NDA’s Strategy for the Management of Spent Fuel and Nuclear Materials at Dounreay

Presentation to DSG

Stuart Chalmers
NDA Programme Manager
7th March 2012
Dounreay – UK centre of fast reactor research 1954 - 94
Now Britain’s biggest nuclear site closure project
Moving towards closure circa 2025
Dounreay Spent Fuels & Nuclear Materials Management Objectives

• To reduce the long term storage and security requirements at the Dounreay Site.

• To support UK security objectives by placing the material in a long term storage facility and consolidation with other similar materials within the UK, where possible.

• To minimise the number of new facilities that are required and maximise the benefit of those that exist or are already necessary.

• To support the safe final disposition of the materials as the process will include the preparation of materials for long term storage together with high quality characterisation.

• To facilitate significant hazard reduction at Dounreay without significant impact on hazards at any other NDA site.
## Fuels and Nuclear Materials Inventory at Dounreay

<table>
<thead>
<tr>
<th>MATERIAL</th>
<th>MAIN FORM</th>
<th>Approx. Tonnes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Irradiated DFR Breeder Material</td>
<td>• Metallic fuel elements or slugs</td>
<td>44</td>
</tr>
<tr>
<td>Irradiated Spent Fuels</td>
<td>PFR Oxide Fuels</td>
<td>15</td>
</tr>
<tr>
<td></td>
<td>PFR Carbide Fuels</td>
<td></td>
</tr>
<tr>
<td>Unirradiated Fuels and Nuclear Materials</td>
<td>• MOX (pellets and powder)</td>
<td>13</td>
</tr>
<tr>
<td></td>
<td>• Nuclear Material Metal</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Oxide Fuel assemblies and pins</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Mixed U/Pu Carbide</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• High Enriched Uranium Oxide</td>
<td></td>
</tr>
<tr>
<td>Unirradiated Uranium</td>
<td>Oxide (powder)</td>
<td>30</td>
</tr>
<tr>
<td>Unirradiated Uranium</td>
<td>Carbide (pellets and pins)</td>
<td>5</td>
</tr>
</tbody>
</table>
Stakeholder Engagement

• **NDA Strategy II**
  – Full consultation in 2010, published in 2011

• **NDA Business Plan 2011-14**
  – Full consultation in 2010/11, published in 2011

• **NDA DFR Credible & Preferred Options Paper**
  – Engagement July – September 2011
  – Response summary published November 2011
  – NDA decision taken and announced in November 2011

• **NDA DSRL Exotic Fuels Credible Options Paper**
  – Engagement January – March 2012
  – Scottish Councils Committee on Radioactive Substances (SCCORS) seminar
Options

• **DFR Breeder Material – CONFIRMED OPTION**
  – Will be sent to Sellafield in standard Magnox flasks, managed by Direct Rail Services.
  – There will be 94 flasks transported over a 5-6 year period.
  – First shipment expected in Summer 2012.

• **Dounreay Exotic Fuels and Nuclear Materials**
  – If “transfer to Sellafield” is chosen, a number of transportation options will need to have been considered.
  – Further discussions with specific stakeholders and in particular the Office for Nuclear Regulation (ONR) Security will need to take place.
Further Information

www.nda.gov.uk

www.dounreay.com

www.hse.gov.uk/nuclear

www.hpa.org.uk/Topics/Radiation/UnderstandingRadiation/AtAGlance/Flash_TransportOfRadioactiveMaterials/
DFR Breeder Fuel – Magnox flask

Inside the Breeder Removal Facility at the Dounreay Fast Reactor
DFR Breeder Fuel – Magnox flask

One of the fleet of DRS trains transporting spent fuel flasks