Preliminary studies for the decommissioning of the reactor compartments of the former Paldiski military nuclear site and for the establishment of a radioactive waste repository

Development of Lithuanian Radioactive Waste Management Strategy

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Country Profile

- From 1984 till 2009 Lithuania operated one Nuclear Power Plant – Ignalina NPP
  - The NPP was the main source of electricity in Lithuania
  - It has generated 80-85% of the total electricity production
- No uranium mining and nuclear fuel fabrication industry
  - The nuclear fuel was supplied by Russia
  - There are no plans for fuel reprocessing
- No research reactor
Waste sources in Lithuania

- More than 99% of waste is generated by Ignalina NPP
  - operation
  - dismantling
- Institutional waste, orphan sources
Nuclear Waste Directive

- In July 2011 EU Council adopted Directive 2011/70/Euratom:
  - The storage of radioactive waste, including long-term storage, is an interim solution, but not an alternative to disposal
  - Member States are obliged to include the disposal options in their national policies
  - “It is broadly accepted at the technical level that, at this time, deep geological disposal represents the safest and most sustainable option as the end point of the management of high-level waste and spent fuel considered as waste”

New Waste Management Strategy elaborated in response to the Nuclear Waste Directive

Objectives:
- Waste minimization
  - waste clearance principle widely applied for the NPP dismantling waste
- High level nuclear, radiation protection and environmental safety of Spent Nuclear Fuel and Radioactive Waste
  - long-term plan for geological repository construction
- Public information
# Classification of waste in Lithuania and waste disposal ways

<table>
<thead>
<tr>
<th>Class</th>
<th>Final processing</th>
<th>Disposal way</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Short-lived waste</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>A - Very low level</td>
<td>Unnecessary</td>
<td>Simple landfill</td>
</tr>
<tr>
<td>B - Low level</td>
<td>Required</td>
<td>Near surface</td>
</tr>
<tr>
<td>C - Intermediate level</td>
<td>Required</td>
<td>Near surface</td>
</tr>
<tr>
<td><strong>Long-lived waste</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>D - Low level</td>
<td>Required</td>
<td>Near surface or intermediate depth</td>
</tr>
<tr>
<td>E - Intermediate level</td>
<td>Required</td>
<td>Geological</td>
</tr>
<tr>
<td>F - Spent sealed sources</td>
<td>Required</td>
<td>Geological</td>
</tr>
<tr>
<td>Spent fuel</td>
<td>Required</td>
<td>Geological</td>
</tr>
</tbody>
</table>

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## Nuclear Waste Management in Lithuania

### Three waste streams

- **Short Lived Very Low Level Waste**
- **Short lived Low and Intermediate Level Waste**
- **Long Lived Intermediate Level, Spent Fuel, Spent Sealed Sources**

### Three disposal facilities

- Simple Landfill with concrete vaults
- Near Surface Repository
- Geological repository
Landfill for Very Low Level Waste in Sweden

Ignalina NPP plans to build similar facility

Amount of wastes: 60,000 m³

Waterproof layers
**Concept of the Near-surface Repository for Low-Level Short-lived Waste**

**Engineering solution**

Concrete vault-based hill-type Repository
- 50 disposal cells for Waste conditioned in concrete containers
- Corrosion-resistant multi-layer engineering protective barriers
- Facility total area, including repository, protection zones and auxiliary structures – ca. 40 ha
- Operational period – till 2030. Post-closure control for at least 300 years

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**Similar Experience**

Geological repository for Spent Fuel and Long-Lived Wastes

- A concept of repository to be built in Sweden
  - at a depth of 500 m
Conclusion

- Lithuanian radioactive waste management experience could be important when Estonia will start planning construction of the NPP.

Thank you very much!