



The Institute of Materials, Minerals & Mining

Committee on Radioactive Waste Management (CORWM) – Institute of Materials, Minerals & Mining Members' Input

The Committee on Radioactive Waste Management (CORWM) has been charged to provide independent scrutiny and advice to UK Government and devolved administration Ministers on the long-term management, including storage and disposal, of radioactive waste. A White Paper, 'Managing Radioactive Waste Safely' (MRWS) was published in June 2008.

CORWM Working Group C: Research and Development has the remit to scrutinize plans for and the performance of UK R&D related to geological disposal and robust interim storage including the availability of the necessary skills and infrastructure.

CORWM has invited the Institute of Materials, Minerals & Mining (IOM3) and other professional institutions and societies to respond to questions with respect to the remit of Working Group C. The questions and the responses obtained from IOM3 members are set out below.

1. What does IOM3 see as its role in the Managing Radioactive Waste Safely (MRWS) process?

IOM3 has within its membership experts on the excavation and construction of large underground caverns and therefore can provide advice on the R&D and other resources needed to create safe geological disposal sites for radioactive waste materials. It also has members who have expertise in the design and materials of construction of first and second level storage barriers to prevent, or delay for as long as possible, the leakage of nuclear waste into the geological disposal cavern. Hence IOM3 can play a role in bringing together these experts in different disciplines to ensure that the whole disposal system and especially the interfaces are rigorously assessed, and the R&D needs, skill gaps and vulnerabilities are identified.

IOM3 members do not believe that sufficient attention has been paid to the materials challenges posed for the safe interim storage, and subsequent geological disposal, of intermediate level (ILW) and high level (HLW) radioactive waste. In particular there is a need to have a clear link between the intermediate storage challenges and the long (geological) time issues for both ILW and HLW. There are R&D needs to examine and a need to predict materials degradation and the monitoring of that degradation over timescales which are much longer than previously addressed.

The UK *Energy Materials Review* (published in November 2007 and in which IOM3 was closely involved) identified challenges for improved inspection, monitoring, and predictive modeling techniques for materials degradation mechanisms which will operate over 0-50 years for ILW and over geological time scales for HLW.

Hence significant R&D programmes are required to underpin initial long-term storage of radioactive wastes, site selection, and the design and operation of the disposal facility. Materials related R&D will be an essential component in each aspect of the programme. It is therefore important that IOM3 is actively engaged in the development and implementation of the programme.

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2. How should IOM3 go about fulfilling this role?

IOM3 members have identified the following mechanisms:

- Convening a structured workshop involving a group of IOM3 experts and the CORWM Working Group on R&D to exchange views and determine how input can be delivered effectively.
- Establishing a small cross disciplinary Group of academic and industrial IOM3 members to provide on going, objective advice for the timeframe of the decisions and implementation of the geological disposal programme.
- Creating a register of IOM3 members with the skills that are relevant to the safe geological disposal of nuclear waste. These will include materials, minerals and mining experts.
- Encouraging and supporting with external lecturers and participation in workshops, university and CPD courses in the disciplines which the safe disposal of radioactive waste requires.
- Encouraging young members of IOM3 to perceive the challenges of safe disposal of radioactive waste to be an attractive career option.

3. How much attention is IOM3 paying to geological disposal and storage, especially packaging materials?

The view of the responding members is that IOM3 is not paying enough attention to this issue. The Institute has responded to requests for information in this area and has linked with the Royal Society of Chemistry to provide a wider view. However, responses so far are deemed to be ad hoc and reactive rather than proactive.

The Energy Materials Group Nuclear Review has included some aspects of decommissioning and storage of nuclear waste in their cradle to grave approach to nuclear power generation.

IOM3 publishes several relevant magazines and journals, including the member magazine *Materials World*, which has published articles and reports of conference proceedings on nuclear waste topics.

4. Do IOM3 Members feel that there should be a focus on this issue?

Most of the IOM3 members who responded are involved professionally through their employment or research in the nuclear industry. These respondents all expressed the view that there should be a focus on this issue along the lines given above in the answers to questions 1 and 2.

A key issue is the nurturing and deployment of the skills required for safe management of radioactive waste. There has been a major erosion of these skills in the UK over the past 20-30 years.

5. Should IOM3 be establishing closer links with other professional bodies, e.g. The Geological Society of London and The Mineralogical Society, to ensure that a systems approach is taken by professional societies and institutions?

All respondents supported closer collaboration with the following professional bodies: The Geological Society of London, the Royal Society of Chemistry, the Institute of Physics, the Royal Academy of Engineering and the Royal Society.

IOM3 should also be involved in providing objective advice to the National Nuclear Laboratory on future research challenges, and feedback on current and near term R&D projects.

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