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Regulatory Framework and Planning for Decommissioning of the RA RR in Vinča Institute

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Content

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- Existing national legislations
  - Laws
  - Regulations - decrees and requirements
  - International agreements and Conventions
- Compliance with the IAEA recommendations
- Regulatory authorities and licensing process
- Upgrade of regulatory framework
- Safety related documentation
- Planning for decommissioning
  - Objective, scope
  - Final state
  - Strategy
  - Main phases and activities
  - Funding
- Conclusions

Background

- RA RR at the Vinča Institute – 6.5 MW heavy water tank type
- Shutdown for modernization in 1984, extended shutdown until decision for final shutdown in 2002, preparations for SNF removal and facility decommissioning
- No decommissioning planning during design, construction and operation
- Technical assistance in the decommissioning planning through the IAEA TC project SRB3002 "Decommissioning of Vinča RA Research Reactor"
- Absence of appropriate legal framework and a regulatory body in early project phase
- No clear governmental policy regarding radioactive waste management
- Law on Ionising Radiation Protection (1996) and existing regulations address provisions only until reactor shutdown and do not cover decommissioning
- Regulations for radiation safety, environmental protection, nuclear safety, waste management, industrial safety
- Temporary Regulatory Body (Regulatory Commission for Nuclear Safety) established in 2005, now RCRNS

Existing regulations

- **Law on Protection against Ionising Radiation**
- **Low on Environmental Protection**
- **Other relevant laws – industrial safety**

Decrees

- requirements for the sitting, construction, trial run, commissioning, operation and final shutdown of a nuclear facility
- format and content of the Nuclear Safety Report and other documents required for verification of the compliance with nuclear safety criteria
- criteria for assessment of safety of nuclear facility
- requirements for professionals employed in nuclear facility
- requirements for trading and use of nuclear materials and the record keeping
- procedures and conditions for systematic monitoring of the radionuclides in the environment surrounding nuclear facilities
- systematic testing of the content of radionuclides in the environment
- requirements for authorization to measure ionising radiation exposure levels of professionals, patients and public

Existing regulations

- professional qualifications and health condition for professionals working with radiation sources
- record keeping for radiation sources and exposure levels for public, patients and professionals
- requirements for authorization for decontamination work
- requirements for authorization for systematic survey of radionuclide content in the environment
- intervention and derived intervention levels and measures to protect population, livestock and agriculture (veterinary practice, plant production and water management)

Rulebooks

- methods and requirements for collecting, preserving, record keeping, storage, treatment and disposal of radioactive waste
- limits of radioactive contamination of the environment and decontamination methods
- methods for mitigation of ionising radiation exposures

Regulatory authorities

- Temporary RB - Regulatory Commission for Radiation and Nuclear Safety
- RCRNS belongs to the Ministry of Science (advisory body of the Minister) – independent from the operator, but not from the authority ensuring funds
- Several Ministries involved (industrial hazards, public health, security)
- Ministry of Environmental Protection defines content of the environmental impact assessment for decommissioning
- Ministry of Work and Social Security - criteria for non-radiological hazards
- Government - state guarantees for funding of decommissioning
- An independent Regulatory Body (Agency) is planned to be established after approval of the new Law

Upgrade of regulatory framework

- Existing regulatory framework not appropriate for decommissioning
- In many existing regulations provisions are in place allowing the use of IAEA safety standards – good solution for the transition phase before developing new regulations for decommissioning
- New regulations and amendment of the existing ones
- Coordination between the different competent authorities (Ministries of Science, Environmental Protection, Health, Work and Social Security, etc.) is essential, this aspect should be clearly addressed
- New law on Radiation Protection and Nuclear Safety prepared with common efforts of experts from Ministries and Institutes, reviewed by the IAEA, is in the final stage of approval

Upgrade of regulatory framework

- New RP&NS law will
  - establish the legal basis for regulation of decommissioning
  - will establish an independent regulatory body (Agency for Radiation Protection and Nuclear Safety - State authority reporting directly to the Government of Serbia)
  - new Agency have to prepare lower level regulations in six months
- It was recognized that the funding of decommissioning, exemption, exclusion and clearance concepts, as well as site release and termination of a practice are not addressed in the new Law – will be considered in the regulations

Upgrade of regulatory framework

- **Meeting "Legal and Regulatory Basis for Decommissioning of Vinča RA Research Reactor", 21-23 February 2007, IAEA Headquarters, Vienna**
  - **operators, regulators/representatives of relevant Ministry, IAEA**
  - **scope: to discuss relevant existing and planned Serbian legislation and its correspondence with international safety standards and recommendations related to decommissioning of RR**
  - **objectives:**
    - **to review Serbian legislation relevant to decommissioning and its consistency with the international safety standards**
    - **to discuss plans for review of the decommissioning plan and authorization of decommissioning activities**
    - **to review and agree on the legal basis for preparation of the decommissioning plan for RA reactor**

Licensing process

- Operational license terminated in 1984, extended shutdown without license
- Final shutdown programme (2003) and Transition Plan (2004)
- "Zero licence" for transition activities
- SNF removal activities under separate license – SAR, TSR
- Decommissioning license to be issued against approved decommissioning plan
- Before submission – internal review by Vinča Institute NRSC
- Approach for the license application still not decided – one license for the whole project or individual licenses for each decommissioning stage
- Main issues to be elaborated
  - clearance values
  - site release values for restricted and unrestricted rules
  - discharge limits (gaseous and liquid)
  - dose constraint per site and for the research reactor
  - criteria and requirements for non-radiological hazards

RA Reactor Decommissioning Plan

- Objective
- Scope
- Final status
- Strategy
- Main phases and activities

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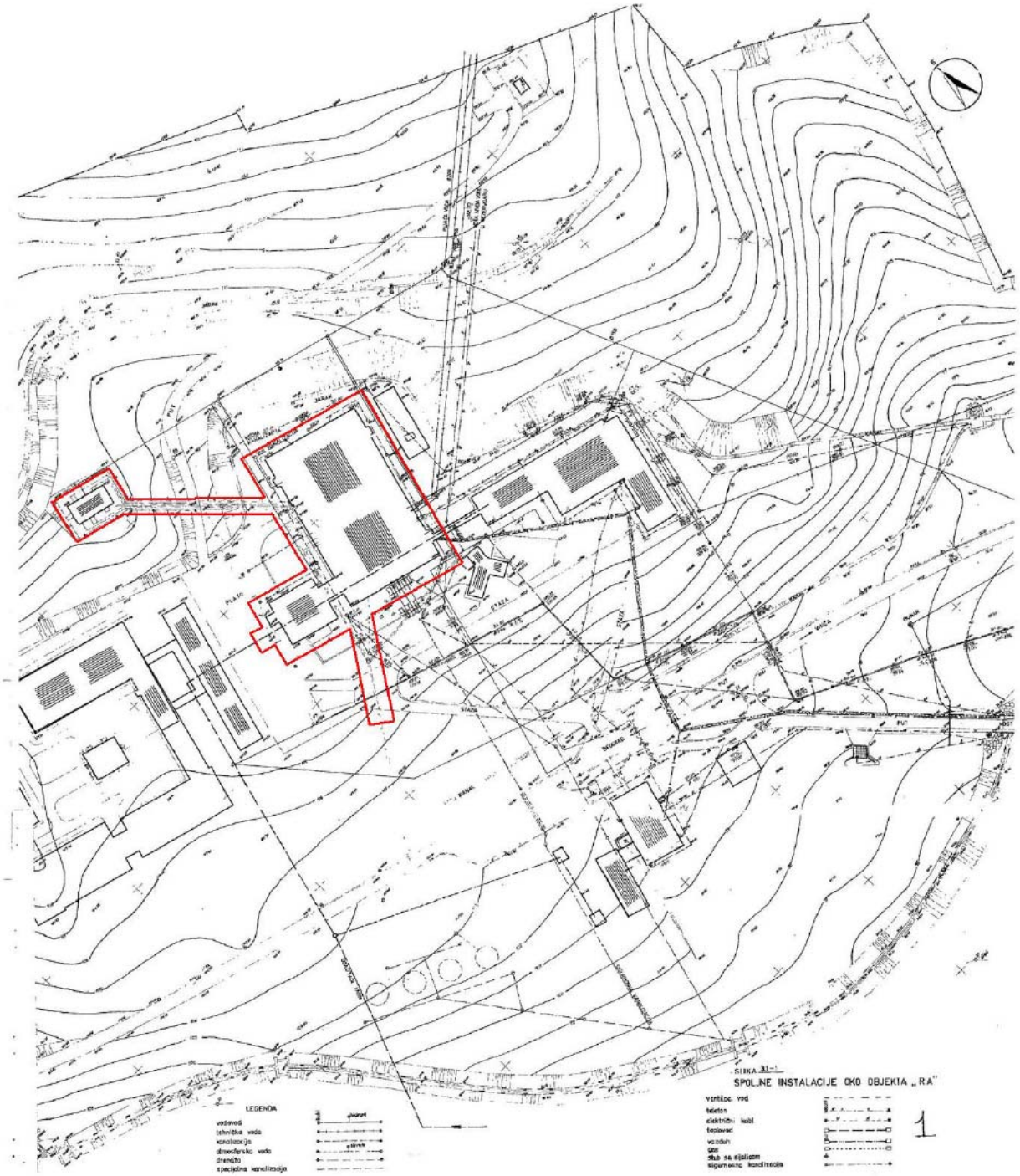

Decommissioning Strategy

Three main options analyzed:

- **Immediate Dismantling – selected as optimal**
- **Deferred Dismantling**
- **Entombment – does not fit strategic plans of the Serbian Government and the VINCA management**

- **Criteria for strategy selection well described in number of the IAEA publications**

Main activities

Short term (before removal of SNF):

- Characterization, Plan, Upgrades, Maintenance, Cleanout activities

Long term (after removal of SNF):

- Implementation of the selected strategy, dismantling and demolition work, removal of radioactive and hazard materials, final survey, reporting
- Empty building for other purposes

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Planning

Three levels of documents:

- **National legislative/regulations (Law on RP&NS)**
- **VINCA Institute regulations/plans (RP, EP, QA, PSS, WMS)**
- **Facility documents/regulations/plans (SAR 1986, Operation rules and regulations 1989)**

- **Existing regulatory framework not appropriate, new law, Agency**
- **Decommissioning Plan to follow all the requirements of national legislative, in accordance with IAEA SRS 45**

Content of the RA Reactor Decommissioning Plan

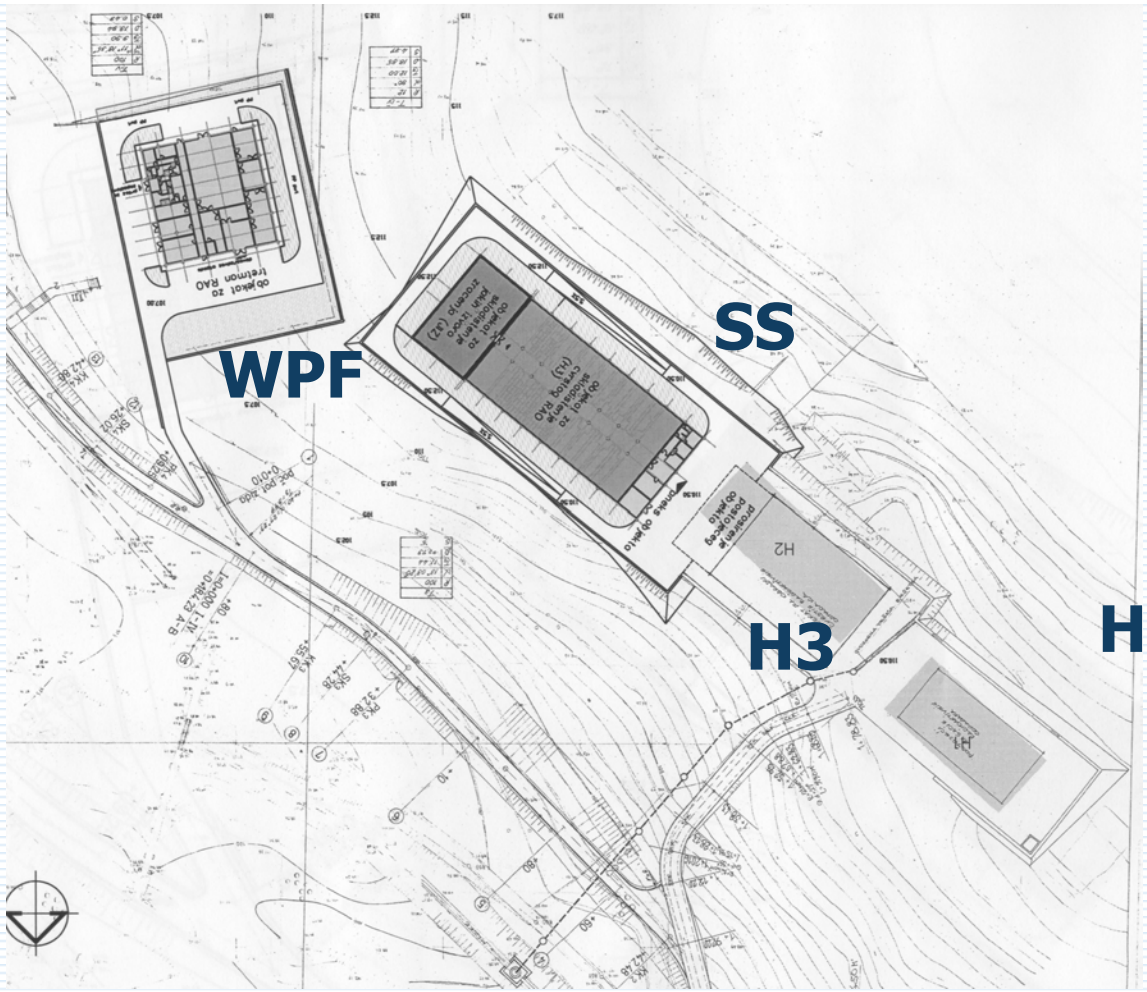
- Introduction
- Facility Description
- Project Management
- Decommissioning Strategy
- Decommissioning Activities
- Surveillance and Maintenance
- Safety Assessment
- Environmental Impact Assessment
- Waste Management
- Health and Safety Plan
- Cost Estimate and Funding Mechanisms
- Quality Assurance Program
- Emergency Planning
- Physical Security and Safeguards
- Final Radiological Survey

Other supporting documents

- Strategy Options Study
- Radiological Characterization Plan
- Transition Plan
- Characterization Report – first phase
- Documents related to SNF removal project
- Number of analyses and studies performed to support preparation of some documents
- Procedures, manuals, training materials
- Update of the Institute documents, plans and rulebooks
  - RP, EP, WM Strategy, WAC, QAP

- Other supporting activities in the planning phase:
  - Establishment of an effective RMS
  - Comparison of the documentation with the existing facility layout

Waste management



H2 and H3 for long term storage
WPF for treatment
Temporary storage at RA reactor building

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Funding and cost estimate

- Funding – from the state budget
- Regular funding of the transition activities since October 2004
- Significant donations from foreign institutions expected
- Cost estimate for dismantling phase
  - Budgetary level of accuracy
  - 10-15 M$ without SNF activities and waste treatment and storage
  - Definitive estimate still not prepared

Conclusions

- Existing regulatory framework not appropriate
- Needs and gaps identified, included in the new NS&RP law (to be in power soon)
- Temporary RCRNS in place, new law will introduce independent Agency
- Agency will prepare set of regulations
- IAEA support to build appropriate regulatory framework
- Decommissioning plan in final stage of preparation
- Planning supported by the Government, IAEA guidance and expert support
- Funding from the state budget

Thank you for your attention

- **Nuclear Technology & Radiation Protection**
  - **International journal, open access**
  - **http://ntrp.vin.bg.ac.yu**

- **CONUSS 2008**
  - **Sixth International Conference of the Nuclear Society of Serbia, Sep 29 - Oct 2, 2008**
  - **http://nss.vin.bg.ac.yu/CoNuSS2008.htm**

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