Response to the DEFRA Consultation Document on Managing Radioactive Waste Safely

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Summary

This document sets out the views of Quintessa Limited on some of the questions raised in the DEFRA Consultation Document on 'Managing Radioactive Waste Safely' published in September 2001.

The topics discussed are:

- LLW policy;
- Techniques for public debate;
- The formation of a new advisory body;
- Regulatory arrangements;
- Waste classification;
- The management of sealed sources;
- Waste substitution;
- Decommissioning;
- Plutonium and uranium;
- Options for radioactive waste management.

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1 Introduction

This document sets out the views of Quintessa Limited on some of the questions raised in the DEFRA Consultation Document on 'Managing Radioactive Waste Safely' published in September 2001. Quintessa's motivation in responding to the present consultation exercise is to help ensure that the UK establishes an integrated programme for the long-term management of radioactive waste that is in keeping with the best international practice.

Quintessa is an Anglo-Japanese scientific and mathematical consultancy company specialising in strategic and safety issues relating to radioactive waste management and disposal. Over the past three years, Quintessa has worked for twenty-five organisations concerned with the implementation and regulation of radioactive waste management in twelve countries. Several staff at Quintessa have over twenty years experience of radioactive waste management in the UK.

2 LLW Policy

While seeking to address the issues that are identified in Chapter 8 of the Consultation Document, we would like to preface our specific comments with a brief observation on the scope of the proposals contained in the paper. Although we would not wish to diminish the importance of making progress in policy on intermediate-level waste (ILW), high-level waste (HLW), plutonium and spent fuel, we consider that some of the most urgent questions of today actually arise in relation to policy on low-level waste (LLW).

The Consultation Document appears to discount such issues by suggesting that potential management options for LLW will need to be addressed only in relation to the period following 2050 (paragraph 3.3). However, projections for the cumulative production of LLW are strongly conditional on assumptions made about the timing of decommissioning. Indeed, it is our understanding that important strategic decisions on waste management planning today are being affected by the lack of a clear disposal route for decommissioning LLW.

Many of the detailed comments reflect our view that various aspects of LLW management merit a higher profile than has been accorded to them in the Consultation Document. Relevant issues include disposal options for the large volumes of very low

activity waste anticipated as a result of decommissioning and guidance on site clearance levels.

3 Techniques for Public Debate

This section responds to paragraphs 5.25 and 5.39 of the Consultation Document.

There are two aspects to the public debate: initiatives taken by Government and initiatives taken by industry.

It is commendable that the Government is seeking to involve as many people as possible in the debate on radioactive waste management policy. However, as indicated by some of the references included in the Consultation Document, radioactive waste issues are not a major concern for most people. Novel communication techniques are unlikely to increase levels of participation greatly, especially if they are not clearly seen to be implemented as part of an institutional process that will deliver results. Whatever the level of participation in the debate, it is the Government's responsibility to determine policy. Everyone should be given the opportunity to contribute to the debate, and all relevant information should be made readily available, but at the end of the consultation period Government must act.

As suggested in the Consultation Document, the use of the Internet is critical. Although industry and Government are making attempts to make effective use of this technology, to date the results compare poorly with best international practice. For example, the web-site operated by the Swedish company SKB provides rapid and open dissemination of information to all interested parties. Its UK counterpart, Nirex, has made significant advances in recent years, but the provision of information on research and documentation is slower and less efficient. The Internet is already the primary information source for many people, and any consultation exercise will need to make maximum use of it to enable information to be provided and views to be expressed. Financial provision needs to be made for this.

BNFL's Stakeholder Dialogue programme can be seen as groundbreaking in the UK nuclear industry. It provides a forum in which nationally important issues can be discussed. Although other nuclear industry organisations have arrangements for stakeholder dialogue at a local level, they do not have corresponding programmes at a national level. Government should encourage the industry to pursue such programmes.

4 The Formation of a New Advisory Body

This section responds to paragraphs 6.10 and 6.25 of the Consultation Document.

Quintessa strongly supports the Government's declared aim (Executive Summary item 4) namely:

> *"…. to develop, and implement, a UK nuclear waste management programme which inspires public support and confidence."*

To achieve this aim it is necessary to establish an organisational structure for radioactive waste management that commands widespread confidence. This matter has recently been considered in depth by the House of Lords Select Committee on Science and Technology, who built on recommendations in the Flowers' Report two decades earlier.

We believe that two principles are important:

- The Advisory Body should be newly constituted. If the Government wishes to make a new start in radioactive waste management, it is important that the Advisory Body is not just a modified form of an existing body. The new body will, of course, draw expertise from existing bodies, but it needs to develop its own culture and reputation independent from any existing organisation.

- The Advisory Body should commission research from a range of different organisations. It should be responsible for planning and co-ordinating the research programme, but not for undertaking the research itself.

These suggestions are broadly in line with the recommendation of the House of Lords Select Committee's concerning the establishment of a Nuclear Waste Management Commission. We believe that the House of Lords recommendations should now be implemented in full as soon as practicable.

5 Regulatory Arrangements

This section responds to paragraph 7.20 of the Consultation Document.

In the present regulatory environment in the UK, radioactive waste producers have conflicting requirements placed on them by two, or even three, regulatory bodies. The problem is not the existence of different regulators for different regulatory functions,

but the effectiveness of co-ordination between regulators on issues (such as waste storage) where regulatory responsibilities overlap.

Generally, the difficulties are most evident where there is a conflict between regulatory objectives for waste management in the short-term versus the long-term. For example, storage of LLW on site is discouraged for operational safety reasons (short-term), whereas storage might benefit the longer-term management of waste by allowing the development of alternative long-term management options.

Arrangements such as the 'Memorandum of Understanding' operate effectively in most existing situations, but a more detailed specification of responsibilities is needed for the longer term waste management problems that are beginning to be faced, particularly decommissioning. Effective mechanisms to enable operators and regulators to have thorough and meaningful discussions on strategic objectives at an early stage are essential.

We suggest that a detailed review of the application of regulation to radioactive waste management should be undertaken as part of the next stage of the Government's programme.

6 Waste Classification

This section responds to paragraph 2.17 of the Consultation Document.

Proposals to include radionuclide half-lives in the UK classification of radioactive waste have been made previously in research commissioned by Government. The current UK scheme has several inconsistencies for historical reasons. In paragraph 2.16 of the Consultation Document it is stated that most UK wastes contain a mixture of radionuclides of different half-lives, but UK waste is no different in this respect from that produced in other countries with a nuclear power programme (particularly France).

As stated in the Consultation Document, one of the conclusions of the UK CEED Consensus Conference was that a new and internationally recognised method of classifying waste should be introduced. The EU classification scheme presents an opportunity for the UK to introduce a more coherent scheme consistent with international practice.

The approach to classifying wastes with very low concentrations of radioactivity will have particularly important implications as increasing numbers of nuclear facilities

begin to plan for decommissioning. In particular, a clear and scientifically sound basis for the clearance of large quantities of demolition and scrap materials could have a substantial impact on decommissioning plans and national requirements for future LLW disposal capacity. The concept of 'generic authorisations' could be of use in this respect. Problems with the existing system of exemption orders are well recognised and have been considered by Government. Any revision of radioactive waste classifications should take into consideration these issues, and related issues such as site de-licensing requirements.

7 The Management of Sealed Sources

This section responds to paragraph 2.41 of the Consultation Document.

Spent sealed sources represent a special waste management problem both in the UK and overseas. RWMAC has recognised the importance of this issue, and their recommendations provide a sound basis for dealing with it.

8 Waste Substitution

This section responds to paragraph 3.14 of the Consultation Document.

Any substitution of ILW for HLW would add to the quantities of ILW that need to be managed in the UK. However, the resulting increase would not represent a large fraction of the total, and would not significantly change the nature of the problem. It has advantages in reducing the volume of waste that needs to be transported between countries. There is therefore no reason in principle why such waste substitution should not take place if it represents the best practicable environmental option.

9 Decommissioning

This section responds to paragraph 3.33 of the Consultation Document.

It is sensible for decommissioning strategies to be produced on a facility-by-facility basis, but the lack of clear Government policy on long-term radioactive waste management makes discussions between the licensee and the HSE much more difficult. This is an example of an area in which there is a clear incentive to clarify policy as soon as possible.

The planning stage would also benefit from broader consultation, in particular on the basic objectives and philosophy for decommissioning. For example, the environment agencies have an interest in long-term waste management and contaminated land, and the overall proposals should recognise local community views. The overall framework of 'strategic environmental assessment' would be useful for developing decommissioning strategy, although we recognise that this regulatory concept is associated with the planning process, and careful consideration would need to be given to whether this is the most appropriate regulatory framework for addressing these issues.

HSE is developing practical definitions for de-licensing criteria. Whilst there are very sound scientific arguments for dose-based criteria, simple calculations show that criteria of 10, or even 300 μSv/y imply very low radionuclide concentrations when considering 'any future use of the site'. In practice such criteria may well be extremely difficult to meet and there is also the danger of adopting dual standards for licensed and non-licensed sites; such criteria can imply levels of contamination that are far below those associated with wastes permitted for free release. Careful consideration needs to be given to how de-licensing can be defined in a manner that both ensures long-term safety and allows the practical 'clean up' of nuclear sites. This may require a fundamental reappraisal of principles and policy.

At present, provisions for decommissioning some UK reactors employ a 'funded' approach, and some do not. Although there are good reasons for this difference between the public and private sectors, public confidence that adequate resources are being put aside would be increased if a funded approach were taken for the decommissioning of all UK nuclear reactors.

10 Plutonium and Uranium

This section responds to paragraphs 3.46 and 3.57of the Consultation Document.

Appendix 5 of the Consultation Document sets out some principles relevant to decisions on the long-term management of radioactive wastes, emphasising sustainable development. The principle of sustainable development can be interpreted as meaning that disposal should only be used as the last resort for materials that cannot be recycled and reused. Thus plutonium and uranium should not be disposed of until it is clear that there is no possibility for recycling and reuse.

The general problem of materials that are currently not declared as wastes, but which may become wastes in the future, was discussed in the R&D study referred to in

paragraph 6.19. The fact that such materials are not included in the National Inventory of Radioactive Wastes makes planning for future radioactive waste facilities more difficult. We suggest that a possible way forward could be found based upon the following principles:

1. The onus should be on the owner of the material to demonstrate to the HSE that it will have a beneficial use in the foreseeable future. In the absence of such a demonstration, the material would be declared to be a waste by the HSE.

2. Materials that are not currently wastes, but which could possibly become wastes in the future, should be included in the National Inventory of Radioactive Wastes with their status clearly indicated.

11 Options for Radioactive Waste Management

The Consultation Document suggests that there are many options for the management of radioactive waste. In fact, as shown in Appendix 1, the number of options is actually very limited. Many options are ruled out by international agreements or impracticality. The options remaining are different storage or disposal concepts, differing with regard to timing and location. Furthermore, there need be no sharp distinction between storage and disposal. For example, a monitored retrievable underground store could be converted to a disposal facility at some time in the future.

We note that the options described in Appendix 1 are principally concerned with methods for long-term management. However, the development and implementation of policy is concerned not only with the mode of waste management, but also the wider strategic question of how such systems are implemented. Strategic questions that should be addressed in relation to long-term management include the potential role of multiple regional facilities rather than single national arrangements for different categories of waste (particularly in relation to wastes of very low activity) and the benefits or otherwise of co-locating facilities for different categories of waste.