

## **New requirements to collect operational data that are essential for facility decommissioning**

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### **Abstract:**

The paper describes the features of the first nuclear regulatory safety guide to be released by the Nuclear Regulatory Authority of the Slovak Republic (UJD SR) in field of decommissioning. This safety guide specifies requirements to collect those nuclear facility operational data that are essential for its decommissioning. Recommendations of international organisations as well as experience in selected countries are provided. The following operational data types necessary for decommissioning process are identified and analysed: design documentation including modifications and changes during operation, photodocumentation, operational events and material and radiological inventory of the nuclear facility. The guide establishes requirements for collection of the operational data that can be recorded in interconnected database modules. In addition, a structure of decommissioning database is proposed, representing material and radiological inventory of a nuclear facility. This inventory database forms a basis for planning of the decommissioning process. At last, the guide summarises recommendations for data collection, archiving and maintenance of database records and also their applications in safety documentation necessary for decommissioning of nuclear facilities in Slovakia.

# **New requirements to collect operational data that are essential for facility decommissioning**

Kristina Kristofova, KIND Consultancy

**WS on Current and Emerging Methods for Optimising Safety and Efficiency in Nuclear Decommissioning**

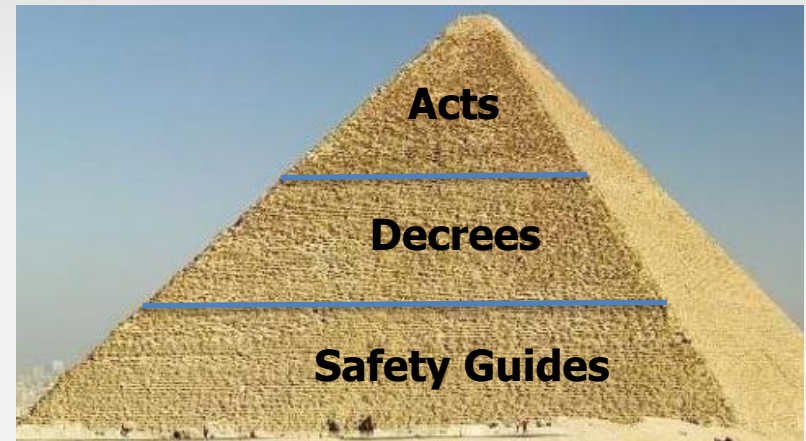
7-9 February, 2017, Sarpsborg, Norway

# Slovak legislation in the field of decommissioning

Nuclear Regulatory Authority of the Slovak Republic – regulatory body over the nuclear safety; founded in 1993

Legislation issued by NRA SR covers:

- Laws and Rules in nuclear safety
- However no safety guides by 12/2016 in decommissioning
- New Decommissioning Safety Guides valid from 2017:



1. BNS I.9.4/2017 Requirements on operational data collection important for decommissioning of nuclear facility – issued 01/2017
2. BNS I.9.3/2017 Requirements on scope and content of different decommissioning plans elaborated during the lifecycle of nuclear facility – under review

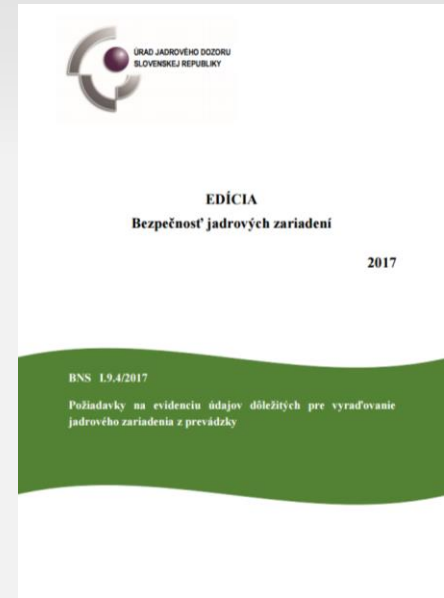


- Under decommissioning: 2 NPPs
- Under operation: 4 NPP units; 2 RWM facilities; Interim Spent Fuel Storage
- Under construction: 2 NPP units + new NPP unit under consideration

# Safety Guide BNS I.9.4/2017 - objectives

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- The document is not binding but a guidance for increasing the quality of decommissioning planning process – following the relevant Acts and Decrees
- Makes decommissioning documentation process review by the Regulatory body NRA more simple and transparent
- The guide refers to all operating nuclear facilities in Slovakia excluding RAW disposal facilities
- The guide does not cover facilities under decommissioning



# Safety Guide BNS I.9.4/2017 – key parts

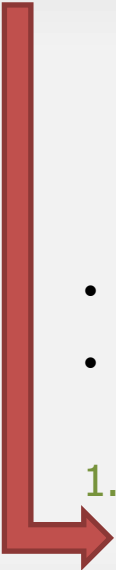
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1. To specify an approach to collection of those operational data that are essential for decommissioning
2. To provide recommendations of international organisations and experience in selected countries
3. To identify & analyse the following operational data:
  - design documentation including operational modifications,
  - photodocumentation,
  - operational events,
  - material and radiological inventory
4. To determine requirements for collection of these operational data
5. To propose structure of material and radiological inventory database
6. To provide recommendations for data collection, archiving, maintenance of decommissioning database records and also their applications in documentation necessary for decommissioning

# International experience in the field

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## A. Recommendations of international organisations

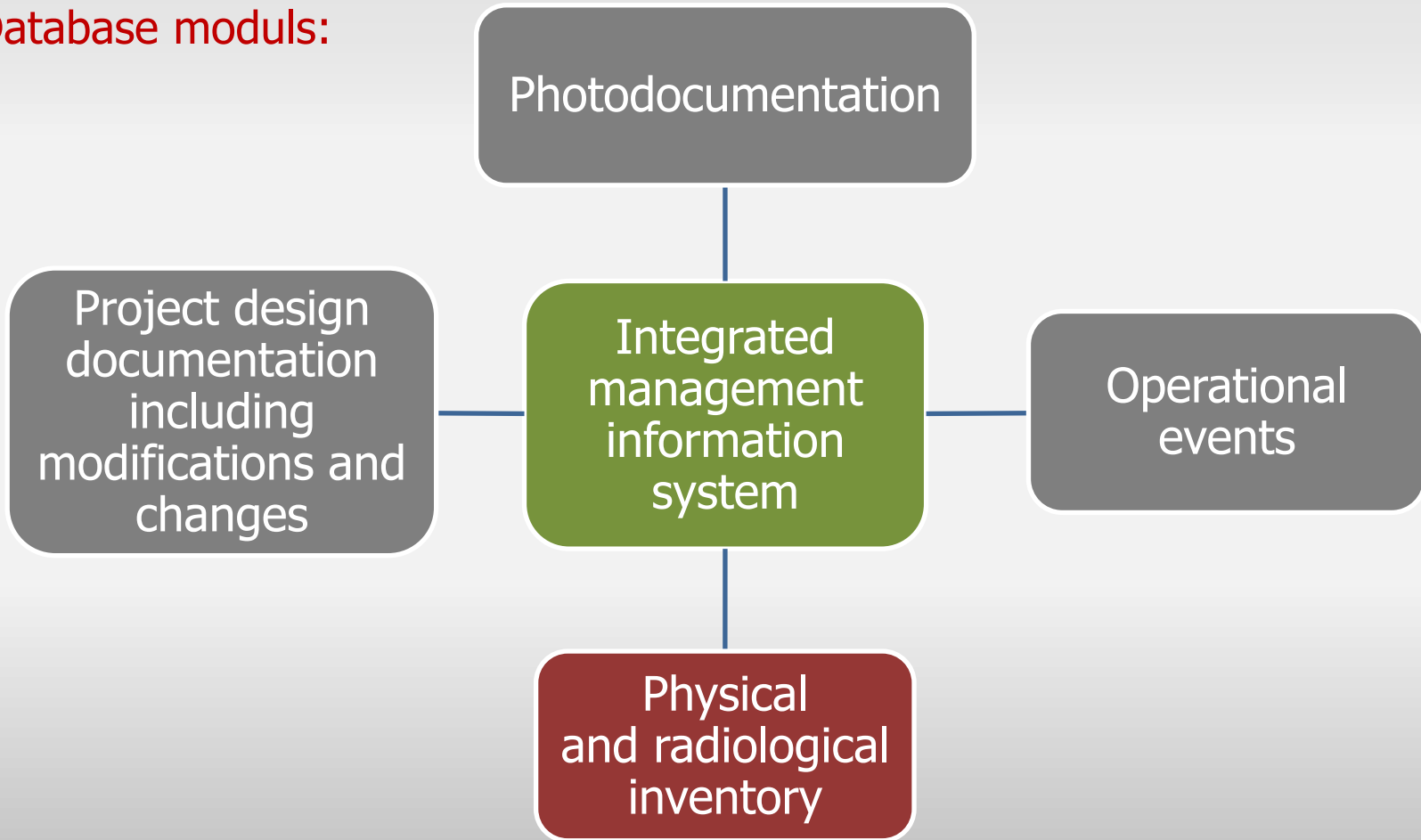
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- IAEA requirement in GSR Part 6 - collection of relevant information and data to facilitate future decommissioning:
    1. Responsibility of the regulatory body: Establishing requirements for the collection and retention of those records and reports and for preserving information about the activities that have been conducted at the site
    2. Responsibility of the licensee: Keeping and retaining records
  - Records relevant to decommissioning are specified in IAEA Safety Guide WS-G-2.1
  - OECD/NEA and EC recommendations: Start data collection for radiological characterization of the facility for the purpose of its decommissioning ASAP
    1. To develop physical and radiological inventory database – the basic info for decommissioning plan preparation
    2. To establish and implement data collection system as a part an integrated record management of the facility - RMS (Record Management Systems) or IMIS (Integrated Management Information System) system

## B. Experience in selected countries – examples of RMS systems in Belgium, Finland, Nederland, Hungary and Germany – Safety Guide Annex

# Facility operational data for decommissioning

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## Database moduls:

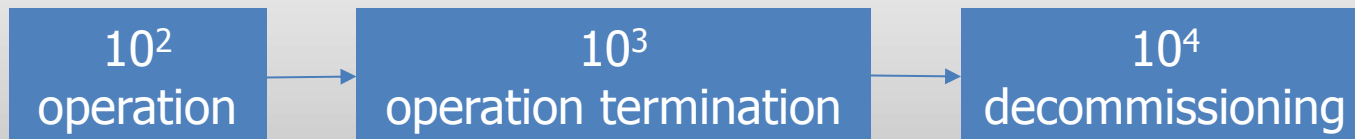


# Facility inventory database for decommissioning

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1. Existing equipment maintenance database of the facility:
  - Known software, maintained, updated, trained personnel
  - Supplement of necessary data for decommissioning process
2. New inventory modul within the existing equipment maintenance database
  - No interventions to existing structure and content of maintenance database
3. New decommissioning database (DDB) system
  - For D&D purposed only: MS Excel, MS Access, Oracle based DDB
  - Suitable if digitalised inventory database does not exist

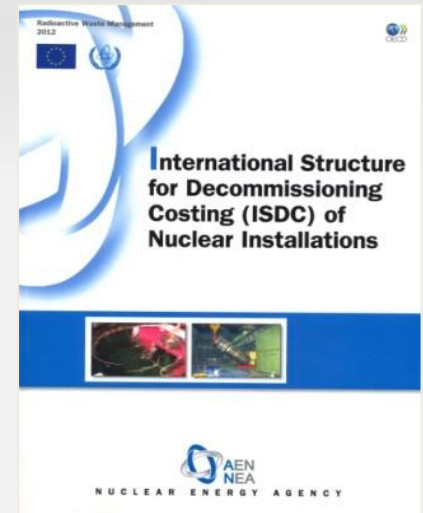
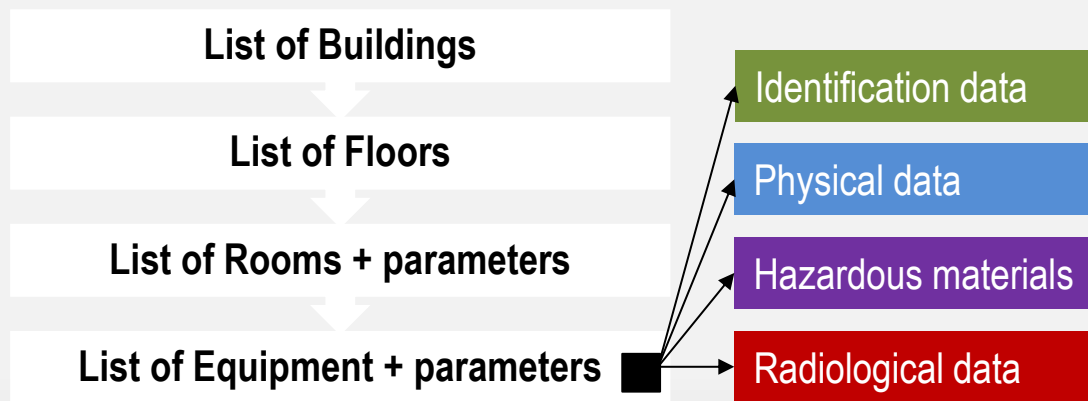
No. of inventory database items:





# Inventory database design and structure (1)

1. **Database structure corresponds to IAEA standardised costing approach:** International Structure for Decommissioning Costing of Nuclear Installations
2. **Hierarchical structure:**



3. **Different level of inventory detail:** inside and outside the controlled area,
4. **Additional code-lists:** technological systems, equipment categories, materials, hazardous substances and waste, radionuclides, radionuclide vectors, etc.

# Inventory database design and structure (2)

Proposed mandatory parameters for equipment and building structures:

Building – Floor – Room No.
Equipment ID, Equipment Name
Technological System, Equipment Group
Reference documentation, Note, Responsible person
Dates of last and planned updates
Mass
Category of equipment
No. of items
Wall thickness
Equipment vertical position (from the floor)
Inner and outer surface
Inner volume
Hazardous material and waste (codes)
Inner contamination, Nuclide vector, Reference date
Outer contamination, Nuclide vector, Reference date
Specific Activity, Nuclide vector, Reference date
Dose rate, Nuclide vector, Reference date

Optional parameters:

Equipment dimensions (length, width, height, diameter), pipeline No., equipment classification, surface material, etc.

# Data collection, archiving and maintenance

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- **Inventory data collection methodology:** proposed step-by-step procedure and diagram
- **Maintenance, frequency of updates and responsibilities:**
  1. To prepare records plan updates = determine and justify frequency of updates (Date parameters of last and planned update)
  2. To update the database in compliance with significant facility modifications and decommissioning plan elaboration
- **Possibilities of mutual interconnections of individual datatabase modules with inventory database**
- **Archiving and backup the records:** determination of rules, user manual, selected appropriate record retention

# Data applications in decommissioning documents

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- Continuous data collection and update is recommended + recording changes in project design documentation
- Radiological data collection conditions: to record only those radiological inventory data that are measured for the purpose of radiation safety during operation (outage) not to perform special measurements for decommissioning planning purpose (ALARA principle for restricted rooms)
- Submitting the data for the regulatory body:
  1. Summary data on material volumes per building (synchronising with Conceptual decommissioning plan update) until submitting the Final decommissioning plan - each 5 years
  2. Records on max. dose rates and max. surface contaminations with reference measurement dates for individual rooms inside the controlled area - each 5 years
  3. Radiological data on technological equipment and building surface contaminations as well as soil - in case of operational events
  4. Results on activation calculations if they are performed (optional)

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Thank you for your attention. Any questions?



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