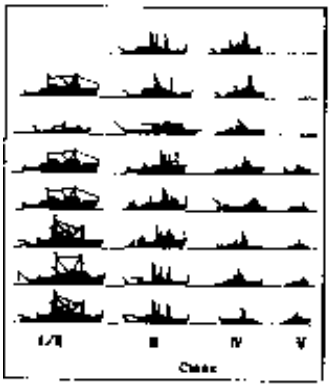
UNIVERSITY - NATIONAL OCEANOGRAPHIC LABORATORY SYSTEM

UNOLS NEWS

VOLUME 17, No. 2 **Fall 2000**



HIGHLIGHTS

Comments from the UNOLS Chair ...

In the coming months the community will witness and, one hopes, help to shape two long-term efforts with fundamental implications for the future of research at sea.

First, in response to one of the recommendations of the Academic Fleet Review conducted for NSF in 1998-9, interagency long-range planning for the size and capability of the fleet a decade or two into the future has begun. The interagency effort falls under the auspices of the new Federal Oceanographic Facilities Committee (FOFC), the successor body to the Federal Oceanographic Fleet Coordination Council (FOFCC). FOFC has a direct reporting link to the senior National Ocean Research Leadership Council (NORLC), an advantage that FOFCC did not enjoy. UNOLS is and will be involved in this process as a non-federal (hence non-voting) FOFC participant, primarily through its Fleet Improvement Committee (FIC). The fundamental issue is that, given today's pace of funded seagoing research activity, there is no current shortage of ship capacity but within two decades normal retirements due to age and obsolescence will claim all but a handful of today's ships. Unless at least some new ships are planned and built during these years, the fleet will be reduced to a small fraction of its current capability. This particularly affects intermediate class ships, the census of which will go to zero in 2016 by normal retirements. However, it takes many years to plan, budget, design, build and bring on line a new ship via federal funding. The conclusion is that good long-range comprehensive fleet planning must begin now, with an earnestness not seen since the era of the UNOLS Fleet Replacement Committee of the mid-1980s. A short paper outlining this situation and planning requirement, prepared by FIC Chair Larry Atkinson and FIC members, appeared in EOS (Vol. 81, No. 30), to urge community attention to this matter.

Meanwhile, a number of individual institutions and consortia are launching design or even construction efforts using non-federal funds. Many of these ships will become elements of the UNOLS fleet. It therefore behooves UNOLS and the agencies to stay abreast of such projects, to respond to requests for FIC advice in order to maximize the utility of the designs to the community as well as to the originating institutions, and to think about how these projects fit into an overall fleet plan with respect to numbers and capabilities.

Continued on page 2…

Comments from the Chair - continued…

In a related effort, NSF commissioned an August workshop, co-chaired by Council members Larry Atkinson and Tim Cowles, to assess and report on the range of observational and experimental capabilities that scientists will expect from the future research fleet. Some of this information will be mined from the existing NSF "Futures" reports, attempting to cast the scientific desiderata of those reports into practical terms that can guide the specification of capabilities and numbers for future ships and seagoing platforms. A broad group of experienced seagoing scientists was convened to take on this workshop and report task.

Second, another recommendation of the Academic Fleet Review admonishes UNOLS and the agencies to work harder at quality control and continuous improvement of service to seagoing science. With the participation of the entire Council, a group headed by Tim Cowles has begun to consider how exactly to do this. It is very much a work in progress. First steps are likely to include distilling and focusing informed opinion from the user community as to just what the service objectives should be. Different scientists and different types of science hold very different views as to whether certain aspects of ship arrangement, equipment, crew capabilities, shipboard technician capabilities and scheduling system constraints are essential, desirable, or irrelevant. Another early step will be to try to define objective measures of progress toward 100% fulfillment of these quality and service goals, measures that can be used into the indefinite future. As in the matter of fleet planning, well-considered inputs from across the community will be sought, and will be essential to success of this quality of service effort.

Bob Knox, UNOLS Chair

UNOLS ANNUAL MEETING ANNOUNCMENT
8:30 A.M., Friday 22 September 2000
National Science Foundation, Room 1235
4201 Wilson Boulevard Arlington, VA

Congressman Sam Farr to Deliver UNOLS Keynote Address

An exciting agenda is planned for this year's UNOLS Annual Meeting. The meeting will take place on Friday, September 22, 2000 at the National Science Foundation in Arlington, VA. Robert Knox, UNOLS Chair, will call the meeting to order at 8:30 a.m. and give a summary of this year's activities and plans for the coming year.

U.S Congressman Sam Farr (Democrat, California), one of the leading members of Congress on issues concerning the oceans, will deliver this year's keynote address.* Representative Farr is a co-chairman of the House Oceans Caucus, a bipartisan focal point for increasing House of Representatives awareness on issues of ocean policy. In 1998, he coordinated the National Oceans Conference in Monterey, the first-ever such conference, and one that was attended by the President and Vice President as well as numerous leaders in government, industry and academia with an interest in our ocean resources. The Ocean Conference began the dialog, at the highest levels, on how to best manage, conserve, explore and sustain the use our oceans for the future. Representative Farr has worked for several years toward a new, integrated national ocean policy and has seen that effort come to legislative fruition in the recently enacted Oceans Act of 2000.

Additional information about Representative Farr is available at http://www.house.gov/farr/. His speech will be a remarkable opportunity for meeting attendees to hear from one of the principal Congressional supporters of enlightened public policy toward the oceans and human use of the oceans.

Following the keynote address, the meeting will continue with reports from the UNOLS committee chairs and federal agency representatives. Various topics of interest will be presented to the membership including the NSF Academic Research Fleet Review, the UNOLS Quality of Service Initiative, and Long Range Academic Fleet Planning and Replacement. Various other issues of interest to UNOLS Members have arisen during the year and will be introduced for discussion. The meeting will include membership votes on proposed charter revisions and Council Elections.

We hope to see you on September 22nd. To confirm your attendance so that we may obtain the proper security ID passes at NSF, please RSVP the UNOLS Office, office@unols.org or (831) 632-4410.

** The time for the Keynote address is tentatively 0845 but may have to shift to accommodate the Congressman's schedule.*

Elections to be Held for UNOLS Council Positions

At the UNOLS Annual Meeting on 22 September, elections will be held to fill expiring Council terms. The first Council terms of Bob Knox (Chair), Tim Cowles, Barbara Prezelin, and Tom Shipley are expiring as well as the second term of Tom Royer (Vice Chair). The UNOLS Nominating Committee of Charlie Flagg (Chair), Paul Ljunggren, and Clare Reimers have assembled a slate of candidates for the UNOLS Council positions to be filled. This election will be held in accordance with the UNOLS Charter as readopted September 1999. The slate is included below. Additional information about each of the candidates can be found on the UNOLS website at: http://www.unols.org/annual/anumt009/slate00.html.

UNOLS COUNCIL SLATE

UNOLS CHAIR (2 year term) - individual affiliated with any UNOLS Member Institution:

Dr. Robert Knox	Scripps Institution of Oceanography

UNOLS VICE-CHAIR (2 year term) - individual affiliated with any UNOLS Member Institution:

Dr. Timothy Cowles	Oregon State University
Capt. Daniel Schwartz	University of Washington

NON-OPERATOR REPRESENTATIVE (3 year term) - from among designated UNOLS Member Non-Operator institutions:

Dr. James Bauer	Virginia Institute of Marine Science
Dr. Curtis Collins	Naval Postgraduate School
Dr. R. Lawrence Swanson	State University of New York, Stony Brook

AT-LARGE (3 year term) - individual affiliated with any UNOLS Member Institution:

Dr. Suzanne Carbotte	Lamont-Doherty Earth Observatory
Dr. Wilford Gardner	Texas A&M University
Dr. Marsh Youngbluth	Harbor Branch Oceanographic Institution

OPERATOR REPRESENTATIVE (3 year term) - from among designated UNOLS Member Operator institutions:

Dr. Dana Kester	University of Rhode Island
RADM Richard Pittenger (USN Ret)	Woods Hole Oceanographic Institution
Dr. Thomas Shipley	University of Texas

Proposed Charter Revisions to be Voted On

Revisions to the UNOLS Charter are proposed and will be voted on at the UNOLS Annual Meeting. The proposed changes would clarify the procedure for replacing members of the Council that leave before the end of their term and modify the provisions for the number of meetings that would allow UNOLS to operate within budget limitations without violating the charter. To view the proposed revisions to the charter, see:

http://www.unols.org/docs/unols_charter_000523.html.

UNOLS Evaluates Approaches for Improving Quality of Service

By Michael Prince, Tim Cowles and Robert Knox

The University-National Oceanographic Laboratory System (UNOLS) Council has recently embarked on an initiative to address concerns expressed in the 1999 Academic Fleet Review about improving the quality of service provided to marine science by the US Academic Research Fleet. Discussion and examination of this issue by the Council and a special ad hoc Quality of Service Committee has raised several questions and a few answers. In this brief article, we will summarize the issues and the results of our discussions to date, and then we will ask you for your feedback on the next steps in the Quality of Service process.

What has stimulated this Quality of Service initiative?

As most of you know, a comprehensive external review of the U.S. Academic Research Fleet was conducted in 1998-99 by a committee appointed by NSF's Assistant Director for Geosciences at the request of the National Science Board. Their report, the Academic Fleet Review, was published in 1999, and provided the community with a careful assessment of the current and future research vessel requirements and the overall management structure for the fleet. The committee found that U.S. marine scientists were provided excellent access to the sea through the centralized scheduling and coordination of UNOLS. The committee assessed the satisfaction of the scientific user community, including representatives of other federal agencies that utilized the academic research fleet and found that user satisfaction with the current system was very high.

While the committee found that the quality of service provided by the UNOLS fleet was generally high, they did find some areas of concern. These included the complexity of cruise scheduling and some lack of consistency between institutions with regard to conventional shared-use equipment and services. In addition, there was concern about the acquisition, use, and maintenance of increasingly sophisticated and expensive equipment that is needed for current and future research projects but which is not available or maintained in a uniform manner throughout the fleet. There also was some concern that some scientific users, particularly those from non-operator institutions, felt they had little recourse for action if a ship, its equipment, or technical staff failed to meet the scientific requirements of their specific project. The Academic Fleet Review states "*Several recurrent issues such as improvement in the scheduling process (especially abrupt changes), equal support of non-operator researchers, quality of shore support, and maintenance/support of installed and pool equipment need to be worked on and improved. The orientation towards a continuous improvement program and a formal quality control program (looking toward the best industry training and practices) needs to be infused into the entire UNOLS and operator system.*"

These observations of the Fleet Review Committee were summarized within two of the eight final recommendations in the 1999 Academic Fleet Review.

- *The funding agencies and UNOLS need to support fleet improvements by enhancing quality control, expanding training of personnel in technical and safety procedures, and developing even higher standards for shared use facilities.*

- *There is a need for a strong, continuing program of new technology introduction; steady improvement of existing facilities and technologies; greater, continuing attention to quality control and safety; and a more systematic, standard approach to maintenance, renovation, up-grading, and replacement.*

These comments from the Fleet Review Committee indicated that UNOLS needed to reevaluate its existing approaches and processes for quality improvement. At the February 2000 meeting of the UNOLS Council, a Quality of Service Committee was formed to initiate discussion and evaluate the issues raised by the Fleet Review Committee. We continued the discussion at the June 2000 UNOLS Council meeting and now provide this interim summary.

Present system for quality control within UNOLS

UNOLS was created to ensure that scientists had access to safe, effective, sea-going platforms for ocean research, regardless of whether or not their home institution operated a vessel in the academic fleet. Several systems within UNOLS are used to monitor the quality of service provided by operators and technical staff. The UNOLS Council, through its committees, summarizes and

provides feedback to the federal agencies about the academic fleet. Much of the information about quality of service comes from the ship users, who complete post-cruise assessment forms and submit those forms to the vessel operator. The key element in a Quality of Service initiative is the quality of the assessment data obtained. UNOLS Council relies on each of its member committees to provide some portion of the quality assessment. The Research Vessel Operators Committee (RVOC) shares information, personnel and resources with one another in an effort to provide uniform, safe and high quality research vessel operations. The Research Vessel Technical Enhancement Committee (RVTEC) fosters cooperation among the marine technician groups of the UNOLS fleet. This group has focused on standard data formats and media, improved shared use equipment and personnel qualifications for marine technical staff. The Fleet Improvement Committee (FIC) has as its purpose the goal of ensuring that the design and capabilities of the research fleet meet the current and future needs of science through community input and formal planning. The Deep Submergence Science Committee (DESSC) and the Arctic Icebreaker Coordinating Committee (AICC) work closely with the operators of specific facilities to provide user input designed to improve those facilities. In summary, each of the component units within UNOLS has a commitment to high-quality service. This commitment to and delivery of quality service was recognized and praised within the Academic Fleet Review. By supporting the direct efforts of the funding agencies to support improved shipboard and scientific equipment, training of crews and technicians, and vessel upgrades or replacements, UNOLS is part of an important partnership that has as its primary goal the improvement of facilities and services in support of U.S. marine science.

As was mentioned above, UNOLS has a formal user feedback system known as the Post Cruise Assessment. This form can be filled out by Principle Investigators (PI's), Chief Scientists and other users after each cruise and sent to the ship operator and the UNOLS office. Some PI's send the form to funding agency program managers as well. The form is available for completion online at: http://www.gso.uri.edu/unols/pcarform.htm. An earlier paper version of the form is still widely used in the fleet and is usually given to the Chief Scientist by the ship's Master to be completed before leaving the vessel. At many institutions, this process is pursued vigorously and the percent return from users of their vessels is at or near 100%. Many times these same institutions are very good about replying in writing to the person submitting the form so that the feedback loop is complete and the scientist is assured that their input is being considered or acted upon. However, at other institutions the process is not as vigorously pursued and the rate of return varies from something greater than 50% to zero. Feedback to scientists completing the form varies from formal written response from top institution managers to informal verbal communications to none at all. In addition to the form completed by the scientists, the Captains and Technicians have a similar form, available in paper format only, which they can complete after each cruise. This form also gives ship operations managers, UNOLS committees and funding agency representatives an indication of how well each ship is supporting specific projects. Past practices of the UNOLS office have been to summarize the information by ship, then forward the information to the RVOC, RVTEC, the UNOLS Council and to funding agencies. These post-cruise assessments have also been used by the NSF and ONR funded inspection teams during their inspections of UNOLS vessels. Most importantly, the ship operating institutions use these reports to correct problems and to plan for improvements. All operators have used recommendations from these reports as justification in proposals for equipment. This post-cruise assessment process works reasonably well, but the findings of the Academic Fleet Review Committee suggest that the process can be improved. We solicit your feedback (see below) for modifying the post-cruise assessment process.

In addition to the written feedback provided by the Post-Cruise Assessment, many UNOLS ship operating institutions have formal Ship Operations Committees or similar bodies that serve as a mechanism for input and oversight by members of the science community both at the institution and from other institutions. These committees can serve varying roles; all with the goal of ensuring the scientific community has direct input into the operational management of vessels of the UNOLS fleet. They are most effective when they can serve as a point of contact for any science user of the vessel regardless of their institution. Not all institutions have these types of committees, but those that do have found them to be very useful and it has been recommended by the UNOLS FIC committee and members of the Quality of Service Committee that every ship operator establish such a committee. UNOLS should continue to encourage and assist these committees in carrying out their responsibilities.

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Next steps in the quality improvement process

As it is an integral part of the UNOLS mission to improve the quality of service provided by the U.S. academic research fleet, the recommendations of the Academic Fleet Review Committee reinforce our goals. The difficult questions arise as we ask how we should modify what we are doing.

The Fleet Review Committee recommended that *"…The orientation towards a continuous improvement program and a formal quality control program (looking toward the best industry training and practices) needs to be infused into the entire UNOLS and operator system."* But what does this mean? We have "formal" mechanisms for improving quality, but they are not part of a comprehensive program that evaluates all aspects of our operations. The Council has heard a couple of presentations on formal quality control and improvement programs that are used by industry. The RVOC has discussed this issue and has received training on the International Ship Management Code (ISM) and the International Standards Organization's ISO 9002 program, both of which are designed to improve safety and quality. ISM, however, is a regulatory requirement for vessels over a certain size engaged on international voyages and will be complied with by the largest of our vessels by the end of this year. It is not by itself a program of continuous improvement. ISO 9002 is oriented more to ensuring that an organization adheres to high standards and documents its procedures for meeting those standards. These regulatory approaches yield compliance to specific standards but do not guarantee excellence.

With the quality improvement challenges posed by the Academic Fleet Review, we must ask whether or not we need help to move toward a more formal quality improvement program. If so, what type of help, successful it will be and how well it will be accepted by all of the "stakeholders."

We think that we can obtain better input on quality issues from the customers of the UNOLS fleet that will then be implemented through a more formal quality improvement process. In February 2000, UNOLS Council had a presentation by a quality improvement professional (Ms. Paula Anderson-Findley) who introduced us to the various approaches used within corporations to improve quality. These include the Malcolm Baldridge National Quality Award, the Deming award, Total Quality Management (TQM) and Six Sigma. The ad hoc committee on quality of service has looked at several of these programs and one of the challenges is to identify a program that would work for an organization as complex as UNOLS. In June 2000, the UNOLS Council heard a presentation by Dr. Mariann (Sam) Jelinek, program manager for the Innovation and Organizational Change program at NSF. She pointed out that UNOLS is much more complex an organization than most industrial firms. This complexity makes UNOLS an interesting challenge for the application of organizational quality improvement programs, as the organization is made up of such a diverse set of independent institutions, funding agencies and individuals. Dr. Jelinek suggested that some quality of service researchers in her program would find UNOLS a productive and fascinating organization to study. There has been some work on formulating cross-organizational quality improvement programs within industry, such as when a manufacturer works with their suppliers on a joint program. Similar concepts could be applied to the UNOLS fleet. Clearly, identifying the right kind of "formal" program will have a big impact on how

<u>We need your help</u>

A quality improvement program must be continuous and permanent. It must become a natural part of the culture of the organization. Every one involved must "buy in" to the program and in order for that to happen it must benefit everyone from deck hands to program managers to graduate students to research scientists. Within the UNOLS fleet we are already blessed with crews, technicians and scientists who are highly motivated to make their ships the best that they can be. Our challenge is to develop a program that enhances their efforts and makes it possible for them to achieve even higher goals.

The key ingredient in any UNOLS quality improvement program is to improve the methods that we use to get meaningful input from all of the stakeholders in our enterprise, with particular emphasis on the input from the scientific users of our facilities. In order to set common high standards we will need to have continuous feedback from science users, operations managers, crewmembers, technicians, and funding agency managers. To this end, we solicit your input on the UNOLS cruise assessment process. Do the post-cruise assessment forms ask the right questions? Do operators and technicians clearly understand your cruise objectives in advance of the cruise? Your participation in this process will assist us in defining the scope of the quality issue, and will improve our ability to recommend the next steps to UNOLS and the funding agencies.

and how do we get it? Do we hire consultants, get funding for an independent survey or study or just hire someone to make it happen? This perhaps is our biggest challenge. A partnership with a researcher in the social sciences that might seek funding through the NSF IOC program might be an answer. Dr. Jelinek and Dr. Sandy Shor (NSF, OCE) are discussing possible approaches to create such a research opportunity.

As we have said before, we are seeking ideas and guidance from the ocean science community on this issue. Anyone interested in the discussion so far should visit the web page dedicated to the issue at: http://www.unols.org/quality/Quality_of_Service.html

This page includes links to information about the Malcolm Baldridge Award and other formal programs, the IOC program at NSF as well as the discussion by the Quality of Service ad hoc committee. From this page you can access a questionnaire that will allow you to add your comments and advise on this important subject. Please join in the discussion. Your insights and experience with the ships in the fleet are invaluable.

NSF Workshop to Address Future Scientific Needs in Oceanography in the Context of Academic Fleet Capabilities

A workshop was held at Oregon State University (Corvallis OR) on August 9 and 10 to discuss future science needs in the context of the academic fleet. The NSF-sponsored workshop was co-chaired by Tim Cowles (OSU) and Larry Atkinson (Old Dominion University). The idea for this workshop was stimulated by oceanography's fundamental need for dependable observations of the ocean in the face of a changing academic fleet. Research vessels have served as the critical platforms for those dependable observations, although oceanographers have expanded the types and extent of observational and experimental approaches to include systems as diverse as satellites, remotely operated vehicles, and molecular probes. As we look into the next ten to twenty years of scientific research into ocean processes, we must consider the wide range of observational and experimental capabilities that scientists will expect from the Academic Fleet. These capabilities and requirements then can guide the design and construction of the next vessels in the fleet.

The 1999 Academic Fleet Review emphasized the need for a defined process for replacing aging vessels in the fleet, and charged the Federal Agencies to develop such a process. A critical complementary recommendation charged the oceanographic research community to articulate a vision for the future of ocean science so that the next research vessels effectively meet the scientific needs of the community for the next two to three decades. Many general aspects of that vision have been addressed in the broad-ranging disciplinary "futures" reports, in the UNOLS Fleet Improvement Committee Reports, and in the upcoming report from the Ocean Sciences Synthesis Committee (Brewer and Moore, 2000). This workshop is designed to supplement those contributions through a two-day workshop that brings together members of the research community to:

- Identify potential observational/experimental approaches that may be used to address fundamental questions in ocean science over the next 20 years,
- Identify the characteristics of different research platforms that could provide the capabilities for meeting the identified technological requirements, and
- Evaluate the role of research vessels and potential trends in vessel utilization within the context of other observational platforms.

As a final product, we will provide a written report to NSF that summarizes the discussions of each of these objectives. We hope that such a document can contribute to the on-going efforts of NSF, ONR, and NOAA to finalize a plan for vessel replacement within the Academic Fleet.

We will provide a summary of the workshop for the next UNOLS newsletter.

by Timothy Cowles and Larry Atkinson

UNOLS Committee Reports and Activities

An update from the DEep Submergence Science Committee (DESSC)

By Patricia Fryer, DESSC Chair

The minutes for the Summer DESSC meeting at WHOI are posted on the UNOLS web site at <http://www.unols.org/dessc/desmt005/desmi005.html>. At the meeting, an update on the planned upgrades to the NDSF ROVs was provided. Details of the plans and upgrade specifications can be viewed at <http://www.marine.whoi.edu/ships/rovs/upgrades.htm>. The SeaCliff study initiated by the NDSF is complete and a short form of the report is available on the web at <http://www.marine.whoi.edu/ships/SeaCliff/report.htm>.

DESSC is following up on recommendations from the DESCEND Workshop that was held last fall. The Executive Summary of the Workshop proceedings is presented in this issue of the UNOLS Newsletter (see below). At the workshop, the participants recommended that the role of DESSC be expanded to encompass the larger community of researchers utilizing submergence vehicles and tools. Since the DESSC summer meeting, Dr. Shirley Pomponi of the Harbor Branch Oceanographic Institution has been contacted and invited to serve as a liaison to DESSC from the shallow water submergence community. We are pleased to announce that Dr. Pomponi has graciously consented to perform this function. Once the UNOLS Council has approved this addition, we will begin working with her and through her with the community of shallow-water submergence scientists to pursue those aspects of submergence science that will be beneficial to us all.

DEveloping Submergence Science for the Next Decade
"DESCEND" Workshop

EXECUTIVE SUMMARY

Systematic observation and sampling of the oceans and seafloor began just over 125 years ago with the voyage of the HMS Challenger. The world's oceans and seas occupy more than 70% of the Earth's surface area, and the enormous volume of ocean water plays a fundamental role in controlling Earth's weather and provides habitats to the greatest number of species on Earth. Compared with the classical sciences which have been studied in one form or another for millennia and whose modern roots stretch back to the Renaissance over 500 years ago, oceanography is a relatively young science. Its foundations lie in the 19th century voyages of discovery, but its modern technological face was shaped by the demands of 20th century global conflicts. Today's oceanographic voyages seek to help us understand the Earth and our place in it. They lead to discoveries regarding the Earth and oceans that are crucial to our understanding of global tectonic processes, coastal hazard assessment, marine resource management, geochemical cycling, global change, and even the processes of life itself.

Our understanding of Earth history through the paradigm of plate tectonics and our growing understanding of historical patterns of Earth's climate are directly attributable to the multidisciplinary study of the oceans and seafloor using increasingly sophisticated techniques. Over the past three decades, significant discoveries have been made which have altered the course of many scientific disciplines. For instance, the discovery with the ALVIN submersible in the late 1970s of deep sea hydrothermal vents and complex animal communities which survive via chemosynthetic processes has revolutionized deep sea biology and changed our concepts of the origins of life on Earth and possibly other terrestrial planets. Many other discoveries, with no less important implications for Earth and ocean sciences, have been made as a result of scientific research in occupied submersibles or using other near bottom mapping and sampling vehicles and tools like remotely operated vehicles (ROVs) or autonomous underwater vehicles (AUVs). In fact, nearly every venture into this vast realm beneath the sea surface produces startling discoveries in all branches of oceanographic sciences, often with important implications for research

in fields outside oceanography. A phenomenal escalation is taking place in technologies that can enhance our abilities to sense, sample, and record phenomena in the seas around us. The US oceanographic community, however, needs resources and a national focus. These key elements will allow the US submergence community to enhance our potential for discovery by utilizing the new instruments, vehicles and data handling capabilities afforded by this burgeoning technology.

The DEveloping Submergence SCiencE for the Next Decade (DESCEND) Workshop, held in October 1999, was prompted by the need to define both the future scientific goals of the submergence research community, and the vehicle and sensor technologies that could best support the science in the coming decades. In order to accomplish its goals the DESCEND Workshop combined both science and technology perspectives. The two and a half-day meeting devoted the first day's discussions to science and the second day to exploring technology needs and possibilities. The last morning was devoted to a plenary discussion to review results and formulate recommendations. The detailed summaries of session proceedings are posted on the UNOLS website at: <http:// www.unols.org/dessc/descend/ descend.htm>. The key statements and recommendations of the meeting deliberations are summarized below:

Science

There is general consensus among the 119 Workshop participants that both deep and shallow submergence science will play important roles in oceanographic research in the coming decades. The research problems are varied in scope, multidisciplinary in nature, and globally distributed. In the mid-ocean ridge environments we seek to understand the complex interactions between the development of lithosphere, the biological processes active in these regions, the geochemical cycling phenomena that affect the composition of the world's oceans, and the connection of all these processes to the ultimate mantle source of heat, volatiles, and silicate melts that drive these systems. The results of research at individual ridge crests must be compared and integrated so that the global variability in these processes can be better understood. Research in the global abyss and open oceans faces the greatest challenges because of the need for comprehensive mapping of spatial and temporal variations of a wide array of phenomena. Quantifying the dynamics of abyssal and open ocean systems must include resolving the fluxes, changes in storage of energy and mass, reactions and interactions between components of abyssal and open ocean systems (chemical, physical, biological, geological), and the importance of variations over many time scales. We seek to answer fundamental questions concerning abyssal and open ocean biological communities, their abundance and spatial distribution patterns, and must understand the influences of physical, chemical and geological linkages that govern them. The margins of the oceans, where the impact of geologic and ocean processes on human populations is of critical interest, are also the locations where some of the most spectacular natural phenomena are to be observed. We wish to better understand the seismicity and volcanism that accompany plate subduction, the slope stability factors that affect hazard assessment in coastal regions (land slides, tsunami generation, etc.), and the factors that adversely affect ecosystems in coastal environments. The geological, biological, and geochemical dynamics that accompany subduction, the evolution of continental crust, global biogeochemical element cycling, the tectonic forcing of hydrologic systems in margin settings, gas hydrate systematics, and anthropogenic impacts on coastal environments are all critical research areas of importance to the study of the margins of the oceans. Polar regions present particular difficulties for submergence science but offer some of the most exciting scientific challenges and potential for discovery in the next century. Dynamics of the polar oceans, glaciation, the role these oceans play in global biological cycles and ecosystems, the effect on global climate change and its historical record that is preserved in these regions are first-order research problems that need to be addressed.

One of the key components of many of the research initiatives to be carried out in the coming years will be the investigation of temporal processes on the seafloor and in the water column over both short and long (decadal) periods. The critical observational and sampling requirement implied by time-dependent research requires that new enabling technologies be developed and made available to the broad research community. The existing suite of deep submergence vehicles and capabilities, at the National Deep Submergence Facility and elsewhere in the US, must be maintained and the research community must be assured of access to the vehicles and other technologies necessary to carry out these time-series efforts. A stable funding base for

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oceanographic facilities, for time dependent studies, and for basic research is a critical component to the success of future submergence research. The workshop participants expressed concern that at present, even field programs that are fully funded lack sufficient access to needed submergence assets. Scheduling of these programs is sometimes delayed for several years because of insufficient availability, either because of logistics or shortfalls in oceanographic facility funding. Providing a stable funding base and greater access to appropriate submergence assets will result in the timely achievement of our federally supported research goals and enhance future research efforts.

Vehicle and Sensor Technology and Development

Occupied submersibles will continue to be the critical tool for maintaining the human presence at sites of experimentation, observation, and sampling on the seafloor. They will require better manipulative capabilities, chemical and biological sensors, the capability to maintain *in situ* conditions during experiments and the ability to preserve those conditions for samples recovered. The participants also supported the need for a greater depth capability. Future submergence research will uniformly require improvements in imaging, particularly high-resolution digital video, still imagery, and data telemetry to the surface and for up/down-loading data from seafloor sensors. Sea floor mapping at various scales using ROV and AUV systems will be important. Improved sensor capabilities will be required for all types of submersible operations, for occupied submersibles (OSs), ROVs, and AUVs. The types of sensors recommended include: *in situ* optical, chemical, high temperature, and heat flow sensors, long-term non-degradable gas-type manifolds for water sampling, pressure sensors, gravimeters, magnetometers, multi-spectral sensors, current flow meters, *in situ* x-ray and mass spectrometers, molecular and biochemical probes and sensors, and computer controlled sediment samplers. Samplers on OSs and ROVs will need to be upgraded so as to perform precision experiments *in situ*, to sample and preserve delicate biological specimens, and to recover samples without cross-contaminating them. New samplers for multiple small volumes of water are envisioned for some experiments. Improved coring will be needed as will the ability to drill various lithologies both to collect samples and deploy instruments downhole. The participants of the workshop also strongly support the continued development of AUVs for a variety of oceanographic sensing, and seafloor mapping and sampling applications and their rapid implementation and integration into the US oceanographic fleet facilities. AUVs have the potential to enable the oceanographic community to respond rapidly to ephemeral events, to revolutionize how certain types of global and regional oceanographic research is conducted, and to enable many aspects of operating remote seafloor observatories.

Infrastructure and Funding

US leadership in submergence technology and scientific productivity is unmatched anywhere in the world. This leadership position has been attained through dedicated efforts by facility providers, individual scientists and engineers, and federal agency program managers. The infrastructure that currently exists to support the US academic research needs for deep ocean science consists principally of the US National Deep Submergence Facility operated by the Woods Hole Oceanographic Institution[1]. This facility is part of UNOLS (University National Oceanographic Laboratory System). It includes the submersible ALVIN, which can dive to 4500 meters depth with 2 observers and 1 pilot, and several 6000-m-rated remotely operated vehicles (ROVs) and tethered mapping and imaging systems (ROV Jason, Argo II mapping and imaging system, and DSL-120 sonar system). Several additional universities and research organizations in the US have technical capabilities that also provide access to the water column and seafloor. These include Harbor Branch Oceanographic Institution (HBOI)[2], the Marine Physical Laboratory (MPL)[3] of the Scripps Institution of Oceanography, the Monterey Bay Research Institution (MBARI)[4], and the Hawaii Undersea Research Laboratory (HURL)[5]. The vehicles operated by all of these facilities provide the key submergence capabilities that allow US scientists to study the water column and seafloor.

Despite the acknowledged dedication to submergence science in this country, it is important to note that US federal spending on submergence science and facilities is dwarfed by the amounts spent by our foreign competitors, principally Japan (spending about 15 times US expenditures) and France (spending about 5 times US expenditures). The workshop participants agree that we must maintain and expand our current submergence science capabilities and assets. A key recommendation from the workshop is that the US federal agencies increase spending for submergence facilities support and technology so as to ensure the needed access,

facilities infrastructure, and technology required to meet the challenges and requirements of submergence research in the coming decades. Planning and budgets for this must begin immediately given the 5 to 10 year time-frame over which these types of facilities are created.

Participants of the workshop agreed that these requirements will encompass an expanded deep water presence to permit research in the abyss and at the ocean margins as well as a greater access to shallow water and polar environments, key areas of research in the 21st Century. The UNOLS DEep Submergence Science Committee has initiated action that will incorporate a representative of the shallow-water research community on DESSC with the goal of providing liaison between the deep and the shallow water submergence communities. The community of investigators involved in shallow oceanography, however, merit a focused committee that can serve as an advocate for shallow-water facility needs within the UNOLS system and provide guidance to the federal agencies for future planning.

Key Findings and Recommendations of the DESCEND Workshop:

1) The oceans are a frontier of science for the 21st century. This frontier has broad and rich societal and academic relevance, from understanding the role of the oceans in moderating global change to understanding the very limits of life on this and other planets.

2) Recent, significant advancements in submergence technologies (submersibles, ROVs, AUVs, sophisticated sensors and samplers) have the potential to provide unprecedented access to the oceans, with astounding promise for further advancement. Currently, this potential is hampered not by imagination or need but by funds.

3) Continued US leadership in submersible science and technology is in jeopardy because of the lack of a national initiative dedicated to providing the requisite funds necessary for increased access to existing submergence assets and to support technological developments for ocean and seafloor exploration.

[1]NDSF - <http://www.marine.whoi.edu/ships/ships_vehicles.htm>
[2]HBOI - <http://www.hboi.edu>
[3]MPL - <http://www-mpl.ucsd.edu>
[4]MBARI - <http://www.mbari.org>
[5]HURL - <http://www.soest.hawaii.edu/HURL/hurl.html>

Research Vessel Technical Enhancement Committee Plans for the 2000 Meeting are Underway

Plans are underway for this year's Research Vessel Technical Enhancement Committee (RVTEC) Meeting. The meeting will be held at Lamont-Doherty Earth Observatory on October 18-20. The agenda is under development with possibilities including a hands-on type program featuring EM wire terminations, National Marine Electronics Association (NMEA) interfacing standards, Autosal techniques and SeaNet protocols and procedures. The agenda will be posted on the UNOLS website.

Arctic Icebreaker Coordinating Committee News

By James Swift, AICC Chair

UNOLS Arctic Icebreaker Coordinating Committee (AICC) members recently participated in the USCGC HEALY ice trials and science systems tests which took place in the northern Labrador Sea, Davis Strait, and Baffin Bay during April through June.

Ice trials

This ambitious program put HEALY through increasingly heavier ice conditions during two three-week legs of icebreaking designed to thoroughly shake down the ship. Although there was a learning curve with respect to the operation of HEALY's advanced propulsion plant, the learning was accomplished, power was available in vast quantities, the ship broke ice, measurements were made, and there were smiles all around because HEALY proved to be a fine icebreaker. Official results have not yet been published, but it appears in general that the vessel's icebreaking specifications have been exceeded, there is not excessive milling of the ice by the props, and the vessel is responsive and maneuvers well in the ice. Thanks to the involvement of the engineering test teams during construction, it was possible to instrument key areas that would not have been easily accessible after the ship was completed. Terry Tucker, Dev Sodhi and their team from CRREL provided information on the sea ice characteristics to match with the readouts from the ship. This should make for some interesting presentations down the road.

Science systems tests

Each of the four science systems test legs which followed the ice trials had a focus. The tests emphasized the "test memo" approach, where a science system was methodically checked out, and also the "science cruise" approach, where equipment was used in the mode expected on a typical research cruise. What made the testing exercise so valuable was the enthusiastic joint participation of the Coast Guard personnel who will be supporting the systems, technical experts from the UNOLS community, and seagoing scientists.

Leg 1 tests included science acoustic equipment (the SeaBeam 2112 swath mapping system, the 150 and 300 kHz ADCPs, and the Bathy2000 and Knudsen bathymetry systems), the XBT system, and the science data network (SDN). All of the planned tests were completed with the exception of testing in the marginal ice zone. The ice had simply retreated too far north to reach within the allotted time frame. (The acoustics gear was, however, exercised in the ice during legs 2-4.)

Based on examination of real time data, dramatic improvements in the ship's SeaBeam 2112 system were made since the warm water trials, largely due to recabling and to repositioning the vertical reference unit. The system now appears to be functional. Potential users of SeaBeam on HEALY can expect to obtain good bathymetric data in moderate seas, at most headings and at reasonable speeds in open waters, and surprisingly good data in ice-covered waters. They can expect to encounter similar data artifacts, reliability and capabilities that have been experienced by the science community on UNOLS vessels.

The 300 kHz ADCP is not presently capable of acquiring water velocities below about 20 m. But the 150 kHz ADCP appears to operate as well as can be expected of a broadband instrument. The Bathy2000 bathymetry system is functional, and the system successfully tracked a pinger to 2000m in moderate seas. The Knudsen bathymetry system functioned well and is readily configured with straightforward controls. It produced clean 12 kHz bottom traces to 4000 m at speeds of 15 knots. The Sippican Mk12 XBT system was tested and worked without problems.

The HEALY science data network (SDN) functions well in many cases, though aspects of the system operation were identified as areas for possible improvement. In addition to suggested changes and improvements, issues regarding maintaining the system, shoreside troubleshooting during missions, expertise on board, and keeping abreast of technological developments are being discussed.

On Leg 2 the uncontaminated seawater system received a careful going over. Seawater supply flow rate and temperature tests were completed at all locations. The thermosalinograph and fluorometer were working. Debugging and fixes improved performance and knowledge of the system.

MOCNESS tows with the 0.680" conducting cable from the aft A-frame were an unqualified success, beginning with an open water tow,

then progressing to a tow in light ice cover, and finally a tow in 80+% ice cover. The ship's bow simply pushed the ice aside. Little ice was ducted into the wake of the ship and so there was never adverse effect on the tow. The MOCNESS, winch systems and deck operations worked very well.

The CTD tests were successful, with a small number of minor problems identified. Steady 30-knot winds did not deter over-the-side operations. With HEALY riding with very little undue motion, the only clue to the wind speed was the wind whipping on deck. In-ice CTD operations did not differ in any significant manner from open water operations. A problem with the outboard sheave for the 0.322" wire was identified and the unit will be modified or replaced for the first field year.

Leg 3 focused on anchor-last deployment of a scientific mooring in open water, recovering that mooring, anchor-first deployment of a scientific mooring in heavy ice cover, recovering that mooring, and continued testing of the ship's underway systems, winch control systems, communications, and CCTV.

The UNOLS mooring test team and the deck crew first carried out a successful open water, anchor last deployment of a scientific mooring near the center of Davis Strait. The exercise was meant to mimic the complete sequence of events that would occur during real deployments and recoveries, as if they were separated by months in time. The mooring operation was a complete success.

For the in-ice mooring test the ship's company carried out much of the work, with the UNOLS team supervising. Deployment went quickly and smoothly. The next morning, after a ranging test, mimicking re-checking the position of a mooring after a long deployment, the ship prepared a mooring recovery "pond" in the ice at the location expected for the mooring to rise into. The release was triggered, the yellow floats appeared in the pond, and from the aft con the HEALY maneuvered into position with the stern close to the floats. Hauling in went as quickly and smoothly as deployment. The coordination between the bridge, deck crew, MSTs, and science party was very good throughout. As with the open water mooring the deployment and recovery were videotaped, with copies made for the ship, for training, and for the AICC, to assist community evaluation.

Other tests continued. The HEALY's biochemistry laboratory is specified to have tight temperature control - at typical laboratory temperature - so that instruments and analyses sensitive to laboratory temperature can be carried out to specification. Several days of logging biochemistry laboratory temperature at 15-minute intervals demonstrated the inability of the installed HVAC and controller to meet the specifications for this space. Modifications have been recommended so that specifications can be met.

And during what was originally intended as simply a test cast to continue scientific evaluation of the winch control system, the ship's company carried out a successful dredge haul in approximately 900 meters of water in a long lead in the ice field, bringing up rocks, mud, and several bottom dwelling organisms.

Testing of the environmental control systems in the climate control chambers continued, imitating use cycles with a schedule of door openings, and with placement of a small heater in one chamber to mimic the thermal load of a person and equipment.

On Leg 4, although there were a few miscellaneous tests to retire, such as those for the science hoist and deck communications system, and a few ongoing tests, such as the climate control chambers and continued evaluation of the science data network and winch control systems, the focus was on evaluating HEALY's coring and dredging capabilities. All parties agreed that HEALY's coring capabilities in open water over the aft A-frame were amply proven during warm water testing, so the emphasis on Leg 4 was on coring over the starboard, and in ice. Associated with this were use of the SeaBeam and 3.5 kHz sub-bottom profiler to survey prospective sites.

The first core, with 40 feet of pipe, was launched and recovered without incident. By all evidence it had not only entered the sediments easily, but had plunged in to the core head. The entire operation was very capably led by the UNOLS groups, who took laudable care to work out procedures and instruct the Coast Guard personnel. Next a 60-foot core was launched. The Coast Guard personnel led this operation, with the academic technical specialists coaching; similar to the way the second mooring operation on Leg 3 was led by the Coast Guard. This coring operation worked well, triggering and pullout were excellent, and the corer brought back a nearly full barrel of mud, up to the 56-foot point, where the core ran into a hard layer.

Continued on page 14…

AICC News - continued…

As the coring team prepared to do a second 60-foot core in order to tune the procedures and help cement the training program, to the surprise and dismay of all, it was learned that the fine control the trawl winch requires to work safely with the massive core head was no longer available. Fixes were attempted, to no avail. This problem demonstrated very clearly that changes were needed in the winch control system, and it was heartening to see the immediate, united effort that sprung forth to guarantee that an improved system will be tested and ready for the 2001 field year.

An 80-foot coring rig was prepared, moved to the vertical and then hoisted back up onto the platform - all operations which did not involve the winch. This operation was videotaped. It uncovered a few minor issues with cranes and handling, but these were easily solved. Thus in the rigging sense, the HEALY was proven ready to carry out up to 80 foot cores, the maximum length feasible with the current configuration.

Teacher Participation

The AICC could not have been more impressed with the participants from NSF's Teachers Experiencing Antarctic or Arctic (TEAA) program. Their enthusiasm, energy, and unique perspective helped to bring everyone on board together. More than that, they brought the ice trials and science systems tests to the public - to anyone with an internet connection - with accuracy, breadth, humor, and insight. The AICC urges that anyone wishing a closer look at the tests and trials examine their web sites:

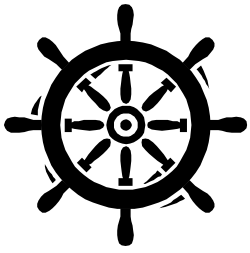
http://tea.rice.edu/tea_kolbfrontpage.html
http://tea.rice.edu/tea_klinkhammerfrontpage.html
http://tea.rice.edu/tea_rosenbergfrontpage.html
http://tea.rice.edu/tea_hindmanfrontpage.html
http://tea.rice.edu/tea_schauerfrontpage.html

Summary

The AICC will soon complete its report on the tests and trials program. After review and editing this will be publicly posted. The trials were not without problems - there is a long list of needed fixes and desirable upgrades - but in general the list is about as expected for any new research vessel. All parties are enthusiastic about getting the most needed work done promptly so that HEALY is ready for science cruises.

This fall the AICC will assist and advise the Coast Guard regarding scientific equipment and technical support requirements for the 2001 field season, which will include the first "paid science" cruises for the vessel.

Due to the yard demands of the post-shakedown warranty period, the ship will not be free until spring, but then is expected to have a busy Arctic science support schedule through late 2001. Future years look busy!



Research Vessel Operators' Committee (RVOC) - Activities and Plans

By Paul Ljunggren, RVOC Chair

Research Vessel Operators' Committee (RVOC) has had an active year with a variety of activities. Over the past year, NSF has placed greater emphasis on volume purchase. Two group purchases were funded. The first resulted in the purchase of 78 immersion suits for five institutions (Lamont-Doherty Earth Observatory, Oregon State University (OSU), University of Alaska, University of Michigan, and the University of Rhode Island). The second involved five institutions, University of Delaware (UDel), Scripps Institution of Oceanography (SIO), University of Washington (UW), OSU, and University of Texas (UT) requesting six portable lab vans. Of the six vans, two were general purpose, three were for radioisotopes, and one was for electronics. NSF requested that standard specifications be developed to allow all vans to be contracted for from one contractor. Matt Hawkins (UDel) has been working specifically with the four institutions requesting vans, and the community in general, to develop these specifications. These specifications can be found on the UNOLS website at: http://www.unols.org/rvoc/vanspec.html. An article about this effort is also included on page 16 of this newsletter.

Marine Superintendents operating vessels from seven UNOLS institutions met in Baltimore, MD on 22-23 March 2000 to discuss future plans for the upgrade or replacement of the regional vessels that they operate. Representatives from the UNOLS Fleet Improvement Committee, National Science Foundation, Office of Naval Research, and the UNOLS Office were also present. The group discussed the impact of new national and international regulations on regional vessels, and discussed revisions to the 1988 Science Mission Requirements (SMR's) for this class vessel. Plans for midlife refits on selected regional vessels were reviewed by those in attendance.

On 22 May, a meeting was held at WHOI to discuss future oceanographic cable and wire requirements. An issue that came out of this was establishing a standard maximum working load for the different types of UNOLS wire/cable. Currently standards for maximum workloads may vary from institution to institution despite the fact that the maximum working load may be for the same types of wire. A work group consisting of two members from RVOC and two from RVTEC has been assembled to investigate establishing a uniform standard for the maximum workload of our wires and cables. The work group members are Tom Althouse, SIO; Marc Willis, OSU; Theo Moniz, WHOI; and Rich Findley, RSMAS/HBOI.

All sections of the Small R/V Compendium have been received and forwarded to the UNOLS office for assembly and review. Jack Bash will write the introduction for the Compendium. The intent will be to post this document on the UNOLS website.

In the fall, both the Chair and Vice Chair of RVOC will have completed two terms in their current positions. A new Chairman and Vice Chairman will be elected at the October RVOC meeting. Nominations are being sought. To be eligible, the individual must be a Marine Superintendent or equivalent at a UNOLS Operator institution.

The 2000 RVOC Meeting will be hosted by Oregon State University on 24-26 October in Newport, Oregon. Information on the agenda is posted on the UNOLS website at: <http://www.unols.org/rvoc/rvomt010/rvoag010.html>.

Mark your calendar for the

Research Vessel Operators' Committee Meeting
October 24-26, 2000
Oregon State University
Newport, Oregon

UNOLS Standard Van Design

By Matthew Hawkins, University of Delaware

In 2000, five UNOLS operating institutions requested funds through NSF Shipboard Scientific Support Equipment proposals to construct portable scientific vans for use on their research vessels. These vans were either for entirely new purposes or to replace existing vans that were aging and in poor repair. In the past, each institution had constructed vans that were designed to be specific to their own operation. The details of construction followed a wide range of standards and configurations, which resulted in substantial variations in cost, quality, and arrangement. As a result, the scientific community had difficulty anticipating what to expect when utilizing vans aboard ships in the UNOLS fleet. The National Science Foundation encouraged the development of a standardized van design that would eliminate some of these problems. Specifically, the goals in developing this standard design were:

- To ensure safe design and construction of portable laboratory vans used on UNOLS vessels.
- To standardize certain design elements to best meet the needs of the scientific community.
- To make portable vans no longer "ship specific", and thus usable throughout the UNOLS fleet.
- To reduce overall cost by facilitating bulk purchase.

The van design is intended to be transportable between institutions and foreign ports, as well as used on different vessels. The ships involved may either be USCG inspected or uninspected. They are intended to be secured in a variety of locations from the main deck (forward or aft) to the 0-1 deck depending on the ship and the project. The types of vans addressed in this study were ones that would be normally occupied by personnel such as a general-purpose lab, isotope lab, berthing, or electronics lab. Refrigerator/ freezer vans (core storage), and mechanical vans (generator or air compressor) will require additional consideration in the future.

To develop this standard van design, the five operating institutions that requested vans formed a working group, led by the University of Delaware. Input was solicited by consulting with individuals at each institution who were familiar with van design and the use of vans in scientific operations. The input received ranged from specific design features required to meet the needs of each institution, to discussion of appropriate regulations and construction standards. Many critical arrangement details were standardized in the design process, including placement of electrical and plumbing services, the number and location of personnel doors and hatches, and recessing all appendages to permit transport by common carrier.

The first version of the specifications and drawings were sent to seven vendors to obtain initial quotes. Of the seven who were asked to bid on the project, four responded with detailed proposals and cost estimates. Three of the four quotes were within 5% of each other, and their figures were used in developing the proposal submitted to NSF. Based on these quotes, and the needs of the institutions involved, a total of five portable vans are requested during this round of construction.

At the present time, there is still some question as to precisely what fire rating the "box" either must, or should, be built to (Structural Fire Protection rules). This will in turn dictate whether or not a standard 20-foot ISO container can be modified to meet the intended purpose outlined in the specification (i.e. go from ship to ship and be secured in a variety of locations on board). To be conservative, all of the vendors suggested the vans be built to an "A" fire rating, which would require plating thicker than the 14 gauge steel in a standard container. Another concern is the panel stiffness on a 20-foot container for ABS rules. The University of Delaware's naval architect is reviewing current regulations and industry standards, as well as consulting with the US Coast Guard and the American Bureau of Shipping (ABS). The final decision may come down to what the UNOLS community feels is prudent.

The effect of having to build the van from the ground up is significant in two ways: 1) cost of construction, and 2) weight. The vendors were consulted to obtain estimates of the cost/weight savings if a standard ISO shipping container was modified, rather than all new construction as suggested. The results were an estimated cost savings of up to 35%, and a weight savings of approximately 6000 pounds.

It may be necessary to revise the concept that all vans be completely interchangeable between all classes of ships. Instead, it may be more appropriate to build two classes of vans: 1) a SOLAS rated van for use on expeditionary ships that typically

operate internationally, and 2) a "Domestic" van for use on smaller ships where weight of the van is a serious consideration. The domestic vans would be built by modifying a standard ISO container, thus reducing cost and saving weight. However, the required construction standards for all vans is still under review at this time.

The specifications and drawings have been posted on the UNOLS home page at: http://www.unols.org/rvoc/vanspec.html in order to obtain input from the other operating institutions that were not involved in the development of the initial design. The intent is to eventually solicit input from the scientific community who may use this standard to build project specific vans. Input from the community at large will be incorporated into the final design before the vans go to construction. The final specification may eventually be used as guidance for institutions or scientists who wish to construct their own vans.

Ship Scheduling Committee News

The summer UNOLS Ship Scheduling Meeting was held on 13 July 2000 at the National Science Foundation. Letters-of-Intent (LOI) for all ships were posted by schedulers in the weeks leading up to the meeting. These LOIs include a listing of potential cruises as indicated by the ship time requests submitted for 2001. The LOI for each ship were reviewed in an effort to identify conflicts, double bookings, problems with transits, and to ensure that the ships were appropriate to the science needs. These conflicts have since been discussed among the operators, funding agencies and PIs. Schedules will be drafted using the information contained in the LOIs. These schedules will be reviewed at the Ship Scheduling Review Committee meeting on 20 September.

The July scheduling meeting also included a brief discussion on the Letter of Intent, Scheduling and Ship Time request systems. Suggestions for improving the existing systems and procedures were made. Most of the suggestions involve enhancements to the web forms. It has also been recommended that the Ship Time Request form should be easily converted to a PDF file so that it can be attached to science proposals and submitted to NSF via fastlane.

It was recommended that a working group on continually improving the scheduling and ship time request system be established and include schedulers, scientists, UNOLS office staff and funding agency representatives. Anyone with suggestions for improvements to the ship time request and scheduling system should send them to the UNOLS Office, <office@unols.org>.

Permit and Permission Resources

A website titled, "Permits and Permission Resources," has been posted on the UNOLS website at, <http://www.unols.org/ssc/permits/permits.html>. This page has been put together to help Principle Investigators (PIs), schedulers and ship operators determine if permits and/or special permission are needed for research cruises. This website should be referred to by PIs as they prepare their Ship Time Requests. The site lists links that will hopefully aid in finding out what permits/permissions are needed and how to apply. Permit requirements for operations in National Marine Sanctuaries are included. Anyone who knows of additional Permit requirements that should be added to the web page should contact the UNOLS Office, office@unols.org.

Fleet Improvement Committee News

By Larry Atkinson, FIC Chair

The Fleet Improvement Committee (FIC) is actively trying to provide information about the state of the fleet to the community at large. To that end they have improved the web site containing FIC activities <http://www.unols.org/fic/>, they have published a 'Letter to the Community' in EOS (July 25, 2000, 81(30):334) and they are planning a letter in *Sea Technology*.

The letter in EOS was meant to focus people's attention on the immediate need for fleet planning. To do that FIC highlighted a figure showing what the future fleet would look like if no replacements occur. With in 5-10 years we will have less ship days available than we predict will be needed. The EOS letter refers to the UNOLS web site <www.unols.org/fic/planning/fltplan.htm> for additional documentation on the fleet and its utilization. This site is being upgraded to include more information on trends in the fleet. The online information now includes plots of the following:

- Historical use of the fleet ship size
- Historical number of bunks used on ships
- Projections of the fleet composition with assumptions about retirement schedules

Also, because of the renewed interest in ship construction, all UNOLS Science Mission Requirements (SMRs) are being posted on-line. The SMRs on-line include the following:

- Large High-endurance, General-purpose Oceanographic Research Ship
- Large Medium-endurance, General-purpose Oceanographic Research Ship
- Large High-performance, General-purpose Oceanographic Research Ship, Small Waterplane Area Twin Hull (SWATH)
- Intermediate General-purpose Oceanographic Research Ship
- Intermediate General-purpose Oceanographic Research Ship, Small Waterplane Area Twin Hull (SWATH)
- Intermediate Ice-Capable General-purpose Oceanographic Research Ship
- Small General-purpose Oceanographic Research Ship
- Small General-purpose Oceanographic Research Ship, Small Waterplane Area Twin Hull (SWATH)
- Manned Spar Buoy (FLIP)
- Intermediate, Ice-Strengthened, General Purpose, and Fisheries Oceanography R/V

In other activities, several members of FIC participated in a workshop at Oregon State University in August. The purpose of the workshop was to address how future science needs might change requirements of the fleet. The increased use of AUV's for example may require ships to have sophisticated AUV deployment and recovery systems. Interestingly all perceived developments in the field require very high bandwidth communications 24 hours a day. For more information about the workshop, see the article on page 7.

SHIPS CONSTRUCTION PROJECTS

AGOR 26 - The AGOR 26 construction project is progressing. Model tests were conducted in San Diego during the spring. Atlantic Marine Inc. (AMI), the ship construction yard, plans to start construction in the late summer/early fall 2000. The ship will be built modularly. Construction is expected to be complete by May 2001.

R/V SAVANNAH - Skidaway's plans for construction of R/V SAVANNAH, BLUE FIN's replacement, are well underway. The contract for construction has been let.

F. G. WALTON SMITH - F. G. WALTON SMITH was delivered on 2 February and has been conducting research cruises. The ship is reported to be very stable and has operated well in fifteen feet seas. University of Miami is very pleased with the vessel.

CAPE HENLOPEN Replacement – The University of Delaware is proceeding with their replacement plans for CAPE HENLOPEN. Science Mission Requirements for the vessel have been drafted and were forwarded to the FIC for review and comment. FIC's comments are being incorporated into the SMR document.

ALPHA HELIX Replacement plans -The University of Alaska has submitted a proposal to NSF for design of an ALPHA HELIX replacement. Their proposal has received an endorsement from both the FIC and the NMFS.

NOAA/National Marine Fisheries Service (NOAA/NMFS) Fisheries Research Vessels (FRV) - The bid package for construction of the NOAA Fisheries Research Vessels (FRV) was advertised in June and was open for 60 days. Competition for acquisition of the FRVs was open to all shipbuilders. After receiving bids, there will be a review which will take about six weeks. NOAA hopes to have a contract out by October 2000. It should then take three years to build and outfit the six vessels. The web site with information on the NOAA FRV is at: http://www.sao.noaa.gov/frv

WHOI SWATH - Woods Hole Oceanographic Institution's (WHOI)'s plans to build a 105-foot SWATH vessel are moving forward. They received a large funding donation. The SWATH has been specifically designed to work year-round in New England coastal waters. Their plans can be seen on the web at:
http://www.marine.whoi.edu/ships/swath/index.html

2000 Calendar for UNOLS Meetings

Meeting	Location	Dates
Schedule Review	NSF, Arlington, VA	September 20, 2000 (Wed)
FIC	NSF, Arlington, VA	September 20, 20000 (Wed)
UNOLS Council	NSF, Arlington, VA	September 21, 2000 (Thurs)
UNOLS Annual	NSF, Arlington, VA	September 22, 2000 (Fri)
RVTEC	Palisades, NY (LDEO)	October 18 - 20, 2000 (W-F)
RVOC	Newport, OR (OSU)	October 24 - 26, 2000 (T-Th)
DESSC	San Francisco, CA (AGU)	December 14, 2000 (Thur)

Mark your Calendar

UNOLS ANNUAL MEETING

8:30 A.M., Friday 22 September 2000
National Science Foundation, Room 1235
4201 Wilson Boulevard Arlington, VA

To view *UNOLS News* on the Web, visit the UNOLS Homepage:
http://www.unols.org

I would like to thank all who contributed information and articles for this issue of the Newsletter. Articles are always welcome and encouraged. Copy can be submitted via mail, FAX or e-mail. The next newsletter is planned for winter 2000/2001.

Thank you, Annette DeSilva - Editor, UNOLS News

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