



**Written submission from the
Radiation Safety Institute of Canada**

**Mémoire de l'Institut de
radioprotection du Canada**

In the Matter of the

À l'égard des

Canadian Nuclear Laboratories Ltd.

Laboratoires Nucléaires Canadiens Ltée

Application for the renewal of the nuclear
research and test establishment
decommissioning licence for the Whiteshell
Laboratories site

Demande visant le renouvellement du permis de
déclassement d'un établissement de recherche
et d'essais nucléaires pour le site des
Laboratoires de Whiteshell

Commission Public Hearing

Audience publique de la Commission

October 23-24, 2024

23-24 octobre 2024



Review of the CNSC Licence Renewal Application from Canadian Nuclear Laboratories for its Nuclear Research and Test Establishment Decommissioning Licence for Whiteshell Laboratories

for

Canadian Nuclear Safety Commission
(Reference: Form number: *PF 2024 WL01*)

by

Radiation Safety Institute of Canada



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Report Date: 12 September 2024

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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 CNL’s application to renew its Whiteshell site "nuclear research and test establishment decommissioning licence". 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:

CNL provides information about the Whiteshell Decommissioning Activities, including 2024 relicensing, at the following website:

[Whiteshell Laboratories Decommissioning - Canadian Nuclear Laboratories \(cnl.ca\)](https://www.cnl.ca/whiteshell-laboratories-decommissioning)

The following text describes the work (from the website):

“The decommissioning of Whiteshell Laboratories began in 2003, after the Canadian Nuclear Safety Commission approved an overall decommissioning framework and then issued a site decommissioning licence. Since that time, redundant buildings have been demolished, and new enabling facilities for waste handling have been constructed. The next major step in the plan is the decommissioning of the WR-1 Research Reactor itself, one of the largest and most complex facilities on the site. The proposal for that project has been sent to the Canadian Nuclear Safety Commission for approval.”

CNL plans to complete the decommissioning of the Whiteshell site by 2027. CNL monitors environmental performance at the Whiteshell site and the results confirm continued responsible stewardship of the site.”

It seems unlikely that the timing assumed on the website is correct. Decommissioning activities will be required at Whiteshell past 2027. However, the next 3 years, the period of the proposed licence, are a crucial period in the decommissioning.

2 Review of Documentation Related to Licence Application

The Institute was provided with copies of (1) e-Doc 7327372, a written submission from the Candian Nuclear Laboratories Ltd. “Application for the renewal of the nuclear research and test establishment decommissioning licence for the Whiteshell Laboratories site and (2) e-Doc 7308064, submitted by CNSC staff, a *CMD related to matters of regulatory interest with respect to CNL’s renewal application for the Nuclear Research and Test Establishment Decommissioning Licence for Whiteshell Laboratories*. In addition, the RSIC reviewed publicly available information, including the Notice of Violation (Corporation) dated October 13, 2023 issued to CNL related to issues at Whiteshell (Amp NUMBER: 2023-amp-04).

Note that (e-Doc 7308064, p. 1) contains the following recommendation: *“CNSC staff recommend that the Commission renew the proposed licence NRTEDL-W5-8.00/2027 for a 3-year period, which would remain valid from January 1, 2025, until December 31, 2027, with an additional licence condition to apply increased regulatory scrutiny”*.

It was clear that CNSC staff feels that there is a requirement to work on *“Rebuilding the trust of the public, Indigenous Nations and communities and the CNSC after several site safety stand-downs during the previous licence period, including the 2023 WL safety stand-down following the discovery of non-compliances in the fire protection program”*.

CNSC staff has identified the need for increased regulatory oversight.

CNSC staff have taken the somewhat unusual step of recommending an additional licence condition. This proposed licence condition *“requires CNL to submit reports covering the progress of the CNL’s integrated assessment plan (IAP) at WL”* to the CNSC. CNSC staff accept CNL’s integrated assessment plan but wish to ensure that CNL will follow through with the plan appropriately. CNSC staff believe *“increased regulatory scrutiny”* is required.

Based on CNSC staff’s assessment, CNL’s own reporting and reports in the local press (e.g., article posted 4 August 2023, *Winnipeg Free Press*, *“Decommission work halted at old nuclear facility in Whiteshell”*), there have clearly been concerns raised during the past licensing period at Whiteshell. These issues included having sufficient numbers of properly trained firefighters,

proper fire safety equipment, and proper maintenance and records of maintenance for fire safety equipment. For example, an assessment of testing and maintenance done for fire systems revealed that a significant number of fire dampers were not included in the preventative maintenance schedule, despite being essential for safety. These dampers had not been inspected or maintained since their installation in 2013. The CNSC has also noted *“procedures that did not align with the criteria used to assess employee work schedules and limits on hours of work and recovery periods for safety-sensitive positions.”*

The Winnipeg Free Press article stated that *“The review discovered the facility failed to maintain fire extinguishers, emergency lighting and fixed suppression systems — including several inoperable fire hydrants that could limit the supply of water in an emergency. Further, the facility failed to provide adequate training, protective equipment and personnel to staff its firefighting complement”*. Furthermore, the CNSC was told there was *“Inadequate oversight from management, poor decision-making, inadequate training protocols and an ineffective organizational structure contributed to the severity of the issues — which date back to at least 2020”*.

Furthermore, the number of events meeting the criteria such that they needed to be reported to the CNSC has been increasing over the past few years, as shown in the figure below.

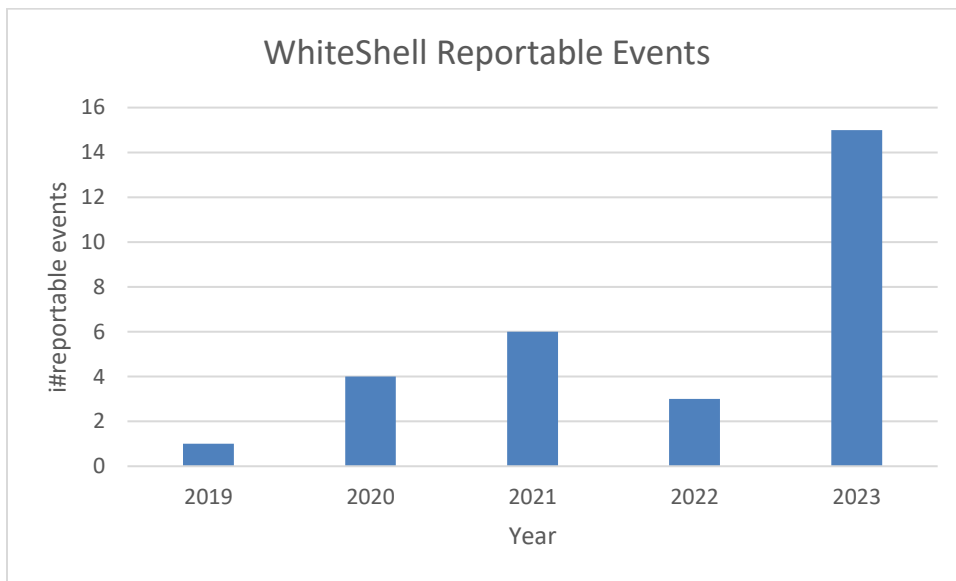


Figure 1 CNSC reportable events by year at the Whiteshell site.

Although a number of the 2023 events, and potentially the majority of them, appear to have been self-identified by CNL, the fact that 2023 had more than four times more reportable events than the average number over the previous 4 years is concerning.

As a result of the deficiencies, CNSC staff plan to increase monitoring and compliance activities at Whiteshell to confirm the effectiveness of the Fire Protection program implemented at the WL site under a focused compliance verification plan.

During their last licensing period, Whiteshell had three consecutive years (2019-2021) where the “security” SCA was deemed “below expectations”. While this has improved the past two years to “satisfactory”, it is worrying that both “security” and “fire safety” have had issues over the last licensing period. The security issue is of particular concern, given that the “fuel consolidation” project that Whiteshell will be working on shortly has security implications. It is essential that CNSC staff help ensure that there are no security problems with this and a thorough assessment of CNL’s transportation security plan is completed prior to approval.

There have been other events of concern during the last licence period. In May 2022, a Whiteshell worker received an electrical shock while performing maintenance activities on a pump. The pump motor was not isolated via lock-out tag-out procedures to remove the hazard to workers. A safety stand-down of all hazardous energy control work resulted. Contributing causes included procedural mistakes, resource shortages, unclear instructions and ineffective changes to engineering and training procedures. *“CNL management also failed to reinforce procedural adherence, maintain consistent training and address hiring challenges with unrealistic resource expectations. These contributing causes indicated a need for better adherence to procedures, resource management and training oversight.”*

While there have been significant issues with licensed activities at Whiteshell, it should be noted that effective doses to NEWs have been low.

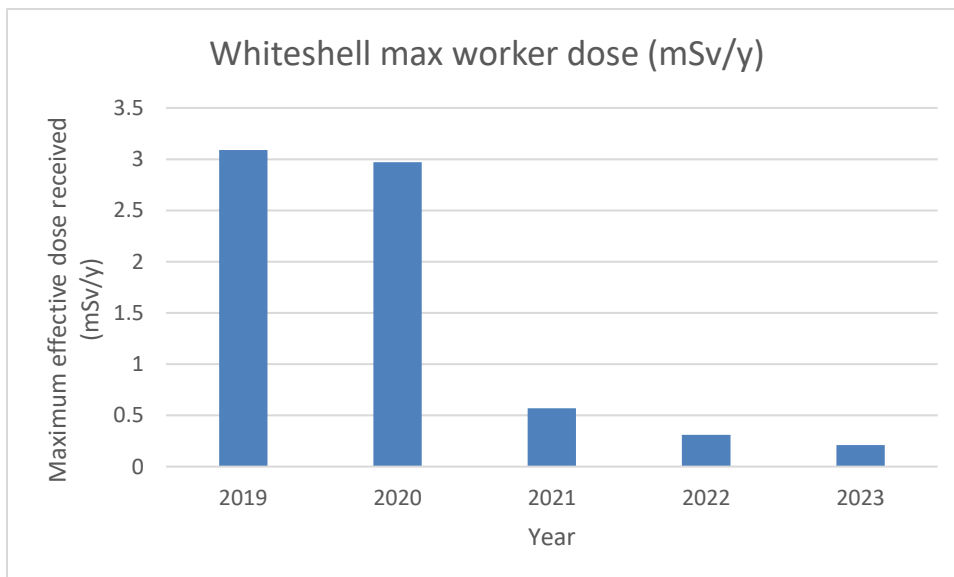


Figure 2 Maximum effective dose to workers.

Maximum effected doses to workers have been well below regulatory limits and has trended downwards (note that the safety pause would have reduced worker dose in 2023). The average dose to workers for these years is much less, ranging from 0.1 mSv/y in 2019 to 0.02 mSv in 2023.

Data such as the above suggest that the RP program has been effective at maintaining low doses to workers.

In the same vein, IEMP sampling also indicated that *“people and the environment in the vicinity of WL are protected and that there are no health impacts”*. Annual radiological releases to air and water were orders of magnitude below derived release limits. This indicates that Whiteshell would not have contributed significant dose to receptors in the environment during the past licensing period.

CNSC staff are recommending a 3-year licence period. This is also the period CNL requested to allow the appropriate amount of time to focus on implementing corrective actions and improvements to all SCA programs at the WL site.

3 Discussion

It is clear from the documentation provided that there have been significant issues at Whiteshell. It is not clear, however, what caused these issues to develop and to continue in place for as long as they did. It is also not clear whether appropriate solutions have been found and other, unrelated issues will not arise because of an underlying systemic weakness. Over the past few years, CNL has been implementing changes to their overall corporate programs and requirements. Chalk River (which houses the leads of the CNL corporate programs) may have made changes without fully assessing how those changes might affect CNL’s other sites, such as Whiteshell, which historically, had their own safety programs. That could be a reason for some non-compliances with CNL’s corporate programs. CNSC staff should encourage CNL to tailor its corporate programs not only on the basis of the Chalk River site’s requirements, but also such that they can work well at quite different sites, such as Whiteshell.

One paragraph sticks out to the reviewers:

“The Fire Department organization was assessed for effectiveness, and improvements were made. Implementation of a new organization for the WL Fire Department includes nine new management positions, as well as a fire protection engineer and fire systems specialist. Considerable support has been and continues to be received from CRL to help ensure Fire Protection Program regulatory compliance at WL.”

In assessing the corrective actions for the fire department issue, the reviewers are concerned that adding 9 management positions and only 2 front line staff positions to the fire department appears to be somewhat out of balance. The addition of more management positions does not always improve performance, and can in fact reduce performance, especially if the management positions are not equipped and authorized to make important decisions, don't listen to the front-line staff, and/or do not actually "manage" the work. It is unclear if the addition of management staff will simply make the problem appear to be resolved, or if the management of the fire department is being split from Chalk River to be able to make local decisions. As insufficient information is provided to assess this, the recommendation is that the CNSC pay particular attention to the resolution of this issue, and the effectiveness of the new positions in addressing the root causes of the non-compliance.

CNSC staff have recommended renewal of the licence, but with an additional licence condition under the "management system" safety and control area to apply increased regulatory scrutiny (i.e., *"The licensee shall submit to the Commission or any person authorized by the Commission, reports covering the progress of the licensee's integrated assessment plan at Whiteshell Laboratories."*). Given CNL's recent performance at the Whiteshell site, it seems prudent to add such a licence condition. This reviewers would encourage CNSC staff to ensure that increased regulatory scrutiny *in general* is maintained throughout the new licencing period for the Whiteshell site.