Waste Container Integrated Innovation Team (IIT)

IGD-TP 7th Exchange Forum
Córdoba, Spain

25-26 October 2016
Agenda

1. Background
2. The Challenge
3. The Plan
4. Case Study
5. Next Steps
1. Background
1. Background

Sellafield
100,000 packages

Waste Containers
3m³ Duplex SS Box
Avg. £40,000 each

UK Geological Disposal Facility

= £4 billion (+ other UK sites...)
1. Background

**Integrated Innovation Teams (IITS)**

1. Characterisation
2. Waste Treatment
3. Waste Encapsulation

4. **Waste Containers**
5. Monitoring and Inspection
6. Post Operational Clean Out (POCO)
7. Beta/gamma dismantling
8. Alpha dismantling
9. Long-term Care and Maintenance (LC&M)

Cost Reduction

< £125 billion
1. Background

Scope

HAW = ILW + PCM

*Higher Activity Waste (HAW)*

*Intermediate Level Waste (ILW)*

*Plutonium Contaminated Material (PCM)*

*Waste Container*
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2. The Challenge
2. The Challenge

- Many waste streams
- Challenging waste forms
- Time constraints
- Funding pressure

Legacy Ponds & Silos

Sellafield ILW Waste Arising's to 2120 (ex PCM)
2. The Challenge

Reduce the lifetime cost of HAW containers from £4bn to £2bn

To provide an improved range of cost-effective waste container options for decommissioning and final disposal

To provide more waste container options
To provide better waste container options
To reduce the waste container constraints
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3. The Plan
2. The Challenge

**Objectives**
- Identify all available waste container options
- Make containers better
- Make better containers
- Challenge the site constraints

**H/L Tactics**
- What options are out there?
- What current R&D will 'win'?
- What other R&D is going on?
- When are the solutions needed?
- What are the container requirements?

**Phase 1**
- Baseline

**Phase 2**
- R&D

**Phase 3**
- Optioneering

**Phase 4**
- Implementation

**Work Packages**
- Waste Container Database
- Feasibility Studies
- Technology Roadmap
- Waste Programme
- Site Requirements Capture

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**Waste Container IIT**

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**Logos**
- Nuclear AMRC
- Sellafield Ltd
- National Nuclear Laboratory
- Radioactive Waste Management
3. The Plan

Waste Container Kick Off Meeting
Today 6/10/2016

Release Work Instructions 13/10/2016

WI1 - Waste Retrieval Programme 1/11/2016 - 13/1/2017

WI2 - Waste Container Database 1/11/2016 - 13/1/2017

WI3 - Technology Road Map 17/1/2017 - 18/1/2017

WI4 - Site Requirements Capture 1/11/2016 - 13/1/2017

WI5 - Feasibility Studies 1/11/2016 - 17/3/2017

Phase 2 Planning 1/11/2016 - 17/3/2017

End of Phase 1 and Board Meeting 17/3/2017
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4. Case Study
4. Case Study

Slashing the cost of waste box manufacture for Sellafield

Project NI255: 3m³ box manufacturing improvements

http://namrc.co.uk/wp-content/uploads/Sellafield-3m3-case-study.pdf
## 4. Case Study

<table>
<thead>
<tr>
<th><strong>Aim</strong></th>
<th>Reduce the overall manufacturing cost by 25%</th>
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<tbody>
<tr>
<td><strong>Scope</strong></td>
<td>Casting, Welding, Inspection</td>
</tr>
<tr>
<td><strong>Start</strong></td>
<td>June 2014</td>
</tr>
<tr>
<td><strong>Finish</strong></td>
<td>February 2017</td>
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<td><strong>Technology Readiness Level (TRL)</strong></td>
<td>5 (1-9)</td>
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</tbody>
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- **1. Pattern Manufacture**
- **2. Investment Manufacture**
- **3. Pouring & Solidification**
- **4. Heat Treatment**

**Casting of the Top Flange Replicast®**
4. Case Study

**Aim**
Reduce the overall manufacturing cost by 25%

**Scope**
- Casting
- **Welding**
- Inspection

**Start**
June 2014

**Finish**
February 2017

**Technology Readiness Level (TRL)**
5 (1-9)
## 4. Case Study

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| Scope | Casting  
Welding  
**Inspection** |
| Start | June 2014 |
| Finish | February 2017 |
| Technology Readiness Level (TRL) | 5 (1-9) |

**Automated Inspection**

CAD model  
After casting  
After heat treatment
5. Next Steps
5. Next Steps

• International Collaboration

• Share: challenges, ideas, capabilities, technologies.

• Technology Roadmap

• Research & Develop Solutions

• Leverage Funding
Waste Container Integrated Innovation Team (IIT)

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