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NUCLEAR ENERGY AGENCY  
RADIOACTIVE WASTE MANAGEMENT COMMITTEE

## Expert Group on Preservation of Records, Knowledge and Memory across Generations

Progress Report of the Project on Preservation of Records, Knowledge and Memory (RK&M) Across Generations

March 2011-March 2012

*This report represents a status of the RK&M project since its launch in March 2011 until March 2012.*

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## THE RK&M PROJECT OF THE NEA/RWMC

### PROGRESS REPORT March 2011- March 2012

#### Introduction

Various NEA member countries are currently developing and constructing deep geological disposal projects for high-level and/or long-lived radioactive waste and spent fuel. These take decades to develop and implement, and the facilities are to operate passively and safely for millennia. Although different countries are in various stages of development with regard to their programmes for final radioactive waste management (RWM), for all countries with nuclear waste the question arises:

- Which records need to be maintained?
- For what purpose?
- Over which timescales?
- By whom?
- For whom?
- What can be done now – from a managerial, technical, legal, regulatory viewpoint – to provide maximum continuity of records, message, and accessibility?
- How much effort, and of what kind, is it reasonable to invest, now or later?

Consideration of these questions led to the launching of the OECD NEA Project on the “Preservation of Records, Knowledge and Memory (RK&M) across Generations” by the NEA Radioactive Waste Management Committee (RWMC) in March 2011. A Collective Statement and a Vision Document have been prepared and released with RWMC approval. A project web-site has been created <http://www.oecd-nea.org/rwm/rkm/>.

As stated in the Vision document, the RK&M project will work towards a *‘Menu-driven document that will allow people to identify the elements of a strategic action plan for RK&M preservation’*. This document will contain recommendations to countries on useful practices as well as suggested follow-on activities in this field. The release of the ‘Menu driven document’ is foreseen in 2014.

Currently, the project counts representatives from 16 organisations in 12 countries, plus the IAEA, and has the support of the European Commission. Most national organizations provide a financial or in-kind contribution to the running of the project.

## **Achievements so far**

Within the RK&M Project, 2011- early 2012 was designated for scoping the issue and identifying challenges that the project shall consider later. Multi-disciplinary studies have been encouraged from the start, since preparing the project in 2010<sup>1</sup>.

So far, three surveys have been completed,<sup>2</sup> a task on creating a relevant bibliography has been set up and a preliminary analysis of the collected documents conducted, a glossary of key terms is being produced, the first projects meeting and workshop have been organised, and two new surveys have been sent to both RK&M members and the RWMC Regulators' Forum<sup>3</sup> on the role of national archives and on the relationship between RK&M and safety and safeguards. Responses to these surveys have been received; the second survey has been re-opened in March 2012 to the full RWMC.

Additionally, the RK&M Project was represented at the conference Waste Management 2012 and contributed to the special session "Geologic Repository Warning Messages to the Future – Ensuring Continuity of Memory and Messages to Future Generations"

## **Priorities at this stage**

The overall priority at this stage of the project is to complete and document the scoping work accomplished so far, including the release of this progress report.

Over the period March 2012 – March 2013 in 2012 the following meetings and activities are under consideration:

- A project meeting will be held in Spring of 2012, which may give rise to new sub-projects and activities. Additionally, at this meeting
  - The final progress report for 2011 will be commented and finalised
  - The proceeding of the October workshop will be finalised;
  - A second workshop will be planned
- A second, open workshop will be prepared and organised in September 2012.
- A project meeting will be held in the time frame March – April 2013.

## **The October 2011 workshop**

The major event of the March 2011 – 2012 period was the organisation of the first project workshop titled "The Preservation of Records, Knowledge and Memory (RK&M) Across Generations". The workshop was organised to further contextualize and delineate the field, to learn from different practitioners (such as RWM implementers, archivists, and archaeologists) how they organise and conduct their work in light of different time scales and what they see as crucial issues throughout their efforts, and to investigate the interaction between RK&M and society. The overarching goal of the workshop was to gain insights that can guide the further development of the project and the later elaboration of "a menu driven document" that will assist practitioners in preserving RK&M.

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<sup>1</sup> This followed the significant interest in the project shown at a Topical Session, held at the 44th Session of the Radioactive Waste Management Committee, in March 2010.

<sup>2</sup> 2010 Survey on Status and Needs – updated in 2012; 2011 Survey on Responsibilities; 2011 Survey on Examples of Memory Loss.

<sup>3</sup> Survey on connection between regulation/safety/safeguards and RK&M ; survey on range of assumptions that may be used for RK&M-loss scenarios

33 participants from 9 different countries and 27 different organisations, including OECD NEA, IAEA & EC, were present. The set of participants formed a pluralistic mix of implementers, regulators and other relevant practitioners (e.g. officials from national archives and regional public works) and academics from the social sciences and humanities (such as sociology and archaeology). In total 24 talks were delivered, each followed by time dedicated for Q&A, and 4 plenary discussions took place.

The workshop provided a fruitful forum for multidisciplinary reflection and discussion and delivered a large amount of information and ideas. Key observations and messages from the workshop are as follows:

- The importance of having a common glossary is confirmed. This allows the project members to communicate better with one another and with others, and it contributes to the development of a common culture of RK&M preservation. The RK&M project should continue its task of elaborating a common set of terms and providing their definitions. Group members will be responsible for translations into national languages in a form agreed by the group.
- It is of interest to the project to better understand the contents of the current bibliography on RK&M. Renewed efforts should be made to review each relevant report and to create a more consistent set of abstracts that not only describe the contents of each document but also respond to other questions that are of interest to the RK&M project.
- Examples of memory loss and records misuse or misplacement exist both inside and outside the nuclear field. The project has performed a first analysis of these examples. Further work is needed in this area: do we have a good taxonomy of events leading to memory loss and records misuse or misplacement? Do we have sufficient number of examples? Emphasis in the project should now be placed on verifying the comprehensiveness and the sufficiency of the information collected to date. A special effort should be made to look for examples that fit more closely the case of deep geological disposal.
- The relationship between regulation and RK&M preservation for the long-term needs to be better understood. Is RK&M preservation needed for long-term safety or other reasons? Do provisions for preserving RK&M for as long as possible need to be addressed at the time of licensing and in the (geological) disposal safety case? The RK&M collective statement does not address these questions directly.
- RK&M preservation or loss and recovery scenarios can be constructed based on a wide range of future human-development hypotheses. For the analysis of long-term safety and the case of human intrusion it is agreed that the future human technological capabilities are similar to today's capabilities.
- The relationship between RK&M preservation and safeguards needs further clarification. It may be that safeguards-related information is part of the multiple legitimate approaches for RK&M keeping on repositories at international level. It must be borne in mind that safeguards agreements are between each single nation and the IAEA and only concern fissile materials. Because of its nature, the information collected under safeguards agreements is kept confidential.

- National archives are a promising venue as one of the multiple approaches for long-term RK&M preservation. The role and functioning of national archives vis-à-vis RK&M preservation in the context of radioactive waste management needs be explored further.
- Records management alone will not equip future generations to deal with long-term stores. For cross-generation knowledge management, one possible scenario that requires further research efforts is that of ‘knowledge mothballing’, i.e. the conscious consolidation of knowledge for later resurrection.  
History has taught us that mothballing and resurrection is possible, through a combining a variety of mechanisms including textbooks, records, archaeological artefacts and the human ability and stamina to reconstruct knowledge. However, for this to be certain, society needs to not only preserve records but also to consciously and purposefully build and maintain a reservoir of tacit knowledge that can provide meaning to records.  
Further research needs to establish the principles and roles in knowledge mothballing and how the required tacit knowledge can be transferred and then updated according to changes in terminology, technology and environmental issues.
- It is important to preserve not only technical records, but also records on the history of the programme, including its siting within a community (metadata).
- The interest in the history of the programme should also be looked at from a *heritage* viewpoint. Adding cultural (historical) value to the facility and creating the conditions for continued value to the community is one of the multiple approaches for contributing to RK&M keeping.
- Understanding the many ways that clues and records can be left in order that knowledge may be reconstituted by generations beyond those immediately succeeding us is important in this context. Historian and others are specialists in reviving older facts and knowledge. There is relevant expertise in the didactics of history that could be looked at.
- In the same vein, while we have to operate on the assumption that the the intra-generational transmission chain continues to preserve RK&M, we have also to reach out to father-out generations directly in case chain is broken. This is identified in the RK&M project as the “dual track strategy”.
- The aim in reaching out to farther-out generations should be, as far as possible, that of informing them. There should be an attitude of openness towards the future. Monuments or markers that are intended to scare people are not recommended. We are on stronger ground if we privilege information that allows people to protect themselves. Also, it should be kept in mind that “The more it is hidden, the larger is the temptation to get to it” and that “Prohibition has short half-life”.
- The set of data to be kept should be commensurate to the future need for the data and the difficulty in keeping them. Requirement management systems are needed that allow for data not only to be kept, but also to be culled: it is important not to “keep everything, and remember nothing”. Waste managers should identify what information needs to be processed and maintained on which time

scales for the project; a collection of practices in data keeping and management in organizations with a view to later needs could be started.

- Standardization of messages may be useful when considering records for the farther future - that is, for the time when national programmes may no longer be extant. One may want to: maximise visual and diagrammatic content; minimise textual presentation; prepare records in host language and major regional languages; and standardize content and the order of material to allow interpretation of fragmentary records. Also, it would be useful to have an international document on markers' messages. Overall, this area is best addressed through international cooperation, and should be developed further.
- Operators and regulators would benefit from a clear national or international position on RK&M requirements. From the international point of view:
  - The EC Waste Directive of July 2012 (Art. 12) requires concepts and plans for the post-closure period of a disposal facility, including the period during which appropriate controls are retained and the means to be employed to preserve knowledge of that facility in the longer term;
  - The Aarhus convention needs to be looked at.

Overall there is interest in compiling the international requirements or, more simply, requests, that countries have to fulfil when dealing with post-closure situations.

### **April 2012 project meeting**

The next project meeting will take place in April. The agenda will likely include the following items:

- Annual progress report
- Report from RWMC meeting of March 2012
- Proceedings of the October 2011 workshop
- Main findings of the October 2011 workshop
- Report from the WM 2012 (Phoenix) conference panel
- Impressions from participants on a French seminar on long-term governance (8-9 February, Paris)
- Report from Andra on their event with M. Madsen, the director of "Into Eternity"
- Updated glossary
- Update of bibliography (consultant's work)
- Update of "memory/records loss" table (consultant's work)
- Discussion of the latest questionnaires. Claudio will also report on the results of discussions of the questionnaires within the Regulators' Forum
- Discussion of other proposals. For example, work on "metadata", and on "common set of records and messages for the long-term". Colleagues are asked to make proposals. Ideally we can start working groups

Although the content of the September workshop needs to be elaborated at the project meeting in April, it has been agreed upon that, in line with the overall project structure, the final, menu driven document will be a central thread.