



CANADIAN NUCLEAR WORKERS' COUNCIL

Canada's Responsible Approach to Nuclear Waste Management

Key Points:

- Canada has safely managed used nuclear fuel and radioactive waste for more than four decades in accordance with the licencing and regulatory requirements of the Canadian Nuclear Safety Commission.
- Currently used fuel is safely stored at nuclear station sites while low and intermediate waste is stored at the Western Waste Management Facility (WWMF) near Kincardine.
- The approach of Canada's Nuclear Waste Management Organization (NWMO) is based on best international practises.
- A multinational research effort is underway to find ways to recycle used nuclear fuel in Canada's well-suited CANDU nuclear technology.
- Both the proposed Deep Geologic Repository (DGR) project and the long-term used fuel storage facility are subject to comprehensive technical and environmental assessments, extensive public consultation and willing host communities.
- Funding mechanisms are in place to construct and operate both facilities.

Background:

Nuclear wastes include used nuclear fuel, intermediate waste (used reactor components) and low-level waste (minimally radioactive waste such as: mop heads, rags, protective clothing etc). All waste management facilities are licensed and regulated by the Canadian Nuclear Safety Commission.

Currently, used fuel is safely and securely stored in water filled bays and dry storage containers at the nuclear station sites and is managed by the utilities that own the fuel. Low and intermediate nuclear waste is stored at Ontario Power Generation's (OPG) WWMF located on the shores of Lake Huron near Kincardine. Low-level waste is sorted and stored as is, or compacted and incinerated. After processing, this waste is stored in above-ground concrete warehouse-like structures called Low Level Storage Buildings. Intermediate waste is stored mainly in steel lined containers set in the ground.

OPG's proposed DGR for the long-term management of low and intermediate waste and the NWMO approach to finding a long-term solution for used nuclear fuel are based on best international practises e.g. Sweden, Switzerland, Japan, Germany and the United Kingdom. The NWMO was established in 2002 by federal legislation to determine a long-term management solution for used nuclear fuel. Legislation requires producers of the used fuel to contribute to trust funds that will ensure the long-term management of Canada's used nuclear fuel. As of 2013, OPG had set aside \$12.5 billion for this purpose.

As well, multi-national research and development efforts are underway to find ways to recycle used nuclear fuel and make use of this massive residual energy. Canada's CANDU nuclear technology is well suited for this purpose.

OPG's Deep Geologic Repository (DGR) Project:

OPG will be the owner, licensee and operator of the DGR which will only manage low and intermediate nuclear waste. The project began in 2001, when the Municipality of Kincardine approached OPG to enter into preliminary discussions on the long-term management of low and intermediate level waste. Since then the project has been subject to comprehensive technical and environmental assessments and extensive public consultation. Additional information, including a timeline of project milestones and regulatory submissions, can be found at www.opg.com.

The proposed location is about one kilometre inland from the shore of Lake Huron and is in an area of low seismic activity. The waste will be put 680 metres below ground in 450-million year-old rock that has remained stable through tectonic events, climate changes and several ice ages. The deepest point of Lake Huron in the Bruce Nuclear site area is about 180 metres.

Much of the waste is safely managed on an interim basis at the WWMF and can be easily transferred for safe, secure long-term management in the DGR.

Ninety percent of the stored waste is low-level. DGR designs are based on more than 30 years of international research, development and demonstration. The project is currently awaiting federal and provincial government approval.

NWMO Adaptive Phased Management Approach (APM)

The federal government, following a three-year dialogue with experts and the general public, selected Canada's APM approach in June 2007. This approach is consistent with long-term best management practises adopted in other jurisdictions around the world. The Project is multi-generational and will be developed over more than 150 years.

The NWMO is responsible for all necessary regulatory approvals associated with identifying and securing a site for a deep geological repository for the long-term management of used fuel that has suitable geology and a willing host community. The NWMO is also responsible for the development of a transportation system to move the used fuel from the facilities where it is currently stored to the new site. This national infrastructure project is estimated to cost about \$21 billion (2010 \$).

The Canada-wide site selection process was initiated in May 2010 by the NWMO. This process and the regulatory approvals are expected to take many years to complete. Construction of the facilities is estimated to occur over a 10-year period. Used fuel transportation, handling and placement in the repository will happen over approximately 40 years. Host communities will benefit from direct, indirect and induced jobs. Construction and facility operation will generate business profits and personal income in the siting area amounting to 100s of millions of dollars.

Additional information, including best long-term waste management practises in other jurisdictions, can be found at: www.nwmo.ca.