

**Global Science Mission Requirements (SMRs) Steering Committee
Organizational Meeting**

**December 13, 2004
Marriott Hotel
San Francisco, CA**

Summary Report

Meeting Participants:

Bruce Howe (UW), Chair
 Bob Embley (OSU)
 Woody Sutherland (SIO)
 Ken Johnson (MBARI)
 Annette DeSilva (UNOLS)
 Mike Prince (UNOLS)
 Kate Sawyers (UNOLS)
 Dolly Dieter (NSF)
 Mike Reeve (NSF)

Participants joining by Phone Link:

Tom Althouse (SIO)
 Jim Broda (WHOI)
 Dave Hebert (URI), FIC Chair
 Paul Ljunggren (LDEO)
 Dan Schwartz (UW) [entered late]
 Al Suchy (WHOI)
 Randy Watts (URI)
 Peter Wiebe (WHOI), UNOLS Chair

Summary of Tasking:

Task	Assignment
Refine Mission Statement – Review the mission statement and send any comments to Dan Schwartz.	Committee
Draft Terms of Reference for the Global SMR Committee	Dave Hebert, Bruce Howe, and Mike Prince
Review the Ocean Class and 1989 Global Class SMRs to determine what should be included in the SMR document. The SMR can be split up for assignment to the committee members.	Committee
Community Survey - The committee should determine what should be included in the community questionnaire.	Committee
Compare current Global Class vessel capabilities with the Ocean Class and 1989 SMRs to determine how well the SMRs describe current and future science requirements.	Large Ship operators (Tom Althouse, Al Suchy, Dan Schwartz, and Paul Ljunggren.
Evaluate construction projects under development in other countries (UK ship, GeoSars vessel). Contact Matt Hawkins (U.Delaware) for the NERC ship project.	Tom Althouse – GeoSars UNOLS Office
Identify modifications that have been made to the current Global Vessels BROWN, ATLANTIS, REVELLE, THOMPSON) since they entered service.	Large Ship Operators
ORION Requirements – keep in touch with Ken Brink	Dave Hebert

Review past workshop recommendations (ocean drilling, NSF Futures documents, Cowles/Atkinson report, etc)	Committee
Review AICC/ARVOC requirements for HEALY and PALMER	Mike Prince and others
Investigate technology developments in new commercial ship construction	Committee
Identify impacts of new and emerging regulatory requirements (ICES Noise standards, ADA, Marine Mammal and Acoustic Permitting, USCG Inspected, SOLAS ships, HAZMAT, International Requirements, Double Hulls, Ice Capable classifications, Etc.	Large Ship Operators
Contact major funding agencies to determine if they have new science requirements.	Bruce Howe and UNOLS Office
Compile large ship utilization trends	Annette DeSilva

Meeting Summary Report:

Welcome and Introductions – The Global Class SMR Steering Committee met on 13 December at the Marriott Hotel in San Francisco. Bruce Howe, Chair of the Global SMR Steering Committee, called the meeting to order at 12:15 pm PST and welcomed the meeting participants. Some committee members joined the meeting via phone link. Participants introduced themselves (the attendance list is included on page 1). Bruce provided a brief background of the project, the purpose of the meeting and reviewed the agenda. The meeting agenda is attached as Appendix I.

In the next five to ten years, several of the present Global Class ships will reach the age where mid-life refits normally occur. The SMRs for this class of vessels were originally drafted in 1989. Since that time, there have been several advances in oceanographic research as well as technology developments that affect the desired capabilities for these vessels. Future ocean observatory facility needs represent an example of new requirements. The UNOLS Fleet Improvement Committee (FIC) believes it is time to update the Global Class SMRs. The first Global ship slated for a mid-life refit is the THOMAS THOMPSON in 2006. An updated set of Global SMRs would be useful in planning for the ship's refit work.

A website for the committee activities has been established on the UNOLS website at <http://www.unols.org/committees/fic/global/global_smr.html>. The page contains background information as well as reference material.

Draft Mission Statement – Prior to the meeting Dan Schwartz drafted a mission statement for the Global SMR project. The Draft Mission Statement and SMR Overall Characteristics document are attached as Appendix II. The group briefly reviewed and

discussed the documents. Randy Watts commented that the Mission Statement seem too broad. The committee was asked to review the Mission Statement and send comments to Dan Schwartz for refinement.

Terms of Reference for the Committee – Bruce, Dave Hebert and Mike Prince were tasked with drafting a charge for the Global Class SMR Committee.

Science Mission Requirements – Purpose, Content and Process – There was a discussion on the SMRs: how they are used, how they are developed, and what they should contain. Mike Prince provided background information on the SMRs that were developed for the Regional and Ocean Class vessels. He discussed their purpose and the process used to develop them. The Regional and Ocean Class SMRs have been very useful in the recent design studies conducted by the Naval Architect, JJMA, to compare and evaluate hull variants. The SMRs are intended to provide a basis for design efforts.

In the Ocean and Regional Class SMR efforts, the process used to develop the document included the following steps:

- Form a steering committee
- Identify any workshop/meeting/internet conferencing needs.
- Work with UNOLS Office to prepare a proposal to support any meetings/workshop.
- Survey the community for future ship needs. Develop mission scenarios.
- Hold a community workshop and draft a set of requirements and desired capabilities.
- Update progress through the UNOLS website. Post draft SMR document on the site.
- Solicit input and feedback from the larger science and operator community
- Produce a SMR document for review and approval by UNOLS.

General Purpose SMR for Global Class: There was discussion on what should be addressed by the SMR document. It was agreed that the SMRs should identify general-purpose requirements for Global Class ships. Any additions or modifications required for specialized Global Class vessels (e.g., the seismic vessel, HOV support vessel or heavy-lift capable vessel) should be placed in appendices to the report.

There was also discussion on prioritization of the SMRs. As a first step the SMRs should all be identified. Then, as potential constraints (cost, size, etc.) are identified, the SMRs should be re-examined and prioritized as needed.

The question was asked if the Global SMRs should address Mid-Life refits needs or new ship acquisition requirements. Annette DeSilva commented that the SMRs should be a document that identifies the science requirements needed for future science (irrespective of how they might be applied). The SMRs should represent the platform capabilities needed to support future science directions. In order to assist the ship operators who are planning mid-life refits, the committee will try to identify the updated SMRs that would enhance the current Global Class ships and could be carried out during a mid-life refit.

Peter Wiebe indicated that development of the SMRs is timely as there are new requirements that are being identified for support of ocean observatories.

Reports and Other Material for Drafting the SMRs –It was agreed that rather than starting from scratch, the existing Global and Ocean Class SMRs be reviewed and updated. Meeting participants identified reports and other information that would be useful in drafting the SMR document. These included:

- 1989 [Large High-endurance, General-purpose Oceanographic Research Ship](#) SMRs – Peter Wiebe recommended that we compare the current Global Class vessels with the 1989 SMRs and learn how well the SMRs describe current and future science requirements. Requirements that are now obsolete should be identified.
- Ocean Class SMRs – Randy Watts recommended that we examine the Ocean Class SMRs and refine the requirements so they apply to the Global class vessels.
- International and Non-UNOLS Vessel Design and Construction Efforts – Bruce Howe suggested that we evaluate design and construction projects under development in other countries. These include the UK (NERC) ship and the GeoSars vessel. Tom Althouse indicated that he has some documentation on the GeoSars vessel. The GeoSars vessel is a 245-ft fisheries vessel with a general-purpose oceanography capability. Matt Hawkins (U.Delaware) is on the advisory committee for the NERC ship project and should be contacted.
- Identify the modifications that have been made to the current Global Vessels – Woody Sutherland suggested that it would be useful to document the changes that have been made to the four AGORS (BROWN, ATLANTIS, REVELLE, THOMPSON) since they entered service. These could provide some information on new requirements and lessons learned.
- ORION Requirements – Peter Wiebe recommended that when the ORION science plan is released it should be reviewed to identify new ocean observatory requirements. The report is expected in summer 2005. We should keep in touch with Ken Brink.
- Past Workshop Recommendations - Bob Embley suggested that the recommendations from workshops such as the one on ocean drilling should be reviewed. Other workshop recommendations that should be reviewed include the NSF Futures documents and the Cowles/Atkinson report.
- HEALY and PALMER Requirements - Jim Broda suggested that the AICC/ARVOC requirements for HEALY and PALMER be considered.
- Commercial Ships – Randy Watts suggested that we examine technology developments in the construction of new commercial ships.

- Regulatory Requirements - Examine the current SMRs to determine if there are missing parameters or elements. Bob Embley commented that there are many new and emerging regulatory requirements that should be considered as the SMRs are developed. These include:
 - Noise
 - ADA
 - Marine Mammal and Acoustic Permitting
 - USCG Inspected, SOLAS ships
 - HAZMAT
 - International Requirements
 - Double Hulls
 - Ice Capable classifications
 - Etc.

- Agency Requirements - All major funding agencies should be contacted to determine any if they have any new requirements. Recently the Navy indicated that they have new SMRs that apply to the Ocean Class vessels.

- Utilization Trends - Bob Embley suggested that the utilization statistics for the current Global Class vessels be examined. It would be of interest to learn where the ships have operated. Annette can compile the statistics.

Is a workshop needed? - Dave Hebert reported that the Ocean Class SMR workshop provided a good forum for getting ideas on the table. Approximately 30 people attended both the Ocean and Regional Class workshops with representation from sea-going scientists, ship operators, marine technicians, agency representatives, and Naval Architects. The workshops were useful. Dolly Dieter added that it is useful to identify any constraints (construction and operation costs) before a workshop so that they can be factored into the discussions.

Timeline – Dan Schwartz joined the meeting. He reported that the updated SMR document would be very useful to help support his proposal for mid-life refit improvements. His proposal to support THOMPSON mid-life refit work could be submitted within a year. It would be helpful to have the SMRs completed when his proposal is submitted.

Community input is very important in the development of the SMRs. The SMRs need to represent the requirements of the user community. Community brainstorming could first take place as a web based survey form. The strawman survey can be drafted by the steering committee.

The optimal time for holding a workshop would likely be mid-way through the project, after input is received from the community survey. If the project is to be completed in a year, the period between May and July should be considered for the workshop. To

support the proposal for THOMPSON's mid-life, a draft SMR document would be needed in September.

For the Ocean and Regional Class SMR workshops, the participants were selected using the following criteria:

- past ship users
- responded to community announcement
- Participated in a pre-workshop survey.
- Maintained a disciplinary balance.

Final prioritization of the SMRs would not be needed for this version of the SMR document.

Tasking was discussed:

- Bruce will work with Mike Prince to draft a proposal for support of a Global Class SMR workshop.
- The committee should review the Ocean Class and 1989 Global Class SMRs to determine what should be included in the SMR document. The SMR can be split up for assignment to the committee members.
- The committee should determine what should be included in the community questionnaire.

A full task summary can be found on page 1.

The group agreed to schedule one teleconference per month to review the project status. The next meeting was scheduled for January 28, 2005, 10:00 am PST (1:00 pm EST).

The meeting adjourned at 1400.

Global SMR Steering Committee
1st Meeting
Agenda
13 December 2004
San Francisco, California,

12:00 Call to order, logistics, and introductions of members present.
(Teleconference connection for non-present members.)

12:10 Discussion of Draft Mission Statement and Terms of Reference for the Committee.

12:45 Review of published reports and other materials (for the Ocean Class and Regional Class, Ocean Observatory Group, etc.) and their utility to this committee's tasking.

13:15 Discussion: laying out a roadmap and timeline for generating the Global Class SMRs. A major decision is whether we need a workshop.

13:45 Assign tasks and review action items.

14:00 Adjourn

Attachments:

1. Draft Mission Statement and Overall Characteristics
2. Draft Agenda, Ocean class R/V SMR Workshop
3. UNOLS Letter of 5/15/02
4. Report of the UNOLS Working Group on Ocean Observatory Facility Needs

**GLOBAL CLASS UNOLS VESSEL, SCIENCE MISSION REQUIREMENTS:
Steering Committee Meeting 12/13/04**

(adapted from Ocean Class by D. Schwartz)

Mission statement and overall characteristics

The Global Class UNOLS Vessels are designed to support integrated, interdisciplinary research, ranging Globally while supporting traditional expeditionary ocean science and meeting the challenges of emerging research demands including, but not limited to, ocean observatories, deep coring, deployment of tethered and un-tethered submersibles and autonomous air and undersea vehicles. Future Global Class refitted and new vessels will substantially expand the existing capabilities provided by most of the existing Global Class UNOLS ships.

These ships are to serve as general-purpose research vessels. The primary requirement is a maximum capability commensurate with ship size in order to support science, educational, and engineering operations in all oceans, with improved over-the-side equipment handling, station keeping, and acoustic system performance while providing a stable laboratory environment for precision measurements. These vessels will provide for larger scientific parties and greater flexibility in use of laboratory/deck spaces than are now available. Some may be configured to accommodate ice-margin research, fisheries related oceanography, heavy lift, long coring, and innovative autonomous vehicle (air and sub-surface) underway survey operations or other specialized missions.

To accomplish these goals there are several features that should receive high priority during the early committee deliberations. These vessels should be acoustically quiet in terms of radiated noise and so that hull mounted acoustic systems can function at their maximum capability. Sea-keeping and station-keeping capabilities will continue to be important design drivers as well. Education and public outreach have become an important function during research cruises and the personnel and equipment to carry out this mission are now widely considered as essential. Paying attention to habitability issues such as noise control, vibration, ventilation, lighting, and aesthetics will also increase the effectiveness and health of the crew and science party and are important factors in recruitment and retention of qualified, motivated technicians and marine personnel.

The specification of scientific and operational equipment outfitting should be carefully planned so that the vessels are equipped with the best research equipment available today—and new tools and technology that will become available in the near future. Expert scientific, technical, and operational groups

should provide guidance and advice on design criteria for all key scientific and operational systems. Experience with the design of past research vessels as well as innovative new approaches should be used to provide designs that will serve the community well for three decades.

These vessels must be reliable, cost effective, and flexible. “Life-Cycle Costs,” i.e. the ability to easily maintain these vessels with minimal manning during full operating years should be a design criterion. Designs should also anticipate and accommodate major machinery overhaul and replacement, as well as future improvements. Fuel efficiency and reliability of machinery and equipment will serve to reduce the life cycle cost of these vessels. The design cycle should consider carefully the tradeoffs between initial acquisition costs and long term operating costs. In conducting this effort, thought should be given as to what enhancements and mission support advances can be accommodated by the present Global Class vessels as they approach their mid-life refits, further identifying those improvements which may be included in the near term as well as those only be achievable when vessels of the class approach their retirement age and replacement vessels are under consideration.

Science Mission Requirements (SMR) - Overview

The purpose of the science mission requirements is to set down design features and parameters that should be used as guidelines during the various design phases—both for existing vessel refits and enhancements, and for new vessel concepts. There are some areas where there will be tradeoffs between two or more desired capabilities. By allowing more than one concept design, the possibility of finding ways to minimize these tradeoffs will be enhanced. A key concept is that ship systems are completely integrated with the science mission for these vessels. Sample mission profiles will be addressed to provide examples of how these vessels might be used in the future. It is possible that not all requirements can be fully realized in any one design and it will be necessary to refine priorities during the design phases. Concept, Preliminary, and Construction design efforts should consider all elements in these requirements and make conscious decisions on how and if they can be addressed.