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

Summary Record of the 3rd Meeting of Records, Knowledge and Memory (RK&M) Across Generations Project

14 September 2012, NEA Headquarters, Issy-les-Moulineaux (France)

Claudio.pescatore@oecd.org

JT03332893

Complete document available on OLIS in its original format

This document and any map included herein are without prejudice to the status of or sovereignty over any territory, to the delimitation of international frontiers and boundaries and to the name of any territory, city or area.
Review of the workshop in view of the programme of work – plenary discussion

Overall, members agreed that the workshop was varied, interesting and useful, and thought provoking in some cases.

General discussion on status and scope of the Project

It is time to narrow down and to concentrate on final products. On the other hand, new themes and information are still coming to the fore (e.g. related to existing mechanism (e.g. UNESCO programmes, IAEA programmes (safeguards, INIS), EC directives, national archives, and other data banks (NEA), ...) and practices (e.g. from DOE Legacy Management, environmental monitoring, safety case approaches, ...). What would “narrowing down” mean? Certainly, we should at least stay in the scope of the project.

Traditionally, RK&M has been evoked to avoid inadvertent intrusion into a repository. We discussed intrusion scenarios (various reasons, e.g. drilling for various resources, perhaps even not only for the currently most favoured mine / cavity type concept of geological disposal, but also for other options such as deep boreholes), the potential reuse of materials in the repository, etc.

Consensus was that this is not in our project scope. Our project is on the preservation of records, knowledge and memory, no less, but also no more. We deal with the kind of records, knowledge and memory that should be available. From case studies in disposal, we are creating a taxonomy of reasons why records may be lost or misused, which may or may not be due to human actions1; the analysis of the possible kinds of, and reasons for, intrusion into a repository is not our task.

Furthermore, RK&M preservation has now evolved towards helping future generations make informed decisions. For this they need to know what exists, what was done and why. As we enter into the period of indirect oversight and more and more into it, i.e., over the medium and long term our aim is to allow future generations to make sense of whatever information they come across.

Whether you focus on people (e.g. by means of rituals, cf. presentation of ANDRA) or on materiality (cf. e.g. the presentation of Simon Wisbey on self-marking facilities) as the vector of memory, or on the combination of both (complementary approach, cf. e.g. the presentation of Cécile Massart (memory through living art) or of Legacy Management (memory through participatory reuse of sites), in other words on the symbolic or on the material components, one aim of RK&M preservation post closure is to allow for sense making. Namely, we don’t want to pass on records or markers as such, we want them to be interpreted in a manner that allows an understanding of what happened and why. It is pertinent to focus on the hazardous nature of the repository contents, but there is consensus that we do not mean to remove opportunities unnecessarily, i.e., we must acknowledge that people may want to go back to the repository and they must be informed that there are in there also other materials than radioactive ones, e.g., fairly large amounts of copper.

1 It must be recognised, however, that while collecting known examples of RKM loss is factual and provides useful information; there may be many more scenarios which can lead to loss and misuse of RKM. We are not creating these scenarios in the current phase of the project.
On the other hand, for periods beyond 10s of thousands of years alternative strategies to sense making may have to be studied.

The concept of “oversight” appears to be a central one for understanding our project and explaining it. Oversight can mean monitoring, RK&M preservation, additional assurance of safety (i.e., avoid disruptive human actions), and providing additional opportunity for decision making in general (i.e., basis for the formulation of retrieval plans) and for societal involvement. Which are the many ways that would contribute to “indirect oversight” and therefore to memory keeping is a question that is worth exploring.

Oversight is a new concept introduced by the NEA R&R project that the ICRP has adopted to explain their recommendations on radiological criteria. It has been included in our glossary. Our project should take advantage of this concept and help, in the process, the WM world take it on board. The notion is rather new so it will take a certain time for it to take a more stable shape. At some stage soon regulators will also have to deal with it for the repository—once closed—can still be seen (ICRP) as a functioning nuclear facility, and lack of oversight would mean to utilise radiological criteria for clearance rather than criteria for “planned exposure situations” (in the ICRP jargon).

Concretely, with regard to end products, the discussions led to the following ideas:

- The menu driven document (MDD) should come to the foreground more and more. It was suggested to include the more philosophical aspects in a separate document to complement the menu driven document. Such a document should not aim to be an exhaustive overview of existing research and literature, but reflect the ideas as they were discussed throughout the project.

- In this context, it was also mentioned that we, within our field, may be forgetting some suggestions made in the past, e.g., the suggestion of a nuclear priesthood made in the 80s. All agreed that we should mention our awareness of previous ideas and work, e.g., referring to the bibliography or compiling an overview (table) of the various options discussed, and also to point out the evolution of thinking that has taken place.

- Discussions such as the previous one above about delineating the scope of the project should also be taken up in the project output.

- A balance needs to be found between theory (referred to as the more “philosophical” or “idealist” part) and practice (referred to as the “engineering” or “pragmatic” aspects)

---

2 Sense making is a process which is anthropocentric and culture-dependent. Prof. Ernst’s central argument was that signal-strategies for marking nuclear waste sites have to be developed which include a time-delayed decoding function independent of "sense making", in the sense of what we nowadays call human understanding. The hermeneutic approach ("understanding" in communication) is a historically limited method of occidental thinking of which Europe can be proud but has to take into account the possibility that is may not last for 10 thousands of years.
Mechanisms for RK&M (and oversight)

We discovered a wealth of already existing mechanisms that can contribute to RK&M preservation: Environmental monitoring (under various Conventions), UNESCO programmes, IAEA programmes and activities (safeguards, INIS), EC directives, national archives, and other data banks (NEA), ...

The recurrent IAEA meetings and cross checking mechanisms in the framework of the Joint Convention were also mentioned, as were the recurring reports of international organisations like IAEA and NEA, which can be seen as a form of meta data.

It was suggested to try to apply a grid to the variety of existing projects and initiatives in a similar manner as done for the analysis of the bibliography by J. Schröder and R. Ferch. The consultant work of T. Schneider will contribute to this work.

The safety case, may be a good way to structure both knowledge needs and RK&M desiderata as shown in the presentation by J-P Boyazis. .

The question was raised whether we want to join an existing international mechanism, or create a new one, or do both. The latter could perhaps be seen as part of defence in depth. It was agreed that these options would indeed be mentioned along with pros and cons. On the one hand it is not good to work in isolation, on the other hand it is not good to dilute information unnecessarily. Discussions at the workshop suggested that dedicated nuclear archives may have benefits as compared to general archives. The notion of “un-archive” was raised, meaning a distributed approach to information management as opposed to the classical concept of a central archive as the sole or main point of information concentration and distribution.

Glossary

Since the last project meeting, some items have been added (e.g. “archive” after the survey on the national archives revealed ambiguity) and some precisions have been made related to the items of knowledge, marker, complementary approach, and dual track strategy. Regarding the latter, in order to avoid confusion with the use of the words “direct” and “indirect” – as used for oversight –, the new definition indicates “straight” and “mediated” transmission of information to future generations. In this context, the alternatives could be “transitive” and “intransitive”, but they do not seem equally effective.

In line with common understanding, and to address some questions that arose in the review of Marcos’ document on markers, the item “knowledge” has been explained a bit more. Our definition is still rather specific (but there are hundreds of definitions), but it reflects the way we use the notion throughout the project (or should be using it). In any case the glossary should be seen as a basis for discussion at this stage, and definitions may well evolve to fit the project’s findings. Colleagues should use the glossary definitions as consistently as possible and identify issues.

The word “repository” is used also in the context of archives (a repository of records), but it was agreed that it should not be added to the glossary. The notion of library as distinct from archive may be considered for the glossary.
It was suggested as well that the INIS thesaurus should be looked at, but it turns out that the INIS thesaurus is “just” a list of terms in a hierarchical structure. It doesn’t include definitions.

Actions (for Anne and Claudio):

- Place the latest version on the project web site

Bibliography

The bibliography has expanded considerably since the last project meeting (albeit with only 2-3 persons making contributions).
A new category “various media” (websites, films, projects ...) has been added.
If this is felt to be necessary, we can make subdivisions within the bibliography, to have more specialized sections.

Actions (All)

- Keep on sending new entries when you come across them
- Provide abstracts if you suggested you would do so! This, however, shouldn’t duplicate Richard’s current work

Markers

Some members have provided comments on Marcos’ report on Markers. Marcos will integrate these in the upcoming weeks and the report will then be placed on the project website as a source of information in this area, perhaps the most complete and up-to-date available. Marcos remains the author of the report, but it will be mentioned that our project contributed to its finalization in the present form.

It was asked whether perhaps A. Van Luik’s study on the tsunami stones in Japan could be added to Marcos’ report, e.g. as a case study, since it offers a useful analysis. Marcos’ report should certainly reference Abe’s paper at our workshop. However more can be done, as well.

It was agreed that members should review Abe’s document and provide suggestions. If Abe agrees, the study would become a separate project result. It was observed that the report factual information has been checked by Japanese colleagues on behalf of the NEA Secretariat and found to be a correct representation. So the study already integrates a host of views.

Action:

- Marcos: integrate comments and finalize study so that it can be put on the project website
- Claudio: Contact Abe and then distribute Abe’s text to the project members
- All: review and give feedback (reflections, structural comments, etc) to Abe’s text. A completion date will be communicated.
Menu driven document

The NEA Secretariat’s (Claire) presentation focussed on the draft proposal to structure the MMD. A matrix (which all members received via email prior to the meeting) with key themes, key questions and work areas was suggested as a strawman. The information behind the cells would include the main project messages related to that cell (2 – 4 paragraphs) + references to other cells + references to other documents.

The main issues to take the MDD forward at this stage are:

- Which should be the main topical headings? It was suggested that the categories to analyse the bibliography as formulated by J. Schröder and currently being further developed by R. Ferch may provide useful input.
- Writing up the introductory paragraphs – this may be group work!
- Materialisation of the MDD itself (cf. next presentation)

There is consensus about the fact that the MDD, as proposed, will meet the project goals. It will be able to provide information for a strategic action plan in RK&M management, but not the plan itself, which may vary from programme to programme. The menu will provide “ingredients” and “recipes”, but not the “full meal”. It will evoke possibilities. It will have recommendations and references. For instance, creating redundancy by means of spreading information and not working in an isolated manner but in connection to existing mechanism can be mentioned as a good practice; the idea of multi-functionality may be another potential recommendation, etc.

Action:

- All: give comments and suggestions on which could be the organising principles by 10 January, 2013

A proposed format for the MDD – Online possibilities

Eelco Kruizinga presented a possible means of materializing the MDD by creating a single point of knowledge using wiki technology. This approach would offer a dynamic working space for project members. The technology is the same as Wikipedia – it looks and works similar – but it can be adapted and regulated flexibly. It can create a traditional report as an end product, but via an interactive medium.

In connection to the previous presentation, the cells in the Excel matrix would be represented by a page in wiki. Every article page can have an article information box with category, author, contact, type of literature, ... Articles can be multi-topic and can cross-reference from the page to various other resources. One can set up rules for articles, e.g. max word count. The approved / latest version of articles is displayed, but the working format allows to keep all changes that were made throughout the project’s development \(\rightarrow\) version management is well arranged (convenient for the articles but also for bibliography, glossary, ...).
With regard to rights management, specific people can be appointed to have access to specific parts, both with regard to contributing as with regard to visiting the site and viewing its content.

The technology also offers the possibility to create documents for printing. The “collection principle” for instance allows to make “books”, e.g. a book on “medium term records”, and obviously also a final deliverable. One could use the internally-provided service (Pediapress) for finalising the document. European Space Agency web site and Skybrary (Eurocontrol, airtraffic control for Europe www.skybrary.aero) were used to illustrate this wiki approach.

Extras:

- Timelines (e.g. incident information), maps, ➔ various ways of presenting information
- Content development plan, informed by new regulation, incidents, political reasons, ...
- Search engine

Method

You download Wikimedia from the internet (for free), install it on your service, and get an URL. When you install Wikimedia, it’s empty. You fill it as follows:

- Develop the main categories of the MDD which show on your home page (organised via app-like items)
- Develop subcategories
- Define type of readership: What do we put in and what do we reference to and thus keep out
- Make a development plan: who writes what, how do we review, when do we close

Apart from setting up the website, the work would be exactly the same as drafting a MDD in the traditional sense – but the wiki format offers both a collaborative platform for the project members and a dynamic, accessible output format for the MDD. The main work is agreeing on the architecture of the MDD and its content, but this needs to be done equally for the traditional approach. The structure and categories can also evolve and be changed over time.

It probably is a good idea to start with a mock up, to explore the way the technology works.

Maintenance

You need to keep up the URL. If you have comparable IT, you can also host it there, e.g., at the NEA, NAGRA, NDA, ... website. It was pointed out that there may be issues with security policies from NEA – but in fact it is irrelevant where the URL is hosted.

Discussion

The site can exist for as long as one wishes and allows updates. Via this medium we can also foresee the next steps in the project, e.g., addressing parts of the MDD. The end of our RK&M project as it is defined now can still be the MDD – we can freeze the site at that stage – but we can also define the future of the project beyond the MDD.
It was asked whether Google would reference our MDD work. The answer was that if it’s on the internet, Google will register it, but the general principle of Google is that things show up if they are referenced a lot.

Members where enthusiastic in principle about the possibilities that this technology platform for the MDD, and positive to go forward. However, some words of caution were also heard so it was agreed that having a pilot. The pilot will be reviewed at the April meeting.

- Secretariat – *with assistance from the group as necessary* - prepare a pilot for demonstration at the April project meeting\(^3\)
- Secretariat - to look into using a training room at the April project meeting to train the group in how to use the Wikimedia site
- Jean Noël Dumont and others - to look into the possibility of using the ANDRA site to host the MDD

**Minimum Set of Records Subgroup**

The presentation given by Simon at the workshop presented idea from the group and from Simon himself. It was agreed to support the main idea of the sub-group on identifying a minimum set of records for the long term. In particular, a focused and short text on the work to be accomplished and clearly referring to the long time scales would be needed. The work should make use of our glossary and be cast in the context of what the project has produced so far and is producing vis-à-vis the MDD. The Secretariat will help to this effect.

It was also acknowledged that valuable input for this working group was received from the workshop; the bibliography also offers references; and the short text on further work should recognise this. If a consultant needs to be engaged, the text needs to have a focused mandate.

It was re-iterated Whilst Marcos’s study can be a reference for the project, and the extant literature on the subject of markers— including self-marking – and on human intrusion informs our discussion. Our project, however, is not about human intrusion scenarios.

**Action for the subgroup**

- Produce a summary of the group’s discussions and a short proposal for taking the subgroup’s work forward along the lines described above.
- Intention is to have actual work produced for presentation at the April 2013 meeting

\(^3\) As a starting point, bibliographic references could be used to “fill” the various categories. This would reduce the need to produce text to illustrate each topic. Marcos’ study also includes a lot of information that could be used.
Other

- Claudio proposed that the workshop of September 2013 may take place in the USA, possibly in Carlsbad (NM) at the WIPP, and also do a site visit to the Long-now clock project, not too far from there. There was agreement in principle, but not final yet. It was observed that European organisations will not be able to send as large teams to such a far way place as they send to Paris. Also, the support from the US side is not acquired yet. The fallback position at this stage is Paris.
- Dates and location of the next project meeting: 16-18 April, 2013, in Paris; 2.5 days (perhaps also 3 days).

Actions

- The Secretariat will investigate the possibility of a workshop in the USA with our American colleagues.
- The Secretariat will prepare for the April project meeting in Paris.

### Actions and Decisions

<table>
<thead>
<tr>
<th>Abstracts</th>
<th>ALL</th>
<th>29 SEPT 2012.</th>
</tr>
</thead>
<tbody>
<tr>
<td>If you have not already done so, please provide a 2-4 page abstract of your workshop presentation</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Glossary and Bibliography</th>
<th>SECRETARIAT</th>
<th>OCTOBER 2012.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Place the latest version on the project open web site</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Bibliography</th>
<th>ALL</th>
<th>APRIL 2013</th>
</tr>
</thead>
<tbody>
<tr>
<td>If anyone has a relevant monitoring reference to submit, please do so.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>If you have committed to providing an Abstract, please do so.</th>
<th>ALL</th>
<th>JANUARY 2013</th>
</tr>
</thead>
<tbody>
<tr>
<td>Markers</td>
<td>SECRETARIAT</td>
<td>APRIL 2013</td>
</tr>
<tr>
<td>-------------------------------------------------------------------------</td>
<td>---------------------------</td>
<td>------------</td>
</tr>
<tr>
<td>Marcos: integrate comments and finalize study so that it can be put on the project website</td>
<td></td>
<td>OCTOBER 2012</td>
</tr>
<tr>
<td>Claudio: Contact Abe and then distribute Abe’s text on tsunami stones to the project members</td>
<td></td>
<td>JANUARY 2013</td>
</tr>
<tr>
<td>All: review and give feedback (reflections, structural comments, etc) to Abe’s text. A completion date will be communicated.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>MDD</th>
<th>ALL</th>
<th>JANUARY 2013</th>
</tr>
</thead>
<tbody>
<tr>
<td>Provide comments on establishing the organising principles of the MDD</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

| Prepare a pilot for demonstration of MDD | SECRETARIAT – With assistance from the group as necessary | APRIL 2013 |

| To look into using a training room at the April project meeting to train the group in how to use the Wikimedia site | SECRETARIAT | APRIL 2013 |

| To look into the possibility of using the ANDRA site or others’ to host the MDD | JEAN NOËL DUMONT and others | JANUARY 2013 |

<table>
<thead>
<tr>
<th>Minimum Set of Records Subgroup</th>
<th>MINIMUM SET OF RECORDS SUBGROUP</th>
<th>OCTOBER-NOVEMBER 2012</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Produce a summary of the group’s discussions and a short proposal for taking the subgroup’s work forward along the lines described above.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Intention is to have actual work produced for presentation at the April 2013 meeting</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Regulatory Catalogue</th>
<th>HELEN GORDON-SMITH</th>
<th>JANUARY 2013</th>
</tr>
</thead>
<tbody>
<tr>
<td>Revise draft to put on webpage for review by the Group.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### UPCOMING MEETINGS

#### Project Meeting
Agreed dates: 2 and a half days week 16\textsuperscript{th} – 18\textsuperscript{th} April 2013, in Paris.

- Agenda: MDD and the closing workshop of the project, which will be in 2014.
- The Secretariat will prepare for the April 2013 project meeting in Paris

#### Workshop 2013 – September/October
This next workshop will no longer be a scoping workshop. It will present and discuss initial findings in the framework of the MDD. Perhaps part of the workshop can be dedicated to markers.

<table>
<thead>
<tr>
<th>The Secretariat will investigate the possibility of a workshop in the USA with our American colleagues.</th>
<th>CLAUDIO PESCATORE</th>
<th>JANUARY 2013</th>
</tr>
</thead>
</table>
# ANNEX: PARTICIPANTS LIST

<table>
<thead>
<tr>
<th>Country</th>
<th>Name</th>
<th>Organization</th>
</tr>
</thead>
<tbody>
<tr>
<td>Belgium</td>
<td>Jean-Paul BOYAZIS</td>
<td>ONDRAF/NIRAS</td>
</tr>
<tr>
<td></td>
<td>Jantine SCHRÖDER</td>
<td>CEN/SCK</td>
</tr>
<tr>
<td>Canada</td>
<td>Lisa LANG</td>
<td>Nuclear Waste Management Organisation</td>
</tr>
<tr>
<td>Czech Republic</td>
<td>Miroslav KUCERKA</td>
<td>Radioactive Waste Repository Authority (RAWRA)</td>
</tr>
<tr>
<td>Finland</td>
<td>Kai HAMALAINEN</td>
<td>Nuclear Waste and Material Regulation (STUK)</td>
</tr>
<tr>
<td>France</td>
<td>Patrick CHARTON</td>
<td>Andra</td>
</tr>
<tr>
<td></td>
<td>Jean-Noël DUMONT</td>
<td>Andra</td>
</tr>
<tr>
<td>Germany</td>
<td>Thomas BEUTH</td>
<td>GRS</td>
</tr>
<tr>
<td></td>
<td>Stephan HOTZEL</td>
<td>GRS</td>
</tr>
<tr>
<td>Hungary</td>
<td>Zoltan NAGY</td>
<td>PURAM</td>
</tr>
<tr>
<td>The Netherlands</td>
<td>Eelco KRUIZINGA</td>
<td>DNV B.V.</td>
</tr>
<tr>
<td>Sweden</td>
<td>Mikael JENSEN</td>
<td></td>
</tr>
</tbody>
</table>
Sweden
Erik SETZMAN  SKB
Sofie TUNBRANT  SKB

Switzerland
Marcos BUSER  Institut für nachhaltige Abfallwirtschaft INA GmbH
Anne CLAUDEL  Nagra

United Kingdom
John A. DAY  Sellafield Ltd
Simon WISBEY  NDA

INTERNATIONAL ORGANISATIONS

International Atomic Energy Agency (IAEA)
Peter ORMAI

OECD NUCLEAR ENERGY AGENCY

Helen GORDON-SMITH
Claire MAYS
Claudio PESCATORE