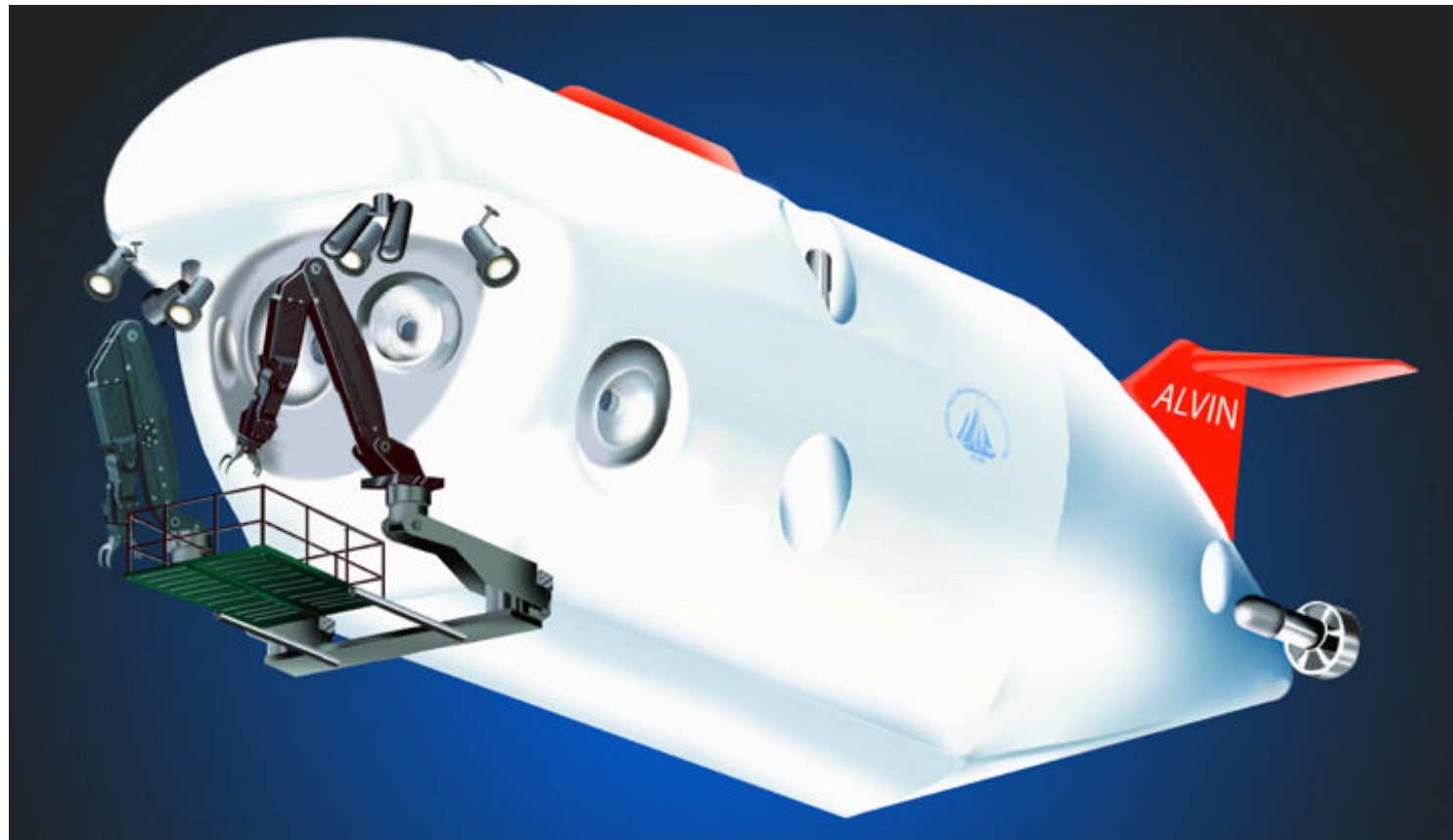


# Replacement HOV Update



# Replacement HOV Update

- Milestone history
- Phased approach
- Phase 1 status
- Phase 2 status
- *Alvin* prototyping
- Schedule



## Milestone History

- **31 July 2004 – NSF Cooperative Agreement awarded**
- **1 Oct 2004 – Acquisition consultant retained (Perot Systems Government Services)**
- **May 2005 – Request for Proposal (RFP) from Southwest Research Institute (SwRI) for personnel sphere design approved by NSF**
- **1 November 2005 – Contract with SwRI signed**
- **1 Dec 2005 – Personnel sphere design kick-off meeting**



## Risk Management

To address areas of higher risk the project has been broken into two phases:

- **Phase One**
  - Design and forging of personnel sphere
  - Feasibility testing for prospective energy system
  - Qualification testing for syntactic buoyancy foam
- **Phase Two**
  - Completion of personnel sphere
  - Design and fabrication of remaining vehicle



# Syntactic Foam Testing and Certification

- Test and fabrication specifications developed
- ABS has approved specifications
- 32 lb/ft<sup>3</sup> foam (single size balloon) developed
- 30 lb/ft<sup>3</sup> foam (DS-30-5000 M) developed
- Continue development of lower density foam w/ 30 lb/ft<sup>3</sup> as target
- Additional manufacturer is starting R&D to produce a 30 lb/ft<sup>3</sup> foam
- Conduct First Article certification testing



## Batteries

- Evaluated current designs & efforts (Li polymer and Li ion)

*LTC*

*SKC*

*Kokam*

*GS Battery*

*Ultralife*

*Lithion*

*Electrovaya*

- Scale battery assemblies for Kokam and LTC
- Baseline and environmental performance testing and safety testing



# Alternative Solutions to Select ABS Rules

- **Alternative oxygen storage solutions**
  - Size of individual containers
  - Number of external containers
- **Means for equalizing pressure across hatch**



## Personnel Sphere Design

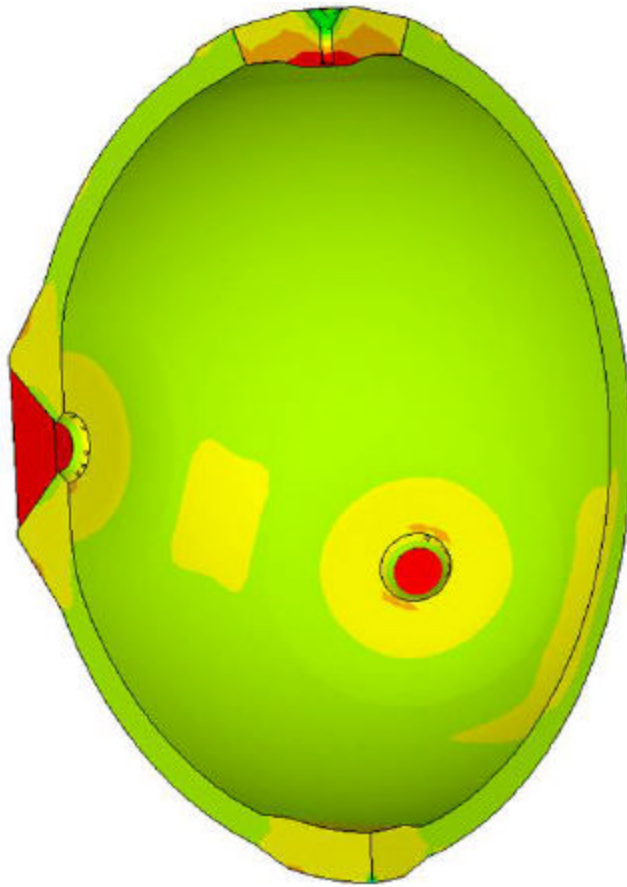
### *Completed*

- **Sea Cliff FEA model & preliminary analysis**
- **Oxygen storage trade-off study**
- **Raw material specifications & Request for Quote**
- **Window design (at ABS for review)**
- **ABS certification plan**
- **Acceptance test plan**
- **Forging specification**





# Personnel Sphere Design



## Personnel Sphere Design

### *In Process*

- **Manufacturing plan**
- **Titanium purchase plan**
- **Trade-off studies**
  - **Window size**
  - **Penetrators**
- **Material Characterization**
  - **Creep testing (tensile & compressive properties)**
  - **Non-creep testing (tensile & compressive properties)**



# U.S. Navy Involvement

## *Review of*

- **Material characteristic test results**
- **FEA of the replacement HOV and *Sea Cliff***
- **Proof test and strain gage plan**
- **Establishment of the hull creep stress design criteria**



## Vehicle Design

- Request for Information (RFI) released 18 April
- Responses (Statement of Interest) requested by June 2
- Request for Proposals (RFP) to be issued late Summer 2006



## *Alvin* Prototyping

- **Inertial Navigation System**
- **Fiber Optic Penetrator**
- **Shaped Memory Alloy Releases**



# Replacement HOV Update

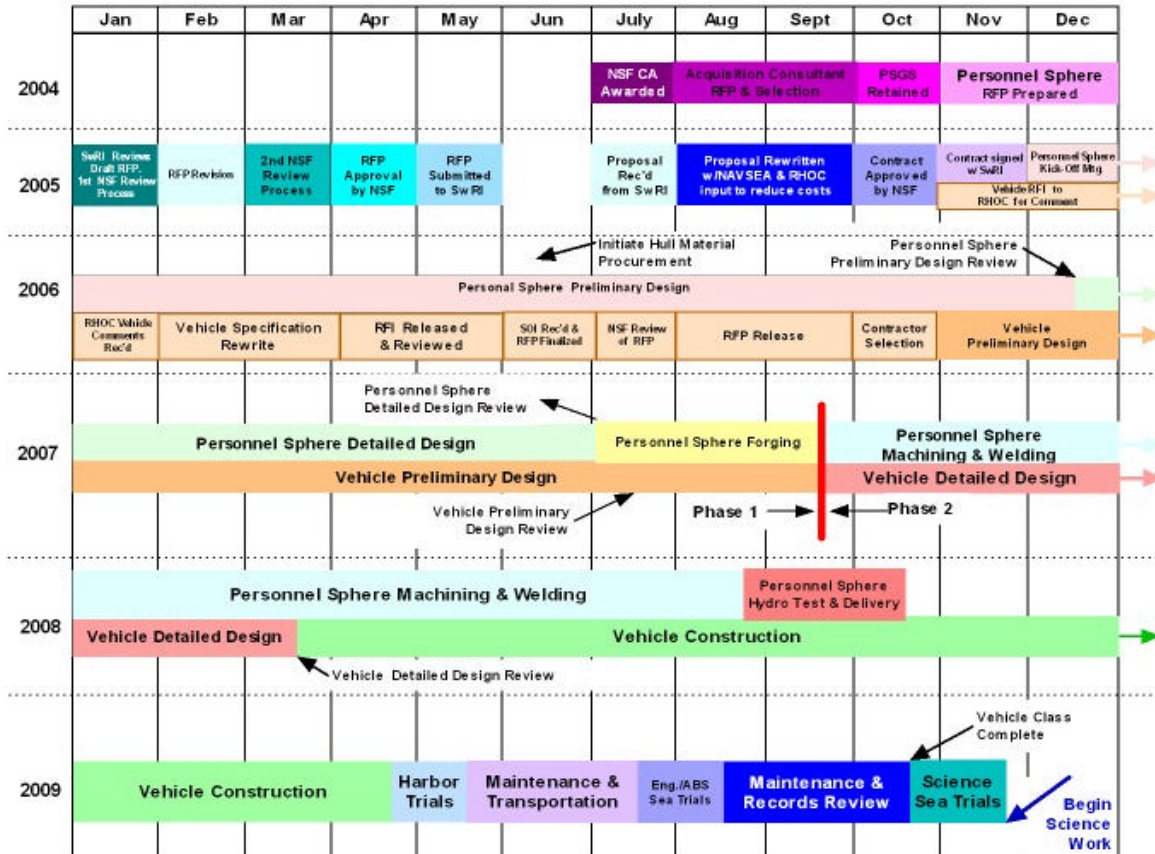
# Schedule

DESSC  
May 2006



As of 19 May 2006

Schedule for the Replacement HOV



## *Thank You*



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