U.S. Department of Energy
Office of Civilian Radioactive Waste Management

YUCCA MOUNTAIN PROJECT

# Waste Package Manufacturing and Closure Welds

Presented to:
**Nuclear Waste Technical Review Board**

Presented by:
**Jack D. Cloud**
**Manager Analyses and Component Design**
**Bechtel SAIC Company, LLC**

**January 28, 2003**
**Las Vegas, Nevada**

# Waste Package Prototype Procurement

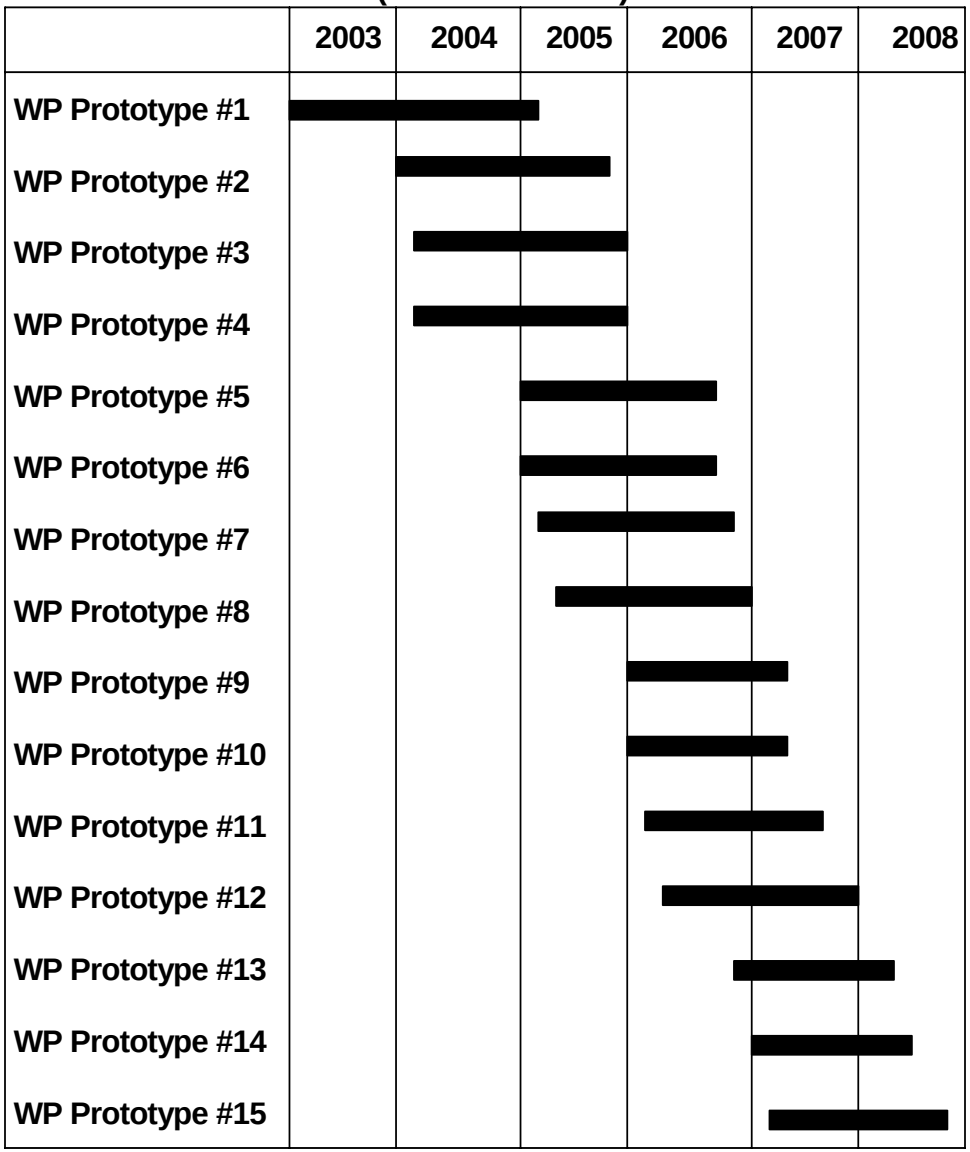
- Determine population of qualified fabricators
- Constructed to exact requirements of actual production models
- Demonstration of fabrication process
- Integral part of design process
- First prototype coincident with License Application submittal

# 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)

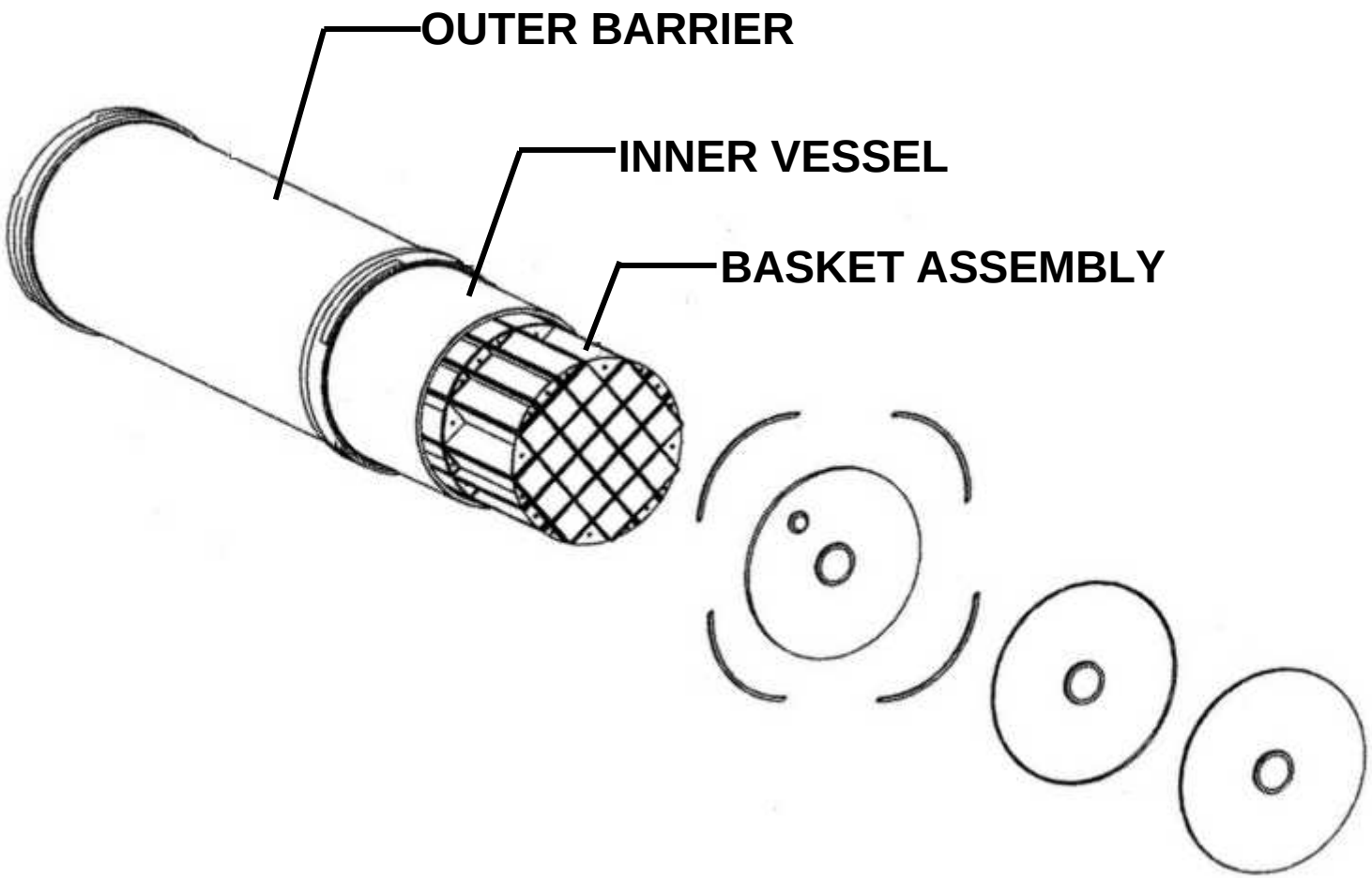


# Status of First Prototype Procurement

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

| | |
|---|---|
| • Pre-qualification | -- Feb 2003 |
| • RFP | -- Mar 2003 |
| • Bid Date | -- 3rd QTR 2003 |
| • Award | -- 4th QTR 2003 |
| • Deliver | -- 4th QTR 2004 - 1st QTR 2005 |
| | (Calendar years) |

# Typical Waste Package



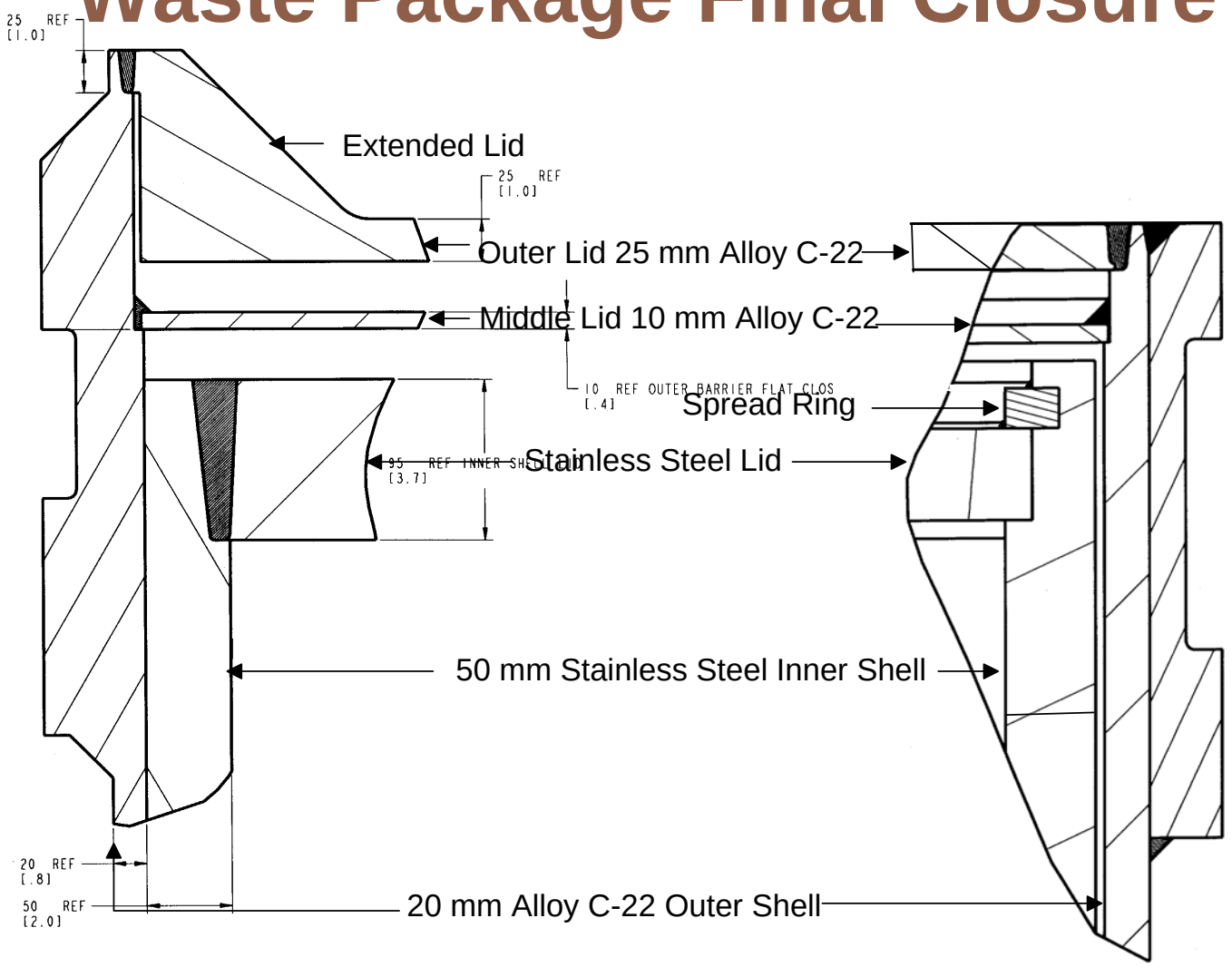
# Weld Process Verification

- 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




**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