Waste Package Manufacturing and Closure Welds

Presented to:
Nuclear Waste Technical Review Board

Presented by:
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Las Vegas, Nevada
Waste Package Prototype Procurement

- Determine population of qualified fabricators
- Constructed to exact requirements of actual production models
- Demonstration of fabrication process
- Integral part of design process
- First prototype coincident with License Application submittal
Waste Package Prototype Procurement

(Continued)

- 15 prototypes
- Uses of prototypes
- American Society of Mechanical Engineers (ASME) Code
  - Inner vessel
  - Corrosion barrier
  - Internals
  - ASME code position paper
## Waste Package Prototype Schedule

### (Calendar Years)

<table>
<thead>
<tr>
<th>WP Prototype #1</th>
<th>2003</th>
<th>2004</th>
<th>2005</th>
<th>2006</th>
<th>2007</th>
<th>2008</th>
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</table>
Status of First Prototype Procurement

• Fabrication specification and drawings
• ASME design specification
• Pre-qualification document
• Request for Proposal (RFP)
• Schedule

<table>
<thead>
<tr>
<th>Event</th>
<th>Date</th>
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<tbody>
<tr>
<td>Pre-qualification</td>
<td>Feb 2003</td>
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<tr>
<td>RFP</td>
<td>Mar 2003</td>
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<tr>
<td>Bid Date</td>
<td>3rd QTR 2003</td>
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<tr>
<td>Award</td>
<td>4th QTR 2003</td>
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<tr>
<td>Deliver</td>
<td>4th QTR 2004 - 1st QTR 2005 (Calendar years)</td>
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</table>
Typical Waste Package

- OUTER BARRIER
- INNER VESSEL
- BASKET ASSEMBLY
Weld Process Verification

- Recognize that there are various welding processes
- Weld selection process
  - Waste Package Closure Development Report
- Consultant position and conclusion
  - Dr. Carl Lundin - University of Tennessee
  - Confirmed Cold Wire - Gas Tungsten Arc Weld (CW-GTAW) welding process
Closure Welds at Yucca Mountain Project

- Six-month value engineering study resulted in design modifications
- Recent design modifications
- Process equipment development and design strategy
- Contracting strategy
- Prototype strategy and schedule
- Prototypes are integral part of design
Waste Package Final Closure

Extended Lid

Outer Lid 25 mm Alloy C-22

Middle Lid 10 mm Alloy C-22

Spread Ring

Stainless Steel Lid

50 mm Stainless Steel Inner Shell

20 mm Alloy C-22 Outer Shell

Site Recommendation Design

Proposed Design
Benefits of Design Modifications

- Time in weld cell reduced by > 50%
- Eliminated thermal stress mitigation
- Less complicated fabrication and closure
- Reduced risk (licensing, operations, performance uncertainties)
- Cost savings
- Recommended by DOE Project Operations Review Board
Weld Process Equipment Contracting Strategy

• Idaho National Engineering and Environmental Laboratory (INEEL)
• Commercial Contractor - Integrated with INEEL
• BSC Hire Specific Expertise
• Commercial Contractor
  – Future Generation Prototypes
  – Production Models - TBD
• Integral part of the Design Process
• 5 Prototype Systems
Weld Process Equipment
Contracting Strategy

(Continued)

• Use of prototypes - installed in Training Facility
  – Establish proof of concept and operations
  – Perform closure operations on waste package prototypes
  – Provide for operator training
  – Establish procedures and processes for Operations Readiness Review (ORR) and operations
  – Potentially used to perform ORR
  – Potentially used in operational facilities
## Weld Cell Process Equipment Development Schedule

### (Calendar Years)

<table>
<thead>
<tr>
<th>Year</th>
<th>Event Description</th>
<th>Responsible Party</th>
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<tbody>
<tr>
<td>2003</td>
<td>Design and develop</td>
<td>INEEL</td>
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<tr>
<td></td>
<td>Build 1&lt;sup&gt;st&lt;/sup&gt; prototype</td>
<td>INEEL</td>
</tr>
<tr>
<td></td>
<td>Work with INEEL</td>
<td>Commercial Contractor</td>
</tr>
<tr>
<td></td>
<td>Design / Build additional prototypes</td>
<td>Commercial Contractor</td>
</tr>
<tr>
<td></td>
<td>Consulting Contract</td>
<td>INEEL</td>
</tr>
<tr>
<td></td>
<td>Build actual production process equipment</td>
<td>Commercial Contractor</td>
</tr>
</tbody>
</table>

(TBD)