Legal and Policy Framework for Low Level Waste Treatment and Disposal

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Overview

• Evolution of LLW policy
• Waste Hierarchy: policy and legislation
• Best available techniques
• Nuclear liabilities and LLW: compliance and risk
Radioactive Waste Inventory 2013

Volume by waste type (m³)

<table>
<thead>
<tr>
<th>Waste Type</th>
<th>Volume (m³)</th>
</tr>
</thead>
<tbody>
<tr>
<td>VLLW</td>
<td>2,800,000</td>
</tr>
<tr>
<td>LLW</td>
<td>1,400,000</td>
</tr>
<tr>
<td>ILW</td>
<td>290,000</td>
</tr>
<tr>
<td>HLW</td>
<td>1,100</td>
</tr>
<tr>
<td>Total</td>
<td>4,500,000*</td>
</tr>
</tbody>
</table>

*Excludes:
- uncharacterised ground
- NORM

LLW destination (2012)

<table>
<thead>
<tr>
<th>Destination</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Disposal to landfill</td>
<td>42%</td>
</tr>
<tr>
<td>Metal waste recycled</td>
<td>24%</td>
</tr>
<tr>
<td>Disposal on site</td>
<td>14%</td>
</tr>
<tr>
<td>Disposal to LLWR</td>
<td>13%</td>
</tr>
<tr>
<td>Combustible waste treated</td>
<td>7%</td>
</tr>
</tbody>
</table>
Waste hierarchy (radioactive waste)

- Prevention
- Re-use
- Recycling
- Decay Storage
- Disposal

Incineration

- VLLW
- LLW

Waste Hierarchy

- Best Available Technique
- Proximity Principle

2007 Policy for Management of LLW
Spent Fuel and Radioactive Waste Directive
Safety Assessment Principle
Environmental PermittingRegs 2010
Waste Framework Directive

Nuclear Site Licence Conditions
"… generation of radioactive waste shall be kept to the minimum which is reasonably practicable, both in terms of activity and volume, by means of appropriate design measures and of operating and decommissioning practices, including the recycling and reuse of materials ..."
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"The choice between re-use, decontamination, and direct disposal of waste should take account of relevant factors, including the form and disposability of the resultant waste, dose to operators, and other waste arisings and resultant discharges."
Waste hierarchy (Waste Framework Directive)
Best available technique / proximity principle

**BAT**
- Environmental Permitting Regulations 2010: exposures kept “as low as reasonably achievable, taking into account social and economic factors”
- Environment agency guidance: “… optimal treatment and disposal routes (taking account of the waste hierarchy and the proximity principle)"
- Affordability and gross disproportionality
**Best available technique / proximity principle**

**BAT**
- Environmental Permitting Regulations 2010: exposures kept “as low as reasonably achievable, taking into account social and economic factors”
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- Affordability and gross disproportionality

**Proximity principle**
- 2007 LLW Policy: “appropriate consideration to the proximity principle and waste transport issues …”
- Consider volume and activity and available modes of transport
- Broad overview of options
- Relevance to exposure to ionising radiation?
Roles and strategy

- NDA / LLW Repository Ltd
- UK Strategy for the Management of Solid Low Level Waste from the Nuclear Industry
  - Application of waste hierarchy
  - Preservation of LLW disposal capacity
  - Development of treatment and disposal routes
- LLW National Waste Programme
- Joint Waste Management Plans

UK Low Level Waste Repository, Drigg, Cumbria
LLW contractual hub

Customers → Waste Services Contract → LLWR → Waste Treatment Services Framework → Supply chain

Waste characterisation → Packaging → Transport → Metallic → Combustible → Supercompactable → Very low level → Low level
Nuclear liabilities conventions and VLLW

• Aggregation of risk
• The "relevant carriage" model
• 2004 Protocols
• Possible exclusion for disposal sites
VLLW disposal - perceived aggregation risk

Licensed site

Licensed site

Licensed site

VLLW Disposal Site

Insurer (max exposure £140m x ?)

Claimant
VLLW disposal - "relevant carriage"

- LLWR takes "charge" of waste
- Assumes liability under express contract terms

Waste has "been in the course of carriage on behalf of [LLWR] as licensee of [the LLW Repository]" (NIA'65 S7(2)(c))

Paris Convention Article 4
- LLWR takes "charge" of waste
- Assumes liability under express contract terms

Insurer (max exposure £140m)
## Comparing Paris, Brussels and the 2004 Protocols

<table>
<thead>
<tr>
<th><strong>Nuclear installations covered</strong></th>
<th><strong>Paris Convention</strong></th>
<th><strong>Brussels Convention</strong></th>
<th><strong>2004 Protocol</strong></th>
</tr>
</thead>
</table>
|                                  | • Reactors (non-transport)  
• Factories for manufacture or processing of nuclear substances, separation of isotopes or fuel reprocessing  
• Facilities for storage of nuclear substances | As Paris | Additions  
• **Installations for disposal of nuclear substances**  
• Factories, facilities and installations in the course of decommissioning |
| **Scope of loss**                | Injury, loss of life and damage to or loss of property | As Paris Convention | Additions  
• Economic loss  
• Cost of reinstating impaired environment  
• Loss of income  
• Cost of preventative measures |
| **Time to bring claim**          | Within 10 years       | As Paris Convention     | • Injury/loss of life: **30 years**  
• Other claims: within 10 years |
| **Minimum cap on liability**     | SDR 15m               | N/a                     | • **€700m**  
• **€70m for low risk installations**  
• **€80m for transport activities** |
| **Layer of state liability**     | None                  | Top up to SDR 175m      | Top up to **€1.2bn** |
| **Layer of liability shared between contracting states** | None                  | Top-up from SDR 175m to SDR 300m | Top up from **€1.2bn to €1.5bn** |
VLLW disposal - post 2004 Protocols

Licensed site

Licensed site

Licensed site

LLWR

VLLW Disposal Site

Insurer (max exposure €70m)

Claimant
Possible exclusion of disposal sites

- "... if the small extent of risk involved so warrants ..."
- Need to exclude both site and material on the site
- Objections in principle
- 1977 Exclusion?

General law
- Cause of action?
- Parties?
- Insurance?
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