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Title:	Preliminary Assessment Report – Design and Engineering (Criterion 4a)
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1 Introduction

This report has been prepared by the Technical Review Group (TRG) to inform the Partnership's assessment of progress towards being able to make a judgement against criterion 4a in its Work Programme.¹

2 Criterion

Criterion 4a is: whether the Partnership is satisfied that the design concepts being developed are appropriate at this stage.

3 What we are looking for

The Partnership's work programme identifies two items under this heading:

- a) Acceptable design concept and flexibility thereof; and
- b) Reassurance that retrievability is an option, and flexibility to confirm this later.

4 Work completed

There are three design and engineering tasks in the Work Programme. The tasks and the chronology of work undertaken are as follows:

4a (i) Examine the generic design concept and how this translates into a specific design depending on any location ultimately chosen.

- 4th September 2009 Partnership Meeting - the Partnership received a paper (Document 29: 'Generic Design Concepts - How will they evolve?') and a presentation from the NDA.
- 14th October 2009 Partnership Meeting - additional clarifications, in the form of answers to questions posed at the September 2009 meeting, were submitted by the NDA in Document 30 ('Five clarifications for the West Cumbria MRWS Partnership').

¹ 'Work Programme for MRWS Partnership 2010/11', Document 13.1.

- 5th August 2010 Partnership Meeting - further clarifications were given in response to issues raised in PSE1 (Document 93, 5 August 2010 Meeting Report, Paragraph 2.12 and reproduced in Annex B).

4a (ii) Develop a common understanding of the meanings of reversibility/retrievability/recoverability and the implications associated with them and associated monitorability, as well as how flexible the generic design concept is.

- 13th January 2010 Partnership Meeting - members received a copy of the Nuclear Energy Agency leaflet on the Retrievability-scale (Document 45) and an accompanying NDA presentation.
- 23rd February 2010 Partnership Meeting - the Partnership agreed the task had been covered to a satisfactory level at this stage and was therefore “provisionally complete”. It was agreed that this would be revisited when the Partnership’s criteria were being formally assessed (Document 58, paragraph 4.5).
- 14th April 2011 Partnership Meeting – presentation on the NDA’s Design System Safety Case (DSSC). In response to a question about retrievability, the NDA stated: “It was acknowledged that there is not a great deal of information about retrievability in the DSSC as retrievability is so site-specific. It was also acknowledged that, from the perspective of a safety case, retrievability has benefits and disadvantages – from a safety case point of view, backfilling and closing sooner is preferable, but from a retrievability point of view it is not. It was noted that this is something that should be discussed with a host community, and it was further noted that, whatever the NDA did, they would have to make sure that it did not compromise the overall safety case.”

4a (iii) Continue to receive updates from the NDA in order to understand the developing generic design concept, and how this translates into a specific design depending on any location ultimately chosen.

- A number of issues that relate to this task were raised in PSE1 (see also Document 73). They are listed, along with the Partnership’s responses, in Annex B.

5 Commentary on the issues

In relation to the criterion and three tasks listed above, the Partnership members have received a great deal of information and had a number of discussions. The NDA/DECC position remains that the details of design and engineering are a site specific issue and this is reflected in the responses we have received to any points that have been raised. Indeed, the NDA’s paper on its generic design concept (Document 29) states that: “At this early stage in the process it is not possible to specify exactly what a geological disposal

facility will look like. The detailed layout and design of the basic geological disposal facility features both above and below ground will depend on its location, as the actual design will be tailored to the geography and specific geological structure at the site in question.” This is likely to continue to be the response received to any issues raised under Task 4a(i) - *Examine the generic design concept and how this translates into a specific design depending on any location ultimately chosen*, and the Partnership seems to have accepted that as a reasonable position, as this is not an issue that has been discussed in depth during recent months.

Task 4a(ii) - *Develop a common understanding of the meanings of reversibility/ retrievability/recoverability and the implications associated with them and associated monitorability, as well as how flexible the generic design concept is* – is potentially confusing, particularly the issue of “retrievability”. (See Annex A for definitions.) However, the White Paper position that retrievability must not be ruled out at this stage and that “the decision about whether or not to keep a geological disposal facility (or vaults within it) open once the facility waste operations cease can be made at a later date” is surely correct. Indeed, the Partnership meeting in February 2010 even considered this task to be “provisionally complete”.

Task 4a(iii) - *Continue to receive updates from the NDA in order to understand the developing generic design concept, and how this translates into a specific design depending on any location ultimately chosen* – could be seen as a bit of a catchall. However, the key outstanding issue raised by the Partnership was in relation to skills and jobs and the NDA presentation to the 24th May Partnership meeting covered both of these issues.

6 Conclusions and recommendations

Criterion 4a is: whether the Partnership is satisfied that the design concepts being developed are appropriate at this stage. If the Partnership is content that issues of detail are site specific and therefore cannot be resolved at this point in the process, then it should be able to agree that it has received what it was looking for in terms of design and engineering.

Annex A – Further information on retrievability taken from Document 37 “Addressing Retrievability in Design”

Policy Position (MRWS White Paper – Section 4.22)

“Government’s view is that the decision about whether or not to keep a geological disposal facility (or vaults within it) open once facility waste operations cease can be made at a later date in discussion with the independent regulators and local communities. In the meantime the planning, design and construction can be carried out in such a way that the option of retrievability is not excluded.”

In its review of options for the long-term management of radioactive waste, CoRWM noted that a phased approach to disposal imparts greater flexibility to future decision-making, but stated that *“leaving a facility open, for centuries after waste has been emplaced, increases the risks disproportionately to any gains”*. In the White Paper (Section 4.20), Government acknowledges that there is a divergence of views on the issue of retrievability, but on balance, considers that CoRWM’s conclusion was correct.

Regulatory Position

The environment agencies Guidance on Requirements for Authorisation (GRA) advises that the incorporation of retrievability into geological disposal should not undermine the long-term safety of the GDF (which would be demonstrated in the environmental safety case for the facility). The GRA notes the particular implications that this would have in terms of demonstrating package longevity:

“If a developer/operator makes provisions for retrievability, these should not unacceptably affect the environmental safety case. For example, a developer/operator might propose to keep a facility open that would otherwise be ready for closure, solely to maintain the option to retrieve waste emplaced in the facility. In such circumstances, the environmental safety case would need to demonstrate that processes such as degradation of waste packages would not unacceptably affect the safety of people or the environment. Such a demonstration would need to consider the effect of remaining open on the environmental safety case both for the period before the delayed closure and for the post-closure period.”

Definitions (from NEA Leaflet – Document 45)

- Retrievability:** Where the design enables the waste to be withdrawn from a GDF, even after vaults had been backfilled.
- Reversibility:** This term is used internationally to denote the ability to reverse decisions, as part of a phased decision-making process. It has also been used in the UK to describe retrieval by reversing the original emplacement process (e.g. removal by the crane which emplaced the package, much as retrieval from a store).
- Recoverability:** A term developed by CoRWM, which usefully defines situations where waste is recovered from a closed GDF by mining or similar intrusive methods.

Annex B – PSE 1 and 2 – Issues relating to Design and Engineering

Issue	Response
3.4.1 (iii) Ensure “transport implications” are covered by NDA’s updates on generic design concept.	Transport implications included within the work of the Impacts Sub-Group (Criterion 3).
3.4.3 (i) Economic Sustainability – Ask the NDA to keep us updated when further, more specific information is available on skills profiles within their three generic design concepts and on plans to ensure these skills are locally available.	This is now complete following the presentation given to the 24 May Partnership Meeting.
3.4.3 (ii) Agree with the NDA what mechanisms could be put in place to ensure that local people and businesses are given maximum opportunity for jobs and contracts within legal limits.	At 5 August 2010 Partnership Meeting, the NDA gave the following response: “given current equal opportunities legislation, the aim would be to maximise local opportunities through skills development, rather than to ring fence jobs.”
3.4.4 (i) Check that the GDSSC covers the venting and containment of gases released from a facility, and that we are content with the response to the issue.	Complete as far as possible at this stage. Presentation received on 14 th April 2011, including on gases. This has now been added to the NDA “Issues Register” and will be investigated further when potential candidate sites have been identified.
3.4.4 (ii) Seek clarification from the NII and the NDA about whose responsibility it is to ensure adequate transport infrastructure is in place before operation, and therefore available for emergency planning purposes.	<p>At the time of writing, the NDA is responsible for transport safety as the Design Authority for the GDF. The transport system design for taking radioactive waste packages to a GDF is defined in the Generic Transport System Designs report and this considers aspects of fleet size, capability to transport all the known waste containers, throughput rates etc. The operational safety of these activities will be covered under the Transport Safety Case and supporting documents with faults and accidents identified in the faults schedule which will form part of the Operational Safety Case.</p> <p>The NDA will also be carrying out a Transport Assessment to support the land use planning process, which will draw a baseline of the current transport infrastructure and the gap between that and the required infrastructure, including provision for emergency response. This assessment will include the wide range of transport issues associated with a GDF, including the movement of</p>

	<p>construction materials and spoil, workers and so on, as well as the transport of radioactive waste packages.</p> <p>The Department for Transport require that the NDA makes arrangements for radioactive incidents/accidents during transport. As the site licence company (SLC), responsible for operations on site, Radioactive Waste Management Directorate (RWMD) would be responsible for meeting site licence requirements. These requirements would include a Site Emergency Plan, as is currently the case for other SLCs.</p>
<p>3.4.4 (iv) Ask the NDA to keep us updated on the progress of the MoDeRn project (Monitoring Developments for safe Repository operation and stage closure project - more information can be found at http://www.modern-fp7.eu/home/) and provide the latest information about monitoring and record keeping e.g. the NDA national archive.</p>	<p>We will keep the Partnership updated on the MoDeRn project, as we have already done with reference to an opportunity for a site visit in 2011 (see 2.6 above).</p> <p>With reference to the NDA National Archive (NNA) this is currently in the design phase, with a possible delivery date of end March 2011. The site has been selected (land previously owned by The Highland Council opposite Wick airport in Caithness) and it is anticipated that the planning permission process will be started very soon. Operational Policies and Procedures are currently in draft and the NNA will co-locate with The North Highland Archive. No further funding for the project has been agreed post-March 2011 until such time as the Public Value Programme and Comprehensive Spending Review processes are completed and approved.</p> <p>A much broader Information Management Compliance Programme is also currently in draft (of which the NNA is a milestone) which we hope to have approval for at the August 2010 NDA board.</p>

A further issue was identified in PSE2:

Issue	Response
<p>4.4 The Partnership should consider the impacts of retrievability and monitorability on public perceptions.</p>	<p>This is an issue to consider as more information on design and retrievability becomes available.</p>