

UNOLS Ship Scheduling Procedure Review Committee

Report of Meeting - 7 January 1997

National Science Foundation, Room 730
4201 Wilson Boulevard
Arlington, VA

APPENDICES

- I. [Agenda](#)
- II. [Attendance List](#)
- III. [Charge to Committee](#)
- IV. [Proposed Two-part Ship Time Request Form](#)

BACKGROUND:

A major goal and responsibility of UNOLS is to coordinate the scheduling of the academic research vessel fleet to maximize scientific access to the ocean while minimizing the cost. While this has always been a difficult task, the procedures adopted by UNOLS have generally worked well. However, in recent years, a variety of factors have conspired to further complicate the scheduling process. These include: 1.) the proportion of Chief Scientists who are from outside the ship's operating institution has increased; 2.) the number of large ships in the fleet has grown, increasing the global nature of the expeditions to be scheduled; 3.) increased ship size has increased the number of Principal Investigators (P.I.s) participating on individual cruises; 4.) the number of Federal agencies providing significant ship support has increased; and 5.) the number of unique, specialized pieces of equipment, such as deep submergence vehicles, that need to be included in the scheduling process have increased.

Because of these factors, the scheduling process in recent years has become more difficult. It was considered timely, therefore, to review the scheduling process. A committee was formed (see [Appendix II](#)) consisting of representatives from the science, ship operators and Federal agency communities to evaluate all aspects of the scheduling procedures ([Appendix III](#) - Charge to Committee). Prior to the meeting, each committee member was asked to provide a listing of the present weaknesses in the procedures and suggested improvements. The items on each list were combined and formed the basis for the agenda ([Appendix I](#)).

PERCEIVED WEAKNESSES

Information Exchange - The effectiveness of information exchange during scheduling was the most commonly cited concern. The consensus was that improved information exchange was needed in three areas. First, the schedulers always do not have sufficient information concerning the scientific requirements for each expedition. The factors that contribute to this are that the information is not requested on the present ship time request form (831) and requirements change between the initial submission of the 831 form and the expedition due to changes in planned activities and additional P.I.s. Basically, 831 forms are not updated as requirements change and certain kinds of information, such as conflicts with teaching schedules and other expedition schedules, are not included in the form. Additionally, some of this information may be lost when expeditions are moved between operators.

Secondly, it was observed that schedulers do not always have sufficient information about ship and port characteristics. If certain expeditions are moved onto other ships, can they perform the required operations, can they enter required ports, etc.? Finally, P.I.s do not always have access to preliminary schedules to identify conflicts or know what information to supply to the schedulers to facilitate this process.

Insufficient Project Tracking - Another common concern was that there is no formal mechanism to track a particular project. It would be possible to make sure that every funded project is scheduled and identify out-year scheduling requirements and commitments with better tracking.

Cost Benefit Analysis - It was suggested that the absence of a rigorous cost-benefit analysis was a weakness in the present scheduling process. However, in the discussion that followed, there was no clear consensus within the committee. Many on the committee felt that much of the present process is already focused on a cost analysis. Indeed, much of the scheduling decisions are driven by an attempt to minimize overall costs, primarily related to transit time, appropriateness of vessels and to maximize research days. The discussion centered on whether a rigorous mathematical, computer-based analysis could improve on the analysis provided presently by the operators. No consensus was reached.

Timing of science meetings and milestones - The ever increasingly complex scheduling process requires that funding decisions and priorities are established prior to the scheduling meetings. It was decided to re-visit the timing of the meetings to ensure that decisions were made in a timely manner but with as much information as possible.

Other factors - One additional factor that was discussed was the problems related to inconsistent charges related for equipment and technical services at the different institutions. Shifting an expedition between operating institutions can routinely impact the science budgets. While not directly affecting the scheduling process, this remains an important consideration for many scientists.

RECOMMENDATIONS

Revise the ship-time request form. The form would be revised into a two-part form. The first part would request much of the information that is presently on the 831 form. This form would be submitted electronically and in hard copy with the proposal and would be used to provide information related to the funding decision and in establishing preliminary ship schedules. A second form would then be required for projects that are funded. This form would request more detailed information concerning ship operational requirements, potential conflicting commitments, etc. to aid schedulers in establishing the final schedules. An example of the proposed forms is provided in [Appendix IV](#).

Develop a ship-request tracking system-relational data base. A tracking system should be developed to ensure that every funded project is scheduled and out-year commitments and requirements are tracked. This system may be similar to those systems already developed and in use by SIO and UW whereby P.I.s names appear at locations on work charts for each requested expedition. These names are hypertext-linked to the full ship time request form so that that information is easily accessible.

Automate the procedure for soliciting P.I. input on preliminary schedules and schedule changes. To encourage P.I. participation and feedback in the scheduling process, it is recommended that the preliminary schedules be posted on the internet and that this posting should be announced to all P.I.s through a community-wide letter or email. This would allow the P.I.s to participate in the scheduling process at an early stage. Furthermore, it was suggested that an automated procedure be developed whereby P.I.s would be notified by email whenever a schedule on which they appear changes. Also, schedules should be maintained by their home institutions and simply linked to the UNOLS Homepage and OCEANIC. This would prevent the possibility of different schedules for the same vessel appearing in the different data bases.

Standardize procedures for all users. All users should use the same request procedures in order to facilitate the scheduling process. Many NOAA and ONR users already submit the standard forms and we should encourage this.

Optimize scheduling meeting and procedure times. Although there is not a lot of latitude between when funding decisions are made and the schedule finalized, some optimization in the timing of the individual milestones was discussed. It was recommended that the process consist of:

- May/June - Regional communications as needed to develop preliminary schedules.
- May/June - Electronic submission of all institutional schedules.
- June/July - Ship Scheduling Review Group meets in Arlington, VA.
- August - Focused communications to resolve problems as needed.
- September - Full scheduling committee meeting in Arlington, VA followed by a meeting of the Ship Scheduling Review Group.

Cost Benefit Analysis System. No consensus was reached concerning the development of a rigorous cost analysis system. However, it was suggested that a list of criteria be developed that are to be considered when comparing potential alternate schedules. Such a list might provide a tangible framework in which difficult scheduling decisions can be justified and documented.

Variable costs should be handled by Program Managers on an individual basis. It was generally agreed that differences in charges for equipment rental and technical support can significantly impact science budgets. However, the committee recommends that this continue to be handled on an individual basis by the cognizant Program Manager.