

MEMO TO: Fleet Replacement Committee

FROM: R. P. Dinsmore

25 July 1984

Woods Hole Oceanographic Institution
Woods Hole, MA 02543
Phone: (617) 548-1400
Telex: 951679



Attached is a copy of the letter and large ship requirements which is going out to all hands.

I have faithfully attempted to include all of our deliberations but have been compelled to take the liberty of making some minor alterations. These are:

1. The "size" statement is back at the beginning -- no change in wording -- but most of my helpers, including naval architects, say it's better here so that a viewer can picture it from the start.
2. MCS "requirement" included up front as a portable installation bearing in mind that this is a general purpose ship. This eliminates the need for the "specialized discipline" page.
3. The articulated stern ramp is still there with a more descriptive statement.
4. Both biologists and chemists have teamed up to plead for a separate analytical lab claiming that fencing of part of the main lab just won't do it.

Bob

R. P. Dinsmore

Attachment
RPD:crm

Copy to: W. D. Barbee
R. W. West

Capt. R. P. Dinsmore
19 July 1984
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consideration by some subgroup either at the January workshop or, perhaps more appropriately, in some separate meeting (which I would be glad to work on) focused primarily on innovative craft.

With regard to sailing oceanographic ships, Jack Langille, who was involved in the Frontier Challenger design studies (Oceanus, spring '82), has indicated that we can probably arrange to have use of their sailing ship design and performance studies as one of the "conceptual design" inputs to our workshop. This was a good look at the conventional hull approach to this problem and should put that matter into good perspective.

Hope things are continuing to move along. I'll be in touch in a couple of weeks.

Sincerely

F. N. Spiess

Director

Institute of Marine Resources



cc: J. Langille
G. Shor
J. Williams
R. Knox
New ships meeting attendees



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OFFICE OF THE DIRECTOR

19 July 1984

Capt. R. P. Dinsmore

Marine Operations

Woods Hole Oceanographic Institution

Woods Hole, MA 02543

Dear Bob:

I will be away from my office on vacation for the next two weeks and thus, since the new version of the general purpose ship requirements has not arrived, I will not be able to react to them in a timely manner. I felt, however, that we were in agreement on a reasonable list, thus it does not seem necessary for me to make further input at this time.

I did convene a small meeting here at SIO yesterday to talk about our committee's activities. My account of the ship requirements was accepted without much comment, although I emphasized that a number of SIO people would be receiving copies of the smooth version for comment in the near future. I could not remember whether we agreed that I would do the SIO distribution or not. I would be glad to do so and will leave word to that effect with my Assistant here so that she can take care of it while I am away. In any event I would appreciate receiving a copy of your distribution list so that I can see whether there are people I should inform in addition to those to whom you will have sent the document.

Our local meeting reinforced the feeling that the most useful improvement we could make would be to enhance ability to work in heavy weather (physical, chemical, biological and acoustic fields primarily). Also the growing need for larger scientific parties in the context of on-site analyses and experiments by biological and chemical oceanographers was emphasized.

Discussion of "innovative" ships took two different directions—one was toward functions falling outside the envelope of logical general purpose ship performance requirements and the other had to do with ship types (in addition to SMATH) which are not now included in the academic research fleet.

In terms of functions there was reasonable discussion of three. One was long-term (several months or more) continuous occupancy of a single station. Another was ability to support operation of sea floor work vehicles, submarines, etc. Third was ability to work in (or under) very stormy seas. These led quite naturally to discussions of floating islands, ocean engineering support craft and full size submarines capable of doing physical, chemical and biological oceanography. At the very least we should gather information from prior studies of these options for

Worth D. Nowlin, Jr.

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Sincerely,

* Special purpose vessel needs. As we move toward more specialized sampling equipment the need increases for research vessels 'almost' dedicated to specific oceanographic disciplines. As the special purpose needs change so do the requirements for such vessels. This may render existing vessels obsolete without major modification, which must be weighed against replacement.

* Operating costs exceed construction costs. Because construction costs are but a fraction of the total operating costs over the life of a vessel, we must be prepared to build new vessels which are designed with cost effectiveness in mind. Changes in vessel design or operating concepts can lead to lower operating costs, e.g., the unattended engine room of the GYRE and MOANA WAVE were not state of the art when the earlier AGOR's were built. This is also true of scientific gear handling equipment. The morals here are not to skimp on construction costs and not to overlook innovative concepts.

* Operational costs. Perhaps we can show a cost analysis which supports retirement relative to some age range. As vessels age the first items to fail are likely to be in the class of auxiliary equipment (pumps, boilers, etc.). And, the development time of such equipment is short compared with the main plant, so spares/parts are difficult to obtain or unavailable, forcing their replacement. Their replacement with new models leads to increased costs and some (though probably not great) loss of operating time. However, from a purely cost basis, it seems unlikely that there is a sharp knee in the operating cost vs time trend until the basic plant or hull must be replaced/modified.

(2) If the replacement were on a continuing basis, designs of each new vessel in a specific size range could benefit from the experience gained from foregoing vessels in this range.

(1) The system can't afford the costs of constructing an entire fleet every so many years, but could budget some amount to be used each year for an orderly replacement program. If a new vessel were constructed every 1-1/2 to 2 years, the fleet replacement time would be about 30-40 years. Special circumstances would force some deviation of course, but such a program would be fiscally feasible.

DEPARTMENT OF OCEANOGRAPHY
TEXAS A&M UNIVERSITY
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JUL 24 1984

R P D

19 July 1984

Dear Bob:

Captain Robert P. Dinsmore
Marine Operations
Woods Hole Oceanographic Institution
Woods Hole, MA 02543

I found the Fleet Replacement Committee meeting more interesting than I had expected. I am enthusiastic regarding the possibility that our report will be a basis for action, unlike the previous studies.

Since our meeting I have thought a bit more about the criteria, or reasons for replacing research vessels. This surely must be included as an important part of our report. We cannot just specify an age as a criterion for replacement, anymore than we could do so as the criterion for replacing a building. It seems that a specified lifetime is a yardstick applied by profit making concerns and is tied to investment amortization (which in turn depends on specific business climate, short and long-term interest rates, etc.) but should not be used as a criterion by the public research community. We must develop our own, defensible criteria. I offer the following points (based largely on our discussions in Monterey) for further consideration.

* Changes in the science. Though there is still a need for survey cruises, we have seen oceanography progress from an era of discovery to an era of process studies. This has meant that outright data/sample collection has been replaced by cruises on which there is the need to analyze and even interpret data as well as collect them. The concomitant requirement is for more equipment, larger scientific complements, better seakeeping and in some cases increased endurance.

* Technological obsolescence. Ships become obsolete in the sense that technological development offers features and capabilities which are needed or desirable but which existing vessels cannot accommodate economically, if at all, e.g., the sea kindliness of SMATH design.

* Continuing fleet replacement. Replacement of the fleet should be spread out over time so that it is on a continuing basis. A fiscal advantage to replacing the fleet with by vessels of a few specific classes is realized only if one has coordinated operation of a reasonably large number of vessels, e.g., a class of submarines by the Navy. The academic community has diverse operators and too few vessels in any one class. There are two reasons for a continuing replacement program.

TO: Fleet Replacement Committee

FROM: R. P. Dinsmore

SUBJECT: Reports/Agenda

Enclosed are three reports which may be of interest.

1. The Report of the NECOR Meeting will form a significant part of our ship requirements effort for the Conceptual Design Studies -- unless we choose to amend any parts of it. Please review it and be prepared to introduce any additions, deletions, etc.
 2. The NSF/OFS Draft of their Long Range Plan has some interesting aspects which may reflect NSF views on ship needs.
 3. USC Replacement study indicates that their aspirations for a tuna clipper are not fully expired. Just what sort of a hull should replace VELLERO IV is receiving a great deal of attention.
- Three matters which are going to need attention in a parallel fashion to the conceptual design studies are instrumentation, and shipboard data processing. These are probably beyond the scope of the Naval Architects. Probably small working groups selected from within UNOLS (with consultants) might be the best approach. Any ideas here?
- I look forward to seeing you on the 9th. Please advise me if you are unable to attend.

R. P. Dinsmore

Bob

RPD:crm
Enclosures

P. S. In view of the current interest in SMATH ships, a report of my visit to KAIMALINO is attached,

2 July 1984



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- August - Develop and circulate to Committee and other reviewers draft science requirements for large research vessel of existing size class
- August - Complete draft of First Committee Study Report on Requirements for Fleet Replacement
- September - J. Martin, et al., complete draft of set of requirements for use in conceptual design of SWATH coastal vessel
- September - Solicit RFP for conceptual design studies for additional (largest) research vessel and large (existing size) research vessel
- 4-5 October - Next Committee meeting in Washington, D. C. Agenda items to include 1) Review of ongoing conceptual design studies, 2) Contractor selection for additional design studies, 3) Review and approval of First Study Report to UNOLS, and 4) Workshop preparation
- 24-25 October - UNOLS Semiannual meeting. Report on Fleet Replacement

1985

7-11 January - Community-Wide Workshop

R. P. Dinsmore
30 July 1984

- b) Scientific requirements for large ships (envisioned between 250-300 ft.) developed by April, 1984 NECOR meeting were reviewed and adopted for UNOLS planning with several amendments. These requirements will be distributed widely to the community for information and the opportunity for comments.
- c) The Committee recommended two further large ship design studies:

- one additional largest (250-300 ft.) conventional ship totally separate from the current W.H.O.I. design

- a design of new general purpose ship in about the size range of existing ships. A set of scientific requirements needs to be developed for this. To be based on existing large ship requirements and circulated for review.

Proposals for the above design studies to be solicited in August-September in time for contractor selection at next Committee meeting in October when, hopefully, funds will be available for support.

- d) Proposals in hand for the New & Innovative Platform category comprise only small vessels of the light multi-hull sailing type. Because these fall more into small ship size, the Committee decided to defer their accomplishment until the small ship requirements are in and additional funds are available.

- e) *NOTE: Subsequent to the meeting, Fred Spiess held a meeting at San Diego which dealt with innovative ships. A copy of his letter regarding that is attached.*

6. Workshop

In order to allow completion and reviews of all the design studies and to assure the possibility of support, the Community-Wide Workshop previously planned for Mid-November is rescheduled for early January. Skidaway or University of South Florida were suggested as possible locations.

7. Schedule of Events

1984

- 20 July - Circulate draft to community of Science Requirements for Large(st) General Purpose Research Vessel
- 25 July - Let W.H.O.I. Conceptual Design Studies of one SWATH and one conventional ship

4. Fleet Planning

- a) First Study Report in progress; to elements of the NECOR Conference 19-20 April 1984 and NSF Long Range Planning Documents plus extracts and references to existing re-ports: OSB, UNOLS Advisory Council, FOFC, etc.
- b) Key element is planned retirements. Based on 30-year age criterion, current fleet replacement pattern would be:

PROJECTED RETIREMENTS FROM UNOLS FLEET
Based on 30-year Age Criterion

1985-1989	1990-1994	1995-1999	2000-2004	2005-2009	2010-2014
VERONA 2	WARFIELD ALPHA HEIK F RICE KNORR MIFVILLE TKIPSON 7	ISLEIV 3	MANA WAVE GYRE 3	NEW HURON CAPT NEWELL 5	CAPE FLORIDA 3

Age alone is not sufficient criterion. Planned retirements should be based on material condition, science capability, shortcomings of existing ships. NOTE: A letter by Worth Nowlin addressing this subject is attached.

- c) Earlier attention should be given to other classes than large. For example, successful new intermediate ships are making older, larger ships obsolete. Some small ship problems require urgent action. For example, CAYUSE cannot be fully utilized north of Point Conception. The Committee approved an informal meeting at MLML to develop requirements and characteristics for small research ships in high coastal sea state environments. (Emphasis here to be on SWATH ships.)

5. Conceptual Designs

- a) Conceptual design studies are currently being supported by University of Texas for geophysics ships -- both conventional and SWATH; and by W.H.O.I. for large general purpose ships -- one conventional and one SWATH.

File: Fleet Replacement Committee
Mtg Reports

UNIVERSITY - NATIONAL OCEANOGRAPHIC LABORATORY SYSTEM

COMMITTEE ON FLEET REPLACEMENT

An association of institutions for the coordination and support of university oceanographic facilities

REPORT of MEETING of UNOLS FLEET REPLACEMENT COMMITTEE

9 - 10 July 1984

1. The UNOLS Fleet Replacement committee met at Moss Landing Marine Laboratory on July 9-10, 1984. Present were:

- R. P. Dinsmore, Chm.
- F. N. Spiess
- G. H. Keller
- W. D. Barbee, UNOLS Office
- J. H. Martin
- R. W. West, NSF (OFS)
- D. W. Menzel

Copy of agenda is appended.

2. Current Fleet Activities

a) MOANA WAVE (University of Hawaii) being stretched from 174 ft. to 207 ft. and will re-enter service in Fall to replace KANA KEOKI. Later will remain at Hawaii in "standby" status.

b) Scripps has replaced 96-ft. E, B, SCRIPPS with a 3-year old 125-ft. oilfield supply vessel.

c) VELERO IV (USC) replacement still under consideration. UNOLS Advisory Council has recommended one of the two Miami ships be reassigned to USC.

d) NSF is replacing HERO (125 ft.) with POLAR DUKE (220 ft.). Later will be able to provide greater science support in Antarctic area.

3. Proposal Status

The Fleet Replacement Proposal is being amended to reflect two stages: First (now) -- through the "Workshop" (mid-term), and Second -- subsequent to Workshop. Later phase to reflect greater attention to intermediate and small size ships. Support of proposal from NSF/ONR is lagging due to curtailment of end-of-year funding. Work, however, continues with conceptual designs funded by University of Texas and Woods Hole; travel supported by UNOLS Office; and Staff support by Woods Hole.