

**Consultation on the proposed justification process for the reuse of plutonium**

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**Summary and Recommendation:**

The Nuclear Decommissioning Authority (NDA) has stated its intention to the Department Of Energy and Climate Change (DECC) to make an application for a justification decision.

As a result DECC have produced a consultation on the proposed process for making applications and decision-making process for justification decisions concerning the reuse of plutonium. Following which DECC will publish guidance to prospective applicants outlining the process for making applications and the decision-making process.

Recommendation: That the draft response to the consultation is approved and any additional comments, recommendations made.

**Background/Introduction**

The UK government has stated that its preferred option for the management of plutonium stock piles is to reuse it as Mixed Oxide fuel (MOX). Having gone through the process of defining their preferred option the next stage in the sequence is to seek 'justification'.

The reason for the need for the 'justification' stage is because before a new type of practise that involves ionising radiation can be undertaken in the UK, it must be considered to be justified.

The concept of justification is based on the internationally accepted principle of radiological protection that no practice involving exposure to ionising radiation should be adopted unless it produces sufficient benefits to the exposed individuals or to society in general to offset the health detriment it may cause.

The law requires, not only for activities involving ionising radiation to be justified, but also that exposure to ionising radiation is kept below stringent legal levels, and are further reduced to as low as is reasonably practicable.

Applicants seeking a 'justification decision' for the reuse of plutonium need to satisfy the Justification Authority that the health detriments are offset by the benefits associated with the practice.

### **The consultation process**

The government is consulting on the proposed justification process. The government proposes to issue generic guidance advice for the reuse of plutonium. The reason the guidance will be generic guidance is that a number of different types of technology may seek justification. As while the government has identified that their preferred option for the reuse of plutonium is as MOX fuel it is possible that our technologies may be found credible as two other technologies are still being considered as possible alternatives.

In February the NDA sought proposals for potential alternative approaches for managing the UKs Plutonium stock. After initial investigations it is considered that 2 possible alternatives to MOX have emerged.

The General Electric-Hitachi (GEH) proposal relates to a UK deployment of its PRISM reactor as part of an integral fuel fabrication/reactor plant solution for Plutonium disposition. The NDA is now focused on assessing the technical and commercial credibility of this approach.

The CANDU (short for CANada Deuterium Uranium) reactor is a Canadian-invented pressurized heavy water reactor. A CANDU power plant generates power in the same fashion as a fossil fuel power station; heat is generated by "burning" fuel, and that heat is used to drive a steam turbine, normally located in a separate "power hall".

The CANDU proposal relates to a UK deployment of its Enhanced CANDU® 6 reactor and associated facilities to provide a solution for Plutonium disposition. The NDA is focused on assessing the commercial credibility of the approach and refreshing and refining technical studies undertaken previously.

The technology proposed by CANDU was taken into account in the NDA credible options paper. For the purposes of the strategic option analysis, the NDA examined the option of fabricating MOX and selling or leasing the resulting fuel for irradiation in the latest generation (known as third generation, GEN III) of nuclear reactor systems such as CANDU in either the UK, Europe or Canada.

As it is not clear which process will be progressed at this stage the proposed consultation recommends that generic guidance, for the process of considering applications, is issued.

## Consultation Response

DECC are currently conducting a consultation into the proposed process of 'justification', the consultation closes on the 20<sup>th</sup> August 2012.

The consultation consists of 4 questions seeking feedback on the rationale, methodology and level of detail being sought from the proposed developer to complete a 'justification' examination.

The following is a draft of the proposed responses to the 4 questions posed in the consultation:

It is recommended that members approve the proposed response and provide any additional information, comments as is necessary.

### Question1:

**Consultation Question One – Do respondents agree with the Government's view that it is sensible to issue generic guidance for the reuse of plutonium? We welcome comments on this proposed approach.**

Yes the Council would agree that as there are still a number of technologies being explored that could also seek justification then it appears practical to issue generic advice which will be applicable to all potential technologies.

### Question Two:

**Are the proposed application and decision-making processes clear, appropriate and proportionate? If not, how can they be improved?**

(Please refer to appendix 1: Proposed Justification process and appendix 2: List of Indicative information to be provided)

- The proposed justification process appears to be a logical sequential process.
- It would be helpful for clarity to explain what the existing class or types are that would not require justification; it is assumed that this refers to MOX?
- It is recommended that the relevant local authority that will host the proposed facility is also included in the list on consultees?
- Under the section economic, societal or other benefits and detriments in table 2, it is recommended that there is included a section to assess the socio-economic impacts of the proposed development. An indication of the types of associated community benefits including skills needed and resources needed to design and operate the facility, if these are readily available within the UK, the potential volume of jobs created and if the skills and resources are not currently readily available how they intend to relieve this problem.

**Question Three:**

**Is the indicative list of information in Table 3 sufficient and appropriate to assist in the making of justification applications and justification decisions? Does the indicative list omit any relevant information, or include any unnecessary information?**

Refer to Appendix 3: Suggested Phases in the Plutonium Reuse Cycle

N/A

**Question Four:**

**Are there any other ways in which the draft justification process can be improved? If so, how?**

- Socio-economic benefits of each type of proposal are a fundamental part of the assessment and it is right that they remain a key part of the justification process. In order to ensure that a full assessment is carried out the full extent of the socio-economic impacts of a proposal must be examined at this stage.
- Ensure that the process remains open and transparent and that the local authority has an opportunity to comment on the justification process. If this is achieved and assuming that detailed information on the socio –economic implications is provided, as outlined in question 2, with the assessment then the proposed process appears acceptable. It allows for flexibility and requires adequate information to make a robust assessment.

## Appendix 1: Proposed justification process

Stage	Description
1	Publish guidance for applicants.
2	Receive and publish application.
3	<p>Consider applications and determine whether proposed Class or Type of Practice is a new or existing (consulting in accordance with the Concordat).</p> <p>If the class or type of practice is found to be 'new' the Justifying Authority will carry out a justification assessment. (Stages 4-10)</p> <p>If it is found to be existing, the Justifying Authority will consider whether to review the justification of that class or type of practice. It may only do so if new or important evidence about the efficacy or consequences of the class or type of practice has been acquired.</p>
4	Assess whether sufficient information has been provided by applicants to make a justification decision. Request any additional information from the applicants and publish any additional information received.
5	Assess applications, gathering additional information from other sources where appropriate and specialist advice where necessary.
6	Prepare draft decision document.
7	Consult statutory consultees (Health and Safety Executive, Food Standards Agency, Health Protection Agency, Environment Agency, Scottish Environmental Protection Agency, Department of Environment for Northern Ireland), Devolved Administrations, relevant Government Departments, other interested parties (e.g. overseas Governments, non-Governmental organisations) and the public on the draft decision document.
8	Consider consultation responses on the draft decision document.
9	Depending on the outcome of this consultation, publish the final decision.
10	<p>If new class or type of practice is found to be justified make justification decision in the form of secondary legislation (a Statutory Instrument) and publish in accordance with the Justification Regulations.</p> <p>If new class or type of practice is not found to be justified publish decision notice to that effect in accordance with regulation 14 of the Justification Regulations.</p>

## Appendix 2: List of Indicative information to be provided

Information Requirement	Guidance
<b>Introductory information on the proposed class or type of practice</b>	
<b>Description of the proposed class or type of practice</b>	<p>Applicants should provide information in the following areas:</p> <ul style="list-style-type: none"> <li>• A summary of the class or type of practice (or phase of the class or type of practice).</li> <li>• The main technical characteristics of the class or type of practice (and of the phases within the class or type of practice).</li> <li>• Confirmation of whether or not the application is being made under Regulation 9 of the 2004 Regulations (for a decision in relation to a new class or type of practice).</li> </ul>
<b>Radiological health detriments</b>	
<b>Radiological Health detriments</b>	<p>Applicants should provide information in the following areas:</p> <ul style="list-style-type: none"> <li>• How the proposed class or type of practice may cause a radiological detriment to human health (including the general public, plant workers, other specific population groups).</li> <li>• Radiological health detriments associated with normal operation and accident conditions.</li> <li>• How design, operation and mitigation strategies will reduce the risk and magnitude of accidental radiological exposures to below regulatory limit.</li> <li>• Any other potential radiological health detriments.</li> </ul>
<b>Economic, societal or other benefits and detriments</b>	
<b>Radioactive waste and decommissioning</b>	<p>Applicants should provide information in the following areas:</p> <ul style="list-style-type: none"> <li>• How decommissioning, waste management, spent fuel management and disposal would be dealt with.</li> <li>• The nature and volume of radioactive waste and spent fuel that could be expected to be produced at each stage.</li> <li>• The features of the design that will facilitate decommissioning.</li> <li>• Mitigation strategies, regulatory arrangements and</li> </ul>

	<p>related assurance to address detriments and risks.</p> <ul style="list-style-type: none"> <li>Any other potential benefits and detriments associated with radioactive waste and decommissioning.</li> </ul>
<b>Environmental</b>	<p>Applicants should provide information in the following areas:</p> <ul style="list-style-type: none"> <li>The total carbon emissions across the full lifecycle of the proposed class or type of practice (compared to the full lifecycle for conventional UOX fuel).</li> <li>Net contribution to the UK's overall carbon emissions.</li> <li>Non-radiological effects on people and the environment (water, air, chemicals, light, thermal, noise, landscape animal health, flora, fauna etc.) Throughout construction, operation and decommissioning.</li> <li>Radiological effects on animal health, flora and fauna.</li> <li>Normal operation and accident or terrorism related conditions, including management and disposal of waste (radioactive and non-radioactive).</li> <li>Accident and terrorism mitigation strategies.</li> <li>Assurance provided against stated risks (including reference to the regulatory regime).</li> <li>Any other potential environmental benefits and detriments.</li> </ul>
<b>Non-proliferation and physical protection (security)</b>	<p>Applicants should provide information in the following areas:</p> <ul style="list-style-type: none"> <li>How the proposed class or type of practice will help to mitigate the security and non-proliferation sensitivities associated with long term storage of separated plutonium.</li> <li>A risk profile showing changes in the security and non-proliferation sensitivities associated with separated plutonium and plutonium bearing materials throughout the lifecycle of the class or type of practice.</li> </ul> <p>Any other potential benefits and detriments from a security perspective.</p>
<b>Other benefits and detriments</b>	<p>Applicants should provide information in the following</p>

	<p>areas:</p> <ul style="list-style-type: none"> <li>• Non-radiological health detriments in normal/accident conditions (including to the general public, plant workers, other specific population groups).</li> <li>• Contribution to security of supply.</li> <li>• Economic benefits and detriments.</li> <li>• Benefits and detriments to UK jobs and skills.</li> <li>• Benefits and detriments to UK's long-term objectives (for example, impact on Sellafield's Lifetime Plan objectives).</li> </ul>
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### Appendix 3: Suggested Phases in the Plutonium Reuse Cycle

Stage	Description
<b>Plutonium Retrieval</b>	<p>The retrieval of separated plutonium from stores.</p> <p>To include internal transport of UK-owned separated plutonium from its point of storage to its point of pre-treatment.</p>
<b>Preparation of Separated Plutonium</b>	<p>Any preparatory activities required to make ready the inventory of UK-owned plutonium for fabrication into fuel.</p> <p>To include internal transport of UK-owned separated plutonium from its point of preparation to its point of fabrication into fuel and the decommissioning of facilities associated with preparatory activities.</p>
<b>Fuel Fabrication</b>	<p>The process of taking the prepared separated plutonium and fabricating fuel assemblies from it.</p> <p>To include internal transport of fuel assemblies from their point of manufacture to their point of irradiation and the decommissioning of fabrication facilities.</p>
<b>Fuel Irradiation</b>	<p>The generation of electricity through the irradiation of plutonium bearing fuel assemblies in nuclear fission reactors.</p> <p>Should include the internal transport, storage and management of spent plutonium bearing fuel and decommissioning of reactors.</p> <p>The Government's response to its consultation on the long-term management of UK owned separated civil plutonium identified that "it would be preferable to have the plutonium put permanently beyond reach via its final disposal in a geological disposal facility (GDF)...", and as such applicants are advised to consider whether spent fuel could be disposed of in a GDF, should one become available.</p>