Developing a Step Wise Approach to Waste Management and Decommissioning at Sellafield Ltd

International Conference on the Safety of Radioactive Waste Management, November ‘16

Dr. Rebecca Weston
Strategy & Technical Director, Sellafield Ltd
Sellafield has more than 60 years of history…

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<thead>
<tr>
<th>1940s/50s</th>
<th>1960s/70s</th>
<th>1980s</th>
<th>1990s</th>
<th>2000s</th>
<th>2010s</th>
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<tbody>
<tr>
<td>Nuclear build begins</td>
<td>Initially a military programme</td>
<td>Waste stored safely – pending treatment</td>
<td>Main expansion of site</td>
<td>Commercialisation of reprocessing — Thorp comes online</td>
<td>NDA formed</td>
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<td>Storage capacity extended incrementally</td>
<td>Major waste treatment focus</td>
<td>Waste arising from processes treated in ‘real time’</td>
<td>Stop start progress in Decommissioning</td>
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<td>Coarse segregation of waste arising from process</td>
<td>Environmental impact substantially reduced</td>
<td>Product waste forms compatible with disposal concepts</td>
<td>Calder Hall ceased generating power after 47 years in operation</td>
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<td>Magnox reprocessing starts</td>
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<td>Vitrification of all overseas Highly Active Waste complete</td>
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<td>Decommissioning gathering pace</td>
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<td>First sludge exports from FGMSP</td>
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Understand The Challenge
Understand Preferred Direction of Travel

- Preferred End States
- Interim End States
- Integrated Waste Management
- Technical Innovation

VLLW Ground Managed in-situ

LLW Ground Managed in engineered system on site
Characterisation - Enabling Waste Led Decommissioning
Engaging Stakeholders

“We have seen real signs of progress over the past two years”
“There has been a cultural change. Many thousands of people now work differently. New energy is breathed into problems and that has been really evident at the G6 Forum”

Andy Lindley
Deputy Chief Inspector
Office for Nuclear Regulation
Focus on the True Drivers - Alternative ILW Approach

“To be able to deliver a technical solution to historic ILW at Sellafield, which not only offers a safe and secure route but also opens up the possibility of a quicker and cheaper alternative to current technology, is a genuinely exciting development.”

Dr. Adrian Simper
Strategy & Technology Director
Nuclear Decommissioning Authority
Alternative ILW Approach - Simplification of Waste Handling Process

ORIGINAL BASELINE

ALTERNATIVE APPROACH
Manage Future Challenges

• Enhanced use of Radioactive Waste Management Case

• Mobility – Re-train and Re-skill for Increased Operator Decision Making

• Land Management

• Funding

• Transport & Disposal
Fit For Purpose Transport Package for Decommissioning Wastes

**Type B : ‘Safe by package’**
Typically heavily engineered packages/transport containers
- Waste package size/mass constrained
- Can be used for high dose rate/high activity wastes

**Type Decommissioning?**
New type that takes account of the robustness of the container to retain shielding
- Large waste containers
- Can be used for medium dose rate wastes

**Industrial Package: ‘Safe by contents’**
Little credit can be taken for container performance
- Wastes limited to low dose-rate
- Cannot take full credit for container shielding
- Large waste containers
Risk Based Management Framework

A: Conservative Application of Nuclear Safety

B: Programme ALARP

C: Unacceptable Time at Risk

D: Event or Critical Risk / Detriment

E: Event or Programme Undeliverable
Key Learning

• Adapt to Changing Priorities
• Characterise Now, Save Later
• Establish Common Goals
• Understand the Real Drivers
• Fit for Purpose Solutions
• Holistic Risk Management