The Nuclear Institute (NI)

Response to:

Consultation on Management of the UK's Plutonium Stocks

A consultation on the long-term management of UK owned separated civil plutonium

Annex A: Response to Consultation Questions

Question 1

Do you agree that it is not realistic for the UK Government to wait until fast breeder reactor technology is commercially available before taking a decision on how to manage plutonium stocks?

We agree that it is not realistic for the UK Government to wait until fast reactor technology is commercially available given our current lack of involvement in any fast reactor R&D programmes. The implementation timescales and the current levels of uncertainty are such that sufficient decision making is required now to steer future research and development, and eventually implementation.

There are however a number of other drivers which we believe are relevant and require consideration including the finite life of packaging and the likely need for periodic re-packaging, at significant cost. Alongside this there is a need for ongoing refurbishment and replacement of plutonium storage facilities along with continued significant security arrangements.

We do note that the fast reactor option has been discarded at a very early stage, on the grounds that commercial fast breeders are still decades away. This is not technically correct and indeed a number of countries have continued to develop this technology following the UK Governments decision to abandon this research in the 1990's.

The plutonium inventory could be considered an asset in the short term in light of the fact that both of the new proposed Generation III reactor technologies planning to be deployed in the UK (EPR and AP1000) are capable of taking significant proportional loadings of MOX fuel, in addition to those that can use it within Europe.

If the UK was to close the fuel cycle this would provide a route to monetise the legacy plutonium and there is every indication that there would be a commercial market for this. At the very least this would reduce the cost of disposal and at best possibly generate a commercial return.

Question 2

Do you agree that the UK Government has got to the point where a strategic sift of the options can be taken?

A strategic sift of the options can be undertaken at any time though we recognise the Governments intent to avoid leaving issues for future generations. Clearly from an international non-proliferation and security point of view it is timely given the international initiatives set out in 2010.

Given the current uncertainties around costs and even feasibility of a number of the options, and that the timescales for development and implementation are measured in decades, then it would be sensible for Government, even it takes an initial policy decision now, to commit to a strategic policy review say every five years.

Question 3

Are the conditions that a preferred option in due course meet, the right ones?

Yes we support the proposed conditions identified. We believe it may also be beneficial to include some additional wording around transparency of decision making to aid in gaining public confidence to the preferred option selection and that this decision may be revisited in future years as greater information on options, costs, implementation capability and socio-economic impact is forth coming.

Question 4

Is the UK Government doing the right thing by taking a preliminary policy view and setting out a strategic direction in this area now?

In principle, we think it appropriate that the Government takes a preliminary policy view and sets a strategic direction, noting our response to Q2 above proposing a regular review framework.

Question 5

Is there any other evidence government should consider in coming to a preliminary view?

It is surprising that evidence of the potential application of fast reactor technology to the specific mission has not been considered, because of the removal at an early stage of the consideration of fast reactor technology as a credible option. Since this appears to be the preferred long term management strategy of the French Government, it would be appropriate that the UK Government seek to validate the preliminary view by seeking appropriate evidence from the French Government.

Given the potential use of MOX fuel in proposed new nuclear power stations and as a result of media reporting from the recent Fukushima Daiichi accident in which one reactor was using MOX fuel, local stakeholders may wish to gain additional information to gain confidence in the implications of this application .

Clearly pursuing the preferred option carries significant cost in implementing, we would wish to ensure that the lessons learnt form the implementation failures at SMP are documented and fed into a potential replacement plant.

The acceptability of new nuclear build in the UK is heavily predicated on achieving a timely, acceptable and affordable solution to the disposal of intermediate and high level waste, ie. geological disposal facility (GDF). Technically acceptable solutions to the disposal of both these waste types are available today. Considering the coincident disposal of plutonium greatly diminishes the chances of agreeing a timely, acceptable and affordable solution. Decoupling the issue of plutonium disposal from that of ILW and HLW will greatly increase the chances of success of the GDF and the economics of new build.

One of the major omissions from the consultation paper is any reference to UK policy on future sustainability in energy supply. Fast reactors and related Gen IV closed cycle options substantially improve energy sustainability as does MOX to a lesser extent. Immobilisation by cementation etc. does not; low specification MOX immobilization could allow some future energy recovery, but in a manner that is neither efficient nor ALARP as it would require reprocessing and re-fabrication prior to use. It seems strange that with UK environmental policy largely driven by sustainability considerations that energy sustainability is not considered.

Question 6

Has the UK Government selected the right preliminary view?

Of the options considered, the UK Government has selected an option which is 'not wrong' given the current level of information. We don't think there is such a thing as the 'right' preliminary view. It is clear that the preferred option is subject to considerable uncertainty as to lifecycle feasibility (disposability in a GDF) as well as cost, and may not prove to be the preferred option as further information (developed for the UK Government or internationally) becomes available.

We believe the options could be separated into three types:

1. Preferred
2. Contingency or opportunity options which could be implemented if circumstances change (particularly if the preferred option becomes less attractive). Some level of development or research should be maintained on each option (at minimum this

may be a watching brief/review of international developments with an associated capability maintenance)

3. Discounted ie. are thought so unlikely to form a preferred option that no further work is to be planned.

Question 7

Are there any other high level options that the UK Government should consider for long-term management of plutonium?

Yes. The use of fast reactor or High Temperature Reactor (HTR) technology to support the plutonium management mission. This appears to be a route that the French government is actively considering, and is an option that the Russian Government (part-funded by the US Government) is considering for managing its excess military stockpile. We would suggest that this option could best be pursued as a collaborative European management solution in partnership with the French and German Governments (although the German Government currently has no facilities for long term Plutonium management, they own significant quantities of Plutonium held in the UK and France).

The UK Government took the decision in 2008 to withdraw from funding developments for Generation IV reactor systems (including both fast reactor and HTR systems) as this would have continued to provide access to development evidence (watching brief) at relatively low cost. As it is, the UK has access to significant access to the data derived considering the EFR design as a suitable vehicle for 'burning' Plutonium. It is unclear whether this data has in itself been considered in foreclosing the fast reactor option.

Submitted and Signed on Behalf of the Nuclear Institute

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