Decommissioning in Slovakia

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Decommissioning activities in Slovakia were transferred into JAVYS, a.s. Jadrová a vyrad’ovacia spoločnosť’, a.s. (Nuclear and decommissioning company)

It is a 100% state owned company (Plc.). The Ministry of Economy of the Slovak Republic is the only JAVYS, a.s. shareholder.

**JAVYS, a.s. activities:**

- **Decommissioning:**
  - A1 NPP decommissioning (HWGCR, 1 unit, KS-150)
  - V1 NPP decommissioning (PWR440, 2 units, V-240)

- **RAW management:**
  - Technologies for RAW processing and treatment
  - Final processing of liquid radioactive waste
  - RAW management
  - National RAW repository

- **SF management:**
  - Interim spent fuel storage

- **Institutional RAW and detected radioactive material (RAM) management**
Jadrová a vyraďovacia spoločnosť, a.s.

Electricity production (under decommissioning)

NPP A1

Final Processing of Liquid RAW

RAW Treatment and Conditioning Facilities

NPP V1

National RAW Repository

Interim Spent Fuel Storage (wet)

RAW and SNF management
A1 NPP decommissioning programme

A1 NPP was operated in period of 1972 – 1977. In 1976 and 1977 two major operational accidents (INES 4) occurred after which the operation was stopped and A1 NPP was effectively put into decommissioning phase.

Stage I - Radiation Safety Status
Stage II - Decommissioning of external active objects and low contaminated parts of the Main Production Unit
Stage III - Continuation of decommissioning of low contaminated parts of the Main Production Unit
Stage IV and Stage V - Decommissioning of intermediate contaminated parts of the Main Production Unit
Main issues in A1 NPP decommissioning:

- Establishment of legislation framework for decommissioning activities
- Build-up of technical infrastructure
  - RAW treatment facilities
  - RAW storage capacities
- Financing of decommissioning activities, National Nuclear Fund from 1996
Bohunice NPP V1 Decommissioning

Governmental decision 801/1999 about pre-mature shut down of the NPP V1
2006 (1st unit) & 2008 (2nd unit)

2 x WWER 440-V230
Fuel: UO2 (2.5% U-235)
Moderator: H₂O
Coolant: H₂O
Loops: 6
Turbines: 2x220MW
Units/NPP: 2
Bohunice NPP V1 Decommissioning

Turbine Hall dismantling

TG 22 before dismantling

TG 22 after dismantling

TG 22 support construction before

TG 22 support construction after
Bohunice NPP V1 Decommissioning

Decontamination of primary circuit
Current state & issues in V1 NPP decommissioning:

- Licence for Stage 2 decommissioning activities from 2015

- Build-up of technical infrastructure
  - New Interim RAW storage facility in Bohunice
  - Extention of RAW storage capacities in Mochovce for VLRAW

- Combined financial sources for decommissioning
  - Financing from EU sources through EBRD – BIDSF fund,
  - National Nuclear Fund
  - Slovak Energy & Innovation Agency to administer EU funding from 2015
Bohunice Rad-waste Treatment Centre

- separation
- incineration
- super compacting
- concentration
- cementation

In operation since 2000
Bohunice Rad-waste Treatment centre

- Rad–waste separation
- Incineration
- liquid rad-waste fixation into the cement
- solid rad-waste super compacting
  compact loading
- supply of empty FCC and removal of full FCC
- solid rad-waste encapsulation
- cement filler maturing, sealing-off container and its review
- Final product transport and depositing
National Rad-waste Repository in Mochovce

Final repository of low and intermediate level RAW designed for 6 double-rows

Repository of surface type

In operation since 2001
Facility for safe management of spent nuclear fuel from VVER 440 type nuclear reactors. Maximum designed storage capacity is 14 112 pcs of fuel elements to be achieved by 2022.

Construction: 1983 - 1987
Operation since: 1987

Plans for extension of current storage capacity to be in place from 2023.
Results in Decommissioning Area

<table>
<thead>
<tr>
<th></th>
<th>1993</th>
<th>2014</th>
</tr>
</thead>
<tbody>
<tr>
<td>Legislation frame</td>
<td>❌</td>
<td>Czechoslovakia split</td>
</tr>
<tr>
<td>NRA</td>
<td>❌</td>
<td>Established 1.1.1993</td>
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<tr>
<td>Financial resources</td>
<td>❌</td>
<td>Limited – State Decom. Found</td>
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<tr>
<td></td>
<td></td>
<td>established in 1994</td>
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<tr>
<td>Human resources</td>
<td>❌</td>
<td>Limited</td>
</tr>
<tr>
<td>Experiences</td>
<td>❌</td>
<td>Limited</td>
</tr>
<tr>
<td>RAW treatment technologies</td>
<td>❌</td>
<td>Limited (pretreatment)</td>
</tr>
<tr>
<td>LLW/ILW disposal</td>
<td>❌</td>
<td>site selection</td>
</tr>
<tr>
<td>RAW transport equipments</td>
<td>❌</td>
<td>In operation</td>
</tr>
<tr>
<td>SF interim storage</td>
<td>✓</td>
<td>In operation</td>
</tr>
<tr>
<td>SF reprocesing plant</td>
<td>❌</td>
<td></td>
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<tr>
<td>HLW deep geological final repository</td>
<td>❌</td>
<td>❌ Deep geological program for 2013 - 2062</td>
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Further plans

JAVYS has an ambition to cover the whole spectrum of decommissioning and RAW, SNF management activities:

<table>
<thead>
<tr>
<th>By legislation established as a national decommissioning entity</th>
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<tbody>
<tr>
<td>Practical experiences in planning and realisation of NPP’s decommissioning and RAW management,</td>
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<tr>
<td>Providing complex services in RAW management - operation of all required facilities for RAW pretreatment, treatment, transport and final disposal of LLW/ILW (solid, liquid, burnable, compactable),</td>
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<tr>
<td>Sufficient installed capacity for RAW treatment,</td>
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<tr>
<td>Qualified staff (830 employees),</td>
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<tr>
<td>Government and public support</td>
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