may be) affected by the event? There has been no impact on the members of the public.

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How were they affected?

During the site safety stand down, work on site has been reduced and therefore several workers and work groups are now supporting WL remotely. Additional approvals are required for site access, and limits are in place affecting the work that can be performed at the WL site.

On the Environment: There were no impacts on the environment.

Other Implications: The lack of a properly qualified and equipped fire brigade impacts the ability of WL to conduct a safe, effective, and sustained fire response to fire incidents at the WL site. The deficiencies with the fire suppression systems increases the risk, as CNL has a reduced ability to mitigate fire.

Licensee Actions

Taken or in Progress:

Following the event, CNL took the following immediate actions.

All non-essential work at WL was ceased and the site was put into a safe stand down state. Activities required for maintenance of compliance on site continued, and no decommissioning work were being under-taken.

A public statement was released on the CNL website detailing the decision for the safety stand down and describing the immediate actions taken.

To reduce the likelihood of a fire at WL, CNL removed fire ignition sources, where possible. CNL replaced all fire extinguishers at the WL site, ran hoses from operational hydrants to areas impacted by non-operational ones, and posted signage on buildings that were impacted by untested emergency lighting.

Deficient emergency response equipment was removed from service and spare equipment was received from Chalk River Laboratories (CRL) on April 30, 2023 as temporary replacements. As a permanent measure, procurement is underway for required turnout gear and other fire response equipment as required for firefighters.

Qualified CRL firefighters were sent to WL to supplement minimum complement and assume response duties to better enable WL shift staff to continue further assessments and training. The first rotation from CRL arrived May 1, 2023. CNL has confirmed that supplying these resources have not impacted the ability to maintain a safe and effective fire response capability at the CRL site.

Supplementary training is underway for all WL firefighters to confirm competency. Two training sessions were held on May 5, 2023 and May 12, 2023 respectively to qualify the necessary number of personnel to fulfill the Incident Commander role.

CNL has confirmed the Memorandum of Understanding with the Local Government District of Pinawa, Manitoba including the provision of firefighters from the Pinawa Fire Department when required to augment the fire response capability at WL.

CNL launched a formal root cause investigation to determine the cause of the programmatic non-compliances.

CNL conducted a comprehensive focused assessment of the implementation of Functions and Programs aligned with the CNSC Safety and Control Areas.

Planned:

The WL site will be maintained in a non-operational state, pending completion of the Root Cause Analysis (by June 21, 2023) and development of a recovery plan to be submitted for CNSC staff review by July 13th, 2023.

A third-party audit of the WL fire response capability will be completed as per the requirements of CSA N393 by August 31, 2023.

On June 8, 2023, CNL submitted a letter committing to achieving and maintaining a minimum of 6 trained and qualified firefighters plus 1 trained and qualified dispatcher (6+1) for fire response during both day and night shifts, seven days a week, by June 26, 2023. This staffing level meets the requirements of section 7.3.6 of NPFA 600-2010, *Standard on Facility Fire Brigades*.

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CNSC Actions

Taken or in Progress:

On May 8, CNSC staff held a focused technical meeting (virtually) with CNL. Discussion topics included the preliminary event report, CNL's immediate measures taken, impacts on CRL fire response capabilities as a result of providing support to WL, next steps and timelines for action completion. During the meeting, CNL provided a presentation highlighting the nature of the event, compensatory measures that were put in place and a summary of the apparent causes related to the event.

Given the number and significance of the non-compliances, CNSC staff determined additional timely information was required to assess whether any enforcement response was needed in alignment with the CNSC's graduated enforcement strategy. Therefore, on May 15, a CNSC designated officer issued a 12 (2) request requesting that CNL:

- I. Conduct a Root Cause Analysis (RCA) for this event and submit the complete RCA to the CNSC.
- II. Conduct a review of the WL organizational structure to confirm it is effective and clearly identifies the roles and responsibilities for fire protection; and that responsibilities are clearly set out and understood.
- III. Conduct a third-party review of the fire protection program as required by CSA N393 and submit the complete results of the review to the CNSC.
- IV. Conduct a review of past fire audits or assessments and analyze how recommendations were implemented or dispositioned appropriately and submit complete results of the review to the CNSC.
- V. For WL, conduct a review of effective management of all Safety and Control Areas and submit the complete results to the CNSC.
- VI. For all other CNL licensed sites, undertake an analysis of the extent of condition with regards to fire safety and submit the complete results to the CNSC.
- VII. Commit that all actions identified in the RCA will be implemented and evaluated for effectiveness prior to resuming normal site operations.
- VIII. Conduct a review to demonstrate that the current fire posture at WL meets requirements as detailed in CSA N393, for responding to interior and exterior fire; including confidence that the Minimum Shift Complement in place is effective for safe fire response.

CNL responded to the 12(2) request as required by May 19. In response to request VII., CNL stated that RCA actions may be longer-term corporate process or structure actions, and certain actions may not be easily tested for efficacy without normal operations on site. As an alternative, CNL proposed that upon completion of the RCA, CNL would document and submit to CNSC staff a WL Multi-Phase restart plan by July 13, 2023. CNL further stated that "the Multi-Phase Re-Start Plan will define RCA actions that must be completed prior to entering the next phase of operations." CNSC staff found this proposal to be reasonable. CNL made commitments to the completion of all other requests which were accepted by CNSC staff. As a result, the designated officer closed the 12(2) request on May 26, 2023.

Following the identification of additional fire protection deficiencies as noted in the full report, CNSC staff conducted a site visit to WL on May 30, 2023. The purpose of this visit was to determine if CNL has in place a safe, effective and sustainable fire response and adequate implementation of compensatory measures to address the fire protection system non-compliances and ensure the protection of all workers, responders, facilities, and the environment.

CNSC staff confirmed that fire extinguishers had been replaced, signage was in place regarding emergency lighting, fire hoses had been pre-deployed to areas lacking operational hydrants, and new firefighting gear was present in the firehall. CNSC staff raised a concern regarding the presence of metal halide lighting as a potential ignition source and CNL took immediate actions to mitigate the risk of the presence of these lights and has initiated the process to have them replaced. A productive discussion was held between CNSC staff and CNL regarding the minimum shift complement of firefighters at WL, and as noted above, CNL has committed to maintaining a complement that CNSC staff confirm meets regulatory requirements. During the site visit, CNSC staff requested records regarding firefighter training, shift complement, the fire screening process and the status of fire hydrants. These records were provided by June 6, 2023 and are currently under review by CNSC staff.

Planned:

Following the WL site visit and closure of the 12(2) request, CNSC staff are:

- reviewing all submissions from CNL related to this matter
- awaiting submission of the Multi-Phase Re-Start Plan for CNSC staff review and acceptance
- developing a reactive compliance plan and follow-up activities for the WL site
- performing all compliance activities identified in the compliance plan by end of March 2024, and
- providing an update to the Commission of the progress made and status of the WL safety stand down during the Regulatory Oversight Report (ROR) for Canadian Nuclear Laboratories Sites scheduled for November 1, 2023

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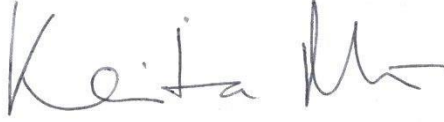
The WL SCAs ratings for Emergency Preparedness and Fire Protection have been downgraded to "Below Expectations in the 2022 ROR for CNL Sites as a result of this event.

Additional reporting to the Commission Members anticipated:

Yes

No

If Yes, provide method of reporting: An update to the Commission will be provided through the CNL Sites Regulatory Oversight Report to be presented at a public meeting on November 1, 2023.

Name and Title	Signature
<p>Kavita Murthy</p> <p>Directorate of Nuclear Cycle and Facilities Regulation</p>	 <hr/> <p>Director General</p> <p style="text-align: right;">6/22/2023 Date</p>