Summary of Annual Safety Review Report: Calendar Year 2017

Canadian Nuclear Laboratories' (CNL) Whiteshell Laboratories (WL) submits an annual report to the Canadian Nuclear Safety Commission (CNSC) staff in compliance with Condition 5.1 of the WL site licence (NRTEDL-W5-8.04/2018).

The annual report provides CNL 2017 performance data for WL and is organized by 14 Safety and Control Areas (SCAs)[1], as well as a report on each of the WL nuclear and non-nuclear facilities.

The following provides overall performance highlights for 2017 activities:

- There were no serious process failures at WL.
- All licensed activities continued to be carried out safely and securely.
- No member of the public received a radiation dose that exceeded any regulatory limit.
- No worker at WL received a dose in excess of any of the respective radiation dose limits for radiation workers, as defined in the Radiation Protection Regulations.
- All releases of radioactive material in WL effluents during 2017 were below their respective derived release limits.
- Building 411, the former laundry and decontamination centre, was demolished.
- A number of small non-nuclear buildings/facilities were decommissioned/demolished.

Below is a summary of the annual report for calendar year 2017.

- **Policy changes**: CNL now operates under twelve policies, committing the CNL organization at all levels, and at all locations (including WL), to conduct work under a consistently applied and established management framework.
- **Organizational changes**: Organizational changes included the announcement of a temporary acting appointment to the position of Head of WL Decommissioning & Waste Management (D&WM).
- **SCA - Management System:** CNL has continued its focus on strengthening management system documentation, with completion of a new suite of management system documentation.

[1] The CNSC evaluates how well licensees meet regulatory requirements and CNSC expectations for the performance of programs in 14 safety and control areas.

- **SCA - Human Performance Management:** Further improvements have been made in the areas of fitness for duty, systematic approach to training, and human performance, aligning with the new Management System at CNL.

- **SCA - Operating Performance:** Whiteshell Laboratories decommissions and operates its facilities according to prescribed programs and procedures, and monitors safety performance in the operational area through the concept of "events". The total number of internal event reports raised continues to show a strong reporting culture. There were four CNSC reportable events, none of which were considered safety-significant.

- **SCA - Safety Analysis:** Effective Safety Analysis Reports and Facility Authorizations continue to be in place for WL's nuclear facilities, helping meet health, safety, security, environmental and regulatory requirements.

- **SCA - Physical Design:** A Certificate of Authorization was obtained from Engineers Geoscientists Manitoba, authorizing CNL to engage in the practice of professional engineering in Manitoba.

- **SCA - Fitness for Service:** A Periodic Inspection Plan (PIP) was previously developed to confirm the ongoing fitness-for-service of the concrete storage facilities at the Waste Management Area (WMA), with no significant issues identified. Regular preventative or corrective maintenance and testing of WL's safety-related systems were carried out to ensure the systems were fit-for-service.

- **SCA - Radiation Protection:** No worker received a whole-body dose (including committed) in excess of any of the respective dose limits for radiation workers as defined in the Radiation Protection Regulations, and average individual doses remain a small fraction of these limits. Doses to persons working at, or visiting WL, have remained below 1.5 mSv and collective doses have not exceeded 65 person-mSv for at least the last decade (1.4 mSv and 19.9 person-mSv, respectively, for 2017). No member of the public received a radiation dose that exceeded the regulatory limit. The majority of WL Dosimetry service activities have been transitioned to CRL Dosimetry.

- **SCA - Conventional Health and Safety:** There were a number of changes to procedures/processes, including bringing more training courses in house and additional requirements for asbestos workers. There were three lost-time injuries.

- **SCA - Environmental Protection:** The results of the radiological and non-radiological effluent monitoring program demonstrate that controls for the release of potentially hazardous substances currently in place at WL continue to provide substantial protection of the environment. Radiological emmissions were below 0.0004% of the Derived Release Limit (DRL) for air emissions and 1.2% of the DRL for liquids. The monitoring program confirms that the WL site is operating in a manner that protects workers, the public, and the environment. Whiteshell Laboratories maintained their ISO-14001 registration.

- **SCA - Emergency Management and Fire Protection**: All planned emergency drills and exercises were completed. The action plan for the gaps identified for implementation of REGDOC 2.10.1, "Nuclear Emergency Preparedness and Response", is complete, and for Canadian Standards Association (CSA) N393, "Fire Protection for Facilities that Process, Handle, or Store Nuclear Substances", is nearing completion. To create redundancy, an additional (alternate) team for the Emergency Operations Centre was formed.

- **SCA - Waste Management:** The Waste Management Program developed an integrated waste transportation strategy and finalized an integrated waste strategy for CNL wastes. WL continued to reuse or recycle as much material as was practically possible. The WL Waste Management division created in 2016 to focus on Waste Management and transportation activities needed to support the WL Closure Project, transitioned from strategy to execution, and were instrumental in successfully shipping over sixty redundant Cs-137 and Cf-252 sources and approximately 1500 m^3 of the former Experimental Cesium Pond soil waste to CRL.

- **SCA – Security:** The Security Program at WL supports the CNL Corporate Security mandate and addresses the regulatory requirements for security. Nuclear Security Officers assigned regular duties continued to meet the physical and psychological fitness requirements for Security Officers as required by the CNSC.

- **SCA - Safeguards:** There were no issues identified with International Atomic Energy Agency (IAEA) Safeguards Inspections conducted at WL. One internal verification inspection was conducted with no recordable findings. An internal inspection of one of the Concrete Canister Storage Facility canisters took place in support of future decommissioning (visually inspected the fuel baskets of a canister using remotely operated cameras).

- **SCA - Packaging and Transport:** There were more than 100 radioactive transport packages successfully sent under the Transportation of Dangerous Goods (TDG) Program, including approximately 1,500 m^3 of contaminated soil shipped to CRL.

- **Other matters of regulatory interest:** Two meetings of the Whiteshell Public Liaison Committee took place, three meetings and three site tours were held for the WL Economic Regeneration Partnership, and numerous public information sessions and Indigenous engagements were held on Whiteshell Reactor 1 (WR-1) in-situ decommissioning.

- **Facilities** (operating nuclear facilities, permanently shutdown facilities, facilities being decommissioned and the non-nuclear facilities): All the licensed activities in these facilities continue to be carried out safely and securely with acceptable radiation doses to personnel and releases to the environment. The following notable facility-specific activities took place: new low-level liquid waste systems were installed in Buildings 100 and 300, enabling the shutdown of services and initiation of decommissioning the Active Liquid Waste Treatment Centre, Building 200; the former laundry and decontamination

centre, Building 411, was demolished; and a few small non-nuclear buildings/facilities were decommissioned/demolished.

CNL is committed to achieving high standards of operational safety and security. The information and data presented in this report support the conclusion that safe and secure performance is being achieved at the WL site, while enhancements are also being implemented to further improve results.