

**NUCLEAR ENERGY AGENCY
RADIOACTIVE WASTE MANAGEMENT COMMITTEE**

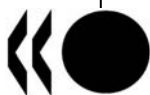
**PRESERVING INFORMATION AND MEMORY ACROSS GENERATIONS:
PROPOSAL FOR A DEDICATED INITIATIVE AND A SPECIFIC PROJECT**

The RWMC vision document on knowledge consolidation and transfer, NEA/RWM(2009)4/PROV, identifies the sharing of information across generations as an area deserving further development. This document proposes a broad initiative on that topic and a project specifically in the area of waste disposal.

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PROPOSAL FOR A DEDICATED INITIATIVE UNDER THE RWMC RUBRIC OF KNOWLEDGE CONSOLIDATION AND TRANSFER

Knowledge consolidation and transfer in the RWMC

Knowledge consolidation and transfer (KCT) is an important structural area of the RWMC programme work and modus operandi as identified and refined at the RWMC meetings of 2007 and 2008. The RWMC position thus far is documented in NEA/RWM(2009)4/PROV. In it two main areas for application of KCT are identified. The first area emphasises action to improve support to national programmes through timely transfer of current and emerging knowledge. This area refers very much to current RWMC activities and aims at the rationalisation of their delivery by the RWMC, its working parties, and the Secretariat. Actions are taking place already and will affect importantly the modus operandi of the Committee. The second, more strategic area addresses inter-generational transfer of knowledge. Sharing of information from one generation to the next is integral to radioactive waste management in order to support lengthy decision-making processes and long operational and post-operational lifetimes. This is a policy area that needs to address unprecedented time-horizons, spanning decades to potentially thousands of years, and regarding which the RWMC has yet to identify specific actions. Hence this document.

The issue

An issue that has long been on the radioactive waste management agenda is the means of preserving the information and marking a waste repository site such that future generations will continue to have forms of knowledge and, therefore, control. The continued and growing importance of subjects such as reversibility and retrievability, stepwise decision making, flexibility and adaptability, transfer of responsibilities between institutional actors, institutional controls, avoidance of human intrusion, surveillance, monitoring and confidence building all depend for their success on the transfer of information to future generations, especially in the short term, but increasingly on longer and longer time scales. Preservation of information and memory can thus be seen as an intergenerational, cross-cutting theme that interacts with many other areas of work during the staged approach to disposal. Three broad classes of generations spanning several millennia are affected: the present and immediately-following generations (a few hundred years), who benefit from nuclear energy and handle the responsibility of the construction, operation and closure of the repository facility; the future generations in the medium term (hundreds to thousands of years), who may possibly bear the burden of additional control and monitoring the repository and could also take actions directly related to the repository; and the far-future generations (e.g. after a few thousand years), who may no longer have to take actions but who are still well served if at least awareness of the repository is maintained.

National policy and regulatory provisions address the topic of preservation of memory and information for waste disposal in various ways. The intent of these laws and regulations is to keep information, memory and control as long as possible. Overall, there is no will to favour the loss of memory of the location of the repository and the nature of its contents. International policy frameworks go in the same direction of maintaining some form of memory and control for as long as possible. Implementers and regulators are thus pressed by the demands expressed by both the law and the wider public to show that the

topic of information and memory preservation, within and across generations, is high on their working agenda.

The indications from the R&R project, the results of the 1st RWMC-RF workshop as well as current work interests within the IGSC and the FSC all point towards making this a new major interdisciplinary topic, in the field of long-lived waste disposal, under the RWMC rubric of knowledge consolidation and transfer. The activities of the WPDD also signal the important role that record-keeping and memory preservation play in the area of decommissioning. Similar issues arise for long-term stewardship projects and for extended storage of a variety of wastes. All this is in line with the strategic expectations identified by the RWMC in the area of intergenerational transfer of knowledge.

Proposal for a new initiative under the aegis of the RWMC – Motivation and benefits

National programmes would benefit from *a shared, broad-based and documented understanding* at the international level of the methods and concepts for the long-term preservation of information and memory. Such understanding – technical, institutional, social and culture-specific – could be used as a reference for those national programmes that are involved in siting and licensing repositories, or that are involved in other long-term projects with or without strong local interactions. Such understanding could also foster the development of more robust waste management strategies and regulations for national programmes that are in their preliminary stages. The RWMC has already identified the area of *inter-generational* transfer of knowledge as one of two areas needing development for the application of KCT, but relevant actions have not yet been defined.

The RWMC working groups will continue to offer good platforms for co-operation among specialists in their specific domains. Preservation of information and memory across generations is, however, a cross-cutting theme of raising importance and it would well deserve having its own dedicated framework initiative in order to reach a critical mass for the development of shared viewpoints and positions on the many subjects that form this topic. Because of the vast experience accumulated by the advanced national programmes that the RWMC represents and the breadth of its related high-level initiatives, the Committee is uniquely placed internationally to combine resources and help develop state-of-the-art guidance on the long-term preservation of information and memory.

The new initiative might be installed as a separate working group or, alternatively, as a series of projects or lines of actions that are started by the RWMC. One or more RWMC lines of actions or projects would make it possible for all to benefit from recent progress in *societal, scientific and engineering* knowledge. The RWMC is already working in an interdisciplinary fashion. Advantage could further be taken of the lessons to be learned, positive or otherwise, from past experience, e.g., in LLW disposal and decommissioning of obsolete nuclear facilities, from nuclear remediation projects (e.g., uranium milling facilities), and from other international work, where it exists, e.g., IAEA TEC-DOC¹ 1222 of 2001 or the IAEA upcoming report on knowledge management for radioactive waste management².

The positive experience of the R&R project, as well as the need not to remove resources from the current work programme, suggests that the one approach is that of structuring the initiative as a series of ad-hoc projects patterned after the R&R project. Namely, a steering group is formed, the NEA acts as the organiser of the project on behalf of the steering group and the RWMC, a consultant to the NEA is hired, meetings with a wider constituency are held to prepare topical sessions, workshops and status reports

¹ *Waste inventory record keeping systems (WIRKS) for the management of radioactive waste.* On the web at: http://www-pub.iaea.org/MTCD/publications/PDF/te_1222_prn.pdf

² http://www.iaea.or.at/inisnkm/nkm/documents/tm_ToR_0710may2007_VIC.pdf

thanks to the provision of both human and financial resources by a core of RWMC member organisations. On the other hand, the current R&R model requires member organisations dedicating staff to a working group that meets relatively often, and this may be problematic for some organisations. In that sense, new lines of actions may be sought. A modified structure to the current R&R project structure may also be looked at, e.g., the idea of a consultant to the NEA Secretariat, relying on intermittent provision of progress reports and with direction provided at key points and mostly by e-mail, teleconference and/or at major meetings.

PROJECT PROPOSAL IN THE FIELD OF RADIOACTIVE WASTE DISPOSAL AND EXAMPLE PROJECT TOPIC

Conditional on a declaration of interest by organizations from at least 4-5 countries, a project could be launched with the following milestones until RWMC-43:

- Step 1: Collection by the NEA of information from the interested parties; pre-analysis of each party's needs and expectations; pre-proposal of a PoW for discussion, keeping in mind the RWMC interests in the field of knowledge transfer and consolidation and the feedback from other RWMC activities, such as the R&R project.
- Step 2: Meeting through a combination of teleconference and/or personal attendance, and definition of the main work items and desired deliverables over the following 2-3 years,
- Step 3: Reporting to the RWMC Bureau for final comments; identification of a reference person for the project in the Bureau.
- Step 4: Informing the whole Committee, inviting broad participation
- Step 5: Start up the project at RWMC-43, e.g., through a Topical Session.

Example project topic

“Elements of an action plan for long-term information and memory preservation in the field of geological disposal”

Contents of the action plan

- - Suggestions for how the implementation of information preservation can be achieved
- - A vision on processes and procedures for keeping the plan up to date

Aims of the action plan

In the short term:

- To manage today's knowledge and information so that the long term goals can be reached

In the long term:

- Allow for our generation and future generations to make decisions based on knowledge (use of the site, withdrawal of spent fuel ...)
- Ensuring adequate records even in the event of accidents

Issues

- What information should be preserved? (e.g., information with focus on the content of the canisters and location of the repository, ...)
- Why should it be preserved? (vital to safety, environmental protection and licensing ; facilitates possible further development of great scientific or social interest; ...)
- Which target groups to consider?
- Which scenarios and time horizons to consider?
- How should it be preserved? (format, language, and medium,...)
- Where should it be preserved? (in established archives, in connection with the repository, as markers in the landscape, in the collective memory, ...)

Other aspects

- Responsibility for collection, updating and revision of information and maintaining it.
- Most serious scenarios to address:
 - Information disappears physically
 - The information is available physically, but cannot be understood or interpreted
- Main countermeasures:
 - International cooperation
 - Geographical redundancy of information
 - Markers
- Compilation of national and international bibliographic references: international guidance , national regulations, and national experiences (e.g. the French and Spanish L-ILW near surface disposal experiences; the lessons to be learned from decommissioning or from remediation project, etc.)