



The Royal Academy
of Engineering

Managing Nuclear Waste Safely

Defra, BERR and the Welsh and Northern Irish devolved administrations

November 2007

Introduction

The Royal Academy of Engineering is pleased to respond to the Managing Nuclear Waste Safely consultation published in June 2007. The Academy recognises that this consultation is primarily about the processes that Government will adopt to decide the siting of any future nuclear waste facility and the establishment of the technical programme in support of its establishment. The Academy is well placed to provide advice on the technical aspects of nuclear waste management and storage, and will be happy to do so at any time in the future as and when the site selection process demands.

In general, the Academy agrees with the conclusions that came out of the CoRWM process; that deep geological storage with secure interim surface storage for the UK's high level nuclear waste is the correct option for the management of radioactive waste. The principles set out in the CoRWM report for the public and stakeholder engagement are also endorsed. Having accepted CoRWM's recommendations on the public and stakeholder engagement processes, it would be unwise for Government to adopt significantly different processes. In particular, the principle of volunteerism should be maintained.

Assessing and Managing Radiological Risk

The Royal Academy of Engineering has long had an interest in the assessment and managing of risk in the field of engineering. Fellows involved in the Academy's risk work were consulted for their views on the Managing Nuclear Waste Safely consultation and feedback from them raised the following points.

The Academy's study on the Public Perception of Risk recognised that people and communities only accept imposed (self or externally) risks when some direct benefit is perceived (enjoyment, excitement, financial etc). Whilst the Academy fully endorses the plans to engage with likely host communities and to address concerns and provide information concerning the concept, design, operations and quantified risks of a disposal facility, acceptance may not be achieved unless something is given in return. Given the importance of a willing host community Government will need to give significant thought to the "contract" or compact which will be needed between the nation and the community.

Public Engagement

The consultation concerns the socio-technical process of securing public confidence in where radioactive waste repositories are sited in the UK. There is therefore a need for absolute clarity over the role and purpose of evidenced-based assessments for the siting of these facilities. The nuclear sector has a highly developed lexicon for the safety cases that support the siting and operation of waste repositories, some of which is alienating to non-expert public observers; though NIREX did some good work to help with communication. Nevertheless, in these long, complex and interdisciplinary assessments of site suitability, there is every opportunity for experts, publics, regulators and NGOs to 'speak past' one another. There is, therefore, a critical need for staged consensus as the process develops and a continual need to reassert the strategic purpose of the science – both the why (confidence building, long term safety, improved design) and the how (risk-based, focused on issues that drive engineering risk and exposure, use of expert elicitation for future exposures, clarity over regulatory decision points).

Capacity

In order to support both the site selection process and the wider stakeholder engagement process, it is important that engineers and scientists with the appropriate technical skill and knowledge are available. Historically, the peaks and troughs of policy and technical activity in the field of nuclear waste management has led to a situation where the national competency in the field is lacking in depth and breadth compared to what might have been had activity been sustained over the last 50 years.

The technical capacity and know-how that is retained in the UK is currently fragmented, residing mostly in bespoke consultancies with no succession plans in place.

Government needs to move to "project detailed assessment and implementation" as soon as practicable. This will mobilise the existing community and pave the way for corporate and regional planning to underpin a skill base which will be needed for over three decades.

Technical Approach

The technical approach for the management and eventual storage of radioactive waste, as laid out in the consultation document, is sound and achievable in engineering terms. As far as the civil engineering of such facilities is concerned, the specifications are challenging but achievable. There is more concern about the mechanical systems that will be required in both above ground interim storage facilities and in the eventual deep geological disposal facility. Maintenance of ventilation and mechanical handling systems, potentially for hundreds of years, could become a higher risk factor than is currently envisaged. Similar concerns exist over the performance of monitoring and control & instrumentation subsystems over such prolonged periods of time.

Conclusions

The Academy endorses the approach laid out in the consultation document and is pleased that the CoRWM process for engagement with potential host communities is being carried forward. The stated commitment to an open and transparent process throughout is welcomed and the Academy looks forward to being part of the ongoing process.

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