

NRU Outage Status Report 2009 August

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Senior Vice-President & Chief Nuclear Officer

2009 August 27



UNRESTRICTED | ILLIMITÉ

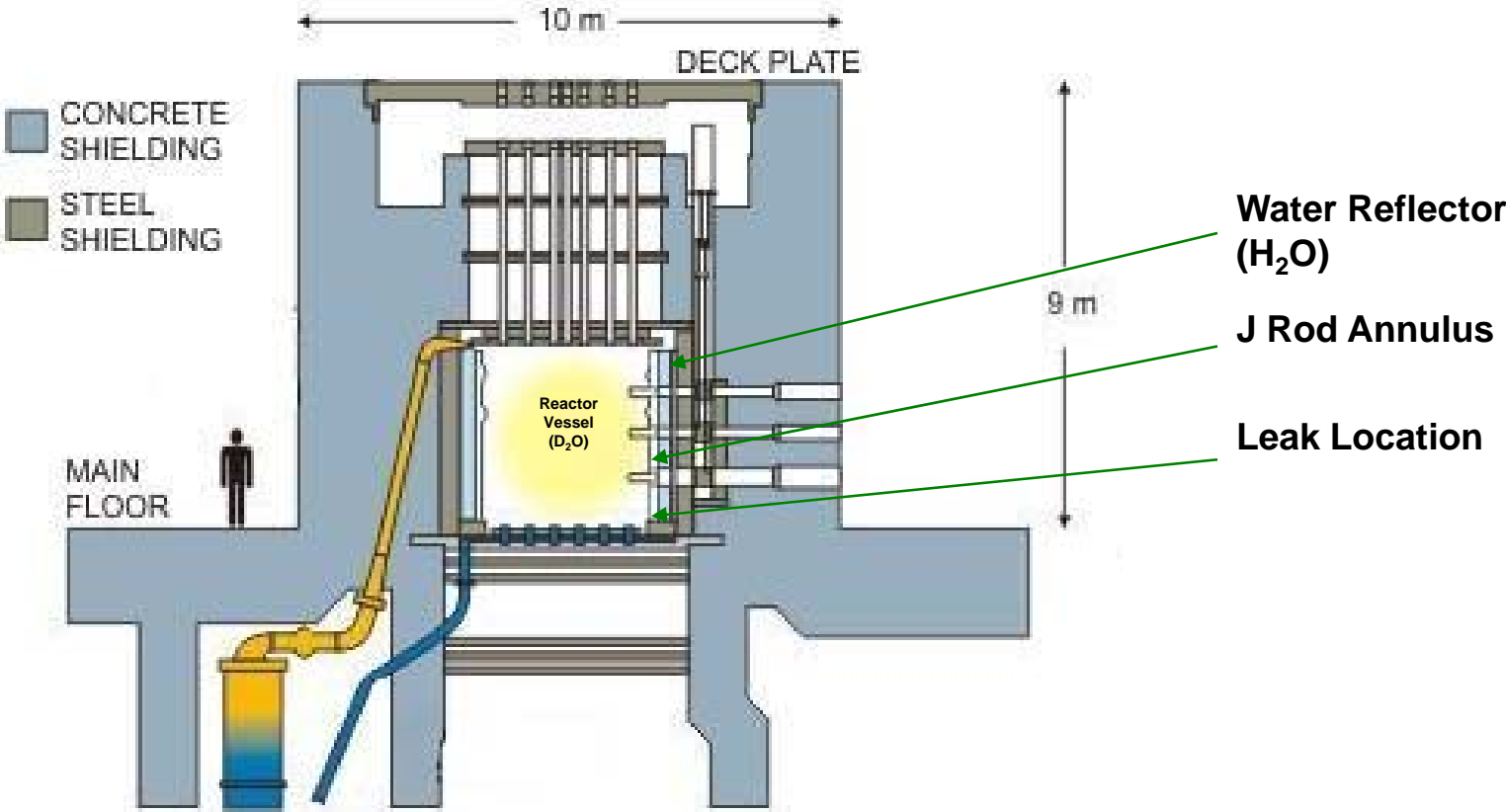
Outline of Presentation

- **General Status & Background**
- **Causal Factors**
- **Condition Assessment**
- **Inspection**
- **Repair**
- **Extended Activities Program**
- **Communications**
- **Schedule**

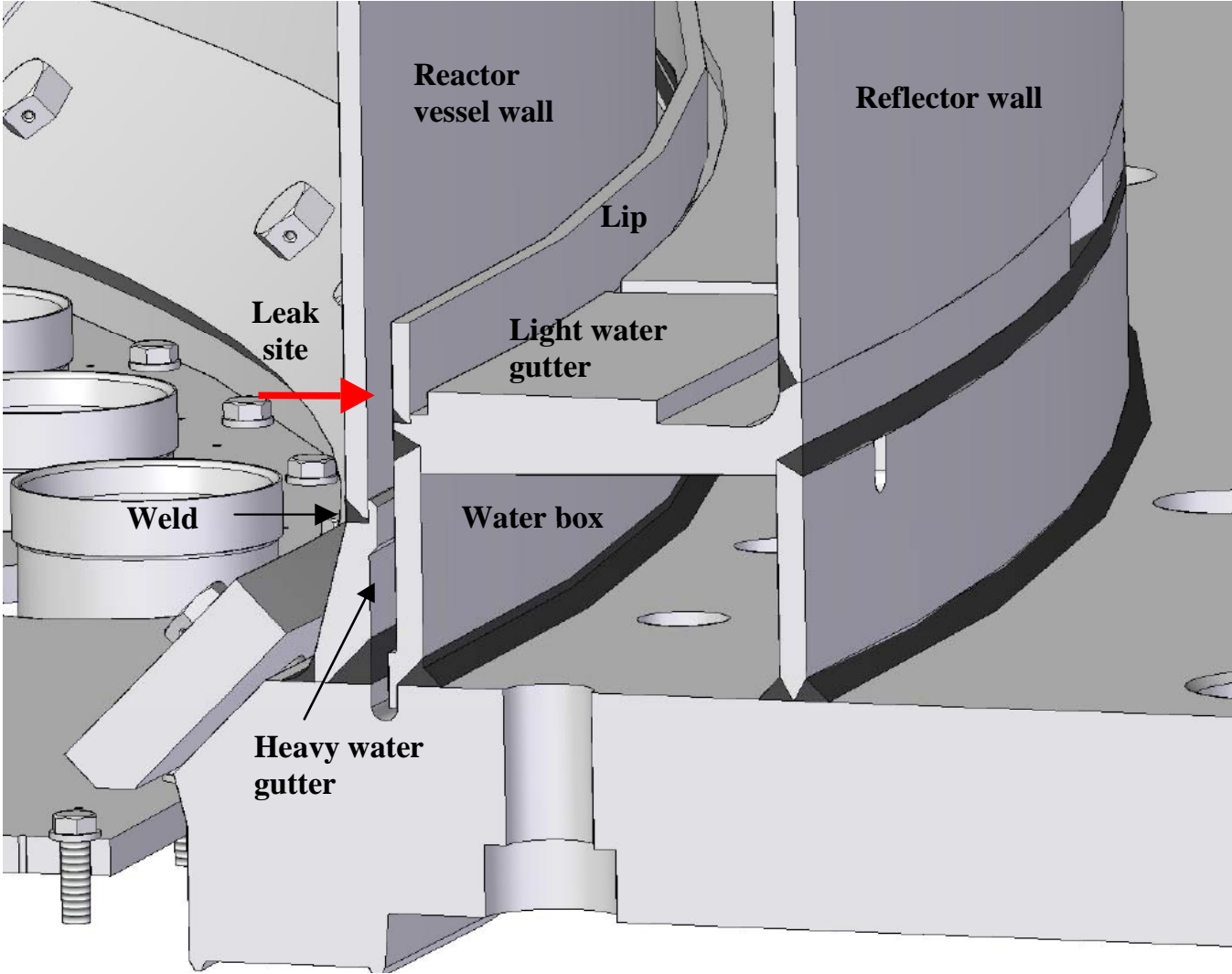
General Status & Background

- **Reactor has been de-fuelled and drained**
- **Leak has been stopped**
- **Tritium releases are below action levels**
- **Vessel inspection in progress**
- **Preferred repair method identified**
- **Repair tooling being manufactured**
- **Preparing plans for Vessel Repair and NRU Return to Service**

Location of the Leak

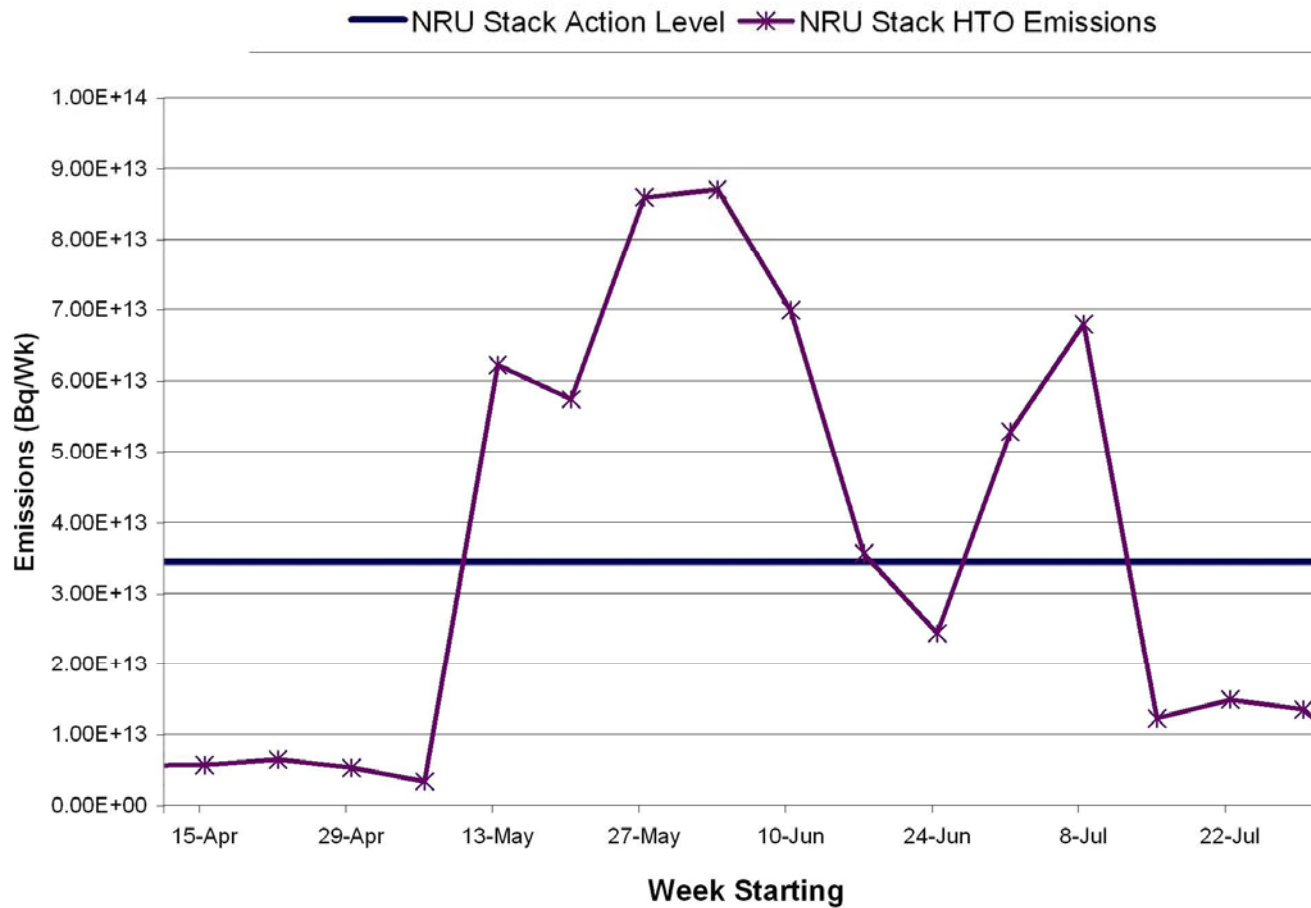


Location of the Leak



Tritium Emissions in Air

Tritium Emissions from NRU



Causal Factors: Technical

- **Corrosion report has been prepared and is undergoing third-party review to ensure the mechanism is fully understood**
- **This assessment is based upon:**
 - **Review of scientific and technical literature**
 - **Operating experience, including the original vessel**
 - **Historical corrosion monitoring (coupons inserted into the annulus)**
 - **Record analysis of water draining from the annulus**
 - **Recent characterization of artifacts removed from the annulus**
- **Cause confirmed to be nitric acid produced by the presence of air and water in the annulus space under radiation conditions**

Causal Factors: Organizational

- **AECL has conducted an investigation into the organizational causal factors that contributed to this event**
- **We are working to identify the underlying factors to prevent similar events, and to improve organizational effectiveness going forward**
- **We have enlisted the services of an external consultant to review our findings and to assist in identifying the underlying causes**
- **A Corrective Action Plan will be put in place to effect improvement**
- **Actions already underway include updating the vessel condition assessment and review of other condition assessments to confirm validity**

Inspection

- **Visual Inspection: Complete**
- **Mark I Tool (ET/UT): Complete**
- **Mark II Tool (Phased Array UT): In Progress**
 - At the weld
 - Above the weld
 - Results from below the weld
- **Five vertical inspections including vertical welds**
- **Inspections behind baffle plate**
- **Data from high resolution scans is being analyzed**
- **Five additional scans have been identified for future work**
- **Nine potential repair sites identified**

Repair

- **Vessel repair strategy being confirmed by ongoing inspection and analysis**
- **External vendors (weld and mechanical) are moving forward with development of their repair technologies and tools**
- **Weld build up has been identified as the preferred method of repair**
- **An optional band of weld build up is being considered for over an arc of base of the vessel**
- **Final assembly of full-height section mock-up complete for repair qualification and training**

Extended Activities Project

Focus:

- **Activities to increase safety and reliability**
- **Opportunity to perform additional work that requires an extended shutdown or the vessel drained**
- **The work will not compromise the schedule for the safe return to service of the NRU**

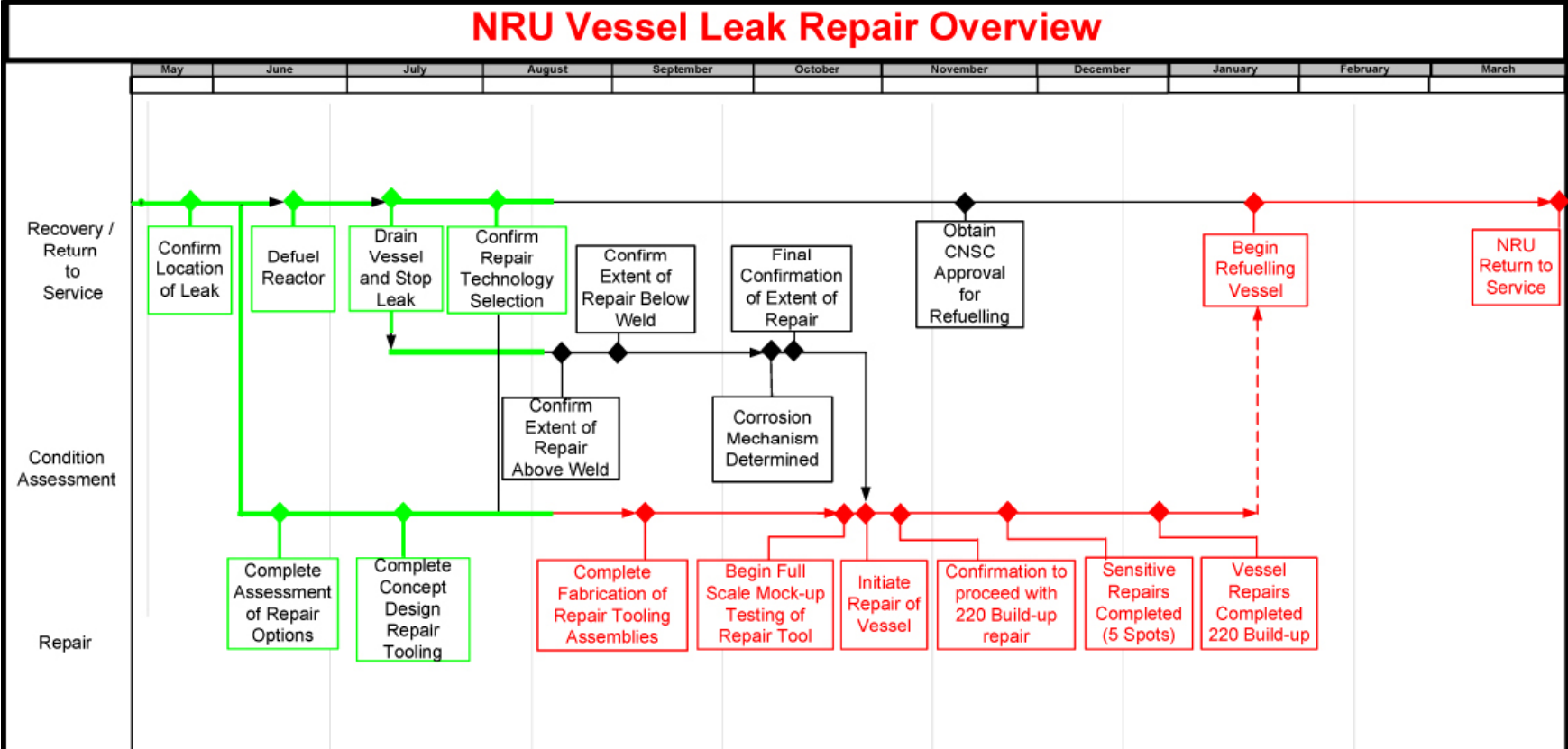
Scope of Work:

- **Equipment refurbishments**
- **Inspections identified in Plant Life Management program**
- **“Walkdowns” supporting design work**
- **Preparations for 2010 scheduled maintenance outage**
- **Work in support of 2011 licence renewal**

Communication

- **Daily protocol communications to government departments**
- **Daily interaction with CNSC Site Staff**
- **Weekly status updates to all stakeholders**
- **CEO weekly status updates to government officials**
- **Teleconferences held with community leaders**
- **Dedicated web site www.NRUCanada.ca launched in July to provide a single point of contact on NRU outage for the general public and the media**

Schedule



Conclusions

- **AECL will not compromise on safety**
- **Returning NRU to safe reliable operation to support medical isotope production is our primary objective**
- **Evidence to date indicates that the NRU reactor vessel can be successfully repaired, and will be returned to service in Q1 of 2010**

 **AECL EACL**

