Review of environmental assessment practice in radioactive waste management organisations

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Summary

UK Government policy for the long term management of higher activity radioactive wastes is geological disposal. This involves isolating the wastes deep inside a suitable rock formation to ensure no harmful quantities of radioactivity ever reach the surface environment. Finding a suitable location for disposal involves communities volunteering to take part in a site selection process and then working in partnership with the Government to first identify and then assess the suitability of potential disposal sites.

The UK's Nuclear Decommissioning Authority (NDA) will be undertaking a Strategic Environmental Assessment (SEA) of the implementation plan for geological disposal. In preparation for this a review has been undertaken of environmental assessment practice in other radioactive waste management organisations around the world [Ref. 1]. This paper presents the findings from the review and identifies the key lessons learnt.

The work involved an initial literature review, creation and distribution of a questionnaire, and discussions with respondents.

A number of key themes emerged from the review. These revolved around the need for early and on-going stakeholder engagement; the ability of stakeholders to influence both the development of proposals and decisions about their implementation; the importance of effects people can actually sense (such as noise and vibration), the importance of transport issues and the importance of socio-economic issues.

The information obtained is now being used to support development of the approach to the SEA and associated stakeholder engagement.

Introduction and Background

In 2008, the UK Government and Devolved Administrations published the Managing Radioactive Waste Safely (MRWS) White Paper [Ref. 2] which sets out a framework for implementing geological disposal for higher activity radioactive waste, including a staged site selection process to identify the location of a geological disposal facility (GDF). The white paper also confirms that the NDA is responsible for planning and implementing geological disposal. The site selection process is based on a voluntarism and partnership approach whereby communities volunteer to take part in the process and work with the Government and NDA to identify and assess potential disposal sites.

Once one or more communities have taken a decision to participate in the site selection process, the NDA will undertake a Strategic Environmental Assessment (SEA) and other related assessment work. This will be used to help assess the suitability of potential

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disposal sites and to inform local and national decisions about continued participation in the process and which sites to take forward for more detailed study.

During later stages of the site selection process, Environmental Impact Assessments will be undertaken on specific development proposals.

Aim of the review

The aim of the review was to identify what lessons can be learnt from environmental assessment work already undertaken (or being undertaken) by other radioactive Waste Management Organisations (WMOs) and UK Major Infrastructure Projects (MIPs). The overall objective is to apply this learning to the NDA's work on geological disposal and to identify and adopt, as far as possible, good practice approaches.

The organisations and projects reviewed were:

- International:
    - The Forsmark repository for spent nuclear fuel – a facility proposed by Svensk Kärnbränslehantering AB (SKB) in Sweden (www.skb.se)
    - The Olkiluoto island repository for spent nuclear fuel – a facility proposed by Posiva in Finland (www.posiva.fi)
    - The Port Hope Area Initiative (PHAI) – a long term management solution for low level radioactive waste proposed by Natural Resources Canada (NRCan) in Canada (www. phai.ca)
    - The Waste Isolation Pilot Plant (WIPP) for transuranic wastes operated by the US Department of Energy (DoE), located outside Carlsbad, New Mexico, USA. (www.wipp.energy.gov)
- UK:
    - Severn Tidal Power – a feasibility study commissioned by the UK Department of Energy and Climate Change (DECC) into constructing a tidal barrage in the Severn estuary (webarchive.nationalarchives.gov.uk)
    - Olympic Legacy Masterplan – development of a legacy masterplan for the 2012 London Olympics (www.londonlegacy.co.uk)
    - Low level radioactive waste repository (LLWR), operated by LLW Repository Ltd in West Cumbria (www.llwrsite.com)
    - Low level radioactive waste repository proposed by Dounreay Site Restoration Ltd (www.dounreay.com)
    - Very low level waste (VLLW) landfill facility, operated by the Waste Recycling Group (WRG) at Lillyhall, Cumbria. (www.wrg.co.uk)

Further information on the above organisations / projects is available through the web sites referenced above.

Approach

A standard approach to the review was adopted to promote consistency:

- an initial review of relevant project documentation;
- asking the implementing organisation to complete a standard questionnaire;
- telephone based discussions with the implementing organisations to identify key points; and
- any further documentation review or data collection as required.

Key Findings

Area	Main Points
Plan Level Strategic Environmental Assessment	• Strategic level environmental assessments work well when undertaken as part of a wider strategic option study • Issues raised during strategic assessments are generally representative of issues raised in later stages • Maintain the strategic focus of the work whilst also allowing stakeholders and consultees to clearly identify the impact that any decision will have on them • Early engagement with stakeholder groups and the appropriate local authorities is beneficial to successful strategic assessments
Project Level Environmental Impact Assessment	• EIA best practice is generally well defined and should be applied to a GDF project • Effective interdisciplinary communication is important to the success of project level environmental assessments • Consideration needs to be given to the appropriate assessment of environmental issues within both the safety case and the EIA. As a minimum, some safety case assessment will need to be reported in the output from the EIA • Consultees need to be consulted at points where they are able to influence the design • Consideration needs to be given to assessing wider sustainability issues within the EIA
Stakeholder Engagement & Consultation	• Engagement with stakeholders is important to influence and guide the public consultation process • Openness and transparency in engagement and consultation is vital; project information must not be withheld • Where there is a lack of robust data this must be clearly communicated to stakeholders and consultees • Stakeholders and consultees must be able to influence the decisions taken and ultimately the design • Consideration needs to be given to if, how and when different stakeholder groups should be defined. Different mechanisms and approaches to engagement may need to be developed for different groups • Caution needs to be exercised when including technical experts within consultation workshops; the message provided needs to be clear and not over-complicated • Consultation associated with environmental assessments should not be separated from wider project consultation

Area	Main Points
Socio-Economic Issues	• Assessment of socio-economic issues is a developing area; there appears to be no clearly defined best practice • Approaches that focus on consultee concerns appear to work well • Community funds can be beneficial to the success of a project but need to be proportional to the level of impact
Transport	• Transport is a significant issue to a wide range of stakeholders and consultees • Concern about transport issues is generally focussed on the physical impacts, e.g. noise, vibration, dust and emissions • Consideration needs to be given to the scope of transport assessments and the associated environmental impacts, e.g. inclusion or exclusion of associated transport of raw materials • Consideration should be given to the inclusion of carbon footprint analysis within transport assessments
Baseline Data Requirements	• Use of readily available information at the strategic level followed by focussed data collection at the project level appears to be generally accepted good practice • Information and data used at each stage needs to be appropriate to the decision being taken and applied consistently across all options • The age of the data is an important consideration in its use • Consideration needs to be given to the appropriate split of baseline forecasting between the environmental assessment and the safety case • A clearly defined waste inventory is important to support discussions with potential host communities
Dealing with Uncertainty	• Uncertainties in data need to be communicated clearly to stakeholder and consultees • Different projects have applied varying approaches to dealing with uncertainty • Consideration needs to be given to the approach to uncertainty that will be adopted during the site selection process for geological disposal
Influence on the Design and/or Implementation Plan	• Effective environmental assessment should influence the design and lead to environmental improvements • Environmental and engineering teams need to be integrated and an effective communication process implemented
Feedback from Regulators, Stakeholders and the Public	• All future approvals need to be identified and agreed with regulators and key stakeholders, taking into account that requirements can change as the project progresses

Conclusions

Several key themes were identified from the review which are particularly relevant to the successful delivery of geological disposal. A significant number of the responses received related to stakeholder engagement and public consultation. This is clearly an area where implementing organisations have learnt valuable lessons. In particular, respondents recommended early engagement with stakeholders and local authorities,

allowing stakeholders and consultees to have a tangible influence on the decisions taken, openness and transparency in the information provided, effective communication of uncertainty, and considered use of technical specialists at consultation workshops.

Although effective stakeholder engagement is key to the successful delivery of any project or programme, the review has highlighted its particular importance for high profile, controversial or emotive projects such as radioactive waste disposal.

Another important piece of feedback was that consultees are likely to place more significance on the impacts of the development that they are able to sense, e.g. noise, vibration, dust, etc. This is particularly relevant in relation to transport considerations, which was one of the key areas of concern for consultees across all of the projects or programmes reviewed.

It is important to note that identification of best practice examples in relation to consideration of socio-economic issues within environmental assessment was not possible through this exercise. It appears that best practice in this area is developing at present. This will need to be kept under review and investigated further at a later date.

While it will be important to take into account all of the learning points identified, those considered to be most important are:

- Issues raised by stakeholders related to strategic assessments at early consultation and engagement events are generally representative of issues raised in later stages
- Safety assessments for radioactive waste disposal proposals and SEA/EIA have a different focus and it may be appropriate for them to be assessed separately. However, some outputs from safety assessments will need to be reported in the outputs from the SEA/EIA work
- Stakeholders and consultees must be able to influence the decisions taken and ultimately the design of a disposal facility
- Transport is usually a significant issue for a wide range of stakeholders. Concern about transport issues is generally focussed on the physical impacts, e.g. noise, vibration, dust and emissions
- A clearly defined waste inventory for a geological disposal facility is important to support discussions with potential host communities
- Environmental and engineering teams need to be integrated and an effective communication process adopted to ensure that environmental (and socio-economic) issues are reflected in the development of implementation plans and facility designs.

References

1. NDA (October 2011) *Geological Disposal: Review of environmental assessment practice in waste management organisations and UK major infrastructure projects* (NDA-RWMD Technical Note 15570732)

   May be downloaded from http://www.nda.gov.uk/documents/biblio/

2. Managing Radioactive Waste Safely: A Framework for Implementing Geological Disposal (A White Paper by Defra, BERR and the devolved administrations for Wales and Northern Ireland), Cm 7386, June 2008

   May be downloaded from http://mrws.decc.gov.uk/