

Long-term plutonium management: Decision methodology

Institute of Physics response to a DECC
pre-consultation discussion paper

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consultations and inquiries can be viewed at
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23 October 2009

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Mr Dean Gallacher
Long-term plutonium management: Decision methodology
3 Whitehall Place
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IOP Institute of Physics

Dear Mr Gallacher

Long-term plutonium management: Pre-consultation discussion paper covering decision methodology and timetable for decision making

The Institute of Physics is a scientific charity devoted to increasing the practice, understanding and application of physics. It has a worldwide membership of over 36,000 and is a leading communicator of physics-related science to all audiences, from specialists through to government and the general public. Its publishing company, IOP Publishing, is a world leader in scientific publishing and the electronic dissemination of physics.

The Institute welcomes the opportunity to submit its views on the second Department of Energy and Climate Change pre-consultation discussion paper on the long-term management of plutonium covering decision methodology and timetable for decision making. The Institute's response was prepared with input from its Science Board's Energy Sub-group which includes a range of leading physicists working across the energy sector.

In response to the first discussion paper on the key factors that could be used to compare one option for long-term plutonium management with another, the Institute stressed the need for a coherent nuclear strategy and the value of plutonium as a near-zero carbon energy resource. It is vital that the decision-making process itself be commensurate with the weightiness and complexity of the issues. Its logic must be impeccable. We have the following observations on the second discussion paper:

- The discussion paper states clearly that: "*Safe and secure storage is the only option available for the short term while thinking around the reuse or waste options is developed.*" It goes on to state that this option could be maintained for 30 to 50 years before a new plutonium store and a probable new treatment plant would be necessary. It follows that, in the absence of a clear and reasoned choice between the 'reuse' and 'waste' options, there is no compelling reason to depart from the 'indefinite storage' option before a commitment is required on these new facilities.

- Until this point is reached, it would be wiser to build on the experience of MOX use and the ongoing assessment of immobilisation techniques to better quantify the uncertainties, the costs and the benefits of the reuse and waste options in order to improve the quality of the decision when it is finally made.
- In the Institute's response to the first discussion paper, we stressed that the energy value of plutonium, in existing stockpiles and in spent fuel, must be considered as a highly valuable low-carbon energy resource. Given the government's stand on global warming, it would clearly be inconsistent and unwise to commit prematurely to a waste option which would abandon this resource. The summary of the reuse option makes no mention of the longer-term and vastly greater potential of the fast reactor, in which the UK is a world leader, having already developed a commercial prototype of the liquid-metal type.
- In the absence of compelling reasons to the contrary, therefore, the option to reuse plutonium in MOX and eventually in fast reactors should remain open as long as possible. A case has not been made for making a decision in the immediate future.
- When it is eventually made, it is likely to hinge largely on the balance between the undoubted and quantifiable benefits (i.e. energy security and low-carbon) of reuse and the unquantifiable risks, except as a function of vigilance, of nuclear proliferation. The Institute has reservations about the use of the possible 'quantitative' approach, as outlined, in deciding between two such disparate issues. The assignment of numerical values to 'weightings' can only be subjective – there is no common reference standard or calibration between participants. Moreover, the numerical process does not expose the reasoning behind the outcome. To avoid obscuring the decision making process we recommend a less formalised but more transparent process in which the logic of the stage-by-stage development of the decision is meticulously scrutinised, recorded and communicated.

I hope these comments are useful and look forward to reviewing and responding to the formal public consultation in due course.

Yours sincerely



Professor Peter Main
Director, Education and Science

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