Briefing Paper 2

Review of nuclear site end states

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nuleaf
nuclear legacy advisory forum

1: Introduction

A **Site End State** is defined by the Nuclear Decommissioning Authority (NDA) as:

'the condition of an entire site (including the land, structures and infrastructure) once decommissioning and clean-up activities have ceased. It may be appropriate to define end states for components of the site, which must be brought together and assessed as a whole to determine the site end state.'

Back in 2007, the NDA oversaw a review of Site End States (SESs) in consultation with stakeholders including local authorities and Nuleaf. The review aimed to identify the physical condition that a nuclear site should be left in when the NDA has completed its work. The End State (or states) will influence the end uses that are possible on a site. The outcome of the review was incorporated into **NDA Strategy[1],** the most recent version of which was published in 2021.

The NDA is currently undertaking a process of reviewing the Site End States to align with new regulatory guidance. This guidance has been developed in anticipation of a new legislative framework for nuclear sites that will allow operators more flexibility to optimise the end states. Originally due for consultation in 2020, it is now anticipated that draft proposals will be consulted on in late 2022. Despite this, the NDA has continued to work with regulators to review the SES assumptions for three 'lead' sites – Winfrith, Trawsfynydd and Dounreay[2].

This Briefing Paper will be revised and updated as and when the new Site End States are published, and to reflect the proposals in the new legislative framework. This version reflects on the 2007 SES review which is, at present, still extant and therefore of interest to local authorities and communities. It will also be of use in informing stakeholder engagement in the development of new SESs.

[1] https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/973438/NDA_Strategy_2021_A.pdf
[2] https://www.gov.uk/government/case-studies/optimising-site-end-states

2: Overview of Review Findings

The 2007 SES review raised important issues, particularly for local authorities with NDA sites, including future land use and the extent to which radioactivity is removed from a site. This briefing enables member authorities to understand:

- the End State currently proposed for the site/s in their area;
- the end uses preferred by Site Stakeholder Groups (SSGs);
- legacy management issues raised by the SES review; and
- learning points about review processes, including stakeholder engagement.

An overview of review findings is set out in tabular form in the Appendix to this report. For each NDA site in England and Wales, the table outlines NDA proposed site end states, SSG preferences for end uses, and key issues raised in the review.

3: Site End State Proposals from NDA

Following discussion with SSG representatives, the NDA proposed:

- a generic End State for Magnox sites;
- some variation in End States for other sites to allow for their specific circumstances.

The proposed generic End State for Magnox sites states that:

'Radioactive contamination will be remediated to a level which meets the criteria for delicensing, based on 'no danger' as established by the NII under the Nuclear Installations Act 1965. Where any radioactive substances remain on site, the requirements of the Radioactive Substances Act will be applied. On this basis, the site will be delicensed.'

It also refers to the applicability of the relevant Contaminated Land Regime for addressing non-radioactive contamination, and to the proposed physical state of the site following remediation.

As indicated in the Appendix, the proposed End States for other sites are largely consistent with the generic End State for Magnox sites but make specific provision for variations appropriate to the circumstances of each site. For a small number of sites, it is likely that much longer-term institutional control will be needed (notably at the Low-Level Waste Repository near Drigg and for the proposed 'inner zone' of the Sellafield site).

4: Site End Use Preferences

After consultation with local stakeholders, SSGs expressed preferences about site end uses and made proposals about their preferred End State. The latter were assessed by the NDA for consistency with national policy developments. In some cases, NDA sought clarification from SSGs about the implications of their proposals. It also held feedback workshops with SSG representatives.

The preferences identified by SSGs vary widely, including:

- recreational use and nature reserve
- redevelopment for tourism, leisure, commercial or industrial use
- redevelopment for science, technology and innovation uses
- nuclear power or nature reserve
- continue as a nuclear-licensed site

Some of the end use preferences took explicit account of Local Development Frameworks. Others were developed without consideration of local authority policies for land use (see below under learning points).

5: Legacy Management Issues

Two main groups of legacy management issues were raised by the SES review:

- the timetable for decommissioning and cleaning up a site
- the possibility of on-site disposal of Low-Level Wastes (LLW).

These issues are of considerable importance to stakeholders at many NDA sites.

6: Timetable Issues

SSGs highlighted the following timetable issues:

- the time taken to achieve decommissioning and/or site de-licensing should be shortened (Berkeley, Oldbury, Trawsfynydd, Harwell and Winfrith);
- there should be an early shrinking of the site boundary to release land for alternative uses (Hinkley Point A, Trawsfynydd, Wylfa, the LLWR and Sellafield); and
- there should be early removal of Intermediate Level Wastes currently stored on site (Harwell and Culham).

The NDA's response was that these issues are subject to considerations of affordability and availability of waste disposal routes.

7: On-Site LLW Disposal

For many sites, the SES review stimulated discussion about disposal routes for LLW, including attitudes to the possibility of disposal on existing NDA sites.

There were two main responses from SSGs:

- that the possibility of on-site disposal should be subject to more discussion (Berkeley, Dungeness A, Oldbury, Wylfa and Springfields); and
- that on-site disposal should not take place (Bradwell, Sizewell A and Culham).

Other issues raised about LLW management were:

- there is a need for more clarity about the types of LLW (and their levels of radioactivity) that may be subject to proposals for on-site disposal;
- there is a need for more clarity about the types of disposal facilities that are potentially suitable for the different types of LLW;
- the Nuclear Installations Inspectorate should clarify the criteria for delicensing
- LLW disposal facilities; and
- development of on-site disposal facilities should be accompanied by community benefit packages.

These responses and issues will need to be addressed in the development of strategy for LLW management.

8: Process Learning Points

Within the context of broad guidance from the NDA, each SSG was able to develop its own approach to the SES review, particularly with regard to public and stakeholder engagement. As a result a variety of approaches were used, with different levels and types of engagement.

Some examples of good practices include:

- early discussion with local authority planners so that the review process was informed by local policy on land use;
- use of local authority expertise on public consultation (for example in drawing up a questionnaire and analysing responses);
- canvassing the views of local councillors (for example through a telephone survey);
- working with the local education authority so that projects could be undertaken in schools;

- use of local authority websites to help publicise the SES review.

The SES review also raised a number of concerns in some areas:

- a lack of engagement with the relevant local authority/local authorities, and therefore inadequate opportunity for input from democratically accountable bodies;
- a lack of consideration of local policy on land use, contributing to some unrealistic expectations about possible site end uses;
- unrealistic expectations about the number of people who would attend open meetings;
- inadequate consideration of the findings of linked engagement processes (particularly in areas where stakeholders had participated in workshops for assessing options for managing LLW from Magnox stations);
- inadequate resourcing and support for some SSGs; and
- a need for greater clarity and accuracy in the use of key terms, for example, 'storage' and 'disposal'.

In several areas, the SES review process reinforced concerns about the need for more systematic and consistent engagement with local authorities.

The NDA should take account of these learning points in its review of local arrangements for stakeholder engagement. There would also be value in undertaking a more detailed evaluation to identify further process learning points from the SES review.

9: Concluding Remarks

The review of Site End States was the first time that all public sector civil nuclear sites involved local stakeholders in a national review process. It stimulated much useful discussion about key nuclear legacy management issues and, as such, is a welcome development.

In addition to identifying SSG preferences for site end states and uses, the review raised a number of important issues about timetables for decommissioning and site clean-up, about LLW disposal on site, and about local engagement processes.

In the years since this review engagement between the NDA and Nuleaf/local authorities has been enhanced and work will continue to ensure that stakeholder views are effectively fed into current work on SES, Lifetime Plans and next planned use.

SITE	PROPOSED SITE END STATE	SSG PREFERRED END USE	MAIN ISSUES RAISED
MAGNOX SITES			
Berkeley	Generic Magnox End State	Recreational use and nature conservation. Possible retention of existing Berkeley Centre buildings for industrial and commercial use	SSG preference for accelerated decommissioning, but NDA notes subject to affordability and availability of waste disposal routes. Potential for on-site LLW disposal requires further discussion.
Bradwell	Generic Magnox End State	Recreational use as a nature reserve	SSG preference not to have on-site LLW disposal.
Dungeness A	Generic Magnox End State	New nuclear power station or nature reserve	Potential for on-site LLW disposal requires further discussion.
Harwell	Remediation to level which meets criteria for delicensing. Where any radioactive substance remain on site, the requirements of the Radioactive Substances Act will be applied. On this basis, the site will be delicensed.	Redevelopment for science, technology and innovation uses. Endorsed by Government.	SSG preference for accelerated 100% delicensing by 2020, but NDA notes subject to affordability and availability of waste routes.
Hinkley Point A	Generic Magnox End State	Recreational use as a nature reserve	SSG preference for early shrinking of the site boundary to release land. Possible on-site LLW disposal is subject to planning process
Oldbury	Generic Magnox End State	Recreational use and nature conservation or agricultural use, but not wishing to foreclose other uses.	SSG preference for accelerated decommissioning, but NDA notes subject to affordability and availability of waste disposal routes. Potential for on-site LLW disposal requires further discussion.
Sizewell A	Generic Magnox End State	Recreational use as nature reserve	SSG preference not to have on-site LLW disposal
Trawsfynydd	Generic Magnox End State	Redevelopment for tourism, leisure, commercial or industrial use	SSG preference for early shrinking of the site and for accelerated decommissioning, but NDA note latter subject to affordability and availability of waste disposal routes. SSG preference not to have on-site LLW disposal
Winfrith	Remediation to level which meets criteria for delicensing. Where any radioactive substances remain on site, the requirements of the Radioactive Substances Act will be applied. On this basis, the site will be delicensed.	Return to heathland, with possibility of retaining some buildings for commercial use	SSG preference for accelerated 100% delicensing, but NDA notes subject to affordability and availability of waste routes. Site currently seeking formal options regarding on-site disposal of LLW.
Wylfa	Generic Magnox End State	Future power generation. If not, then recreational use as a nature reserve.	SSG preference for early shrinking of the site to release land to facilitate new nuclear build. Potential for on-site LLW disposal requires further discussion.

SITE	PROPOSED SITE END STATE	SSG PREFERRED END USE	MAIN ISSUES RAISED
OTHER SITES			
Capenhurst	Radioactive contamination will be remediated to a level which ensures that a subsequent Nuclear Licensee will not be legally inhibited from achieving delicensing of the site.	Continuing use as a nuclear licensed site undertaking uranium enrichment.	
Jet Culham	Current baseline strategy to clear the site to remain, pending change of planning consents to enable continued research activities that would entail retention of support buildings and key infrastructure.	Continued research activities on fusion.	Change of planning consents required. SSG preference not to have LLW disposal on site.
Low Level Waste Repository near Drigg	Following closure, anticipated that the site will remain licensed for a period of around 300 years. The disposed waste will remain in-situ as determined by the Post-Closure Safety Case and the requirement of the Radioactive Substances Act will apply.	Waste management and nature conservation.	SSG preference for early shrinking of the site boundary to release part of the site for access.
Sellafield (including Calder Hall and Windscale)	'Inner zone' – long-term institutional control 'Outer zone' – remediation to levels allowing delicensing	'Inner zone' – nuclear industrial activities including waste management 'Outer zone' – industrial and commercial use, including research.	Further work required to define zone boundaries. Aim to maximise area of outer zone, SSG preference for early release of parts of site in outer zone for new industrial and commercial activities.
Springfields	Remediation to level which meets criteria for delicensing. Where any radioactive substances remain on site, the requirements of the Radioactive Substances Act will be applied. On this basis, the site will be delicensed.	Should seek to achieve a mixture of economic, environmental and social benefits. Existing commercial operations on the site should continue for as long as possible.	Potential for on-site LLW disposal requires further discussion.