

NRU Vessel Repair Project

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In May 2009, following a Class 4 power outage that affected most of Eastern Ontario, including the Chalk River Laboratories site, Atomic Energy of Canada Limited (AECL) announced to its various stakeholders that a small heavy-water leak in the NRU reactor had been detected during routine monitoring while the reactor was being readied for return to service.

Over the next 15 months AECL located, inspected, repaired and returned the NRU reactor to service. This presentation will focus on the extensive efforts required to support the unique activities associated with reactor vessel inspection and repair including initial assessment, repair site challenges, repair preparation and finally repair execution. The presentation will summarize:

- Initial leak search and assessment of the vessel condition through the use of specialized tooling and non-destructive evaluation which resulted in one of the largest single NDE inspection campaigns ever carried out in the nuclear industry;
- Challenges of executing a repair through 12 cm access ports at a distance of nine meters including the development of the specialized tooling;
- The importance of development of repair techniques through mock up testing to perform welding repairs on a thin wall aluminium vessel and the measures taken and engineering challenges overcome to achieve a successful repair;
- The final repair process, including site preparation, weld execution and final NDE inspection techniques;
- Challenges encountered and lesson learned during the execution of weld repair, NDE inspections, and return-to-service of the reactor.