Presentation Outline

• AECL in Canada’s nuclear history

• Current decommissioning and major waste management projects at Chalk River Laboratories (CRL) and Whiteshell Laboratories (WL)
Historical Perspective

• Defence mission, Montreal

• Co-60 cancer therapy technology pioneered

• >30 CANDU power reactors
  • Advanced reactor design & engineering
  • Advanced material research
  • Fuel development
  • Isotope production
  • Decommissioning/waste management
  • Reactor products/services

1942

1945

1951

1952

1962

CRL established

AECL created as a Crown Corporation

CANDU prototype (NPD) supplies first power to grid

The Future

• Next generation reactors
  • Advanced reactor development (Gen IV)
  • Reactor products/services
  • Decommissioning/waste management of AECL sites and commercial services

AECL Today

AECL – OFFICIAL USE ONLY
The “Nuclear Legacy Liability” Associated with AECL Sites

• Buildings, facilities & sites shut down over last 60 yrs
  – Chalk River Laboratories (CRL) (Ontario)
  – Whiteshell Laboratories (WL) (Manitoba)
  – Three prototype reactors - NPD, DP (Ontario), G1 (Quebec)

• Waste management facilities at CRL and WL
  – Numerous waste management areas, some dating as far back as 1946
  – Over 75 types of reactor fuels in tile holes, some degraded
  – High-level radioactive liquid wastes

• Contaminated lands
  – Plumes from historic practices/events
Chalk River & Whiteshell Laboratories

Whiteshell

Chalk River
Prototype Power Reactors

Nuclear Power Demonstration

Douglas Point

Gentilly 1
Approach to Decommissioning

- **Initiate** - safely shut down redundant facility

- **Define** - assess decommissioning risks, costs, wastes

- **Enable** - put in place decommissioning approvals, funds, staff, facilities

- **Mitigate** - reduce/control immediate safety, health and environmental risks

- **Achieve Endstate** - decontaminate and dismantle facility to remove liability
Key Outcomes at CRL - First Five Years

• Transfer over 20 redundant contaminated buildings from “Operations” to “Decommissioning”
• Secure CNSC approvals & decommission selected buildings (>10)
• Complete Liquid Waste Transfer & Storage Project
• Complete Fuel Packaging & Storage Project
• Complete CRL Waste Analysis Facility (to minimize quantities of waste otherwise directed to expensive storage/disposal facilities)
• Complete facility to treat WMA “A” groundwater plume
• Engage public on overall strategy/plan, and adjust plan accordingly
Key Outcomes at WL - First Five Years

- Adopt accelerated site decommissioning plan - from 60 years to ~30 years
- Decontaminate B300 Radiochemical Laboratory complex
- Decommission B400 engineering complex
- Decommission redundant non-nuclear structures (>10)
- Complete engineering assessment of Waste Management Area and advance design/licensing for remediation work
- Site Utility reconfiguration (convert from Oil to electric) for non-redundant buildings.
- Complete WL Waste Clearance Facility
- Place Underground Research Laboratory in safe shutdown state.
CRL Liquid Waste Transfer & Storage Project

Objectives:

- Retrieve 300 m$^3$ of liquids from 21 underground tanks
- Transfer and consolidate wastes in two new tanks
- Condition wastes for future solidification
CRL Fuel Packaging & Storage Project

Objectives:

- Retrieve degraded fuel from ~100 early tile holes
- Dry / repackage fuels
- Place fuels in new above-ground vault
CRL Waste Analysis Facility
Decommissioning Progress
Removal of Cut Rod Bay Trench

Before

After
IFTF Canisters Demolition
Field Work Completed
Core Area Labs
Engineering & Cafeteria
2008 January              2008 Sept