In-Situ Decommissioning of the WR-1 Reactor

PROJECT BACKGROUND

The WR-1 reactor was a research reactor that played an important role in building Canada’s scientific and industrial capacity. When operating more than 31 years ago, WR-1 reached a maximum of 60 megawatt thermal (MWt), which is significantly less than power reactors, which operate at values greater than 1,500 MWt. The safe shutdown of WR-1 was done in a planned and controlled manner. Shutdown in 1985 and de-fuelled thereafter, WR-1 has been safely maintained in a state of “storage with surveillance.”

As part of its work to manage Canada’s decommissioning and waste-management responsibilities on behalf of Atomic Energy of Canada Limited, CNL is proposing to decommission and leave in-situ the research reactor (WR-1) at the Whiteshell Laboratories site. The proposed approach will provide a safe, secure and effective disposal solution for the existing contaminated below-grade building. This approach minimizes the risks to the health, safety and security of the public, workers and the environment.

STATUS OF WR-1 DECOMMISSIONING

At the time of the WR-1 shutdown in 1985, deferred decommissioning was the preferred strategy for management of the main reactor building. The deferment period has allowed a significant reduction of radiation fields within the facility and the associated systems. This reduction has helped to reduce the risks to staff preparing to complete the decommissioning project.

PROJECT GOAL

To safely decommission the WR-1 reactor thereby reducing long-term nuclear liabilities.
**THE PLAN**

The technique CNL is proposing involves pouring a specially-engineered grout into the reactor to lock contaminants in place, essentially making a giant, underground, block of concrete.

A protective cover will then be added on the surface which will also serve to channel water away from the site and protect it from the elements.

Long-term care, maintenance activities and decommissioning site environmental monitoring will continue to ensure that the site remains safe and the decommissioning approach performs to expectation.

The proposed end state leaves approximately 10,800 acres of land unaffected, and only a small portion, approximately 0.5 per cent of the former laboratories site, would be maintained under institutional control.

**DECOMMISSIONING ACTIVITIES**

- Environmental Assessment process
- Regulator decision on proposed technique
- Grouting of below grade structures
- Removal of above grade structures
- Installation of concrete cap and engineered barrier over the grouted area
- Final site restoration and preparation for long-term care and maintenance activities

Date of Issue: June 2016