

Nuclear Free Local Authorities **RADIOACTIVE WASTE POLICY** Briefing on the Government Review

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DECOMMISSIONING POLICY UNDER THE SPOTLIGHT

The Government is shortly to issue a consultation paper on nuclear decommissioning, with the aim of having a clear policy framework in place by the time the new Nuclear Decommissioning Authority (NDA) has been set up¹. This briefing has been prepared to assist local authorities and other readers respond to the consultation. It focuses on the key features of a policy framework that seeks to secure stakeholder and public confidence.

Two of the critical questions under consideration by Government are:

- What is meant by decommissioning² being carried out “as soon as reasonably practicable”, as stated in existing policy?
- What is the best way of ensuring review and audit of decommissioning strategies on the basis of independent advice and consultation?

NFLA and other evidence³ to the recent Planning Inquiry into the decommissioning of Trawsfynydd Nuclear Power Station provide a powerful account of the problematic history that lies behind these questions.

Overcoming this problematic history is likely to require the use of best practice in stakeholder engagement. This briefing argues that this should encompass: ‘joint fact finding’ on contested knowledge claims relevant to reactor decommissioning; a national strategic review of decommissioning options, under the auspices of the NDA and involving key stakeholders; and full local consultation on the proposed strategy, so that it can be amended and adapted on a site specific basis.



THE LOCAL GOVERNMENT VOICE ON NUCLEAR ISSUES

DECOMMISSIONING STRATEGY: A PROBLEMATIC HISTORY

To date, there has been only limited public scrutiny of decommissioning strategies in the UK. This has largely focussed on the Magnox reactors, which are owned by BNFL and licensed to its subsidiary, Magnox Electric.

Magnox Electric describes its decommissioning strategy as ‘safestore’, which usually entails:

- Stage 1: after closure, removal of the spent fuel, removal of most inactive buildings, and preparation of the reactor buildings for a period of ‘care and maintenance’;
- Stage 2: after around 30 years, further work on the reactor buildings to enable an extended period of ‘surveillance’ (creating the ‘safestore’); and
- Stage 3: after extended ‘safestore’, dismantling of the reactors.

For the Trawsfynydd station, Magnox Electric proposes that Stage 2 will be carried out immediately after Stage 1.

The emergence of the ‘safestore’ strategy can be traced back to 1990, when – under pressure to reduce costs - the Board of Magnox Electric’s predecessor, Nuclear Electric, gave the go-ahead for studies of a range of decommissioning strategies, including ‘safestore’ and an in-situ option known as ‘entombment’⁴. These were followed by the use of a Multi-Attribute Decision Analysis (MADA) to inform a choice between the various options.

The MADA involved internal company teams ascribing scores to different options, having assessed each against weighted environmental, safety, technical and costs criteria. The results were summarised by Nuclear Electric as follows:

The clear outcome of the analysis and the sensitivity studies was that ‘safestore’ followed at 135 years by dismantling is an attractive strategy .. The timing of the construction of the ‘safestore’ did not appear to be critical between doing it early or at 35 years. However, cash flow considerations lead to a strong preference for deferring it to 35 years after station shutdown.⁵

Initially, no information about the scores and weightings that lie behind this conclusion was released. However, in 1993 a further paper was published⁶. Although acknowledging that the outcome of the MADA depended on the “subjective views of the expert groups which made the decision”, the paper claimed that the findings were robust because of the sensitivity testing that had been carried out. However, this claim is of limited value because one key option – early dismantlement – had been completely excluded from the MADA.

As explained in the Nuclear Installations Inspectorate’s (NII) most recent review of Magnox decommissioning strategy, the company carried out a more extensive MADA in 1997/98⁷. However, this was also confined to internal company teams, and rejected some key options early in the assessment. The rejected options included:

- at Stage 1, the retention of spent fuel on site in a purpose-built store (because of “ongoing contractual discussions”); and
- at Stage 3, immediate dismantling (because of “insufficient data”).

Twelve options were then taken through the MADA process. This concluded that the ‘Best Practicable Environmental Option’ (BPEO) is a ‘safestore’ option with final dismantling *or* in-situ-disposal deferred for a period of 70 years or more following shutdown. It also observed that there is no overall advantage between early or deferred ‘safestore’, and immediate dismantlement is not optimum on the grounds of safety, waste minimisation and cost.⁸

The NII has expressed a number of reservations about the Magnox Electric MADA/BPEO study:

- it has asked the Company to review the “appropriateness” of its decisions to reject key options at the screening stage, and “justify any proposals not to progress further work” to address each of the rejected options;
- it is concerned that policy that decommissioning be carried out “as soon as reasonably practicable” may not have been sufficiently addressed, and considers that the desirability of earlier decommissioning should have a more significant influence on the MADA results;
- it is concerned that the costs (‘net present value’) attribute heavily influences the MADA results, and that this should be initially excluded from a further analysis so that the effects of other attributes can be more clearly identified; and
- it considers that the Company should engage with its external stakeholders to review the retention or rejection of options, and subsequent scoring and weighting.

The NII also points out that the MADA process has influenced, but not determined, Company strategy⁹. Internal management discussions subsequent to the MADA have revised the strategy, which now involves early dismantling of most plant on a site, with the exception of the reactor buildings and the creation of a new ILW store. Reactor dismantling is envisaged around 100 years after shutdown. On this the NII comments:

The NII, whilst recognising that some deferral period appears to be appropriate, considers that the documentation does not provide sufficient evidence that a further reduction in the deferral period would not be reasonably practicable.¹⁰

The MADA/BPEO study was also a major bone of contention at the Trawsfynydd Public Inquiry. NFLA evidence argued that the inquiry should have full access to the study because:

.. it is believed that examination of the MADA would enable us to present evidence that the decision-making process has been defective in a number of ways, including supporting the deferral of dismantlement for 100 years and failing to examine early site clearance in any sufficient way.¹¹

Magnox Electric, however, refused to make the study available.

NFLA evidence also highlighted that the early dismantling of Magnox reactors is planned in Italy and Japan, providing a sharp contrast to the industry’s favoured approach in the UK¹².

DECOMMISSIONING STRATEGY: THE NEED FOR FUNDAMENTAL REVIEW

It is likely that Magnox Electric considers its decommissioning strategy to be consistent with the output of the MADA process and the identification of a BPEO.

However, as highlighted in NFLA evidence to the Trawsfynydd inquiry, the Royal Commission on Environmental Pollution (RCEP) has stated that a BPEO should be the outcome of a “systematic consultative and decision-making procedure”, which provides “.. the widest possible opportunity for

others who may be affected to contribute to the decision”¹³. More recently, the RCEP has stated that “The public should be involved in the formulation of strategies, rather than merely being consulted on already drafted proposals”¹⁴.

In contrast, Magnox Electric’s approach to MADA and identifying a BPEO has relied on internal company teams, and has not met the RCEP’s expectations of openness, transparency and external participation.

The company’s approach also looks inadequate when viewed against the Government’s expectations of how the proposed Nuclear Decommissioning Authority (NDA) will operate in the future. It states that the NDA will:

.. be a champion of public information – visible, accessible, providing clear and comprehensive information about its activities consistent with security requirements and necessary commercial confidentiality, and actively engaging with its stakeholders .. The Government will expect major decisions to be taken only in the light of full consultation with stakeholders.¹⁵

In the light of the problematic history, and the expectations above, there is a strong case for the proposed NDA to undertake a fundamental review of reactor decommissioning strategy. This review should engage external stakeholders from the outset – including local authority representatives - so that buy-in to the scope and methods can be secured. External stakeholders should also be directly involved in the identification and screening of options, the identification and weighting of evaluation criteria, and the scoring of options¹⁶. Although the final decision on decommissioning strategy would still lie with the NDA, such an approach should be able to take full account of different stakeholder values and perspectives. It would also enable the NII’s concerns about the 1997/98 MADA/BPEO to be addressed.

LAYING THE GROUNDWORK FOR FUNDAMENTAL REVIEW

Evidence to the Trawsfynydd inquiry, and the NII review of Magnox Electric’s decommissioning strategy, highlight a number of contested issues relevant to the proposed fundamental review. At the time of writing, it is not known to what extent the Inspector’s report will clarify or tackle these issues. It does not seem likely, however, that it will resolve key issues to the satisfaction of all stakeholders. There will almost certainly be a need for some additional work to be done to seek to achieve this prior to the fundamental review of decommissioning strategy.

This additional work may need to address the following issues:

- *Changes in allowable reactor access over time*: In evidence to the Trawsfynydd inquiry the Welsh Anti Nuclear Alliance (WANA) highlighted a series of inconsistencies in industry claims for changes in allowable reactor access over time¹⁷. It is important to resolve these inconsistencies because of the way in which estimates of access time can influence decisions, particularly on the timing of reactor dismantling. WANA conclude that a hundred year delay is of questionable value in terms of permitting worker access to reactor cores, because it will remain necessary to use remote handling techniques to do the job safely. They add that, as a result, dismantling may just as well be done after a 30 year deferral period, after which the radioactive inventory in the reactors will have decayed by 99%, with little gain through further delay.

- *Are radioactive wastes in the reactors sufficiently passively safe for substantial delay before dismantling?* WANA evidence argues that Magnox Electric has failed to demonstrate that the radioactive wastes in the core of the Trawsfynydd reactors are passively safe and in a suitable form for long periods of delay before dismantling¹⁸. It argues that although the hazard posed by these wastes is acceptable for 30 years or so, it will increase to unacceptable levels over a longer period, as a result of degradation caused by corrosion, moisture penetration, or microbiological action.
- *Costs and funding of decommissioning:* NFLA evidence to the Trawsfynydd inquiry notes that the “ostensible financial advantages of delay” encourage strategies based on the postponement of dismantling¹⁹. It adds, however, that funding arrangements based on substantial delay involve a breach of intergenerational equity and polluter pays principles, and of policy that steps should not be taken to “foreclose technically or economically the option of completing .. [decommissioning] on an earlier timescale should that be required.”²⁰ The NFLA evidence concludes that current decommissioning cost and funding estimates should be subject to public review, and that this should encompass consideration of the impacts of adopting a strategy based on much shorter periods of delay. The NII review of Magnox Electric’s decommissioning strategy also raises important cost and funding issues that it wants the company to address²¹.

One potentially fruitful approach to tackling some of these issues is ‘Joint Fact Finding’ (JFF). This involves a mixed group of stakeholders commissioning work on the basis of agreement about terms of reference, who should undertake it, and methodologies. Agreement on these aspects increases the likelihood of widespread stakeholder confidence in the findings. Such an approach has been used with success in the National BNFL Stakeholder Dialogue²², and could in principle be pursued in BNFL’s Magnox Decommissioning Dialogue.

It would clearly be beneficial if jointly agreed outputs on these issues could be fed into a fundamental review of decommissioning strategies by the proposed NDA²³.

LOCAL CONSULTATION

Assuming that the NDA agrees the broad thrust of a reactor decommissioning strategy, it would then be necessary to undertake some form of participative local consultation, to inform the adaptation and development of strategy on a site-specific basis.

One approach to local consultation might be to build on that being developed at Dounreay, where the UKAEA have set up a panel of local stakeholders to review the company’s assessment of options for dealing with particular waste streams²⁴. The panel approach is being supplemented by steps to seek the views of a wider range of local stakeholders.

For Magnox sites, there are a range of local factors that need to be taken into account when reviewing and adapting decommissioning strategy. These include:

- *Reactor design differences:* there are considerable differences in the detailed designs of the Magnox reactors, including whether they have cylindrical or spherical, and steel or concrete pressure vessels²⁵.

- *Potential impact of Climate Change*: the currently proposed timetable for ‘safestore’ structures are sufficiently long for coastal changes to become a potential issue, which could impact on measures to maintain a site in a satisfactory state²⁶.
- *Environmental and socio-economic impacts*: the significance of these could vary from site to site, depending on the local environment and economy.

Other factors relevant to site clean-up will also need to be addressed through local participative consultation. These include:

- *Contaminated land*: some of the sites contain contaminated land as a result of spillage, leakage, or shallow burial of radioactive materials, raising issues which need to be taken into account in management and clean-up²⁷.
- *End-points for site remediation*: the Radioactive Waste Management Advisory Committee (RWMAC) has suggested that it is becoming increasingly important to identify the desired ‘end points’ for site remediation. It adds that any perception that major sites can be returned to uncontaminated “green field” status is likely to be unrealistic. Indeed, the Committee suggests that consideration be given to the in-situ burial or on-site landfill of low level radioactive wastes from decommissioning, so as to avoid the excavation and transport of huge volumes of slightly contaminated material from one site to another²⁸. RWMAC has flagged up a big dilemma²⁹. All management routes - including in-situ burial and on-site landfill - look deeply problematic. In particular, the Government has previously back-tracked on proposals for increased use of local landfill, following public opposition in the mid-1990s.

The NDA will need to take full account of the outcome of local consultation on this range of issues when agreeing a programme of decommissioning and clean-up across the Magnox sites.

IMPLICATIONS FOR POLICY

The arguments developed in this briefing have some important implications for the development of a clear policy framework for the NDA.

Two of the critical questions under consideration by Government are:

- What is meant by decommissioning being carried out “as soon as reasonably practicable”, as stated in existing policy?
- What is the best way of ensuring review and audit of decommissioning strategies on the basis of independent advice and consultation?

On the first question, it is clear that interpretation of the term “as soon as reasonably practicable” requires significant technical input and the exercise of judgement based on the weighing of a wide range of national and local factors. This briefing has shown that previous interpretations have been challenged, on the grounds of both contested technical inputs and disputed value judgements.

In such circumstances, the Government’s proposed policy statement should not seek to impose a narrow meaning of the term “as soon as reasonably practicable”, but set out the required features of a

process which will enable legitimate interpretations to be properly mapped out. Such a process should enable the NDA to take decisions which are properly informed by a full range of stakeholder views.

The key features of the required process have been outlined above. They include:

- some form of ‘Joint Fact Finding’ on contested knowledge claims, where a mixed group of stakeholders commissions and oversees work on the basis of agreement about terms of reference, who should undertake it, and methodologies;
- a national strategic review of decommissioning options by the NDA, conducted in a way which conforms with the expectations of the RCEP and the ‘Managing the Nuclear Legacy’ White Paper on openness, transparency and stakeholder engagement; and
- participative local consultation on the proposed strategy, so that it can be amended and adapted on a site specific basis, in the light of local factors and views.

It is worth noting that this approach provides a challenge to a statement in the Government’s ‘Managing Radioactive Waste Safely’ consultation paper, which invited comments on decommissioning policy. The statement in question is:

We believe that the timetable for decommissioning should be determined by the licensee, in conjunction with the HSE.³⁰

In contrast, the approach outlined above proposes that the timetable for Magnox decommissioning should be determined by the NDA, in conjunction with the licensee and HSE, and after engagement with other key stakeholders at national and local levels.

On the second question – what is the best way of ensuring review and audit of decommissioning strategies – there is a need to consider how to build on the reviews carried out by the NII on a five year cycle. The task of undertaking quinquennial reviews was given to the NII as a result of the 1995 White Paper on radioactive waste management³¹. Although these reviews are important – as evidenced by the references to the recent review of Magnox Electric’s strategy at various points in this briefing – there is a need to enhance current arrangements.

A starting point would be to require early publication of an operator’s submission to the NII as a matter of policy, so that stakeholder comments could be taken into account by the NII as part of its review. Beyond that, there is a need to involve a wider range of stakeholders in the review and audit of decommissioning strategies. The precise form that this wider involvement takes will depend in part on the processes for stakeholder engagement that the NDA sets up. At the very least, this should include review and audit of the strategy at specific sites through participative consultation on a local level. Such an approach would conform with the emphasis now being placed on stakeholder engagement by the Government.

Against this background, and as the setting up of the NDA approaches, it is clear that the nuclear industry will have to learn fast from the problematic history of developing decommissioning strategies. It is hoped that this briefing will assist that process.

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- ¹ For a briefing on the Nuclear Decommissioning Authority (formerly known as the LMA), see NFLAs, ‘Government Seeks Views on the Managing the Nuclear Legacy’, Radioactive Waste Policy Briefing, No 7, September 2002.
- ² The Government has defined decommissioning as “the process whereby a nuclear facility, at the end of its economic life, is taken permanently out of service and its site made available for other purposes.” DTI, ‘Managing the Nuclear Legacy: A Strategy for Action’, Cm 5552, July 2002, Glossary.
- ³ J K Woolley, Proof of Evidence, Planning Inquiry, Trawsfynydd Power Station, PE/NFLA/1, 2002, and H Richards, ‘Proofs of Evidence’, WANA, October 2002.
- ⁴ ‘Entombment’ is envisaged to entail the mounding over of a reactor in the location where it was built, thereby creating a radioactive waste disposal site.
- ⁵ F H Passant, ‘Power Station Decommissioning – UK Strategy’, Paper presented to the Nuclear Forum ’91, 25-26 June 1991.
- ⁶ S C Gordelier, ‘Illustration of an Approach to the Assessment of Decommissioning Strategies’, February 1993, Paper presented to the IBC Conference, the ‘Decommissioning of Nuclear Facilities’.
- ⁷ NII, ‘Magnox Electric plc’s strategy for decommissioning its nuclear licensed sites’, HSE, February 1992.
- ⁸ NII, as above, para 80.
- ⁹ NII, as above, para 85.
- ¹⁰ NII, as above, para 86.
- ¹¹ J K Woolley, as above, p23.
- ¹² J K Woolley, as above, p39-41.
- ¹³ RCEP, ‘Best Practicable Environmental Option’, 12th Report, 1988.
- ¹⁴ RCEP, ‘Setting Environmental Standards’, 21st report, 1998 (see paras 7.22 and 9.77).
- ¹⁵ DTI, ‘Managing the Nuclear Legacy: A Strategy for Action’, Cm 5552, July 2002, para 3.24.
- ¹⁶ A fundamental challenge to those involved in strategy review is how to ‘represent’ future generations in the discussion. Without specifically addressing this issue, it is unlikely that current generations will adequately weigh the interests of future generations. One approach to tackling this might be to appoint a ‘future generation advocate’ in the review process.
- ¹⁷ H Richards, ‘Hundred Year Deferral Does not Mean Safe Access for Workers’, WANA Proof of Evidence 2, Trawsfynydd Public Inquiry, October 1002.
- ¹⁸ H Richards, ‘Radioactive Waste in the Reactors is not Passively Safe’, WANA Proof of Evidence 3, October 2002.
- ¹⁹ J K Woolley, as above, p36.
- ²⁰ ‘Review of Radioactive Waste Management Policy – Final Conclusions’, Cm2919, July 1995, para 126.
- ²¹ NII, as above, paras 83, 121, 124-125, 129-130, and 133.
- ²² See for example, ‘Radioactivity Monitoring at Brent Yard Railway sidings, Willesden’, The Environment Council, October 2001, and ‘West Cumbria: SocioEconomic Study’, ERM for The Environment Council, November 2001.
- ²³ It is understood that Magnox Electric has commissioned research from the Warwick Business School on the sustainable development implications of decommissioning. The reports of this work should be released into the public domain, so that they are available for consideration prior to the proposed NDA review of decommissioning strategies.
- ²⁴ UKAEA, ‘Dounreay Site Restoration Plan’, Public Participation Newsletter 1, October 2002.
- ²⁵ NII, as above, paras 35-44.
- ²⁶ NII, as above, para 90a.
- ²⁷ NII, as above, paras 99-101.
- ²⁸ RWMAC, ‘Advice to Ministers on Management of Low Activity Solid Radioactive Wastes within the UK’, March 2003, paras 6.6-6.9 and 7.3.
- ²⁹ In response to the RWMAC report, the Environment Minister has stated that the Government is reviewing the issue, and will be asking the new Committee on Radioactive Waste Management to “examine the delivery of our plans for the disposal of low-level waste”. Parliamentary Written Answer, 3 April 2003, Col 1065.
- ³⁰ DEFRA et al, ‘Managing Radioactive Waste Safely: Proposals for developing a policy for managing solid radioactive waste in the UK’, September 2001, para 3.32.
- ³¹ DoE et al, ‘Review of Radioactive Waste Management Policy: Final Conclusions’, Cm 2919, July 1995.