

# *Subcommittee Report:*

## **Establishing Safety Standards for Human Occupied Vehicles**

Report to the  
DEep Submergence Science Committee

May 25, 2006



**University-National Oceanographic Laboratory System**

# ***The situation:***

- NSF and NOAA have traditionally provided support for science cruises on the NAVY owned and inspected DSV *Alvin*.
- NOAA routinely uses vehicles, including Pisces and JSL subs, certified and inspected by ABS as well.
- NAVY is moving away from HOV operations and have indicated they are not interested in certifying the *Alvin* replacement.
- For many years, the science community has expressed interest in using HBOI and HURL submersibles for appropriate NSF-sponsored projects.

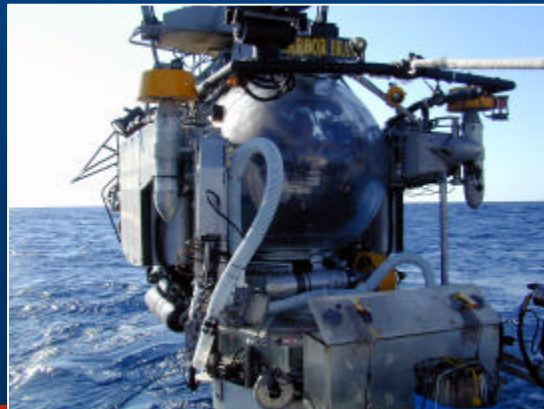
## ***A timely opportunity:***

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- The new HOV will be ABS certified.
- NAVSEA is now advising ABS on certification procedures for deep diving submersibles.
- NOAA and NSF want to ensure that academic HOVs all meet adequate standards.
- Unification of safety standards should remove a major obstacle for NSF funding of research that uses compliant HOVs.

# ***The HOV Safety subcommittee will:***

- Establish uniform safety standards for HOVs.
- Follow draft task statement from NSF and NOAA.
- Complete tasks before the new HOV comes on line.
- Recognize that each HOV has unique attributes.



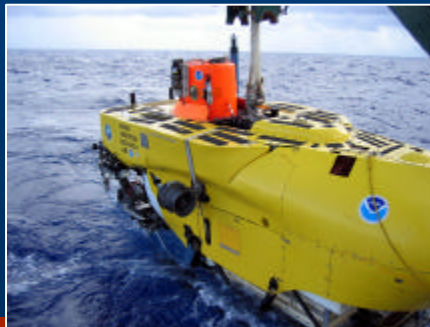
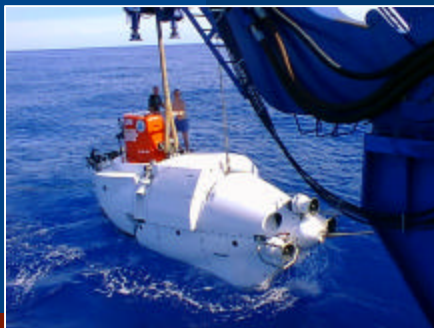
# ***TASK STATEMENT***

***(As provided by NSF and NOAA – January 15, 2006)***

- **Establish Safety Standards for use of Human Occupied Vehicles that will address:**
  - Certification of the vehicle
  - Certification of the ship
  - Certification of the handling system
  - Certification of the operation
- **Develop standards for the training of vehicle and ships' crew**

# ***Steps toward uniform standards***

- Evaluate certification and safety procedures currently in place at HOV Operating Institutions.
- Write safety standards that will apply to all vehicles, while respecting uniqueness of each vehicle and program.
- Submit safety standards to Agency Representatives at NSF and NOAA for review. They, in turn, will consult with their respective Legal Counsels.



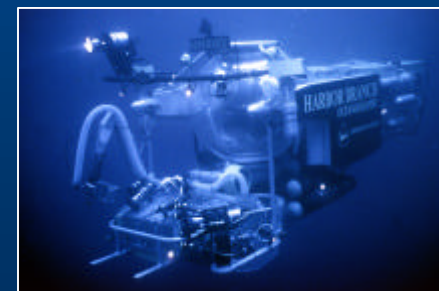


# ***Committee Membership:***

- Dana Wilkes (Chair) - NOAA Representative
- Tim Askew (HBOI) – HOV Operator, UNOLS Safety Committee
- Colleen Cavanaugh (Harvard U.) – Science HOV user
- Pat Hickey (WHOI) - HOV pilot
- Terry Kerby (HURL) – HOV Operator and Pilot
- Dan Schwartz (UW) - Marine Superintendent, past Ship Captain
- Barrie Walden (WHOI) – HOV Operator
- Craig Young (U. of OR) - Science HOV user, DESSC

## **Agency Representatives:**

- NSF- Dolly Dieter, Holly Smith
- NOAA – Barbara Moore



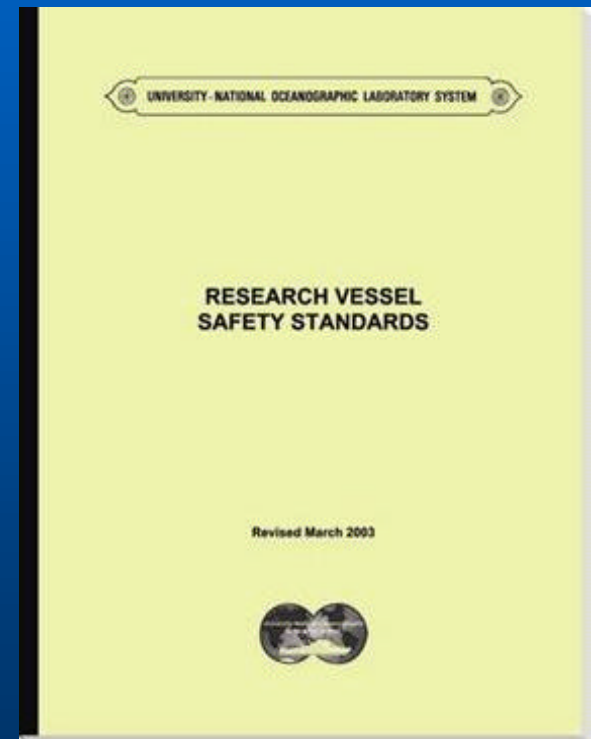
## ***First Meeting: January 25, 2006. Tampa, FL***

- Reviewed Project Background and Task Statement
- Nominated a Committee Chair
- Heard reports on current standards and operating manuals from HOV Operators (WHOI, HURL, HBOI)
- Discussed areas that should be addressed by an HOV Safety Standards Document.
- Defined writing and research assignments for committee members



# ***Proposed Model - Research Vessel Safety Standards***

“These standards are based in major part on applicable laws and regulations. In addition and where appropriate, they supplement, extend, and assist in the interpretation of the legal requirements. Nothing herein is intended to conflict with the legal standards, but rather to encourage and assist the operator to not only meet, but to go beyond the legal minimums, as may be desirable and practicable...”





## *Document Outline*

- Certification of the Vehicle
- Certification of the Support Ship
- Certification of Handling Systems
- Certification of the Operation
- Training Procedures for HOV Crewpersons
- Science User Safety Guidelines

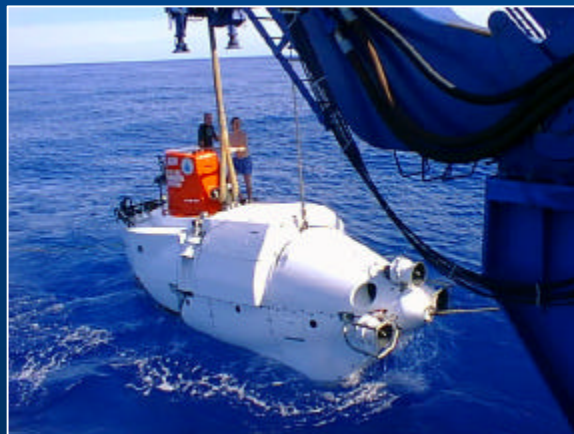


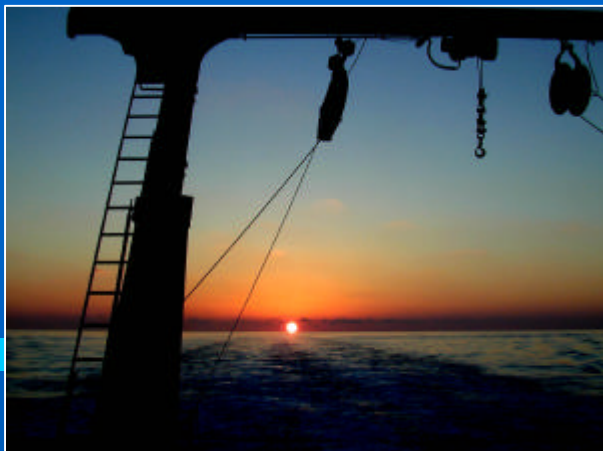
# ***Certification of the Vehicle***

***(P. Hickey, B. Walden, T. Askew, T. Kerby)***

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**Each HOV will be Certified to ABS or  
NAVSEA (SS800-AG-MAN-010/P-  
9290) standards.**





## ***Certification of Submersible Support Ship (D. Schwartz)***

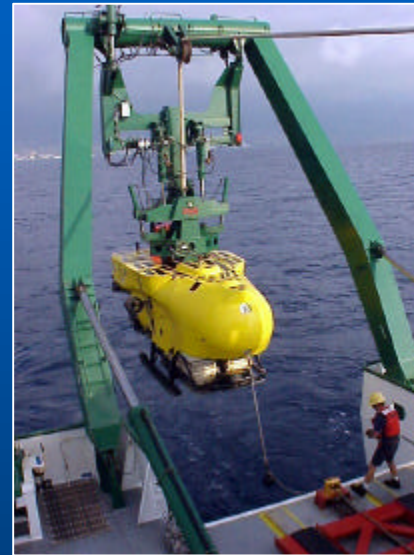
- **Must meet the UNOLS Research Vessel Safety Standards**
- **ISM Compliant**
- **Essential capabilities of a support vessel:**
  - Communications with the HOV
  - Tracking HOV
  - Depth sounding
  - Infrastructure as needed for self rescue ops.
- **Desirable Capabilities**
  - Space for servicing HOV
  - Multibeam – seafloor mapping capability
  - Labs, environmental rooms, etc



## ***Certification of the Handling System (T. Askew)***



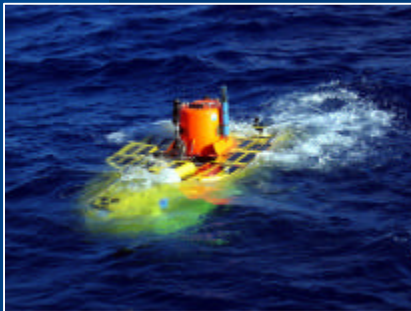
- **Must be human rated**
- **Must meet ABS or P9290 certification standards**
- **Must be periodically tested**
- **Operator qualifications must be established**



# ***Certification of the Operation***

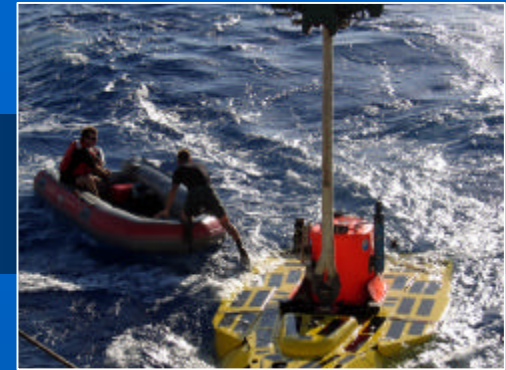
***(B. Walden, T. Kerby, T. Askew)***

- **Certification of the operation will include:**
  - **Operations and Maintenance Manuals**
  - **Decision Making / Chain of Command**
  - **Operational Guidelines and Limitations (depth, hazards, visibility, etc.)**
  - **Emergency Procedures**
  - **Unique Operations (multiple vehicles, etc)**





## *Training (P. Hickey, T. Kerby)*



- HOV-operating institutions define and document qualifications and training procedures for their submersible crewpersons.
- Train ship crewmembers (including winch and handling system operators, deck personnel, conning officers) in safe launch and recovery.
- Allocate adequate time for HOV personnel training while minimizing impacts on science programs.
- Train submersible recovery swimmers and small boat operators.



# ***Science User Safety Guidelines***

***(C. Cavanaugh)***

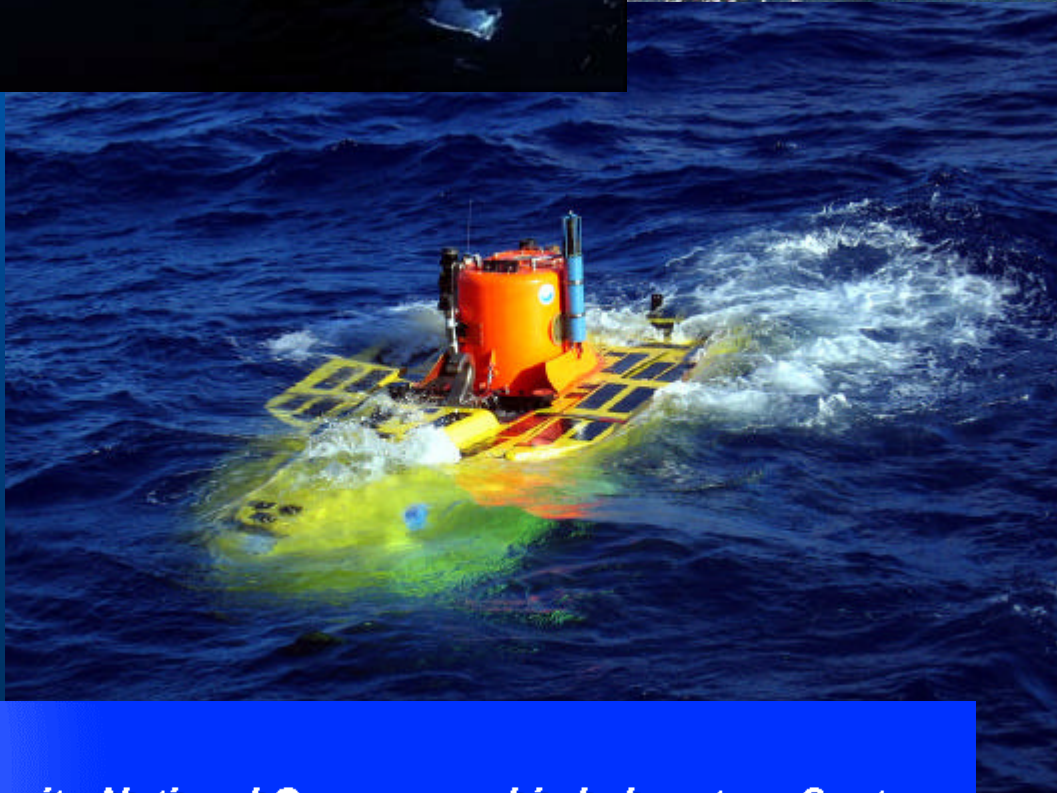
- **Written Safety Guidelines for Science Party**
- **Provision of a safety brief for the scientists including pre-dive systems familiarization**
- **Evaluation of any psychological or physiological factors that may constrain participation by an individual**
- **Documentation of briefings to scientists**
- **Familiarization of observer with emergency procedures.**





# ***Project Timeline and Meetings***

- Timeline: Multi-year
- Meetings:
  - Phone and Web conferencing as needed
  - 2<sup>nd</sup> Meeting – May 25-26, 2006 (WHOI)
- Milestones/Schedule: To be established during 2<sup>nd</sup> Meeting
- Completion: before new HOV comes into service.



**University-National Oceanographic Laboratory System**