PREDEC 2016

International Symposium on PREparation for DECommissioning

IAEA Perspectives on Preparation for Decommissioning

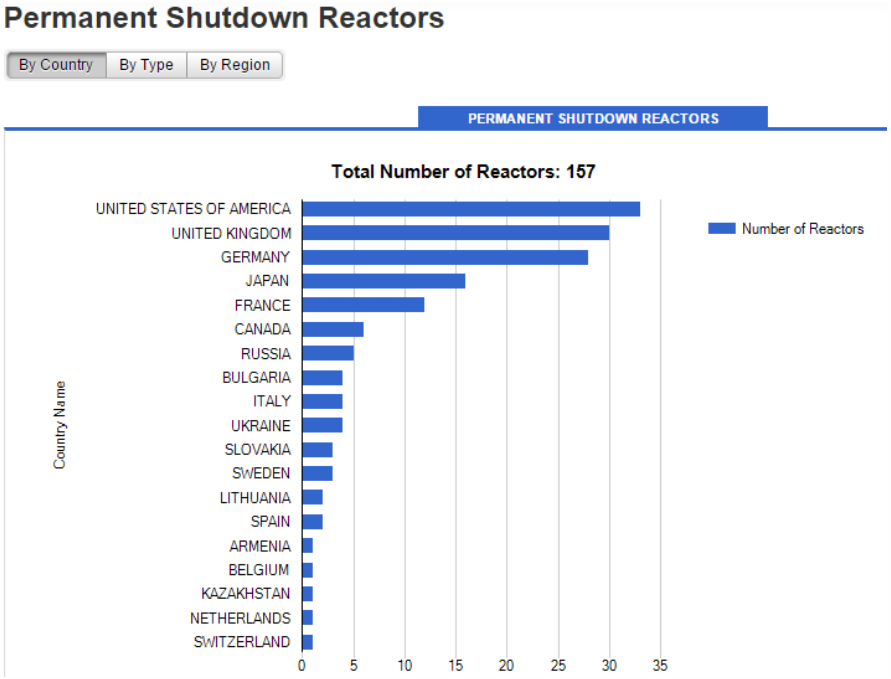
Vladimir MICHAL and Vladan LJUBENOV

16 February 2016

IAEA International Atomic Energy Agency

Worldwide decommissioning statistics

- Recently there are 157 power reactors permanently shutdown worldwide, awaiting decommissioning or being already in the decommissioning phase.
- In addition, more than 480 research reactors and critical assemblies, and several hundred of other fuel cycle facilities have been shutdown for decommissioning, have been undergoing active decommissioning or have already been fully dismantled.
- Some non-nuclear facilities which used, processed or stored radioactive materials will have to be also subject of decommissioning.

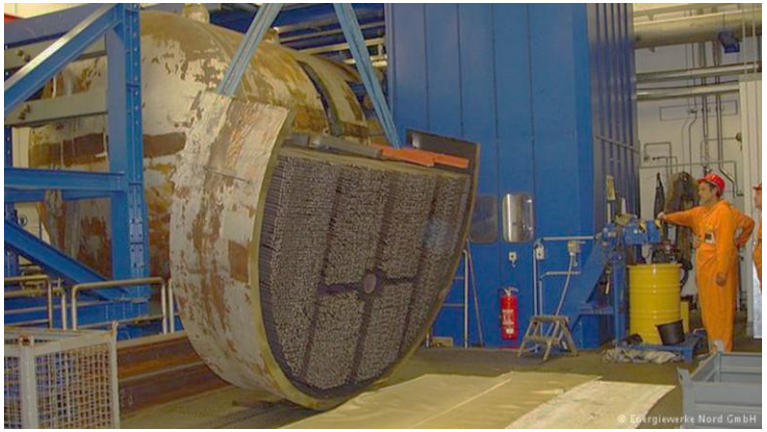


Safety and technical considerations

- Preparatory actions for decommissioning need to be performed during the transition period in accordance with the authorization (license) for operation of the facility or under a modified operational authorization.
- The authorization for operation of the facility usually remains in place, unless the regulatory body approves modifications on the basis of reduction of hazards associated with the facility.
- There are important organizational and administrative activities to be performed either prior to the final shutdown or at latest during the transition period as part of preparations for implementation of the decommissioning strategy.
- Clear interfaces with all stakeholders have to be established, including information exchange mechanisms to build confidence in, and acceptance of the selected decommissioning strategy.

Safety and technical considerations

- Important non-technical activities include also a **preparation of the final decommissioning plan** with all required supporting documents, collection and retention of decommissioning related records and establishment of an efficient record management system.
- In many cases a program has to be defined for development of working procedures, to detail the use of techniques and equipment required for decontamination, dismantling, demolition and management of decommissioning waste.

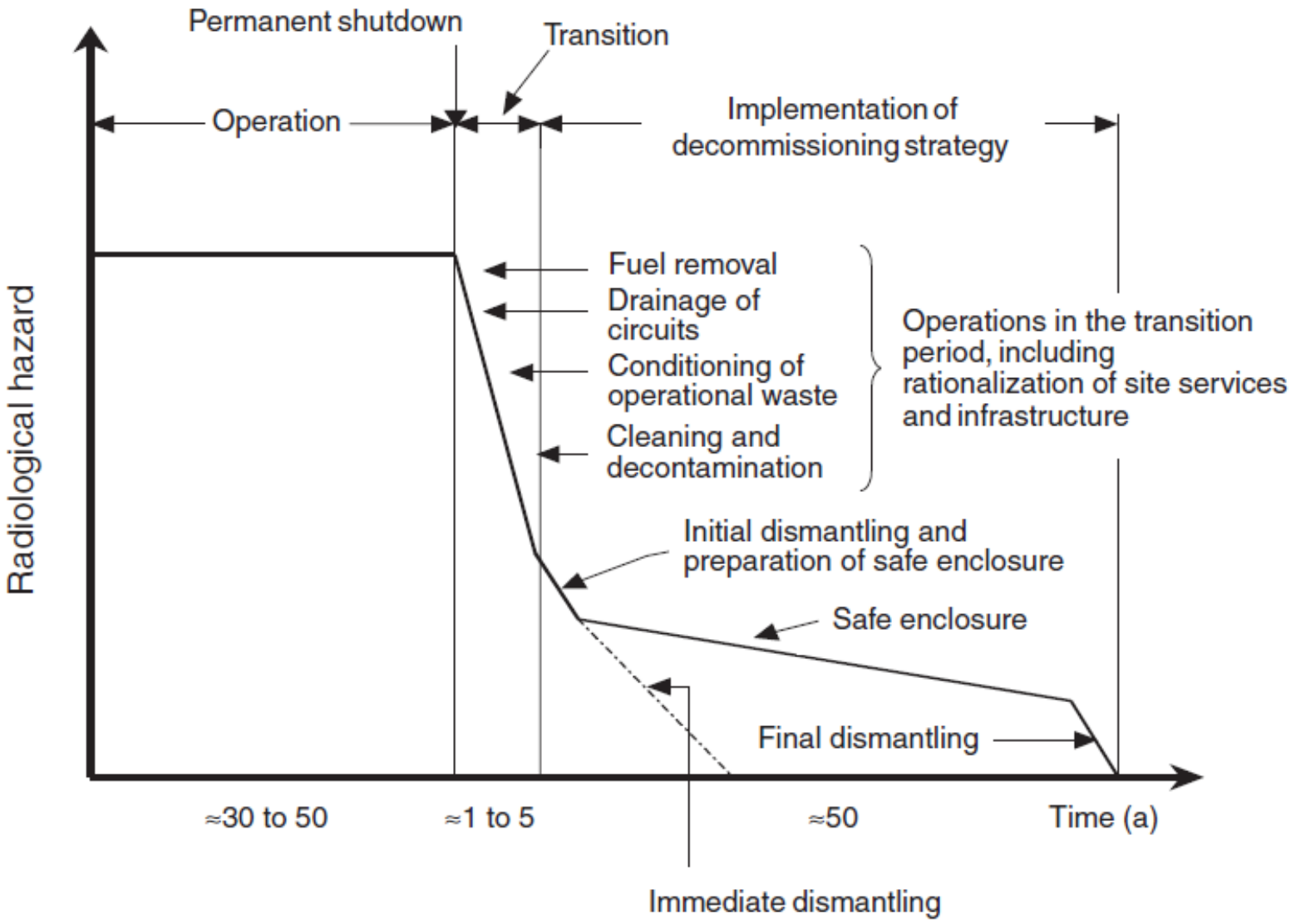


Safety and technical considerations

Typical technical tasks in preparation for decommissioning include:

- Removal of spent fuel (and other nuclear material) from the facility, but not necessarily from the site;
- Removal of operational waste, unnecessary material and some minor components from the facility;
- Treatment, conditioning and, if possible, disposal of operational waste;
- Enlargement of waste management capacities to deal with large amount of decommissioning waste;
- Draining of circuits and systems – this activity may result in a considerable amount of liquid waste to be treated;
- Post-operational decontamination and cleaning to the extent possible – this activity will produce secondary waste;
- Radiation surveys and radiological control of the work areas;
- Physical and radiological characterization to support decommissioning planning, etc.

Safety and technical considerations



IAEA services related to the preparation for decommissioning

- Safety and technical publications (Safety Reports Series, Technical Reports Series);
- Training courses, workshops and seminars to support sharing of good practices on preparation for decommissioning among experts and involved organizations (TC events, IDN);
- Focused support to address specific needs of particular Member State may be provided within the national TC project or through project financed by extra-budgetary contributions to the IAEA;
- Assistance in planning for decommissioning, including safety assessment and estimation of decommissioning costs, or support to characterization activities are typical examples of aspects covered within such kind of projects.

IAEA services related to the preparation for decommissioning

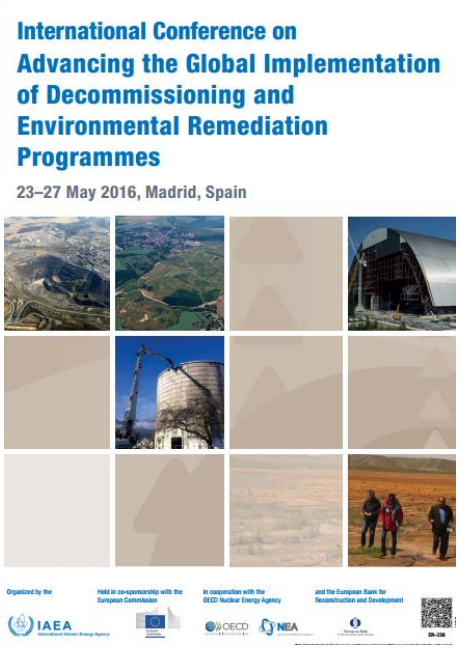
- Topical international projects to provide longer-term platforms for cooperation, training, exchange of knowledge and experience, and for promotion of good practices;
- Examples of such projects are the Research Reactor Decommissioning Demonstration Project (R^2D^2P) and the International Project on Data Analysis and Collection for Costing of Research Reactor Decommissioning (DACCORD);
- The IAEA also provides support to several Member States with nuclear facilities damaged by accidents or with legacy facilities (TC projects in Slovakia or Ukraine, International project DAROD) – preparation for decommissioning in these cases is very challenging due to the variety of technical, safety, regulatory, financial and socioeconomic issues.

General lessons learned

- Early planning is the key to a smooth preparation for decommissioning before the final shutdown and during the transition period;
- Safety related considerations have to be addressed by the operator (licensee) based on the regulatory requirements;
- Numerous actions can be taken prior to or during the facility transition period to prepare for and to optimize eventual dismantling;
- Preparatory activities should be evaluated to ensure that they are allowable under the operating license and are not pre-determining decommissioning options available for the nuclear facility (regulator to be involved in such considerations);
- The facility has to be placed in a safe shutdown condition and safety has to be maintained during implementation of preparatory activities, until the decommissioning activities are initiated.

Conclusions

- Many valuable technical lessons learned are available in the Member States with advanced nuclear decommissioning programmes, and should be shared with others;
- Good examples include timely and effective planning of preparatory and transition activities to reduce expenditures and hazards, simplify waste and material management and help to keep the workforce motivated;
- Aspects related to preparation for decommissioning will be addressed during the **International Conference on Advancing the Global Implementation of Decommissioning and Environmental Remediation Programmes** (23-27 May 2016, Madrid, Spain).



Thank you for your attention and see you in Madrid !

PREDEC 2016

International Symposium on PREparation for DECommissioning