Canadian Nuclear Safety Commission | Commission canadienne de sûreté nucléaire

CMD 24-M16.10

Date: 2024-10-08
File / dossier : 6.02.04
Edocs pdf : 7379462

Written submission from the Radiation Safety Institute of Canada

Mémoire de l'Institut de radioprotection du Canada

Canadian Nuclear Laboratories

Regulatory Oversight Report for Canadian Nuclear Laboratories Sites: 2023

Laboratoires Nucléaires Canadiens

Rapport de surveillance réglementaire des sites des Laboratoires Nucléaires Canadiens : 2023

Commission Meeting

Réunion de la Commission

November 7, 2024

7 novembre 2024

Canada

Radiation Safety Institute of Canada
Institut de radioprotection du Canada

GOOD SCIENCE IN PLAIN LANGUAGE®

Review of the Regulatory Oversight Report for Canadian Nuclear Laboratories Sites: 2023

for

Canadian Nuclear Safety Commission

(Reference: Form number: *PFP 2024 CNL ROR*)

by

Radiation Safety Institute of Canada

Report Date: October 7, 2024

Submitted to:

Participant Funding Program administrator
Canadian Nuclear Safety Commission
P.O Box 1046, Station B
280 Slater Street
Ottawa, ON K1P 5S9
Tel: 1-800-668-5284

Contents

1 Introduction

1.1 About the Radiation Safety Institute of Canada

Founded in 1980, the Radiation Safety Institute of Canada (RSIC) is an independent, national organization dedicated to promoting and advancing radiation safety in the workplace, in the environment, and in the community. Our commitment to the principle of "good science in plain language"® underpins everything we do. The Radiation Safety Institute of Canada is incorporated under federal statute as a not-for-profit corporation and is also a registered charity (number: 106861511RR001).

The Radiation Safety Institute of Canada offers a broad range of educational, technical, and scientific services to businesses, government organizations, health care providers, communities, and individuals across Canada and around the world. The Institute is known for the high quality and scientific integrity of its work, and the practical and helpful assistance of its staff. The Institute's independent information service receives hundreds of calls and e-mails every year, for information and assistance on workplace radiation questions.

1.2 Project

The *Radiation Safety Institute of Canada* (Institute) applied for and is to receive funding through CNSC's Participant Funding Program (PFP). This funding is intended to assist in the review of the 2023 Regulatory Oversight Report (ROR) for Canadian Nuclear Laboratories Sites. The Institute agreed to a review of related documentation, including CNSC staff's and CNL's Commission member documents, and for participation in the public Commission hearing if required.

1.3 Background:

The ROR in question covered CNSC staff's evaluation of 14 safety and control areas ("SCAs") for six sites licensed under CNL:

(1) Chalk River Laboratories (CRL)
(2) Whiteshell Laboratories (WL)
(3) Port Hope Area Initiative (PHAI)
(4) Douglas Point Waste Facility (DPWF)
(5) Gentilly-1 Waste Facility (G1WF)
(6) Nuclear Power Demonstration Waste Facility (NPDWF)

While CNSC staff inspected based on 14 different SCAs, the report provided focusses on three SCAs:

(1) Radiation protection

(2) Environmental protection
(3) Conventional Health and Safety

The report also covers specific items of “regulatory interest”

2 Review of Documentation Related to Licence Application

The Institute was provided with a copy of CMD 24-M16 – CNSC Staff Submission “Regulatory Oversight Report for Canadian Nuclear Laboratories Sites: 2023”. Additional contextual information was obtained from CNL’s own website (i.e., https://www.cnl.ca/) and from published news reports regarding CNL sites.

Data from the report is presented graphically below.

2.1 Notices of Non-Compliance

CNSC staff issued 119 “notices of non-compliance” (NNCs) to CNL following site inspections during 2023.

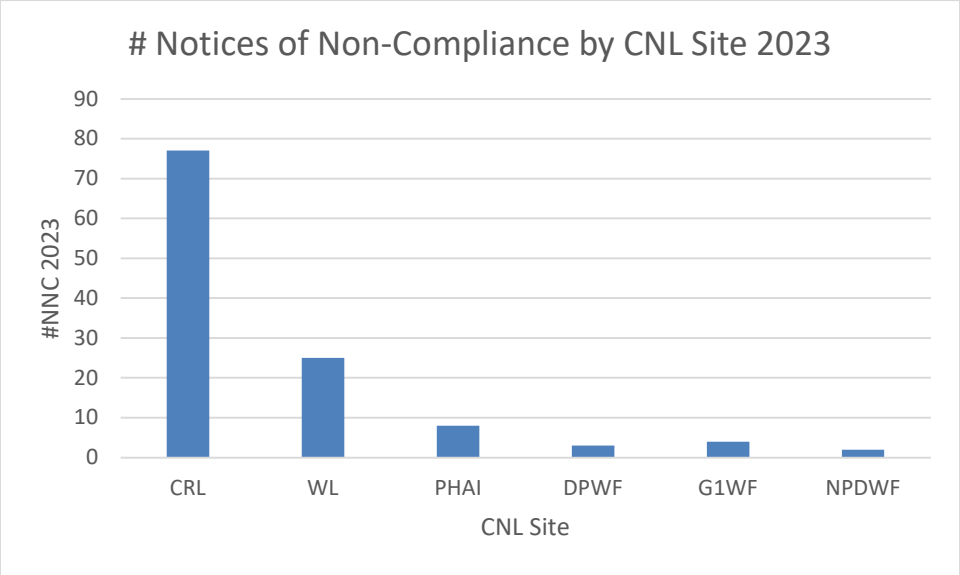

Figure 1 NNCs by site. Note that the number does not reflect severity. CRL was subject to more inspections than other sites.

Based on the information provided in the report, it is difficult to assess the severity of the NNCs in question. Of all CNL sites, WL appears to have some of the greatest issues, but was not fully operational during 2023 due to a partial work shutdown to deal with these issues. Given WL’s known specific issues related to fire protection, the RSIC was interested to see if the CNSC flagged any Fire Protection issues at other CNL sites and whether this may be a more systemic issue for CNL. For example, CNSC staff list the following issues for the CRL site (p.20, CMD):

- non-compliant fire extinguisher installation
- non-compliant material storage practices and chemical labelling
- inconsistent signs identifying fire doors
- improper fire dampers identification
- egress aisles obstruction
- non-compliant flammable storage containers
- non-compliant waste management areas
- fire protection reviews not performed
- documentation updates and reviews not performed

As noted, WL had issues related to fire protection, which lead to the issuing of an "Administrative Monetary Penalty" (AMP) to CNL. These issues included:

- deficiencies in firefighter medical assessments
- inappropriate storage of combustibles
- incorrect color-coding of a fire hydrant
- improper maintenance and identification of fire separations
- out-of-date pre-fire plans

At G1WF, one NNC was issued due to a fire protection issue:

- fire extinguisher locations not indicated by signs or other means

At NPDWF there was also one NNC issued due to a fire protection issue:

- two fire doors were missing self-closure mechanisms

No issues with fire protection were noted by CNSC staff during 2023 for PHAI and DPWF.

2.2 Reportable Events

Like all other CNSC licensees, CNL must report certain types of events when they occur to the CNSC. During 2023, CNL had 79 reportable events.

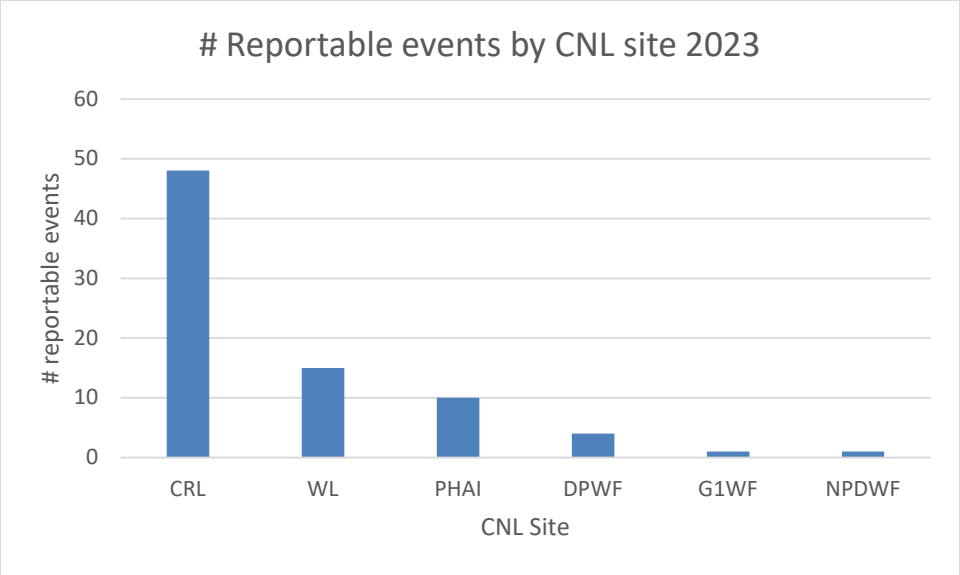

Figure 2 2023 reportable events by CNL site. As expected, CRL had more of these than the other sites

RSIC reviewed the brief descriptions provided of each of the reportable events. There did not seem to this reviewer to be any consistent pattern that would indicate a systematic problem with an aspect of CNL's safety program.

2.3 Radiation dose to workers

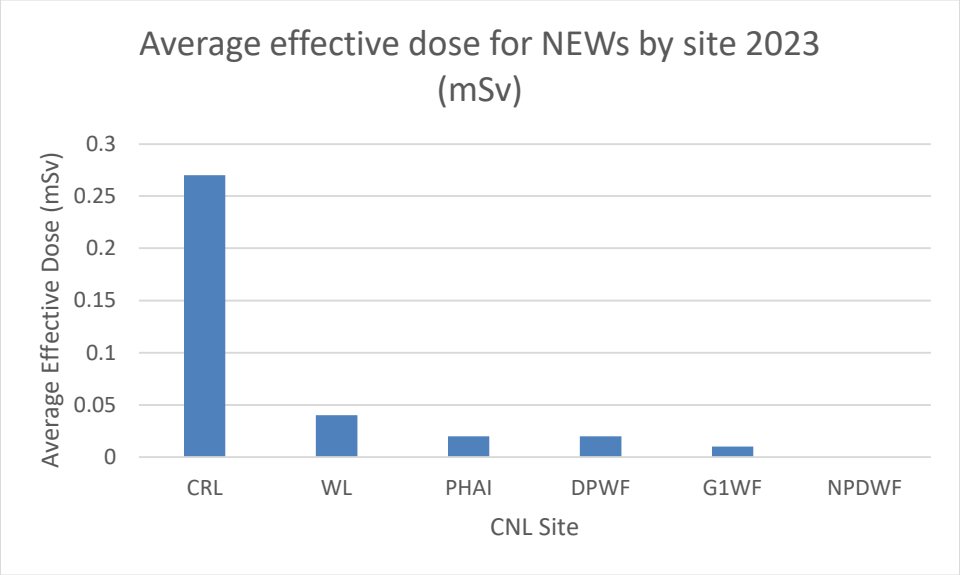

Figure 3 Average radiation dose to "Nuclear Energy Workers" (NEWs) at CNL ssites.

Given that the average Canadian receives 2.4 mSv/y from background radiation alone, these values are very low.

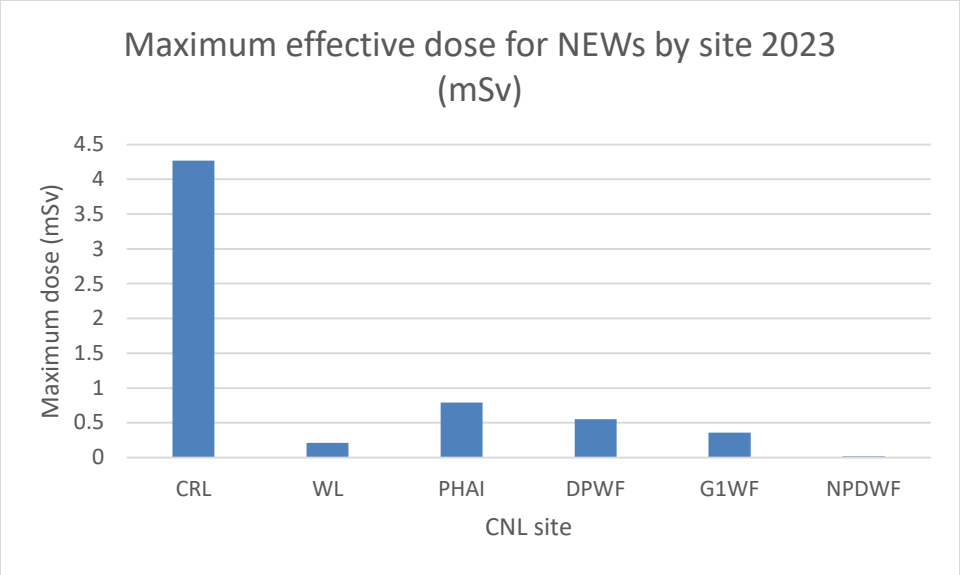

Figure 4 maximum radiation dose to any "Nuclear Energy Worker" (NEW) at the CNL sites.

The annual limit for NEWs is 50 mSv. The values suggest that no worker is receiving an excessive radiation dose due to work at CNL sites.

2.4 Environmental protection

At CRL, all airborne and liquid effluent radiological releases were well below regulatory limits. However, CNL's environmental risk assessment (ERA) is now "out of date" (it is to be updated every 5 years and the last one was completed in 2019). An updated version is now to be submitted by January 31, 2025.

At WL, there were issues noted in 2023 regarding environmental protection, including:

- schedules for environmental monitoring, effluent verification monitoring, and groundwater monitoring schedules not up to date
- Environmental Protection staff training records not up to date

While there were no exceedances of radioactive materials to the environment at WL, there were a few action level exceedances of non-radiological substances from WL's process outfall liquid effluent. While the CNSC is satisfied with the actions taken to prevent re-occurrence, this is an issue that should be monitored closely.

There were no regulatory exceedances related to Environmental Protection in 2023 for PHAI. However, there was an action level exceedance for copper at the PHAI water treatment plant.

At DPWF, there were no CNSC inspections during 2023 that included environmental protection. However, based on DPWF monitoring, there were no exceedances.

At G1WF, there were no CNSC inspections during 2023 that included environmental protection. However, based on G1WF monitoring, there were no exceedances. Note that CNL has completed a

"need-for-monitoring" assessment for airborne and waterborne emissions and determined that there is no need to monitor any effluent streams at G1WF.

At NPDWF, airborne and liquid releases were well below regulatory limits, with no exceedances in 2023.

2.4.1 Independent Environmental Monitoring Program (IEMP)

The Independent Environmental Monitoring Program (IEMP) is an environmental sampling program carried out by CNSC staff in publicly accessible areas around nuclear facilities, and is independent from a licensee's technical environmental sampling program. In 2023, CNSC staff conducted IEMP sampling around three CNL sites: G1WF, NPDWF, and PHAI. All results were below guideline values with the exception of one sediment sample from PHAI that had an arsenic level slightly above the CCME's interim sediment quality guideline. This arsenic result may have been due to historical releases from the Welcome Waste Management Facility. Arsenic guideline values are set well below levels that are expected to cause effects to the environment or to people's health. 2023 IEMP results were consistent with those submitted by CNL as part of their own environmental monitoring programs. The IEMP results suggest that the public and the environment in the vicinity of these facilities are protected.

3 Discussion

In general, the results of CNSC staff inspections are reasonably positive. Radiation Protection programs at CNL sites appear to be effective in keeping worker radiation dose low and maintaining releases to the environment below regulatory concern. However, the CNSC issued 119 notices of non-compliance to CNL in 2023, which, while not excessive considering the size of the programs involved, is also not a trivial number. One issue of concern that stands out to this reviewer is that CNL may have a systematic problem with respect to fire protection at its sites. Note that CNSC staff found the "Emergency management and fire protection SCA" at Whiteshell Laboratories was also not satisfactory during inspections in 2022. It is not clear why CNL has taken as long as it has to address these issues. It would make sense for CNL and CNSC staff to ensure that this does not become a more serious problem in 2024.