



Úrad jadrového dozoru SR



Regulatory aspects of decommissioning in Slovakia

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General overview (1)

- ▶ **12 nuclear installations within 2 sites including**
 - ◆ **NPPs**
 - ◆ **Spent fuel and radwaste management facilities**
 - ◆ **Repository**
 - ◆ **Experimental fuel cycle facilities**



General overview (2)

- ▶ **4 nuclear facilities under decommissioning**
 - ◆ **NPP A-1 (1999, 2nd stage)**
 - ◆ **NPP V-1 (2011, 1st stage)**
 - ◆ **Experimental bituminization plant (2006, 2nd stage)**
 - ◆ **Experimental incinerator with cementation plant (2006, 2nd stage)**
- ▶ **Decommissioning activities concentrated to Jaslovské Bohunice site**





State supervision in nuclear area

- ▶ **ÚJD SR – nuclear safety, civil construction (except of siting)**
- ▶ **County Civil Construction Authorities – siting of installations**
- ▶ **Ministry of Health (UVZ SR) – radiation protection**
- ▶ **Ministry of Environment – environmental protection**
- ▶ **Ministry of Interior Affairs – fire and civil protection**
- ▶ **Ministry of Economy – economical aspects and financing**
- ▶ **Ministry of Labour – safety of work**
- ▶ **Ministry of Transport – transport**

- ▶ **ÚJD SR**
 - ◆ **nuclear safety of nuclear installations**
 - ◆ **shipment and management of radioactive waste and spent fuel**



Historical background

- ▶ **Governmental resolution No. 190/1994 and modified by No. 5/2001**
- ▶ **All radwaste management aspects as well as decommissioning planning procedure post-poned to period after operation termination**
- ▶ **Missing strategy and coordination**
- ▶ **Safe enclosure for many years preferred option (time factor)**
- ▶ **Lack of legislation at the beginning of process (case by case approach)**



National strategy

- ▶ **Strategy for back-end of nuclear energy and fuel cycle (Governmental resolution No. 328/2008)**
 - ◆ **On the basis of Act on nuclear fund**
 - ◆ **Covers all NI resulting from individual CDP**
 - ◆ **Covers decommissioning as well as spent fuel and radwaste management issues**
 - ◆ **Long period of time planning**
 - ◆ **Technical and financial aspects**
 - ◆ **Coordination of costs consumption**
 - ◆ **Periodical 3 years up-date required**



Legal basis

- ▶ **Atomic act No. 541/2004 Coll.**
 - ◆ **Licensing procedure**
 - ◆ **Framework for inspection activities**
 - ◆ **Scope and content of documentation**

- ▶ **13 regulations entered into force in March 2006**

- ▶ **Amendment in preparation to harmonize with EU legislation and WENRA RL as well**



Supplementary legislation (1)

- ▶ **Act on public health protection No. 126/2006 Coll.**
 - ◆ **ALARA principle applied**
 - ◆ **Establishment and control of clearance levels**
 - ◆ **Requirements for release of material and sites into the environment**

- ▶ **Act on civil construction No. 50/1976 Coll.**
 - ◆ **UJD became Civil Construction Authority for nuclear installations (except siting)**

- ▶ **Act on EIA and SEA (No. 24/2006 Coll.)**
 - ◆ **EIA process prior to decommissioning**
 - ◆ **Modifications**
 - ◆ **Public involvement**



Supplementary legislation (2)

▶ Act on nuclear fund No. 238/2006 Coll.

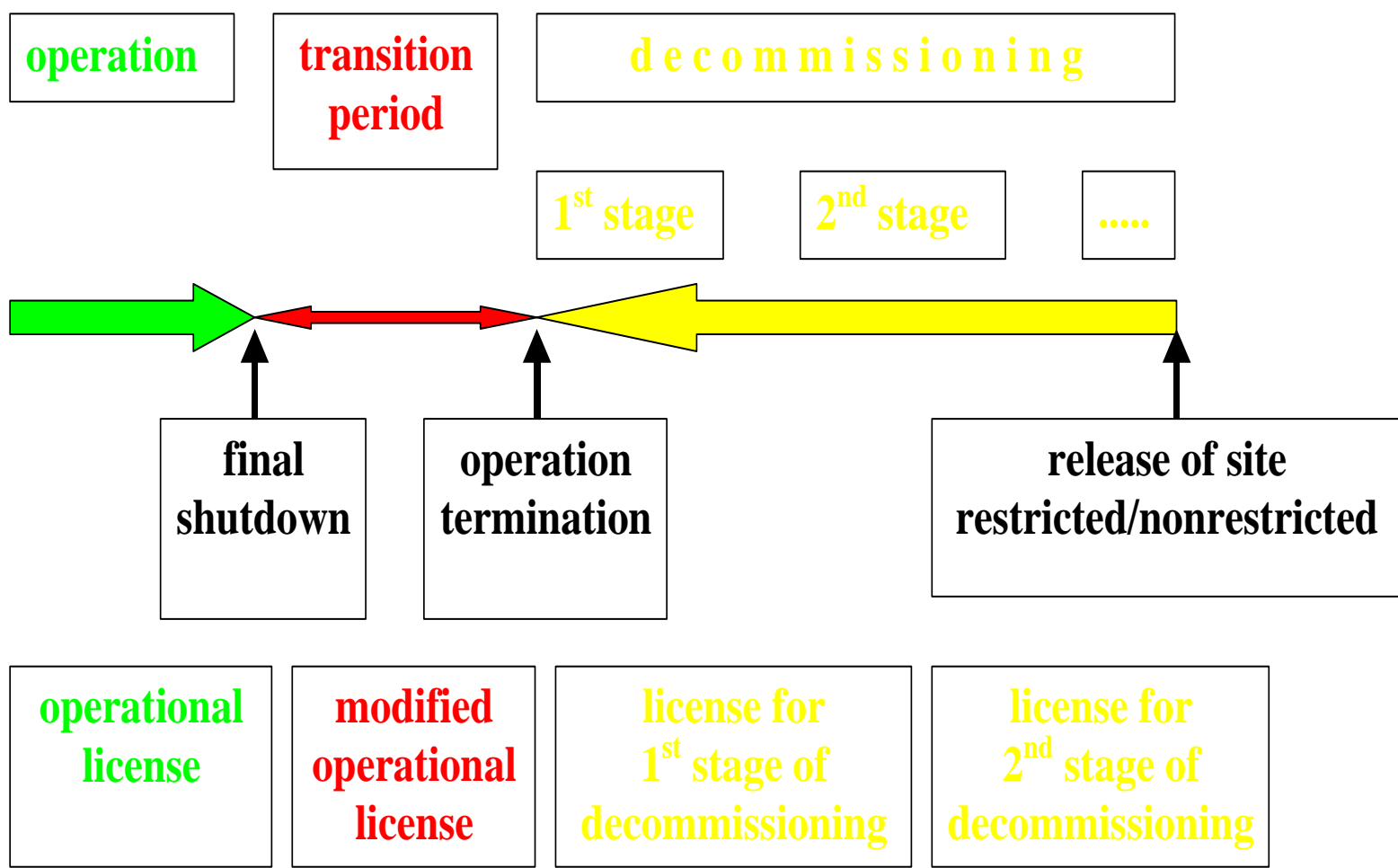
Main sources

- ◆ 5.95 % of electric power market price +
- ◆ 350 000 Sk/MWe installed per year
- ◆ Payments to cover deficit

Usage of the fund

- ◆ Transition period costs
- ◆ Decommissioning and RW/SF management
- ◆ Investment, R&D of repositories
- ◆ Unknown originator radwaste

Licensing scheme





Licensing procedure

- ▶ **Maximum period for issuing license 10 years**
- ▶ **Independent license for each decommissioning stage**
- ▶ **Requirement of continuous license**
- ▶ **Based on written application with documentation**

- ▶ **PSR**
 - ◆ **Comparison of planned and reached status**
 - ◆ **Defining safety-relevant activities for future**
 - ◆ **Up-date of documentation**



Licensing documentation for decommissioning

▶ Main set

- ◆ L&C
- ◆ Decommissioning stage plan
- ◆ Concept of decommissioning after permitted stage
- ◆ Plan for management of radwaste from decommissioning including its shipment
- ◆ Plan for management of conventional waste form decommissioning

▶ + Additional docs



Regulatory requirements related to decommissioning (examples 1)

- ▶ **After the termination of NI operation the authorization holder liable to ensure its decommissioning**
- ▶ **Radwaste generation and management shall follow technical and organizational measures so as to optimize their amount and activity**
- ▶ **All activities during radwaste management directed towards safe disposal thereof**
- ▶ **Qualified staff are available for safety related activities during decommissioning in accordance with licensing conditions**
- ▶ **Adequate financial resources are available during decommissioning in accordance with licensing conditions**
- ▶ **Authorization holder shall ensure the earmarked funds to cover the costs connected with decommissioning**
- ▶ **Important part of QA documentation approved by UJD SR before decommissioning**



Regulatory requirements related to decommissioning (examples 2)

- ▶ **Originator of radwaste responsible for safe management prior to their receipt at the repository**
- ▶ **The responsibility for disposal of radioactive waste as well as for closure of repository and its institutional control with the State**
- ▶ **Authorization holder shall keep records on information important for decommissioning**
- ▶ **The first list of records in Conceptual decommissioning plan prior to operation**
- ▶ **The precise list of records in Decommissioning plans prior to respective decommissioning phase**
- ▶ **Treatment of operational radwaste before start of decommissioning process**
- ▶ **RLs by WENRA**



Regulatory inspection (1)

▶ **Types of inspection**

- ◆ **Planned**
- ◆ **Unexpected**
- ◆ **Performed by permanent on-site inspector**



Regulatory inspection (2)

► **Focused on**

- ◆ **Fulfillment of license conditions/inspection measures**
- ◆ **Minimization of radwaste generation/optimization of radwaste management**
- ◆ **Interdependencies among radwaste management steps, demonstration of fulfilling of WAC**
- ◆ **Compliance between documentation and actual status of facility/compliance between decommissioning plan and performed activities**
- ◆ **Record-keeping system including system for dealing with specimens and long term management of decommissioning data**
- ◆ **Fulfillment of licensee's internal documentation (programs, procedures, instructions) by all staff**
- ◆ **Implementation of corrective measures resulting from events**

Lessons learned

- ▶ **Immediate dismantling seems to be the best option**
- ▶ **Mechanism for fund generation**
- ▶ **Well defined waste streams**
- ▶ **Legal basis established**
- ▶ **Availability of storage/disposal facilities**
- ▶ **Existing standards for reuse/release**





Challenges

- ▶ **Licensing of enlargement of Mochovce repository**
- ▶ **Licensing of VLLW disposal facility**
- ▶ **Licensing of integral storage facility**
- ▶ **Licensing of next stages of decommissioning of facilities**
- ▶ **Licensing of transport equipment**
- ▶ **Full harmonization with WENRA reference levels for decommissioning**



More info at

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