

Feedback Mechanisms for Lessons Learnt in the Decommissioning of Nuclear Facilities



An international snapshot

Background

The NEA Committee on Decommissioning of Nuclear Installations and Legacy Management (CDLM) and the Technical Advisory Group (TAG) of the International Co-operative Programme for the Exchange of Scientific and Technical Information Concerning Nuclear Installation Decommissioning Projects (CPD) addressed the topic of “Feedback Mechanisms for Lessons Learnt” in the topical sessions of their 2021 meetings. This brochure summarises the key findings.

Objectives

Given the amount of active nuclear decommissioning projects, including the 203 nuclear power plants that have been shut down and numerous legacy sites, the sharing of strategies, lessons learnt and advancements in the field is of great benefit to the involved stakeholders. For this reason, work on the topic of “Feed-back Mechanisms for Lessons Learnt” addressed by CDLM and CPD-TAG members considered the means and adequacy of established processes for experience feedback by involved stakeholders (i.e. regulators, utilities, technical services organisations, service providers, researchers and others). Because most of the time the activities are one-of-a-kind in their respective projects, the topic took into account the following fact and questions:

Fact:

- The feedback could be of great benefit to other decommissioning projects, although the reporting entity might not profit from the knowledge gained.

Addressed questions:

- What are the existing means of information sharing?
- How should existing reporting mechanisms be assessed to see if they are reflecting the right information on incidences or lessons learnt?
- What type of information should be reported?
- How could knowledge management be improved in this regard?

Basis and structure of the exchange

Due to travel restrictions in 2021, the individual topical sessions with members of the CDLM and CPD-TAG were carried out through videoconferencing.

The CDLM topical session took place on 17 March 2021 with 80 registered participants from 22 NEA and one non-NEA member country, as well as the International Atomic Energy Agency (IAEA). The session was structured in two parts:

- 1) Presentations from five different perspectives: a German regulator, a US operators coalition, an independent professor from Japan, as well as two perspectives from implementers, the CEA (Commissariat à l'énergie atomique et aux énergies alternatives, France) and Rosatom (Russia).
- 2) Discussions among participants in breakout groups as well as a plenary exchange.

The CPD-TAG topical session took place on 12 May 2021 with 37 participants. The topical session covered three presentations including experiences collected by JAVYS (Slovak Republic) and Enresa (Spain) as well as preliminary findings from the collected inputs from the CDLM topical session. The presentations were followed by a plenary discussion resulting in further recommendations to support feedback mechanisms in the field.

Information assessed

The discussion included an overview of the current international practice to support feedback mechanisms. Using lessons learnt is important to improve and optimise decommissioning, to share experiences, to improve safety culture, and to allow the transfer of information and knowledge to different projects and activities. The following main mechanisms were highlighted:

- Close links during transfer periods (between generations, between the different stages of the life cycle). These take into account industry sustainability throughout the supply chain.
- Use of existing and new technologies – such as modelling, databases and other advanced methods – to capture, visualise and transfer knowledge (e.g. Wikis, Building-Information-Modelling); keeping in mind:
 - Intellectual property (IP);
 - Security aspects;
 - Resources (e.g. time, cost, dedicated and knowledgeable staff) required for digitalisation.
- Use of existing reporting systems, such as the International Reporting System for Operating Experience (IRS).
- Seminars, conferences, community dialogue and other events allowing stakeholder interaction.
- Bilateral exchanges between individuals, organisations, programmes and other national and international platforms.
- Capturing and making public experiences in literature and data banks (reports, papers, books, documentation, etc.).



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Beyond the existing and straightforward means of knowledge sharing, the following aspects were identified:

- There is a need for integrated project management to support decommissioning projects (with reasonable safety focus) taking into account experience from operation maintenance, radiation protection, engineering and waste management.
- There are good exchange mechanisms between regulators and/or operators. There are varying levels of maturity regarding the inclusion of contractors/service providers and technical support organisations in these exchanges.
- There is a need for training and educational tools to gain a qualified workforce. This includes hands-on experience through implementers. The use of digital tools could help make the field more attractive to young professionals.
- The development of a patterning method (similar parts description from facility to facility) ensuring correct use of the data (not just collection of it) should be considered.
- Issues (technical, societal, economic, etc.) including non-technical knowledge management, such as community engagement and consultation processes, should be taken into account.
- The relationship with interested and affected parties should be improved in a systemic manner to increase understanding, trust and engagement in the decommissioning process.
- Mechanisms for transparent information sharing should be encouraged.
- Exchanges between industry sectors are needed to allow the transfer of technical solutions.
- Having a centralised reporting system with clear and common criteria, taking into account transparency and trust, should be encouraged.

From the operators' experience, the following proposals were made:

- Comprehensive collection of data that should include, beyond operator information, inputs from subcontractors, project management, regulators and literature making use of advanced technologies for visualisation and data analysis.
- Development of data-supported action plans, with regular updates and improvements by management.
- Transparency, integration and trust-building through stakeholder involvement (discussion with team, contractors, etc.).
- Early establishment of an organisation involving experienced workers from operation, maintenance, radiation protection, engineering and waste management.
- Implementers and contractors taking into account:
 - That the different types of recruitment, procurement procedures and tender actions must be considered based on fixed prices, administration, service delivery or supplies. The strategy will have to be considered



according to the volume of work and the complexity and scope of the contracts.

- The possibility of subcontracting large and medium-sized tasks, as well as the technical specifications required for tenders.
- The number of workers to be involved by each contractor and their internal organisational structure.
- That documenting, processing and optimising these procedures helps derive lessons learnt.
- Interaction with the regulator:
 - Early engagement to develop and approve licensing documentation in key areas such as radiological protection, radioactive waste management, operating conditions in the transition period, quality assurance, fire protection, development of technical specifications, liquid and gaseous effluents, and ventilation.
 - Establish different working groups to facilitate greater knowledge by the regulator and support the licensing and acceptance process of licensing documentation.

The challenges identified from these findings are:

- Individuals need to be motivated to contribute and present lessons learnt given the lack of competence and knowledge it could reveal.
- A large number of contributors should be engaged, since the usual mechanisms are limited to a few individuals.
- Dissemination of information only brings short-term impact. Long-term information preservation means are required.
- Database management requires continuous and regular use so as to integrate it operationally.
- The cost-benefit of the feedback mechanisms systems has to be adequate.

Future perspectives and considerations

The topical session is a useful tool to better understand the status and challenges of the feedback mechanisms used to improve nuclear decommissioning. The current travel restrictions have a significant impact on bilateral exchange opportunities. Nevertheless, virtual breakout sessions provided a good opportunity to assess and process the experience and knowledge of large groups in a short time frame.

The main takeaway actions for the CDLM and CPD include:

- Continue to benefit from the NEA groups focused on different aspects of decommissioning including regulatory challenges, social engagement, management and organisational as well as technical, environmental and safety aspects, costing, decision-making, information, data and knowledge management and dedicated robotics and remote systems.
 - Enlarge, in a structured manner, the relationship and common views with other international organisations (IAEA, World Nuclear Association, Electric Power Research Institute, etc.).
 - Support the creation/extension/strengthening of international systems to share knowledge and experience of decommissioning.
 - Evaluate the need for change, updates or modifications to the reporting requirements for operating facilities and the decommissioning stage. This takes into account shifts in reporting criteria (including non-technical, e.g. human factors).
 - Provide guidance on the development of standard reporting systems in all countries.
- Improve the involvement of the industry sector (including other business areas) by adopting a transparent and sustainable feedback mechanism.
 - Improve, in a systemic manner, the relationship with communities.
 - Support capacity and skills building and knowledge maintenance for decommissioning and legacy management.

Complementary information

The CDLM was created in 2018 following a request from NEA member countries to enhance NEA visibility in nuclear decommissioning and the remediation of legacy sites. The creation of the CDLM reflects the NEA goals in providing governments and other interested stakeholders with authoritative and reliable information on the political, strategic, regulatory and social aspects of decommissioning activities and the management of legacy and complex sites.

The CPD is a joint undertaking of a limited number of organisations executing or planning the decommissioning of nuclear facilities. The objective of the CPD Programme, launched in 1985, is to exchange and share information from operational experience in decommissioning nuclear installations to advance and support current and future projects. The programme covers 75 projects in 15 NEA member countries, two non-NEA members and the EC in their biannual meetings of the TAG. These biannual meetings are hosted at the site of one of the participating projects, ensuring both an exchange of information among the members as well as a visit of site.

Potential drivers of feedback mechanisms for lessons learnt

- Advanced knowledge management tools and data analysis capabilities.
- Safety and security improvements of people and environment.
- Long-term engagement and stakeholder involvement.
- Trust building and maintenance.
- Transparency (communication, strategy, process, roles, etc.).
- Value of personal exchanges.
- Motivational tools to support individual engagement.
- Increase of project efficiency.
- Sustainability in the usage and maintenance of the feedback mechanism.
- Capacity and skills building involving the onboarding of young professionals.
- Knowledge maintenance and knowledge transfer to professionals entering the decommissioning field.
- Organised and efficient information exchange (experiences, specific tools, waste treatment) between members (taking into account the intellectual property).
- Establishment under the NEA umbrella of an international relationship dialogue platform between operators and regulatory bodies on decommissioning issues.

Questions and contact information

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