

# **THE DECOMMISSIONING OF THE UK NUCLEAR INDUSTRY'S FACILITIES**

## **Introduction**

1. This statement of the UK Government and devolved administrations' policy on the decommissioning of nuclear facilities updates and replaces the previous statement contained in paragraphs 120-131 of "Review of Radioactive Waste Management Policy Final conclusions" (Cm 2919) published in July 1995.<sup>1</sup>

## **Coverage of the policy**

2. This statement covers all (existing and new) UK nuclear industry facilities and their sites. This includes power stations, other reactors, research facilities, fuel fabrication and reprocessing plants and laboratories on sites licensed under the Nuclear Installations Act 1965. It also includes the site at Culham used for research into fusion and, where relevant, facilities on sites owned by the Ministry of Defence, nuclear submarines and their liabilities.

## **Decommissioning operations and strategies**

3. Decommissioning is a staged process through which a nuclear facility, at which normal operations have finally ceased, is taken out of service, including full or partial dismantling of buildings and their contents. It may include other operations such as the decontamination of buildings which are not to be dismantled and the remedial treatment or restoration of the land under and around the facility. The objective of decommissioning is to remove the hazard the facility poses progressively, giving due regard to security considerations, the safety of workers and the general public and protecting the environment, while in the longer term reducing the number of sites and acreage of land which remain under regulatory control. Decommissioning operations should be carried out as soon as reasonably practicable, taking all relevant factors into account as provided for in the relevant operator's strategy and plan. The Government recognises that decommissioning operations may, however, involve two or more separate stages spanning a number of decades. It may also be more appropriate to delay particular operations to benefit from new or developing technologies or from further development of existing best practice, or to take advantage of radioactive decay. The Government confirms that, as with regulatory approval, the relevant factors, and their respective importance, can only be determined on a case-by-case basis.

4. Each operator is expected to produce and maintain a decommissioning strategy and plans for its sites. The Government expects that those strategies and plans will take into account the views of stakeholders (including relevant local authorities, public and stakeholder groups). Strategies should include a comprehensive site decommissioning plan for safely carrying out the decommissioning process with due regard to security and protection of the environment. Each plan should take into account any proposed future

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<sup>1</sup> The statement was the subject of a public consultation which began on 30 November 2003 and ended on 27 February 2004. 55 responses to the consultation document were received. These have been taken into account in finalising the statement.

use of the site in question. Operators of sites which are the responsibility of the Nuclear Decommissioning Authority (NDA)<sup>2</sup> are expected to produce and maintain plans for their sites. Each plan will need to be consistent with the overall strategy of the NDA and be subject to its approval. A strategy may apply to more than one facility on a site or to a number of similar facilities on different sites, but in this situation each individual facility should be separately assessed and costed. The Government also expects that operators will typically begin to refine strategies and plans, in consultation with the regulators and stakeholders before they plan to close the facilities (or first facility as appropriate).

5. A strategy should take into account all relevant factors, assessing and presenting them in a transparent way underpinned by objective information and arguments. These include:

- ensuring worker and public safety,
- maintaining site security,
- minimising waste generation and providing for effective and safe management of wastes which are created,
- minimising environmental impacts including reusing or recycling materials whenever possible,
- maintaining adequate site stewardship,
- using resources effectively, efficiently and economically,
- providing adequate funding,
- maintaining access to an adequate and relevant skills and knowledge base,
- using existing best practice wherever possible,
- conducting research and development(R&D) to develop necessary skills or best practice and,
- consulting appropriate public and stakeholder groups on the options considered and the contents of the strategy.

These factors should be applied throughout each decommissioning programme to ensure that programmes are optimised, and to help to establish the earliest practicable timetable for the operations.

6. Sites of decommissioned nuclear facilities may represent a potentially valuable resource. The future use of the site, once decommissioning operations have been safely completed, could therefore be a significant factor in determining decommissioning operations. It may be possible in some cases to complete decommissioning operations to the point where unrestricted use is possible, although an overriding consideration will be whether it represents the Best Practicable Environmental Option(BPEO) for the site. Experience to date suggests that potential uses will range from industrial and commercial use to unrestricted use. The objective should be to get the best solution overall taking into account the needs of the environment and the safety of workers and the local community. The range of facilities and circumstances to which the proposed policy will apply mean that the specific use (or uses) of each site cannot sensibly be determined many years in advance of decommissioning operations. To do otherwise risks foreclosing options currently not envisaged or imposing uses which turn out to be unsuitable. The Government expects operators to address the future use of sites in good time and to take decisions which take into account local factors and the wishes of the local community. Operators will therefore need to discuss potential uses with the Local Planning Authority, the regulators and local public and stakeholder groups. In the case of sites for which the NDA is to become responsible, the NDA's strategy will include an objective as to the condition to which the site is restored, which will be subject to Ministerial approval.

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<sup>2</sup> The NDA is expected to commence operations on 1 April 2005.

7. Operators' decommissioning strategies will need to take into account relevant developments in UK radioactive waste management policy. This includes both the outcome of the "Managing Radioactive Waste Safely" (MRWS) programme to determine how the higher activity components of the UK's solid radioactive waste should be managed over the longer term and, potentially also, the approaches agreed with the regulators and the NDA for more immediate treatment and management of waste. Ultimately developments such as these will serve to simplify an operator's task in drawing up and implementing its decommissioning strategy. The Government recognises that changes in policy in this complex and sensitive area are unlikely to be achieved immediately (e.g. decisions on the MRWS programme are not expected before 2006) and that, given the timescale likely to be involved, the policy itself will be subject to review and refinement. The Government considers that decommissioning strategies should seek to avoid the creation of radioactive wastes in forms which may foreclose options for safe and effective long-term waste management.

8. Strategies should harness the general benefits of radioactive decay while the problems to which it may give rise in certain areas should be avoided. Careful consideration should be given to delaying operations to allow radioactive decay to occur. This should maximise the amounts of materials suitable for re-use or recycling, as opposed to being managed as low level waste(LLW).

9. By the use of Best Practical Means(BPM) strategies should minimise the volumes of radioactive wastes which are created, particularly the volume of LLW. Wherever possible wastes should not be created during decommissioning until an appropriate management solution is, or will shortly be, available for use. Priorities for managing the various types of wastes which do arise should be established. Until long-term management solutions have been identified, some of the wastes arising from decommissioning will need to be stored and initially operators are likely to be packaging and treating decommissioning wastes for storage rather than for disposal. Unless there are overriding safety implications, this should be done in a way which does not preclude disposal options. Under the improved regulatory arrangements for the conditioning of intermediate level waste(ILW), which came into effect in January 2004, the disposability of waste packages will be one aspect taken into account by the regulatory authorities. In this respect the regulators will examine any advice given to licensees by Nirex under the Letter of Comfort system. Unless alternative arrangements come into effect in future, the Government confirms that operators should continue to process their decommissioning wastes, where appropriate, in accordance with Letter of Comfort arrangements.<sup>3</sup> Wastes might be stored on the site of production or on another site and these options should be considered and the reasons for the chosen option stated.

10. The UK Strategy for Radioactive Discharges 2001 – 2020 requires progressive and substantial reductions in radioactive discharges to the marine environment. The Government considers that the rigorous application of the principles of As Low As Reasonably Achievable(ALARA) and BPM to the control of discharges, and the radiation doses and risks associated with them, will reduce discharges sufficiently to achieve the Strategy's objective. Short term increases in discharges of some radionuclides may be unavoidable. However, where this is the case, the relevant environment agency will need to be satisfied that, among other things, they represent the optimal result from appropriate option studies and reflect the application of the BPM/ALARA principles.

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<sup>3</sup> Nirex' guidance will be examined by the Health and Safety Executive(HSE) as part of its examination of the safety case for the site. HSE will consult the Environment Agency(EA) or the Scottish Environment Protection Agency(SEPA) as appropriate as part of this examination.

## Review of decommissioning strategies

11. Operators should review their strategies when changes in circumstances, including relevant Government policies, make this necessary. Operators whose sites are an NDA responsibility will need to work closely with it to ensure that site plans are modified when the need arises.

12. To implement the requirements of Cm 2919 the regulatory authorities<sup>4</sup> have been reviewing operators' decommissioning strategies for licensed sites every five years. The Government considers that, except where equivalent arrangements are made (eg by the NDA), strategies should continue to be subject to regular periodic reviews, at least every five years, by HSE in consultation with the environment agencies.

13. The Government expects that successive strategy reviews will require significantly less effort from operators and the HSE. This will be especially true during extended periods of care and maintenance, unless there have been major changes (for example in radioactive waste policy or any redefinition of the end point) since the previous review.

## Funding of decommissioning operations

14. The Government expects that all operators will take the steps necessary to ensure that their decommissioning work is adequately funded. No stage of a decommissioning project should be started unless it is clear that sufficient funds will be available to complete decommissioning of the stage in question in a safe and secure way which represents BPEO for the site. Arrangements already exist in the UK, on an individual operator basis, to meet the costs of all decommissioning operations, but the establishment of the NDA will result in changes in respect of the sites for which it will be responsible. Current and potential future arrangements may be further influenced by European legislation or by international agreements.

15. The NDA will be funded directly by Government. The Government's intention is to ensure that sufficient funds are available to enable the NDA to drive forward decommissioning of its sites in the most effective way. The financial arrangements for the NDA include the creation of a dedicated statutory segregated account which will underline the Government's commitment to clean up and help build public and market confidence that funding will be available to support substantial work programmes over a period of years<sup>5</sup>.

## Regulation of decommissioning operations

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<sup>4</sup> HSE, EA and SEPA

<sup>5</sup> Under British Energy (BE)'s restructuring plan, the independent Nuclear Decommissioning Fund, which is intended to meet BE's UK nuclear decommissioning liabilities, will be enlarged into a new Nuclear Liabilities Fund which will cover decommissioning and certain other liabilities. BE will make payments into the new fund, which will be underwritten by Government to the extent that there is any shortfall so as to ensure safety and environmental protection.

16. The Government and the regulators are committed to ensuring that the application of the regulatory controls before and during decommissioning, which ensure adequate control of operations, is transparent. Where appropriate, this includes the regulatory system which will operate on the site after the completion of dismantling operations. The key parts of the regulatory regime are the controls imposed by the HSE under national regulations<sup>6</sup> and the nuclear site licence and the conditions attached by the environment agencies to radioactive discharge and waste disposal authorisations. The Office for Civil Nuclear Security (OCNS) also plays an important regulatory role.

17. The Government expects that the nuclear regulators will continue to implement its policy on better regulation by ensuring that the level of regulation is proportionate to the level of the risk to safety, the environment or security posed by the site. The Government expects that the amount of regulation will reduce as decommissioning proceeds although there may be periods of intense decommissioning activity when regulatory oversight will need to be temporarily increased. It endorses a continuation of the regulators' proportionate and flexible approach to regulating decommissioning operations, so as to achieve this reduction.

18. The regulatory regime allows the removal from HSE's regulatory control of all or parts of a licensed site once HSE is satisfied that there is no danger from radiation on the site or the relevant part of it.

### **Access to skills and development and spread of best practice**

19. Operators should maintain the knowledge base, records and skills necessary to their decommissioning operations and management of associated wastes. This should include the retention, recruitment and training of staff and the preservation of the documentation necessary fully to underpin the operations. Action to acquire new skills or develop existing ones should be carried out as necessary. Operators may also wish to bring forward operations in order to utilise existing skills or knowledge.

20. To enable operators to augment their skills the Government considers that best practice should be developed and spread to ensure that decommissioning in the UK is carried out effectively. The NDA will have an objective of championing best practice. The Government considers it important that all operators identify, implement and share best practice, if necessary under appropriate financial arrangements.

### **Designing new nuclear facilities to take account of decommissioning**

21. As has generally been the case with recently built plant, the Government considers that any new facility covered by this policy should be designed and built so as to minimise decommissioning and associated waste management operations and costs. This approach will ensure that the UK minimises the creation of decommissioning liabilities which future generations would have to deal with.

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<sup>6</sup> For reactor sites, currently the Nuclear Reactors (Environmental Impact Assessment for Decommissioning) Regulations 1999.

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## GLOSSARY OF TERMS

This appendix sets out a number of definitions of key items used in this policy statement, to help clarify its overall meaning.

**ALARA**(As Low As Reasonably Achievable). ALARA means that all reasonable steps should be taken to protect people. In making this judgement, factors such as the costs involved in taking protection measures are weighed against benefits obtained, including the reduction in risks to people.

**Best Practicable Environmental Option (BPEO)**. The radioactive waste management option which is the outcome of a systematic and consultative decision-making procedure which emphasises the protection and conservation of the environment across land, air and water. The BPEO procedure establishes, for a given set of objectives, the option that provides the most benefit or least damage to the environment as a whole, at acceptable cost, in the long term as well as in the short term.

**Best Practicable Means (BPM)**. BPM is a term used by EA and SEPA in authorisations issued under the Radioactive Substances Act. Essentially, it requires operators to take all reasonably practicable measures in the design and operational management of their facilities to minimise discharges and disposals of radioactive waste, so as to achieve a high standard of protection for the public and the environment. BPM is applied to such aspects as minimising waste creation, abating discharges and monitoring plant, discharges and the environment. It takes account of such factors as the availability and cost of relevant measures, operator safety and the benefits of reduced discharges and disposals. If the operator is using BPM, radiation risks to the public and the environment will be ALARA.

**Delicensing**. The release of the licensed site, or part of the licensed site, from regulation under the Nuclear Installations Act 1965 and the release of the operator of the facilities from his period of responsibilities from any nuclear liability.

**Environment Agency (EA)**. An agency tasked with, among other things, regulating under specific legislation aimed at protecting the environment in England and Wales. The principal legislation under which EA regulates nuclear sites is the Radioactive Substances Act 1993 under which it grants authorisations for disposal of radioactive wastes, including discharges to air and water and transfers to other premises. The authorisation granted by EA are subject to limitations and conditions which have the force of law. See also the Scottish Environment Protection Agency (SEPA).

**Hazard** is the potential for harm – e.g. arising from ionising radiation. This may vary from time to time according to the operations being carried out or for other reasons.

**Health and Safety Executive (HSE)**. A statutory body with day-to-day responsibility for the enforcement of safety legislation. It is the statutory licensing authority for UK civil nuclear installations, a function it delegates to the Nuclear Installations Inspectorate (NII), which is part of its Nuclear Safety Directorate.

**HLW**. High Level (or heat generating) waste, in which the temperature may rise significantly as a result of its radioactivity.

**ILW**. Intermediate level waste, with radioactivity levels which exceed the upper boundary for low-level waste, but which does not generate significant amounts of heat.

**Letter of Comfort(LOC)** Under its Letter of Comfort system, in the context of a phased approach to disposal, Nirex provides guidance to the nuclear industry on its requirements for the packaging and transport of ILW. LOCs are issued in three stages which successively assess the suitability of the proposals against the requirements for safe disposal against the phased disposal concept. This function has been absorbed into the regulatory framework.

**LLW.** Low level waste, which contains radioactive materials which do not exceed 4 GigaBecquerels/tonne alpha or 12 GigaBecquerels/tonne beta/gamma activity.

**OCNS.** The Office for Civil Nuclear Security is an independent unit within DTI responsible for the regulation of security in the civil nuclear industry. It is responsible for determining the standards of all aspects of protective security applicable to the industry and for monitoring compliance through the enforcement of the Civil Nuclear Industries Regulations 2003

**Operator.** The legal entity which has the responsibility for operating a UK nuclear industry facility.

**Plan.** A programme of detailed operations for the decommissioning of an individual site or facility which forms part of a strategy.

**Radioactive decay** is the process whereby the atoms of a radionuclide disintegrate and the radionuclide becomes progressively less radioactive as a result. The rate at which this process proceeds is measured in terms of a half-life, which is the time required for one half of the atoms of the radionuclide to disintegrate. Each radionuclide has a unique half-life.

**Risk** is the chance that someone or something that is valued will be adversely affected by a hazard.

**Scottish Environment Protection Agency (SEPA).** An agency tasked with, among other things, regulating under specific legislation aimed at protecting and enhancing the environment in Scotland. The principal legislation under which the SEPA regulates nuclear sites is the Radioactive Substances Act 1993, under which it grants authorisations for disposal of radioactive wastes, including discharges to air and water and transfers to other premises. The authorisations granted by the SEPA are subject to limitations and conditions having the force of law. See also the Environment Agency (EA) for England and Wales.

**Strategy.** A programme for the decommissioning of an individual site or group of sites which sets out the wider objectives and other issues which govern the plans which are subject to it.