A-4500 HOV Project

Design, Fabrication and Testing of the New Vehicle
WHOI has assumed the role of Primary Builder
WHOI is designing and will build a vehicle in a 2-Phased approach.

Phase I (A-4500HOV)
- Install new sphere
- Cross deck key systems to reduce cost
- Deliver 4500 meter vehicle

Phase II (A-6500 HOV)
- Upgrade all 4500 meter components
- Add desired enhancements
- Reclassify vehicle for 6500 meter operations
New Components

- Sphere
- Video and Lighting System
- Penetrators
- Syntactic foam (6500m)
- Forward Section of frame
- Command and Control System
- Pressure vessels (6500m)
- Junction Boxes
- Compensation System
Alvin Cross Decked Components

- Main Battery System
- Mercury Trim system
- Hydraulic System
- Aft section of frame
- Pressure Vessels (4500m)
- VB System
- HP Air System
- Propulsion System
Workspace Concept
Internal Arrangement
Vehicle Milestones

- Preliminary Design Review: December 2009
- Final Design Review: September 2010
- Begin Disassembly: April 2011
- Begin Assembly: July 2011
- Sea Trials: September 2011
A-4500 HOV Project

Design, Fabrication and Testing of the Personnel Sphere
Southwest Research Institute (SwRI) is prime contractor
Sphere Fabrication

- 7-inch Viewport Reinforcement
- Hatch & Reinforcement
- 5-inch Viewport Reinforcement
- Penetrator Plate
Viewport Field of View Comparison

Approximate limit of illumination area

Manipulator reach

Current *Alvin*
180° field of view

A-4500
245° field of view
Forged Hemisphere

Final Forged Hemisphere with ≈ 6 inch prolongation

Hemisphere Heat Treatment and Water Quench
Machining and Welding

Final Machining of Hemisphere

Electron Beam Welded Sphere
Machining and Welding

Machining Insert Holes

Sphere with Port and Starboard Viewport Insert Holes (Sphere is upside down)
Sphere Milestones

• Major Welds Complete       June 2010
• Post Weld Stress Relief     July 2010
• Final Assembly              February 2011
• Hydrostatic Test            March 2011
• Ship to WHOI                March 2011