

IAEA Global Support of Decommissioning Implementation with a Focus on Advanced Technologies

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Recently there are about 140 power reactors in decommissioning phase worldwide excluding 17⁺ that might be considered as decommissioned. In addition, more than 400 other nuclear facilities, such as research reactors or nuclear fuel cycle facilities, have been shutdown for decommissioning, have been undergoing active decommissioning or have already been fully dismantled.

The IAEA provides various kind of support for Member States including publication of safety and technical reports providing guidance, recommendations, experiences, good practices and lessons learned covering the preparatory and implementation decommissioning phases. Many training courses, workshops, seminars etc. were organized to support sharing of good practices among specialists and organizations involved. In line with the non-technical aspects, such as decommissioning planning, costing, managerial approaches etc., there are also presented and discussed technical solutions often with a focus on the advanced technologies to be considered. Several completed and ongoing IAEA initiatives partially or fully address the advanced approaches and techniques to support safe and effective implementation of decommissioning projects.

The presentation will provide an overview of relevant activities organized so far and perspectives of the IAEA on advanced technologies for decommissioning.



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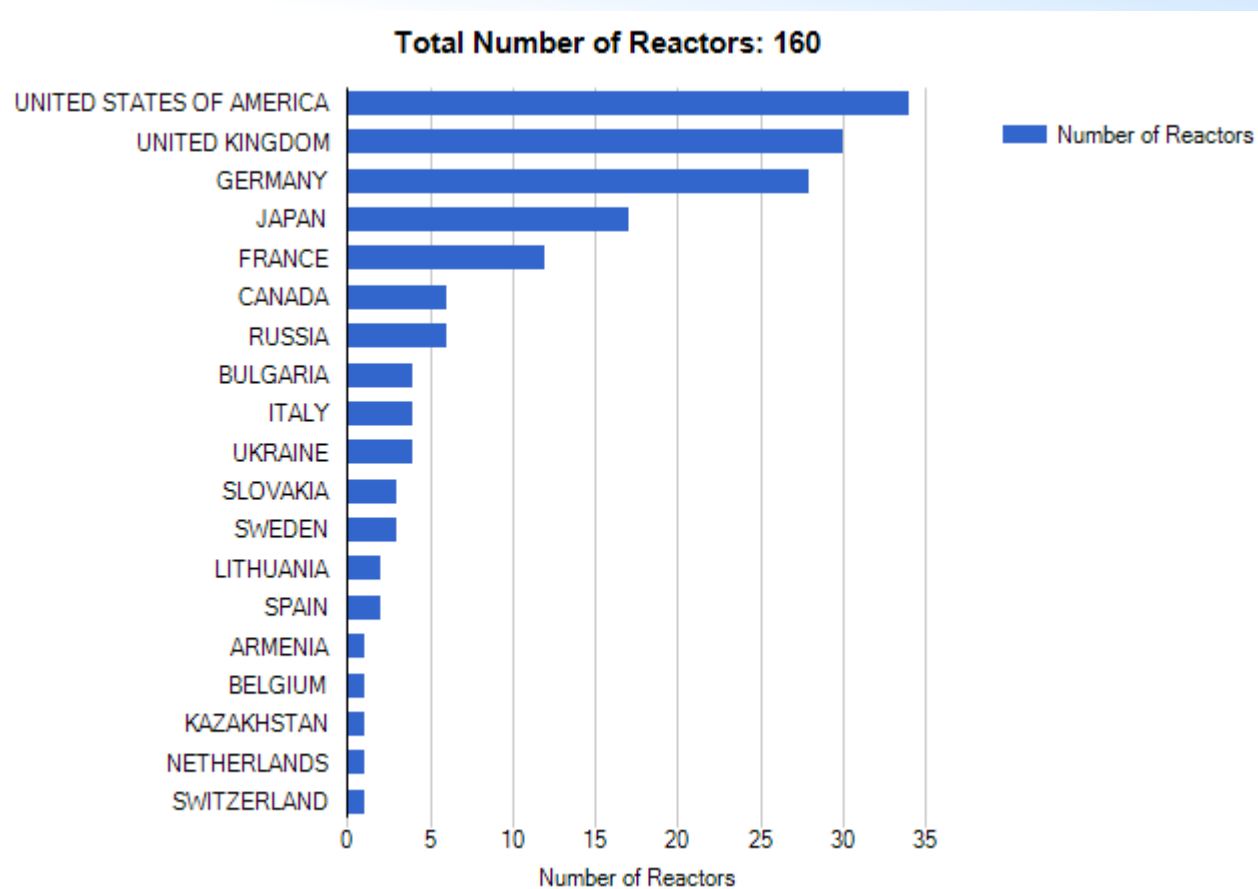
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IAEA Global Support of Decommissioning Implementation with a Focus on Advanced Technologies

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Decommissioning Statistics – number of power reactors permanently shutdown



- 17+ power reactors decommissioned;
- More than 400 other nuclear facilities (research reactors, nuclear fuel cycle facilities) have been shutdown for decommissioning, undergoing decommissioning or have already been fully dismantled.

IAEA Support – general activities

- Assisting in development of consistent policies and related strategies for decommissioning & support of planning and implementation of decommissioning projects;
- Conferences, workshops, training courses, seminars etc. to support sharing of good practices among involved specialists and organizations;
- Safety standards and guidance & technical publications;
- International Decommissioning Network ... and related projects (CIDER, DACCORD, GRAPA, DRiMa etc.);
- TC projects (national, regional, interregional);
- Coordinated Research Projects;

IAEA Support – general activities

- Development of E-learning material and decommissioning wiki;
- Peer review services (on MS request, ARTEMIS);
- Extrabudgetary support of several international or national projects.

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Agency Peer Reviews

The IAEA has organized numerous peer reviews of facilities or activities pertaining to radioactive waste or spent fuel management, radiological impact assessments, and management of residues arising from uranium production, decommissioning and remediation.

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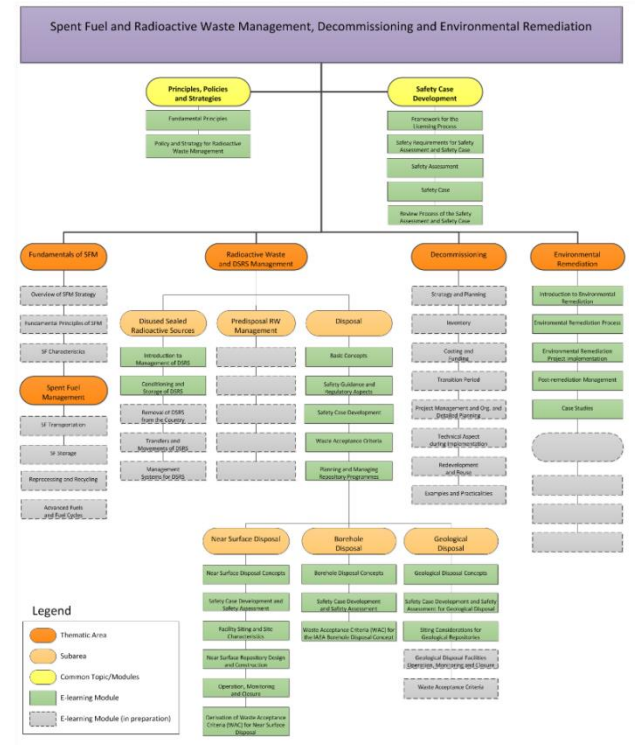
An integrated review service for radioactive waste management, decommissioning and remediation programmes

Do you want to learn more about ARTEMIS for your facility, organization or programme?
 To enquire about inviting an independent expert peer review tailored to your needs, email the ARTEMIS Review Coordinator: ARTEMIS@IAEA.ORG

Internationally recognized experts in radioactive waste management convened by the IAEA to provide independent review and advice tailored to the specific needs of your government and organization.

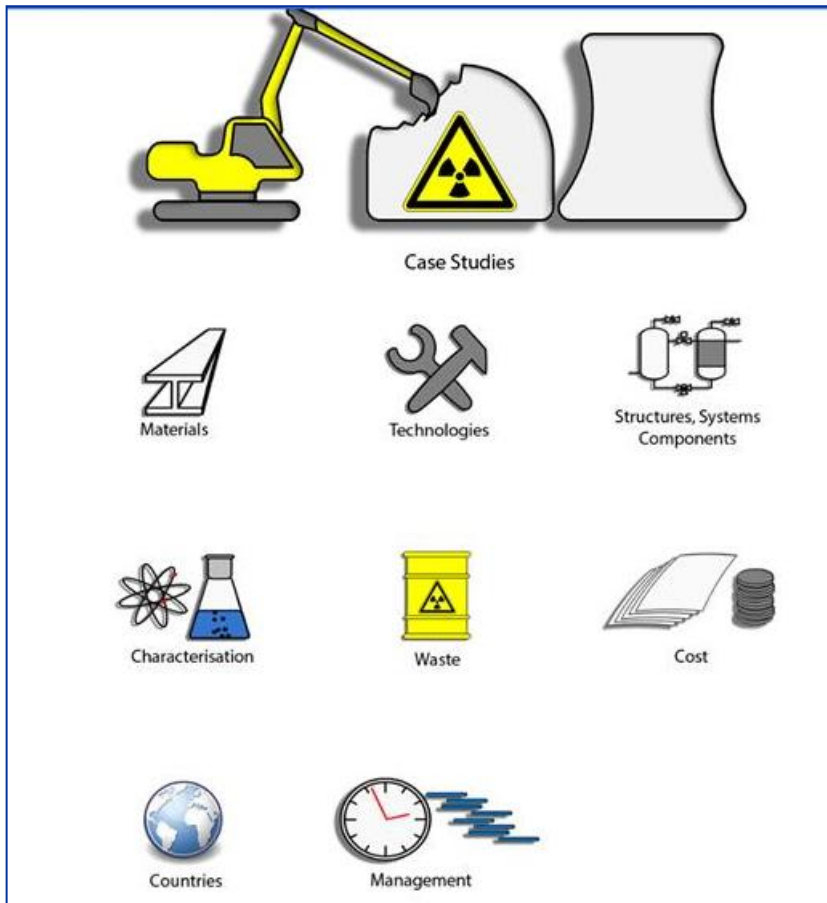
To learn more about the process, search previous mission reports, and more, visit www.iaea.org/artemis

Reports of all past reviews are available at www.iaea.org/artemis



Examples of focused actions

- TC project SLR/4/008 “Remotely Operated and Robotic Technologies for Decommissioning of A1 NPP” (2001-2006);
- Examples of related CRPs:
 - Innovative and Adaptive Technologies in Decommissioning of Nuclear Facilities, TECDOC-1602 (2008),
 - Planning, Management and Organizational Aspects of the Decommissioning of Nuclear Facilities, TECDOC-1702 (2013).
- International Experts Meeting on Strengthening R&D Effectiveness in Light of the Accident at the Fukushima Daiichi NPS (February 2015), Session 5 on Post-Accident Recovery;
- Decommissioning Wiki – under the IDN, officially launched in December 2016 ...



- Wiki can be used for a number of purposes such as helping select the best dismantling or decontamination methods, identifying where decommissioning activities are taking place, opportunities for benchmarking, knowledge sharing, forum for practitioners, etc.;
- Recent (quantitative) status: 139 case studies and 150 technologies described;
- **How Do I Gain Access?**
 - <http://nucleus.iaea.org/Home/index.html>
 - <https://nucleus.iaea.org/sites/connect/IDNpublic/Pages/default.aspx>

Examples of focused actions

- Annex on remote operations and robotics in NE Series report on Managing the Unexpected in Decommissioning (NW-T-2.8, 2016);
- TC training courses and workshops covering advanced decommissioning technologies (e.g. in cooperation with ANL, CEA or FZK);
- International project DAROD on decommissioning of damaged nuclear facilities, WG on technical aspects (ongoing);
- Third International Conference on Nuclear Knowledge Management – Challenges and Approaches (November 2016);

Examples of focused actions

- NE Series report on decommissioning after a nuclear accident: approaches, techniques, practices and implementation considerations (to be published in 2017);
- Continuous collaboration with research organizations worldwide.

Remotely controlled tools can be used to measure radioactivity, decontaminate nuclear power plants and eventually to segment and handle the plant components, avoiding the risk a human being would face.

— Vladimir Michal, Team Leader, Decommissioning and Environmental Remediation, IAEA

Lasers and drones for better planning

Before starting decommissioning or environmental remediation, experts need to plan each step of the process, and to do that, they first need a clear idea of the characteristics of the structure and the level of radiation that they can expect to encounter.

While characterization for planning



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New Technologies in Decommissioning and Remediation

By Vincent Fournier, IAEA Office of Public Information and Communication

IAEA decommissioning events in 2017

- Training course on environmental impact assessment for D&ER projects [INT/9/183], Lancaster, UK, 20-24 February;
- Regional Workshop on risk management in decommissioning [RER/9/138], Slavutych, Ukraine, 27 February – 3 March;
- Regional Workshop on decommissioning planning and cost estimation for decommissioning of research reactors [INT/9/183], Sydney, Australia, 27-31 March;
- Workshop on safety assessment of sites for D&ER [INT/9/183], ANL, 24 April – 5 May;

IAEA decommissioning events in 2017

- Workshop on application of state-of-the-art technologies for decommissioning [RER/9/138], Sellafield, UK, 2Q (TBC);
- Regional Workshop on transition and mobilization for decommissioning implementation (TBC);
- Interregional workshop on optimization decommissioning and waste and spent fuel management strategies (TBC).

Considerations for 2018 / 2019 and beyond

- Planning for decommissioning vs detail design for decommissioning implementation;
- Support of coordination of R&D on decommissioning and on-site remediation;
- Further support of regulators and operators to safely implement decommissioning projects (follow-up of conclusions of D&ER conference in Madrid):
 - **Capacity building** – collaborative projects, communities of practice, dedicated training programmes,
 - **Technology** – support development of new technologies and knowledge sharing of best practices,
 - **Societal aspects** – support in the transfer of best practice and experience on stakeholder engagement and decision-making process.



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