

UK Governments Response to the Consultation on Management of the UK's Plutonium Stocks

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Summary and Recommendation:

This report provides a summary of the UK Governments response to the consultation on the long-term management of the UK's civil plutonium stock, which was out for consultation in Feb 2011.

The government's approach is to pursue the reuse of plutonium as mixed oxide fuel (MOX), any remaining Plutonium that can not be converted, will be immobilised and treated as a waste for disposal.

Recommendation:
That the contents of the report are noted

1. Introduction

The UK is currently storing a significant quantity of plutonium for which there is currently no clear policy for its long-term management. The existing plutonium management plans are for it to be continuously stored in specially constructed facilities that afford both security and safety - but this is far from the ideal long-term option because it requires continued active management.

Long-term continued storage of plutonium leaves a burden of security risks and proliferation sensitivities for future generations to manage. In this context, it may be preferable to have the plutonium placed permanently beyond reach via its final disposal in a geological disposal facility, either directly as a waste in an immobilised form or after its reuse as MOX fuel.

2. Why there is a stock pile of plutonium

In the 1960's it was thought that nuclear power in the form of fast reactors could offer a solution to fossil fuels running out. This led to the UK stockpiling plutonium in order to fuel the

reactors. Despite having been in development for many years and having some success in generating electricity, the UK abandoned almost all research into fast reactors in 1994 due to the realisation that they would not be commercially viable in the foreseeable future.

The UK Government judged that there was no guarantee that commercial fast reactors will be available for several decades and so considered that it was not a realistic strategy to wait for them to become a commercial reality before deciding what to do with the plutonium.

Fast reactors may, at some point in the future, offer a potential solution for plutonium management. While significant resources have been spent developing fast reactor technology there is still considerable work to be carried out before they could become commercially viable. We are, therefore still potentially decades away from deploying a fast reactor solution for plutonium management.

There are serious nuclear security risks associated with the storage of the UK's plutonium and significant measures are put in place to ensure it can continue to be managed safely and securely. However the increasing global threat of terrorism and the desire of the international community to manage stocks of fissile materials means the UK Government no longer believes that it is acceptable to store such quantities of plutonium without having a deliverable policy in place for its long-term management. Keeping our plutonium in long-term storage until commercial fast reactors become available, before deciding what to do, is therefore not a realistic strategy.

3. The Consultation Process On the UK's Plutonium Stocks

The UK Government published, for public scrutiny and consultation, a consultation paper on 'Management of the UK's Plutonium Stocks' in Feb 2011. The Consultation process closed in May 2011. The consultation responses and the government's response were published in December 2011 and are available to view online, via the webpage link available at Appendix A – Executive Summary of the UK's Plutonium Stock Responses.

The proposed preliminary policy on the long-term management of the UK's plutonium recognises that, in view of threats from terrorism and proliferation sensitivities, it has a responsibility to develop a long-term vision for its future handling.

106 responses were received to the consultation. These came from a wide range of respondents including individual members of the public, companies involved in the energy industry, Non-Governmental Organisations (NGO's) including local campaigning groups and local authorities. A full breakdown on the government's response to consultation on management of plutonium stocks is on their website, via the link in Appendix A.

The UK Government has concluded that for nuclear security reasons the preferred policy for managing the vast majority of UK civil separated plutonium is reuse and it therefore should be converted to MOX fuel for use in civil nuclear reactors. Any remaining plutonium whose

condition is such that it cannot be converted into MOX will be immobilised and treated as waste for disposal.

4. The 3 high level options of dealing with the Plutonium Stocks.

The UK Government's conclusion is that there is a need to address now the serious nuclear security risks and proliferation sensitivities posed by our plutonium accumulations. The 3 alternative strategies proposed for dealing with the waste can be summarised as:

- 1) Reuse as fuel. - Requires the plutonium to be converted into Mixed Oxide (MOX) fuel for use in a nuclear reactor. Conversion of the UK's plutonium would require construction of a new MOX plant and associated facilities, regulatory consents for the use of MOX fuel in new reactors and a range of other permissioning activities including fuel vendor licences.
- 2) Immobilisation and direct disposal as waste. - An immobilisation technology would be employed to produce a stable plutonium-containing material that would be suitable for geological disposal. This would require the development of a suitable facility to manage and immobilise the large volumes of plutonium.
- 3) Continued long-term storage. - This option would see plutonium remain in secure storage until the end of the Sellafield site decommissioning programme, assuming the UK's plutonium was consolidated on one site. In this option there is no provision for any on-going storage beyond these timescales, nor are there plans in place for ultimate treatment solutions, should that point be reached.

The Government has decided to adopt option 1 to pursue reuse of plutonium as mixed oxide fuel (MOX). This will mean converting the vast majority of UK civil separated plutonium into fuel for use in civil nuclear reactors

5. Way Forward

The consultation was the beginning of the process to take forward the policy on long-term plutonium management. The next steps towards implementation will see further information being gathered by the UK Government and NDA through detailed commercial discussions on the market for MOX fuel and the availability of reactors in which it can be burned.

The adoption of a policy option for plutonium management is not the end of this matter. It will necessarily take several years to reach the point where UK Government is satisfied that it has sufficient information for it to be able to take a final decision on reusing separated plutonium through MOX. Even if such a decision is taken there will be many decades on top of that until all the plutonium has been dealt with. Should fast reactors become commercially available or significant other advances be made during that period there will be the opportunity to consider again whether such technology could be employed.

7. List of Appendices –

Appendix A – Executive Summary of Management of the UKs Plutonium Stock – Report by DECC

8. Consultees

Appendix A – Executive Summary of Management of the UKs Plutonium Stock Responses

For full document please click on the link below:

<http://www.decc.gov.uk/en/content/cms/consultations/plutonium/plutonium.aspx>

1 Executive Summary

1.1 The UK is currently storing a significant quantity of civil plutonium. There has not been a clear policy for its long-term management. In view of the security concerns and proliferation sensitivities associated with plutonium, the UK Government therefore published, for public scrutiny and consultation, its proposed preliminary policy on the long-term management of the UK's civil plutonium.

1.2 The consultation document made it clear that, although there remain many issues to be resolved before any policy could be implemented, the UK Government believed that there was sufficient information available to make a high-level judgement as to the right strategic policy option for plutonium management. The Government therefore proposed adopting a preferred solution, or preliminary policy view, for plutonium and then taking forward work to progressively address the practical issues of implementation. That approach is to pursue reuse of plutonium as mixed oxide fuel (MOX). This would mean converting the vast majority of UK civil separated plutonium into fuel for use in civil nuclear reactors. Any remaining plutonium whose condition is such that it cannot be converted into MOX, will be immobilised and treated as waste for disposal.

1.3 Having considered all responses received during the consultation period the UK Government has concluded that it has identified the right preliminary view. Accordingly, the Government confirms this as the preferred policy. While the UK Government believes it has sufficient information to set out a direction, it is not yet sufficient to make a specific decision to proceed with procuring a new MOX plant. The Government is now commencing the next phase of work, which will provide the information required to make such a decision. Only when the Government is confident that its preferred option could be implemented safely and securely, that is affordable, deliverable, and offers value for money, will it be in a position to proceed with a new MOX plant. If we cannot establish a means of implementation that satisfies these conditions then the way forward may need to be revised.

1.4 The Government is therefore not closing off alternatives. Disposal options will need to be worked up in any case, to deal with an expected small percentage of waste plutonium from the existing inventory that would not be re-usable and secure storage will need to continue for some decades until all the Plutonium has been processed. However, rather than continuing to pursue all options with equal vigour, the Government is now prioritising work on reuse, with the intention of demonstrating whether, and if so, how the obstacles to its implementation can be overcome.

1.5 The Government believes that there is benefit in setting out now the preferred way forward for future plutonium management. It demonstrates to the international community that the UK Government recognises the security and non-proliferation sensitivities of plutonium and is seeking to develop a long-term strategy for managing this material. Indicating a preferred solution now will help with the Nuclear Decommissioning Authority's (NDA's) future planning for plutonium and allow research to be more focused on relevant areas. It will also allow the UK Government to be more focused on an option that presents the best prospect for success.

1.6 Implementing the policy will take time and, any specific decision to procure a new plant would be a significant investment. Within Government the project will therefore be under the scrutiny of the new Major Projects Authority (MPA). This is a partnership between the Cabinet Office and HM Treasury and will oversee and direct the effective management of all large-scale projects that are funded and delivered by central government. This will mean a staged approvals process to ensure value for money. Affordability will also have to be determined through the Spending Review process in the normal way.

1.7 The Government has concluded that converting the plutonium into MOX is the most credible and technologically mature option for reuse. However, the Government remains open to any alternative proposals that offer better value to the taxpayer.

1.8 The consultation document also addressed foreign-owned plutonium stored in the UK. Having considered all the responses, the UK government has concluded that overseas owners of plutonium stored in the UK could, subject to commercial terms that are acceptable to UK Government, have their plutonium managed in line with this policy. In addition, subject to compliance with inter-governmental agreements and commercial arrangements that are acceptable to UK Government, the UK is prepared to take ownership of overseas plutonium stored in the UK after which it would be treated in line with this policy.